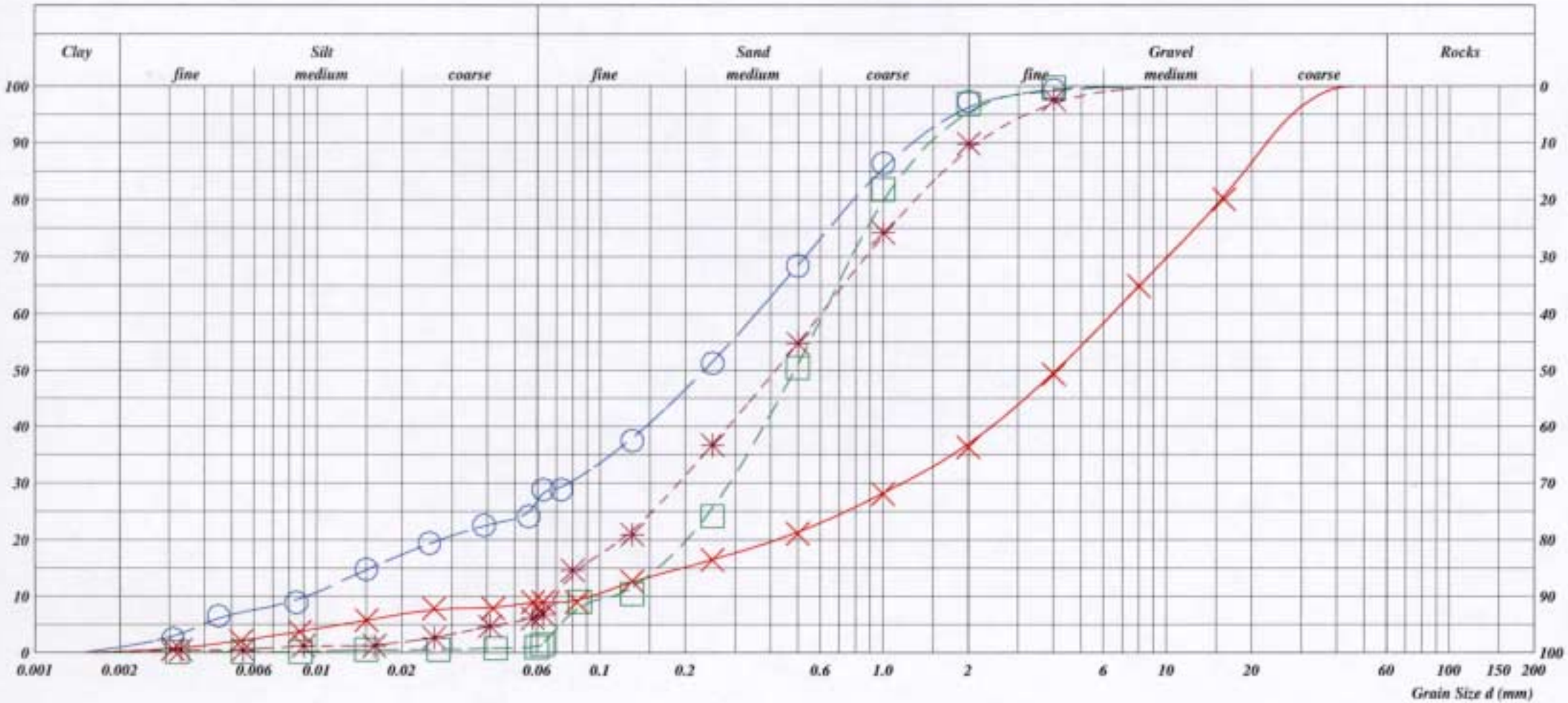
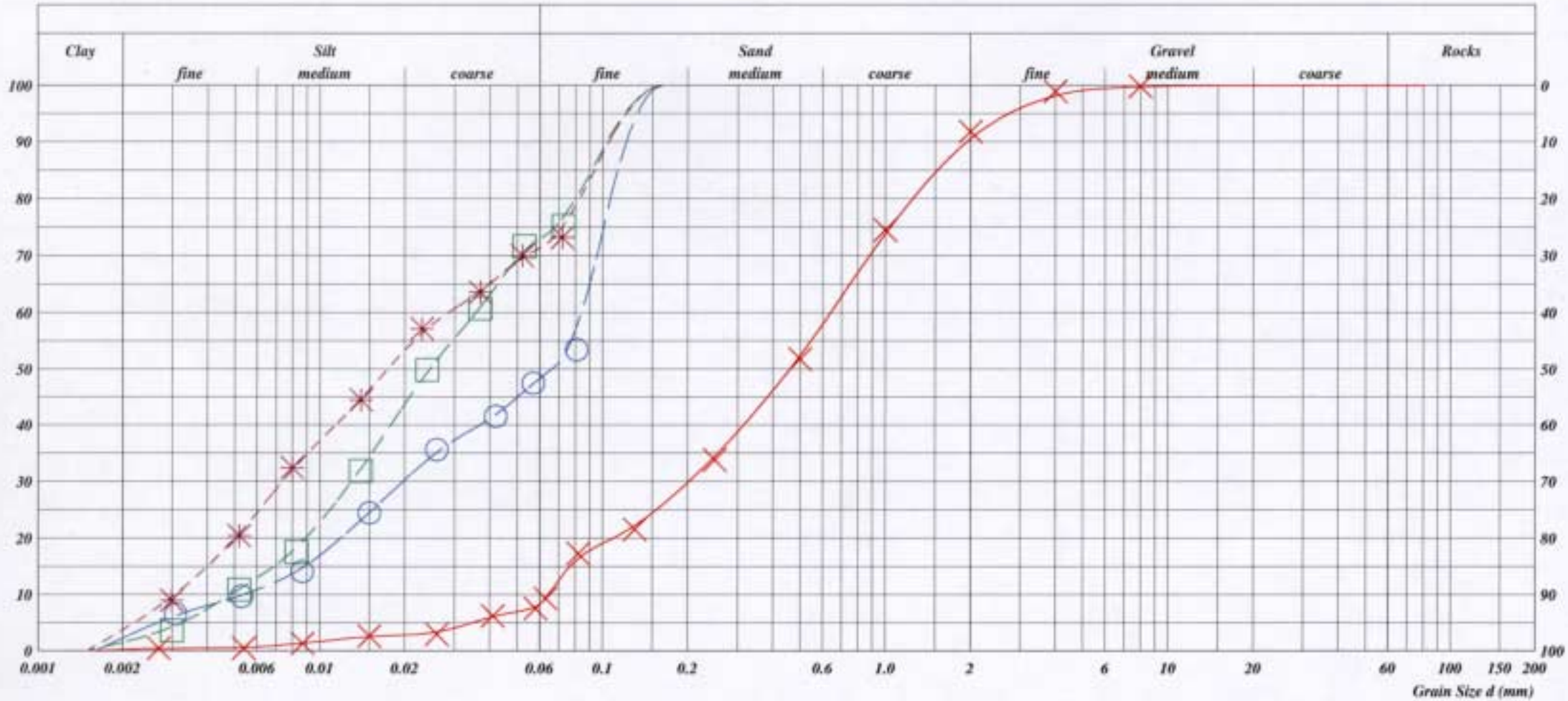


Uranium Tailings Schneckenstein	Labratory No.	Outcropp No.	Depth (m)	Line	Soil Name	Water Content (%)	Grain Density (g/cm^3)	Permeability (m/s)	VGl %	VCa %
	II/1	BPII	0-0.5m		G,cs',ms',fs',cl'	7.98	1.61	7.4E-5	1.32	0.29
	II/2	BPII	0.5-1.5m		S,cl	9.37	1.56	3.2E-7	2.99	0.21
Borehole N°2	II/3	BPII	2.5-3.5m		S	19.96	1.59	1.4E-4	1.84	0.26
	II/4	BPII	3.5-4.5m		S,fg',cl'	13.57	1.52	7.0E-5	2.81	1.42

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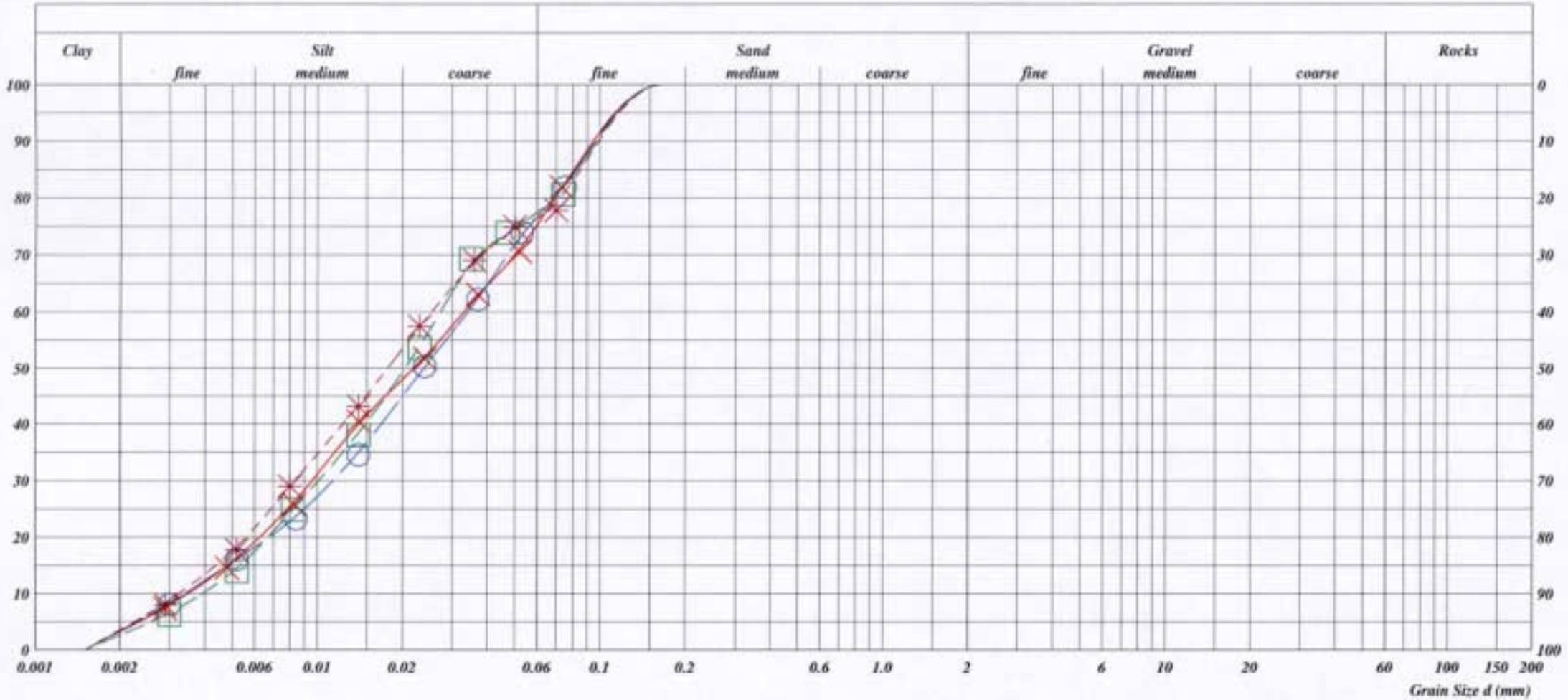


Uranium Tailings Schneckenstein	Labratory No.	Outcropp No.	Depth (m)	Line	Soil Name	Water Content (%)	Grain Density (g/cm^3)	Permeability (m/s)	VGl %	VCa %
	II/5	BPII	4.5-5.5m		S,fg',cl'	20.82	1.62	5.2E-5	2.7	1.90
	II/6	BPII	5.5-6.5m		Cl+fS+S	21.75	1.9	1.2E-7	5.72	4.13
Borehole N°2	II/7	BPII	6.5-7.5m		Cl,fs	19.4	1.98	4.0E-8	4.91	6.41
	II/8	BPII	7.5-8.5m		Cl,fs	21.2	1.97	1.0E-7	6.51	4.30

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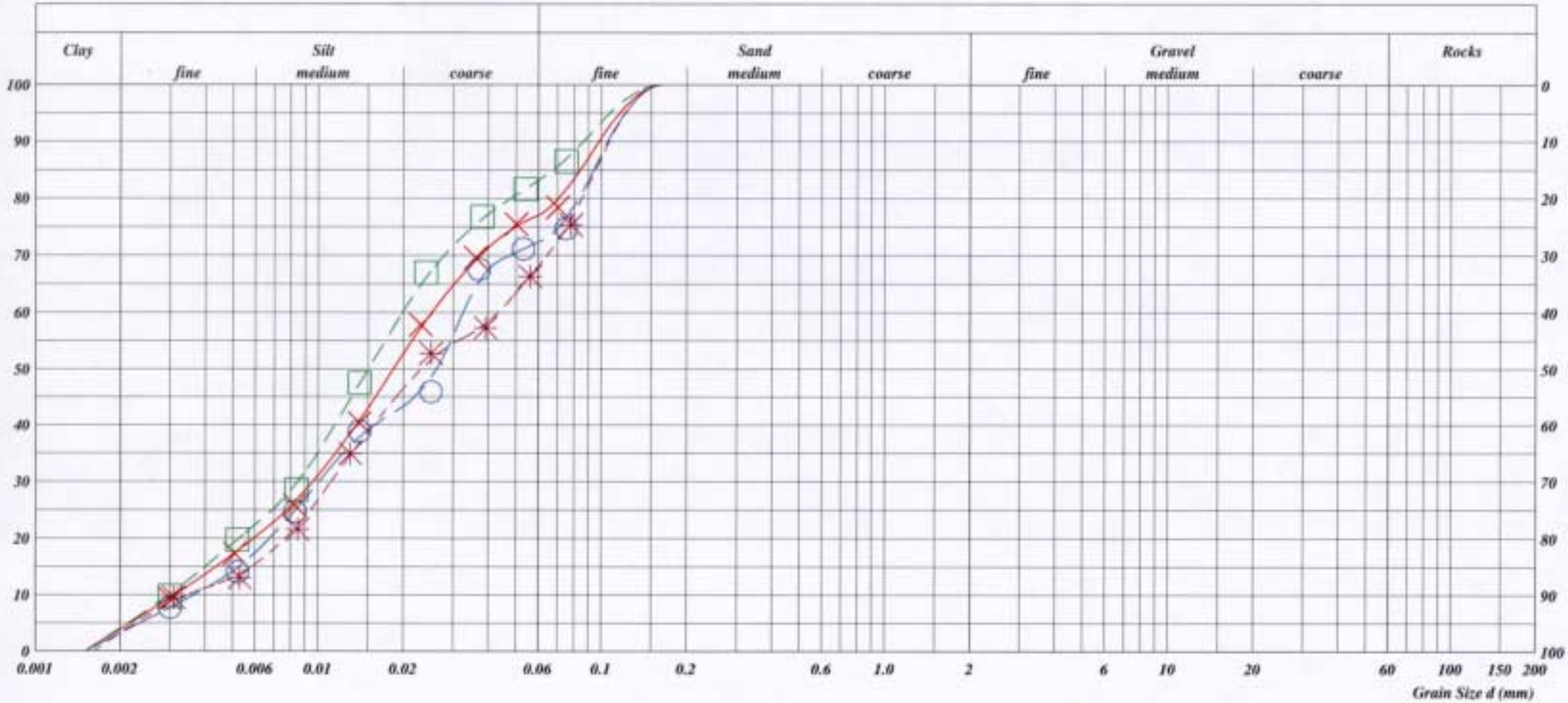


Uranium Tailings Schneckenstein	Labratory No.	Outcropp No.	Depth (m)	Line	Soil Name	Water Content (%)	Grain Density (g/cm^3)	Permeability (m/s)	VGl %	VCa %
	II/9	BPII	8.5-9.5m		Cl,fs	19.45	1.95	3.1E-8	3.76	3.85
	II/10	BPII	9.5-10.5m		Cl,fs	19.74	1.99	3.1E-8	3.92	3.67
Borehole N°2	II/11	BPII	10.5-11.5m		Cl,fs	19.09	1.99	6.1E-8	5.67	4.23
	II/12	BPII	11.5-12.5m		Cl,fs	18.54	1.91	1.2E-7	5.46	4.24

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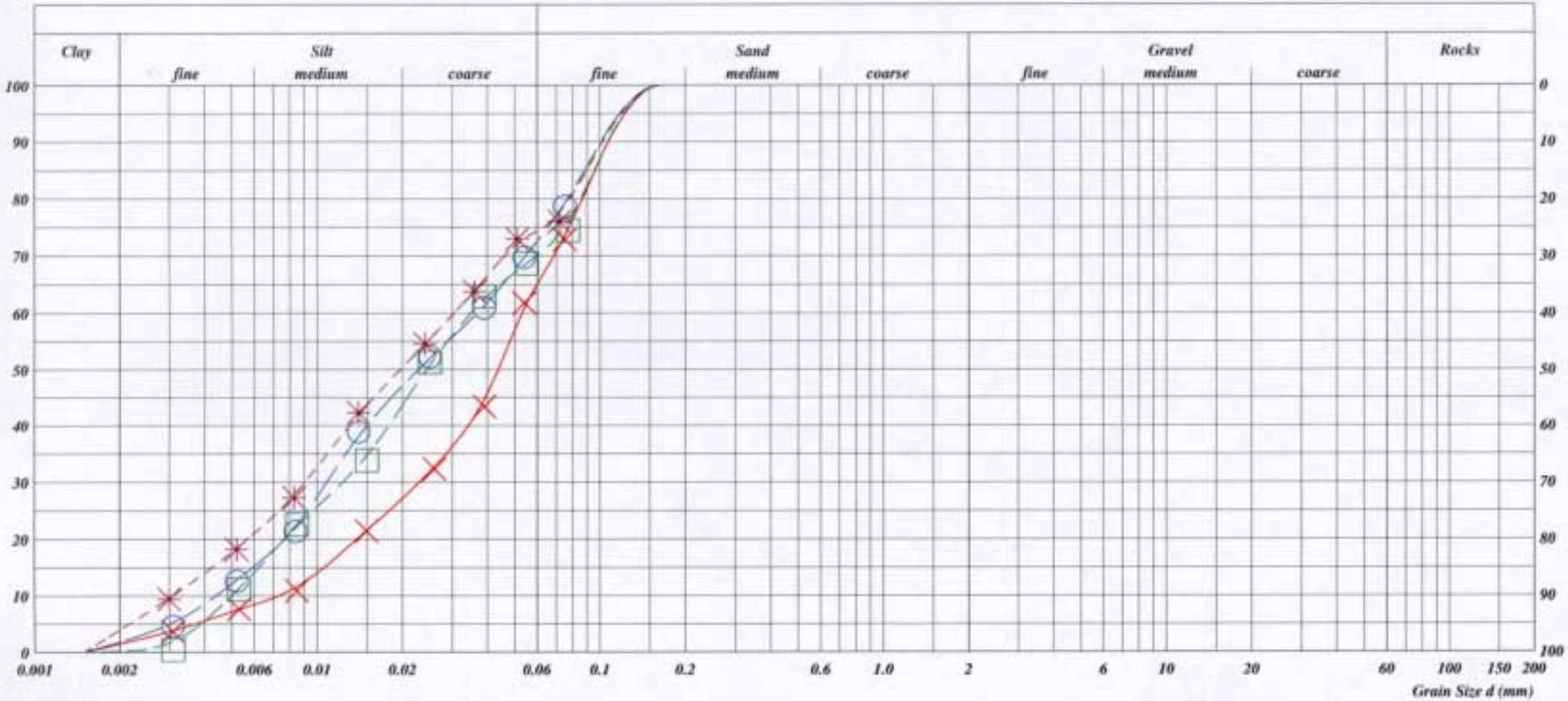


Uranium Tailings Schneckenstein	Labratory No.	Outcropp No.	Depth (m)	Line	Soil Name	Water Content (%)	Grain Density (g/cm^3)	Permeability (m/s)	VGl %	VCa %
	II/13	BPII	12.5-13.5m		Cl,fs	20.35	1.96	5.8E-8	4.19	3.65
	II/14	BPII	13.5-14.5m		Cl,fs	18.66	1.59	4.5E-8	3.73	2.52
Borehole N°2	II/15	BPII	14.5-15.5m		Cl,fs	20.4	1.86	4.4E-8	3.06	1.47
	II/16	BPII	15.5-16.5m		Cl,fs	17.81	1.90	7.4E-8	3.91	2.23

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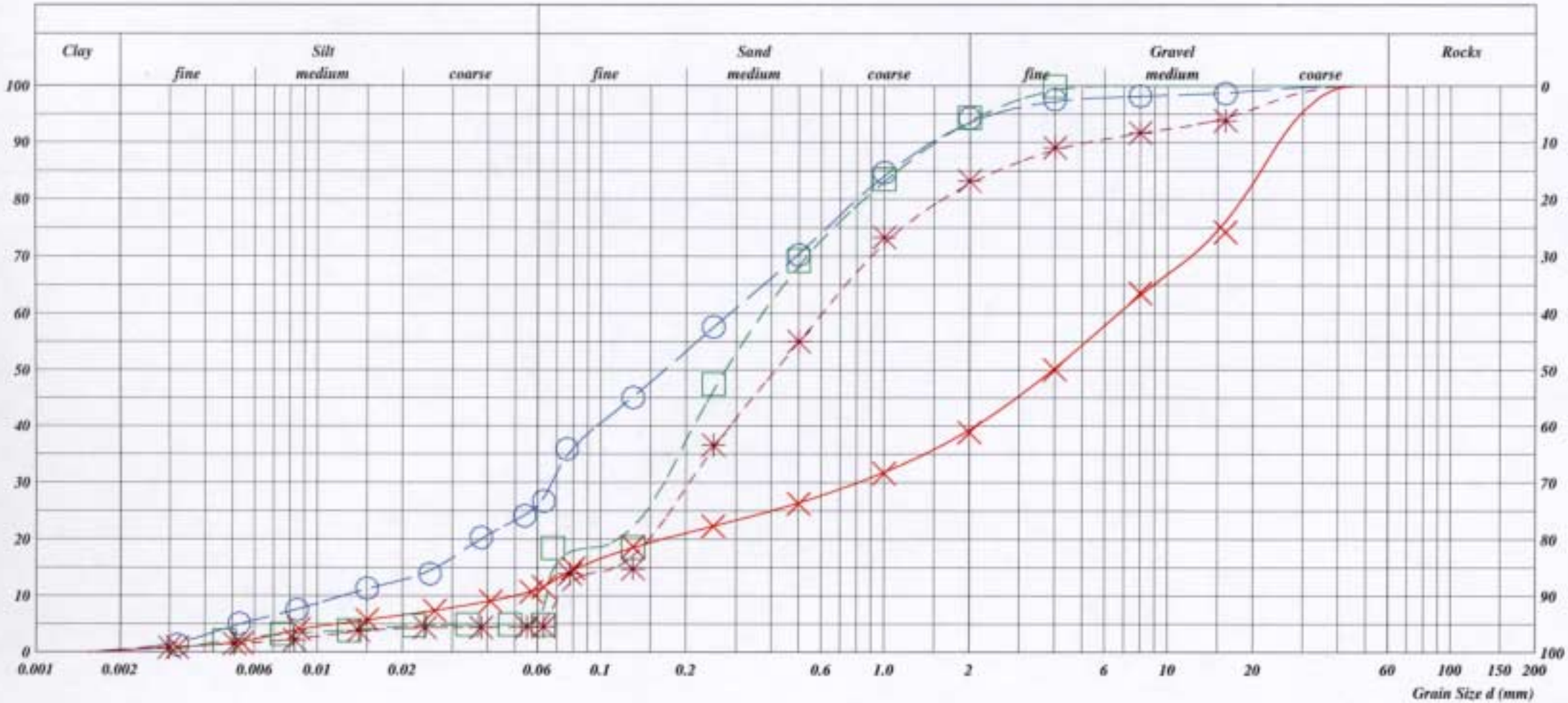


Uranium Tailings Schneckenstein	Labratory No.	Outcropp No.	Depth (m)	Line	Soil Name	Water Content (%)	Grain Density (g/cm^3)	Permeability (m/s)	VGl %	VCa %
	II/17	BPII	16.5-17.5m		Cl$\bar{fs}$	18.5	1.96	4.0E-7	3.68	1.99
	II/18	BPII	17.5-18.5m		Cl,fs	19.54	1.89	3.1E-8	3.47	2.46
Borehole N°2	II/19	BPII	18.5-19.5m		Cl,fs	19.4	1.87	1.5E-7	5.3	3.82
	II/20	BPII	19.5-20.2m		Cl,fs	13.46	1.88	5.4E-8	4.19	0.49

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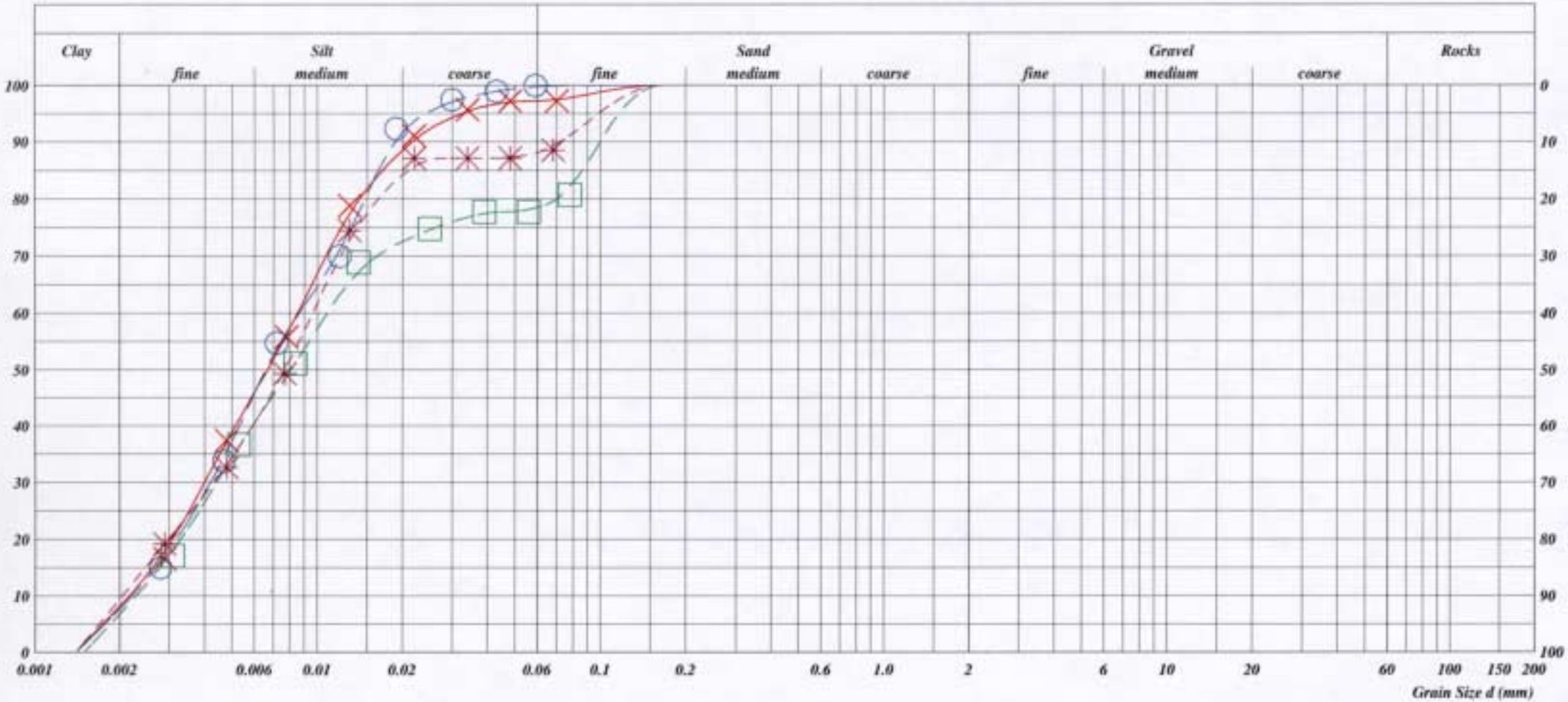


Uranium Tailings Schneckenstein	Labratory No.	Outcropp No.	Depth (m)	Line	Soil Name	Water Content (%)	Grain Density (g/cm^3)	Permeability (m/s)	VGl %	VCa %
	III/1	**BPIII**	**0-1m**		**G,cs',ms',fs',cl'**	**7.13**	**1.77**	**1.9E-5**	**2.44**	**0.63**
	III/2	BPIII	1-2m		S,cl	12.87	1.9	2.7E-7	4.19	2.89
Borehole N°3	III/3	BPIII	2-3m		S,fg',cl'	19.81	1.51	5.1E-5	2.42	0.49
	III/4	BPIII	3-4m		S,fg'	31.91	1.76	7.3E-5	6.73	3.31

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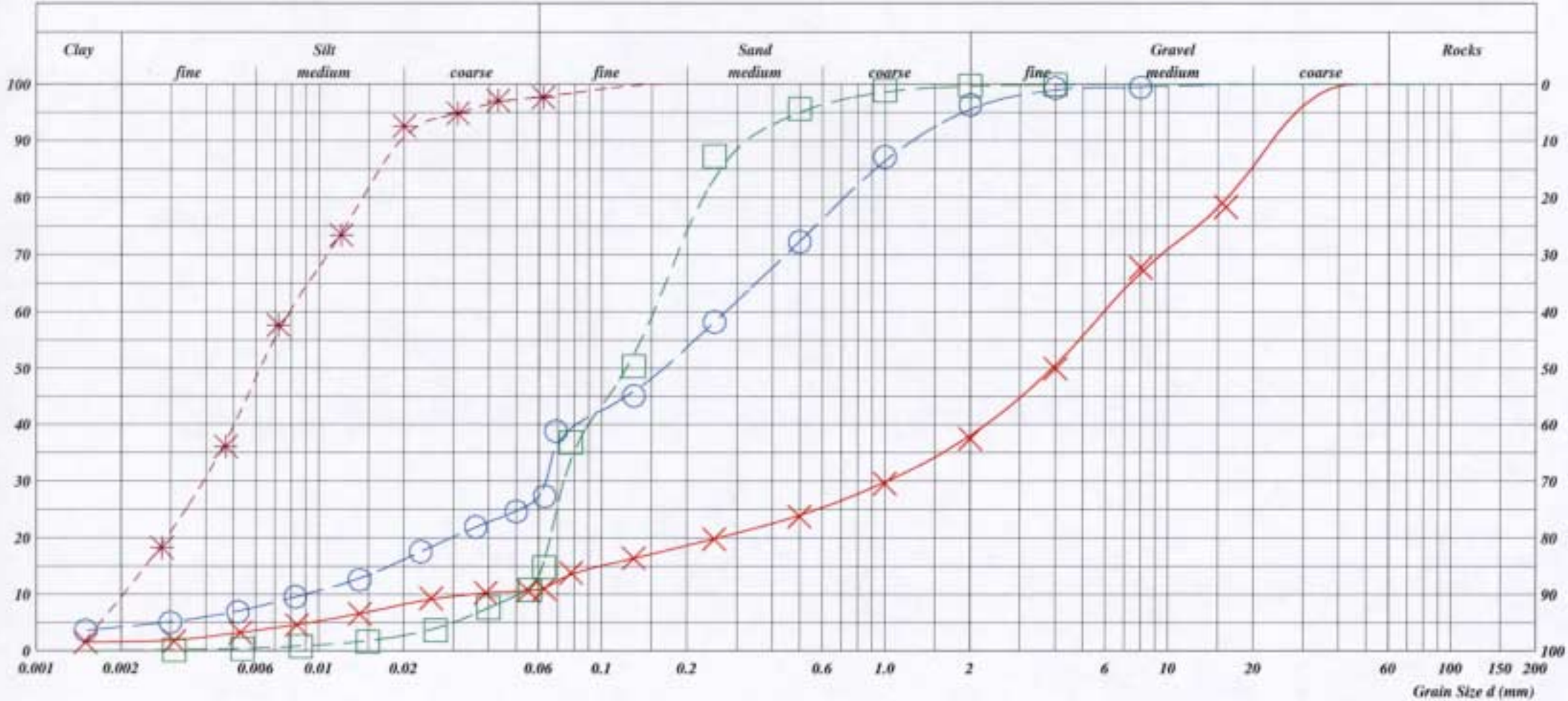


Uranium Tailings Schneckenstein	Labratory No.	Outcropp No.	Depth (m)	Line	Soil Name	Water Content (%)	Grain Density (g/cm^3)	Permeability (m/s)	VGl %	VCa %
	III/5	BPIII	4-5m		Cl	36.2	1.4	2.0E-8	6.68	2.70
	III/6	BPIII	5-6m		Cl	30.84	1.55	2.1E-8	4.57	1.67
Borehole N°3	III/7	BPIII	6-7m		Cl,fs	31.86	1.5	6.9E-8	5.66	1.58
	III/8	BPIII	7-8m		Cl,fs'	28.71	1.56	1.8E-8	5.73	3.08

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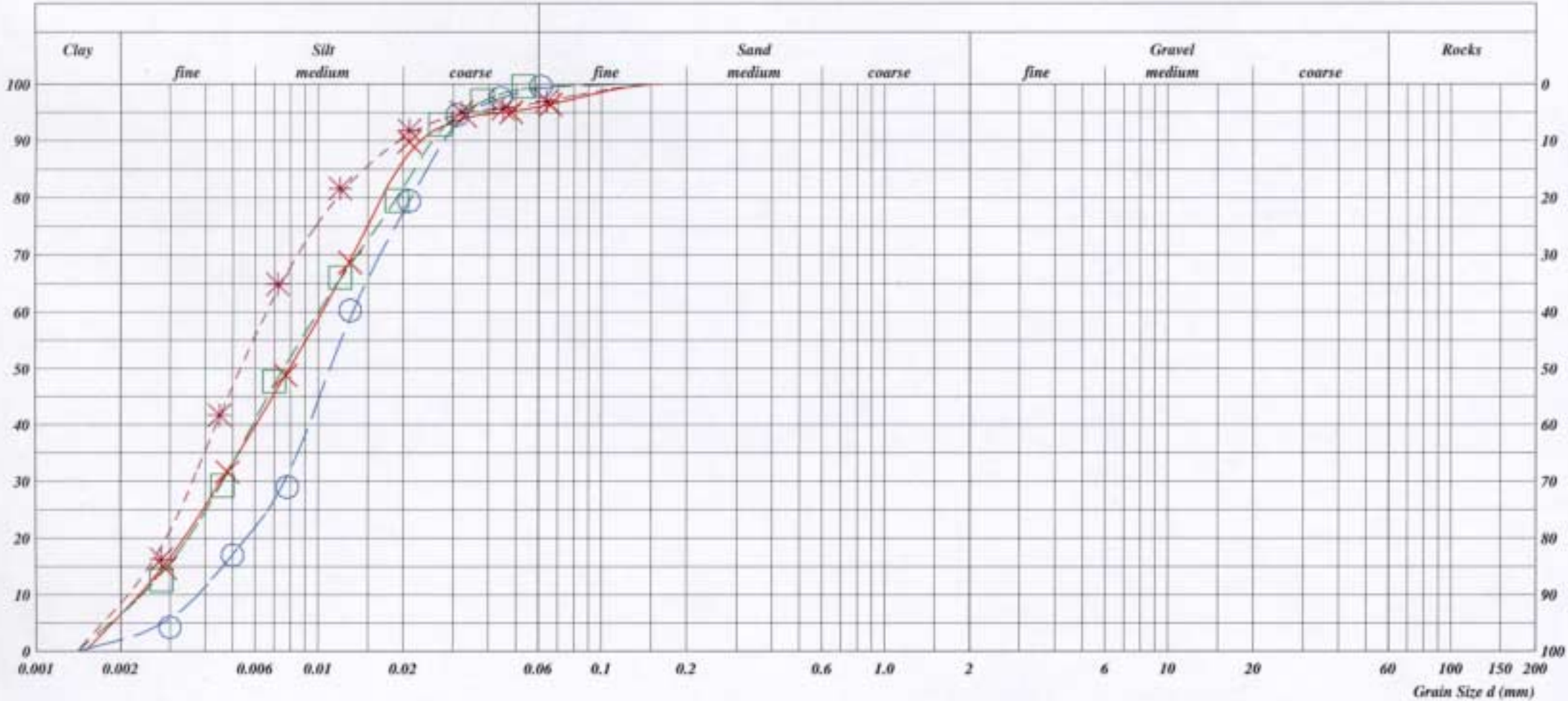


Uranium Tailings Schneckenstein	Labratory No.	Outcropp No.	Depth (m)	Line	Soil Name	Water Content (%)	Grain Density (g/cm^3)	Permeability (m/s)	VGl %	VCa %
	IV/1	BP IV	0 - 1 m		G,cs',ms',fs',cl'	8.34	1.59	1.7E-5	2.79	0.28
	IV/2	BP IV	1 - 2 m		S,cl	12.89	1.86	5.8E-7	2.79	1.05
Borehole N°4	IV/3	BP IV	2 - 3 m		S,cl'	19.01	1.5	2.3E-5	0.2	0.82
	IV/4	BP IV	3 - 4 m		Cl	36.42	1.6	1.9E-8	6.86	3.51

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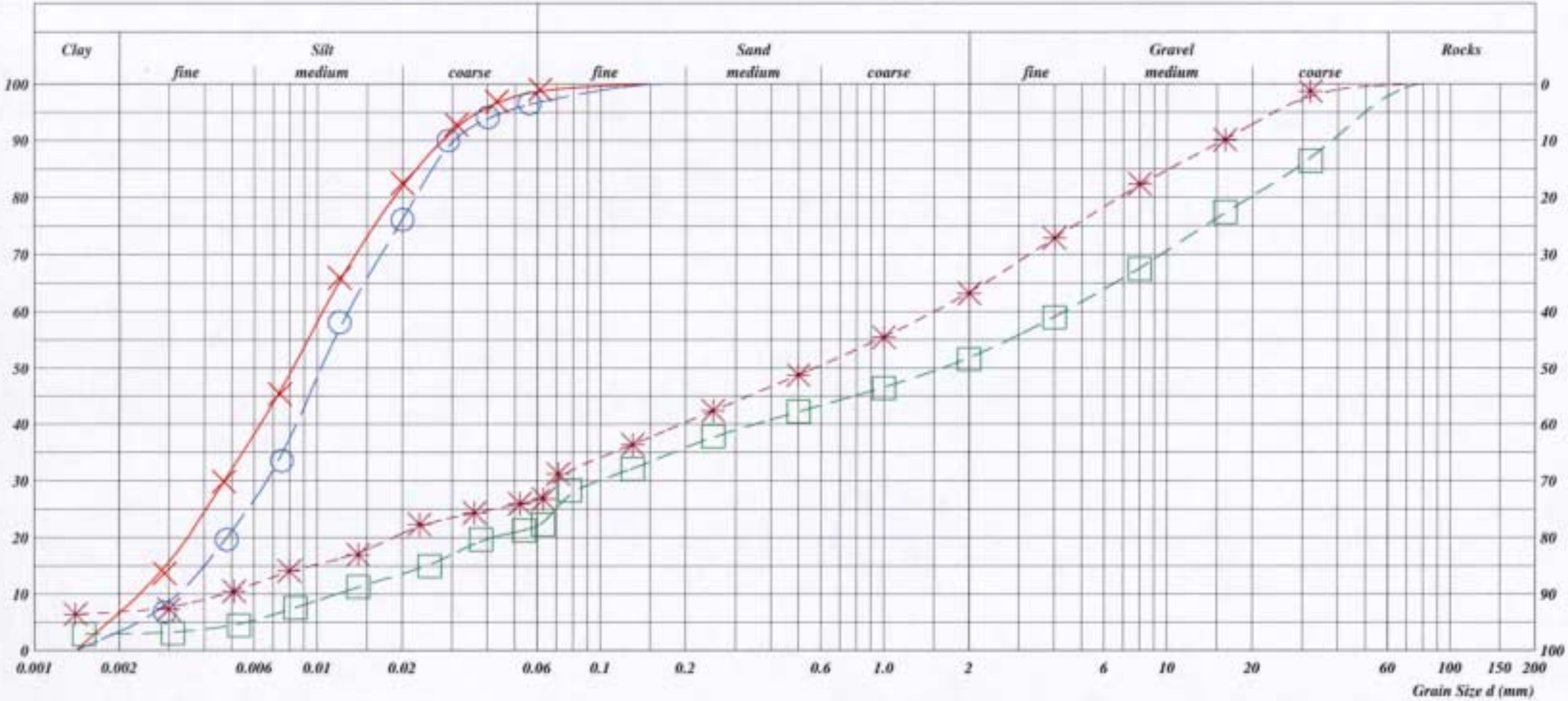


Uranium Tailings Schneckenstein	Labratory No.	Outcropp No.	Depth (m)	Line	Soil Name	Water Content (%)	Grain Density (g/cm^3)	Permeability (m/s)	VGl %	VCa %
	IV/5	BP IV	4 - 5 m		Cl	33.86	1.57	7.2E-8	5.17	1.77
	IV/6	BP IV	5 - 6 m		Cl	35.28	1.62	7.9E-8	3.66	1.36
Borehole N°4	IV/7	BP IV	6 - 7 m		Cl	28.33	1.7	2.3E-8	4.59	1.53
	IV/8	BP IV	7 - 8 m		Cl	34.61	1.57	2.0E-8	5.74	4.71

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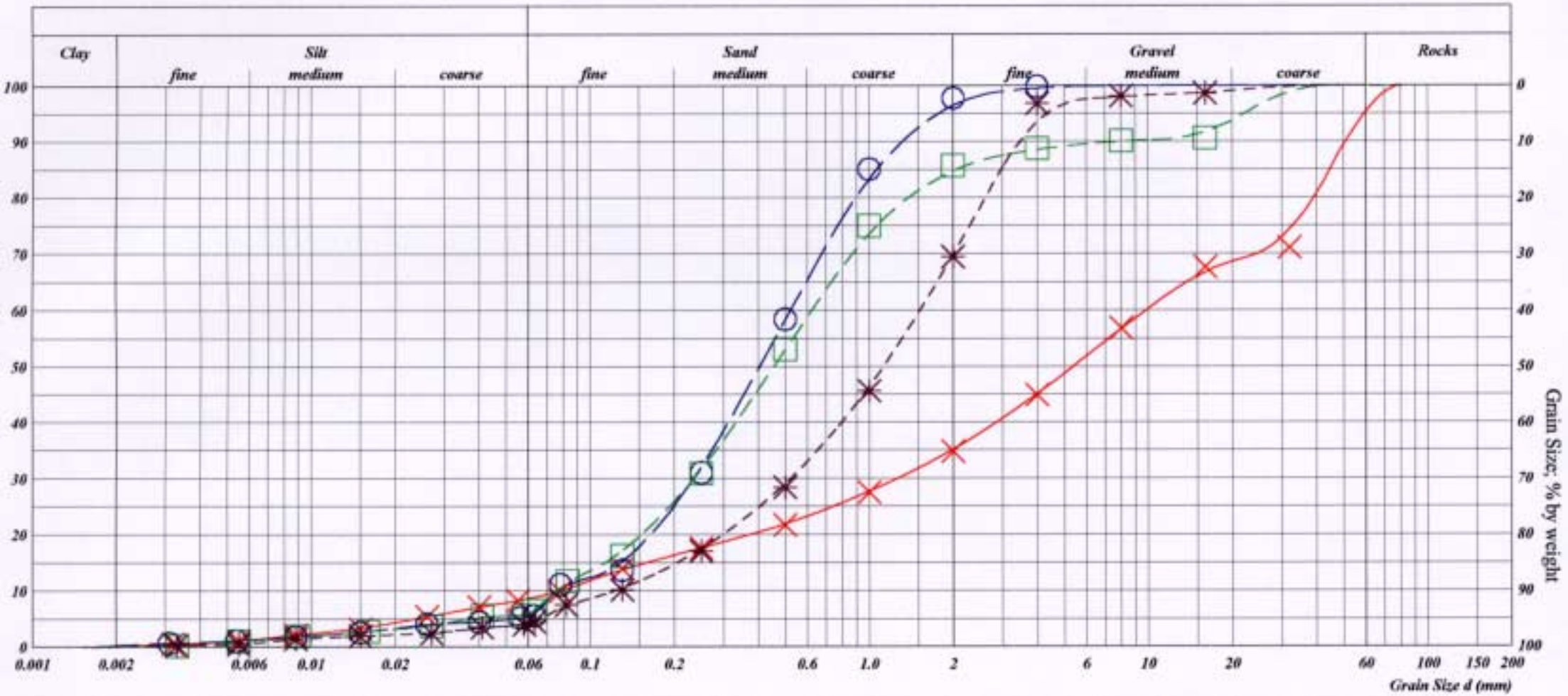


Uranium Tailings Schneckenstein	Labratory No.	Outcropp No.	Depth (m)	Line	Soil Name	Water Content (%)	Grain Density (g/cm^3)	Permeability (m/s)	VGl %	VCa %
	IV/9	BP IV	8 - 9 m		Cl	30.75	1.65	2.2E-8	5.8	2.31
	IV/10	BP IV	9 - 10 m		Cl	28.94	1.64	5.0E-8	4.39	1.08
Borehole N°4	IV/11	BP IV	10 - 11 m		G,cl,cs',ms',fs'	10.8	1.73	1.4E-6	5.17	0.28
	IV/12	BP IV	11 - 12 m		C,mg,fg,fs,cl,cs',ms	8	1.73	1.3E-7	3.46	1.66

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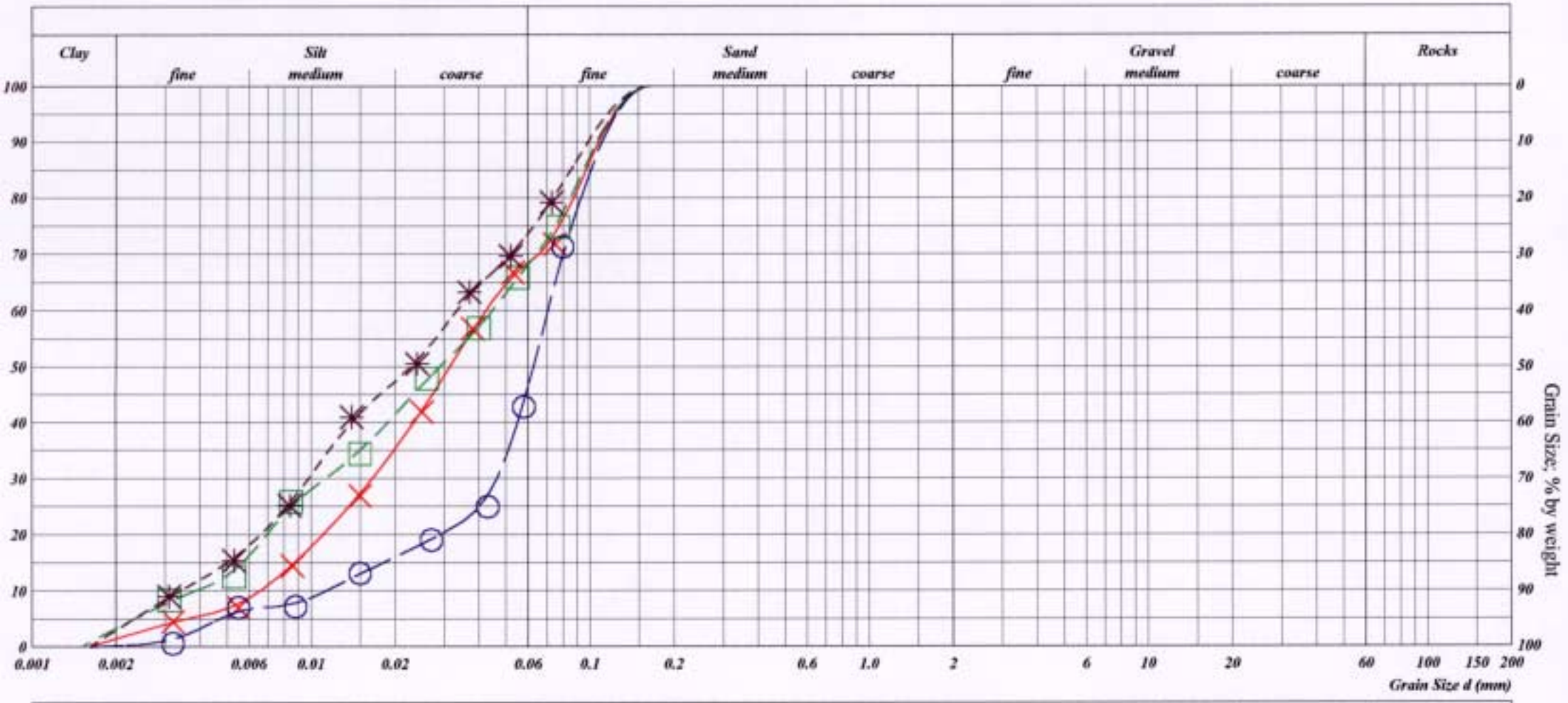


Uranium Tailings Schneckenstein	Labratory No.	Outcropp No.	Depth (m)	Line	Soil Name	Water Content (%)	Grain Density (g/cm^3)	Permeability (m/s)	VGl %	VCa %
	I/1	BPI	0-1m		G,cs',ms',fs',cl'	8.33	1.54	4.8E-5	2.42	1.78
	I/2	BPI	1-1.5m		S,cl'	17.56	1.84	8.7E-5	3.88	1.84
Borehole N°1	I/3	BPI	1.5-2.5m		S,cg',cl'	8.94	1.80	8.0E-5	3.04	1.13
	I/4	BPI	2.5-3.5m		S,fg	5.2	1.78	1.8E-4	2.45	1.84

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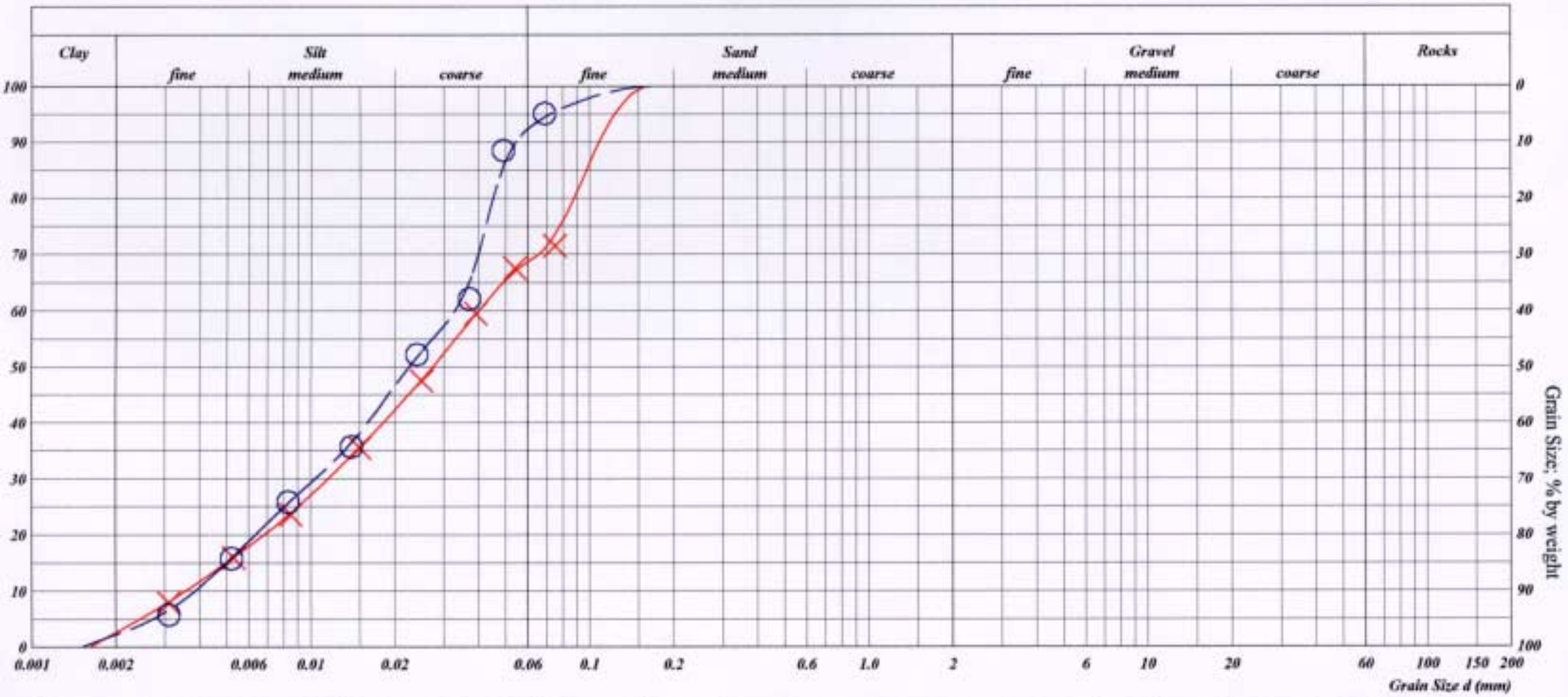


Uranium Tailings Schneckenstein	Labratory No.	Outcropp No.	Depth (m)	Line	Soil Name	Water Content (%)	Grain Density (g/cm^3)	Permeability (m/s)	VGl %	VCa %
	1/5	**BPI**	**3.5-4.5m**		**$Cl_{\bar{f}}s$**	**25.29**	**1.67**	**2.7E-7**	**6.23**	**6.06**
	1/6	BPI	4.5-5.5m		S+Cl	18.79	1.94	1.1E-6		
Borehole N°1	1/7	BPI	5.5-6.5m		$Cl_{\bar{f}}s$	18.29	1.97	7.9E-8	4.35	4.35
	1/8	BPI	6.5-7.5m		$Cl_{\bar{f}}s$	25.08	1.83	6.2E-8	4.85	2.56

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Sieve Analysis

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Uranium Tailings Schneckenstein	Labratory No.	Outcropp No.	Depth (m)	Line	Soil Name	Water Content (%)	Grain Density (g/cm^3)	Permeability (m/s)	VGl %	VCa %
	1/9	BP1	7.5-8.5m		Cl,fs	17.52	1.95	5.7E-8	3.38	2.01
	1/10	BP 1	8.5-9.5 m		Cl	17.52	1.95	1.2E-7	4.42	0.15
Borehole N°1										

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Sieve Analysis

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Appendix: 7.1.2

SIEVE ANALYSIS after DIN 18 123

Sample Nr.:	I/1	Location:	Schneckenstein
Labor Nr.:	BPI	Depth:	0-1m
Check Character:	Wet-Sieve	Description of soil:	
Date of testing:	20.06.97		

Mass of dry sample: 557,00 g = 100%

Stitch-wide [mm]	Mass retained [g]	% retained [%]	% passing [%]
64,0	0,0	0,0	100,0
32,0	161,2	28,9	71,1
16,0	19,0	3,4	67,6
8,0	60,5	10,9	56,8
4,0	66,5	11,9	44,8
2,0	56,2	10,1	34,8
1,0	40,7	7,3	27,5
0,5	32,4	5,8	21,6
0,25	22,9	4,1	17,5
0,125	20,4	3,7	13,9
0,063	0,0	0,0	13,9
Schale	0,0	0,0	13,9
Sum	479,80		86,1
Loss	77,20		13,9

Remark

Appendix: 7.1.2.

SIEVE ANALYSIS after DIN 18 123

Sample Nr.:	I/2	Location:	Schneckenstein
Labor Nr.:	BPI	Depth:	1-1,5m
Check Character:	Wet-Sieve	Description of soil:	
Date of testing:	20.06.97		

Mass of dry sample: 236,20 g = 100%

Stitch-wide	Mass retained	% retained	% passing
[mm]	[g]	[%]	[%]
64,0	0,0	0,0	100,0
32,0	0,0	0,0	100,0
16,0	0,0	0,0	100,0
8,0	0,0	0,0	100,0
4,0	0,5	0,2	99,8
2,0	4,7	2,0	97,8
1,0	30,0	12,7	85,1
0,5	62,9	26,6	58,5
0,25	64,8	27,4	31,0
0,125	41,0	17,4	13,7
0,063	13,1	5,5	8,1
Schale	0,0	0,0	8,1
Sum	217,00		91,9
Loss	19,20		8,1

Remark

Appendix: 7.1.2

SIEVE ANALYSIS after DIN 18 123

Sample Nr.:	I/3	Location:	Schneckenstein
Labor Nr.:	BPI	Depth:	1,5-2,5
Check Character:	Wet-Sieve	Description of soil:	
Date of testing:	20.06.97		

Mass of dry sample: 216,30 g = 100%

Stitch-wide	Mass retainde	% retained	% passing
[mm]	[g]	[%]	[%]
64,0	0,0	0,0	100,0
32,0	0,0	0,0	100,0
16,0	20,4	9,4	90,6
8,0	1,0	0,5	90,1
4,0	3,0	1,4	88,7
2,0	6,6	3,1	85,7
1,0	23,3	10,8	74,9
0,5	47,6	22,0	52,9
0,25	48,2	22,3	30,6
0,125	31,7	14,7	16,0
0,063	11,5	5,3	10,6
Schale	0,0	0,0	10,6
Sum	193,30		89,4
Loss	23,00		10,6

Remark

Appendix: 7.1.2

SIEVE ANALYSIS after DIN 18 123

Sample Nr.:	I/4	Location:	Schneckenstein
Labor Nr.:	BPI	Depth:	2,5-3,5m
Check Character:	Wet-Sieve	Description of soil:	
Date of testing:	20.06.97		

Mass of dry sample: 536,40 g = 100%

Stitch-wide	Mass retained	% retained	% passing
[mm]	[g]	[%]	[%]
64,0	0,0	0,0	100,0
32,0	0,0	0,0	100,0
16,0	7,2	1,3	98,7
8,0	2,7	0,5	98,2
4,0	7,3	1,4	96,8
2,0	146,7	27,3	69,4
1,0	127,9	23,8	45,6
0,5	92,8	17,3	28,3
0,25	60,7	11,3	17,0
0,125	37,0	6,9	10,1
0,063	16,3	3,0	7,0
Schale	0,0	0,0	7,0
Sum	498,60		93,0
Loss	37,80		7,0

Remark

Appendix: 7.1.2

SIEVE ANALYSIS after DIN 18 123

Sample Nr.:	II/1	Location:	Schneckenstein
Labor Nr.:	BPII	Depth:	0-0,5
Check Character:	Wet-Sieve	Description of soil:	
Date of testing:	20.06.97		

Mass of dry sample: 353,80 g = 100%

Stitch-wide	Mass retained	% retained	% passing
[mm]	[g]	[%]	[%]
64,0	0,0	0,0	100,0
32,0	0,0	0,0	100,0
16,0	70,5	19,9	80,1
8,0	53,6	15,1	64,9
4,0	55,1	15,6	49,3
2,0	45,9	13,0	36,4
1,0	29,3	8,3	28,1
0,5	24,6	7,0	21,1
0,25	16,4	4,6	16,5
0,125	13,3	3,8	12,7
0,063	0,0	0,0	12,7
Schale	0,0	0,0	12,7
Sum	308,70		87,3
Loss	45,10		12,7

Remark

Appendix: 7.1.2

SIEVE ANALYSIS after DIN 18 123

Sample Nr.:	II/3	Location:	Schneckenstein
Labor Nr.:	BPII	Depth:	2,5-3,5m
Check Character:	Wet-Sieve	Description of soil:	
Date of testing:	20.06.97		

Mass of dry sample: 378,50 g = 100%

Stitch-wide	Mass retained	% retained	% passing
[mm]	[g]	[%]	[%]
64,0	0,0	0,0	100,0
32,0	0,0	0,0	100,0
16,0	0,0	0,0	100,0
8,0	0,0	0,0	100,0
4,0	0,8	0,2	99,8
2,0	11,1	2,9	96,9
1,0	57,5	15,2	81,7
0,5	119,7	31,6	50,0
0,25	100,4	26,5	23,5
0,125	52,4	13,8	9,7
0,063	29,0	7,7	2,0
Schale	0,0	0,0	2,0
Sum	370,90		98,0
Loss	7,60		2,0

Remark

Appendix: 7.1.2

SIEVE ANALYSIS after DIN 18 123

Sample Nr.:	II/4	Location:	Schneckenstein
Labor Nr.:	BPII	Depth:	3,5-4,5m
Check Character:	Wet-Sieve	Description of soil:	
Date of testing:	20.06.97		

Mass of dry sample: 349,00 g = 100%

Stitch-wide	Mass retained	% retained	% passing
[mm]	[g]	[%]	[%]
64,0	0,0	0,0	100,0
32,0	0,0	0,0	100,0
16,0	0,0	0,0	100,0
8,0	0,0	0,0	100,0
4,0	8,4	2,4	97,6
2,0	27,4	7,9	89,7
1,0	54,9	15,7	74,0
0,5	68,3	19,6	54,4
0,25	63,5	18,2	36,2
0,125	55,4	15,9	20,4
0,063	27,4	7,9	12,5
Schale	0,0	0,0	12,5
Sum	305,30		87,5
Loss	43,70		12,5

Remark

Appendix: 7.1.2

SIEVE ANALYSIS after DIN 18 123

Sample Nr.:	II/5	Location:	Schneckenstein
Labor Nr.:	BPII	Depth:	4,5-5,5m
Check Character:	Wet-Sieve	Description of soil:	
Date of testing:	20.06.97		

Mass of dry sample: 559,10 g = 100%

Stitch-wide	Mass retained	% retained	% passing
[mm]	[g]	[%]	[%]
64,0	0,0	0,0	100,0
32,0	0,0	0,0	100,0
16,0	0,0	0,0	100,0
8,0	1,0	0,2	99,8
4,0	5,0	0,9	98,9
2,0	39,9	7,1	91,8
1,0	97,3	17,4	74,4
0,5	127,1	22,7	51,7
0,25	100,6	18,0	33,7
0,125	69,0	12,3	21,3
0,063	44,5	8,0	13,4
Schale	0,0	0,0	13,4
Sum	484,40		86,6
Loss	74,70		13,4

Remark

Appendix: 7.1.2

SIEVE ANALYSIS after DIN 18 123

Sample Nr.:	III/1	Location:	Schneckenstein
Labor Nr.:	BPII	Depth:	0-1m
Check Character:	Wet-Sieve	Description of soil:	
Date of testing:	20.06.97		

Mass of dry sample: 556,60 g = 100%

Stitch-wide	Mass retained	% retained	% passing
[mm]	[g]	[%]	[%]
64,0	0,0	0,0	100,0
32,0	0,0	0,0	100,0
16,0	142,6	25,6	74,4
8,0	59,1	10,6	63,8
4,0	74,5	13,4	50,4
2,0	61,9	11,1	39,3
1,0	40,2	7,2	32,0
0,5	29,6	5,3	26,7
0,25	21,9	3,9	22,8
0,125	19,8	3,6	19,2
0,063	18,3	3,3	15,9
Schale	0,0	0,0	15,9
Sum	467,90		84,1
Loss	88,70		15,9

Remark

Appendix: 7.1.2

SIEVE ANALYSIS after DIN 18 123

Sample Nr.:	III/2	Location:	Schneckenstein
Labor Nr.:	BPII	Depth:	1-2m
Check Character:	Wet-Sieve	Description of soil:	
Date of testing:	20.06.97		

Mass of dry sample: 440,50 g = 100%

Stitch-wide	Mass retained	% retained	% passing
[mm]	[g]	[%]	[%]
64,0	0,0	0,0	100,0
32,0	0,0	0,0	100,0
16,0	5,7	1,3	98,7
8,0	2,1	0,5	98,2
4,0	2,6	0,6	97,6
2,0	14,0	3,2	94,5
1,0	40,7	9,2	85,2
0,5	61,5	14,0	71,3
0,25	53,7	12,2	59,1
0,125	53,3	12,1	47,0
0,063	39,2	8,9	38,1
Schale	0,0	0,0	38,1
Sum	272,80		61,9
Loss	167,70		38,1

Remark

Appendix: 7.1.2

SIEVE ANALYSIS after DIN 18 123

Sample Nr.:	III/3	Location:	Schneckenstein
Labor Nr.:	BPII	Depth:	2-3m
Check Character:	Wet-Sieve	Description of soil:	
Date of testing:	20.06.97		

Mass of dry sample: 429,20 g = 100%

Stitch-wide	Mass retained	% retained	% passing
[mm]	[g]	[%]	[%]
64,0	0,0	0,0	100,0
32,0	0,0	0,0	100,0
16,0	0,0	0,0	100,0
8,0	0,0	0,0	100,0
4,0	0,4	0,1	99,9
2,0	22,8	5,3	94,6
1,0	44,5	10,4	84,2
0,5	58,5	13,6	70,6
0,25	89,7	20,9	49,7
0,125	118,6	27,6	22,1
0,063	55,6	13,0	9,1
Schale	0,0	0,0	9,1
Sum	390,10		90,9
Loss	39,10		9,1

Remark

Appendix: 7.1.2

SIEVE ANALYSIS after DIN 18 123

Sample Nr.:	III/4	Location:	Schneckenstein
Labor Nr.:	BPIII	Depth:	3-4m
Check Character:	Wet-Sieve	Description of soil:	
Date of testing:	20.06.97		

Mass of dry sample: 413,50 g = 100%

Stitch-wide	Mass retained	% retained	% passing
[mm]	[g]	[%]	[%]
64,0	0,0	0,0	100,0
32,0	0,0	0,0	100,0
16,0	25,0	6,0	94,0
8,0	8,8	2,1	91,8
4,0	10,6	2,6	89,3
2,0	23,8	5,8	83,5
1,0	40,2	9,7	73,8
0,5	74,2	17,9	55,8
0,25	74,8	18,1	37,8
0,125	88,7	21,5	16,3
0,063	38,0	9,2	7,1
Schale	0,0	0,0	7,1
Sum	384,10		92,9
Loss	29,40		7,1

Remark

Appendix: 7.1.2

SIEVE ANALYSIS after DIN 18 123

Sample Nr.:	IV/1	Location:	Schneckenstein
Labor Nr.:	BPIV	Depth:	0-1m
Check Character:	WET-SIVE	Description of soil:	
Date of testing:	21.12.98		

Mass of dry sample: 423,70 g = 100%

Stitch-wide	Mass retained	% retained	% passing
[mm]	[g]	[%]	[%]
64,0	0,0	0,0	100,0
32,0	0,0	0,0	100,0
16,0	91,8	21,7	78,3
8,0	44,9	10,6	67,7
4,0	75,5	17,8	49,9
2,0	52,9	12,5	37,4
1,0	33,6	7,9	29,5
0,5	24,5	5,8	23,7
0,25	16,8	4,0	19,8
0,125	14,3	3,4	16,4
0,063	12,1	2,9	13,5
Schale	0,0	0,0	13,5
Sum	366,40		86,5
Loss	57,30		13,5

Remark

Appendix: 7.1.2

SIEVE ANALYSIS after DIN 18 123

Sample Nr.:	IV/2	Location:	Schneckenstein
Labor Nr.:	BPIV	Depth:	1-2m
Check Character:	Wet-Sieve	Description of soil:	
Date of testing:	21.12.98		

Mass of dry sample: 527,60 g = 100%

Stitch-wide	Mass retained	% retained	% passing
[mm]	[g]	[%]	[%]
64,0	0,0	0,0	100,0
32,0	0,0	0,0	100,0
16,0	0,0	0,0	100,0
8,0	3,0	0,6	99,4
4,0	0,8	0,2	99,3
2,0	15,7	3,0	96,3
1,0	48,4	9,2	87,1
0,5	78,5	14,9	72,3
0,25	74,3	14,1	58,2
0,125	69,1	13,1	45,1
0,063	60,8	11,5	33,5
Schale	0,0	0,0	33,5
Sum	350,60		66,5
Loss	177,00		33,5

Remark

Appendix: 7.1.2

SIEVE ANALYSIS after DIN 18 123

Sample Nr.:	IV/3	Location:	Schneckenstein
Labor Nr.:	BPIV	Depth:	2-3m
Check Character:	Wet-Sieve	Description of soil:	
Date of testing:	21.12.98		

Mass of dry sample: 409,60 g = 100%

Stitch-wide [mm]	Mass retained [g]	% retained [%]	% passing [%]
64,0	0,0	0,0	100,0
32,0	0,0	0,0	100,0
16,0	0,0	0,0	100,0
8,0	0,0	0,0	100,0
4,0	0,4	0,1	99,9
2,0	0,7	0,2	99,7
1,0	3,5	0,9	98,9
0,5	13,4	3,3	95,6
0,25	34,7	8,5	87,1
0,125	152,5	37,2	49,9
0,063	91,1	22,2	27,7
Schale	0,0	0,0	27,7
Sum	296,30		72,3
Loss	113,30		27,7

Remark

Appendix: 7.1.2

SIEVE ANALYSIS after DIN 18 123

Sample Nr.:	IV/11	Location:	Schneckenstein
Labor Nr.:	BPIV	Depth:	10-11m
Check Character:	Wet-Sieve	Description of soil:	
Date of testing:	21.12.98		

Mass of dry sample: 423,30 g = 100%

Stitch-wide [mm]	Mass retained [g]	% retained [%]	% passing [%]
64,0	0,0	0,0	100,0
32,0	57,5	13,6	86,4
16,0	38,1	9,0	77,4
8,0	42,1	9,9	67,5
4,0	36,1	8,5	58,9
2,0	31,2	7,4	51,6
1,0	21,7	5,1	46,4
0,5	17,7	4,2	42,3
0,25	18,6	4,4	37,9
0,125	24,5	5,8	32,1
0,063	25,3	6,0	26,1
Schale	0,0	0,0	26,1
Sum	312,80		73,9
Loss	110,50		26,1

Remark

Appendix: 7.1.2

SIEVE ANALYSIS after DIN 18 123

Sample Nr.:	IV/12	Location:	Schneckenstein
Labor Nr.:	BPIV	Depth:	11-12m
Check Character:	WET-SIVE	Description of soil:	
Date of testing:	21.12.98		

Mass of dry sample: 983,40 g = 100%

Stitch-wide	Mass retained	% retained	% passing
[mm]	[g]	[%]	[%]
64,0	0,0	0,0	100,0
32,0	12,5	1,3	98,7
16,0	84,5	8,6	90,1
8,0	76,6	7,8	82,3
4,0	93,3	9,5	72,9
2,0	95,6	9,7	63,1
1,0	75,8	7,7	55,4
0,5	66,0	6,7	48,7
0,25	62,1	6,3	42,4
0,125	59,6	6,1	36,3
0,063	43,6	4,4	31,9
Schale	0,0	0,0	31,9
Sum	669,60		68,1
Loss	313,80		31,9

Remark

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	I/1
Labor Nr.:	BP I
Location:	Schneckenstein
Depth of sample:	0-1m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,53

Evaluation of solid mass

Mass of dry sample + dish (g):	334,9
Mass of dish (g):	314,9
Mass of dry sample (g):	20,0
Mass for elutriation (g):	77,20

a =	8,030

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
19,0	08:50	test- begin							
19,0	08:50:30	30 s	1,0085	8,5	0,0780	-0,18	8,32	66,81	25,62
19,0	08:51	1 min	1,0070	7,0	0,0550	-0,18	6,82	54,77	9,30
19,0	08:52	2 min	1,0060	6,0	0,0400	-0,18	5,82	46,74	6,20
19,0	08:55	5 min	1,0045	4,5	0,0260	-0,18	4,32	34,69	9,30
19,0	09:08	18 min	1,0025	2,5	0,0150	-0,18	2,32	18,63	12,40
19,1	09:35	45 min	1,0015	1,5	0,0088	-0,16	1,34	10,76	6,08
19,3	10:50	2 h	1,0005	0,5	0,0055	-0,12	0,38	3,05	5,95
19,3	14:50	6 h	1,0000	0,0	0,0032	-0,12	-0,12	-0,96	3,10
19,5	08:50	24 h	0,9995	-0,5	0,00160	-0,09	-0,59	-4,74	2,91
in solution < 0,0015									-3,66

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	I/2
Labor Nr.:	BP I
Location:	Schneckenstein
Depth of sample:	1-1,5
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,77

Evaluation of solid mass

Mass of dry sample + dish (g):	332,0
Mass of dish (g):	314,7
Mass of dry sample (g):	17,3
Mass for elutriation (g):	19,20

a =	9,284

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
19,5	08:50	test- begin							
19,5	08:50:30	30 s	1,0070	7,5	0,0780	-0,09	7,41	68,79	5,99
19,5	08:51	1 min	1,0065	7,0	0,0560	-0,09	6,91	64,15	0,89
19,5	08:52	2 min	1,0055	6,0	0,0400	-0,09	5,91	54,87	1,78
19,5	08:55	5 min	1,0050	5,5	0,0260	-0,09	5,41	50,22	0,89
19,4	09:08	18 min	1,0030	3,5	0,0150	-0,10	3,40	31,56	3,58
19,4	09:35	45 min	1,0020	2,5	0,0088	-0,10	2,40	22,28	1,78
19,5	10:50	2 h	1,0010	1,5	0,0054	-0,09	1,41	13,09	1,76
19,5	14:50	6 h	1,0005	1,0	0,0031	-0,09	0,91	8,45	0,89
20,0	08:50	24 h	0,9995	0,0	0,00150	0,00	0,00	0,00	1,62
in solution < 0,0015									0,00

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	I/ 3
Labor Nr.:	BP I
Location:	Schneckenstein
Depth of sample:	1,5-2,5
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,78

Evaluation of solid mass

Mass of dry sample + dish (g):	273,3
Mass of dish (g):	264,1
Mass of dry sample (g):	9,2
Mass for elutriation (g):	23,00

a =	17,457

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
18,9	08:50	test- begin							
18,9	08:50:30	30 s	1,0030	3,0	0,0830	-0,19	2,81	49,05	11,72
18,9	08:51	1 min	1,0025	2,5	0,0580	-0,19	2,31	40,33	2,01
18,9	08:52	2 min	1,0025	2,5	0,0410	-0,19	2,31	40,33	0,00
19,0	08:55	5 min	1,0015	1,5	0,0270	-0,18	1,32	23,04	3,97
19,0	09:08	18 min	1,0010	1,0	0,0160	-0,18	0,82	14,31	2,01
19,1	09:35	45 min	1,0005	0,5	0,0090	-0,16	0,34	5,94	1,93
19,2	10:50	2 h	1,0000	0,0	0,0055	-0,14	-0,14	-2,44	1,93
19,3	14:50	6 h	0,9995	-0,5	0,0033	-0,12	-0,62	-10,82	1,93
19,5	08:50	24 h	0,9995	-0,5	0,00160	-0,09	-0,59	-10,30	-0,12
in solution < 0,0015									-2,37

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	I/4
Labor Nr.:	BP I
Location:	Schneckenstein
Depth of sample:	2,5-3,5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,76

Evaluation of solid mass

Mass of dry sample + dish (g):	275,2
Mass of dish (g):	264,0
Mass of dry sample (g):	11,2
Mass for elutriation (g):	37,80

a =	14,340

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
19,1	08:50	test- begin							
19,1	08:50:30	30 s	1,0040	4,0	0,0820	-0,16	3,84	55,06	16,99
19,1	08:51	1 min	1,0035	3,5	0,0580	-0,16	3,34	47,90	2,71
19,1	08:52	2 min	1,0030	3,0	0,0410	-0,16	2,84	40,73	2,71
19,1	08:55	5 min	1,0020	2,0	0,0270	-0,16	1,84	26,39	5,42
19,2	09:08	18 min	1,0015	1,5	0,0150	-0,14	1,36	19,50	2,60
19,2	09:35	45 min	1,0010	1,0	0,0088	-0,14	0,86	12,33	2,71
19,3	10:50	2 h	1,0000	0,0	0,0055	-0,12	-0,12	-1,72	5,31
19,4	14:50	6 h	1,0000	0,0	0,0033	-0,10	-0,10	-1,43	-0,11
19,5	08:50	24 h	0,9995	-0,5	0,00160	-0,09	-0,59	-8,46	2,66
in solution < 0,0015									-3,20

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	I /5
Labor Nr.:	BP I
Location:	Schneckenstein
Depth of sample:	3,5-4,5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,76

Evaluation of solid mass

Mass of dry sample + dish (g):	294,6
Mass of dish (g):	264,0
Mass of dry sample (g):	30,6
Mass for elutriation (g):	30,60

a =	5,249

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
19,4	08:50	test- begin							
19,4	08:50:30	30 s	1,0130	13,0	0,0750	-0,10	12,90	67,71	9,88
19,4	08:51	1 min	1,0120	12,0	0,0530	-0,10	11,90	62,46	1,61
19,4	08:52	2 min	1,0100	10,0	0,0380	-0,10	9,90	51,96	3,21
19,4	08:55	5 min	1,0070	7,0	0,0250	-0,10	6,90	36,22	4,82
19,4	09:08	18 min	1,0040	4,0	0,0150	-0,10	3,90	20,47	4,82
19,4	09:35	45 min	1,0015	1,5	0,0086	-0,10	1,40	7,35	4,02
19,5	10:50	2 h	1,0000	0,0	0,0055	-0,09	-0,09	-0,47	2,39
19,5	14:50	6 h	0,9995	-0,5	0,0032	-0,09	-0,59	-3,10	0,80
20,0	08:50	24 h	0,9985	-1,5	0,00160	0,00	-1,50	-7,87	1,46
in solution < 0,0015									-2,41

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	I/ 6
Labor Nr.:	BP I
Location:	Schneckenstein
Depth of sample:	4,5-5,5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,76

Evaluation of solid mass

Mass of dry sample + dish (g):	276,1
Mass of dish (g):	264,2
Mass of dry sample (g):	11,9
Mass for elutriation (g):	11,90

a =	13,496

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
20,6	08:50	test- begin							
20,6	08:50:30	30 s	1,0044	4,4	0,0800	0,10	4,50	60,73	4,67
20,6	08:51	1 min	1,0020	2,0	0,0580	0,10	2,10	28,34	3,85
20,6	08:52	2 min	1,0005	0,5	0,0430	0,10	0,60	8,10	2,41
20,6	08:55	5 min	1,0000	0,0	0,0270	0,10	0,10	1,35	0,80
20,6	09:08	18 min	0,9995	-0,5	0,0155	0,10	-0,40	-5,40	0,80
20,6	09:35	45 min	0,9990	-1,0	0,0088	0,10	-0,90	-12,15	0,80
20,5	10:50	2 h	0,9990	-1,0	0,0055	0,09	-0,91	-12,28	0,02
20,3	14:50	6 h	0,9985	-1,5	0,0032	0,05	-1,45	-19,57	0,87
21,1	08:50	24 h	0,9985	-1,5	0,00160	0,20	-1,30	-17,55	-0,24
in solution < 0,0015									-2,09

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	I/7
Labor Nr.:	BPI
Location:	Schneckenstein
Depth of sample:	5,5-6,5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,79

Evaluation of solid mass

Mass of dry sample + dish (g):	282,7
Mass of dish (g):	264,0
Mass of dry sample (g):	18,7
Mass for elutriation (g):	18,70

a =	8,589

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
19,1	08:50	test- begin							
19,1	08:50:30	30 s	1,0085	8,5	0,0770	-0,16	8,34	71,63	5,31
19,1	08:51	1 min	1,0075	7,5	0,0550	-0,16	7,34	63,04	1,61
19,1	08:52	2 min	1,0065	6,5	0,0400	-0,16	6,34	54,45	1,61
19,1	08:55	5 min	1,0055	5,5	0,0260	-0,16	5,34	45,86	1,61
19,1	09:08	18 min	1,0040	4,0	0,0150	-0,16	3,84	32,98	2,41
19,3	09:35	45 min	1,0030	3,0	0,0085	-0,12	2,88	24,74	1,54
19,4	10:50	2 h	1,0015	1,5	0,0053	-0,10	1,40	12,02	2,38
19,6	14:50	6 h	1,0010	1,0	0,0031	-0,07	0,93	7,99	0,75
20,0	08:50	24 h	1,0000	0,0	0,00150	0,00	0,00	0,00	1,49
in solution < 0,0015									0,00

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	I/ 8
Labor Nr.:	BP I
Location:	Schneckenstein
Depth of sample:	6,5-7,5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,77

Evaluation of solid mass

Mass of dry sample + dish (g):	314,8
Mass of dish (g):	288,0
Mass of dry sample (g):	26,8
Mass for elutriation (g):	26,80

a =	5,993

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
19,6	08:50	test- begin							
19,6	08:50:30	30 s	1,0130	13,0	0,0730	-0,07	12,93	77,49	6,03
19,6	08:51	1 min	1,0115	11,5	0,0520	-0,07	11,43	68,50	2,41
19,6	08:52	2 min	1,0105	10,5	0,0370	-0,07	10,43	62,50	1,61
19,6	08:55	5 min	1,0085	8,5	0,0240	-0,07	8,43	50,52	3,21
19,6	09:08	18 min	1,0070	7,0	0,0140	-0,07	6,93	41,53	2,41
19,7	09:35	45 min	1,0045	4,5	0,0084	-0,05	4,45	26,67	3,98
19,5	10:50	2 h	1,0030	3,0	0,0053	-0,09	2,91	17,44	2,47
19,5	14:50	6 h	1,0020	2,0	0,0031	-0,09	1,91	11,45	1,61
20,0	08:50	24 h	1,0005	0,5	0,00155	0,00	0,50	3,00	2,26
							in solution < 0,0015		0,80

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	I / 9
Labor Nr.:	BP I
Location:	Schneckenstein
Depth of sample:	7,5-8,5
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,79

Evaluation of solid mass

Mass of dry sample + dish (g):	336,4
Mass of dish (g):	314,9
Mass of dry sample (g):	21,5
Mass for elutriation (g):	21,50

a =	7,470

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
19,1	08:50	test- begin							
19,1	08:50:30	30 s	1,0095	9,5	0,0750	-0,16	9,34	69,77	6,50
19,1	08:51	1 min	1,0090	9,0	0,0540	-0,16	8,84	66,04	0,80
19,1	08:52	2 min	1,0080	8,0	0,0390	-0,16	7,84	58,57	1,61
19,1	08:55	5 min	1,0065	6,5	0,0250	-0,16	6,34	47,36	2,41
19,1	09:08	18 min	1,0050	5,0	0,0150	-0,16	4,84	36,16	2,41
19,2	09:35	45 min	1,0035	3,5	0,0085	-0,14	3,36	25,10	2,38
19,4	10:50	2 h	1,0025	2,5	0,0053	-0,10	2,40	17,93	1,54
19,4	14:50	6 h	1,0015	1,5	0,0031	-0,10	1,40	10,46	1,61
19,5	08:50	24 h	1,0005	0,5	0,00155	-0,09	0,41	3,06	1,59
in solution < 0,0015									0,66

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	I / 10
Labor Nr.:	BP I
Location:	Schneckenstein
Depth of sample:	8,5-9,5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,8

Evaluation of solid mass

Mass of dry sample + dish (g):	341,6
Mass of dish (g):	314,8
Mass of dry sample (g):	26,8
Mass for elutriation (g):	26,80

a =	5,993

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
19,7	08:50	test- begin							
19,7	08:50:30	30 s	1,0175	17,5	0,0690	-0,05	17,45	104,57	-1,23
19,7	08:51	1 min	1,0165	16,5	0,0490	-0,05	16,45	98,58	1,61
19,7	08:52	2 min	1,0105	10,5	0,0370	-0,05	10,45	62,62	9,64
19,7	08:55	5 min	1,0090	9,0	0,0240	-0,05	8,95	53,64	2,41
19,7	09:08	18 min	1,0065	6,5	0,0140	-0,05	6,45	38,65	4,02
19,7	09:35	45 min	1,0050	5,0	0,0083	-0,05	4,95	29,66	2,41
19,6	10:50	2 h	1,0035	3,5	0,0052	-0,07	3,43	20,56	2,44
19,5	14:50	6 h	1,0020	2,0	0,0031	-0,09	1,91	11,45	2,44
20,2	08:50	24 h	1,0010	1,0	0,00150	0,03	1,03	6,17	1,41
in solution < 0,0015									1,65

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	II/1
Labor Nr.:	BPII
Location:	Schneckenstein
Depth of sample:	0-0.5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,62

Evaluation of solid mass

Mass of dry sample + dish (g):	273,4
Mass of dish (g):	264,1
Mass of dry sample (g):	9,3
Mass for elutriation (g):	45,10

a =	17,269

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
17,8	08:50	test- begin							
17,8	08:50:30	30 s	1,0040	4,0	0,0830	-0,38	3,62	62,52	16,91
17,8	08:51	1 min	1,0040	4,0	0,0580	-0,38	3,62	62,52	0,00
17,8	08:52	2 min	1,0035	3,5	0,0420	-0,38	3,12	53,88	3,89
17,8	08:55	5 min	1,0035	3,5	0,0265	-0,38	3,12	53,88	0,00
18,1	09:08	18 min	1,0025	2,5	0,0150	-0,33	2,17	37,47	7,40
18,6	09:35	45 min	1,0015	1,5	0,0087	-0,25	1,25	21,59	7,17
20,0	10:50	2 h	1,0005	0,5	0,0054	0,00	0,50	8,63	5,84
21,8	14:50	6 h	0,9995	-0,5	0,0031	0,33	-0,17	-2,94	5,22
21,7	08:50	24 h	0,9993	-0,8	0,00155	0,30	-0,45	-7,77	2,18
							in solution < 0,0015		-3,50

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	II/2
Labor Nr.:	BPII
Location:	Schneckenstein
Depth of sample:	0.5-1.5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,77

Evaluation of solid mass

Mass of dry sample + dish (g):	284,8
Mass of dish (g):	264,0
Mass of dry sample (g):	20,8
Mass for elutriation (g):	207,80

a =	7,721

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
18,4	08:50	test- begin							
18,4	08:50:30	30 s	1,0100	10,0	0,0730	-0,29	9,71	74,98	52,00
18,4	08:51	1 min	1,0085	8,5	0,0560	-0,29	8,21	63,39	24,07
18,4	08:52	2 min	1,0080	8,0	0,0390	-0,29	7,71	59,53	8,02
18,4	08:55	5 min	1,0070	7,0	0,0255	-0,29	6,71	51,81	16,05
18,6	09:08	18 min	1,0055	5,5	0,0149	-0,25	5,25	40,54	23,43
19,3	09:35	45 min	1,0035	3,5	0,0085	-0,12	3,38	26,10	30,00
20,7	10:50	2 h	1,0025	2,5	0,0045	0,12	2,62	20,23	12,19
21,8	14:50	6 h	1,0010	1,0	0,0031	0,33	1,33	10,27	20,70
21,4	08:50	24 h	1,0003	0,3	0,00150	0,25	0,55	4,25	12,52
in solution < 0,0015									8,82

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	II/3
Labor Nr.:	BPII
Location:	Schneckenstein
Depth of sample:	2.5-3.5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,78

Evaluation of solid mass

Mass of dry sample + dish (g):	318,7
Mass of dish (g):	315,0
Mass of dry sample (g):	3,7
Mass for elutriation (g):	7,60

a =	43,407

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
21,0	08:50	test- begin							
21,0	08:50:30	30 s	1,0000	0,0	0,0850	0,18	0,18	7,81	7,01
21,0	08:51	1 min	0,9995	-0,5	0,0600	0,18	-0,32	-13,89	1,65
21,0	08:52	2 min	0,9993	-0,8	0,0425	0,18	-0,57	-24,74	0,82
21,0	08:55	5 min	0,9990	-1,0	0,0270	0,18	-0,82	-35,59	0,82
21,0	09:08	18 min	0,9990	-1,0	0,0155	0,18	-0,82	-35,59	0,00
21,0	09:35	45 min	0,9985	-1,5	0,0088	0,18	-1,32	-57,30	1,65
21,0	10:50	2 h	0,9985	-1,5	0,0055	0,18	-1,32	-57,30	0,00
21,8	14:50	6 h	0,9983	-1,7	0,0032	0,33	-1,37	-59,47	0,16
21,8	08:50	24 h	0,9982	-1,8	0,00155	0,33	-1,47	-63,81	0,33
							in solution < 0,0015		-4,85

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	II/4
Labor Nr.:	BPII
Location:	Schneckenstein
Depth of sample:	3.5-4.5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,78

Evaluation of solid mass

Mass of dry sample + dish (g):	1048,1
Mass of dish (g):	1033,7
Mass of dry sample (g):	14,4
Mass for elutriation (g):	43,70

a =	11,153

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
19,6	08:50	test- begin							
19,6	########	30 s	1,0040	4,0	0,0800	-0,07	3,93	43,83	24,55
19,6	08:51	1 min	1,0035	3,5	0,0575	-0,07	3,43	38,26	2,44
19,6	08:52	2 min	1,0025	2,5	0,0410	-0,07	2,43	27,10	4,87
19,6	08:55	5 min	1,0010	1,0	0,0265	-0,07	0,93	10,37	7,31
19,6	09:08	18 min	1,0000	0,0	0,0157	-0,07	-0,07	-0,78	4,87
19,6	09:35	45 min	1,0000	0,0	0,0090	-0,07	-0,07	-0,78	0,00
19,5	10:50	2 h	0,9995	-0,5	0,0055	-0,09	-0,59	-6,58	2,53
19,5	14:50	6 h	0,9995	-0,5	0,0033	-0,09	-0,59	-6,58	0,00
20,3	08:50	24 h	0,9990	-1,0	0,00155	0,05	-0,95	-10,60	1,75
						in solution < 0,0015			-4,63

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	II/5
Labor Nr.:	BPII
Location:	Schneckenstein
Depth of sample:	4.5-5.5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,76

Evaluation of solid mass

Mass of dry sample + dish (g):	870,0
Mass of dish (g):	860,4
Mass of dry sample (g):	9,6
Mass for elutriation (g):	74,70

a =	16,730

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
20,9	08:50	test- begin							
20,9	08:50:30	30 s	1,0034	3,4	0,0820	0,16	3,56	59,56	30,21
20,9	08:51	1 min	1,0026	2,6	0,0580	0,16	2,76	46,17	10,00
20,9	08:52	2 min	1,0020	2,0	0,0410	0,16	2,16	36,14	7,50
20,9	08:55	5 min	1,0006	0,6	0,0265	0,16	0,71	11,88	18,12
20,9	09:08	18 min	1,0004	0,4	0,0150	0,16	0,56	9,37	1,87
21,0	09:35	45 min	0,9998	-0,2	0,0087	0,18	-0,02	-0,33	7,25
21,1	10:50	2 h	0,9994	-0,6	0,0054	0,20	-0,40	-6,69	4,75
21,6	14:50	6 h	0,9993	-0,7	0,0027	0,29	-0,41	-6,86	0,12
21,0	08:50	24 h	0,9992	-0,8	0,00155	0,18	-0,62	-10,37	2,62
							in solution < 0,0015		-7,75

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	II/6
Labor Nr.:	BPII
Location:	Schneckenstein
Depth of sample:	5.5-6.5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,75

Evaluation of solid mass

Mass of dry sample + dish (g):	329,8
Mass of dish (g):	315,0
Mass of dry sample (g):	14,8
Mass for elutriation (g):	14,80

a =	10,852

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
18,8	08:50	test- begin							
18,8	#######	30 s	1,0050	5,0	0,0810	-0,20	4,80	52,09	7,09
18,8	08:51	1 min	1,0045	4,5	0,0570	-0,20	4,30	46,66	0,80
18,8	08:52	2 min	1,0040	4,0	0,0420	-0,20	3,80	41,24	0,80
18,8	08:55	5 min	1,0035	3,5	0,0260	-0,20	3,30	35,81	0,80
19,2	09:08	18 min	1,0025	2,5	0,0150	-0,14	2,36	25,61	1,51
19,9	09:35	45 min	1,0015	1,5	0,0087	-0,01	1,49	16,17	1,40
20,7	10:50	2 h	1,0010	1,0	0,0053	0,12	1,12	12,15	0,59
21,9	14:50	6 h	1,0005	0,5	0,0031	0,35	0,85	9,22	0,43
21,7	08:50	24 h	1,0000	0,0	0,00155	0,30	0,30	3,26	0,88
							in solution < 0,0015		0,48

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	II/7
Labor Nr.:	BPII
Location:	Schneckenstein
Depth of sample:	6.5-7.5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,81

Evaluation of solid mass

Mass of dry sample + dish (g):	339,2
Mass of dish (g):	314,9
Mass of dry sample (g):	24,3
Mass for elutriation (g):	24,30

a =	6,609

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
21,2	08:50	test- begin							
21,2	#######	30 s	1,0110	11,0	0,0730	0,21	11,21	74,09	6,30
21,2	08:51	1 min	1,0105	10,5	0,0530	0,21	10,71	70,79	0,80
21,2	08:52	2 min	1,0090	9,0	0,0370	0,21	9,21	60,87	2,41
21,2	08:55	5 min	1,0075	7,5	0,0240	0,21	7,71	50,96	2,41
21,3	09:08	18 min	1,0050	5,0	0,0140	0,23	5,23	34,57	3,98
21,4	09:35	45 min	1,0030	3,0	0,0083	0,25	3,25	21,48	3,18
21,8	10:50	2 h	1,0020	2,0	0,0052	0,33	2,33	15,40	1,48
21,8	14:50	6 h	1,0010	1,0	0,0030	0,33	1,33	8,79	1,61
21,8	08:50	24 h	1,0005	0,5	0,00150	0,33	0,83	5,49	0,80
							in solution < 0,0015		1,33

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	II/8
Labor Nr.:	BPII
Location:	Schneckenstein
Depth of sample:	7.5-8.5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,79

Evaluation of solid mass

Mass of dry sample + dish (g):	317,9
Mass of dish (g):	288,1
Mass of dry sample (g):	29,8
Mass for elutriation (g):	29,80

a =	5,389

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
19,2	08:50	test- begin							
19,2	#######	30 s	1,0140	14,0	0,0720	-0,14	13,86	74,70	7,54
19,2	08:51	1 min	1,0135	13,5	0,0520	-0,14	13,36	72,00	0,80
19,2	08:52	2 min	1,0125	12,5	0,0370	-0,14	12,36	66,61	1,61
19,2	08:55	5 min	1,0115	11,5	0,0235	-0,14	11,36	61,22	1,61
19,3	09:08	18 min	1,0095	9,5	0,0140	-0,12	9,38	50,55	3,18
20,0	09:35	45 min	1,0075	7,5	0,0080	0,00	7,50	40,42	3,02
20,7	10:50	2 h	1,0055	5,5	0,0052	0,12	5,62	30,29	3,02
22,1	14:50	6 h	1,0035	3,5	0,0030	0,33	3,83	20,64	2,87
22,3	08:50	24 h	1,0020	2,0	0,00147	0,43	2,43	13,10	2,25
						in solution < 0,0015			3,90

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	II/9
Labor Nr.:	BPII
Location:	Schneckenstein
Depth of sample:	8.5-9.5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,77

Evaluation of solid mass

Mass of dry sample + dish (g):	1057,4
Mass of dish (g):	1033,9
Mass of dry sample (g):	23,5
Mass for elutriation (g):	23,50

a =	6,834

Tempe-ratur [°C]	Time of reading	Elapset time	Actual hyd. reading [g/cm³]	Corr. hyd. reading M-corr.	Grain-size d, mm	Tempe-ratur-corr.	Improved reading	% from a < d [mm] mud-sample	entire sample
21,3	08:50	test- begin							
21,3	#######	30 s	1,0115	11,5	0,0730	0,23	11,73	80,17	4,66
21,3	08:51	1 min	1,0100	10,0	0,0520	0,23	10,23	69,91	2,41
21,3	08:52	2 min	1,0090	9,0	0,0370	0,23	9,23	63,08	1,61
21,3	08:55	5 min	1,0075	7,5	0,0240	0,23	7,73	52,83	2,41
21,4	09:08	18 min	1,0060	6,0	0,0140	0,25	6,25	42,71	2,38
21,6	09:35	45 min	1,0040	4,0	0,0083	0,29	4,29	29,32	3,15
21,7	10:50	2 h	1,0025	2,5	0,0048	0,30	2,80	19,14	2,39
21,9	14:50	6 h	1,0015	1,5	0,0029	0,35	1,85	12,64	1,53
22,0	08:50	24 h	1,0005	0,5	0,00150	0,37	0,87	5,95	1,57
							in solution < 0,0015		1,40

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	II/10
Labor Nr.:	BPII
Location:	Schneckenstein
Depth of sample:	9.5-10.5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,78

Evaluation of solid mass

Mass of dry sample + dish (g):	286,5
Mass of dish (g):	264,0
Mass of dry sample (g):	22,5
Mass for elutriation (g):	22,50

a =	7,138

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
21,2	08:50	test- begin							
21,2	08:50:30	30 s	1,0110	11,0	0,0750	0,21	11,21	80,02	4,50
21,2	08:51	1 min	1,0100	10,0	0,0530	0,21	10,21	72,88	1,61
21,2	08:52	2 min	1,0085	8,5	0,0370	0,21	8,71	62,17	2,41
21,2	08:55	5 min	1,0070	7,0	0,0240	0,21	7,21	51,47	2,41
21,2	09:08	18 min	1,0050	5,0	0,0140	0,21	5,21	37,19	3,21
21,5	09:35	45 min	1,0035	3,5	0,0084	0,27	3,77	26,91	2,31
22,0	10:50	2 h	1,0025	2,5	0,0052	0,37	2,87	20,49	1,45
21,9	14:50	6 h	1,0015	1,5	0,0030	0,35	1,85	13,21	1,64
21,8	08:50	24 h	1,0005	0,5	0,00150	0,33	0,83	5,92	1,64
						in solution < 0,0015			1,33

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	II/11
Labor Nr.:	BPII
Location:	Schneckenstein
Depth of sample:	10.5-11.5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,79

Evaluation of solid mass

Mass of dry sample + dish (g):	352,9
Mass of dish (g):	314,8
Mass of dry sample (g):	38,1
Mass for elutriation (g):	38,10

a =	4,215

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
19,4	08:50	test- begin							
19,4	08:50:30	30 s	1,0190	19,0	0,0740	-0,10	18,90	79,67	7,75
19,4	08:51	1 min	1,0175	17,5	0,0470	-0,10	17,40	73,35	2,41
19,4	08:52	2 min	1,0165	16,5	0,0350	-0,10	16,40	69,13	1,61
19,4	08:55	5 min	1,0130	13,0	0,0230	-0,10	12,90	54,38	5,62
19,6	09:08	18 min	1,0095	9,5	0,0137	-0,07	9,43	39,75	5,57
20,0	09:35	45 min	1,0065	6,5	0,0082	0,00	6,50	27,40	4,71
20,4	10:50	2 h	1,0040	4,0	0,0052	0,07	4,07	17,16	3,90
21,9	14:50	6 h	1,0020	2,0	0,0030	0,35	2,35	9,91	2,76
22,5	08:50	24 h	1,0005	0,5	0,00150	0,47	0,97	4,09	2,22
in solution < 0,0015									1,56

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	II/14
Labor Nr.:	BPII
Location:	Schneckenstein
Depth of sample:	13.5-14.5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,79

Evaluation of solid mass

Mass of dry sample + dish (g):	288,3
Mass of dish (g):	264,1
Mass of dry sample (g):	24,2
Mass for elutriation (g):	24,20

a =	6,637

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
20,3	08:50	test- begin							
20,3	######	30 s	1,0110	11,0	0,0750	0,05	11,05	73,33	6,45
20,3	08:51	1 min	1,0105	10,5	0,0530	0,05	10,55	70,02	0,80
20,3	08:52	2 min	1,0100	10,0	0,0370	0,05	10,05	66,70	0,80
20,3	08:55	5 min	1,0070	7,0	0,0250	0,05	7,05	46,79	4,82
20,4	09:08	18 min	1,0060	6,0	0,0140	0,07	6,07	40,28	1,57
20,5	09:35	45 min	1,0040	4,0	0,0083	0,09	4,09	27,14	3,18
20,7	10:50	2 h	1,0025	2,5	0,0052	0,12	2,62	17,39	2,36
21,3	14:50	6 h	1,0015	1,5	0,0030	0,23	1,73	11,48	1,43
20,9	08:50	24 h	1,0005	0,5	0,00150	0,16	0,66	4,38	1,72
							in solution < 0,0015		1,06

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	II/13
Labor Nr.:	BPII
Location:	Schneckenstein
Depth of sample:	12.5-13.5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,78

Evaluation of solid mass

Mass of dry sample + dish (g):	293,2
Mass of dish (g):	264,0
Mass of dry sample (g):	29,2
Mass for elutriation (g):	29,20

a =	5,500

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
20,0	08:50	test- begin							
20,0	08:50:30	30 s	1,0140	14,0	0,0700	0,00	14,00	77,00	6,72
20,0	08:51	1 min	1,0135	13,5	0,0500	0,00	13,50	74,25	0,80
20,0	08:52	2 min	1,0125	12,5	0,0360	0,00	12,50	68,75	1,61
20,0	08:55	5 min	1,0105	10,5	0,0235	0,00	10,50	57,75	3,21
20,2	09:08	18 min	1,0075	7,5	0,0140	0,03	7,53	41,42	4,77
20,3	09:35	45 min	1,0050	5,0	0,0083	0,05	5,05	27,78	3,98
20,5	10:50	2 h	1,0035	3,5	0,0051	0,09	3,59	19,75	2,34
21,3	14:50	6 h	1,0020	2,0	0,0030	0,23	2,23	12,27	2,18
20,8	08:50	24 h	1,0005	0,5	0,00150	0,14	0,64	3,52	2,55
in solution < 0,0015									1,03

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	II/14
Labor Nr.:	BPII
Location:	Schneckenstein
Depth of sample:	13.5-14.5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,79

Evaluation of solid mass

Mass of dry sample + dish (g):	288,3
Mass of dish (g):	264,1
Mass of dry sample (g):	24,2
Mass for elutriation (g):	24,20

a =	6,637

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
20,3	08:50	test- begin							
20,3	######	30 s	1,0110	11,0	0,0750	0,05	11,05	73,33	6,45
20,3	08:51	1 min	1,0105	10,5	0,0530	0,05	10,55	70,02	0,80
20,3	08:52	2 min	1,0100	10,0	0,0370	0,05	10,05	66,70	0,80
20,3	08:55	5 min	1,0070	7,0	0,0250	0,05	7,05	46,79	4,82
20,4	09:08	18 min	1,0060	6,0	0,0140	0,07	6,07	40,28	1,57
20,5	09:35	45 min	1,0040	4,0	0,0083	0,09	4,09	27,14	3,18
20,7	10:50	2 h	1,0025	2,5	0,0052	0,12	2,62	17,39	2,36
21,3	14:50	6 h	1,0015	1,5	0,0030	0,23	1,73	11,48	1,43
20,9	08:50	24 h	1,0005	0,5	0,00150	0,16	0,66	4,38	1,72
							in solution < 0,0015		1,06

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	II/13
Labor Nr.:	BPII
Location:	Schneckenstein
Depth of sample:	12.5-13.5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,78

Evaluation of solid mass

Mass of dry sample + dish (g):	293,2
Mass of dish (g):	264,0
Mass of dry sample (g):	29,2
Mass for elutriation (g):	29,20

a =	5,500

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
20,0	08:50	test- begin							
20,0	08:50:30	30 s	1,0140	14,0	0,0700	0,00	14,00	77,00	6,72
20,0	08:51	1 min	1,0135	13,5	0,0500	0,00	13,50	74,25	0,80
20,0	08:52	2 min	1,0125	12,5	0,0360	0,00	12,50	68,75	1,61
20,0	08:55	5 min	1,0105	10,5	0,0235	0,00	10,50	57,75	3,21
20,2	09:08	18 min	1,0075	7,5	0,0140	0,03	7,53	41,42	4,77
20,3	09:35	45 min	1,0050	5,0	0,0083	0,05	5,05	27,78	3,98
20,5	10:50	2 h	1,0035	3,5	0,0051	0,09	3,59	19,75	2,34
21,3	14:50	6 h	1,0020	2,0	0,0030	0,23	2,23	12,27	2,18
20,8	08:50	24 h	1,0005	0,5	0,00150	0,14	0,64	3,52	2,55
in solution < 0,0015									1,03

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	II/16
Labor Nr.:	BPII
Location:	Schneckenstein
Depth of sample:	15.5-16.5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,79

Evaluation of solid mass

Mass of dry sample + dish (g):	333,8
Mass of dish (g):	314,9
Mass of dry sample (g):	18,9
Mass for elutriation (g):	18,90

a =	8,498

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
20,2	08:50	test- begin							
20,2	08:50:30	30 s	1,0085	9,0	0,0780	0,03	9,03	76,73	4,40
20,2	08:51	1 min	1,0075	8,0	0,0560	0,03	8,03	68,24	1,61
20,2	08:52	2 min	1,0065	7,0	0,0390	0,03	7,03	59,74	1,61
20,2	08:55	5 min	1,0060	6,5	0,0250	0,03	6,53	55,49	0,80
20,3	09:08	18 min	1,0040	4,5	0,0127	0,05	4,55	38,66	3,18
20,4	09:35	45 min	1,0025	3,0	0,0085	0,07	3,07	26,09	2,38
20,7	10:50	2 h	1,0015	2,0	0,0053	0,12	2,12	18,02	1,53
21,3	14:50	6 h	1,0010	1,5	0,0031	0,23	1,73	14,70	0,63
21,0	08:50	24 h	1,0000	0,5	0,00155	0,18	0,68	5,78	1,69
in solution < 0,0015									1,09

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	II/17
Labor Nr.:	BPII
Location:	Schneckenstein
Depth of sample:	16.5-17.5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,79

Evaluation of solid mass

Mass of dry sample + dish (g):	309,7
Mass of dish (g):	288,1
Mass of dry sample (g):	21,6
Mass for elutriation (g):	21,60

a =	7,435

Tempe-ratur [°C]	Time of reading	Elapset time	Actual hyd. reading [g/cm³]	Corr. hyd. reading M-corr.	Grain-size d, mm	Tempe-ratur-corr.	Improved reading	% from a < d [mm] mud-sample	entire sample
21,4	08:50	test- begin							
21,4	08:50:30	30 s	1,0090	9,0	0,0750	0,25	9,25	68,78	6,74
21,4	08:51	1 min	1,0075	7,5	0,0540	0,25	7,75	57,62	2,41
21,4	08:52	2 min	1,0050	5,0	0,0390	0,25	5,25	39,04	4,02
21,4	08:55	5 min	1,0035	3,5	0,0260	0,25	3,75	27,88	2,41
21,5	09:08	18 min	1,0020	2,0	0,0150	0,27	2,27	16,88	2,38
21,8	09:35	45 min	1,0005	0,5	0,0085	0,33	0,83	6,17	2,31
22,1	10:50	2 h	1,0000	0,0	0,0053	0,39	0,39	2,90	0,71
21,9	14:50	6 h	0,9995	-0,5	0,0031	0,35	-0,15	-1,12	0,87
21,9	08:50	24 h	0,9990	-1,0	0,00150	0,35	-0,65	-4,83	0,80
in solution < 0,0015									-1,04

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	II/18
Labor Nr.:	BPII
Location:	Schneckenstein
Depth of sample:	17.5-18.5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,79

Evaluation of solid mass

Mass of dry sample + dish (g):	308,1
Mass of dish (g):	288,1
Mass of dry sample (g):	20,0
Mass for elutriation (g):	20,00

a =	8,030

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
20,3	08:50	test- begin							
20,3	08:50:30	30 s	1,0095	9,5	0,0750	0,05	9,55	76,69	4,66
20,3	08:51	1 min	1,0085	8,5	0,0540	0,05	8,55	68,66	1,61
20,3	08:52	2 min	1,0075	7,5	0,0390	0,05	7,55	60,63	1,61
20,4	08:55	5 min	1,0065	6,5	0,0250	0,07	6,57	52,76	1,57
20,4	09:08	18 min	1,0050	5,0	0,0145	0,07	5,07	40,71	2,41
20,5	09:35	45 min	1,0030	3,0	0,0084	0,09	3,09	24,81	3,18
20,6	10:50	2 h	1,0020	2,0	0,0052	0,10	2,10	16,86	1,59
21,1	14:50	6 h	1,0010	1,0	0,0031	0,20	1,20	9,64	1,45
21,0	08:50	24 h	1,0000	1,0	0,00150	0,18	1,18	9,48	0,03
							in solution < 0,0015		1,90

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	II/19
Labor Nr.:	BPII
Location:	Schneckenstein
Depth of sample:	18.5-19.5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,79

Evaluation of solid mass

Mass of dry sample + dish (g):	330,5
Mass of dish (g):	314,8
Mass of dry sample (g):	15,7
Mass for elutriation (g):	15,70

a =	10,230

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
20,4	08:50	test- begin							
20,4	08:50:30	30 s	1,0070	7,0	0,0770	0,07	7,07	72,32	4,35
20,4	08:51	1 min	1,0065	6,5	0,0550	0,07	6,57	67,21	0,80
20,4	08:52	2 min	1,0060	6,0	0,0390	0,07	6,07	62,09	0,80
20,4	08:55	5 min	1,0050	5,0	0,0250	0,07	5,07	51,86	1,61
20,4	09:08	18 min	1,0035	3,5	0,0150	0,07	3,57	36,52	2,41
20,5	09:35	45 min	1,0025	2,5	0,0085	0,09	2,59	26,49	1,57
20,6	10:50	2 h	1,0015	1,5	0,0053	0,10	1,60	16,37	1,59
21,0	14:50	6 h	1,0005	0,5	0,0031	0,18	0,68	6,96	1,48
20,8	08:50	24 h	1,0000	1,0	0,00150	0,14	1,14	11,67	-0,74
in solution < 0,0015									1,83

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	II/20
Labor Nr.:	BPII
Location:	Schneckenstein
Depth of sample:	19.5-20.2m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,82

Evaluation of solid mass

Mass of dry sample + dish (g):	1061,9
Mass of dish (g):	1033,8
Mass of dry sample (g):	28,1
Mass for elutriation (g):	28,10

a =	5,716

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
20,4	08:50	test- begin							
20,4	08:50:30	30 s	1,0130	13,0	0,0720	0,07	13,07	74,70	7,11
20,4	08:51	1 min	1,0125	12,5	0,0510	0,07	12,57	71,84	0,80
20,4	08:52	2 min	1,0110	11,0	0,0360	0,07	11,07	63,27	2,41
20,4	08:55	5 min	1,0095	9,5	0,0240	0,07	9,57	54,70	2,41
20,4	09:08	18 min	1,0075	7,5	0,0140	0,07	7,57	43,27	3,21
20,6	09:35	45 min	1,0050	5,0	0,0083	0,10	5,10	29,15	3,97
20,7	10:50	2 h	1,0035	3,5	0,0052	0,12	3,62	20,69	2,38
21,0	14:50	6 h	1,0020	2,0	0,0030	0,18	2,18	12,46	2,31
20,8	08:50	24 h	1,0010	1,0	0,00150	0,14	1,14	6,52	1,67
in Lösung < 0,0015									1,83

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	III/1
Labor Nr.:	BPIII
Location:	Schneckenstein
Depth of sample:	0-1m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,74

Evaluation of solid mass

Mass of dry sample + dish (g):	303,6
Mass of dish (g):	288,1
Mass of dry sample (g):	15,5
Mass for elutriation (g):	88,70

a =	10,362

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
19,1	08:50	test- begin							
19,1	08:50:30	30 s	1,0070	7,0	0,0800	-0,16	6,84	70,87	25,83
19,1	08:51	1 min	1,0065	6,5	0,0570	-0,16	6,34	65,69	4,60
19,1	08:52	2 min	1,0055	5,5	0,0410	-0,16	5,34	55,33	9,19
19,1	08:55	5 min	1,0045	4,5	0,0260	-0,16	4,34	44,97	9,19
19,2	09:08	18 min	1,0035	3,5	0,0150	-0,14	3,36	34,82	9,01
19,3	09:35	45 min	1,0025	2,5	0,0086	-0,12	2,38	24,66	9,01
19,3	10:50	2 h	1,0010	1,0	0,0054	-0,12	0,88	9,12	13,79
19,4	14:50	6 h	1,0005	0,5	0,0032	-0,10	0,40	4,14	4,41
19,5	08:50	24 h	1,0000	0,0	0,00155	-0,09	-0,09	-0,93	4,50
							in solution < 0,0015		-0,83

Appendix:7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	III/2
Labor Nr.:	BPIII
Location:	Schneckenstein
Depth of sample:	1-2m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,78

Evaluation of solid mass

Mass of dry sample + dish (g):	1058,5
Mass of dish (g):	1033,8
Mass of dry sample (g):	24,7
Mass for elutriation (g):	167,70

a =	6,502

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
19,0	08:50	test- begin							
19,0	08:50:30	30 s	1,0115	11,5	0,0760	-0,18	11,32	73,61	44,26
19,0	08:51	1 min	1,0105	10,5	0,0540	-0,18	10,32	67,10	10,90
19,0	08:52	2 min	1,0090	9,0	0,0380	-0,18	8,82	57,35	16,36
19,0	08:55	5 min	1,0065	6,5	0,0255	-0,18	6,32	41,09	27,26
19,0	09:08	18 min	1,0055	5,5	0,0150	-0,18	5,32	34,59	10,90
19,1	09:35	45 min	1,0040	4,0	0,0085	-0,16	3,84	24,97	16,14
19,3	10:50	2 h	1,0030	3,0	0,0053	-0,12	2,88	18,73	10,47
19,4	14:50	6 h	1,0015	1,5	0,0032	-0,10	1,40	9,10	16,14
19,5	08:50	24 h	1,0010	1,0	0,00155	-0,09	0,91	5,92	5,34
						in solution < 0,0015			9,92

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	III/3
Labor Nr.:	BPIII
Location:	Schneckenstein
Depth of sample:	2-3m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,73

Evaluation of solid mass

Mass of dry sample + dish (g):	887,9
Mass of dish (g):	859,6
Mass of dry sample (g):	28,3
Mass for elutriation (g):	39,10

a =	5,675

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
21,3	08:50	test- begin							
21,3	08:50:30	30 s	1,0168	16,8	0,0680	0,23	17,03	96,65	1,31
21,3	08:51	1 min	1,0168	16,8	0,0480	0,23	17,03	96,65	0,00
21,3	08:52	2 min	1,0168	16,8	0,0340	0,23	17,03	96,65	0,00
21,3	08:55	5 min	1,0164	16,4	0,0215	0,23	16,63	94,38	0,89
21,3	09:08	18 min	1,0148	14,8	0,0127	0,23	15,03	85,30	3,55
21,3	09:35	45 min	1,0136	13,6	0,0075	0,23	13,83	78,49	2,66
21,4	10:50	2 h	1,0114	11,4	0,0047	0,25	11,65	66,12	4,84
21,7	14:50	6 h	1,0076	7,6	0,0028	0,30	7,90	44,83	8,32
20,9	08:50	24 h	1,0052	5,2	0,00145	0,16	5,36	30,42	5,64
							in solution < 0,0015		11,89

Appendix:7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	III/4
Labor Nr.:	BPIII
Location:	Schneckenstein
Depth of sample:	3-4m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,74

Evaluation of solid mass

Mass of dry sample + dish (g):	717,0
Mass of dish (g):	700,3
Mass of dry sample (g):	16,7
Mass for elutriation (g):	29,40

a =	9,617

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
21,3	08:50	test- begin							
21,3	08:50:30	30 s	1,0084	8,4	0,0775	0,23	8,63	83,00	5,00
21,3	08:51	1 min	1,0084	8,4	0,0550	0,23	8,58	82,51	0,14
21,3	08:52	2 min	1,0082	8,2	0,0380	0,23	8,43	81,07	0,42
21,3	08:55	5 min	1,0082	8,2	0,0240	0,23	8,43	81,07	0,00
21,3	09:08	18 min	1,0074	7,4	0,0140	0,23	7,63	73,38	2,26
21,3	09:35	45 min	1,0050	5,0	0,0083	0,23	5,23	50,30	6,79
21,4	10:50	2 h	1,0040	4,0	0,0051	0,25	4,25	40,87	2,77
21,7	14:50	6 h	1,0030	3,0	0,0030	0,30	3,30	31,74	2,69
20,9	08:50	24 h	1,0020	2,0	0,00150	0,16	2,16	20,77	3,22
in solution < 0,0015									6,11

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	III/5
Labor Nr.:	BPIII
Location:	Schneckenstein
Depth of sample:	4-5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,77

Evaluation of solid mass

Mass of dry sample + dish (g):	519,6
Mass of dish (g):	492,5
Mass of dry sample (g):	27,1
Mass for elutriation (g):	27,10

a =	5,926

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
21,2	08:50	test- begin							
21,2	08:50:30	30 s	1,0158	15,8	0,0700	0,21	16,01	94,88	1,39
21,2	08:51	1 min	1,0158	15,8	0,0480	0,21	16,01	94,88	0,00
21,2	08:52	2 min	1,0156	15,6	0,0340	0,21	15,81	93,70	0,32
21,2	08:55	5 min	1,0150	15,0	0,0220	0,21	15,21	90,14	0,96
21,2	09:08	18 min	1,0134	13,4	0,0130	0,21	13,61	80,66	2,57
21,2	09:35	45 min	1,0104	10,4	0,0078	0,21	10,61	62,88	4,82
21,2	10:50	2 h	1,0080	8,0	0,0048	0,21	8,21	48,66	3,85
21,7	14:50	6 h	1,0052	5,2	0,0029	0,30	5,50	32,60	4,35
20,8	08:50	24 h	1,0032	3,2	0,00145	0,14	3,34	19,79	3,47
in solution < 0,0015									5,36

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	III/6
Labor Nr.:	BPIII
Location:	Schneckenstein
Depth of sample:	5-6m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,71

Evaluation of solid mass

Mass of dry sample + dish (g):	509,9
Mass of dish (g):	468,9
Mass of dry sample (g):	41,0
Mass for elutriation (g):	41,00

a =	3,917

Tempe-ratur [°C]	Time of reading	Elapset time	Actual hyd. reading [g/cm³]	Corr. hyd. reading M-corr.	Grain-size d, mm	Tempe-ratur-corr.	Improved reading	% from a < d [mm] mud-sample	entire sample
20,7	08:50	test- begin							
20,7	08:50:30	30 s	1,0249	24,9	0,0590	0,12	25,02	98,01	0,82
20,7	08:51	1 min	1,0247	24,7	0,0425	0,12	24,82	97,23	0,32
20,7	08:52	2 min	1,0244	24,4	0,0300	0,12	24,52	96,05	0,48
20,7	08:55	5 min	1,0234	23,4	0,0190	0,12	23,52	92,13	1,61
20,7	09:08	18 min	1,0190	19,0	0,0120	0,12	19,12	74,90	7,07
20,7	09:35	45 min	1,0160	16,0	0,0072	0,12	16,12	63,15	4,82
21,1	10:50	2 h	1,0118	11,8	0,0047	0,20	12,00	47,01	6,62
21,7	14:50	6 h	1,0080	8,0	0,0028	0,30	8,30	32,51	5,94
20,9	08:50	24 h	1,0052	5,2	0,00145	0,16	5,36	21,00	4,72
in solution < 0,0015									8,61

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	III/7
Labor Nr.:	BPIII
Location:	Schneckenstein
Depth of sample:	6-7m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,73

Evaluation of solid mass

Mass of dry sample + dish (g):	638,9
Mass of dish (g):	626,4
Mass of dry sample (g):	12,5
Mass for elutriation (g):	12,50

a =	12,848

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
21,0	08:50	test- begin							
21,0	08:50:30	30 s	1,0058	5,8	0,0780	0,18	5,98	76,83	2,90
21,0	08:51	1 min	1,0056	5,6	0,0560	0,18	5,78	74,26	0,32
21,0	08:52	2 min	1,0056	5,6	0,0390	0,18	5,78	74,26	0,00
21,0	08:55	5 min	1,0054	5,4	0,0250	0,18	5,58	71,69	0,32
21,0	09:08	18 min	1,0050	5,0	0,0145	0,18	5,18	66,56	0,64
21,0	09:35	45 min	1,0038	3,8	0,0084	0,18	3,98	51,14	1,93
21,2	10:50	2 h	1,0028	2,8	0,0053	0,21	3,01	38,67	1,56
21,6	14:50	6 h	1,0014	1,4	0,0031	0,29	1,69	21,71	2,12
20,8	08:50	24 h	1,0004	0,4	0,00150	0,14	0,54	6,94	1,85
in solution < 0,0015									0,87

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	III/8
Labor Nr.:	BPIII
Location:	Schneckenstein
Depth of sample:	7-8m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,79

Evaluation of solid mass

Mass of dry sample + dish (g):	843,5
Mass of dish (g):	813,8
Mass of dry sample (g):	29,7
Mass for elutriation (g):	29,70

a =	5,408

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
20,9	08:50	test- begin							
20,9	08:50:30	30 s	1,0162	16,2	0,0680	0,16	16,36	88,47	3,42
20,9	08:51	1 min	1,0160	16,0	0,0480	0,16	16,16	87,39	0,32
20,9	08:52	2 min	1,0160	16,0	0,0340	0,16	16,16	87,39	0,00
20,9	08:55	5 min	1,0160	16,0	0,0220	0,16	16,16	87,39	0,00
20,9	09:08	18 min	1,0142	14,2	0,0127	0,16	14,36	77,65	2,89
21,0	09:35	45 min	1,0106	10,6	0,0077	0,18	10,78	58,29	5,75
21,2	10:50	2 h	1,0082	8,2	0,0048	0,21	8,41	45,48	3,81
21,7	14:50	6 h	1,0062	6,2	0,0029	0,30	6,50	35,15	3,07
21,0	08:50	24 h	1,0036	3,6	0,00145	0,18	3,78	20,44	4,37
in solution < 0,0015									6,07

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	IV/1
Labor Nr.:	BPIV
Location:	Schneckenstein
Depth of sample:	0-1m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,69

Evaluation of solid mass

Mass of dry sample + dish (g):	568,1
Mass of dish (g):	555,1
Mass of dry sample (g):	13,0
Mass for elutriation (g):	57,30

a =	12,354

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
21,4	08:50	test- begin							
21,4	08:50:30	30 s	1,0058	6,3	0,0780	0,25	6,55	80,92	10,93
21,4	08:51	1 min	1,0056	6,1	0,0550	0,25	6,35	78,45	1,42
21,4	08:52	2 min	1,0054	5,9	0,0390	0,25	6,15	75,98	1,42
21,4	08:55	5 min	1,0048	5,3	0,0250	0,25	5,55	68,57	4,25
21,3	09:08	18 min	1,0032	3,7	0,0145	0,23	3,93	48,55	11,47
21,3	09:35	45 min	1,0020	2,5	0,0084	0,23	2,73	33,73	8,49
21,3	10:50	2 h	1,0012	1,7	0,0053	0,23	1,93	23,84	5,66
21,7	14:50	6 h	1,0002	0,7	0,0031	0,30	1,00	12,35	6,58
21,2	08:50	24 h	1,0002	0,7	0,00150	0,21	0,91	11,24	0,64
					in solution < 0,0015				6,44

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	IV/2
Labor Nr.:	BPIV
Location:	Schneckenstein
Depth of sample:	1-2m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,78

Evaluation of solid mass

Mass of dry sample + dish (g):	499,1
Mass of dish (g):	466,9
Mass of dry sample (g):	32,2
Mass for elutriation (g):	177,00

a =	4,988

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
21,1	08:50	test- begin							
21,1	08:50:30	30 s	1,0156	15,6	0,0690	0,20	15,80	78,81	37,51
21,1	08:51	1 min	1,0140	14,0	0,0500	0,20	14,20	70,83	14,13
21,1	08:52	2 min	1,0124	12,4	0,0360	0,20	12,60	62,85	14,13
21,1	08:55	5 min	1,0098	9,8	0,0235	0,20	10,00	49,88	22,95
21,1	09:08	18 min	1,0068	6,8	0,0140	0,20	7,00	34,91	26,49
21,1	09:35	45 min	1,0050	5,0	0,0083	0,20	5,20	25,94	15,89
21,2	10:50	2 h	1,0034	3,4	0,0052	0,21	3,61	18,01	14,04
21,6	14:50	6 h	1,0022	2,2	0,0030	0,29	2,49	12,42	9,89
21,3	08:50	24 h	1,0014	1,4	0,00150	0,23	1,63	8,13	7,59
						in solution < 0,0015			14,39

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	IV/3
Labor Nr.:	BPIV
Location:	Schneckenstein
Depth of sample:	2-3m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,76

Evaluation of solid mass

Mass of dry sample + dish (g):	578,5
Mass of dish (g):	556,4
Mass of dry sample (g):	22,1
Mass for elutriation (g):	113,30

a =	7,267

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
21,4	08:50	test- begin							
21,4	08:50:30	30 s	1,0062	6,2	0,0780	0,25	6,45	46,87	60,19
21,4	08:51	1 min	1,0042	4,2	0,0560	0,25	4,45	32,34	16,47
21,4	08:52	2 min	1,0026	2,6	0,0400	0,25	2,85	20,71	13,17
21,4	08:55	5 min	1,0006	0,6	0,0265	0,25	0,85	6,18	16,47
21,4	09:08	18 min	0,9996	-0,4	0,0150	0,25	-0,15	-1,09	8,23
21,3	09:35	45 min	0,9992	-0,8	0,0087	0,23	-0,57	-4,14	3,46
21,2	10:50	2 h	0,9990	-1,0	0,0054	0,21	-0,79	-5,74	1,81
21,6	14:50	6 h	0,9988	-1,2	0,0031	0,29	-0,91	-6,61	0,99
21,3	08:50	24 h	0,9988	-1,2	0,00150	0,23	-0,97	-7,05	0,49
					in solution < 0,0015				-7,99

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	IV/4
Labor Nr.:	BPIV
Location:	Schneckenstein
Depth of sample:	3-4m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,78

Evaluation of solid mass

Mass of dry sample + dish (g):	783,3
Mass of dish (g):	745,5
Mass of dry sample (g):	37,8
Mass for elutriation (g):	37,80

a =	4,249

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
20,7	08:50	test- begin							
20,7	08:50:30	30 s	1,0225	22,5	0,0620	0,12	22,62	96,11	1,47
20,7	08:51	1 min	1,0224	22,4	0,0430	0,12	22,52	95,68	0,16
20,7	08:52	2 min	1,0220	22,0	0,0305	0,12	22,12	93,98	0,64
20,7	08:55	5 min	1,0216	21,6	0,0200	0,12	21,72	92,28	0,64
20,7	09:08	18 min	1,0182	18,2	0,0120	0,12	18,32	77,84	5,46
20,7	09:35	45 min	1,0154	15,4	0,0072	0,12	15,52	65,94	4,50
20,6	10:50	2 h	1,0116	11,6	0,0047	0,10	11,70	49,71	6,14
20,8	14:50	6 h	1,0084	8,4	0,0028	0,14	8,54	36,29	5,08
20,6	08:50	24 h	1,0052	5,2	0,00145	0,10	5,30	22,52	5,20
in solution < 0,0015									8,51

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	IV/5
Labor Nr.:	BPIV
Location:	Schneckenstein
Depth of sample:	4-5m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,81

Evaluation of solid mass

Mass of dry sample + dish (g):	794,0
Mass of dish (g):	762,6
Mass of dry sample (g):	31,4
Mass for elutriation (g):	31,40

a =	5,115

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
20,6	08:50	test- begin							
20,6	08:50:30	30 s	1,0184	18,4	0,0660	0,10	18,50	94,62	1,69
20,6	08:51	1 min	1,0182	18,2	0,0480	0,10	18,30	93,60	0,32
20,6	08:52	2 min	1,0181	18,1	0,0330	0,10	18,20	93,09	0,16
20,6	08:55	5 min	1,0174	17,4	0,0210	0,10	17,50	89,51	1,12
20,6	09:08	18 min	1,0142	14,2	0,0130	0,10	14,30	73,14	5,14
20,5	09:35	45 min	1,0112	11,2	0,0077	0,09	11,29	57,75	4,83
20,5	10:50	2 h	1,0086	8,6	0,0048	0,09	8,69	44,45	4,18
20,7	14:50	6 h	1,0060	6,0	0,0029	0,12	6,12	31,30	4,13
20,6	08:50	24 h	1,0038	3,8	0,00150	0,10	3,90	19,95	3,57
in solution < 0,0015									6,26

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	IV/6
Labor Nr.:	BPIV
Location:	Schneckenstein
Depth of sample:	5-6m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,81

Evaluation of solid mass

Mass of dry sample + dish (g):	646,0
Mass of dish (g):	607,4
Mass of dry sample (g):	38,6
Mass for elutriation (g):	38,60

a =	4,161

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
20,3	08:50	test- begin							
20,3	08:50:30	30 s	1,0234	23,4	0,0610	0,05	23,45	97,57	0,94
20,3	08:51	1 min	1,0230	23,0	0,0440	0,05	23,05	95,91	0,64
20,3	08:52	2 min	1,0224	22,4	0,0310	0,05	22,45	93,41	0,96
20,3	08:55	5 min	1,0194	19,4	0,0205	0,05	19,45	80,93	4,82
20,3	09:08	18 min	1,0156	15,6	0,0125	0,05	15,65	65,12	6,10
20,3	09:35	45 min	1,0094	9,4	0,0078	0,05	9,45	39,32	9,96
20,4	10:50	2 h	1,0070	7,0	0,0050	0,07	7,07	29,42	3,82
20,8	14:50	6 h	1,0044	4,4	0,0030	0,14	4,54	18,89	4,06
20,6	08:50	24 h	1,0036	3,6	0,00145	0,10	3,70	15,39	1,35
in solution < 0,0015									5,94

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	IV/7
Labor Nr.:	BPIV
Location:	Schneckenstein
Depth of sample:	6-7m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,76

Evaluation of solid mass

Mass of dry sample + dish (g):	610,6
Mass of dish (g):	562,4
Mass of dry sample (g):	48,2
Mass for elutriation (g):	48,20

a =	3,330

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
20,3	08:50	test- begin							
20,3	08:50:30	30 s	1,0294	29,4	0,0530	0,05	29,45	98,05	0,94
20,3	08:51	1 min	1,0288	28,8	0,0380	0,05	28,85	96,06	0,96
20,3	08:52	2 min	1,0278	27,8	0,0275	0,05	27,85	92,73	1,60
20,3	08:55	5 min	1,0246	24,6	0,0190	0,05	24,65	82,07	5,14
20,3	09:08	18 min	1,0214	21,4	0,0115	0,05	21,45	71,42	5,14
20,4	09:35	45 min	1,0170	17,0	0,0070	0,07	17,07	56,83	7,03
20,4	10:50	2 h	1,0126	12,6	0,0046	0,07	12,67	42,18	7,06
20,6	14:50	6 h	1,0086	8,6	0,0028	0,10	8,70	28,97	6,37
20,5	08:50	24 h	1,0056	5,6	0,00140	0,09	5,69	18,94	4,83
in solution < 0,0015									9,13

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	IV/8
Labor Nr.:	BPIV
Location:	Schneckenstein
Depth of sample:	7-8m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,85

Evaluation of solid mass

Mass of dry sample + dish (g):	969,9
Mass of dish (g):	933,6
Mass of dry sample (g):	36,3
Mass for elutriation (g):	36,30

a =	4,424

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
20,2	08:50	test- begin							
20,2	08:50:30	30 s	1,0216	21,6	0,0640	0,03	21,63	95,70	1,56
20,2	08:51	1 min	1,0214	21,4	0,0450	0,03	21,43	94,82	0,32
20,2	08:52	2 min	1,0213	21,3	0,0315	0,03	21,33	94,37	0,16
20,2	08:55	5 min	1,0208	20,8	0,0205	0,03	20,83	92,16	0,80
20,3	09:08	18 min	1,0192	19,2	0,0120	0,05	19,25	85,17	2,54
20,3	09:35	45 min	1,0166	16,6	0,0072	0,05	16,65	73,67	4,18
20,3	10:50	2 h	1,0130	13,0	0,0045	0,05	13,05	57,74	5,78
20,6	14:50	6 h	1,0090	9,0	0,0028	0,10	9,10	40,26	6,34
20,4	08:50	24 h	1,0065	6,5	0,00140	0,07	6,57	29,07	4,06
in solution < 0,0015									10,55

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	IV/9
Labor Nr.:	BPIV
Location:	Schneckenstein
Depth of sample:	8-9m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,83

Evaluation of solid mass

Mass of dry sample + dish (g):	879,1
Mass of dish (g):	839,1
Mass of dry sample (g):	40,0
Mass for elutriation (g):	40,00

a =	4,015

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
20,1	08:50	test- begin							
20,1	08:50:30	30 s	1,0242	24,2	0,0610	0,01	24,21	97,21	1,12
20,1	08:51	1 min	1,0238	23,8	0,0430	0,01	23,81	95,60	0,64
20,1	08:52	2 min	1,0230	23,0	0,0310	0,01	23,01	92,39	1,28
20,1	08:55	5 min	1,0210	21,0	0,0200	0,01	21,01	84,36	3,21
20,1	09:08	18 min	1,0178	17,8	0,0120	0,01	17,81	71,51	5,14
20,2	09:35	45 min	1,0138	13,8	0,0074	0,03	13,83	55,53	6,39
20,2	10:50	2 h	1,0108	10,8	0,0047	0,03	10,83	43,48	4,82
20,5	14:50	6 h	1,0076	7,6	0,0029	0,09	7,69	30,88	5,04
20,3	08:50	24 h	1,0050	5,0	0,00145	0,05	5,05	20,28	4,24
in solution < 0,0015									8,11

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	IV/10
Labor Nr.:	BPIV
Location:	Schneckenstein
Depth of sample:	9-10m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,85

Evaluation of solid mass

Mass of dry sample + dish (g):	669,2
Mass of dish (g):	622,4
Mass of dry sample (g):	46,8
Mass for elutriation (g):	46,80

a =	3,432

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
21,1	08:50	test- begin							
21,1	08:50:30	30 s	1,0276	27,6	0,0560	0,20	27,80	95,40	2,15
21,1	08:51	1 min	1,0270	27,0	0,0400	0,20	27,20	93,34	0,96
21,1	08:52	2 min	1,0260	26,0	0,0285	0,20	26,20	89,91	1,61
21,1	08:55	5 min	1,0226	22,6	0,0195	0,20	22,80	78,24	5,46
21,1	09:08	18 min	1,0182	18,2	0,0120	0,20	18,40	63,14	7,07
21,1	09:35	45 min	1,0122	12,2	0,0075	0,20	12,40	42,55	9,64
21,1	10:50	2 h	1,0088	8,8	0,0048	0,20	9,00	30,89	5,46
21,5	14:50	6 h	1,0056	5,6	0,0029	0,27	5,87	20,14	5,03
21,2	08:50	24 h	1,0040	4,0	0,00145	0,21	4,21	14,45	2,67
						in solution < 0,0015			6,76

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	IV/11
Labor Nr.:	BPIV
Location:	Schneckenstein
Depth of sample:	10-11m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,74

Evaluation of solid mass

Mass of dry sample + dish (g):	618,4
Mass of dish (g):	602,4
Mass of dry sample (g):	16,0
Mass for elutriation (g):	110,50

a =	10,038

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
21,6	08:50	test- begin							
21,6	08:50:30	30 s	1,0078	7,8	0,0775	0,20	8,00	80,30	21,77
21,6	08:51	1 min	1,0074	7,4	0,0540	0,20	7,60	76,29	4,44
21,6	08:52	2 min	1,0068	6,8	0,0380	0,20	7,00	70,27	6,66
21,6	08:55	5 min	1,0050	5,0	0,0250	0,20	5,20	52,20	19,97
21,5	09:08	18 min	1,0036	3,6	0,0142	0,20	3,80	38,14	15,53
21,4	09:35	45 min	1,0022	2,2	0,0084	0,20	2,40	24,09	15,53
21,3	10:50	2 h	1,0010	1,0	0,0053	0,20	1,20	12,05	13,31
21,4	14:50	6 h	1,0004	0,4	0,0031	0,27	0,67	6,73	5,88
21,0	08:50	24 h	1,0004	0,4	0,00150	0,21	0,61	6,12	0,67
in solution < 0,0015									6,77

Appendix: 7.1.2

PARTICULE-SIZE ANALYSIS-HYDROMETER METHOD after DIN 18 123

Sample Nr.:	IV/12
Labor Nr.:	BPIV
Location:	Schneckenstein
Depth of sample:	11-12m
Soil state:	undisturbed
Date:	21/11/1996

Elutriation

Tested by:	Taoufik Naamoun
Date:	20/06/1997
Dispersing agent:	0.5 Natriumpyrophosphat
Meniscus:	0.5
G_s [g/cm³]:	2,79

Evaluation of solid mass

Mass of dry sample + dish (g):	811,4
Mass of dish (g):	786,3
Mass of dry sample (g):	25,1
Mass for elutriation (g):	313,80

a =	6,399

Tempe-	Time	Elapset	Actual	Corr.	Grain-	Tempe-	Improved	% from a < d [mm]	
ratur	of	time	hyd.	hyd.	size	ratur-	reading	mud-	entire
[°C]	reading		reading	reading	d, mm	corr.		sample	sample
			[g/cm³]	M-corr.					
21,2	08:50	test- begin							
21,2	08:50:30	30 s	1,0124	12,4	0,0710	0,21	12,61	80,69	60,60
21,2	08:51	1 min	1,0120	12,0	0,0520	0,21	12,21	78,13	8,03
21,2	08:52	2 min	1,0112	11,2	0,0360	0,21	11,41	73,01	16,06
21,2	08:55	5 min	1,0102	10,2	0,0230	0,21	10,41	66,61	20,08
21,2	09:08	18 min	1,0076	7,6	0,0139	0,21	7,81	49,97	52,21
21,2	09:35	45 min	1,0062	6,2	0,0080	0,21	6,41	41,02	28,11
21,3	10:50	2 h	1,0044	4,4	0,0051	0,23	4,63	29,63	35,74
21,6	14:50	6 h	1,0028	2,8	0,0030	0,29	3,09	19,77	30,92
21,3	08:50	24 h	1,0024	2,4	0,00145	0,23	2,63	16,83	9,24
						in solution < 0,0015			52,81

Appendix. 7.1.3

Particle-size distribution

Borehole N°1:

Depth int./m	Clays	Silts	Fine sand	Medium sand	Coarse sand	Fine gravel	Medium gravel	Coarse gravel	Cobbles	U	C
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)		
0--1	0	9	7	7	12	16	18	28	4	130.536	2.191
1--1.5	0	5	18	42	32	2	0	0	0	7.057	1.489
1.5--2.5	0	6	18	34	27	4	4	7	0	8.628	1.176
2.5--3.5	0	4	10	19	37	28	2	1	0	12.62	1.472
3.5--4.5	0	68	31	0	0	0	0	0	0	6.336	1.009
4.5--5.5	0	49	51	0	0	0	0	0	0	6.067	2.666
5.5--6.5	0	68	32	0	0	0	0	0	0	15.944	0.773
6.5--7.5	0	74	26	0	0	0	0	0	0	13.439	1.014
7.5--8.5	0	68	32	0	0	0	0	0	0	15.994	1.038
8.5--9.5	0	98	2	0	0	0	0	0	0	9.828	0.908

Borehole N°2:

Depth int./m	Clays	Silts	Fine sand	Medium sand	Coarse sand	Fine gravel	Medium gravel	Coarse gravel	Cobbles	U	C
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)		
0--0.5	0	9	6	8	13	21	28	15	0	70.984	2.367
0.5--1.5	0	28	17	28	24	2	0	0	0	66.908	1.96
2.5--3.5	0	1	17	40	38	3	0	0	0	6.505	1.408
3.5--4.5	0	7	23	30	30	9	1	0	0	9.075	0.894
4.5--5.5	0	9	19	29	34	8	1	0	0	10.539	1.026
5.5--6.5	0	51	49	0	0	0	0	0	0	25.456	0.738
6.5--7.5	0	73	27	0	0	0	0	0	0	15.412	1.732
7.5--8.5	0	71	29	0	0	0	0	0	0	9.146	0.59
8.5--9.5	0	76	24	0	0	0	0	0	0	17.533	1.15
9.5--10.5	0	77	23	0	0	0	0	0	0	18.662	1.376
10.5--11.5	0	77	23	0	0	0	0	0	0	10.429	1.109
11.5--12.5	0	76	24	0	0	0	0	0	0	7.663	0.813
12.5--13.5	0	77	23	0	0	0	0	0	0	10.668	1.35
13.5--14.5	0	72	28	0	0	0	0	0	0	15.634	1.082
14.5--15.5	0	83	17	0	0	0	0	0	0	9.849	1.312
15.5--16.5	0	68	32	0	0	0	0	0	0	17.026	1.066
16.5--17.5	0	66	34	0	0	0	0	0	0	6.895	1.393
17.5--18.5	0	73	27	0	0	0	0	0	0	17.988	1.476
18.5--19.5	0	71	29	0	0	0	0	0	0	6.998	0.904
19.5--20.2	0	74	26	0	0	0	0	0	0	13.095	0.997

Appendix. 7.1.3. **Particle-size distribution**

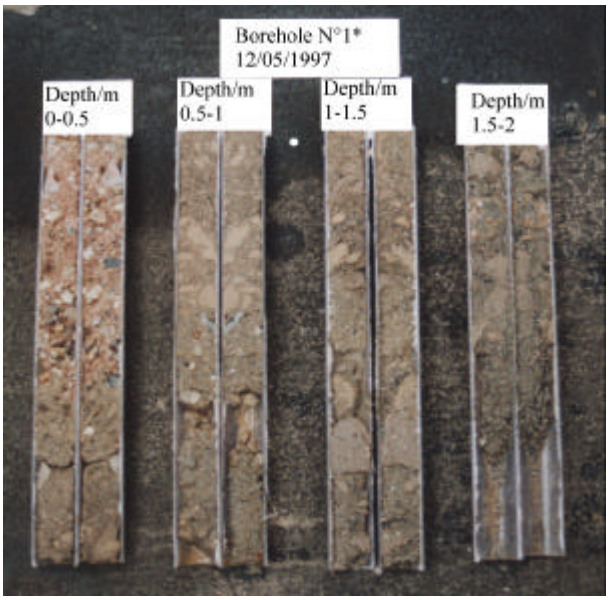
Borehole N°3:

Depth int./m	Clays	Silts	Fine sand	Medium sand	Coarse sand	Fine gravel	Medium gravel	Coarse gravel	Cobbles	U	C
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)		
0--1	0	11	9	7	11	18	24	19	0	154.633	2.14
1--2	0	27	24	22	21	3	1	1	0	48.293	2.44
2--3	0	5	31	38	21	5	0	0	0	5.891	1.144
3--4	0	4	23	32	23	7	5	5	0	8.909	1.003
4--5	0	97	3	0	0	0	0	0	0	3.798	0.844
5--6	0	100	0	0	0	0	0	0	0	3.891	0.887
6--7	0	78	22	0	0	0	0	0	0	4.6	0.759
7--8	0	87	13	0	0	0	0	0	0	4.56	0.904

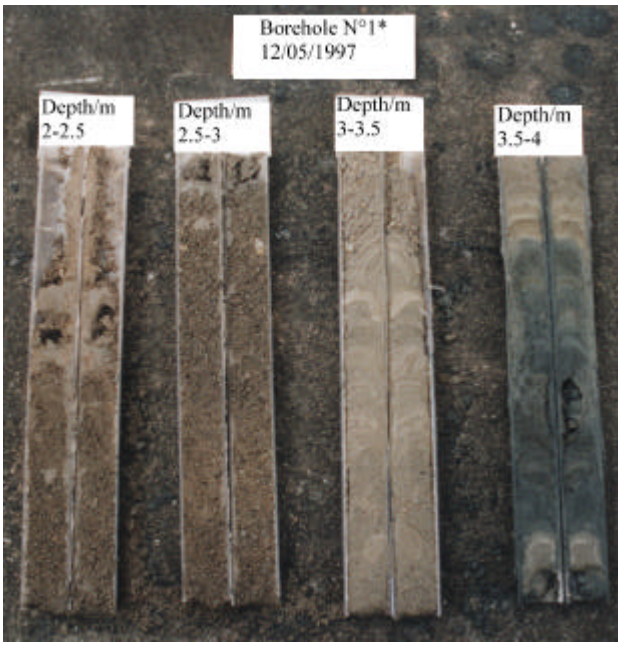
Borehole N°4:

Depth int./m	Clays	Silts	Fine sand	Medium sand	Coarse sand	Fine gravel	Medium gravel	Coarse gravel	Cobbles	U	C
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)		
0--1	0	9	7	7	12	22	26	16	0	178.042	5.126
1--2	0	24	26	24	21	3	1	0	0	30.778	1.6
2--3	0	15	57	25	3	0	0	0	0	3.101	0.641
3--4	0	98	2	0	0	0	0	0	0	3.654	0.957
4--5	0	96	4	0	0	0	0	0	0	4.353	0.813
5--6	0	100	0	0	0	0	0	0	0	3.319	1.256
6--7	0	100	0	0	0	0	0	0	0	4.122	0.849
7--8	0	97	3	0	0	0	0	0	0	2.935	0.922
8--9	0	99	1	0	0	0	0	0	0	4.269	0.837
9--10	0	97	3	0	0	0	0	0	0	3.808	1.071
10--11	0	20	13	8	8	12	18	20	1	372.501	0.191
11--12	0	21	14	12	14	15	16	8	0	333.041	0.622

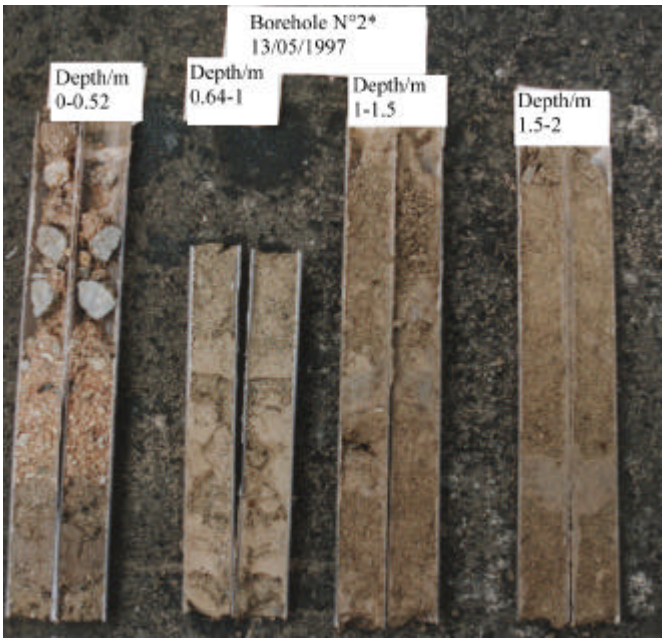
Appendix: 7.1.4



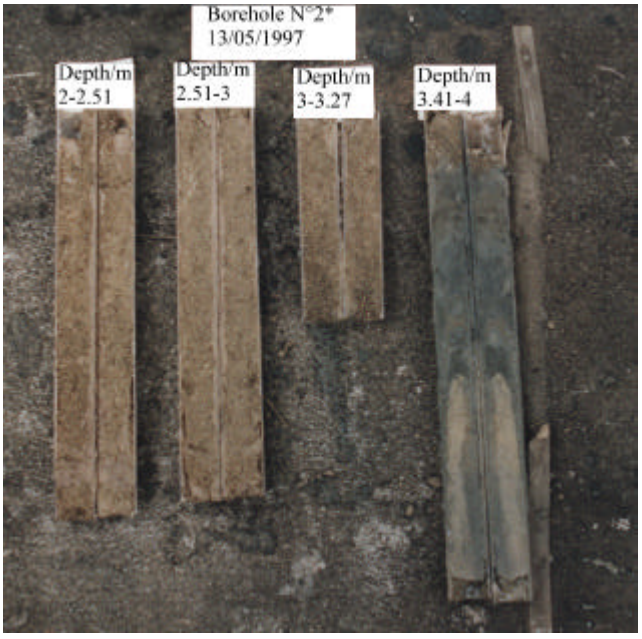
App. 7.1.4.1: An overview of the soil material in the upper most tailings. The soil core was taken near of the borehole N°1.



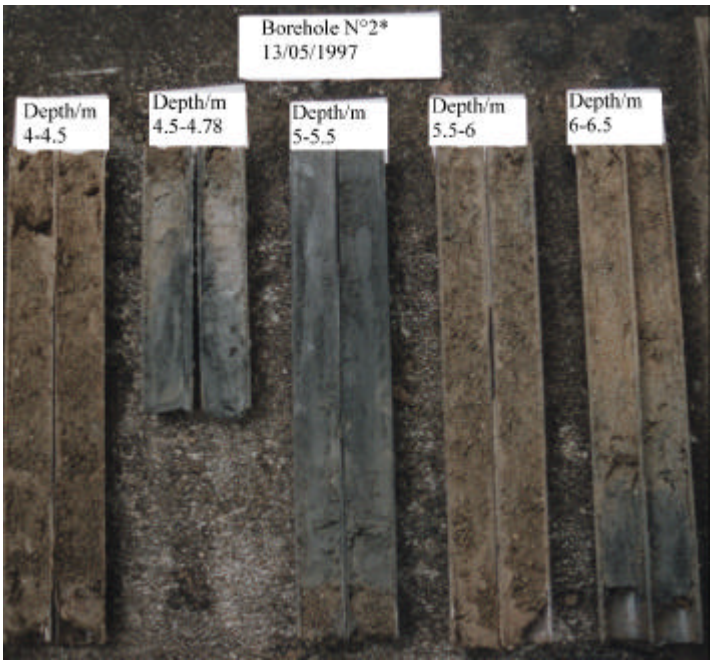
App. 7.1.4.2: The grain size decrease with depth & the change of the soil material is remarkable.



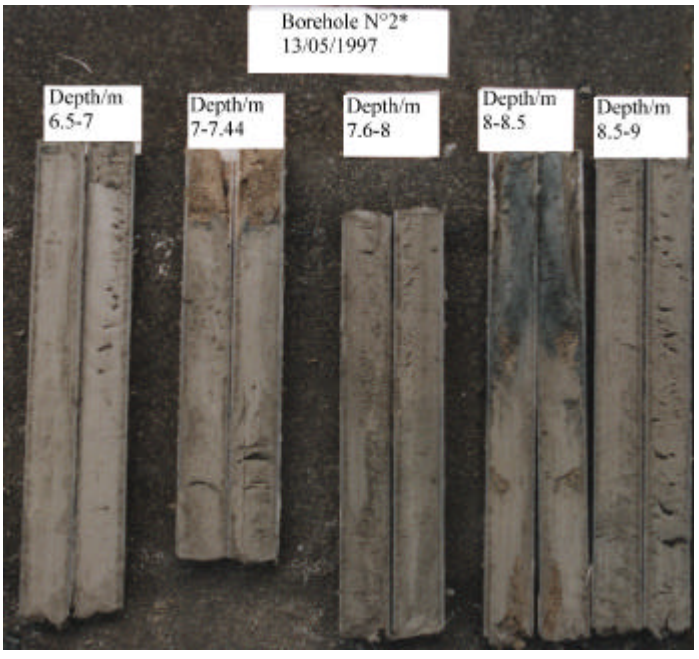
App. 7.1.4.3: In most tailings the first depth intervals are constituted from heap materials.



App. 7.1.4.4: The colour change is probably in relation with the uranium deposit type.



App. 7.1.4.5: The uniformity of the grain size can be in relation with the leaching technology.

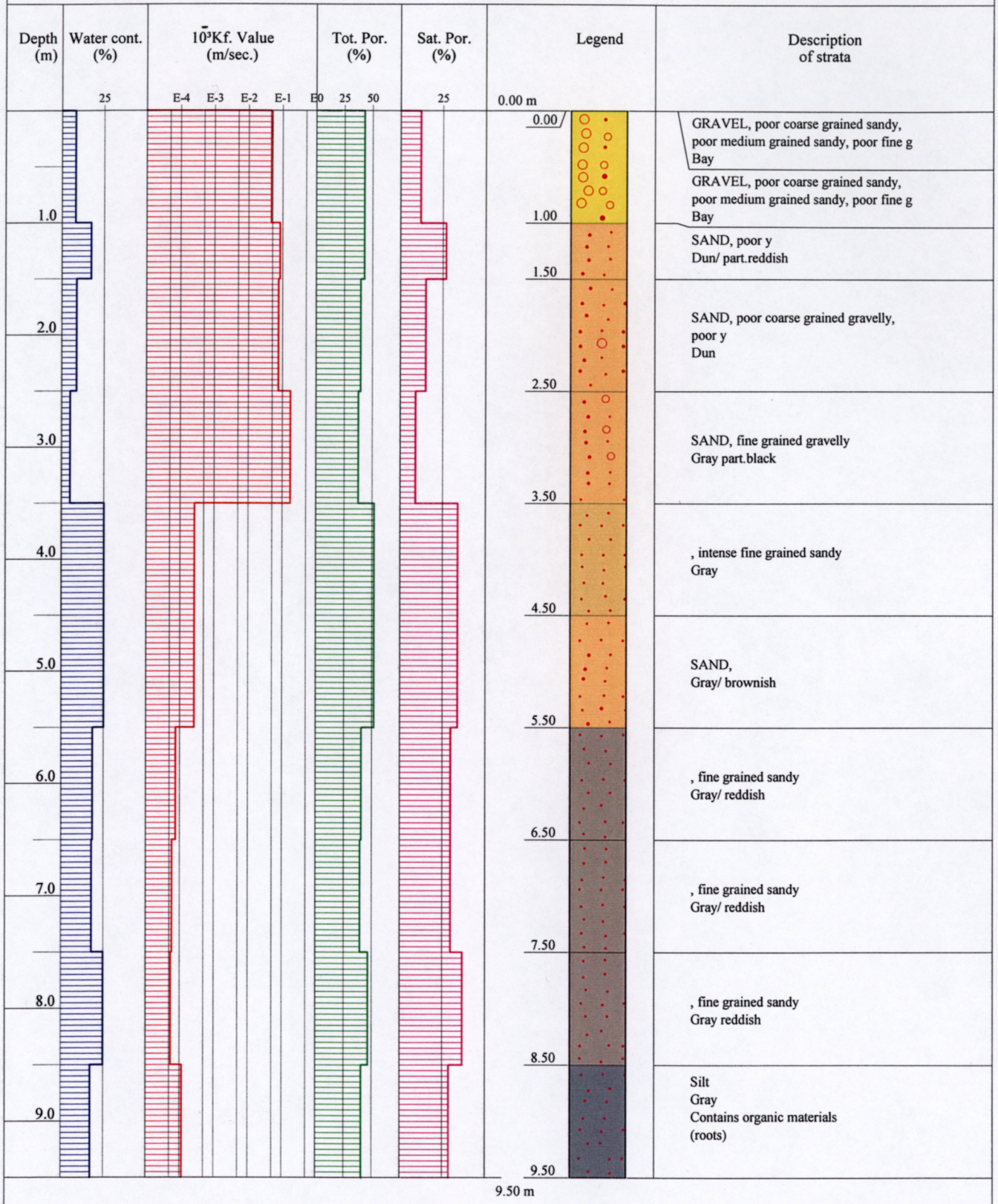


App. 7.1.4.6: The effect of milling & grinding is clearly demonstrated.

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Uranium tailings
Schneckenstein
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Borehole N°1

BORE1



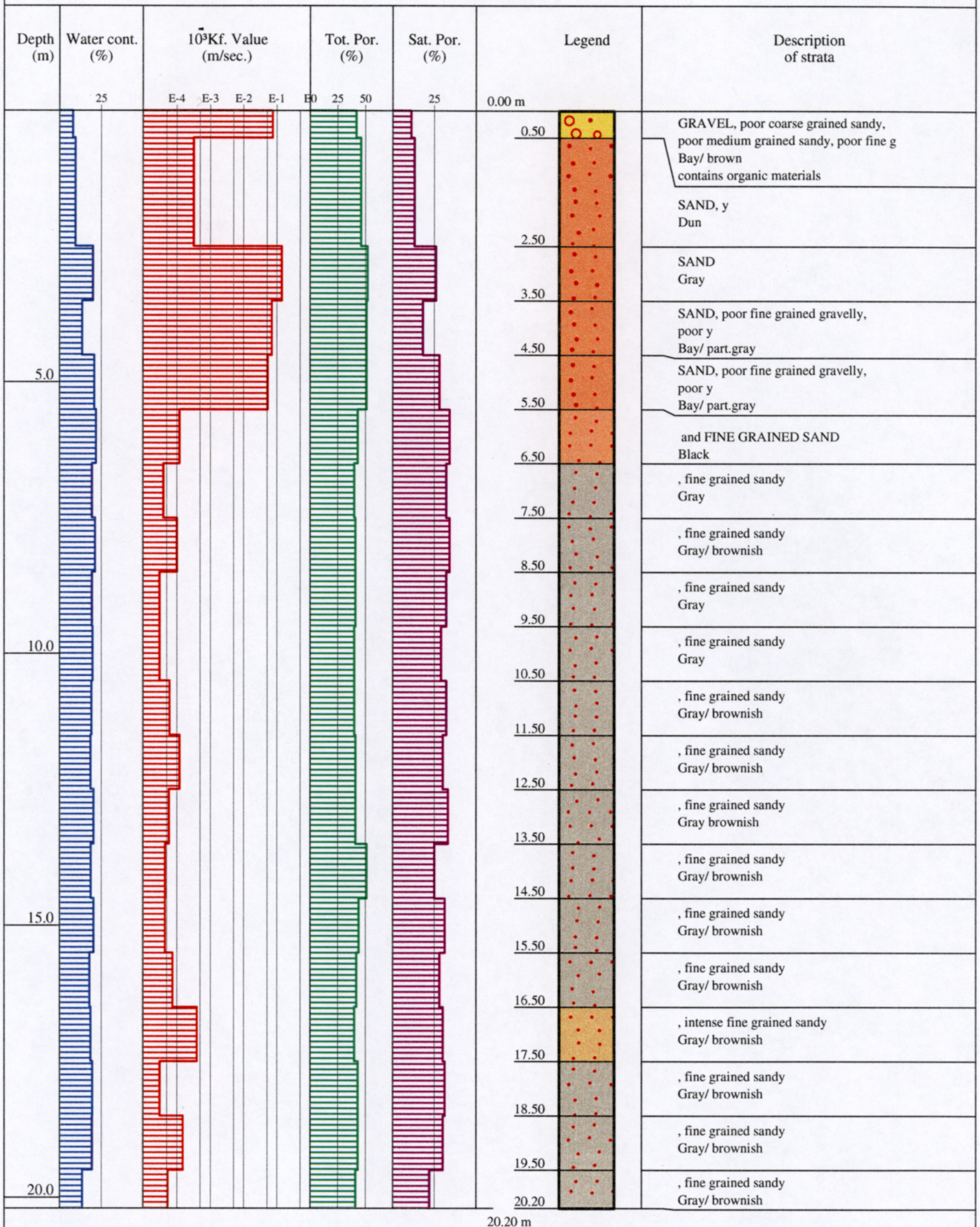
Description of strata
GRAVEL, poor coarse grained sandy, poor medium grained sandy, poor fine g Bay
GRAVEL, poor coarse grained sandy, poor medium grained sandy, poor fine g Bay
SAND, poor y Dun/ part.reddish
SAND, poor coarse grained gravelly, poor y Dun
SAND, fine grained gravelly Gray part.black
, intense fine grained sandy Gray
SAND, Gray/ brownish
, fine grained sandy Gray/ reddish
, fine grained sandy Gray/ reddish
, fine grained sandy Gray reddish
Silt Gray Contains organic materials (roots)

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Borehole N°2

BORE2

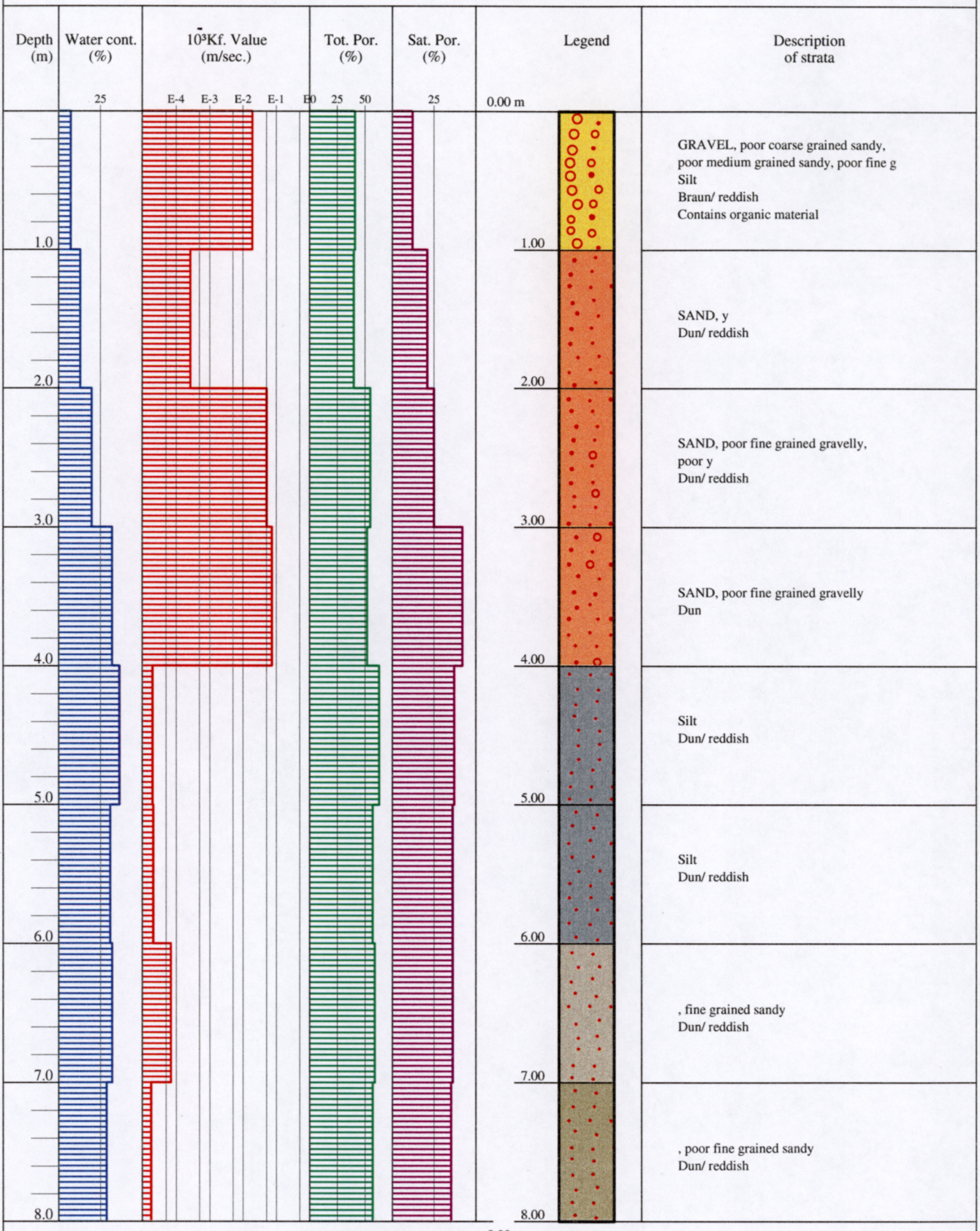


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Schneckenstein
Germany
Borehole N°3

BORE3

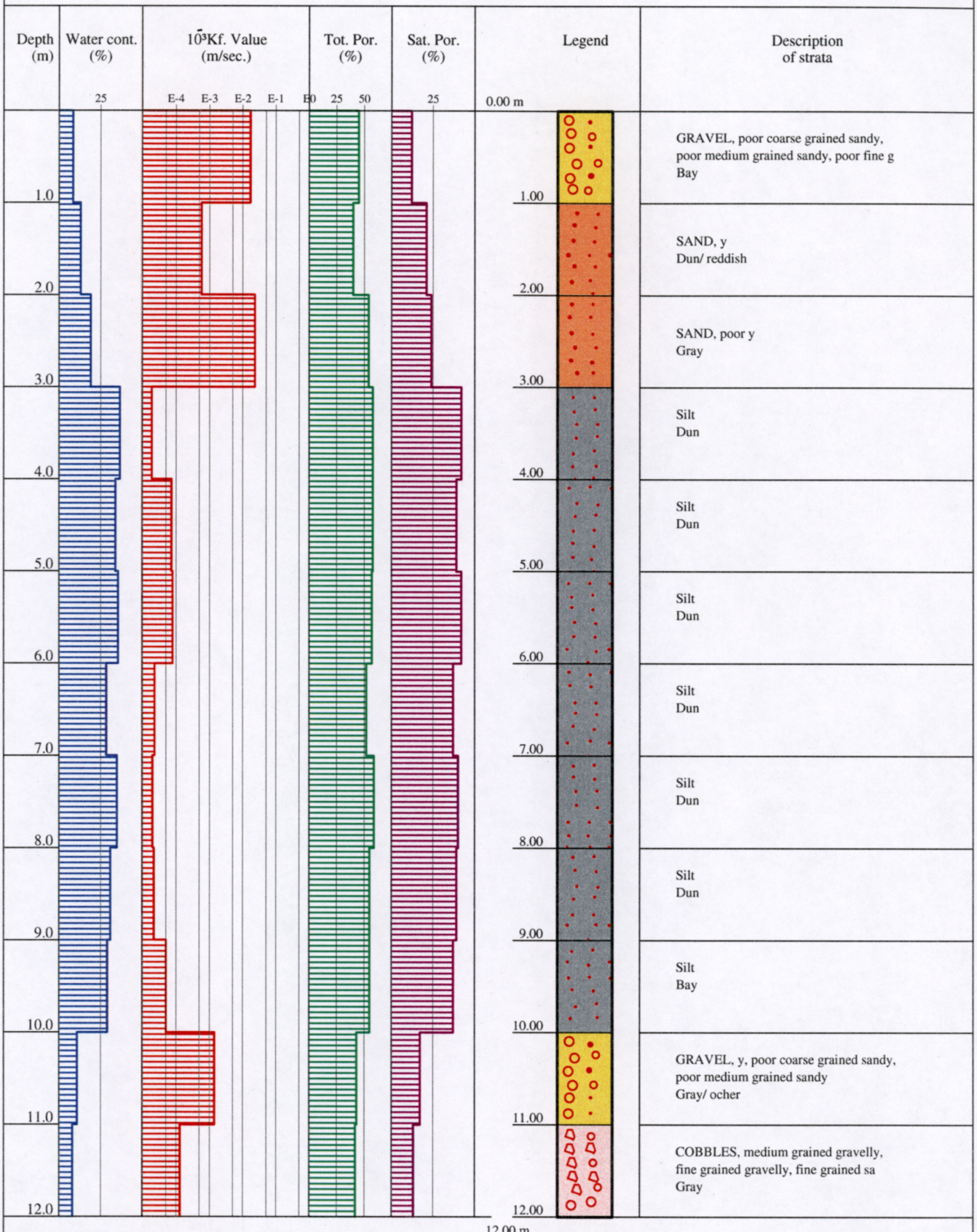


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Borehole N°4

BORE4



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Appendix: 7.1.6 Physical Soil Properties

Borehole N°1;

Depth Interv.	Water content	Wet density	Dry density	Grain-density	Tot. Porosity	Sat. Porosity	d.saturation	K_f after Hazen
meter	%	g/cm³	g/cm³	g/cm³	%	%		m/s
0 - 1	8.33	1.54	1.42	2.53	43	12	0.27	4.80E-05
1.0 - 1.5	17.56	1.84	1.57	2.77	43	27	0.63	8.70E-05
1.5 - 2.5	8.94	1.8	1.65	2.78	40	15	0.36	8.00E-05
2.5 - 3.5	5.2	1.78	1.69	2.76	38	9	0.23	1.80E-04
3.5 - 4.5	25.29	1.67	1.33	2.76	52	34	0.65	2.70E-07
5.5 - 6.5	18.79	1.94	1.63	2.79	41	30	0.74	7.90E-08
6.5 - 7.5	18.29	1.97	1.67	2.77	40	30	0.76	6.20E-08
7.5 - 8.5	25.08	1.83	1.46	2.79	47	37	0.77	5.70E-08
8.5 - 9.5	17.52	1.95	1.66	2.8	41	29	0.71	1.20E-07

Appendix: 7.1.6 Physical Soil Properties

Borehole N°2:

Depth Interv.	Water content	Wet density	Dry density	Grain density	Tot Porosity	Sat. Porosity	d.saturation	$K_f$after Hazen
meter	%	g/cm³	g/cm³	g/cm³	%	%		m/s
0 - 0.5	7.98	1.61	1.49	2.62	42	11	0.27	7.40E-05
0.5-1.5	9.37	1.56	1.43	2.77	46	13	0.29	3.20E-07
2.5-3.5	19.96	1.59	1.33	2.77	52	26	0.5	1.40E-04
3.5-4.5	13.57	1.52	1.34	2.76	51	18	0.35	7.00E-05
4.5-5.5	20.82	1.62	1.34	2.76	51	28	0.54	5.20E-05
5.5-6.5	21.75	1.9	1.56	2.75	43	34	0.79	1.20E-07
6.5-7.5	19.4	1.98	1.66	2.81	40	32	0.78	4.00E-08
7.5-8.5	21.2	1.97	1.63	2.79	41	34	0.83	1.00E-07
8.5-9.5	19.45	1.95	1.63	2.77	41	32	0.78	3.10E-08
9.5-10.5	19.74	1.99	1.66	2.78	40	29	0.82	3.10E-08
10.5-11.5	19.09	1.99	1.67	2.79	40	32	0.8	6.10E-08
11.5-12.5	18.54	1.91	1.61	2.77	41	30	0.72	1.20E-07
12.5-13.5	20.35	1.96	1.63	2.78	41	33	0.8	5.80E-08
13.5-14.5	18.66	1.59	1.34	2.79	51	25	0.48	4.50E-08
14.5-15.5	20.4	1.86	1.54	2.8	44	31	0.7	4.40E-08
15.5-16.5	17.81	1.9	1.61	2.79	42	28	0.68	7.40E-08
16.5-17.5	18.5	1.96	1.65	2.79	40	30	0.76	4.00E-07
17.5-18.5	19.54	1.89	1.58	2.79	43	31	0.72	3.10E-08
18.5-19.5	19.4	1.87	1.57	2.79	43	30	0.69	1.50E-07
19.5-20.2	13.46	1.88	1.66	2.82	41	22	0.54	5.40E-08

Appendix: 7.1.6 Physical Soil Properties

Borehole N°3:

Depth Interv.	Water content	Wet density	Dry density	Grain density	Tot. Porosity	Sat. Porosity	d.saturation	K_f after Hazen
meter	%	g/cm³	g/cm³	g/cm³	%	%		m/s
0--1	7.13	1.77	1.65	2.74	39	12	0.3	1.90E-05
1--2	12.87	1.9	1.68	2.73	38	21	0.56	2.70E-07
2--3	19.81	1.51	1.26	2.73	54	25	0.46	5.10E-05
3--4	31.91	1.76	1.33	2.74	51	42	0.82	7.30E-05
4--5	36.2	1.4	1.03	2.77	63	37	0.59	2.00E-08
5--6	30.84	1.55	1.18	2.71	56	36	0.64	2.10E-08
6--7	31.86	1.5	1.14	2.73	58	36	0.62	6.90E-08
7--8	28.71	1.56	1.21	2.79	56	35	0.61	1.80E-08

Appendix: 7.1.6 Physical Soil Properties

Borehole N°4:

Depth Interv.	Water content	Wet density	Dry density	Grain density	Tot. Porosity	Sat. Porosity	d.saturation	K_f after Hazen
meter	%	g/cm³	g/cm³	g/cm³	%	%		m/s
0 - 1	8.34	1.59	1.47	2.69	45	12	0.27	1.70E-05
1.0 -2.0	12.89	1.86	1.65	2.78	40	21	0.52	5.80E-07
2.0 - 3.0	19.01	1.5	1.26	2.76	54	24	0.44	2.30E-05
3.0 - 4.0	36.42	1.6	1.17	2.78	58	42	0.74	1.90E-08
4.0 - 5.0	33.86	1.57	1.17	2.81	58	39	0.68	7.20E-08
5.0 - 6.0	35.28	1.62	1.20	2.81	57	42	0.74	7.90E-08
6.0 - 7.0	28.33	1.7	1.32	2.76	52	37	0.72	2.30E-08
7.0- 8.0	34.61	1.57	1.17	2.85	59	40	0.69	2.00E-08
8.0 - 9.0	30.75	1.65	1.26	2.83	55	39	0.7	2.20E-08
9.0 - 10.0	28.94	1.64	1.27	2.85	55	37	0.66	5.00E-08
10.0-11.0	10.8	1.73	1.56	2.74	43	17	0.39	1.40E-06
11.0-12.0	8	1.73	1.60	2.79	42	13	0.3	1.30E-07

Appendix: 7.1.7 Coefficient of Permeability -Triaxial Test

Borehole N°1:

Sample	Time (s)	Water volume cm^3	Pressure-altitude(m)	Temperature (°C)	Correction coefficient	K_{ft}	K_{f10}
I*. 0.5-0.75m	1885200	409	0.34	25.5	0.68	5.22E-08	3.55E-08
	1909200	414	0.34	25.5	0.68	5.22E-08	3.55E-08
Mean value							**3.55E-08**
I. 1.5-2.5m	1746000	402	0.08	24	0.70	1.66E-07	1.17E-07
	1700400	397	0.08	24	0.70	1.69E-07	1.18E-07
Mean value							**1.18E-07**
I. 2.5-3.5m	1910400	4268	0.12	26	0.67	1.12E-06	7.49E-07
	1874400	4359	0.12	26	0.67	1.16E-06	7.79E-07
Mean value							**7.64E-07**
I. 3.5-4.5m	1862400	949	0.27	25	0.69	1.23E-07	8.42E-08
	1946400	979	0.27	25	0.69	1.21E-07	8.31E-08
Mean value							**8.37E-08**
I. 5.0-5.25m	1768800	83	0.32	21.5	0.74	1.13E-08	8.43E-09
	1797600	88	0.32	21.5	0.74	1.18E-08	8.79E-09
Mean value							**8.61E-09**
I. 5.5-6.5m	1725600	94	0.25	25	0.69	1.23E-08	8.42E-09
	1748400	94	0.25	25	0.69	1.21E-08	8.31E-09
Mean value							**8.37E-09**
I. 6.5-7.5m	1711200	98	0.36	25	0.69	1.39E-08	9.57E-09
	1754400	98	0.36	25	0.69	1.36E-08	9.32E-09
Mean value							**9.45E-09**
I. 7.5-8.5m	1851600	198	0.33	25	0.69	2.58E-08	1.77E-08
	1957200	219	0.33	25	0.69	2.69E-08	1.85E-08
Mean value							**1.81E-08**

Appendix: 7.1.7 Coefficient of Permeability -Triaxial Test

Borehole N°2:

Sample	Time (s)	Water volume cm^3	Pressure-altitude(m)	Temperature (°C)	Correction coefficient	K_{ft}	K_{f10}
II. 0,5-1,5m	313200	3802	0.04	22	0.74	1.75E-05	**1.29E-05**
II. 3,27-3,41m	457200	2471	0.05	22	0.74	8.39E-06	6.17E-06
	309600	1459	0.04	22	0.74	8.23E-06	6.05E-06
Mean value							**6.11E-06**
II. 4,78-5,0m	1843200	130	0.27	24	0.70	1.73E-08	1.22E-08
	1993200	126	0.27	23	0.72	1.53E-08	1.10E-08
Mean value							**1.16E-08**
II. 5,5-6,5m	3409200	220	0.24	20.5	0.76	1.56E-08	1.19E-08
II. 6,5-7,5m	1734000	91	0.22	24	0.70	1.27E-08	8.90E-09
	1663200	96	0.22	24	0.70	1.39E-08	9.75E-09
Mean value							**1.02E-08**
II. 7,5-8,5m	1784400	100	0.28	20.5	0.76	1.35E-08	1.03E-08
	1735200	92	0.28	20.5	0.76	1.28E-08	9.75E-09
Mean value							**1.00E-08**
II. 8,5-9,5m	1923600	88	0.19	21	0.75	1.10E-08	8.31E-09
	1800000	85	0.19	21	0.75	1.14E-08	8.58E-09
Mean value							**8.45E-09**
II. 9,5-10,5m	1756800	68	0.25	21	0.75	9.28E-09	6.99E-09
	1774800	67	0.25	21	0.75	9.05E-09	6.81E-09
Mean value							**6.90E-09**
II. 10,5-11,5m	1708800	96	0.24	23	0.72	1.36E-08	9.74E-09
	1866000	100	0.24	23	0.72	1.30E-08	9.31E-09
Mean value							**9.53E-09**
II. 11,5-12,5m	1675200	124	0.28	21.5	0.74	1.79E-08	**1.33E-08**
II. 12,5-13,5m	2138400	130	0.24	20.5	0.76	1.47E-08	1.12E-08
	1677600	101	0.24	20.5	0.76	1.45E-08	1.11E-08
Mean value							**1.11E-08**
II. 13,5-14,5m	1695600	104	0.18	24.5	0.69	1.47E-08	1.02E-08
	1749600	106	0.18	24.5	0.69	1.46E-08	1.01E-08
Mean value							**1.02E-08**
II. 14,5-15,5m	1660800	152	0.27	21	0.75	2.21E-08	**1.66E-08**
II. 15,5-16,5m	1856400	118	0.24	20.5	0.76	1.53E-08	1.16E-08
	1782000	110	0.24	20.5	0.76	1.48E-08	1.13E-08
Mean value							**1.15E-08**
II. 16,5-17,5m	1821600	106	0.27	18	0.81	1.40E-08	1.13E-08
	1672800	102	0.27	18	0.81	1.46E-08	1.18E-08
Mean value							**1.16E-08**
II. 17,5-18,5m	1789200	80	0.27	18	0.81	1.07E-08	**8.65E-09**
II. 19,5-20,2m	1700400	158	0.27	23	0.72	2.24E-08	1.61E-08
	1668000	147	0.27	22	0.74	2.12E-08	1.56E-08
Mean value							**1.58E-08**

Appendix: 7.1.7 Coefficient of Permeability -Triaxial Test

Borehole N°3:

Sample	Time (s)	Water volume cm^3	Pressure-altitude(m)	Temperature (°C)	Correction coefficient	K_{ft}	K_{f10}
III. 0-1m	75600	1737	0.16	23	0.72	1.11E-05	7.97E-06
	75600	1722	0.16	23	0.72	1.10E-05	7.90E-06
Mean value							**7.94E-06**
III. 1-2m	75600	1494	0.12	23	0.72	9.55E-06	**6.86E-06**
III. 2-3m	1795200	235	0.24	21	0.75	3.16E-08	2.38E-08
	1858800	245	0.24	21	0.75	3.18E-08	2.39E-08
Mean value							**2.39E-08**
III. 4-5m	1794000	213	0.29	21	0.75	2.86E-08	2.16E-08
	1858800	218	0.29	21	0.75	2.83E-08	2.13E-08
Mean value							**2.14E-08**
III. 6-7m	1788000	289	0.29	23.5	0.71	3.89E-08	2.76E-08
	1812000	284	0.29	23.5	0.71	3.77E-08	2.68E-08
Mean value							**2.72E-08**
III. 7-8m	1759200	292	0.27	21.5	0.74	3.99E-08	2.97E-08
	1798800	292	0.27	21.5	0.74	3.90E-08	2.91E-08
Mean value							**2.94E-08**

Appendix: 7.1.7 Coefficient of Permeability -Triaxial Test

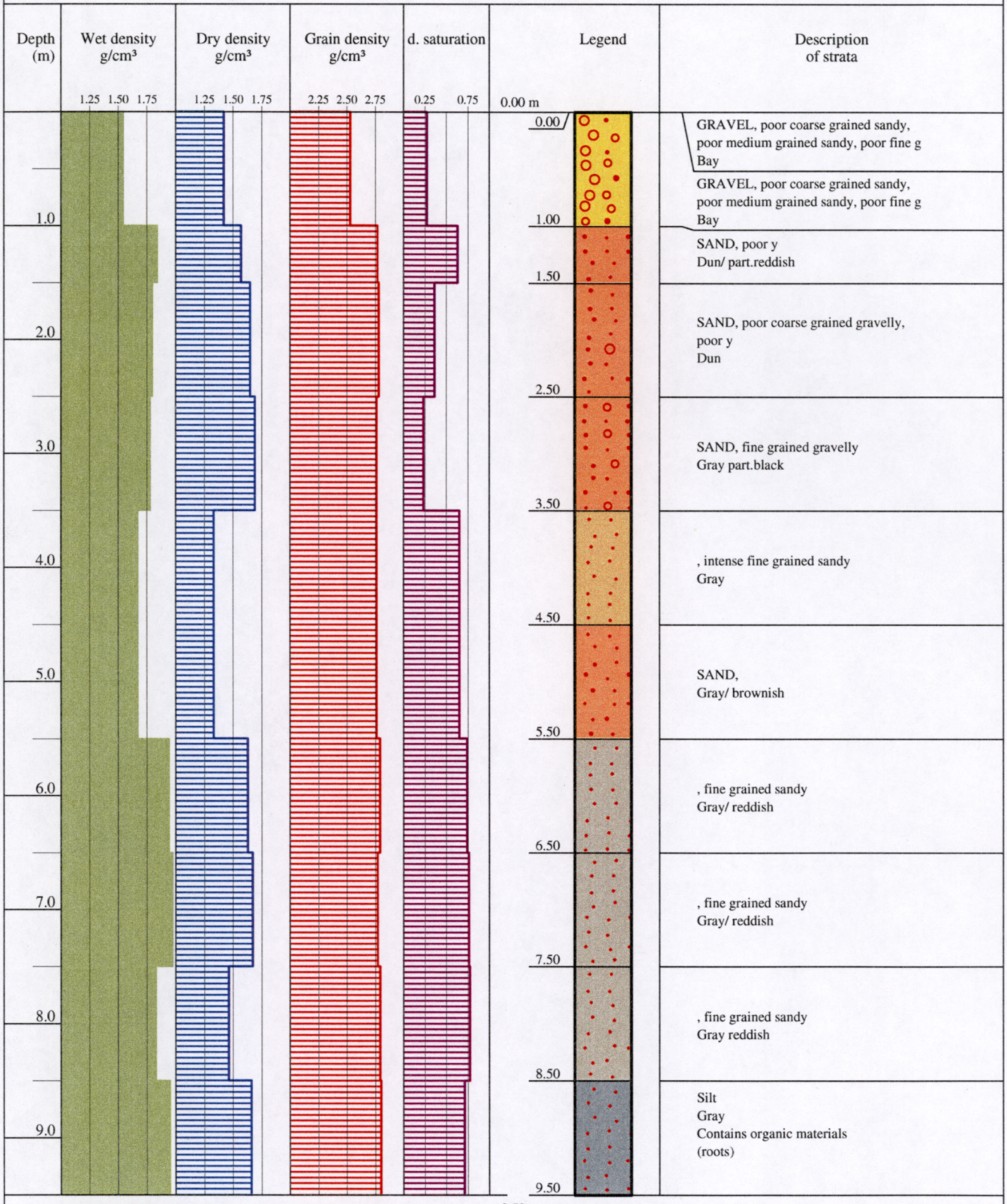
Borehole N°4:

Sample	Time	Water volume	Pressure-	Temperature	Correction	K_{ft}	K_{f10}
	(s)	cm^3	altitude(m)	(°C)	coefficient		
IV. 0-1m	85200	1190	0.09	20	0.77	1.24E-05	9.54E-06
	79200	1076	0.09	20	0.77	1.20E-05	9.27E-06
Mean value							**9.41E-06**
IV. 1-2m	72000	339	0.11	20	0.77	3.40E-06	**2.62E-06**
IV. 2-3m	1802400	1416	0.38	21.5	0.74	1.89E-07	1.41E-07
	1813200	1421	0.38	21.5	0.74	1.89E-07	1.40E-07
Mean value							**1.41E-07**
IV. 3-4m	1804800	254	0.27	21.5	0.74	3.39E-08	2.52E-08
	1812000	259	0.27	21.5	0.74	3.44E-08	2.56E-08
Mean value							**2.54E-08**
IV. 4-5m	1696800	284	0.24	19	0.79	4.02E-08	3.18E-08
	1768800	296	0.24	19	0.79	4.02E-08	3.18E-08
Mean value							**3.18E-08**
IV. 5-6m	1668000	283	0.23	22	0.74	4.07E-08	2.99E-08
	1668000	290	0.23	22	0.74	4.17E-08	3.06E-08
Mean value							**3.03E-08**
IV. 6-7m	1723200	118	0.28	23	0.72	1.64E-08	1.18E-08
	1744800	120	0.28	23	0.72	1.65E-08	1.19E-08
Mean value							**1.18E-08**
IV. 7-8m	1746000	314	0.19	19	0.79	4.31E-08	3.41E-08
	1730400	318	0.19	18.5	0.80	4.40E-08	3.52E-08
Mean value							**3.46E-08**
IV. 8-9m	1744800	247	0.25	23.5	0.71	3.40E-08	2.42E-08
	1876800	273	0.25	21.5	0.74	3.50E-08	2.60E-08
Mean value							**2.51E-08**
IV. 9-10m	1742400	1667	0.23	19	0.79	2.30E-07	1.82E-07
	1695600	1580	0.23	19	0.79	2.24E-07	1.77E-07
Mean value							**1.80E-07**
IV. 10-11m	1728000	261	0.10	21	0.75	1.09E-07	8.20E-08
	1732800	257	0.10	21	0.75	1.07E-07	8.05E-08
Mean value							**8.13E-08**
IV. 11-12m	1742400	144	0.09	20.5	0.76	5.96E-08	4.54E-08
	1730400	144	0.09	20.5	0.76	6.00E-08	4.57E-08
Mean value							**4.56E-08**

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Schneckenstein
Germany
Borehole N°1

BORE1

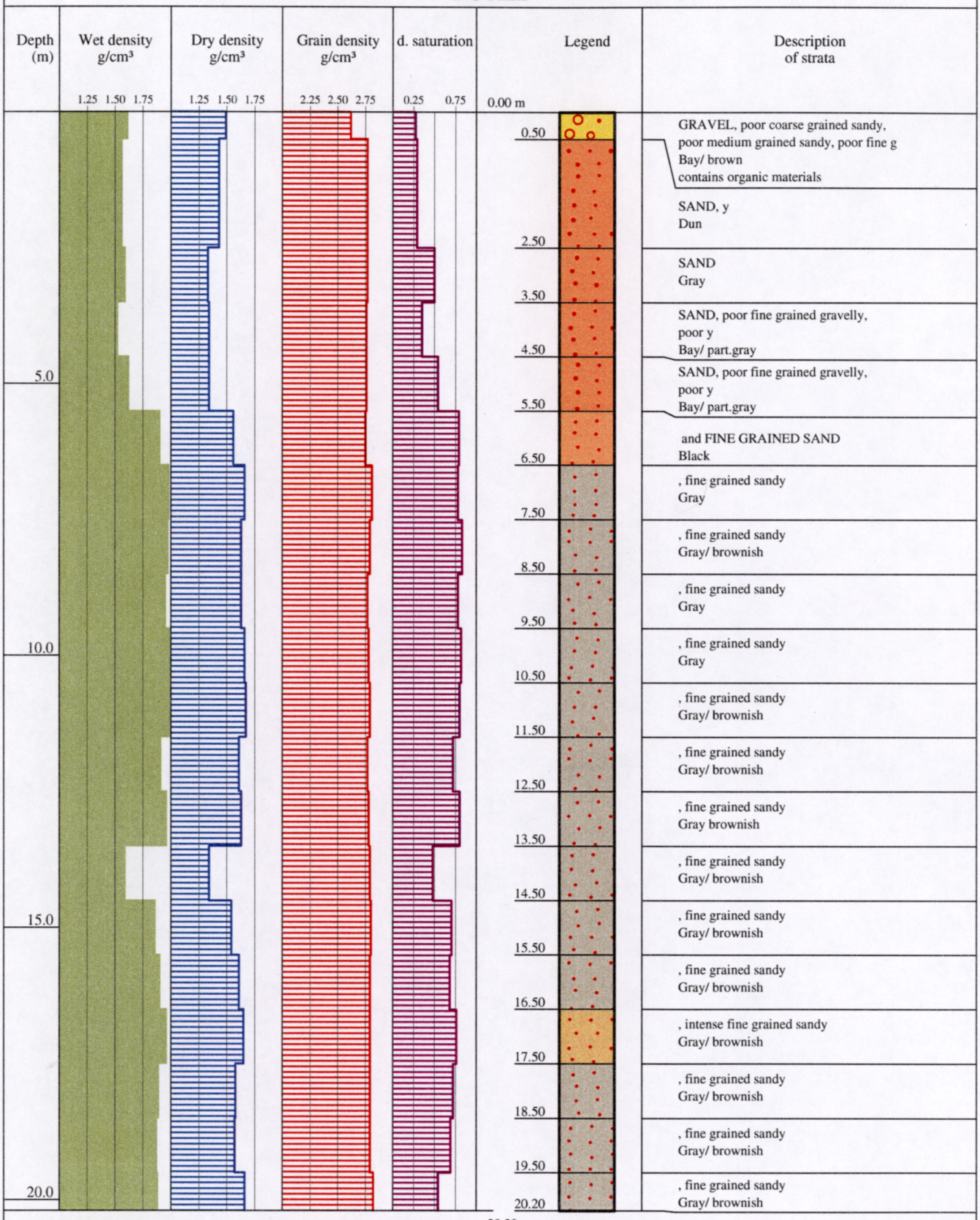


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Uranium tailings
Schneckenstein
Germany
Borehole N°2

BORE2

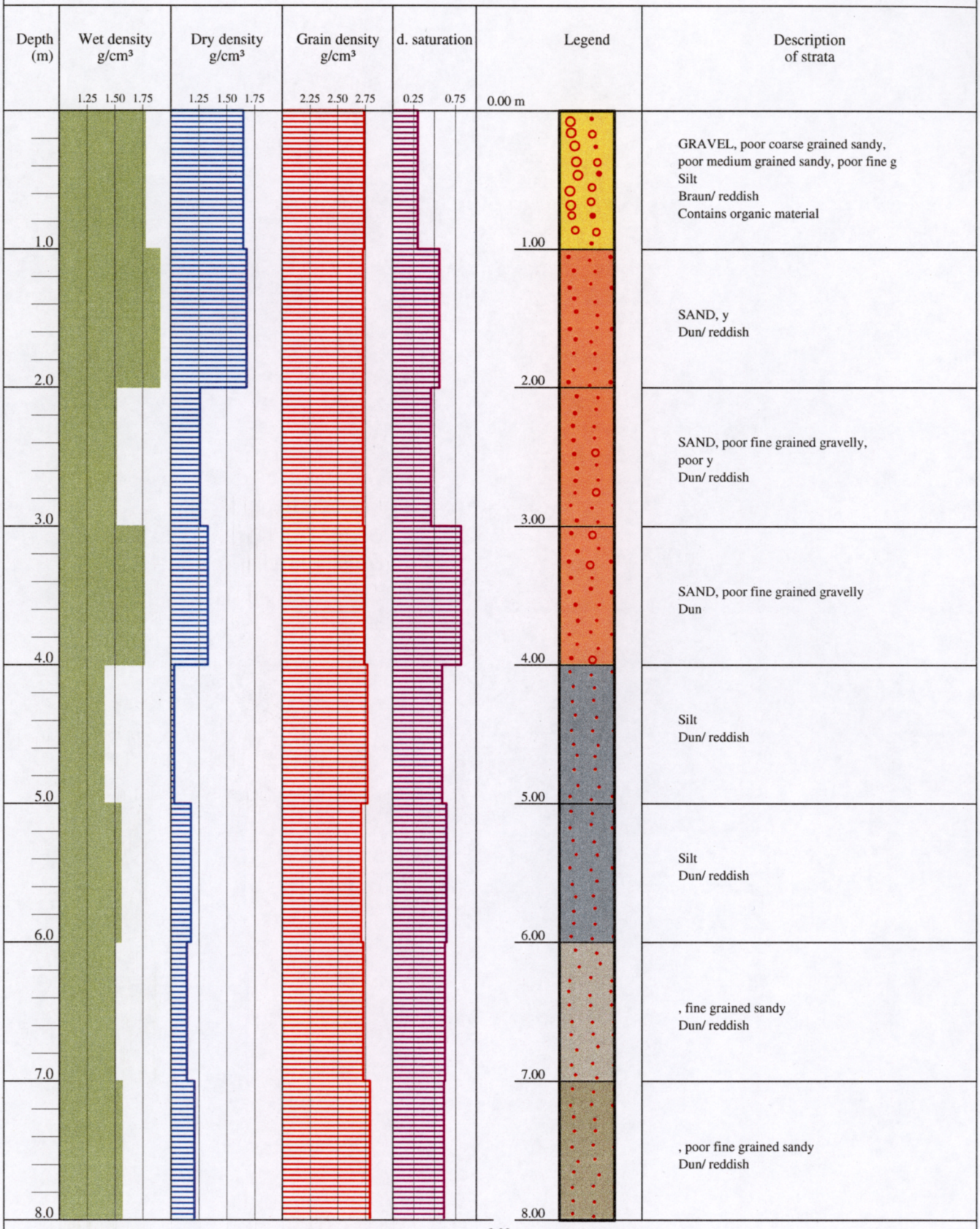


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Schneckenstein
Germany
Borehole N°3

BORE3

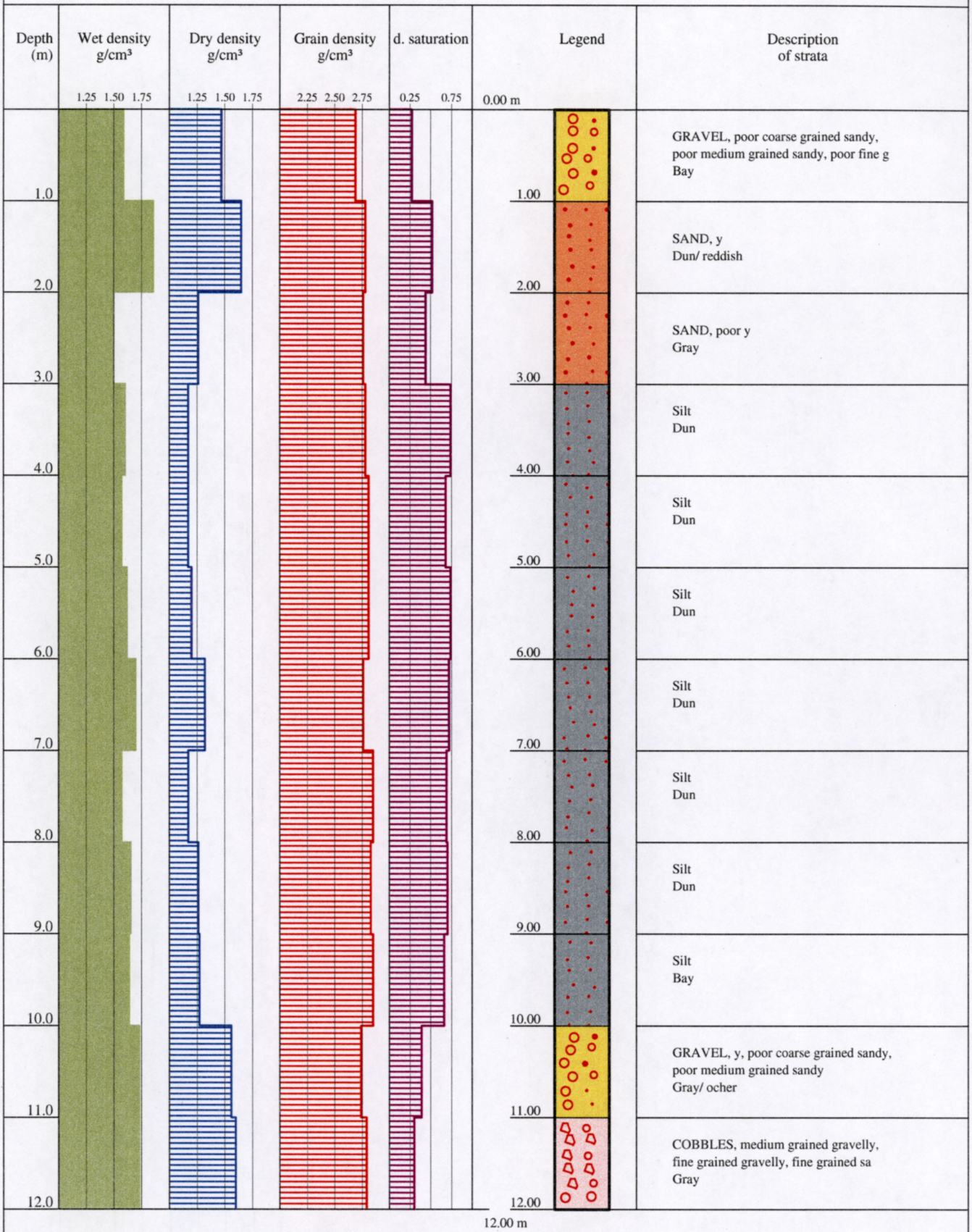


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Uranium tailings
Schneckenstein
Germany
Borehole N°4

BORE4



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Appendix: 7.2.1. The Change with Depth of the Tritium Activity

Borehole N°1

Depth (m)	activity	2s	year
1	11	6.2	98
1.5	17	6	97
2.5	14	6	97
3.5	18	6	97
5.5	15	6	97
6.5	48	7	97
7.5	52	7	97
8.8	37	7	97
9.5	34	7	97

Borehole N°2

Depth (m)	activity	2s	year
1.5	19	7	96
3.5	15	7	96
4.5	21	7	96
5.5	39	8	97
6.5	10	7	96
7.5	4	6	97
8.5	5.3	5.3	97
9.5	4	7	97
10.5	0.3	0.3	97
11.5	7	5.6	98
12.5	6	5.8	98
13.5	1.4	5.9	98
14.5	0.5	0.5	98
15.5	0.5	--	98
16.5	1.4	5.9	98
17.5	0.1	--	98
18.5	3	6.4	98
19.5	0.8	6.4	98
20.2	10.4	8.2	98

Appendix: 7.2.1. The Change with Depth of the Tritium Activity

Borehole N°3

Depth (m)	activity	2s	year
0.5	11	6	97
1.5	13	6.2	97
2.5	16	7	97
3.5	12	7	97
4.5	50	7	97
5.5	50	7	97
6.5	28	7	97
7.5	15	7	97

Borehole N°4

Depth (m)	activity	2s	year
0.75	14	6	98
1.75	15.5	6	98
2.75	14	6	98
3.75	28.1	5.8	98
4.75	45.7	6.6	98
5.75	62.5	9.2	98
6.75	35.3	9	98
7.75	11.26	6.42	98
8.75	3.7	5.1	98
9.75	1.7	9	98
10.75	11.8	6	98
11.75	17.47	6.48	98

Appendix: 7.3.1: **The whole mineralogy of the borehole N°1 by means of X-ray mineral phase analysis**

Depth/m	Albite	Chlorite	Dolomite	Hornblende	Kaolinite	Microcline	Muscovite	Orthoclase	Pyrite	Quartz
Sample										
I. 0----1	6	--	--	1	2	13	27	4	1	46
I. 1----1,5	5	5	1	3	3	5	30	4	--	44
I. 1,5----2,5	4	10	--	4	3	3	29	5	1	41
I. 2,5----3,5	2	9	1	2	2	3	26	3		52
									--	
I. 3,5----4,5	--	3	7	2	5	2	31	3	1	46
I. 5,5----6,5	1	7	6	1	7	1	35	3	1	38
I. 6,5----7,5	--	8	4	2	7	5	38	1	--	35
I. 7,5----8,5	--	5	3	1	7	7	27	6	--	46
I. 8,5----9,5	6	2	--	1	3	7	23	7	--	51
Results given in %										

Appendix: 7.3.1 **The whole mineralogy of the borehole N°2 by means of X-ray mineral phase analysis**

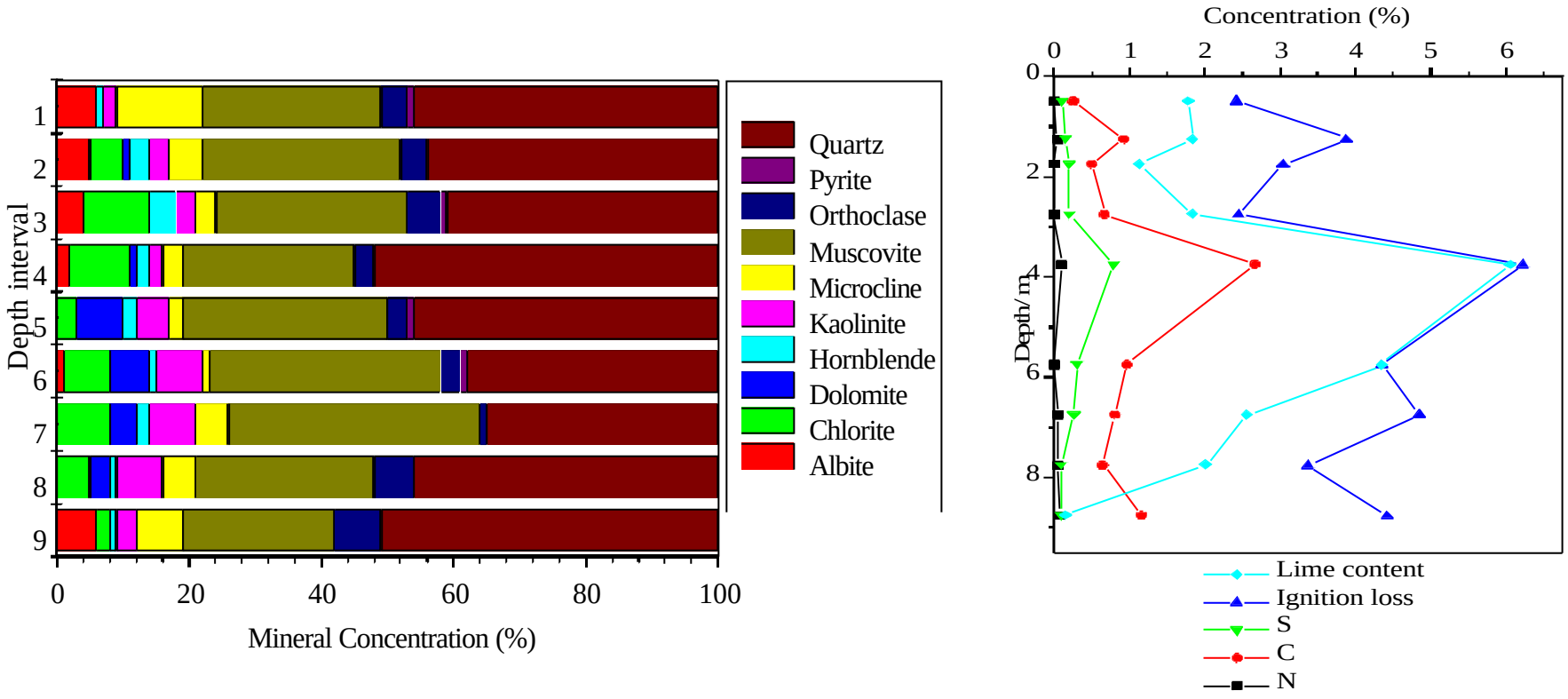
Depth/m	Albite	Andalusite	Calcite	Chlorite	Cordierite	Dolomite	Hornblende	Kaolinite	Muscovite	Potash feldspar	Pyrite	Quartz
Sample												
0--0,5	7	--	--	--	--	1	--	2	31	15	--	44
0,5--1,5	3	--	--	9	2	--	--	3	35	5	--	43
2,5--3,5	4	--	--	8	--	2	3	3	29	5	--	46
3,5--4,5	3	--	--	5	--	2	--	3	30	4	--	53
4,5--5,5	4	--	--	8	--	3	2	3	28	5	--	47
5,5--6,5	--	--	1	7	--	5	--	4	30	1	2	50
6,5--7,5	--	--	--	8	1	7	3	4	35	4	--	38
7,5--8,5	--	--	1	8	1	4	--	4	38	3	--	41
8,5--9,5	--	--	--	8	2	3	3	4	36	4	--	40
9,5--10,5	1	--	1	11	1	3	2	4	33	4	1	39
10,5--11,5	1	--	1	8	--	6	--	4	40	2	--	38
11,5--12,5	--	--	1	9	--	4	--	6	40	2	1	37
12,5--13,5	1	--	1	9	--	3	--	5	37	5	--	39
13,5--14,5	0	--	0	7	--	3	--	6	38	3	--	42
14,5--15,5	0	--	0	9	--	0	--	6	41	4	1	39
15,5--16,5	1	--	0	8	--	2	--	6	37	4	--	43
16,5--17,5	--	1	--	8	--	1	--	7	39	4	--	40
17,5--18,5	--	--	1	7	--	1	--	8	39	5	--	39
18,5--19,5	6	--	1	10	--	2	--	6	35	7	--	33
19,5--20,2	3	--	--	4	--	1	--	5	28	10	--	49
Results given in %												

Appendix: 7.3.1 **The whole mineralogy of the borehole N°3 by means of X-ray mineral phase analysis**

Depth/m	Albite	Andalusite	Biotite	Calcite	Chlorite	Cordierite	Dolomite	Hematite	Hornblende	Kaolinite	Muscovite	Potash feldspar	Pyrite	Quartz	Topaz
Sample															
0-1	2	4	13	--	7	1	--	--	3	3	21	3	--	43	--
1--2	5	--	--	--	10	2	2	--	--	3	34	4	1	39	--
2--3	--	--	--	1	4	--	--	2	--	6	26	3	--	53	5
3--4	--	--	--	1	12	--	2	--	--	7	51	3	1	23	--
4--5	--	--	--	--	11	--	1	--	--	9	55	4	1	19	--
5--6	--	--	--	--	10	--	1	--	--	7	38	4	1	39	--
6--7	--	--	--	1	8	--	1	--	--	16	50	4	--	20	--
7--8	4	--	--	--	11	--	3	--	3	6	42	7	1	23	--
Results given in %															

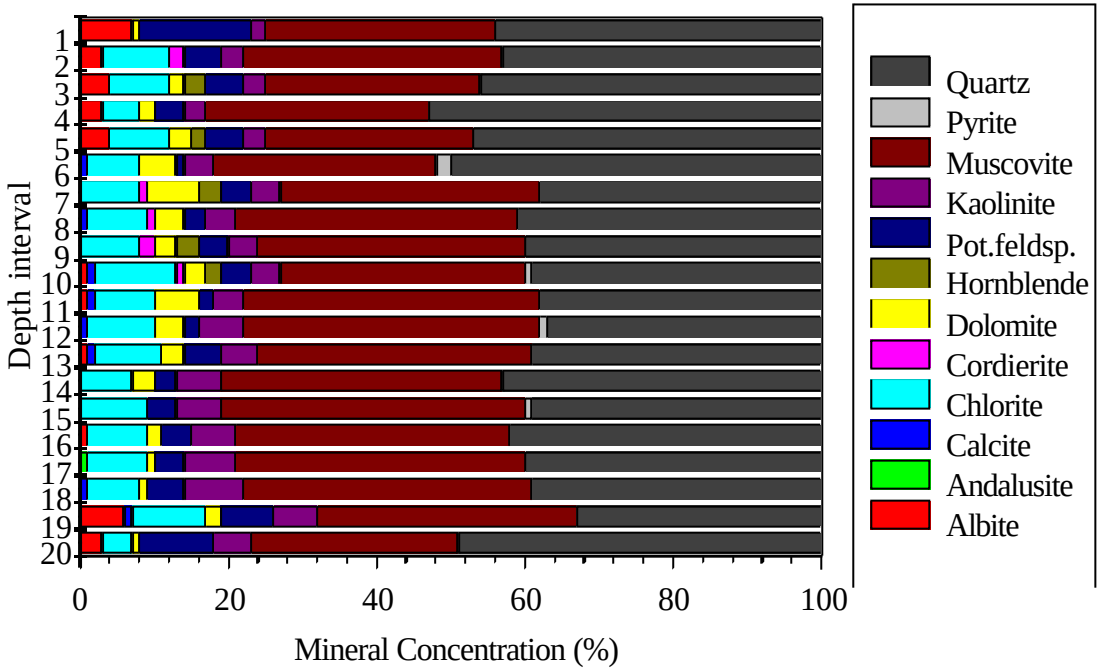
Appendix: 7.3.1: **The whole mineralogy of the borehole N°4 by means of X-ray mineral phase analysis**

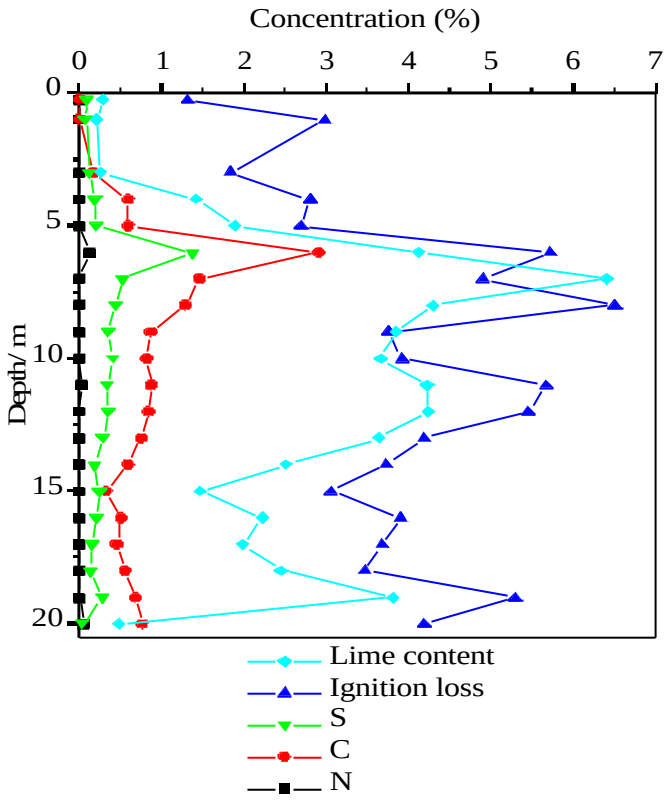
Depth/m	Albite	Ankerite	Calcite	Chlorite	Hematite	Kaolinite	Microcline	Muscovite	Pyrite	Quartz	Topaz
Sample		Fe0.2									
0-1	--	--	--	5	--	--	2	47	--	47	--
1--2	5	1	--	7	2	--	5	34	0.5	46	--
2--3	--	--	--	2	--	--	1	23	--	68	5
3--4	--	2	--	4	--	6	6	53	--	29	--
4--5	--	1	--	6	1	7	4	58	0.7	22	--
5--6	--	1	--	7	1	5	4	59	--	24	--
6--7	--	1	--	8	1	7	4	57	--	22	--
7--8	2	2	2	8	2	4	5	55	--	21	--
8--9	--	2	--	8	3	6	7	50	0.5	20	--
9--10	--	--	--	9	1	4	--	61	--	25	--
10--11	--	--	--	4	--	--	--	51	--	45	--
11--12	--	--	--	6	1	6	5	37	--	45	--
Results given in %											



1* 0-1m; 2* 1-1.5m; 3* 1.5-2.5m; 4* 2.5-3.5m;5*3.5-4.5m;
6* 5.5-6.5m; 7*6.5-7.5m; 8* 7.5-8.5m; 9* 8.5-9.5m

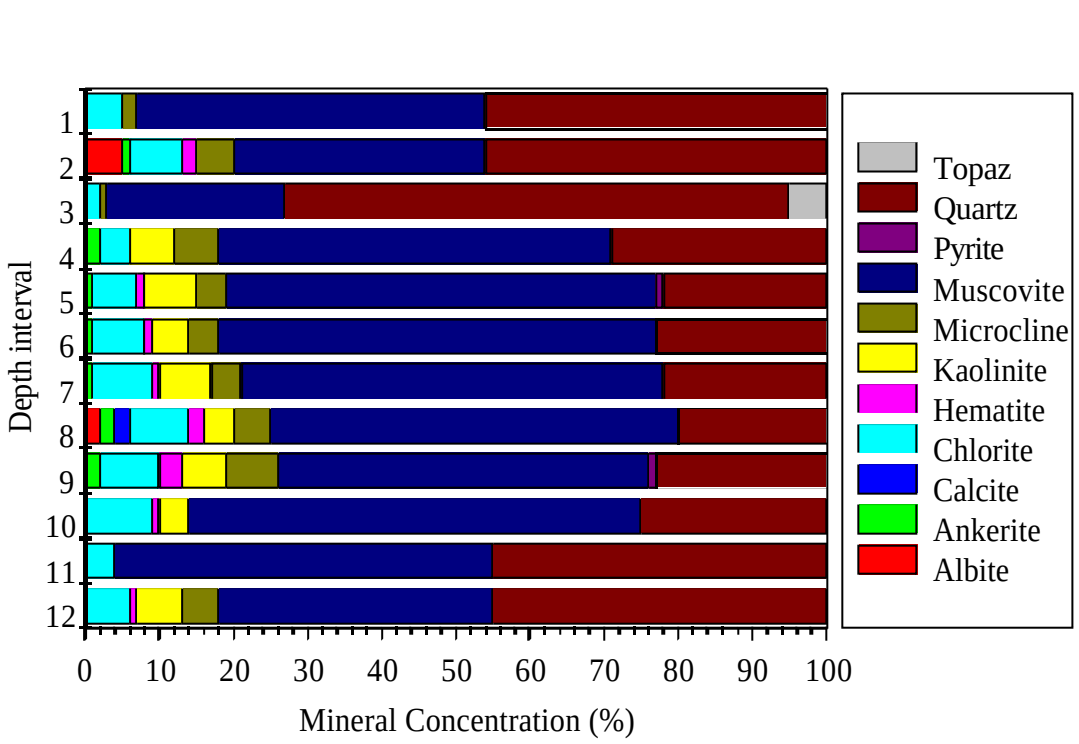
Fig. 7.3.2.1: The whole mineralogy of the Borehole N°1.

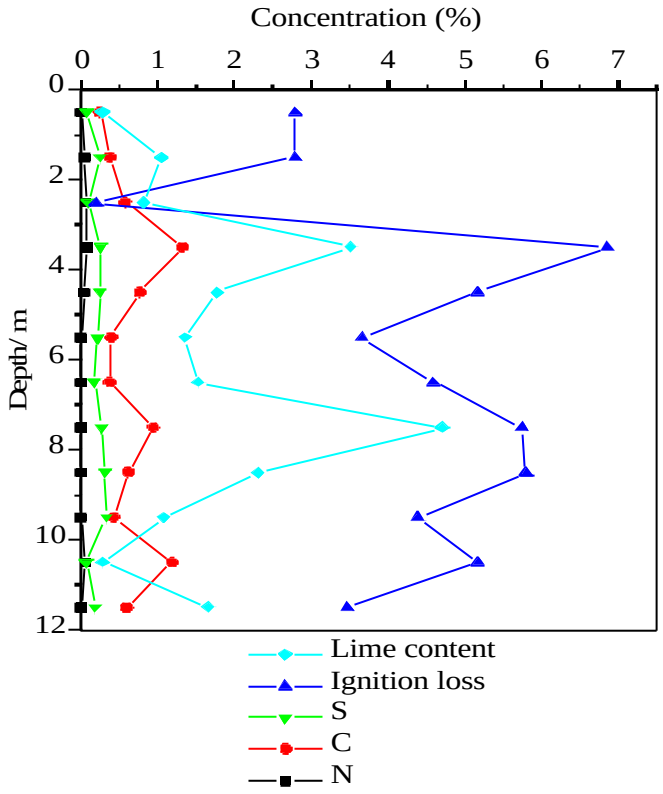




1* 0-0.5m; 2* 0.5-1.5m; 3* 2.5-3.5m; 4* 3.5-4.5m;5*4.5-5.5m; 6* 5.5-6.5m; 7*6.5-7.5m; 8* 7.5-8.5m; 9* 8.5-9.5m; 10* 9.5-10.5; 11* 10.5-11.5; 12* 11.5-12.5; 13* 12.5-13.5; 14* 13.5-14.5; 15* 14.5-15.5; 16* 15.5-16.5; 17* 16.5-17.5; 18* 17.5-18.5; 19* 18.5-19.5; 20* 19.5-20.2.

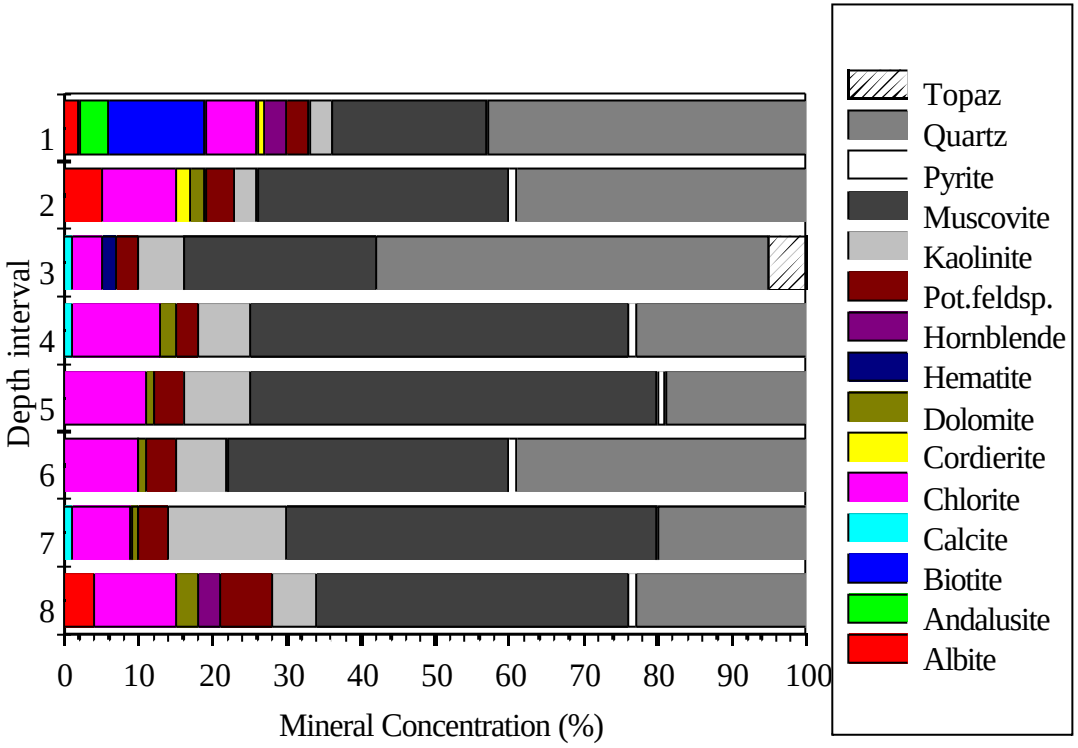
App. 7.3.2.2.: The whole mineralogy of the Borehole N°2.

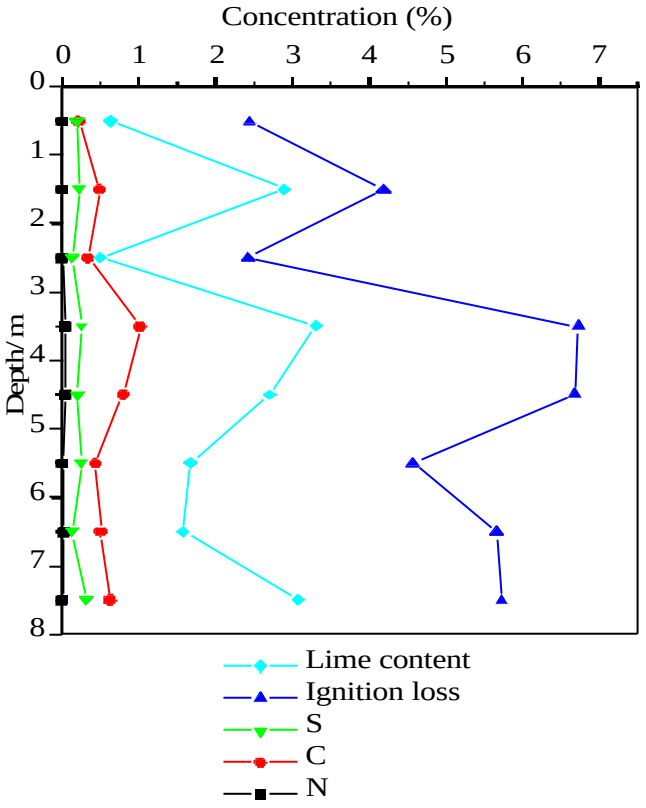




1* 0-1m; 2* 1-2m; 3* 2-3m; 4* 3-4m;5*4-5m;
6* 5-6m; 7*6-7m; 8* 7-8m; 9* 8-9m; 10*
9-10m; 11* 10-11m; 12* 11-12m.

App. 7.3.2.3.: The whole mineralogy of the borehole N°4





1* 0-1m; 2* 1-2m; 3* 2-3m; 4* 3-4m;5*4-5m;
6* 5-6m; 7*6-7m; 8* 7-8m.

App. 7.3.2.3.: The whole mineralogy of the Borehole N°3.

Appendix: 7.3.3 **The heavy mineral concentrations determined by means of heavy liquids separation (Borehole N°1)**

Depth/m	And.	Ank.	Barite	Biot.	Calcite	Chalc.	Chl.	Cord.	Fluorite	Goet.	Hemat.	Hornb.	Kaol.	Microc.	Musc.	Plag.	Pyrite	Quartz	Sch.	Sid.	Topaz
Sample				1M																	
0-1m	0.9	1.9	1.3	2.1	--	--	5.3	2.3	0.6	2.2	7.4	12.3	7.5	6.7	26.9	7.2	3.7	9.3	--	2.5	--
1-1,5m	0.9	3.4	1.2	3.2	--	--	6.1	2.2	0.5	4.9	6.5	17.3	0.6	8.2	22.5	7.2	3.2	10.0	--	2.2	--
1,5-2,5m	1.0	2.2	1.0	2.3	--	0.4	4.6	3.1	1.7	3.7	4.9	14.8	--	6.4	30.9	7.3	2.5	9.7	--	3.7	--
2,5-3,5m	1.4	3.6	4.9	1.8	0.6	--	5.5	4.1	1.5	8.4	6.0	8.9	7.0	4.9	17.7	2.3	5.8	9.8	--	5.9	--
3,5-4,5m	0.5	2.3	2.3	0.6	--	--	5.5	3.3	1.1	13.2	9.5	7.2	0.5	6.5	27.2	3.4	4.6	8.1	--	4.3	--
5,5-6,5m	1.1	2.1	3.4	1.5	2.4	--	7.9	3.6	0.4	8.3	4.8	4.5	7.2	7.0	20.4	1.7	7.7	10.9	--	5.2	--
6,5-7,5m	0.6	0.3	3.1	0.9	2.7	--	9.7	1.7	0.5	12.8	4.4	6.2	2.5	4.8	29.0	0.4	4.2	11.2	--	5.1	--
7,5-8,5m	1.2	14.0	9.3	0.4	3.0	--	2.9	2.2	0.5	3.5	2.0	3.4	1.5	0.8	25.6	0.4	10.5	11.4	--	7.3	--
8,5-9,5m	3.7	0.0	0.0	1.6	0.7	--	1.6	0.0	0.0	15.1	4.5	0.0	5.1	2.6	17.8	0.5	--	5.8	4.0	0.0	37.0
		Results given in %																			

And.	Andalusite		Hornb.	Hornblende
Ank.	Ankerite		Kaol.	Kaolinite
Biot.	Biotite		Microc.	Microcline
Chalc.	Chalcopirite		Musc.	Muscovite
Chl.	Chlorite		Plag.	Plagioclase
Cord.	Cordierite		Sch.	Schorl
Dol.	Dolomite		Sid.	Siderite
Goet.	Goethite		Top.	Topaz
Hemat.	Hematite			

Appendix: 7.3.3 **The heavy mineral concentrations determined by means of heavy liquids separation (Borehole N°2)**

Depth/m	And.	Ank.	Barite	Biot.	Calcite	Chl.	Cord.	Fluorite	Goet.	Hemat.	Hornb.	Iron alpha	Kaol.	Microc.	Musc.	Plag.	Pyrite	Quartz	Sch.	Sid.	Top.
Sample				1M																	
0,5-1,5m	--	1.4	3.3	0.7	0.5	6.3	5.2	--	9.4	8.1	10.0	--	6.7	3.2	18.4	3.2	8.8	9.8	--	3.4	1.5
2,5-3,5m	0.9	--	1.6	0.9	--	4.8	2.3	0.4	6.9	7.5	18.6	--	0.7	4.0	31.9	6.8	3.3	7.4	--	2.1	--
3,5-4,5m	1.4	3.6	4.9	1.8	0.6	5.5	4.1	1.5	8.4	6.0	8.9	--	7.0	4.9	17.7	2.3	5.8	9.8	--	5.9	--
5,5-6,5m	1.1	7.3	8.0	--	2.2	6.9	0.0	8.6	7.4	6.2	6.1	--	--	4.1	9.0	1.8	15.3	11.1	--	4.9	--
6,5-7,5m	--	5.2	10.9	1.4	1.1	5.6	3.8	4.1	6.9	3.9	4.2	--	0.6	2.8	6.3	1.0	26.4	8.9	--	4.8	2.0
7,5-8,5m	2.4	4.3	5.3	1.9	1.0	8.1	5.0	6.0	5.3	5.5	8.8	--	1.6	3.0	10.2	2.5	10.3	7.8	--	9.3	1.7
8,5-9,5m	2.3	4.6	4.0	1.7	1.0	8.2	5.7	4.5	8.8	5.8	7.8	--	2.7	4.2	8.6	1.7	11.0	8.6	--	5.7	3.0
9,5-10,5m	2.0	3.2	2.2	3.4	--	4.7	4.8	5.5	4.8	5.6	6.5	--	2.4	3.3	7.9	3.9	10.3	9.5	--	6.7	13.4
10,5-11,5	0.6	3.5	2.0	0.6	--	5.4	2.8	2.7	6.8	3.5	2.0	--	2.9	2.5	7.8	1.5	6.7	5.3	--	6.4	37.0
11,5-12,5	1.0	5.8	4.1	0.4	--	7.6	5.8	1.9	7.1	6.9	5.2	--	1.1	2.0	16.2	1.1	14.3	10.4	--	5.5	3.6
12,5-13,5	--	4.8	4.5	--	3.1	9.4	6.7	3.4	11.8	5.9	4.0	--	2.1	2.7	9.2	2.5	10.3	9.5	--	7.9	2.4
13,5-14,5	--	4.3	2.5	2.5	2.8	9.2	6.5	3.3	5.9	5.3	4.4	--	0.8	1.9	15.9	2.0	13.4	8.1	--	5.7	5.6
14,5-15,5	--	1.7	5.6	2.4	0.5	8.0	4.7	1.6	9.0	6.2	3.9	--	6.9	4.0	22.8	1.4	5.4	10.2	--	4.2	1.7
15,5-16,5	--	0.3	5.8	1.3	0.9	7.1	1.4	0.6	17.7	5.5	4.2	--	4.4	2.6	25.2	1.2	4.6	9.7	--	4.6	3.2
16,5-17,5	--	--	2.0	0.6	0.2	8.2	1.9	0.7	14.1	5.1	--	15.3	1.1	0.0	23.2	0.0	3.8	11.0	8.2	2.8	1.9
17,5-18,5	--	1.1	1.1	1.9	0.3	10.1	4.6	0.7	14.7	7.8	3.9	--	1.7	1.3	21.4	2.5	6.9	10.5	6.1	3.5	--
18,5-19,5	0.7	6.6	3.2	0.9	--	7.9	4.2	1.2	5.5	7.5	11.3	--	0.8	3.3	20.2	6.3	5.0	6.5	--	9.1	--
19,5-20,2	3.2	0.8	--	--	--	--	--	--	17.5	4.6	--	--	3.9	1.9	22.5	0.5	--	5.9	4.8	2.7	31.9
Results given in %																					

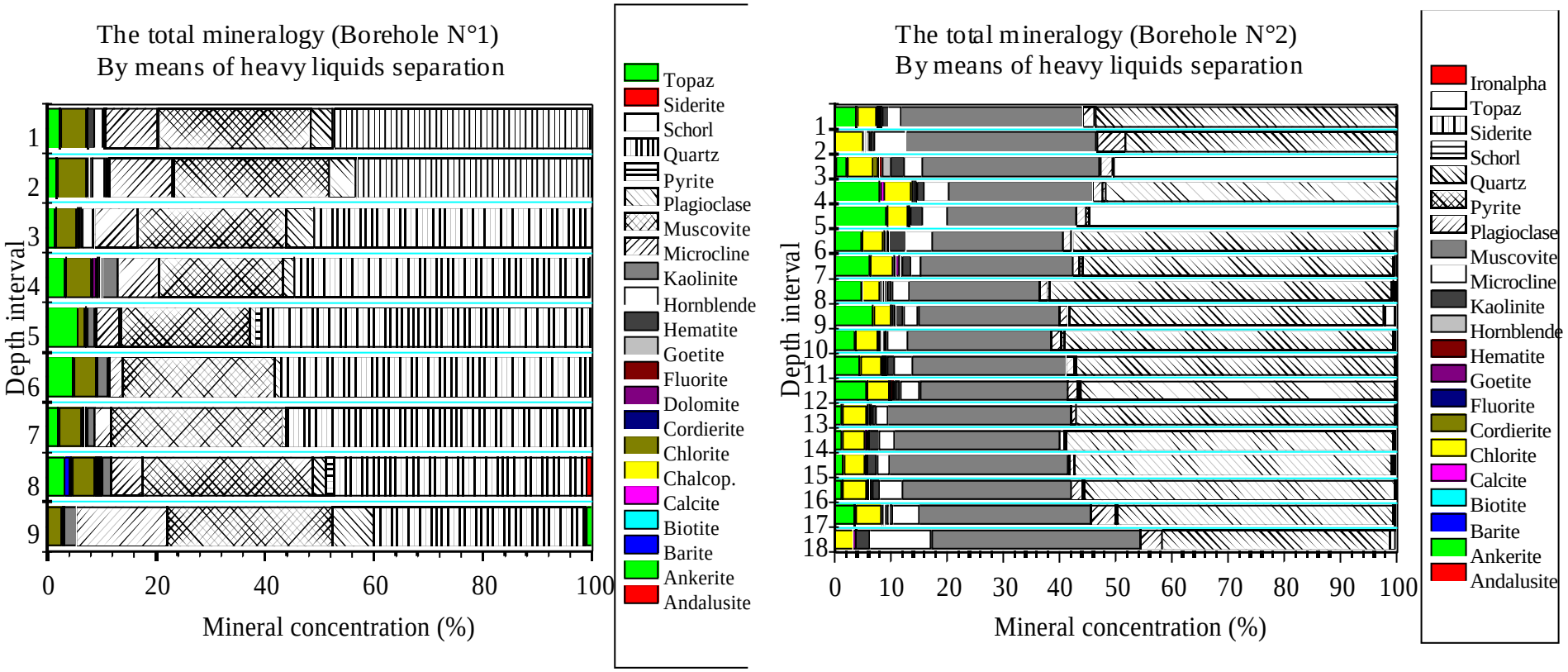
And.	Andalusite		Hornb.	Hornblende
Ank.	Ankerite		Kaol.	Kaolinite
Biot.	Biotite		Microc.	Microcline
Chalc.	Chalcopirite		Musc.	Muscovite
Chl.	Chlorite		Plag.	Plagioclase
Cord.	Cordierite		Sch.	Schorl
Dol.	Dolomite		Sid.	Siderite
Goet.	Goethite		Top.	Topaz
Hemat.	Hematite			

Appendix. 7.3.3 **The light mineral concentrations determined by means of heavy liquids separation (Borehole N°1)**

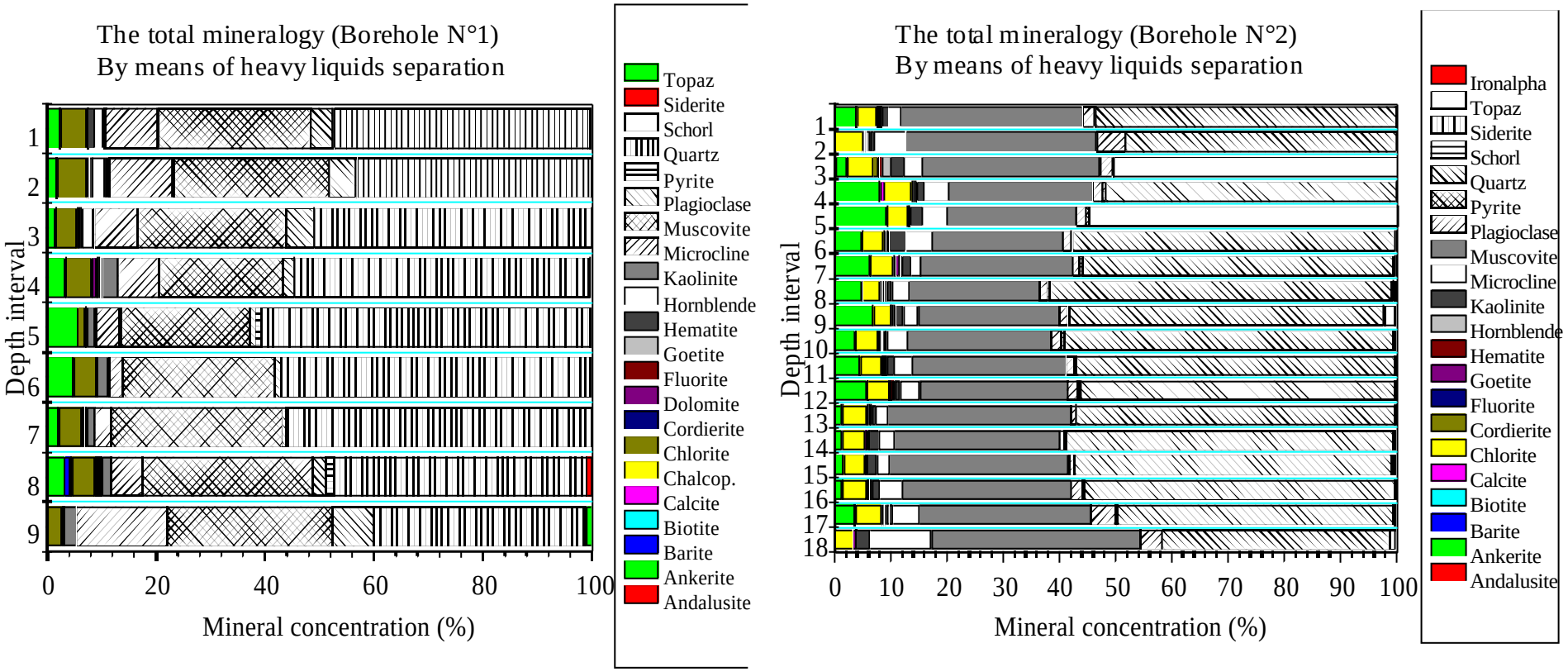
Depth/m	Ankerite	Chlorite	Dolomite	Hematite	Hornblende	Kaolinite	Microcline	Muscovite	Plagioclase	Pyrite	Quartz
Sample					1M						
0-1m	2.2	4.9	--	0.7	1.1	--	9.8	28.2	3.8	0.1	49.2
1-1,5m	1.4	5.3	--	--	1.2	0.6	12.0	29.3	4.6	0.2	45.5
1,5-2,5m	1.4	3.7	--	--	1.3	0.4	7.8	27.2	5.0	0.1	53.2
2,5-3,5m	3.1	4.6	0.7	--	--	2.6	7.6	23.0	2.0	--	56.4
3,5-4,5m	5.7	1.4	--	--	--	1.6	4.5	23.9	1.0	1.0	61.1
5,5-6,5m	4.8	3.9	--	--	--	1.6	2.3	28.1	1.2	--	58.1
6,5-7,5m	2.0	4.0	--	--	--	1.3	3.0	31.5	0.8	--	57.4
7,5-8,5m	1.6	4.3	--	--	--	1.7	6.2	32.2	2.7	--	51.3
8,5-9,5m	0.0	2.6	--	--	--	2.0	17.0	30.8	7.7	--	39.8
Results given in %											

Appendix: 7.3.3 **The light mineral concentrations determined by means of heavy liquids separation (Borehole N°2)**

Depth/m	Ankerite	Chlorite	Hematite	Microcline	Muscovite	Plagioclase	Pyrite	Quartz	Kaolinite	Calcite
Sample										
0,5-1,5m	4.0	3.4	--	2.2	32.7	2.1	--	54.7	1.1	--
2,5-3,5m	--	4.9	--	5.8	34.0	4.9	--	49.8	0.6	--
3,5-4,5m	0.8	2.1	--	2.7	20.1	3.0	--	69.4	1.9	--
5,5-6,5m	7.9	4.8	--	4.3	26.2	1.7	--	53.3	1.3	0.5
6,5-7,5m	9.4	3.6	--	4.4	23.3	1.5	0.4	55.4	2.1	--
7,5-8,5m	4.7	3.4	--	4.7	23.8	1.1	--	59.4	2.9	--
8,5-9,5m	6.1	3.6	--	1.6	28.2	1.0	--	58.1	1.4	--
9,5-10,5m	4.8	2.9	--	3.1	23.8	1.3	--	63.4	0.7	--
10,5-11,5	7.0	3.0	--	2.6	26.0	1.5	--	58.6	1.3	--
11,5-12,5	3.6	3.6	--	3.8	26.0	1.8	--	60.8	0.5	--
12,5-13,5	4.4	3.5	--	3.2	28.0	1.2	--	58.4	1.3	--
13,5-14,5	5.7	3.6	0.4	3.7	26.5	1.9	--	57.5	0.8	--
14,5-15,5	1.2	4.1	--	2.0	32.9	0.9	--	58.4	0.6	--
15,5-16,5	1.4	3.9	--	2.8	29.6	0.8	--	60.0	1.5	--
16,5-17,5	1.5	3.8	--	2.4	31.9	1.1	--	57.8	1.6	--
17,5-18,5	1.4	4.1	--	4.0	30.3	2.0	--	56.6	1.5	--
18,5-19,5	3.5	4.3	--	4.8	31.0	4.5	--	51.4	0.6	--
19,5-20,2	--	3.3	--	11.2	37.7	4.0	--	41.5	2.4	--
Results given in %										



App. 7.3.3.2.: The total mineralogy of the tailings sites by means of heavy liquids separation.



App. 7.3.3.2.: The total mineralogy of the tailings sites by means of heavy liquids separation.

The whole mineralogy of the borehole N°1 by means of heavy liquids separation

Depth/m	And.	Ank.	Barite	Biot.	Calcite	Chl.	Cord.	Dol.	Fluorite	Goet.	Hemat.	Hornb.	Kaol.	Microc	Musc.	Plag.	Pyrite	Quartz	Sch.	Sid.	Top.
Sample																					
0-1m	--	2.2	0.1	0.1	--	4.9	0.1	--	--	0.1	1.1	1.7	0.4	9.6	28.1	4.0	0.3	47.0	--	0.1	--
1-1,5m	0.1	1.5	0.1	0.2	--	5.4	0.2	--	--	0.3	0.5	2.3	0.6	11.8	28.8	4.7	0.4	42.9	--	0.2	--
1,5-2,5m	0.1	1.4	0.1	0.1	--	3.8	0.2	--	0.1	0.2	0.3	2.0	0.4	7.7	27.4	5.1	0.2	50.7	--	0.2	--
2,5-3,5m	0.1	3.1	0.2	0.1	--	4.6	0.2	0.7	0.1	0.4	0.3	0.4	2.8	7.5	22.7	2.0	0.3	54.1	--	0.3	--
3,5-4,5m	--	5.6	--	--	--	1.4	--	--	--	0.1	0.1	0.1	1.5	4.5	23.9	1.0	1.0	60.5	--	--	--
5,5-6,5m	--	4.7	0.1	--	0.1	4.0	0.1	--	--	0.2	0.1	0.1	1.8	2.5	27.9	1.2	0.2	56.7	--	0.2	--
6,5-7,5m	--	2.0	0.1	--	0.1	4.2	0.1	--	--	0.4	0.2	0.2	1.4	3.0	31.4	0.8	0.1	55.8	--	0.2	--
7,5-8,5m	0.1	3.0	1.1	--	0.4	4.1	0.3	--	0.1	0.4	0.2	0.4	1.6	5.6	31.4	2.5	1.3	46.6	--	0.9	--
8,5-9,5m	0.1	--	--	--	--	2.6	--	--	--	0.4	0.1	0.0	2.1	16.7	30.4	7.6	0.0	38.9	0.1	--	0.9
Results given in %																					

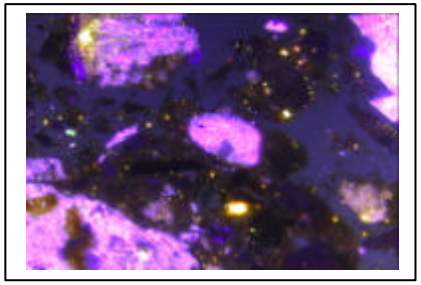
And.	Andalusite		Hornb.	Hornblende
Ank.	Ankerite		Kaol.	Kaolinite
Biot.	Biotite		Microc.	Microcline
Chalc.	Chalcopirite		Musc.	Muscovite
Chl.	Chlorite		Plag.	Plagioclase
Cord.	Cordierite		Sch.	Schorl
Dol.	Dolomite		Sid.	Siderite
Goet.	Goethite		Top.	Topaz
Hemat.	Hematite			

The whole mineralogy of the borehole N°2 by means of heavy liquids separation

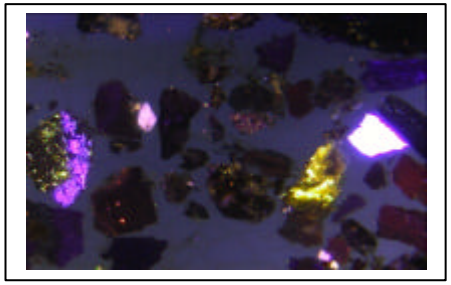
Depth/m	And.	Ank.	Barite	Biot.	Calcite	Chl.	Cord.	Fluorite	Goet.	Hemat.	Hornb.	Kaol.	Microc.	Musc.	Plag.	Pyrite	Quartz	Sch.	Sid.	Top.	Iron alpha
Sample																					
0,5-1,5m	--	3.9	0.1	--	--	3.5	0.1	--	0.3	0.2	0.3	1.2	2.2	32.3	2.1	0.2	53.5	--	0.1	--	--
2,5-3,5m	--	--	0.1	--	--	4.9	0.1	--	0.3	0.3	0.7	0.6	5.7	33.9	5.0	0.1	48.2	--	0.1	--	--
3,5-4,5m	0.3	1.8	--	0.2	--	4.5	1.0	--	0.2	0.5	1.5	2.4	3.2	31.6	2.3	0.2	50.4	--	--	--	--
5,5-6,5m	--	7.9	0.3	--	0.6	4.9	--	0.3	0.3	0.2	0.2	1.3	4.3	25.6	1.7	0.5	51.8	--	0.2	--	--
6,5-7,5m	--	9.3	0.1	--	--	3.6	0.1	0.1	0.1	0.1	0.1	2.1	4.4	23.1	1.5	0.8	54.7	--	0.1	--	--
7,5-8,5m	0.1	4.7	0.2	0.1	--	3.6	0.2	0.2	0.2	0.2	0.4	2.8	4.7	23.3	1.2	0.4	57.3	--	0.4	0.1	--
8,5-9,5m	0.1	6.0	0.2	0.1	0.1	3.9	0.3	0.2	0.5	0.3	0.4	1.5	1.7	27.1	1.1	0.6	55.4	--	0.3	0.2	--
9,5-10,5m	0.1	4.7	0.1	0.2	--	3.0	0.2	0.3	0.2	0.3	0.3	0.8	3.1	23.1	1.4	0.5	60.9	--	0.3	0.6	--
10,5-11,5	--	6.8	0.1	--	--	3.1	0.1	0.1	0.4	0.2	0.1	1.4	2.6	25.0	1.5	0.3	55.8	--	0.3	1.9	--
11,5-12,5	--	3.7	0.2	--	--	3.8	0.2	0.1	0.3	0.3	0.2	0.5	3.7	25.5	1.7	0.6	58.7	--	0.2	0.2	--
12,5-13,5	--	4.4	0.1	--	0.1	3.7	0.2	0.1	0.4	0.2	0.1	1.3	3.2	27.4	1.3	0.3	56.9	--	0.3	0.1	--
13,5-14,5	--	5.7	0.1	0.1	0.1	3.7	0.2	0.1	0.2	0.5	0.1	0.8	3.6	26.2	1.9	0.4	56.1	--	0.2	0.1	--
14,5-15,5	--	1.2	0.2	0.1	--	4.2	0.2	0.1	0.3	0.2	0.1	0.8	2.1	32.5	0.9	0.2	56.6	--	0.2	0.1	--
15,5-16,5	--	1.3	0.2	--	--	4.0	--	--	0.5	0.2	0.1	1.6	2.8	29.4	0.8	0.1	58.5	--	0.1	0.1	--
16,5-17,5	--	1.5	0.1	--	--	3.9	--	--	0.4	0.1	0.0	1.6	2.3	31.7	1.0	0.1	56.5	0.2	0.1	0.1	0.4
17,5-18,5	--	1.4	--	0.1	--	4.3	0.1	--	0.4	0.2	0.1	1.5	4.0	30.0	2.0	0.2	55.4	0.2	0.1	--	--
18,5-19,5	--	3.6	0.2	--	--	4.5	0.2	0.1	0.3	0.4	0.5	0.6	4.7	30.5	4.5	0.2	49.2	--	0.4	--	--
19,5-20,2	0.1	--	--	--	--	3.2	--	--	0.5	0.1	--	2.4	10.9	37.2	3.9	--	40.3	0.1	--	1.0	--
Results given in %																					

And.	Andalusite		Hornb.	Hornblende
Ank.	Ankerite		Kaol.	Kaolinite
Biot.	Biotite		Microc.	Microcline
Chalc.	Chalcopirite		Musc.	Muscovite
Chl.	Chlorite		Plag.	Plagioclase
Cord.	Cordierite		Sch.	Schorl
Dol.	Dolomite		Sid.	Siderite
Goet.	Goethite		Top.	Topaz
Hemat.	Hematite			

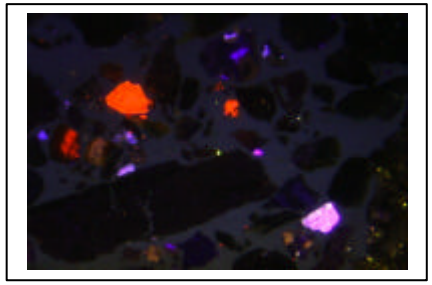
Appendix: 7.3.4 (Borehole N°1)



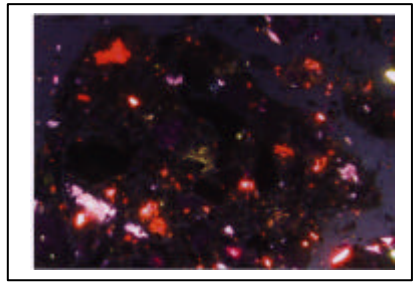
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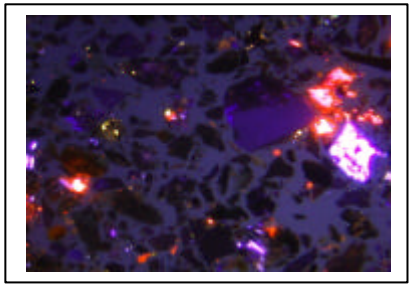
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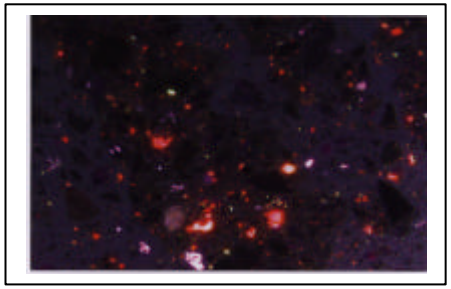
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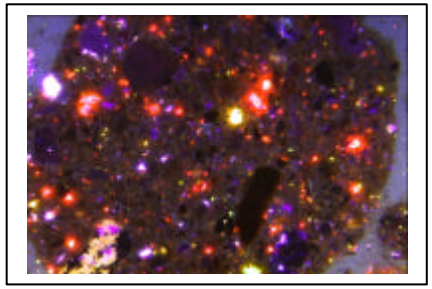
Int. 3.5-4.5m



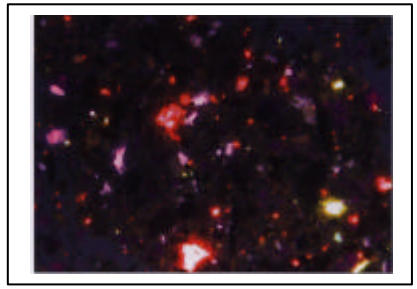
Int. 4.5-5.5m



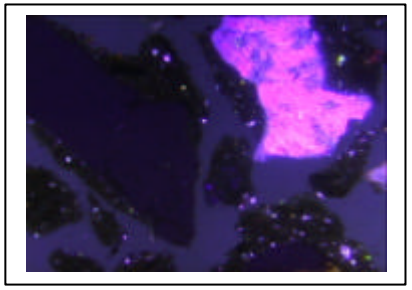
Int. 5.5-6.5m



Int. 6.5-7.5m



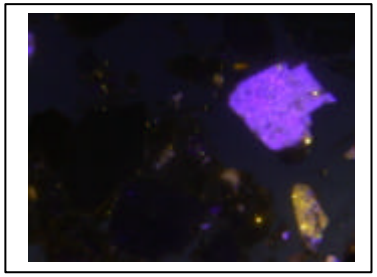
Int. 7.5-8.5m



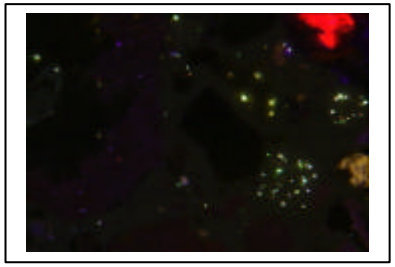
Int. 8.5-9.5m

Colour- coding
Quartz: dark brown until dark-blue-violet.
Alkali –feldspars: white until reddish-violet.
Plagioclase: light-yellow until-yellow-green.
Kaolinite: ink-blue
Carbonates: orange-red until red.

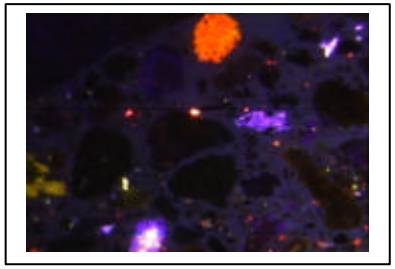
Appendix: 7.3.4 (Borehole N°2)



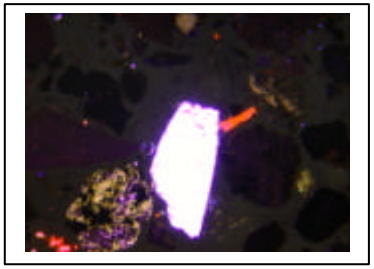
Int. 0.0-0.5m



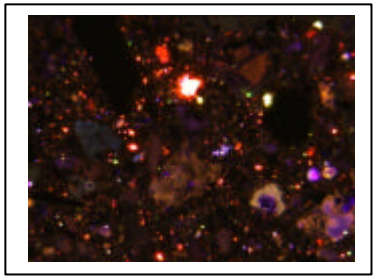
Int. 0.5-1.5m



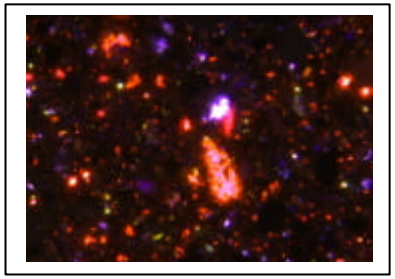
Int. 3.5-4.5m



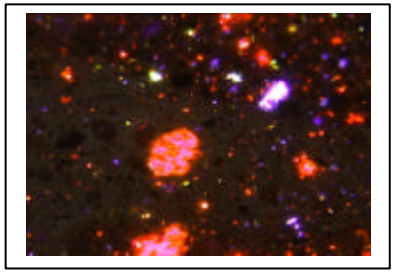
Int. 4.5-5.5m



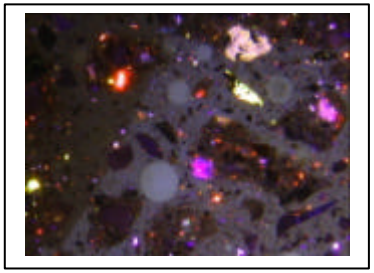
Int. 5.5-6.5m



Int. 6.5-7.5m



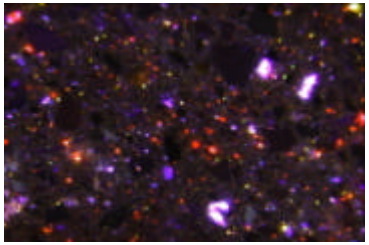
Int. 7.5-8.5m



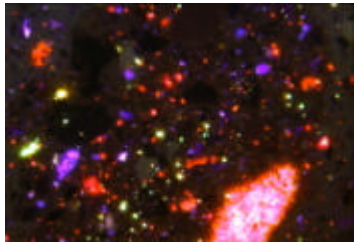
Int. 8.5-9.5m

Colour- coding
Quartz: dark brown until dark-blue-violet.
Alkali –feldspars: white until reddish-violet.
Plagioclase: light-yellow until-yellow-green.
Kaolinite: ink-blue
Carbonates: orange-red until red.

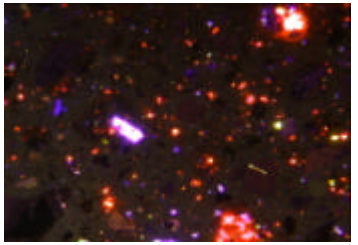
Appendix: 7.3.4 (Borehole N°2)



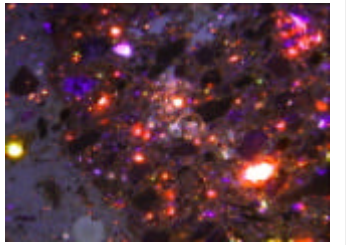
Int. 9.5-10.5m



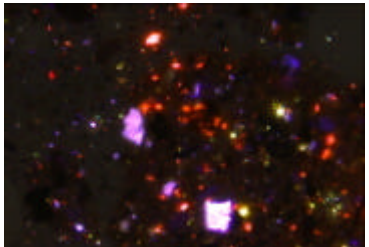
Int. 10.5-11.5m



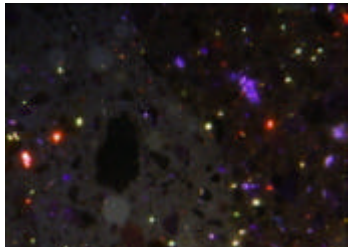
Int. 11.5-12.5m



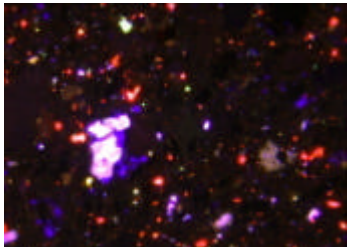
Int. 12.5-13.5m



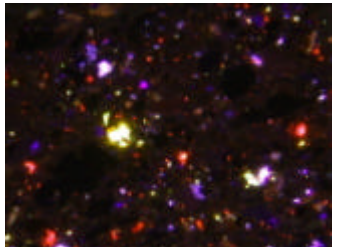
Int. 13.5-14.5m



Int. 14.5-15.5m



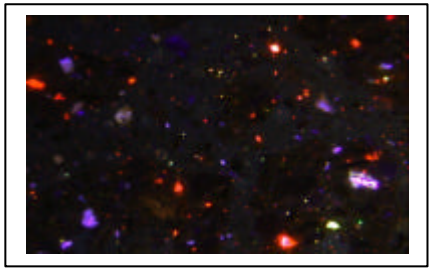
Int. 15.5-16.5m



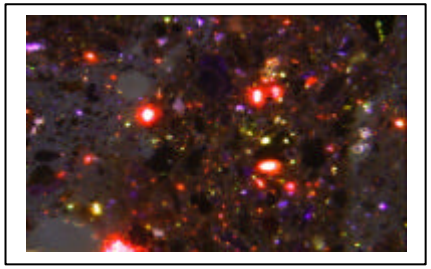
Int. 16.5-17.5

Colour- coding
Quartz: dark brown until dark-blue-violet.
Alkali –feldspars: white until reddish-violet.
Plagioclase: light-yellow until-yellow-green.
Kaolinite: ink-blue
Carbonates: orange-red until red.

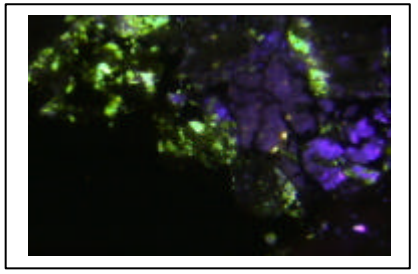
Appendix: 7.3.4 (Borehole N°2)



Int. 17.5-18.5



Int. 18.5-19.5m



Int. 19.5-20.5m

Colour- coding
Quartz: dark brown until dark-blue-violet.
Alkali –feldspars: white until reddish-violet.
Plagioclase: light-yellow until-yellow-green.
Kaolinite: ink-blue
Carbonates: orange-red until red.

Appendix: 7.4.1.

Trace Elements determination by means of X-ray fluorescence analysis
(Borehole N°1)

Depth int./m	V	Cr	Co	Ni	Cu	Zn	Ga	As	Se	Rb	Sr	Y	Zr	Nb	Mo	Cd	Sn	Ba	La	Ce	W	Pb	Bi	Th	U
0---1	35	<100	17	<30	68	410	31	190	<30	650	50	<20	110	23	<20	<60	470	<80	<100	<80	<80	170	9	<80	<80
1---1,5	130	59	52	54	210	340	23	270	<30	390	110	30	200	19	<20	<60	180	1270	<100	50	39	120	28	<80	55
1,5---2,5	210	83	53	48	180	270	25	350	<30	310	98	35	210	21	<20	<60	62	1080	50	50	22	85	30	<80	560
2,5---3,5	220	94	65	105	180	260	24	360	<30	260	98	31	180	17	12	<60	40	1500	40	60	26	59	38	<80	20
3,5---4,5	380	73	84	150	620	690	21	340	24	250	330	41	230	18	<20	<60	28	3100	80	40	<80	230	26	<80	130
5,5---6,5	190	82	82	120	620	490	25	340	<30	300	320	42	230	16	<20	<60	74	1400	50	80	<80	150	40	<80	120
6,5---7,5	200	92	73	97	450	610	33	420	<30	320	250	39	230	16	<20	<60	50	1800	80	90	19	160	140	<80	130
7,5---8,5	150	73	54	55	400	760	24	260	<30	280	290	38	340	14	<20	<60	32	940	60	90	<80	210	14	<80	70
8,5---9,5	64	29	26	<30	24	54	25	140	<30	430	47	<20	290	17	<20	<60	35	230	<100	40	<80	34	<80	<80	61
Results in ppm																									

Main Elements determination by means of X-ray fluorescence analysis
(Borehole N°1)

Depth int./m	SiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	S
0---1	72.1	16	2.68	0.094	0.87	1.02	0.7	5.3	0.41	0.37	0.075
1---1,5	66.1	18.6	5.6	0.127	1.48	1.23	0.46	4.6	0.94	0.27	0.112
1,5---2,5	62.9	19.4	7	0.098	1.83	1.24	0.56	4.5	1.39	0.32	0.14
2,5---3,5	67.1	16.8	6.1	0.12	2.16	1.51	0.25	3.78	1.23	0.29	0.13
3,5---4,5	63.2	18.7	5.5	0.13	2.3	3.12	0.13	4.2	0.99	0.31	0.57
5,5---6,5	61.4	21.1	5.9	0.14	2.21	2.21	0.34	4.6	1.06	0.24	0.2
6,5---7,5	60.7	22	6.5	0.15	1.77	1.56	0.28	4.8	1.06	0.25	0.17
7,5---8,5	63	21.1	6	0.18	1.37	1.21	0.32	4.8	1.1	0.22	0.061
8,5---9,5	71.5	17	3.73	0.031	0.5	0.117	1.14	4.8	0.65	0.15	0.13
Results in %											

Appendix. 7.4.1.

Trace Elements determination by means of X-ray fluorescence analysis

(Borehole N°2)

Depth int./m	V	Cr	Co	Ni	Cu	Zn	Ga	As	Se	Rb	Sr	Y	Zr	Nb	Mo	Cd	Sn	Sb	Ba	La	Ce	W	Pb	Bi	Th	U
0---0,5	14	<100	14	<30	69	220	28	910	<30	660	53	<20	87	22	<20	<60	390	<60	<80	<100	60	<80	82	<80	<80	<80
0,5---1,5	160	64	26	14	74	170	31	300	<30	310	101	22	190	20	<20	<60	56	<60	1020	80	80	17	45	<80	<80	25
2,5---3,5	180	66	38	41	200	280	21	300	<30	300	107	28	190	22	<20	<60	66	<60	1230	40	40	<80	62	17	<80	92
3,5---4,5	230	77	57	67	240	370	22	300	<30	270	106	31	190	20	<20	<60	43	<60	1260	70	70	18	95	30	<80	52
4,5---5,5	210	77	47	73	280	350	22	320	<30	270	120	28	190	17	11	<60	47	<60	1400	60	80	<80	86	26	<80	60
5,5---6,5	560	100	97	300	440	380	19	370	<30	190	160	50	200	14	<20	<60	<60	30	1800	70	90	26	140	38	<80	310
6,5---7,5	270	130	130	290	480	400	33	690	<30	280	390	41	220	20	<20	<60	40	<60	3700	70	110	34	180	106	<80	170
7,5---8,5	290	130	140	320	420	360	31	720	<30	300	350	41	230	15	<20	<60	43	<60	3400	40	110	38	180	140	<80	200
8,5---9,5	260	107	120	210	390	340	28	600	<30	310	180	40	200	17	15	<60	43	<60	2500	<100	110	<80	140	140	<80	180
9,5---10,5	240	130	105	220	390	530	31	590	<30	350	220	34	220	20	14	<60	85	<60	2200	<100	100	<80	140	240	<80	210
10,5---11,5	190	90	100	130	470	460	32	420	<30	320	250	37	220	20	<20	<60	80	<60	2000	60	50	25	170	310	<80	230
11,5---12,5	210	104	93	130	670	550	29	390	8	310	290	46	230	19	<20	<60	80	<60	1400	70	90	<80	180	89	<80	170
12,5---13,5	210	110	100	130	750	410	28	430	<30	310	330	43	250	19	<20	<60	80	<60	1500	<100	110	25	150	160	<80	170
13,5---14,5	170	90	63	87	510	550	25	320	<30	310	220	39	230	15	<20	<60	76	<60	1700	70	90	<80	210	33	<80	59
14,5---15,5	190	85	71	61	310	340	24	350	<30	320	140	38	200	18	<20	<60	76	<60	2900	80	100	<80	150	71	<80	94
15,5---16,5	150	68	64	92	460	580	25	310	<30	310	210	42	240	13	<20	<60	44	<60	1900	60	70	<80	220	65	<80	180
16,5---17,5	140	79	61	53	300	750	29	270	<30	300	180	35	270	14	<20	<60	43	<60	1310	100	60	<80	200	37	<80	106
17,5---18,5	150	76	61	59	340	870	28	240	<30	290	270	43	280	15	<20	<60	39	<60	1040	40	90	<80	190	18	<80	86
18,5---19,5	220	83	90	77	230	430	31	480	<30	310	150	36	200	20	<20	<60	39	<60	2500	50	70	21	220	37	<80	130
19,5---20,2	93	68	34	13	56	110	26	180	<30	430	63	30	240	20	<20	<60	112	<60	370	60	90	<80	40	<80	<80	<80
19,5---20,2(b)	89	64	38	28	59	120	32	170	<30	420	64	30	240	22	<20	<60	120	<60	390	<100	60	16	40	<80	<80	<80
		Results in ppm																								

Appendix: 7.4.1.

Main Elements determination by means of X-ray fluorescence analysis (Borehole N°2)

Depth int./m	SiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	S
0---0,5	73.2	16	2.5	0.057	0.47	0.52	0.87	5.4	0.21	0.36	0.047
0,5---1,5	64.7	20.3	6.1	0.063	1.43	0.45	0.36	4.6	1.17	0.123	0
2,5---3,5	65.4	19.1	5.9	0.06	1.65	0.66	0.44	4.6	1.43	0.17	0.108
3,5---4,5	67.2	17.2	6.1	0.09	1.91	1.25	0.29	3.93	1.17	0.22	0.15
4,5---5,5	67.5	16.9	6	0.092	1.77	1.29	0.36	3.97	1.24	0.2	0.15
5,5---6,5	64	18	6.2	0.19	1.88	2.3	0.68	3.76	0.98	0.32	0.93
6,5---7,5	58.9	20.1	6.5	0.15	2.89	3.4	0.76	4.32	1.27	0.31	0.39
7,5---8,5	58.5	20.7	6.8	0.15	2.69	3.02	0.69	4.5	1.26	0.29	0.34
8,5---9,5	61.2	19.6	6.8	0.15	2.32	2.39	0.66	4.37	1.17	0.3	0.24
9,5---10,5	59.6	21.1	6.7	0.14	2.41	2.27	0.59	4.6	1.19	0.35	0.28
10,5---11,5	58.9	22.2	6.6	0.17	2.24	2.33	0.58	4.5	1.12	0.28	0.23
11,5---12,5	59.2	22	6.5	0.15	2.21	2.25	0.64	4.6	1.15	0.27	0.25
12,5---13,5	60.3	21.3	6.5	0.16	2.12	2.11	0.59	4.5	1.19	0.27	0.21
13,5---14,5	61.1	21.7	6.4	0.15	1.73	1.47	0.58	4.7	1.05	0.22	0.124
14,5---15,5	61.1	21.8	6.9	0.13	1.52	0.92	0.57	4.8	1.02	0.23	0.15
15,5---16,5	60.3	22.4	6.6	0.16	1.69	1.29	0.57	5	1.04	0.2	0.15
16,5---17,5	60	23.2	6.4	0.17	1.63	1.21	0.59	4.9	1.03	0.19	0.115
17,5---18,5	59.7	23	6.5	0.17	1.62	1.42	0.7	4.8	1.07	0.21	0.097
18,5---19,5	57.5	21.5	8.4	0.2	2.18	2.35	0.83	4.6	1.3	0.27	0.19
19,5---20,2	66.6	20.2	5.2	0.116	0.71	0.113	0.94	4.7	0.76	0.26	0.017
Results in %											

Appendix: 7.4.1.

Trace Elements determination by means of X-ray fluorescence analysis

(Borehole N°3)

Depth int./m	V	Cr	Co	Ni	Cu	Zn	Ga	As	Se	Rb	Sr	Y	Zr	Nb	Mo	Cd	Sn	Ba	La	Ce	W	Pb	Bi	Th	U
0---1	160	56	52	59	750	310	22	500	64	350	102	91	140	11	27	<60	43	2000	50	60	21	260	160	<80	820
1---2	270	92	98	109	290	410	28	510	8	300	120	33	230	29	<20	<60	63	1230	60	40	<80	120	41	<80	68
2---3	69	29	34	24	660	180	30	940	<30	310	450	24	130	17	<20	<60	4100	680	<100	90	60	59	470	<80	27
3---4	330	160	130	250	380	470	25	540	11	400	260	50	260	17	<20	<60	110	2600	70	90	<80	210	110	<80	330
4---5	240	140	130	200	500	610	46	610	11	430	310	50	240	15	17	<60	64	1500	70	50	25	220	180	<80	530
5---6	200	92	65	72	340	380	31	420	<30	300	180	38	220	15	<20	<60	91	3400	50	100	<80	150	41	<80	350
6---7	170	89	83	86	450	910	40	470	9	360	350	43	260	20	<20	<60	300	960	40	50	<80	370	77	<80	380
7---8	290	100	130	300	250	640	33	610	<30	350	111	39	230	22	<20	<60	76	1400	70	90	33	200	109	<80	340
Results in ppm																									

Main Elements determination by means of X-ray fluorescence analysis

(Borehole N°3)

Depth int./m	SiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	S
0---1	68.2	16.2	7.4	0.097	1.33	0.58	0.21	3.71	0.97	0.3	0.16
1---2	59.4	18.9	9.4	0.17	2.41	2.13	0.38	4.32	1.84	0.36	0.14
2---3	71.1	17.8	4.7	0.071	0.51	<2e	3.1	0.43	0.32	0.17	0.103
3---4	54.3	23.6	8.8	0.18	2.92	2.24	0.16	5.2	1.25	0.3	0.2
4---5	53	25.6	8.8	0.25	2.2	1.94	0.21	5.6	1.15	0.28	0.17
5---6	59.7	22.8	7.1	0.14	1.84	1.1	0.29	4.7	1.06	0.26	0.18
6---7	53.9	26.9	8.1	0.2	1.72	1.24	0.3	5.5	1.15	0.23	0.087
7---8	51.8	23.5	10.6	0.22	2.91	2.44	0.42	5.1	1.71	0.34	0.23
Results in %											

Appendix: 7.4.1.

Trace Elements determination by means of X-ray fluorescence analysis
(Borehole N°4)

Depth int./m	V	Cr	Co	Ni	Cu	Zn	Ga	As	Se	Rb	Sr	Y	Zr	Nb	Mo	Cd	Sn	Ba	La	Ce	W	Pb	Bi	Th	U
0---1	130	68	29	28	190	220	31	450	<30	400	130	40	210	21	<20	<60	90	2800	<100	80	<80	109	40	<80	<80
1---2	310	99	65	93	240	380	31	550	<30	350	150	38	250	29	<20	<60	74	1700	60	80	30	130	32	<80	92
2---3	113	67	40	20	330	220	25	880	<30	330	300	24	160	21	<20	<60	1800	880	50	70	40	62	190	<80	<80
3---4	320	130	120	230	560	950	45	780	<30	410	510	50	280	21	<20	<60	490	2600	60	110	<80	300	109	<80	400
4---5	300	160	150	290	420	510	43	950	9	480	300	60	270	22	19	<60	92	2800	90	90	30	260	220	<80	640
5---6	220	120	88	105	410	540	39	400	10	460	250	50	250	24	<20	<60	110	4800	80	70	30	230	75	<80	290
6---7	210	130	90	101	400	930	39	480	14	420	300	50	300	24	<20	<60	80	1800	40	80	<80	290	33	<80	440
7---8	290	110	105	160	310	650	35	670	<30	420	150	40	240	26	<20	<60	91	2000	70	90	<80	310	74	<80	410
8---9	390	150	101	140	290	550	35	580	<30	410	130	60	280	24	<20	<60	77	1700	80	70	30	170	52	<80	430
9---10	240	120	74	93	180	600	34	350	<30	420	95	50	270	23	<20	<60	76	1150	50	60	<80	220	64	<80	210
10---11	160	97	38	34	54	140	30	210	<30	340	88	45	400	27	<20	<60	40	930	90	40	<80	109	69	<80	<80
11---12	220	94	84	107	340	440	32	710	<30	380	290	40	240	24	<20	<60	920	1700	60	70	40	170	160	<80	250
Results in ppm																									

Main Elements determination by means of X-ray fluorescence analysis
(Borehole N°4)

Depth int./m	SiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	S
0---1	64.3	20.7	6.4	0.1	0.99	0.14	0.26	5.2	1	0.22	0
1---2	58	18.6	10	0.16	2.43	2.13	0.41	4.6	2.06	0.36	0
2---3	69.8	16.6	5.4	0.12	1.12	1.07	0.17	3.9	0.71	0.23	0.118
3---4	55.3	23.7	8	0.17	2.33	2.22	0.14	5.4	1.23	0.28	0.23
4---5	52.7	24.9	9.5	0.19	2.31	1.6	0.22	5.8	1.27	0.31	0.18
5---6	53.3	26.1	9	0.18	1.79	0.85	0.29	5.9	1.2	0.21	0.15
6---7	52.6	26.6	9.5	0.2	1.69	0.85	0.36	5.9	1.28	0.21	0.125
7---8	50.8	23.3	11.3	0.26	2.66	3.23	0.41	5.3	1.54	0.29	0.17
8---9	50.9	22.1	12.6	0.24	3.16	2.17	0.41	5.1	1.99	0.36	0.22
9---10	52.4	24.5	10.4	0.21	2.25	1.51	0.45	5.8	1.44	0.23	0.22
10---11	62.1	22	6.8	0.055	0.66	0.67	0.35	5.1	1.35	0.2	0.068
11---12	60.1	20.5	8.3	0.15	1.83	1.58	0.26	4.7	1.26	0.28	0.14
Results in %											

Appendix: 7.4.2. **Elements determination after the mineral separation by means of heavy liquids (Borehole N°1)**

Depth int.	SiO_2/HM	Al_2O_3/HM	Fe_2O_3/HM	MnO/HM	MgO/HM	CaO/HM	Na_2O/HM	K_2O/HM	TiO_2/HM	P_2O_5/HM	S/HM
0---1m	37.6	17.1	24.5	0.39	4.04	5.5	0.57	2.24	3.74	0.47	1.4
1---1,5m	38.6	17.3	23.3	0.36	4.03	6.1	0.72	2.39	3.59	0.45	1.21
1,5---2,5m	37.4	15.7	22.4	0.49	5.1	7	0.49	1.96	5.7	0.75	0.91
2,5---3,5m	31	15.5	29.7	0.74	3.26	4.43	0.12	1.91	4.5	0.85	2.03
3,5---4,5m	37.8	16.8	26.6	0.82	2.68	4.01	0.16	1.89	4.01	0.69	1.47
5,5---6,5m	37.8	18.7	23.5	0.79	2.6	2.43	<2e	1.82	4.32	0.63	2.44
6,5---7,5m	34.2	20.3	28.3	1.1	2.64	1.84	0.075	2.83	2.58	0.77	1.44
7,5---8,5m	31.8	15.3	23.8	0.44	4.35	6.9	<2e	2.5	2.03	0.89	4.38
8,5---9,5m	39.9	35	18.7	0.34	0.5	0.14	0.052	1.85	1.94	0.39	0.095
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11
		Results (%)									

Depth int.	SiO_2/LM	Al_2O_3/LM	Fe_2O_3/LM	MnO/LM	MgO/LM	CaO/LM	Na_2O/LM	K_2O/LM	TiO_2/LM	P_2O_5/LM	S/LM
0---1m	65.9	17.1	6.1	0.127	2.02	1.71	0.4	4.26	1.32	0.21	0.081
1---1,5m	67.1	17.5	5.4	0.098	1.77	1.12	0.45	4.27	1.23	0.18	0.07
1,5---2,5m	69.1	16.3	5	0.078	1.84	1.19	0.34	4.03	1.15	0.22	0.058
2,5---3,5m	70.7	15.9	4.42	0.108	1.68	1.62	0.2	3.78	0.79	0.16	0.051
3,5---4,5m	74.6	12.5	3	0.077	1.64	2.74	0.053	3.31	0.51	0.24	0.5
5,5---6,5m	71.1	15.7	4.16	0.113	1.67	1.85	0.16	3.72	0.76	0.15	0.058
6,5---7,5m	71.9	16.6	3.98	0.1	1.14	0.7	0.18	4.03	0.66	0.095	0.037
7,5---8,5m	69.5	16.9	4.8	0.113	1.42	1.14	0.34	4.07	0.9	0.14	0.048
8,5---9,5m	68.2	19.5	3.73	0.046	0.48	0.107	0.96	5.9	0.47	0.15	0.061
	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
		Results (%)									

Depth int.	A1/B1	A2/B2	A3/B3	A4/B4	A5/B5	A6/B6	A7/B7	A8/B8	A9/B9	A10/B10	A11/B11
0---1m	0.6	1.0	4.0	3.1	2.0	3.2	1.4	0.5	2.8	2.2	17.3
1---1,5m	0.6	1.0	4.3	3.7	2.3	5.4	1.6	0.6	2.9	2.5	17.3
1,5---2,5m	0.5	1.0	4.5	6.3	2.8	5.9	1.4	0.5	5.0	3.4	15.7
2,5---3,5m	0.4	1.0	6.7	6.9	1.9	2.7	0.6	0.5	5.7	5.3	39.8
3,5---4,5m	0.5	1.3	8.9	10.6	1.6	1.5	3.0	0.6	7.9	2.9	2.9
5,5---6,5m	0.5	1.2	5.6	7.0	1.6	1.3		0.5	5.7	4.2	42.1
6,5---7,5m	0.5	1.2	7.1	11.0	2.3	2.6	0.4	0.7	3.9	8.1	38.9
7,5---8,5m	0.5	0.9	5.0	3.9	3.1	6.1		0.6	2.3	6.4	91.3
8,5---9,5m	0.6	1.8	5.0	7.4	1.0	1.3	0.1	0.3	4.1	2.6	1.6

Appendix: 7.4.2. **The total elements concentration after the mineral separation by means of heavy liquids (Borehole N°1)**

Depth int.	SiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	S
0---1m	64.3	17.1	7.1	0.1	2.1	1.9	0.4	4.1	1.5	0.2	0.0
1---1,5m	64.9	17.5	6.8	0.1	1.9	1.5	0.5	4.1	1.4	0.2	0.0
1,5---2,5m	67.3	16.3	6.0	0.1	2.0	1.5	0.3	3.9	1.4	0.3	0.0
2,5---3,5m	68.7	15.9	5.7	0.1	1.8	1.8	0.2	0.8	1.0	0.2	0.0
3,5---4,5m	74.2	12.5	3.3	0.1	1.7	2.8	0.1	3.3	0.5	0.2	0.2
5,5---6,5m	70.1	15.8	4.7	0.1	1.7	1.9	0.2	3.7	0.9	0.2	0.0
6,5---7,5m	70.6	16.7	4.8	0.1	1.2	0.7	0.2	4.0	0.7	0.1	0.0
7,5---8,5m	65.1	16.7	7.0	0.2	1.8	1.8	0.3	3.9	1.0	0.2	0.1
8,5---9,5m	67.5	19.9	4.1	0.1	0.5	0.1	0.9	5.8	0.5	0.2	0.0
Results (%)											

The approximately percentage of elements concentration in the heavy fraction

Depth int.	SiO_2/HM	Al_2O_3/HM	Fe_2O_3/HM	MnO/HM	MgO/HM	CaO/HM	Na_2O/HM	K_2O/HM	TiO_2/HM	P_2O_5/HM	S/HM
0---1m	3.1	5.5	22.2	17.0	11.0	17.8	7.9	2.9	15.6	12.4	95.4
1---1,5m	4.5	7.7	33.6	28.6	17.7	42.4	12.4	4.4	22.7	19.5	**100.0**
1,5---2,5m	3.1	5.6	25.8	36.2	16.0	33.9	8.3	2.8	28.6	19.7	90.5
2,5---3,5m	2.2	4.9	33.9	34.6	9.8	13.8	3.0	2.6	28.8	26.8	**100.0**
3,5---4,5m	0.6	1.5	10.0	12.0	1.8	1.7	3.4	0.6	8.9	3.2	3.3
5,5---6,5m	1.6	3.6	16.9	21.0	4.7	3.9	0.0	1.5	17.1	12.6	**100.0**
6,5---7,5m	1.6	4.2	24.5	38.0	8.0	9.1	1.4	2.4	13.5	28.0	**100.0**
7,5---8,5m	5.4	10.6	58.3	45.8	36.0	71.1	0.0	7.2	26.5	74.7	**100.0**
8,5---9,5m	1.5	4.5	12.6	18.6	2.6	3.3	0.1	0.8	10.4	6.6	3.9

The relationship between the elements concentration in the entire mineral samples before and after the mineral separation

Depth int.	SiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	S
0---1m	1.1	0.9	0.4	0.7	0.4	0.5	1.7	1.3	0.3	1.6	1.7
1---1,5m	1.0	1.1	0.8	1.1	0.8	0.8	1.0	1.1	0.7	1.3	2.2
1,5---2,5m	0.9	1.2	1.2	1.0	0.9	0.8	1.6	1.2	1.0	1.3	4.4
2,5---3,5m	1.0	1.1	1.1	0.9	1.2	0.9	1.3	4.5	1.3	1.5	2.8
3,5---4,5m	0.9	1.5	1.7	1.5	1.4	1.1	2.4	1.3	1.8	1.3	2.4
5,5---6,5m	0.9	1.3	1.2	1.1	1.3	1.2	2.2	1.3	1.2	1.5	4.9
6,5---7,5m	0.9	1.3	1.3	1.1	1.5	2.1	1.6	1.2	1.5	2.1	6.1
7,5---8,5m	1.0	1.3	0.9	1.2	0.8	0.7	1.1	1.2	1.1	1.0	0.4
8,5---9,5m	1.1	0.9	0.9	0.6	1.0	1.1	1.2	0.8	1.3	1.0	6.5

Appendix: 7.4.2. **Elements determination after the mineral separation by means of heavy liquids (HM); Borehole N°1**

Depth int.	V	Cr	Co	Ni	Cu	Zn	Ga	As	Rb	Sr	Y	Zr	Nb	Ba	La	Ce	W	Pb	Bi	Th	U
0---1m	370	76	140	120	2100	1200	22	2000	160	330	61	280	38	10500	90	140	30	240	74	<80	210
1---1,5m	330	92	160	97	1040	750	20	1400	160	320	43	260	37	8400	<100	130	30	220	75	<80	260
1,5---2,5m	420	200	170	170	970	650	16	1350	140	330	68	310	49	10200	<100	70	80	280	103	<80	180
2,5---3,5m	320	107	260	240	3600	1900	<30	2300	140	590	69	300	41	35200	80	220	120	610	230	<80	390
3,5---4,5m	250	80	290	170	1700	2000	<30	2200	130	310	53	300	40	13100	200	260	80	490	130	<80	370
5,5---6,5m	180	70	460	630	5300	1900	21	3800	120	340	57	340	36	22200	140	130	70	780	430	30	1700
6,5---7,5m	220	105	290	240	2300	2800	33	2400	200	370	65	260	29	19300	130	280	<80	800	110	30	720
7,5---8,5m	310	100	240	390	4700	2000	24	1400	150	1030	79	220	31	53000	90	150	<80	380	36	<80	760
8,5---9,5m	130	44	100	<30	460	280	23	1230	250	49	33	200	66	750	120	240	80	170	100	40	40
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	A21
Results in ppm																					

Elements determination after the mineral separation by means of heavy liquids (LM)

Depth int.	V	Cr	Co	Ni	Cu	Zn	Ga	As	Rb	Sr	Y	Zr	Nb	Ba	La	Ce	W	Pb	Bi	Th	U
0---1m	180	69	37	33	2400	270	19	160	310	103	22	180	25	910	<100	40	<80	59	20	<80	21
1---1,5m	200	93	44	39	1700	300	21	190	300	85	25	170	22	710	<100	50	20	50	<80	<80	<80
1,5---2,5m	200	91	42	53	1900	200	230	210	290	80	24	150	17	510	<100	90	<80	44	320	<80	<80
2,5---3,5m	140	85	46	50	1100	330	22	180	260	102	20	150	14	540	<100	40	20	76	15	<80	<80
3,5---4,5m	440	55	39	83	2400	200	12	140	190	120	30	110	17	760	<100	50	<80	53	<80	<80	54
5,5---6,5m	140	72	35	39	1400	190	28	150	260	110	22	150	13	450	<100	90	<80	59	13	<80	43
6,5---7,5m	110	70	26	35	1500	310	25	120	260	85	22	140	15	640	<100	70	<80	76	<80	<80	25
7,5---8,5m	120	68	40	17	1140	260	22	120	270	112	20	150	15	770	<100	70	<80	67	11	<80	<80
8,5---9,5m	62	38	23	<30	350	105	30	150	560	43	<20	98	19	350	<100	<100	<80	28	<80	<80	<80
	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18	B19	B20	B21
Results in ppm																					

Depth int.	A1/B1	A2/B2	A3/B3	A4/B4	A5/B5	A6/B6	A7/B7	A8/B8	A9/B9	A10/B10	A11/B11	A12/B12	A13/B13	A14/B14	A15/B15	A16/B16	A17/B17	A18/B18	A19/B19	A20/B20	A21/B21
0---1m	2.1	1.1	3.8	3.6	0.9	4.4	1.2	12.5	0.5	3.2	2.8	1.6	1.5	11.5	--	3.5	--	4.1	3.7	--	10.0
1---1,5m	1.7	1.0	3.6	2.5	0.6	2.5	1.0	7.4	0.5	3.8	1.7	1.5	1.7	11.8	--	2.6	1.5	4.4	--	--	--
1,5---2,5m	2.1	2.2	4.0	3.2	0.5	3.3	0.1	6.4	0.5	4.1	2.8	2.1	2.9	20.0	--	0.8	--	6.4	0.3	--	--
2,5---3,5m	2.3	1.3	5.7	4.8	3.3	5.8	0.0	12.8	0.5	5.8	3.5	2.0	2.9	65.2	--	5.5	6.0	8.0	15.3	--	--
3,5---4,5m	0.6	1.5	7.4	2.0	0.7	10.0	0.0	15.7	0.7	2.6	1.8	2.7	2.4	17.2	--	5.2	--	9.2	--	--	6.9
5,5---6,5m	1.3	1.0	13.1	16.2	3.8	10.0	0.8	25.3	0.5	3.1	2.6	2.3	2.8	49.3	--	1.4	--	13.2	33.1	--	39.5
6,5---7,5m	2.0	1.5	11.2	6.9	1.5	9.0	1.3	20.0	0.8	4.4	3.0	1.9	1.9	30.2	--	4.0	--	10.5	--	--	28.8
7,5---8,5m	2.6	1.5	6.0	22.9	4.1	7.7	1.1	11.7	0.6	9.2	4.0	1.5	2.1	68.8	--	2.1	--	5.7	3.3	--	--
8,5---9,5m	2.1	1.2	4.3	--	1.3	2.7	0.8	8.2	0.4	1.1	--	2.0	3.5	2.1	--	--	--	6.1	--	--	--

Appendix: 7.4.2 **The total elements concentration after the mineral separation by means of heavy liquids (Borehole N°1)**

Depth int.	V	Cr	Co	Ni	Cu	Zn	Ga	As	Rb	Sr	Y	Zr	Nb	Ba	La	Ce	W	Pb	Bi	Th	U
0---1m	190.5	69.4	42.7	37.8	2383.4	321.4	19.2	261.6	301.7	115.5	24.2	185.5	25.7	1439.7	5.0	45.5	1.7	69.0	23.0	0.0	31.4
1---1,5m	210.1	92.9	53.0	43.5	1648.6	335.0	20.9	284.2	289.1	103.3	26.4	177.0	23.2	1308.6	0.0	56.2	20.8	63.2	5.8	0.0	20.2
1,5---2,5m	212.7	97.3	49.4	59.8	1846.3	226.0	217.6	275.8	281.3	94.4	26.5	159.2	18.8	1069.4	0.0	88.8	4.6	57.6	307.5	0.0	10.4
2,5---3,5m	149.1	86.1	56.8	59.6	1226.3	409.3	20.9	287.1	253.9	126.6	22.5	157.6	15.4	2290.3	4.0	49.1	25.1	103.0	25.9	0.0	19.7
3,5---4,5m	437.9	55.3	41.8	84.0	2392.1	220.3	11.9	163.3	189.3	122.1	30.3	112.1	17.3	899.4	2.3	52.4	0.9	57.9	1.5	0.0	57.6
5,5---6,5m	141.2	71.9	47.8	56.7	1517.0	241.3	27.8	259.5	255.8	116.9	23.1	155.7	13.7	1102.5	4.2	91.2	2.1	80.6	25.5	0.9	92.7
6,5---7,5m	113.8	71.2	35.1	42.1	1527.6	395.9	25.3	198.7	257.9	94.8	23.5	144.1	15.5	1283.8	4.5	77.2	0.0	101.0	3.8	1.0	49.0
7,5---8,5m	142.3	71.8	63.5	60.8	1558.3	464.5	22.2	270.4	255.9	219.9	26.9	158.2	16.9	6907.0	10.6	79.4	0.0	103.8	13.9	0.0	89.3
8,5---9,5m	63.7	37.0	23.2	0.0	341.2	214.1	37.3	376.2	546.7	42.2	0.0	95.6	19.7	355.7	0.5	0.0	0.1	195.4	0.0	0.0	0.0
Results in ppm																					

The approximately percentage of elements concentration in the heavy fraction

Depth int.	V	Cr	Co	Ni	Cu	Zn	Ga	As	Rb	Sr	Y	Zr	Nb	Ba	La	Ce	W	Pb	Bi	Th	U
0---1m	11.3	6.1	20.9	20.1	4.8	24.5	6.4	69.0	2.8	17.7	15.3	8.6	8.4	63.7	**100.0**	19.3	**100.0**	22.5	20.4	--	55.2
1---1,5m	12.8	7.7	28.3	19.4	4.8	19.5	7.4	57.3	4.1	29.3	13.4	11.9	13.1	92.0	--	20.2	11.7	34.2	**100.0**	--	**100.0**
1,5---2,5m	12.1	12.7	23.4	18.5	2.9	18.8	0.4	37.1	2.8	23.8	16.3	11.9	16.6	**100.0**	--	4.5	**100.0**	36.7	1.9	--	**100.0**
2,5---3,5m	11.5	6.4	28.5	24.2	16.5	29.1	**0.0**	64.5	2.7	29.2	17.4	10.1	14.8	**100.0**	**100.0**	27.8	30.3	40.5	77.4	--	**100.0**
3,5---4,5m	0.6	1.6	8.4	2.3	0.8	11.3	**0.0**	17.8	0.8	2.9	2.0	3.1	2.7	19.5	**100.0**	5.9	**100.0**	10.4	**100.0**	--	7.7
5,5---6,5m	3.9	2.9	39.4	48.5	11.4	30.0	2.3	76.0	1.4	9.3	7.8	6.8	8.3	**100.0**	**100.0**	4.3	**100.0**	39.7	99.2	**100.0**	**100.0**
6,5---7,5m	6.9	5.2	38.5	23.7	5.3	31.2	4.6	69.0	2.7	15.0	10.2	6.4	6.7	**100.0**	**100.0**	13.8	--	36.3	**100.0**	**100.0**	99.4
7,5---8,5m	30.4	17.3	70.5	**100.0**	48.4	90.4	12.8	**100.0**	6.5	**100.0**	46.4	17.2	24.3	**100.0**	**100.0**	25.2	--	66.6	38.5	--	**100.0**
8,5---9,5m	5.3	2.9	11.0	--	3.3	6.7	1.9	20.7	1.1	2.9	**100.0**	5.1	8.8	5.4	**100.0**	**100.0**	**100.0**	15.3	**100.0**	**100.0**	**100.0**

The relationship between the elements concentration in the entire mineral samples before and after the mineral separation

Depth int.	V	Cr	Co	Ni	Cu	Zn	Ga	As	Rb	Sr	Y	Zr	Nb	Ba	La	Ce	W	Pb	Bi	Th	U
0---1m	0.2	--	0.4	--	0.0	1.3	1.6	0.7	2.2	0.4	--	0.6	0.9	--	--	--	--	2.5	0.4	--	--
1---1,5m	0.6	0.6	1.0	1.2	0.1	1.0	1.1	1.0	1.3	1.1	1.1	1.1	0.8	1.0	--	0.9	1.9	1.9	4.8	--	2.7
1,5---2,5m	1.0	0.9	1.1	0.8	0.1	1.2	0.1	1.3	1.1	1.0	1.3	1.3	1.1	1.0	--	0.6	4.8	1.5	0.1	--	53.9
2,5---3,5m	1.5	1.1	1.1	1.8	0.1	0.6	1.1	1.3	1.0	0.8	1.4	1.1	1.1	0.7	9.9	1.2	1.0	0.6	1.5	--	1.0
3,5---4,5m	0.9	1.3	2.0	1.8	0.3	3.1	1.8	2.1	1.3	2.7	1.4	2.1	1.0	3.4	35.4	0.8	--	4.0	17.7	--	2.3
5,5---6,5m	1.3	1.1	1.7	2.1	0.4	2.0	0.9	1.3	1.2	2.7	1.8	1.5	1.2	1.3	11.9	0.9	--	1.9	1.6	--	1.3
6,5---7,5m	1.8	1.3	2.1	2.3	0.3	1.5	1.3	2.1	1.2	2.6	1.7	1.6	1.0	1.4	17.8	1.2	--	1.6	36.9	--	2.7
7,5---8,5m	1.1	1.0	0.9	0.9	0.3	1.6	1.1	1.0	1.1	1.3	1.4	2.1	0.8	0.1	5.7	1.1	--	2.0	1.0	--	0.8
8,5---9,5m	1.0	0.8	1.1	--	0.1	0.3	0.7	0.4	0.8	1.1	--	3.0	0.9	0.6	--	--	--	0.2	--	--	--

Appendix. 7.4.2. **Elements determination after the mineral separation by means of heavy liquids (HM) (Borehole N°2)**

Depth int./m	SiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	S
0,5---1,5	32.4	15	31.1	0.5	2.8	3.5	0.2	2.0	4.3	0.6	2.87
2,5---3,5	37.2	17	25.4	0.3	3.5	5.2	0.7	2.2	4.2	0.5	0.87
3,5---4,5	49.2	24.9	11.1	0.2	2.9	2.4	0.4	5.3	2.2	0.3	0.20
5,5---6,5	33.3	12.4	22.9	0.6	4.1	7.8	0.1	1.2	6.7	0.6	4.07
6,5---7,5	30.5	9.8	27.3	0.6	3.4	5.1	<	0.9	4.4	0.3	8.10
7,5---8,5	27.6	13	28.3	0.9	3.7	7.6	<2e	1.6	6.4	0.9	3.69
8,5---9,5	29.1	14.1	28.2	0.8	3.8	6.6	0.1	1.8	6.2	0.7	3.51
9,5---10,5	30	17.1	24.6	0.7	3.9	6.9	<2e	1.7	6.1	1.3	3.35
10,5---11,5	29.7	26	21.9	1.0	2.8	5.3	<	1.2	3.9	1.0	3.10
11,5---12,5	35.1	15.3	24.3	0.7	3.5	4.6	0.1	1.6	5.1	0.8	4.14
12,5---13,5	28.6	13.9	30.2	1.0	3.4	5.2	<	1.8	5.0	0.9	3.83
13,5---14,5	35.3	17.5	23.7	0.7	3.1	4.1	<2e	1.7	4.1	0.7	3.88
14,5---15,5	30	17.3	29.3	0.9	3.1	3.7	<	2.3	4.4	1.1	2.16
15,5---16,5	36.5	18.3	26.3	1.2	2.2	2.0	<2e	2.1	2.9	0.9	1.74
16,5---17,5	37.7	19.2	25.6	1.0	2.2	2.3	<	2.1	3.7	0.9	1.30
17,5---18,5	30.7	17.4	31.6	1.3	2.9	2.9	<2e	2.4	3.9	1.1	1.96
18,5---19,5	30.6	15	29.5	1.1	3.9	7.3	0.4	2.0	3.5	0.8	1.77
19,5---20,2	36.8	30.8	24.1	1.6	0.5	0.3	0.0	1.7	1.8	0.5	0.04
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11
Results (%)											

Appendix: 7.4.2. **Elements determination after the mineral separation by means of heavy liquids (LM) (Borehole N°2)**

Depth int./m	SiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	S
0,5---1,5	68.5	16.7	5.1	0.126	1.71	1.67	0.25	4.08	1.02	0.14	0.073
2,5---3,5	68.1	17.9	5	0.053	1.46	0.5	0.38	4.36	1.28	0.117	0.058
3,5---4,5	79.5	11.1	2.8	0.035	1.02	0.59	0.22	3.04	0.58	0.126	0.06
5,5---6,5	74	13.2	3.48	0.102	2.3	3.1	0.15	2.42	0.71	0.15	0.079
6,5---7,5	72.2	13.4	3.86	0.121	2.65	3.69	0.12	2.35	0.87	0.17	0.14
7,5---8,5	75.8	13.3	3.21	0.087	1.76	1.9	0.17	2.51	0.72	0.14	0.071
8,5---9,5	73.8	14.8	3.22	0.083	1.73	2.07	0.098	2.89	0.77	0.13	0.074
9,5---10,5	72.6	13.4	4.16	0.101	1.95	2.37	0.2	3.54	0.76	0.21	0.083
10,5---11,5	74.9	13.7	3.21	0.094	1.92	2.31	0.12	2.6	0.71	0.113	0.075
11,5---12,5	70.8	14.2	4.8	0.117	1.94	2.42	0.25	3.59	0.85	0.23	0.076
12,5---13,5	75.1	14.4	3.21	0.083	1.59	1.61	0.17	2.57	0.76	0.124	0.057
13,5---14,5	74.6	14.8	3.13	0.087	1.51	1.73	0.083	2.9	0.69	0.123	0.072
14,5---15,5	71.2	16.7	4.37	0.074	1.21	0.57	0.24	4.12	0.71	0.128	0.039
15,5---16,5	74.9	15.7	3.24	0.086	1.08	0.71	0.19	3.04	0.61	0.088	0.043
16,5---17,5	76.1	15.3	3.01	0.068	0.94	0.5	0.19	2.99	0.58	0.071	0.031
17,5---18,5	71.1	16.3	4.42	0.11	1.37	0.89	0.26	3.95	0.71	0.115	0.049
18,5---19,5	71.4	16	4	0.124	1.79	1.91	0.32	3.02	0.98	0.16	0.046
19,5---20,2	65.7	20.7	5	0.065	0.65	0.122	0.71	5.6	0.65	0.17	0.018
Results in %											

Appendix: 7.4.2. **The relationship between the (HM) & (LM); Borehole N°2**

Depth int./m	SiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	S
0,5---1,5	0.5	0.9	6.1	4.2	1.6	2.1	0.7	0.5	4.2	4.0	39.3
2,5---3,5	0.5	0.9	5.1	6.4	2.4	10.4	1.7	0.5	3.3	4.1	15.0
3,5---4,5	0.6	2.2	4.0	5.4	2.8	4.1	1.7	1.7	3.8	2.2	3.3
5,5---6,5	0.5	0.9	6.6	5.5	1.8	2.5	0.4	0.5	9.4	3.8	51.5
6,5---7,5	0.4	0.7	7.1	4.8	1.3	1.4	--	0.4	5.0	1.9	57.9
7,5---8,5	0.4	1.0	8.8	10.7	2.1	4.0	--	0.6	8.9	6.1	52.0
8,5---9,5	0.4	1.0	8.8	9.9	2.2	3.2	0.8	0.6	8.1	5.7	47.4
9,5---10,5	0.4	1.3	5.9	6.7	2.0	2.9	--	0.5	8.0	6.1	40.4
10,5---11,5	0.4	1.9	6.8	10.2	1.5	2.3	--	0.5	5.5	8.8	41.3
11,5---12,5	0.5	1.1	5.1	6.3	1.8	1.9	0.2	0.5	6.0	3.3	54.5
12,5---13,5	0.4	1.0	9.4	12.5	2.2	3.2	--	0.7	6.6	7.2	67.2
13,5---14,5	0.5	1.2	7.6	8.0	2.1	2.4	--	0.6	5.9	5.9	53.9
14,5---15,5	0.4	1.0	6.7	12.3	2.5	6.5	--	0.5	6.1	8.3	55.4
15,5---16,5	0.5	1.2	8.1	14.1	2.0	2.8	--	0.7	4.8	9.7	40.5
16,5---17,5	0.5	1.3	8.5	14.3	2.4	4.6	--	0.7	6.4	13.2	41.9
17,5---18,5	0.4	1.1	7.1	11.8	2.1	3.2	--	0.6	5.5	9.6	40.0
18,5---19,5	0.4	0.9	7.4	8.8	2.2	3.8	1.1	0.7	3.6	4.8	38.5
19,5---20,2	0.6	1.5	4.8	24.6	0.8	2.7	0.1	0.3	2.8	2.8	1.9

Appendix: 7.4.2. **The total elements concentration after the mineral separation by means of heavy liquids (Borehole N°2)**

Depth int./m	SiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	S
0,5---1,5	67.5	16.7	5.8	0.1	1.7	1.7	0.2	4.0	1.1	0.2	0.15
2,5---3,5	67.0	17.9	5.8	0.1	1.5	0.7	0.4	4.3	1.4	0.1	0.09
3,5---4,5	68.2	16.2	5.9	0.1	1.7	1.3	0.3	3.9	1.2	0.2	0.11
5,5---6,5	72.6	13.2	4.2	0.1	2.4	3.3	0.1	2.4	0.9	0.2	0.22
6,5---7,5	71.6	13.4	4.2	0.1	2.7	3.7	0.1	2.3	0.9	0.2	0.25
7,5---8,5	73.9	13.3	4.2	0.1	1.8	2.1	0.2	2.5	0.9	0.2	0.22
8,5---9,5	71.4	14.8	4.6	0.1	1.8	2.3	0.1	2.8	1.1	0.2	0.26
9,5---10,5	70.6	13.6	5.1	0.1	2.0	2.6	0.2	3.5	1.0	0.3	0.23
10,5---11,5	72.5	14.3	4.2	0.1	2.0	2.5	0.1	2.5	0.9	0.2	0.23
11,5---12,5	69.3	14.2	5.6	0.1	2.0	2.5	0.2	3.5	1.0	0.3	0.25
12,5---13,5	73.6	14.4	4.1	0.1	1.6	1.7	0.2	2.5	0.9	0.1	0.18
13,5---14,5	73.6	14.4	3.0	0.1	1.5	3.1	0.1	3.2	0.7	0.1	0.07
14,5---15,5	69.7	16.7	5.3	0.1	1.3	0.7	0.2	4.1	0.8	0.2	0.11
15,5---16,5	73.7	15.8	3.9	0.1	1.1	0.7	0.2	3.0	0.7	0.1	0.09
16,5---17,5	75.1	15.4	3.6	0.1	1.0	0.5	0.2	3.0	0.7	0.1	0.07
17,5---18,5	70.0	16.3	5.1	0.1	1.4	0.9	0.3	3.9	0.8	0.1	0.10
18,5---19,5	69.4	16.0	5.2	0.2	1.9	2.2	0.3	3.0	1.1	0.2	0.13
19,5---20,2	64.8	21.0	5.6	0.1	0.6	0.1	0.7	5.5	0.7	0.2	0.02
Results in %											

Appendix: 7.4.2. **The approximately percentage of elements concentration in the heavy fraction (Borehole N°2)**

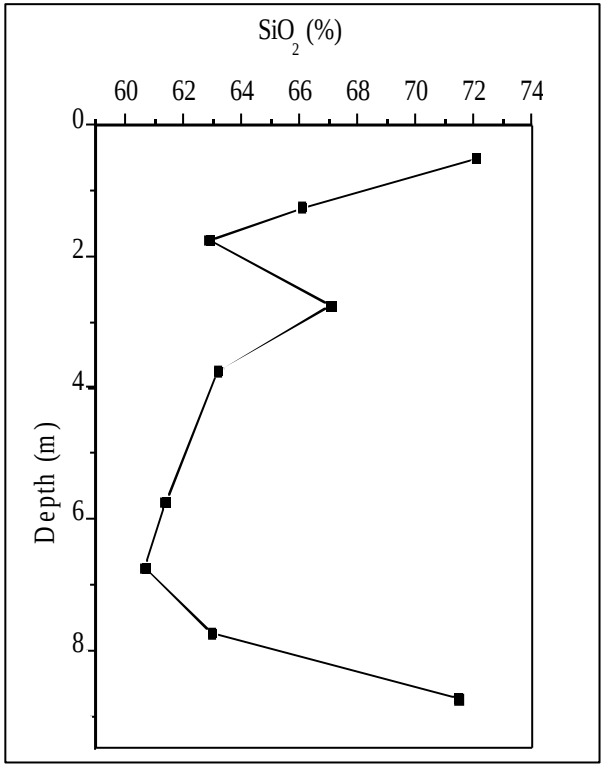
Depth int./m	SiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	S
0,5---1,5	1.3	2.4	16.2	11.2	4.4	5.6	1.9	1.3	11.3	10.6	**100.0**
2,5---3,5	2.0	3.5	18.8	23.8	8.9	38.6	6.3	1.8	12.3	15.2	55.7
3,5---4,5	23.1	83.6	**100.0**	**100.0**	**100.0**	**100.0**	64.3	64.9	**100.0**	82.8	**100.0**
5,5---6,5	1.6	3.3	23.4	19.5	6.4	8.9	1.4	1.7	33.5	13.5	**100.0**
6,5---7,5	0.6	1.0	9.6	6.5	1.8	1.9	**0.0**	0.5	6.8	2.6	78.7
7,5---8,5	1.5	3.9	35.3	42.8	8.5	16.0	**0.0**	2.5	35.6	24.6	**100.0**
8,5---9,5	2.1	5.2	47.6	53.7	11.8	17.3	4.3	3.4	43.8	31.0	**100.0**
9,5---10,5	1.9	5.9	27.4	31.2	9.1	13.5	**0.0**	2.2	37.2	28.2	**100.0**
10,5---11,5	2.1	9.9	35.5	53.2	7.6	12.0	**0.0**	2.4	28.5	46.1	**100.0**
11,5---12,5	2.1	4.5	21.3	26.6	7.6	8.0	0.9	1.9	25.3	13.9	**100.0**
12,5---13,5	1.2	3.1	29.8	39.7	6.8	10.2	**0.0**	2.2	20.9	22.8	**100.0**
13,5---14,5	1.3	3.1	20.1	21.4	5.5	6.3	**0.0**	1.6	15.6	15.8	**100.0**
14,5---15,5	1.5	3.7	23.9	43.8	9.0	23.2	**0.0**	2.0	21.8	29.5	**100.0**
15,5---16,5	1.5	3.5	24.4	42.2	6.1	8.4	**0.0**	2.0	14.4	29.0	**100.0**
16,5---17,5	1.3	3.4	22.8	38.2	6.4	12.4	**0.0**	1.9	17.3	35.5	**100.0**
17,5---18,5	1.2	2.9	19.1	31.6	5.6	8.6	**0.0**	1.6	14.6	25.5	**100.0**
18,5---19,5	2.1	4.5	35.7	42.5	10.6	18.5	5.4	3.3	17.4	23.0	**100.0**
19,5---20,2	1.7	4.6	15.0	76.6	2.4	8.4	0.2	1.0	8.8	8.8	6.0
Results in %											

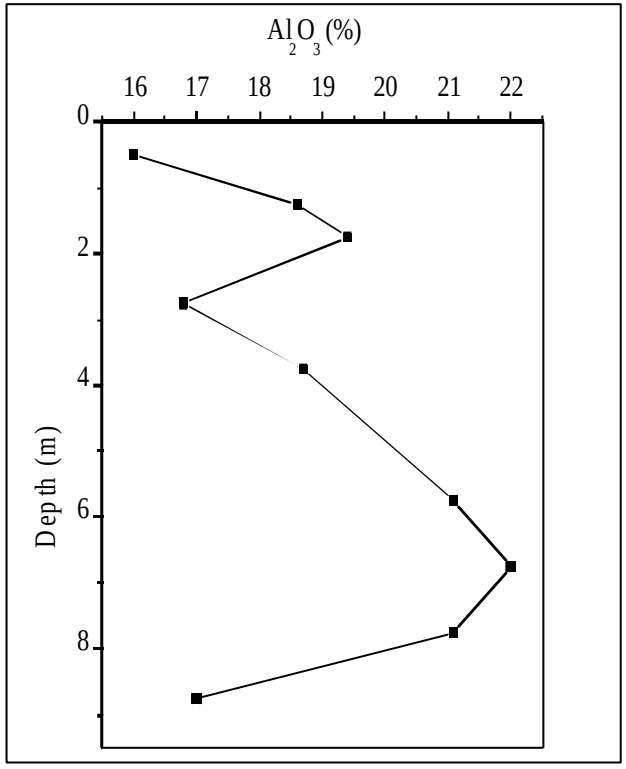
Appendix: 7.4.2.

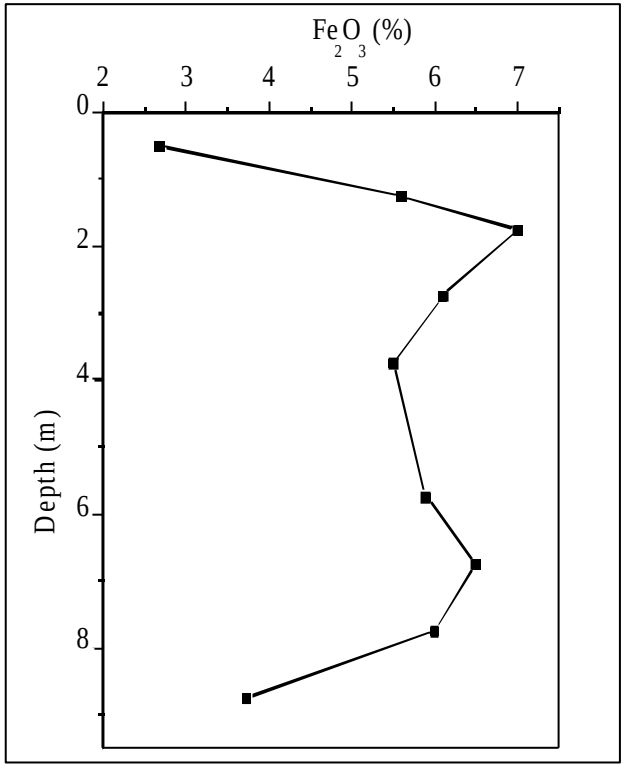
The relationship between the elements concentration in the entire mineral samples before and after the mineral separation by means of heavy liquids (Borehole N°2)

Depth int./m	SiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	S
0,5---1,5	1.0	1.2	1.1	0.5	0.8	0.3	1.5	1.1	1.1	0.8	--
2,5---3,5	1.0	1.1	1.0	0.9	1.1	1.0	1.1	1.1	1.0	1.3	1.2
3,5---4,5	1.0	1.1	1.0	1.0	1.1	1.0	1.0	1.0	1.0	1.2	1.3
5,5---6,5	0.9	1.4	1.5	1.6	0.8	0.7	4.6	1.6	1.1	1.9	4.2
6,5---7,5	0.8	1.5	1.6	1.2	1.1	0.9	6.4	1.9	1.4	1.8	1.6
7,5---8,5	0.8	1.6	1.6	1.2	1.5	1.4	4.2	1.8	1.3	1.7	1.6
8,5---9,5	0.9	1.3	1.5	1.2	1.3	1.0	6.8	1.5	1.1	1.8	0.9
9,5---10,5	0.8	1.6	1.3	1.1	1.2	0.9	3.1	1.3	1.2	1.3	1.2
10,5---11,5	0.8	1.5	1.6	1.2	1.1	0.9	5.1	1.8	1.3	1.8	1.0
11,5---12,5	0.9	1.5	1.2	1.0	1.1	0.9	2.6	1.3	1.1	1.1	1.0
12,5---13,5	0.8	1.5	1.6	1.4	1.3	1.2	3.6	1.8	1.3	1.8	1.2
13,5---14,5	0.8	1.5	2.1	1.8	1.2	0.5	7.2	1.5	1.5	1.5	1.8
14,5---15,5	0.9	1.3	1.3	1.3	1.2	1.3	2.5	1.2	1.2	1.4	1.3
15,5---16,5	0.8	1.4	1.7	1.3	1.5	1.7	3.1	1.7	1.5	1.8	1.6
16,5---17,5	0.8	1.5	1.8	1.8	1.7	2.2	3.2	1.7	1.5	2.0	1.8
17,5---18,5	0.9	1.4	1.3	1.2	1.1	1.5	2.8	1.2	1.3	1.5	1.0
18,5---19,5	0.8	1.3	1.6	1.2	1.2	1.1	2.6	1.5	1.2	1.4	1.5
19,5---20,2	1.0	1.0	0.9	1.0	1.1	0.9	1.4	0.9	1.1	1.4	0.9

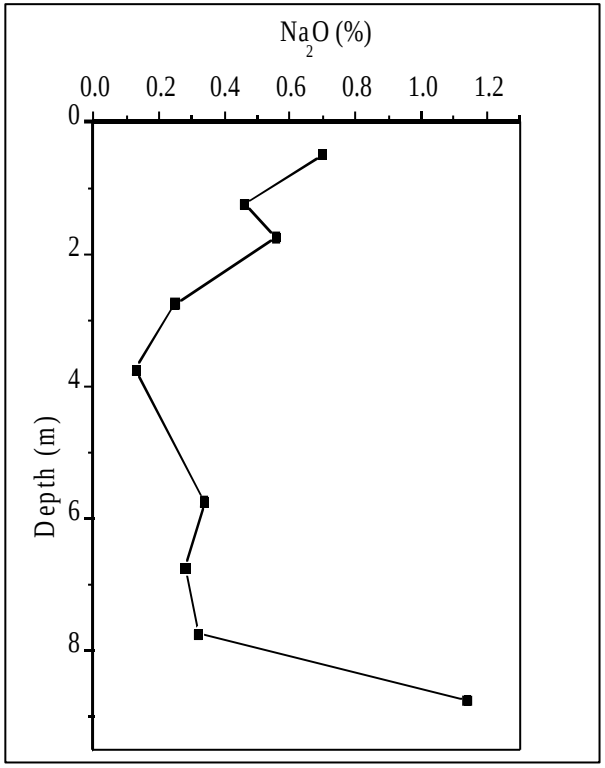
Appendix: 7.4.3. **Main elements determination; Borehole N°1**

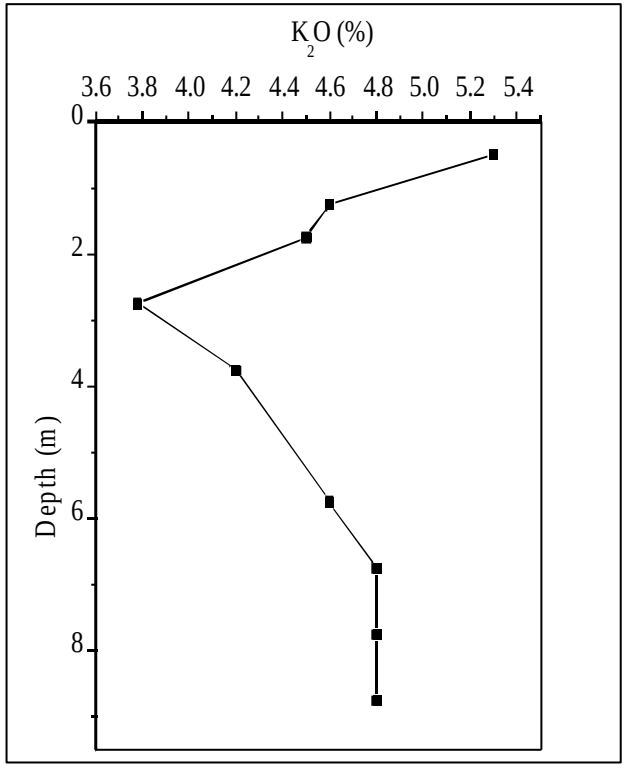


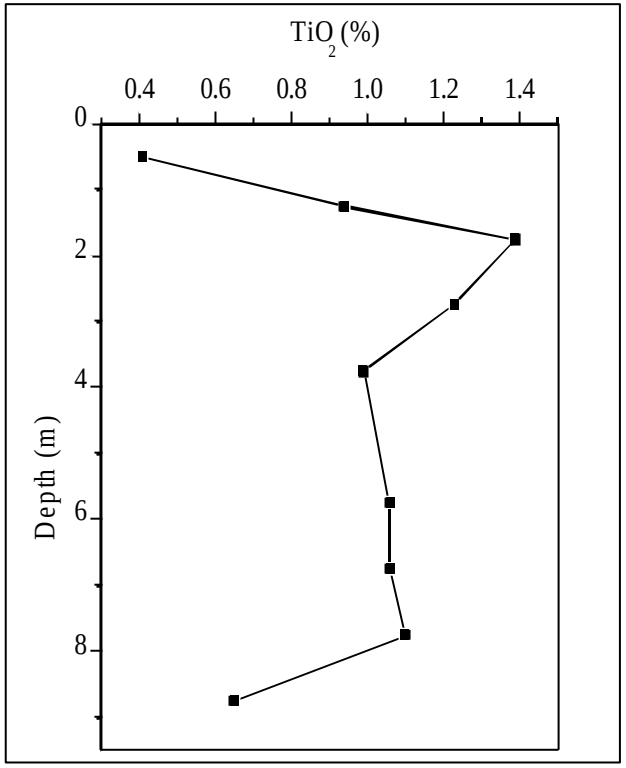




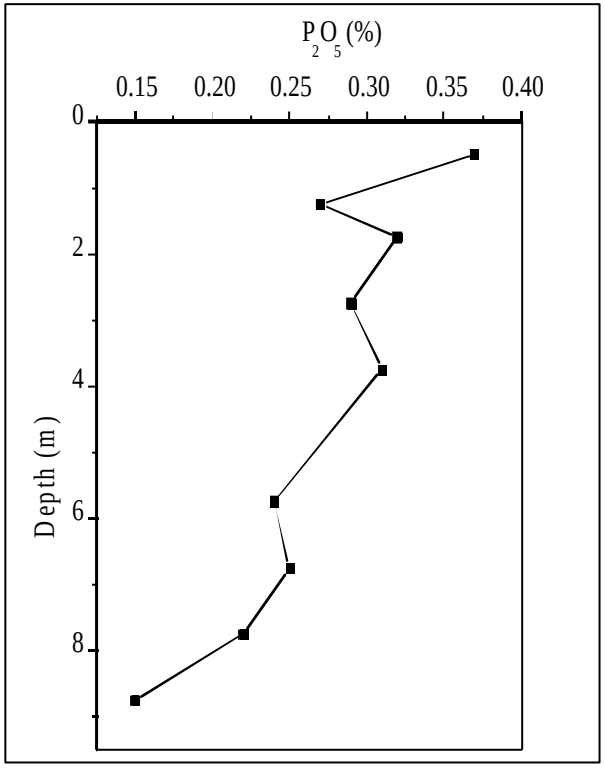
Appendix: 7.4.3. **Main elements determination; Borehole N°1**

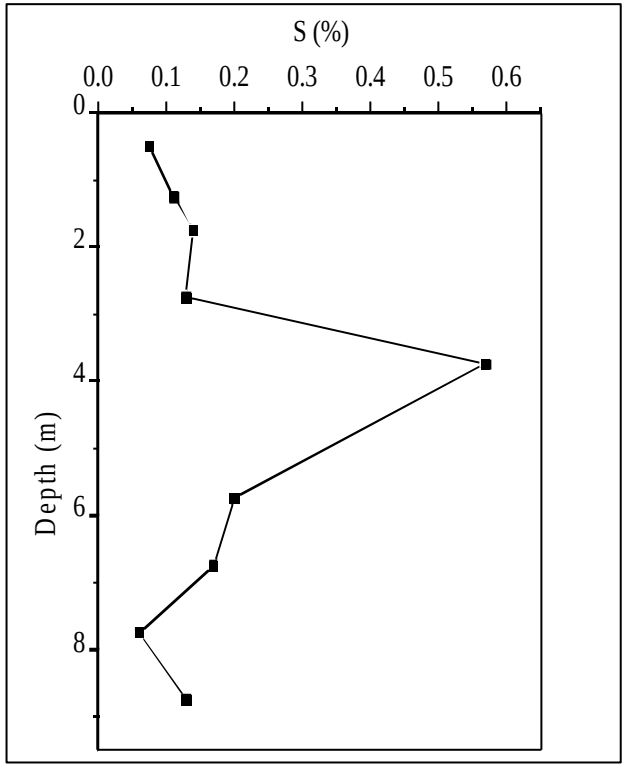




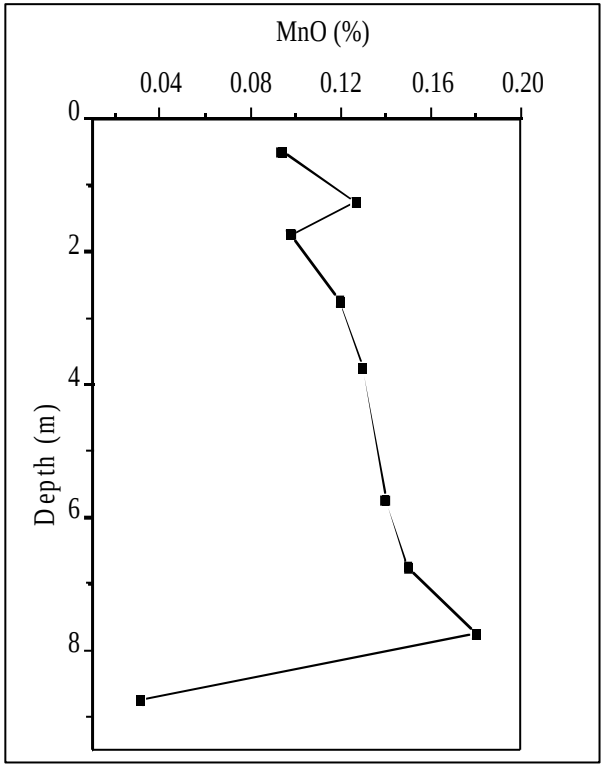


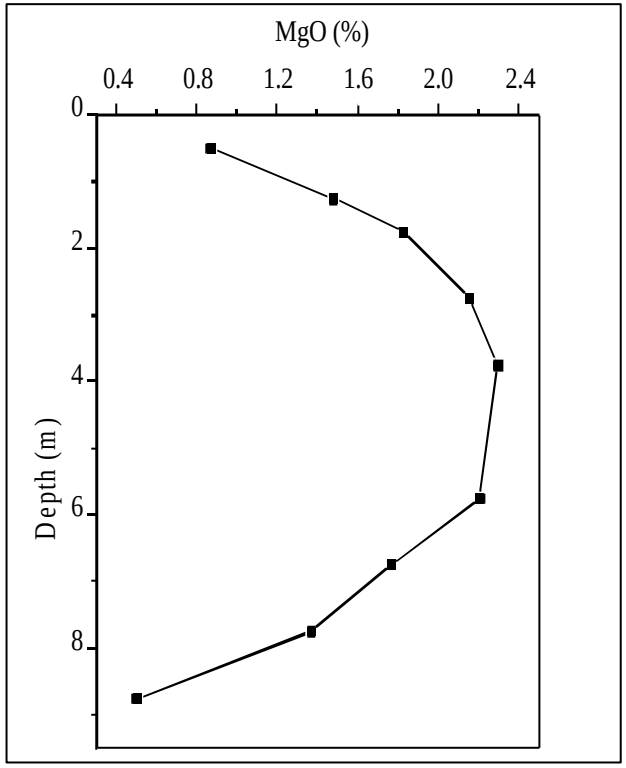
Appendix: 7.4.3. **Main elements determination; Borehole N°1**

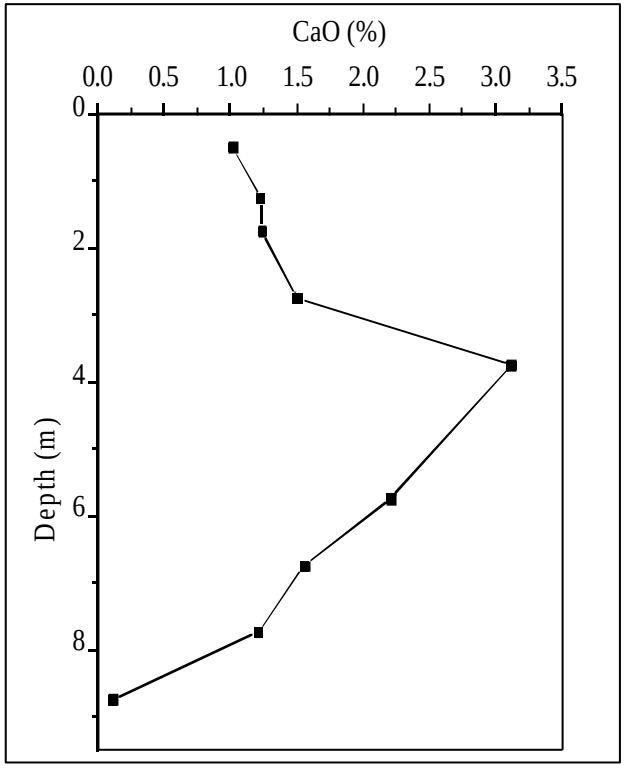




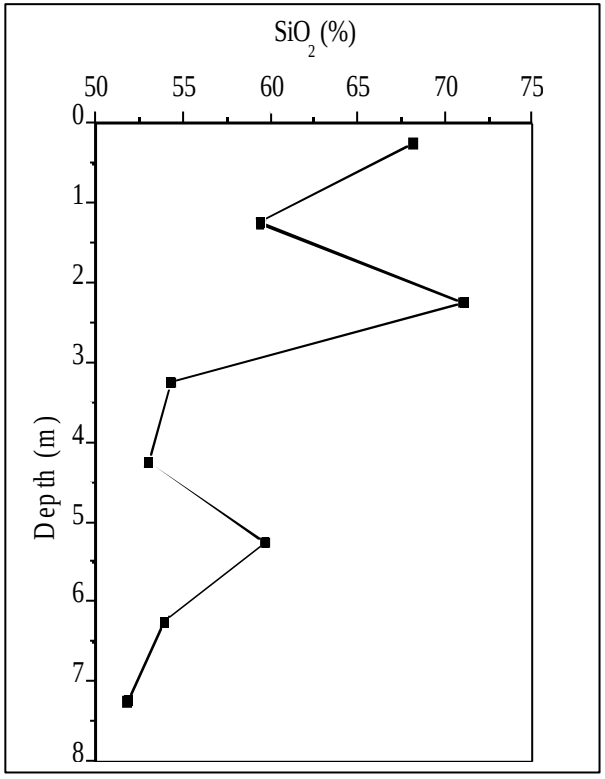
Appendix: 7.4.3. **Main elements determination; Borehole N°1**

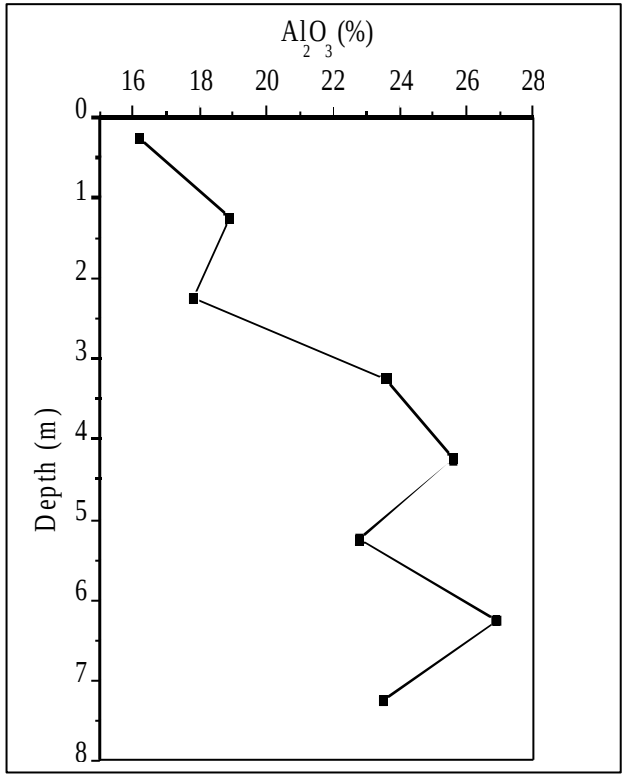


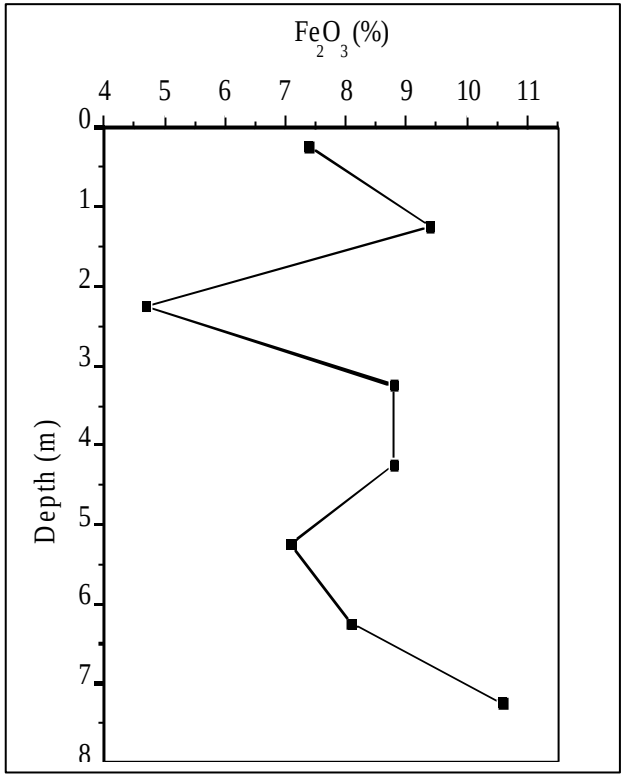




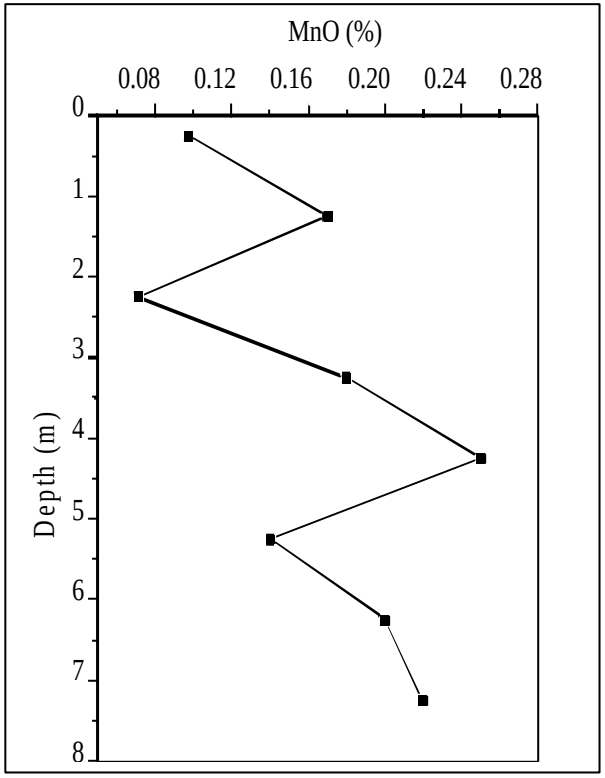
Appendix: 7.4.3. **Main elements determination; Borehole N°3**

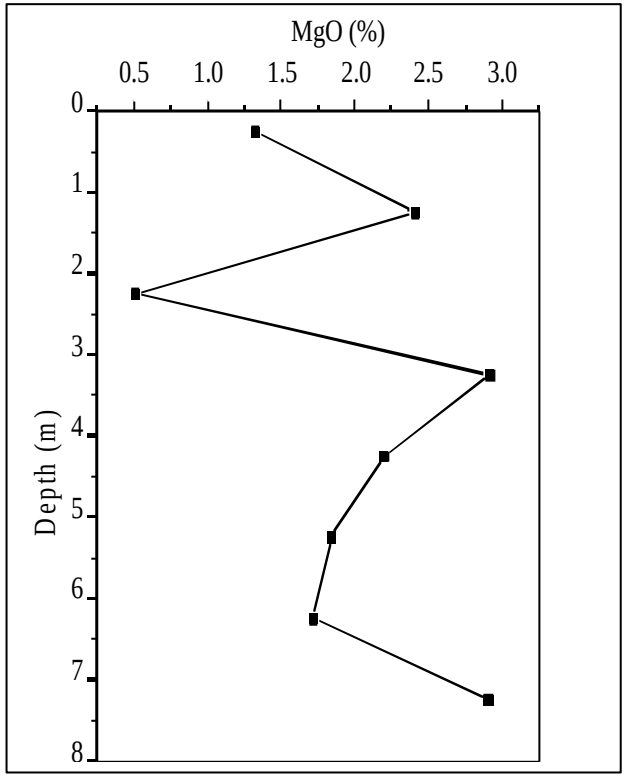


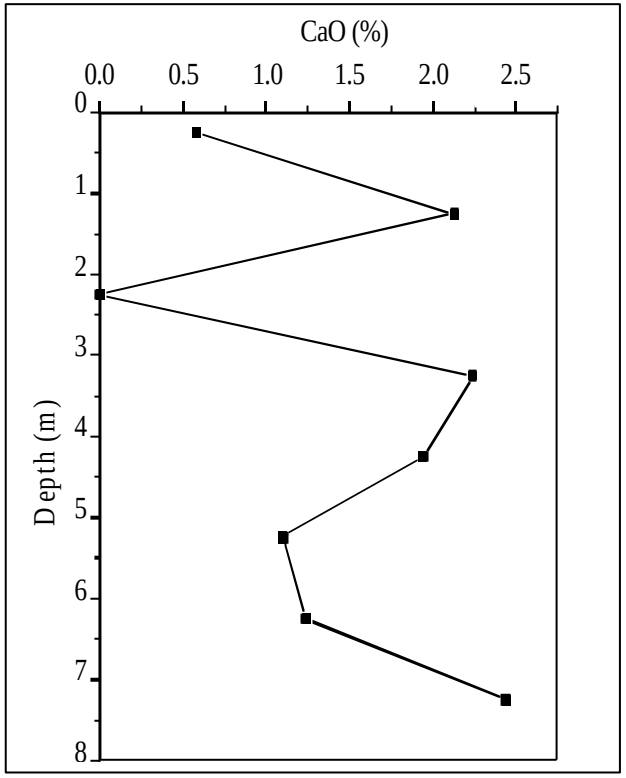




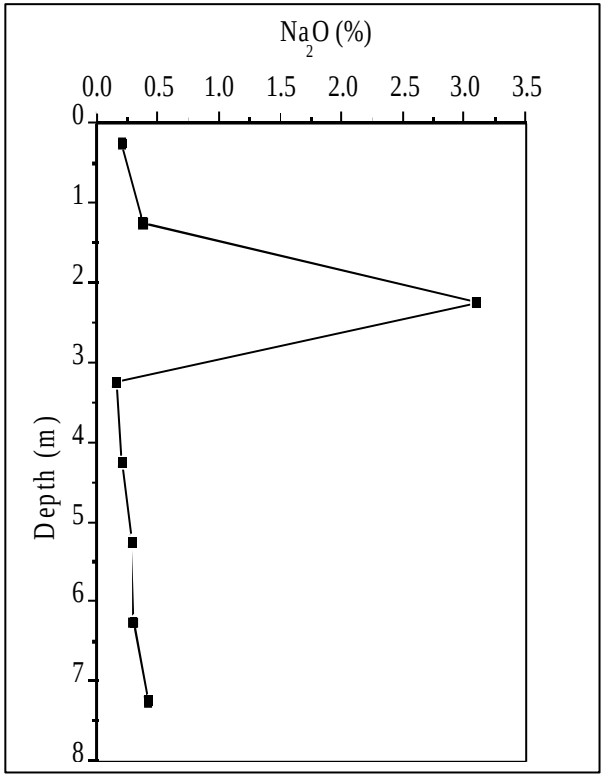
Appendix: 7.4.3. **Main elements determination; Borehole N°3**

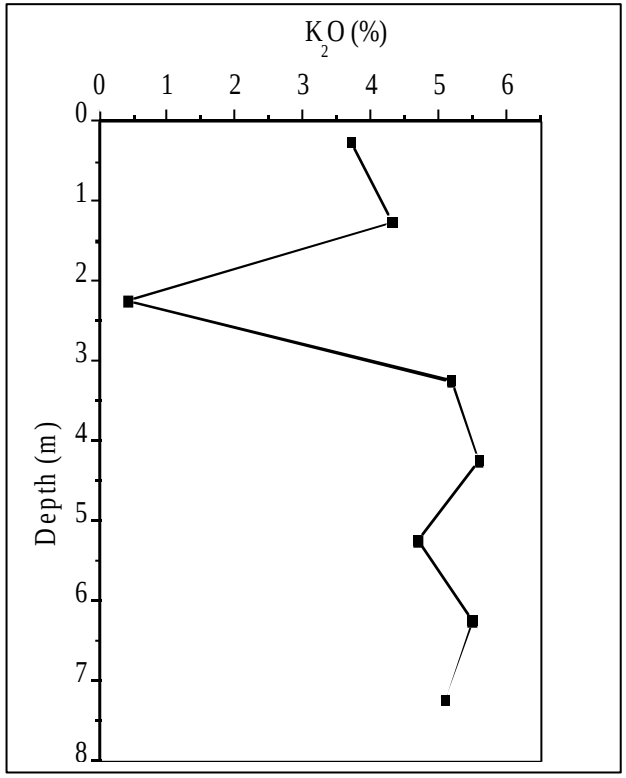


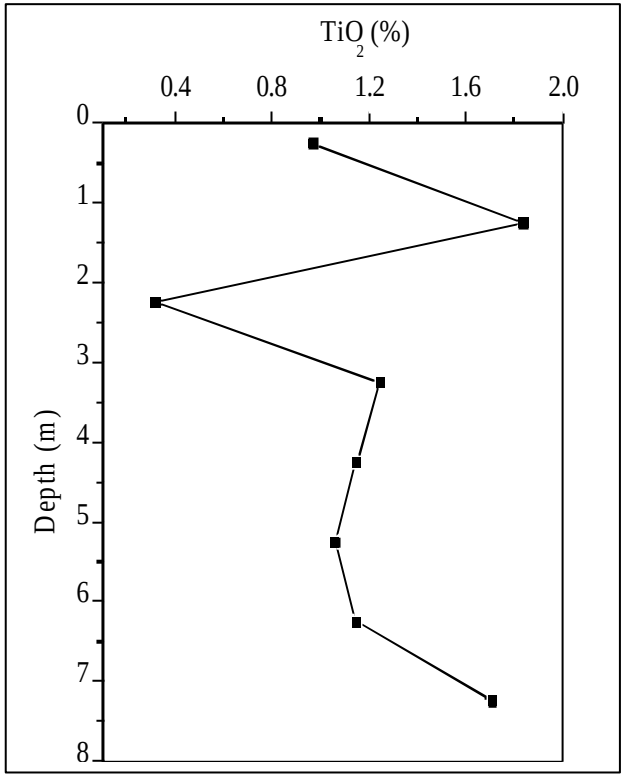




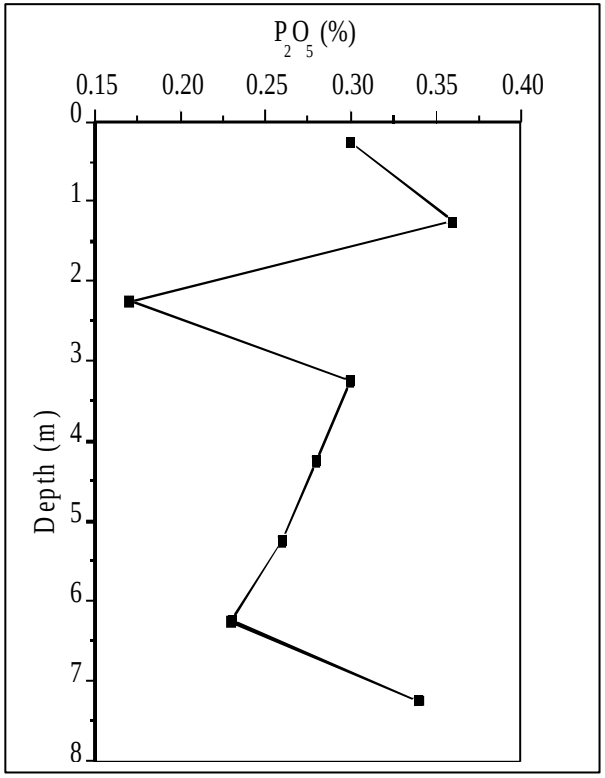
Appendix: 7.4.3. **Main elements determination; Borehole N°1**

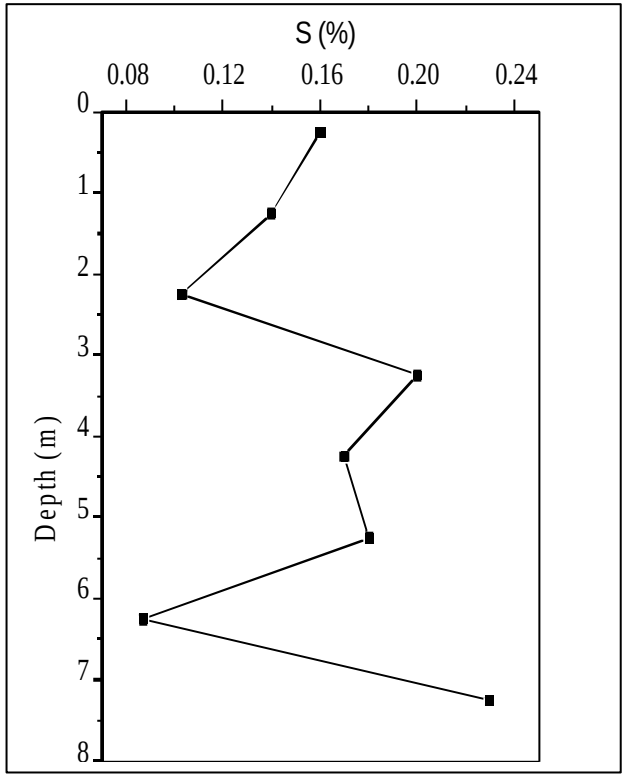




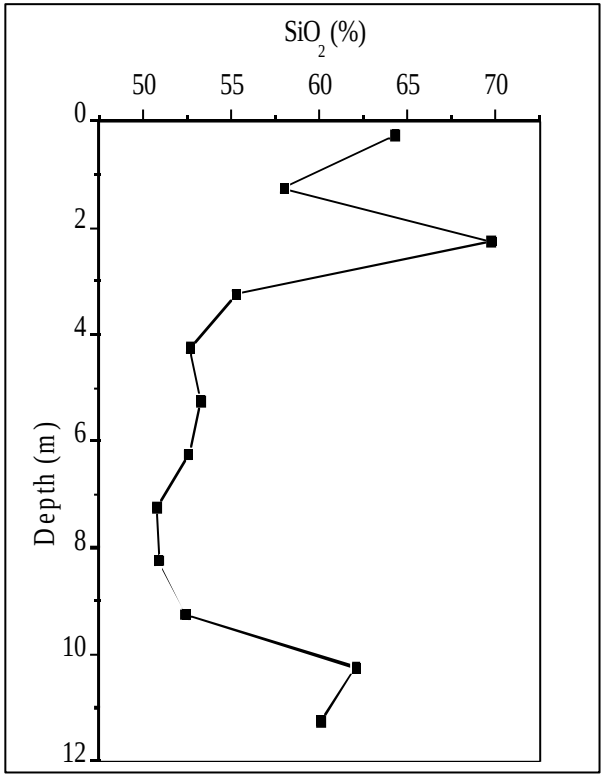


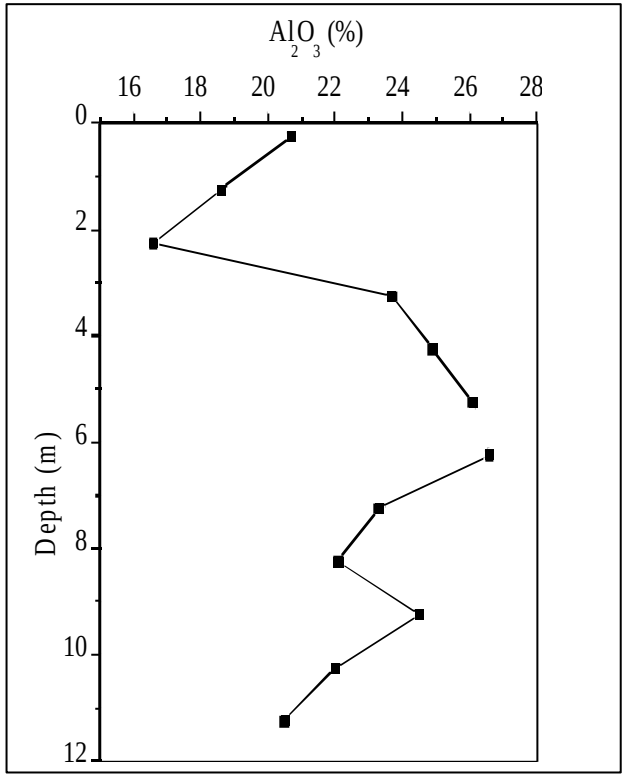
Appendix: 7.4.3. **Main elements determination; Borehole N°3**

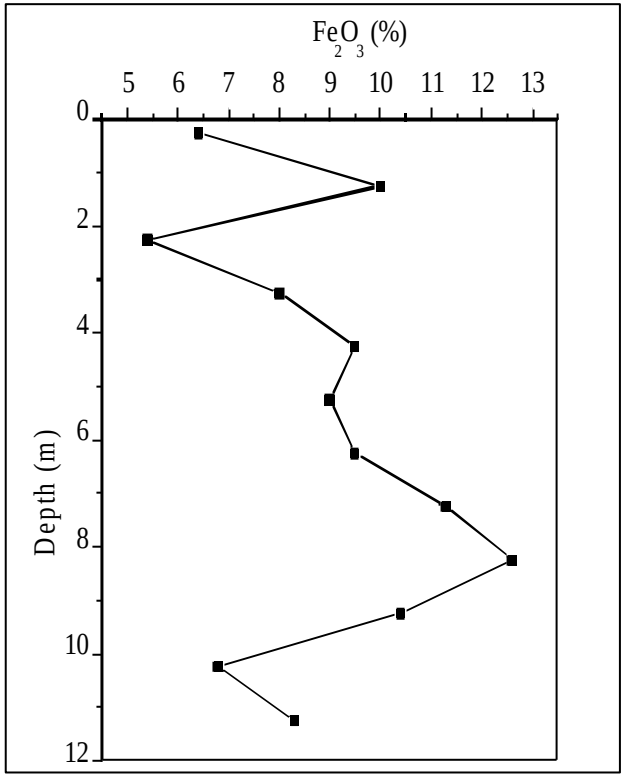




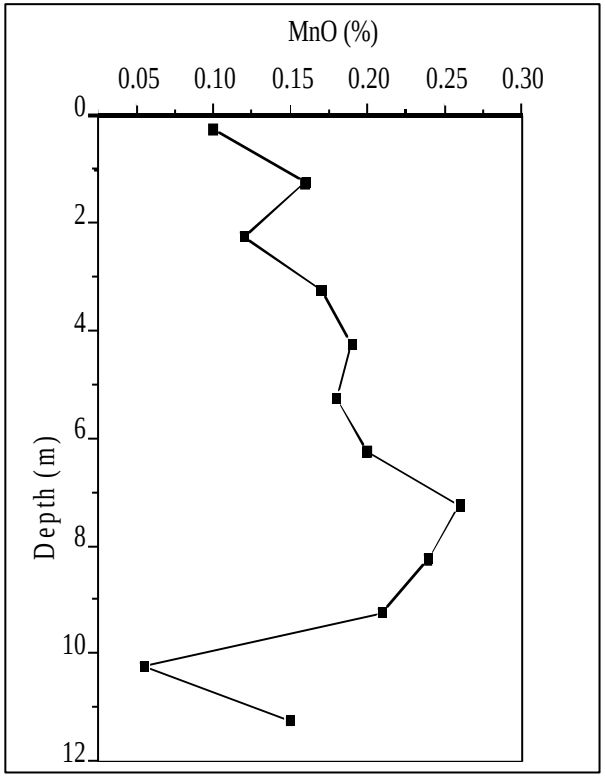
Appendix: 7.4.3. **Main elements determination; Borehole N°4**

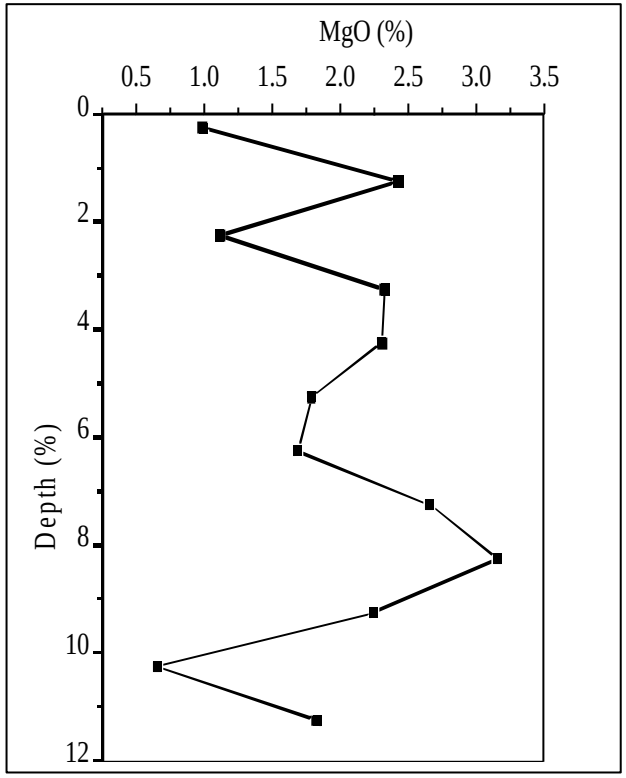


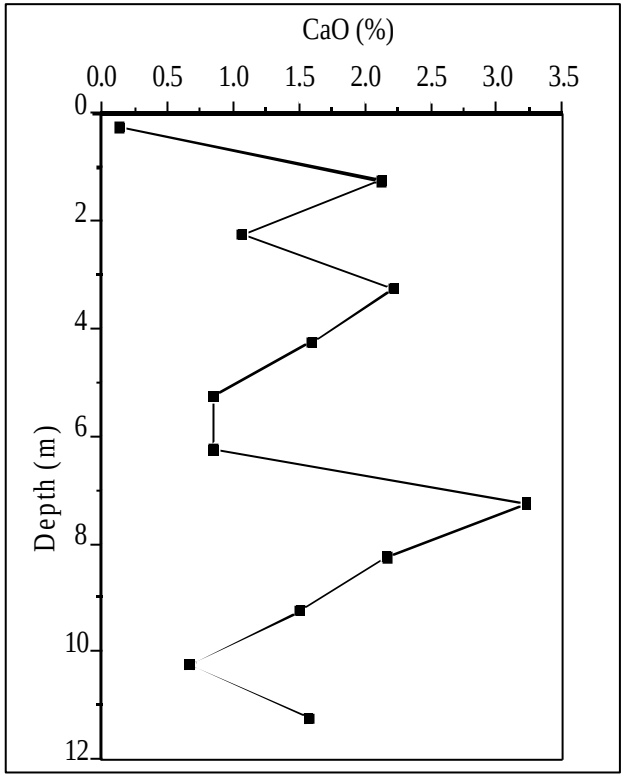




Appendix: 7.4.3. **Main elements determination; Borehole N°4**

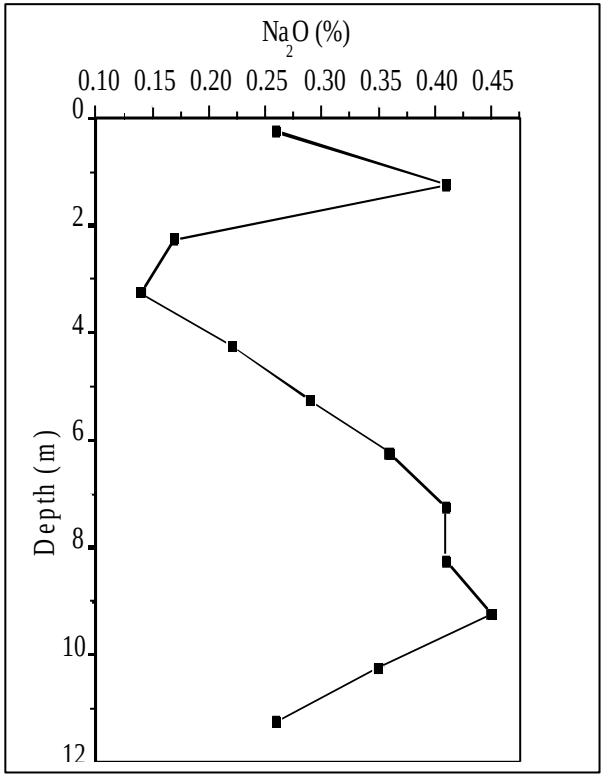


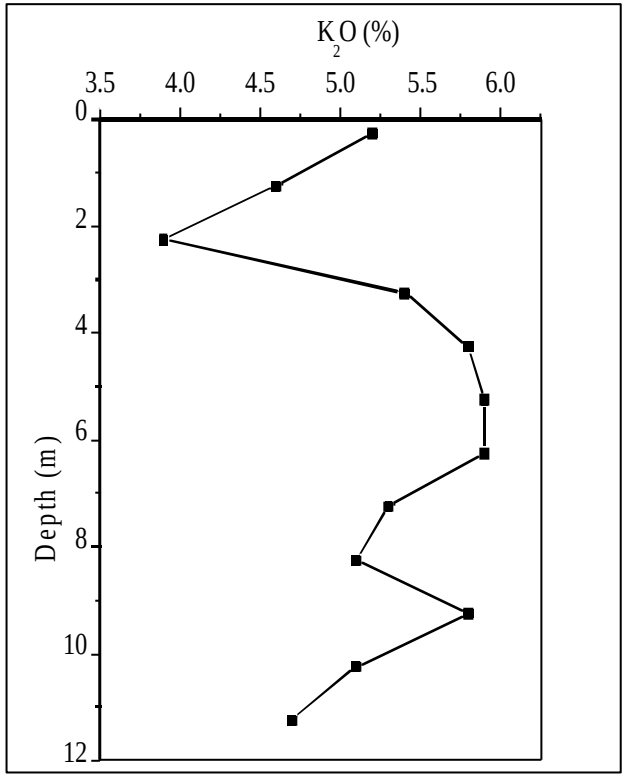


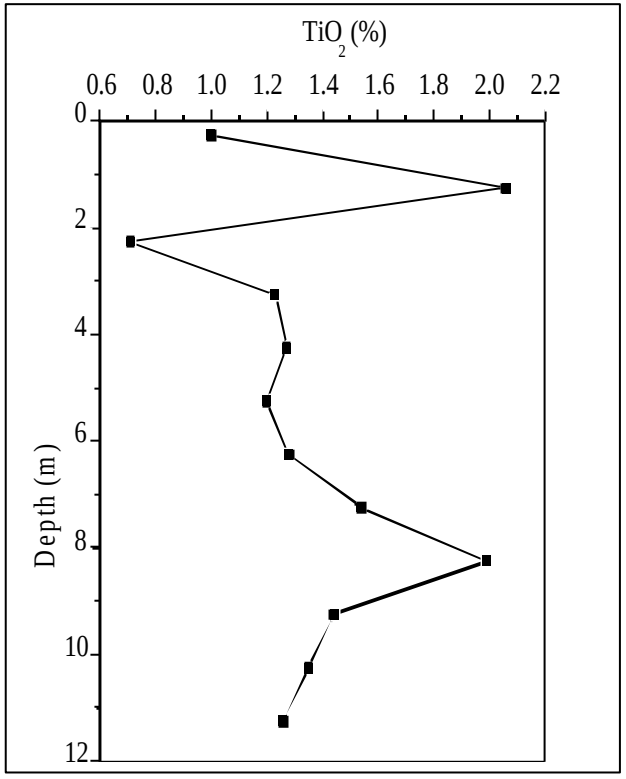


Appendix: 7.4.3.

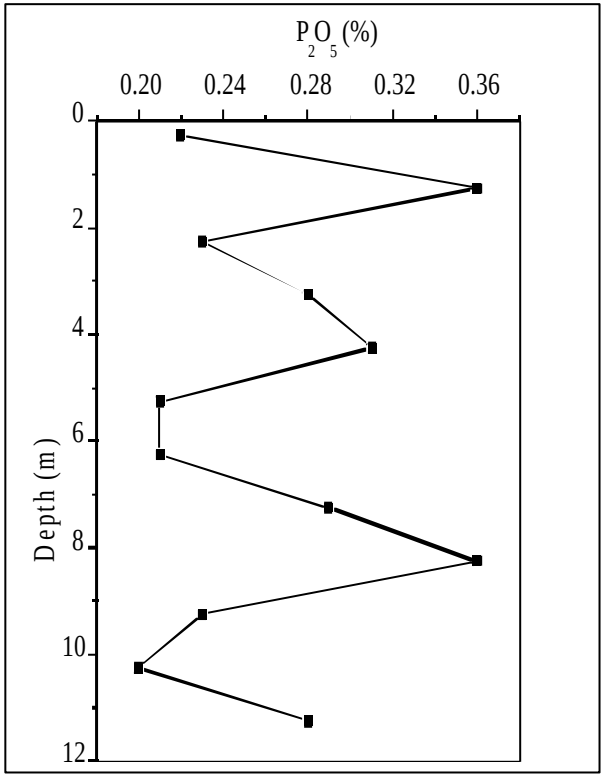
Main elements determination; Borehole N°4

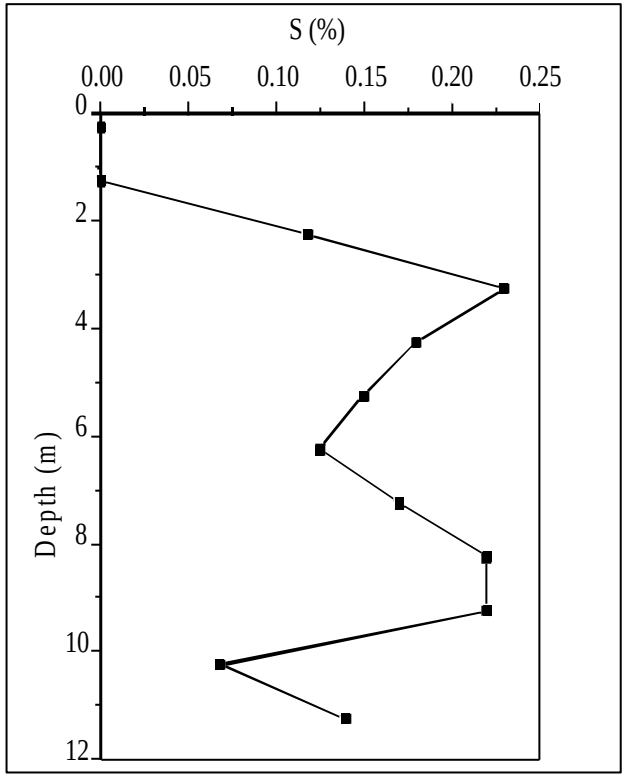




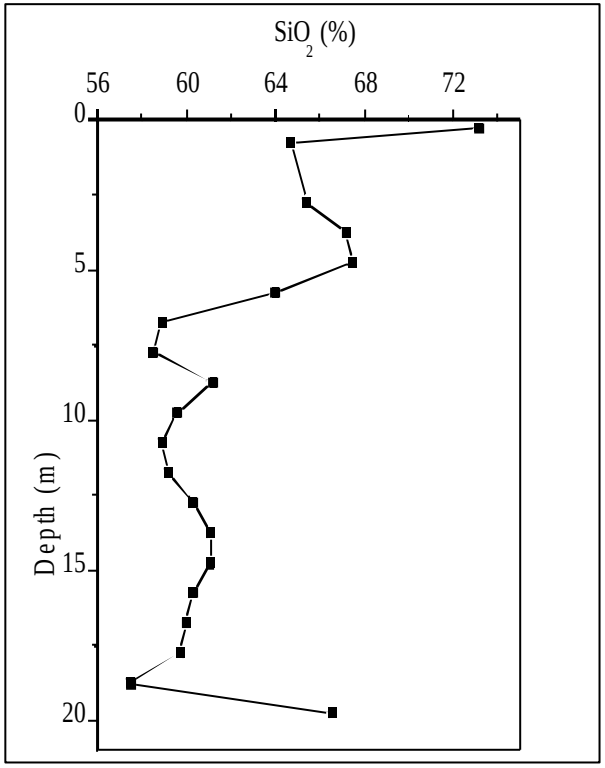


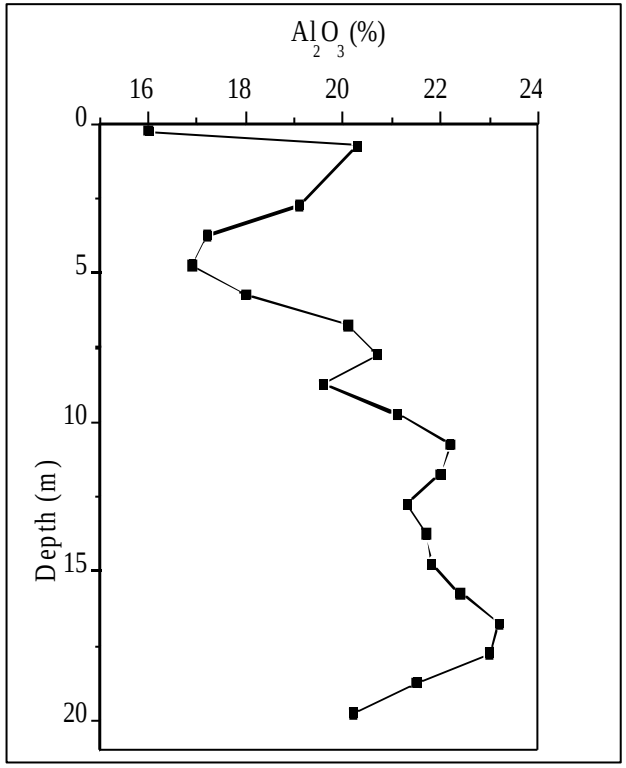
Appendix: 7.4.3. **Main elements determination; Borehole N°4**

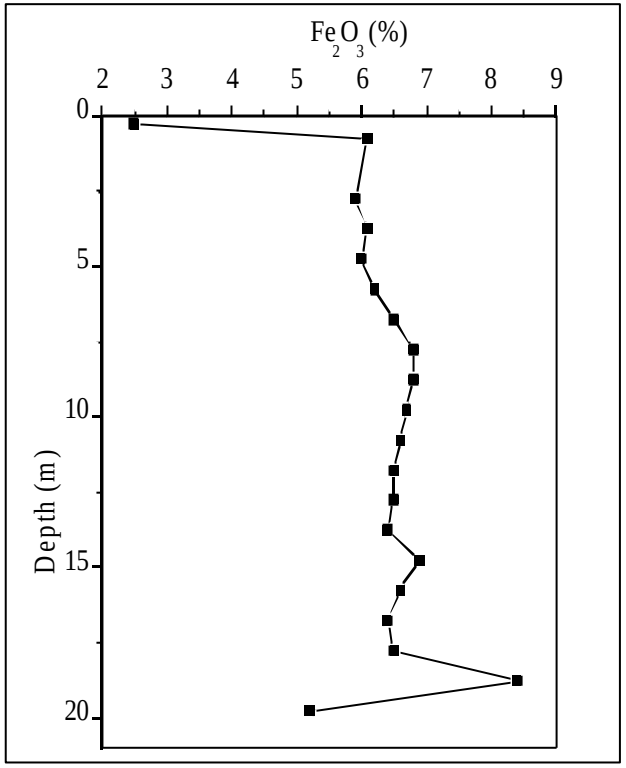




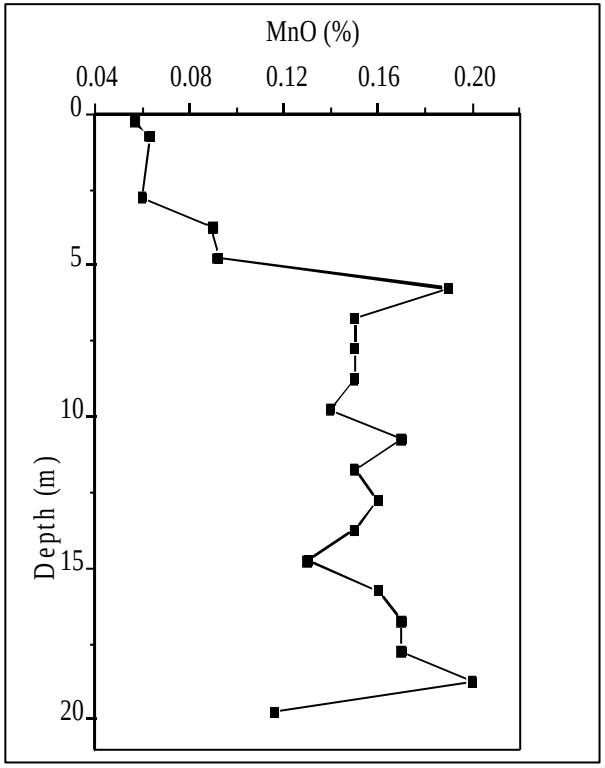
Appendix: 7.4.3. **Main elements determination; Borehole N°2**

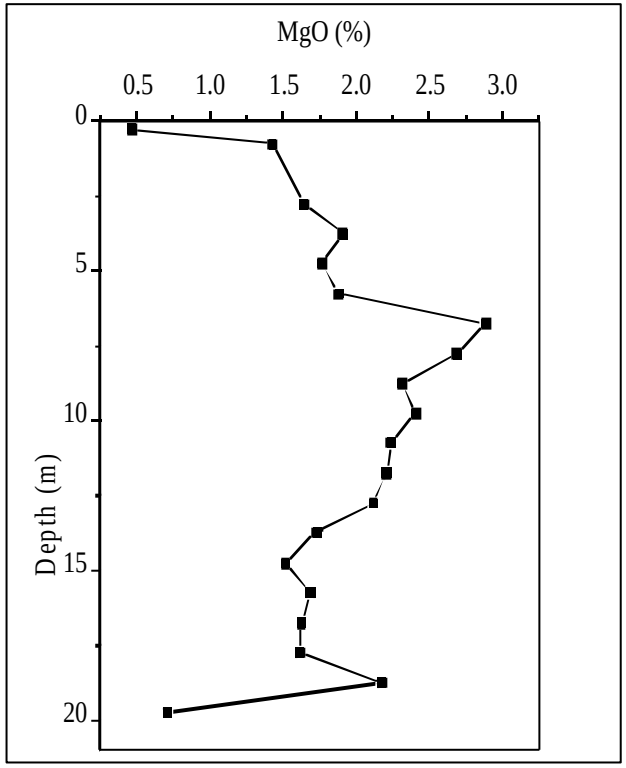


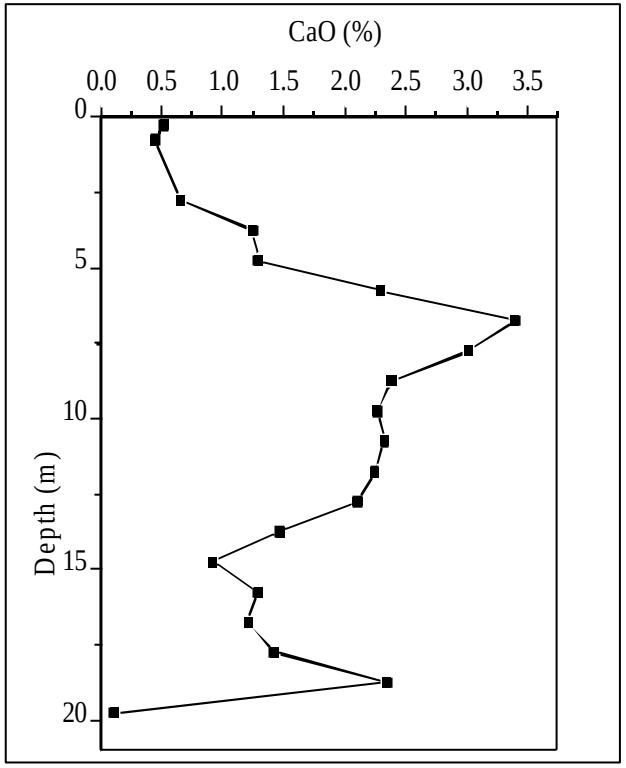




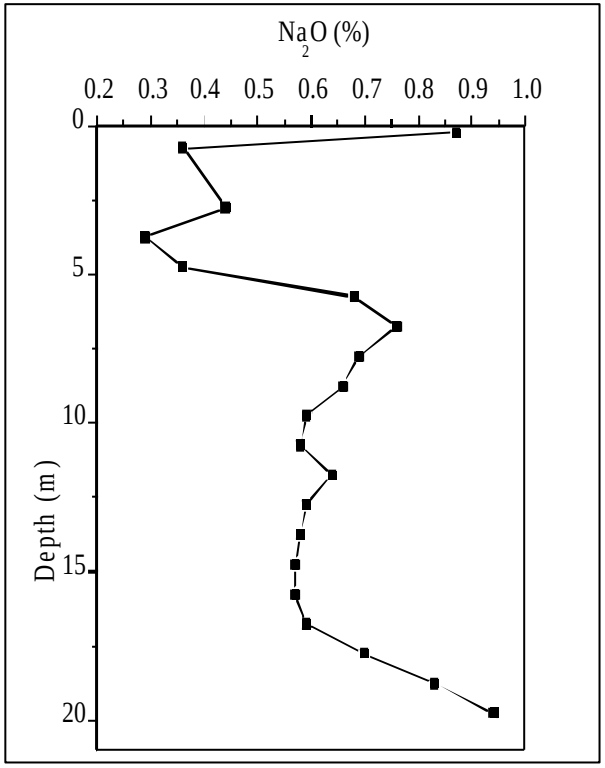
Appendix: 7.4.3. **Main elements determination; Borehole N°2**

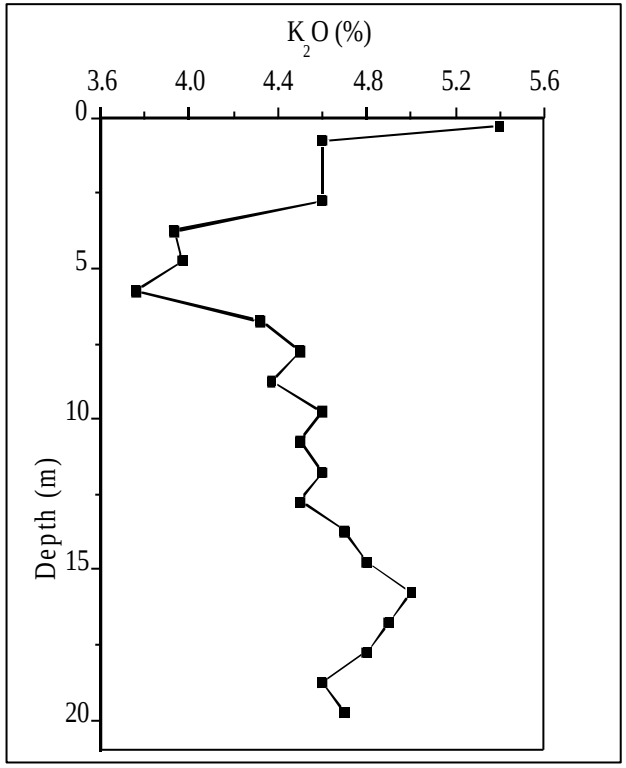


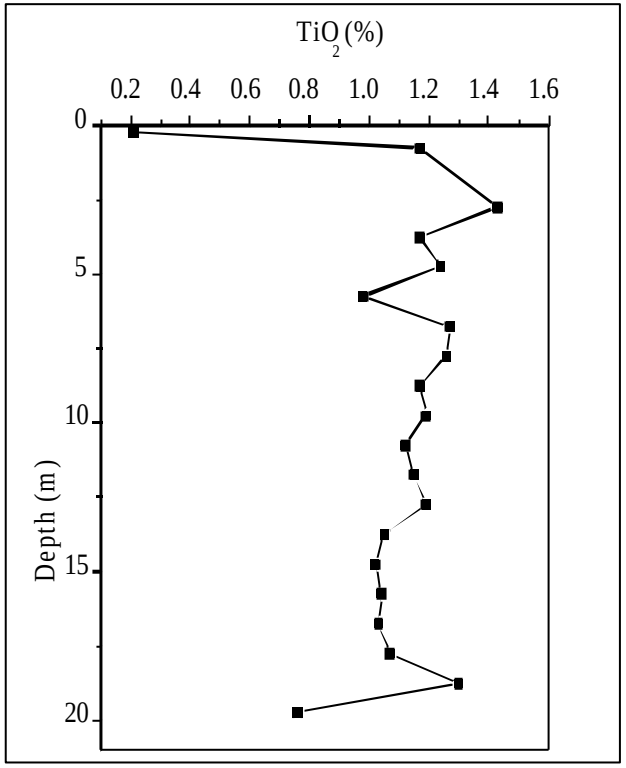




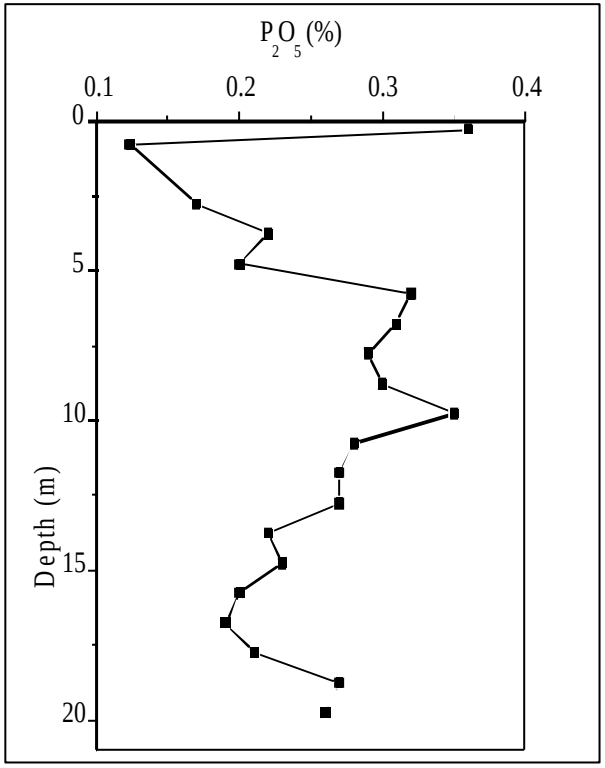
Appendix: 7.4.3. **Main elements determination; Borehole N°2**

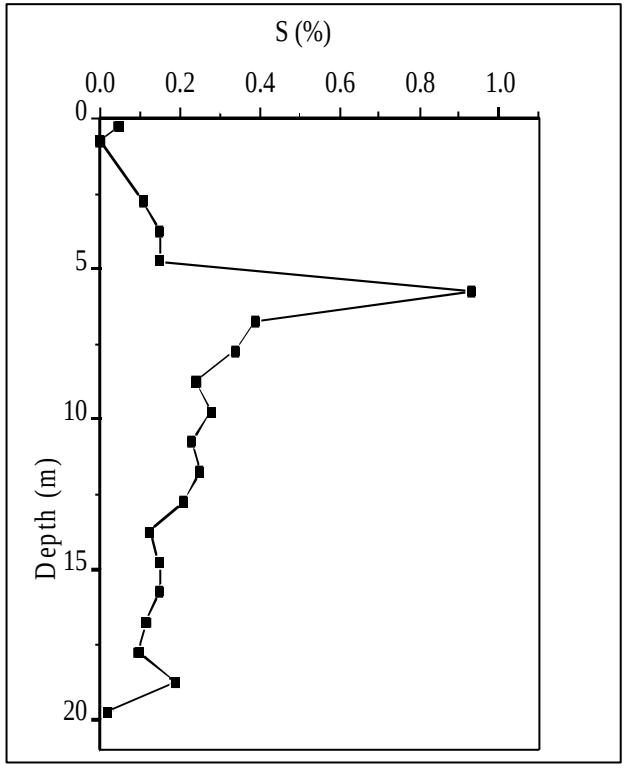






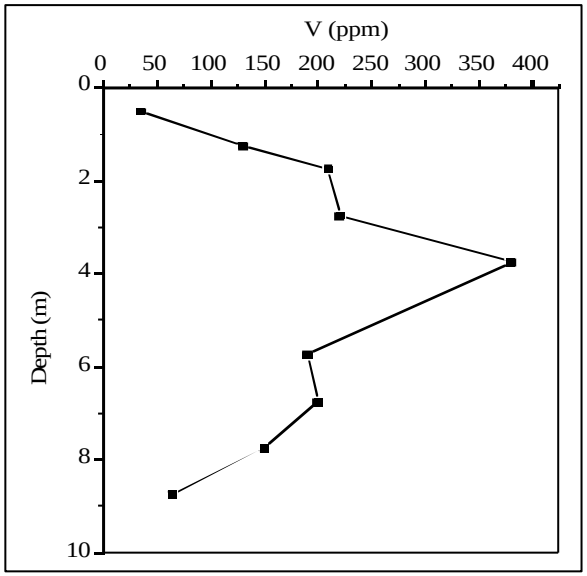
Appendix: 7.4.3. **Main elements determination; Borehole N°2**

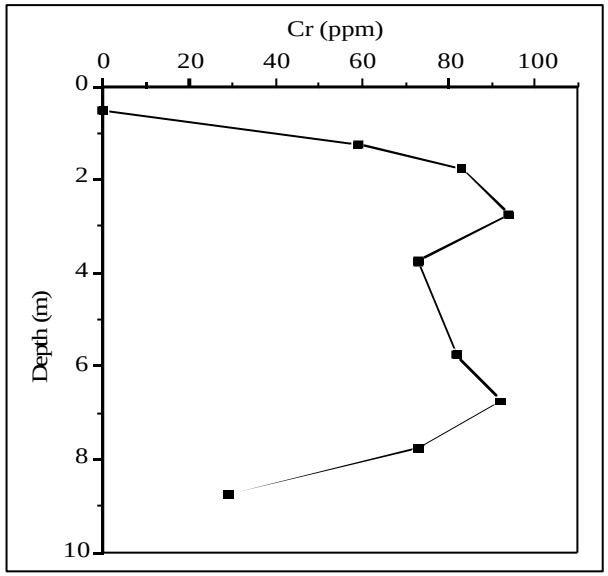


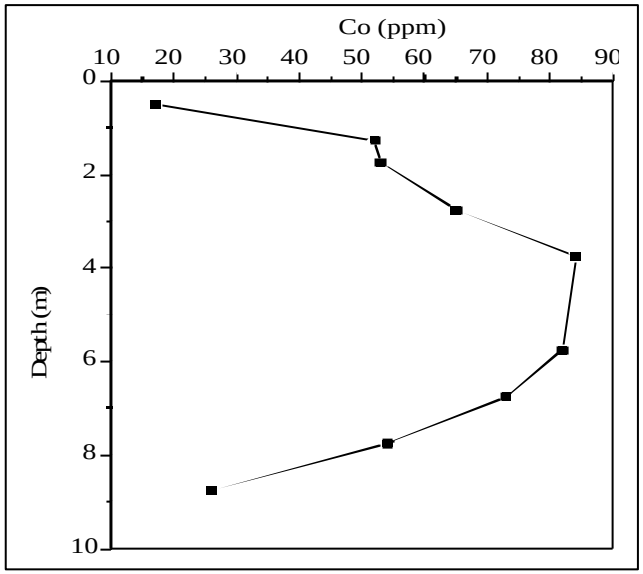


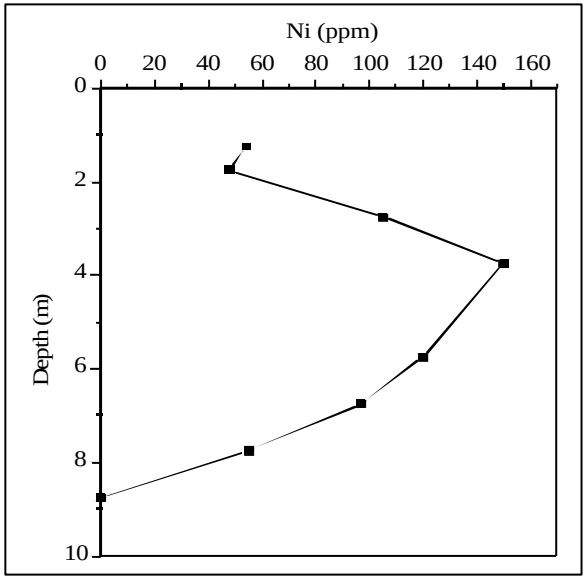
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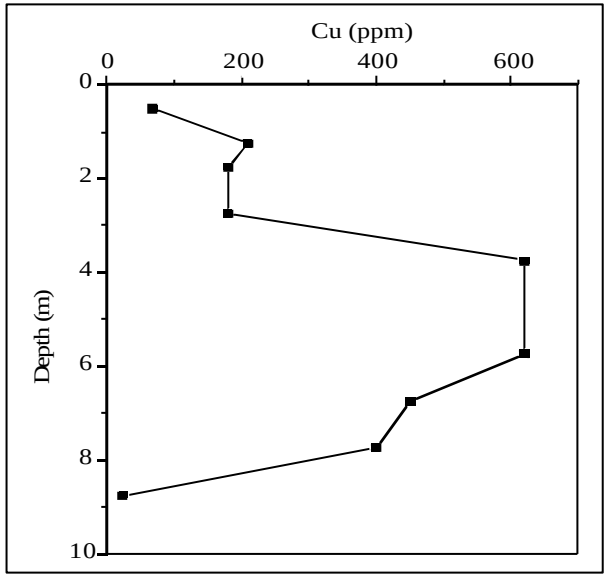
Trace elements determination; Borehole N°1

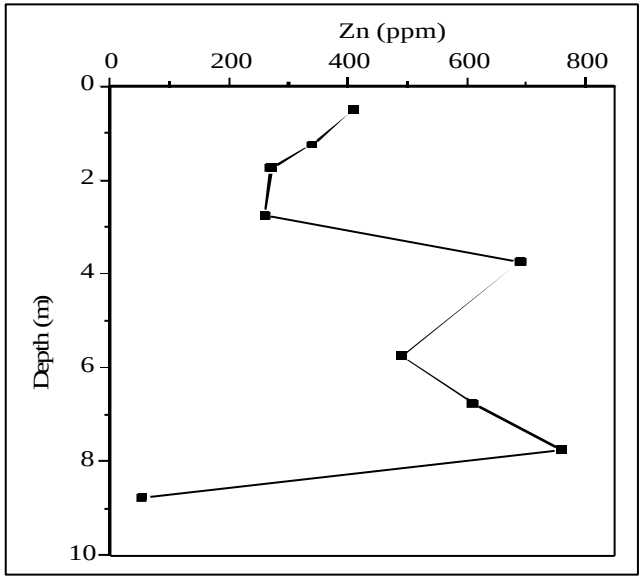






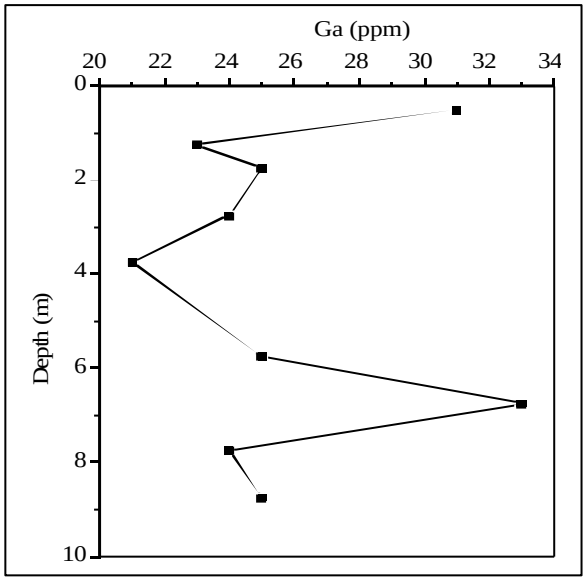


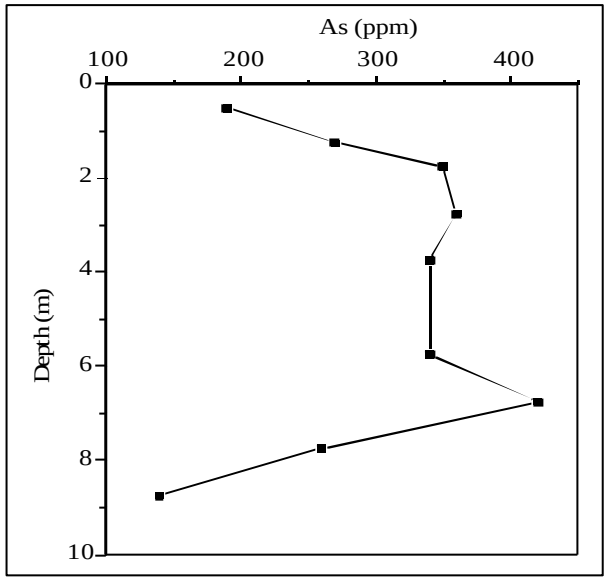


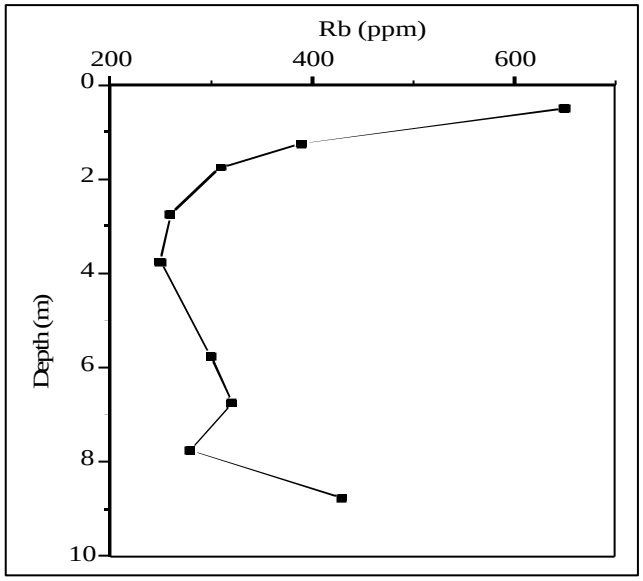


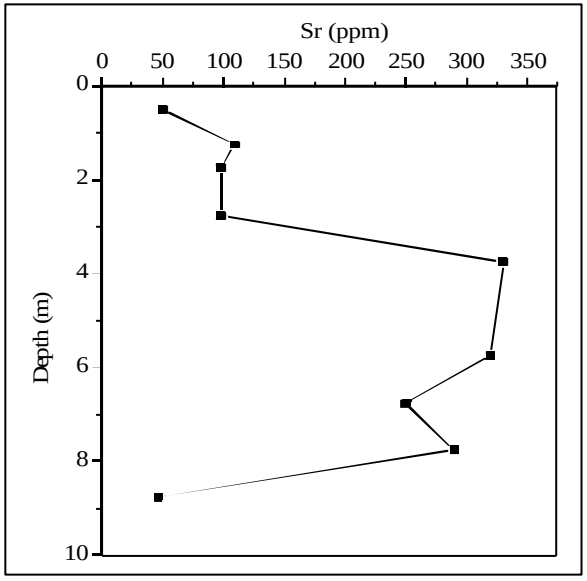
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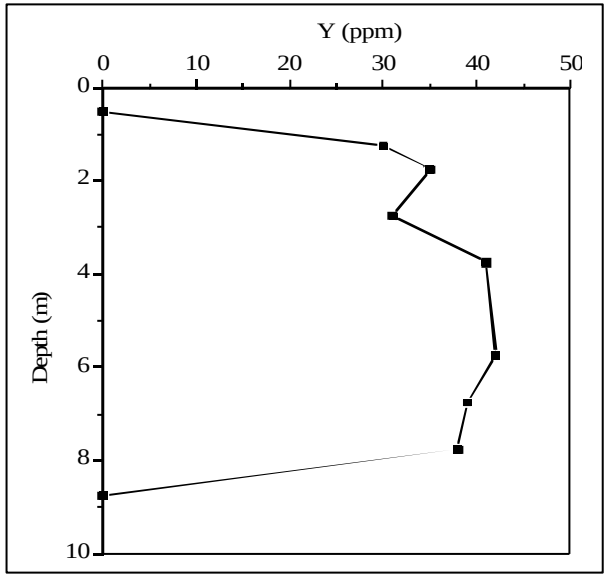
Trace elements determination; Borehole N°1

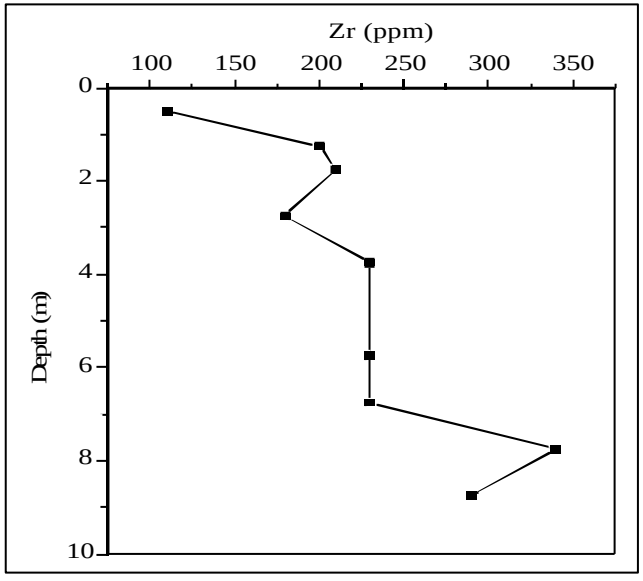






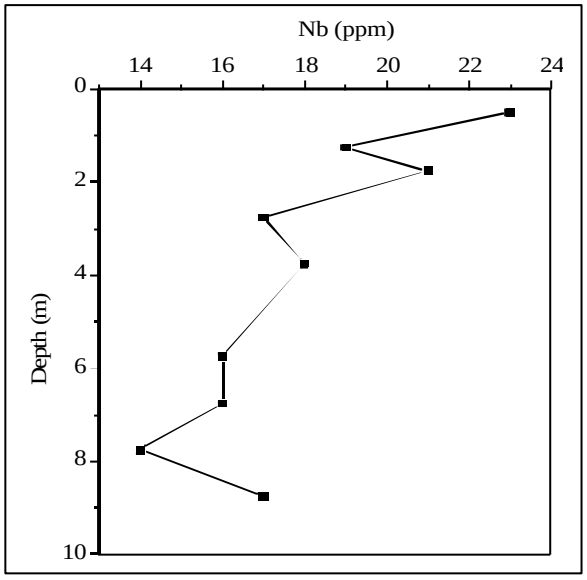


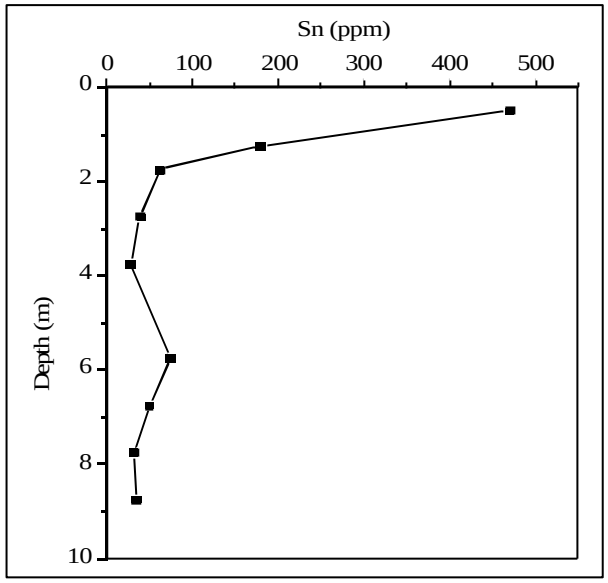


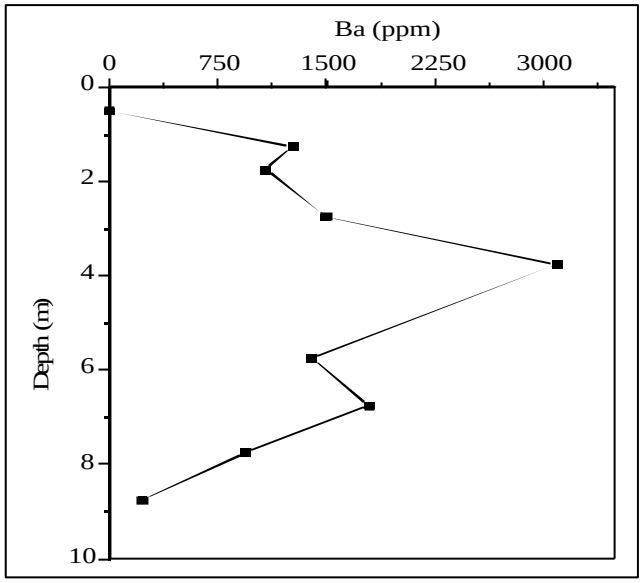


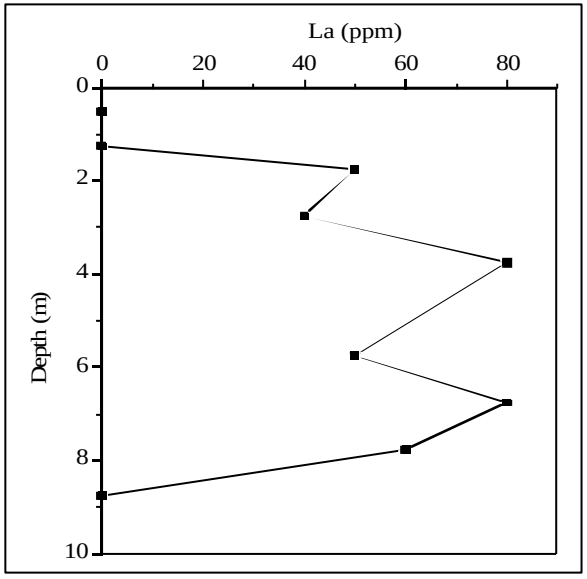
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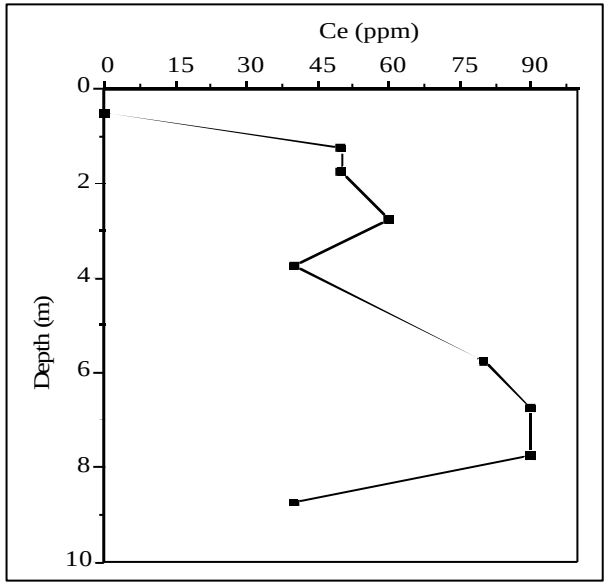
Trace elements determination; Borehole N°1

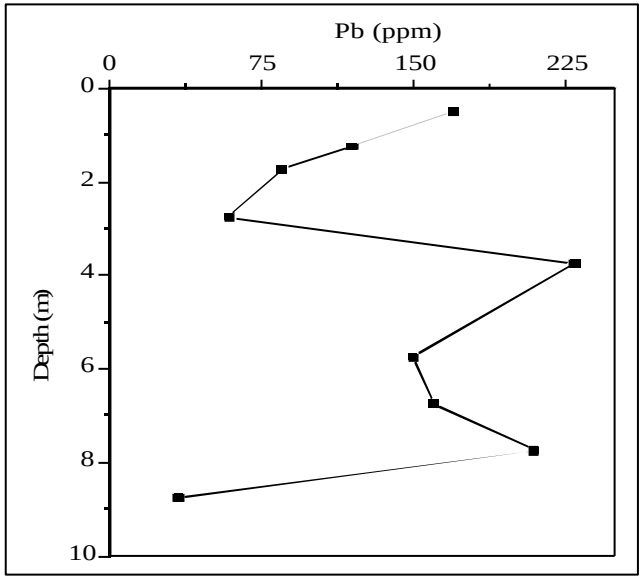




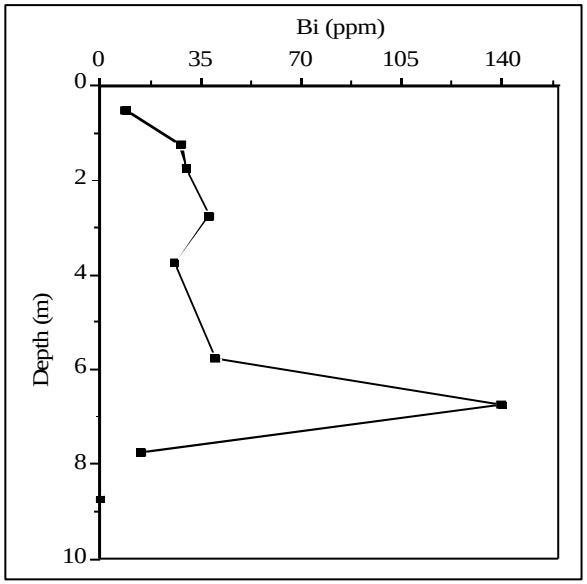


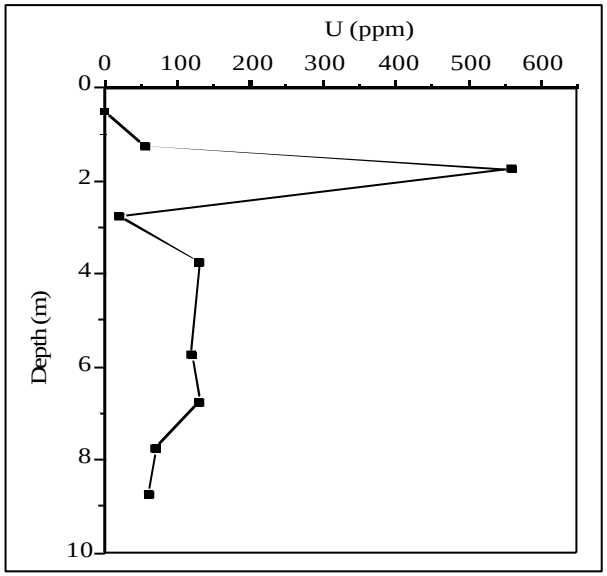






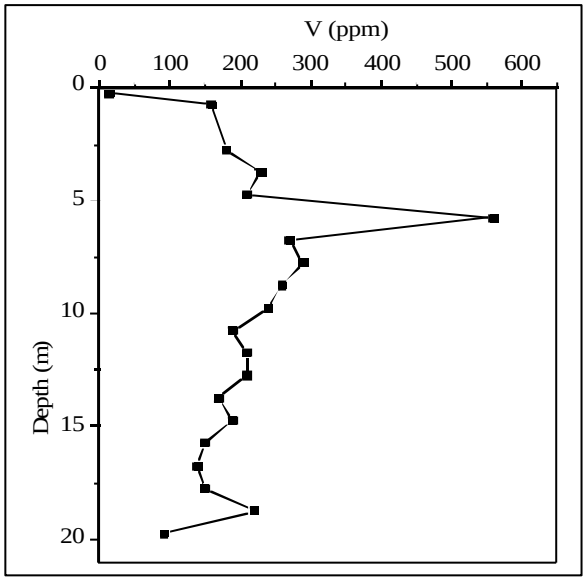
Appendix: 7.4.3. **Trace elements determination; Borehole N°1**

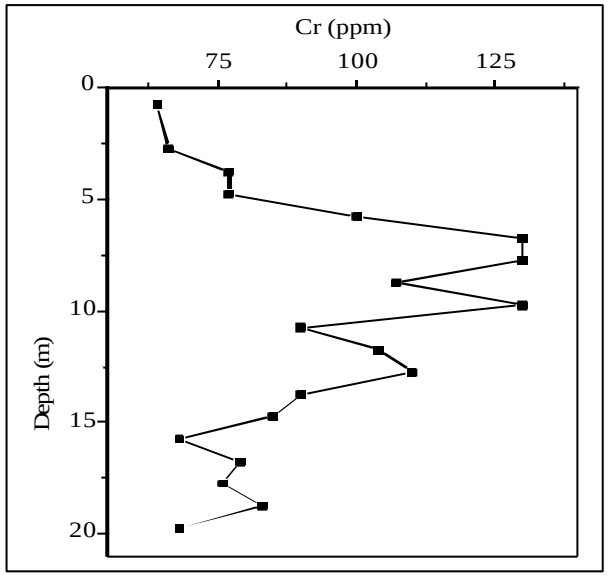


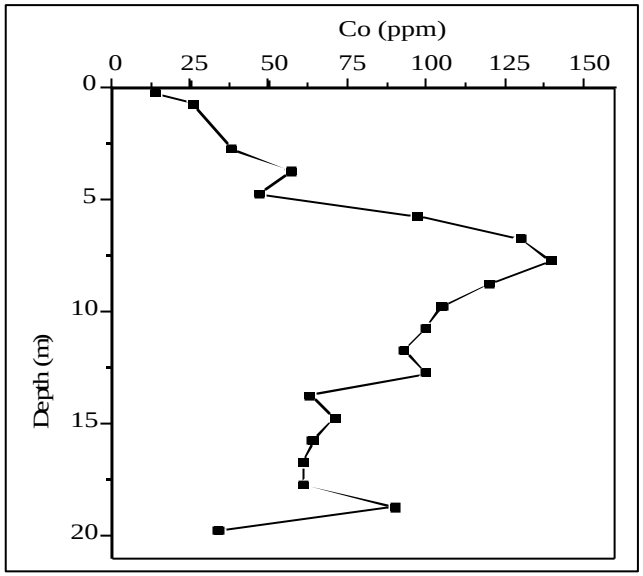


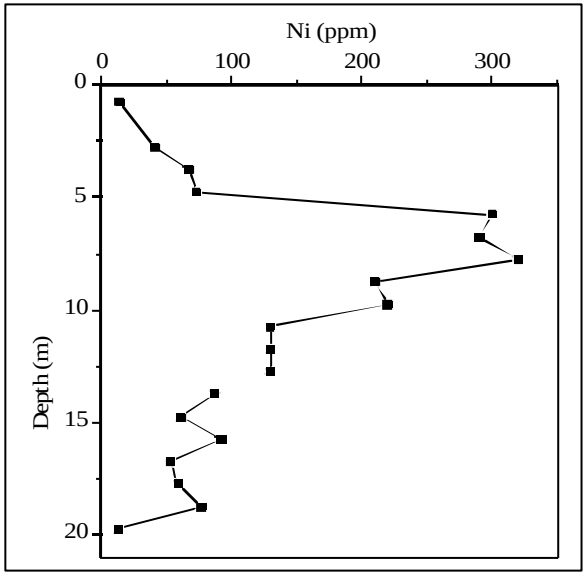
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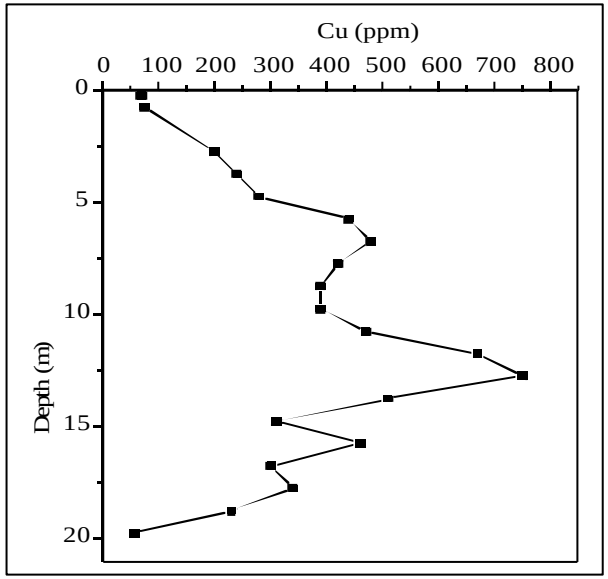
Trace elements determination; Borehole N°2

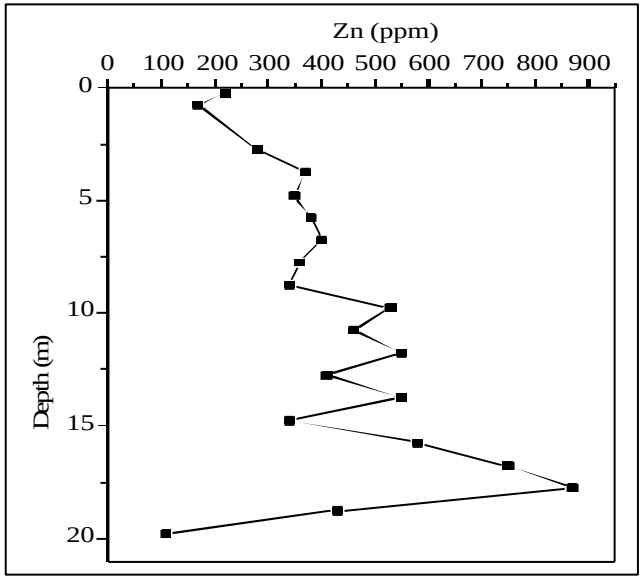






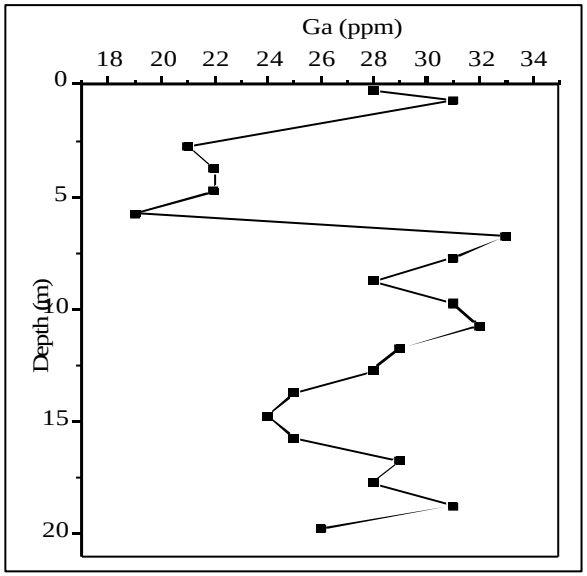


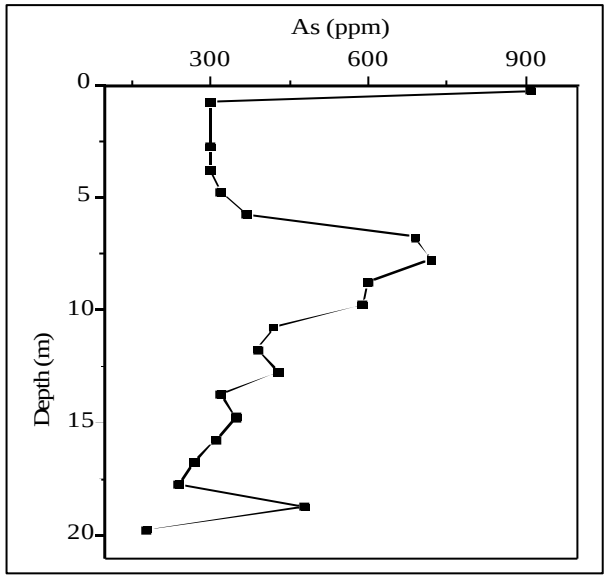


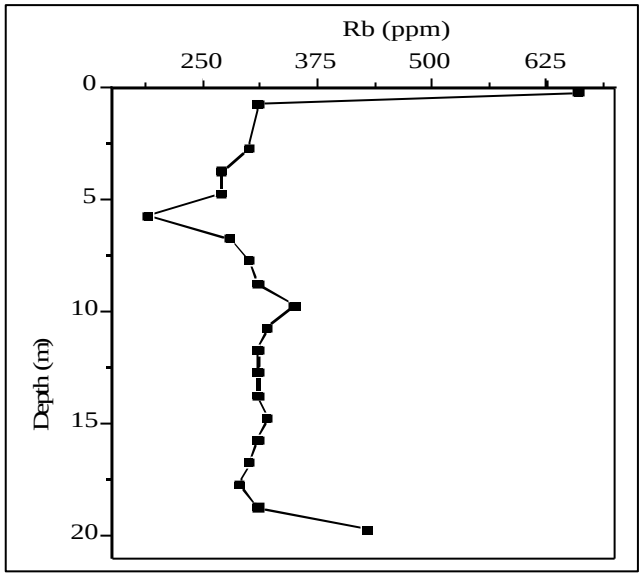


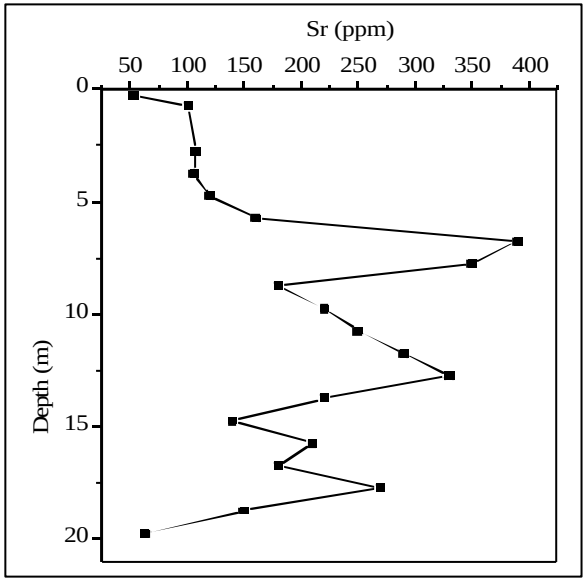
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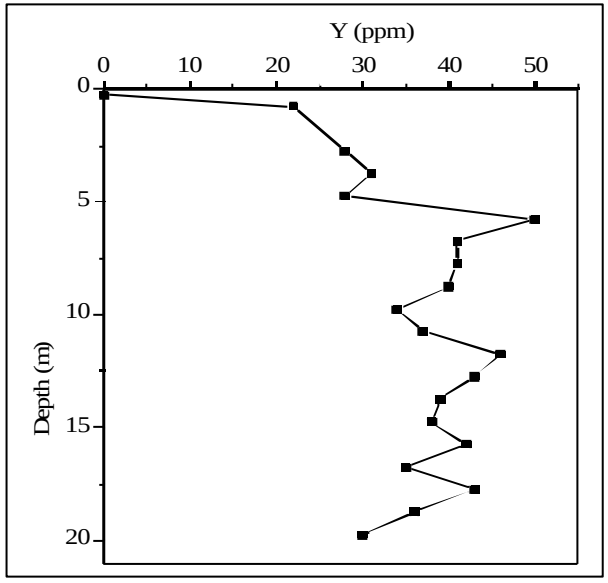
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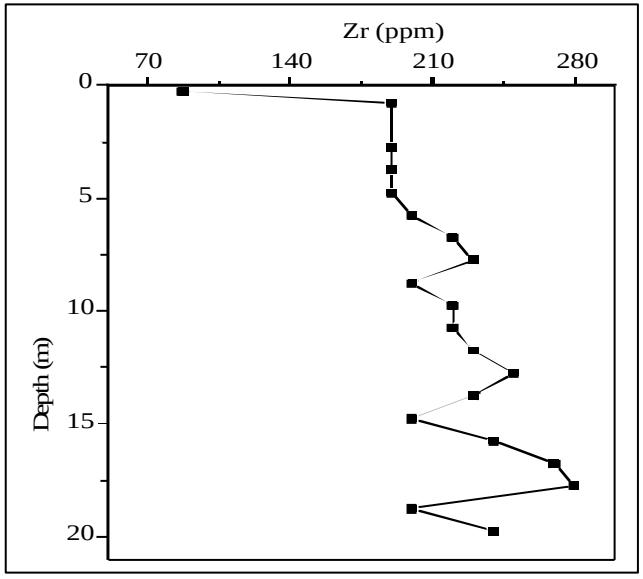






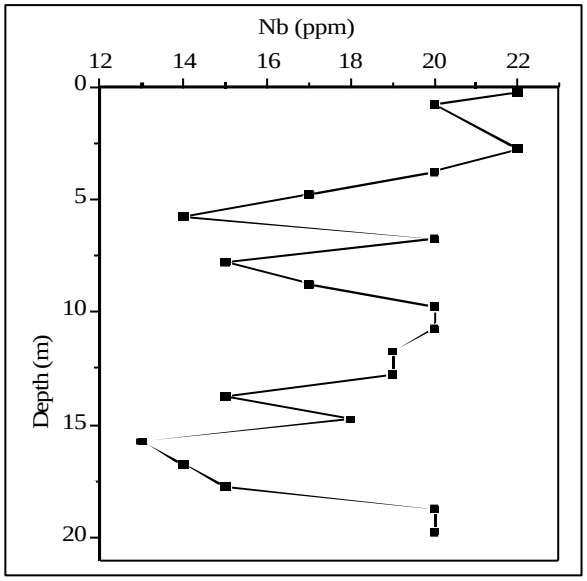


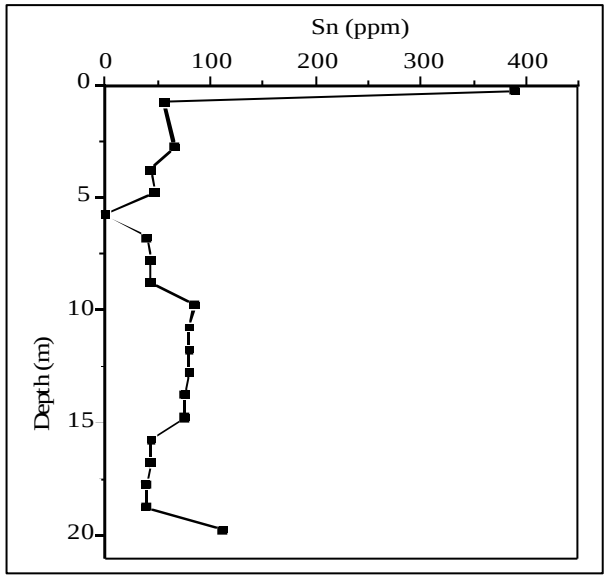


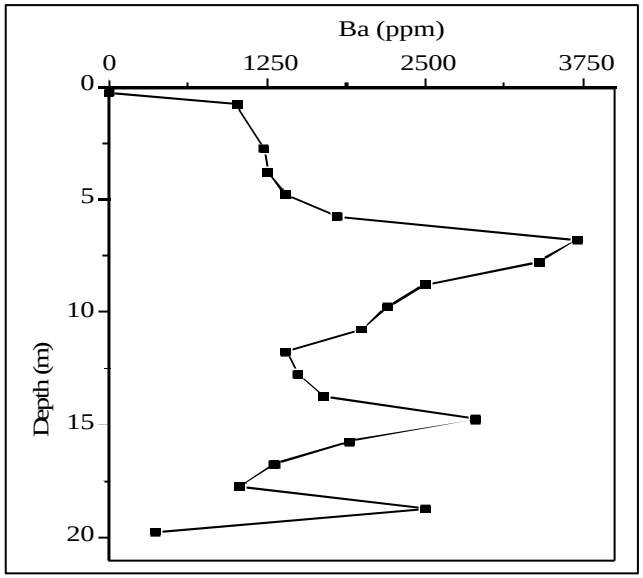


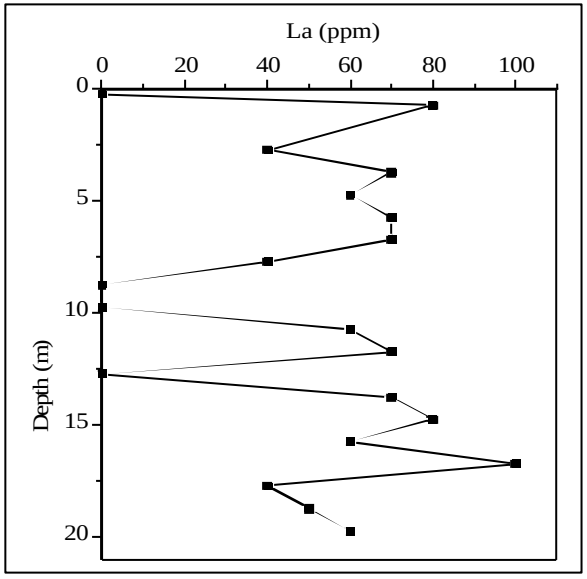
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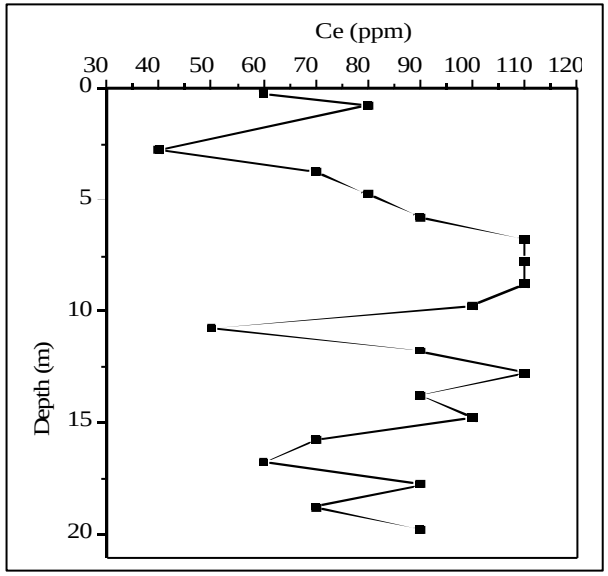
Trace elements determination; Borehole N°2

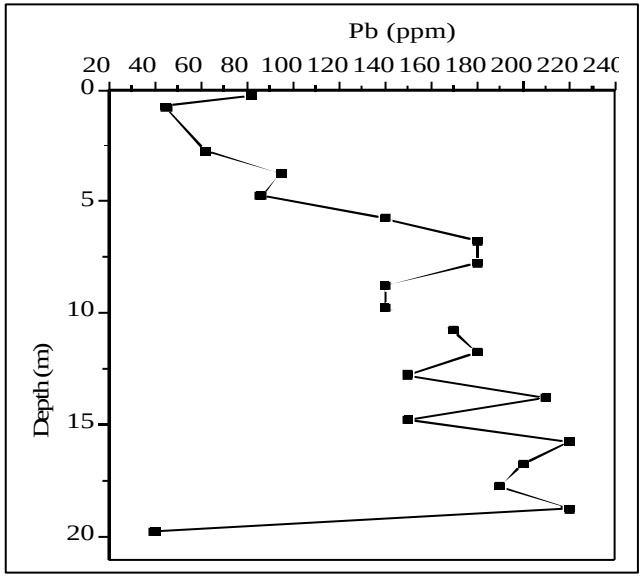




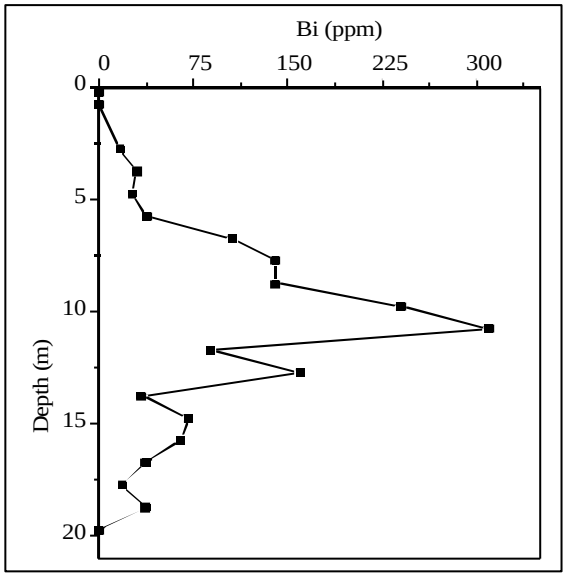


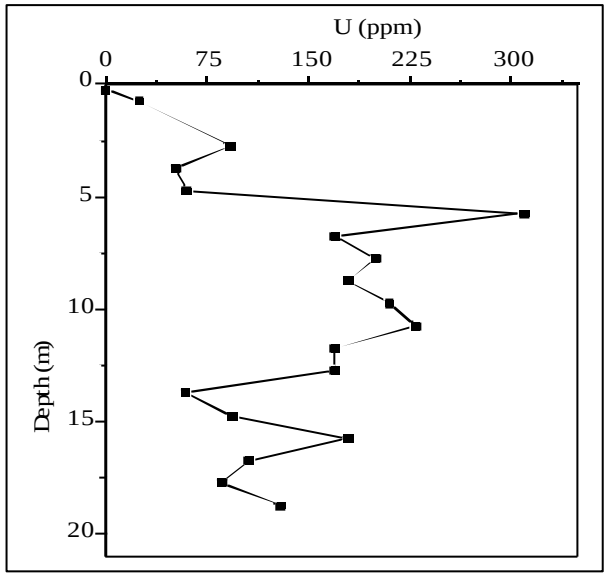






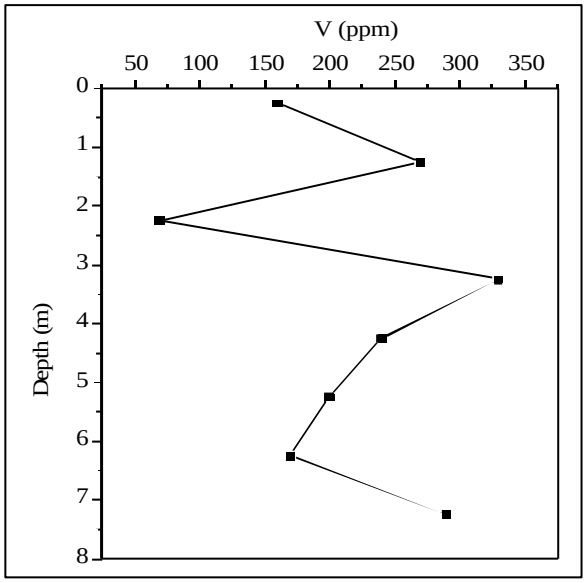
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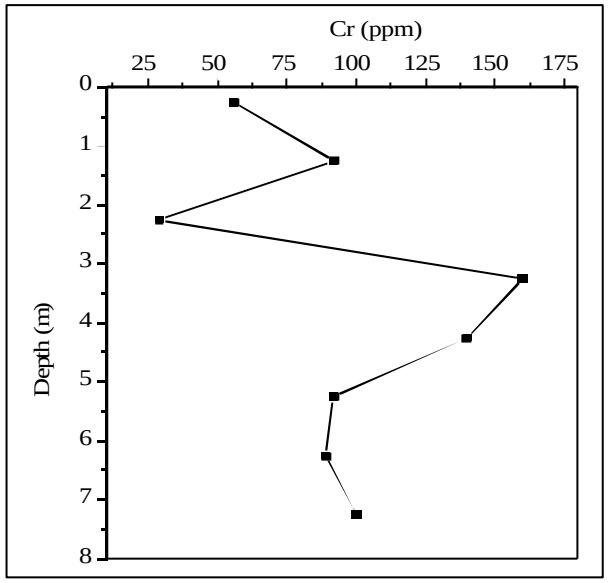


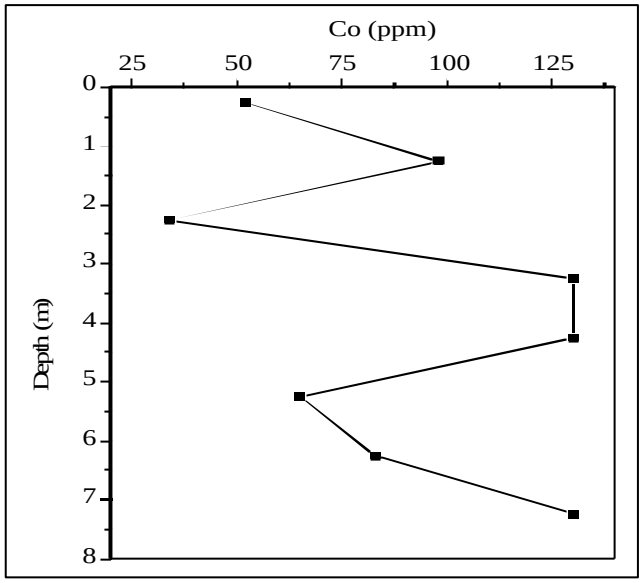


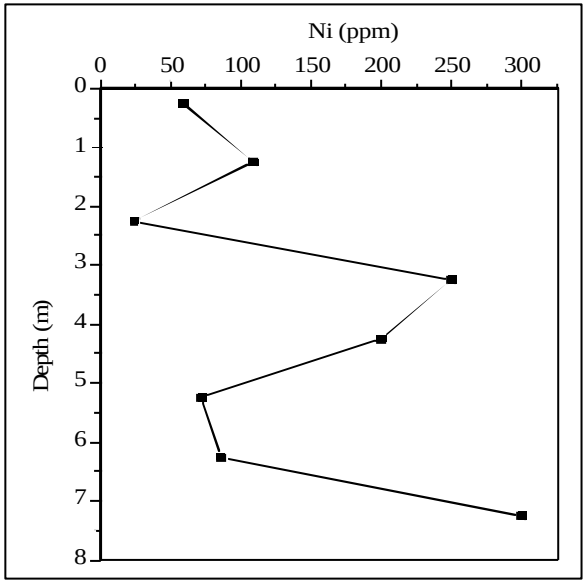
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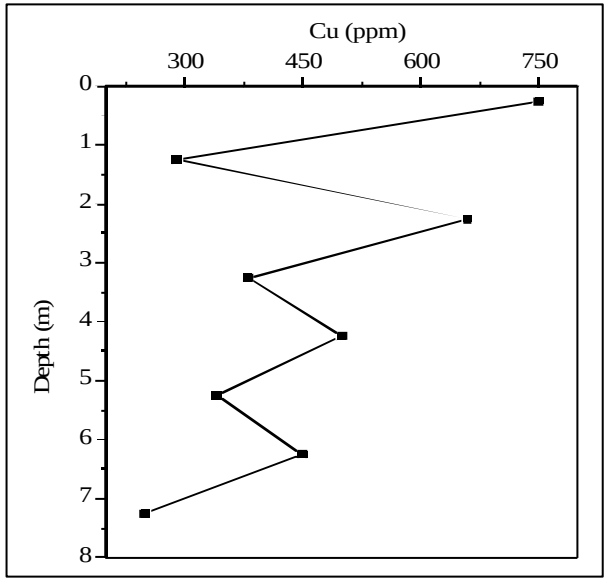
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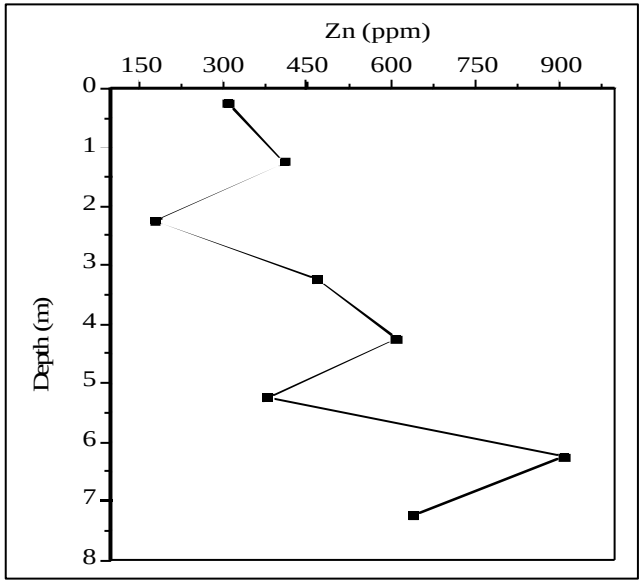






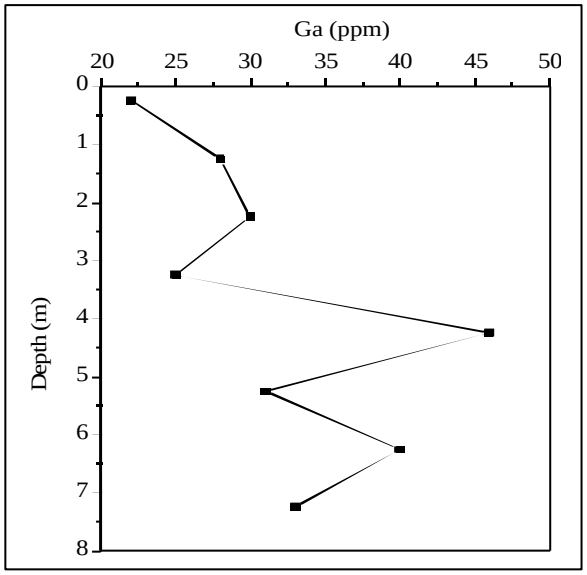


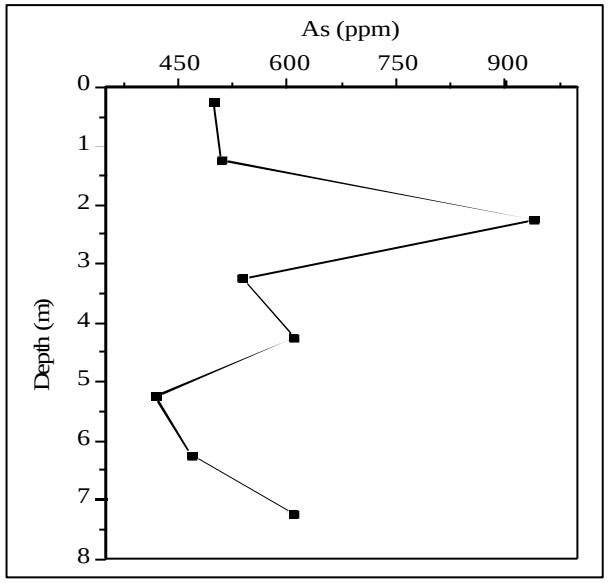


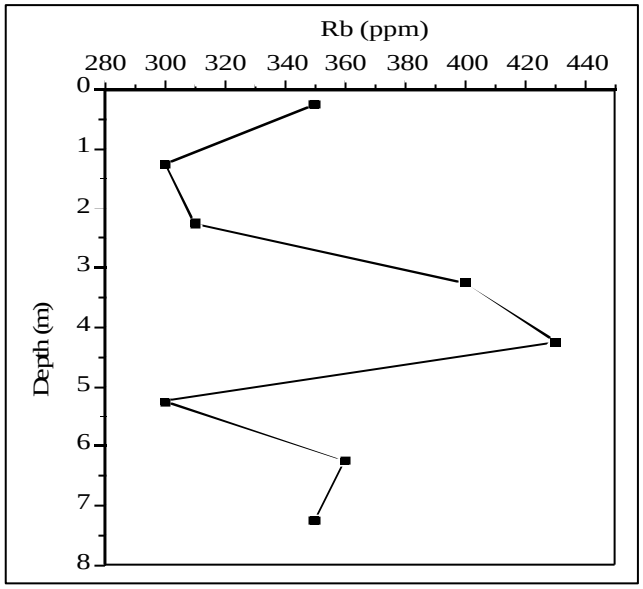


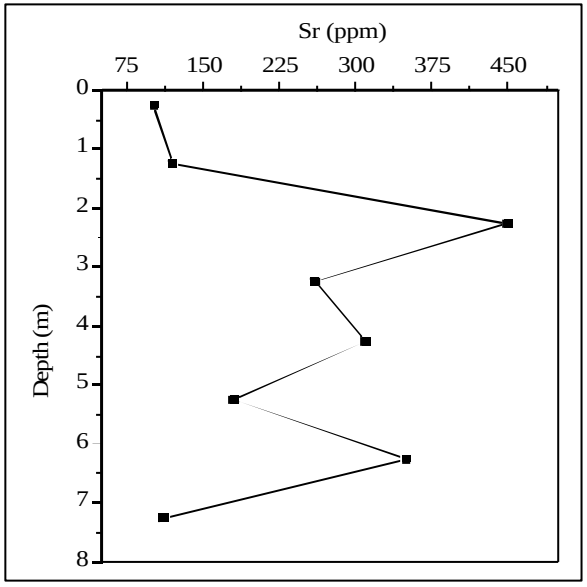
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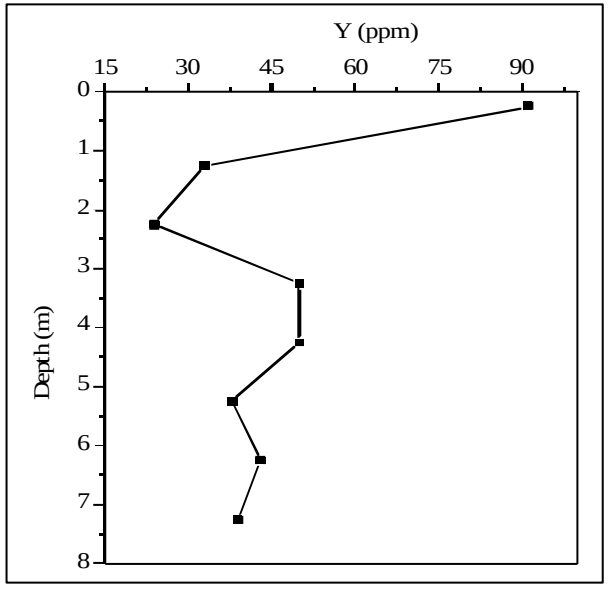
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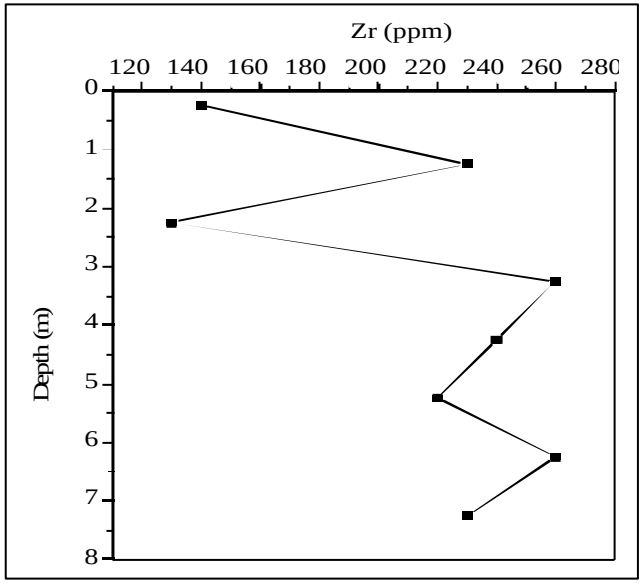






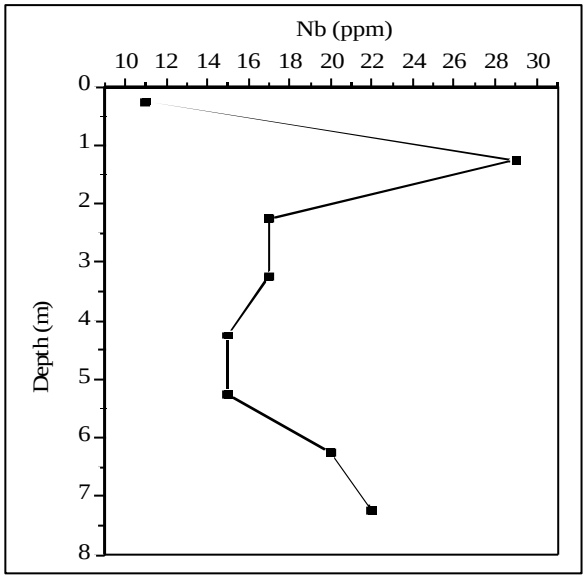


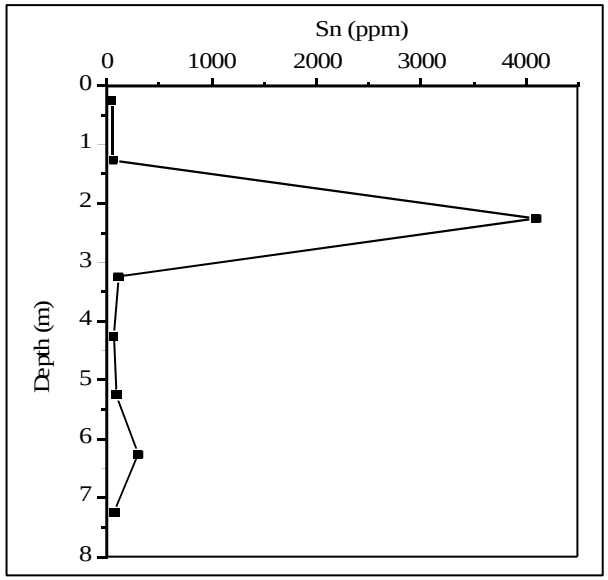


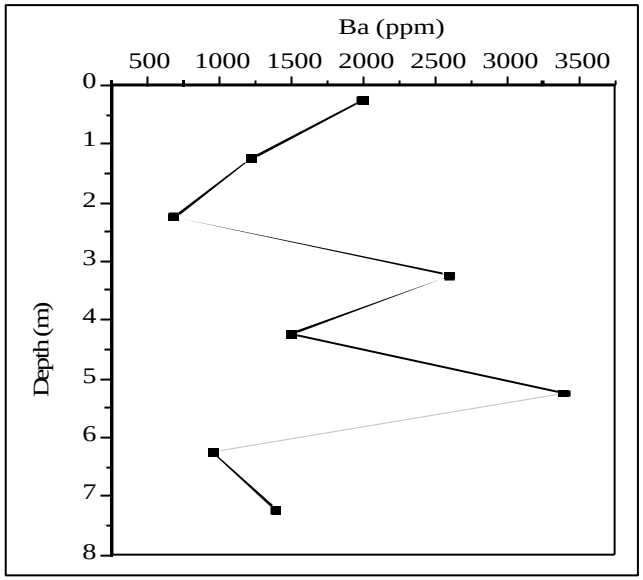


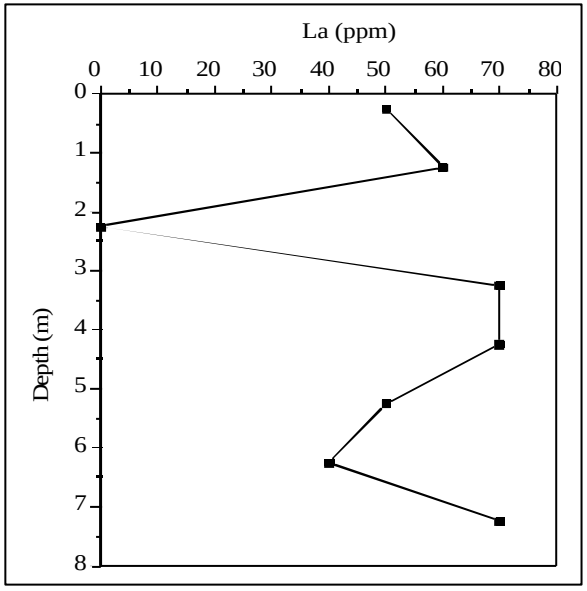
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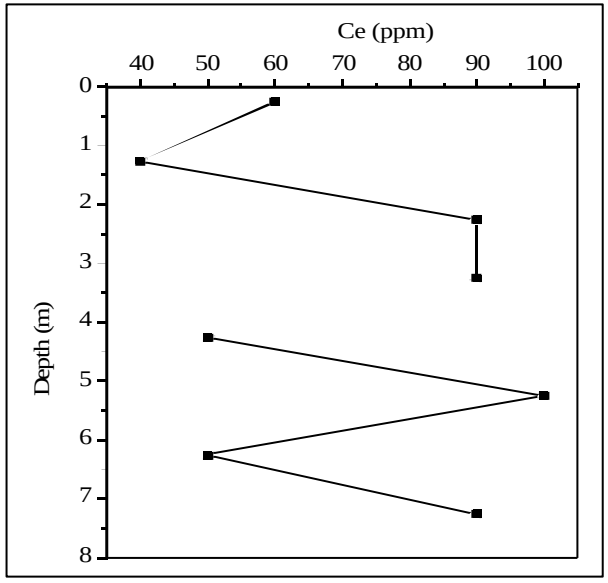
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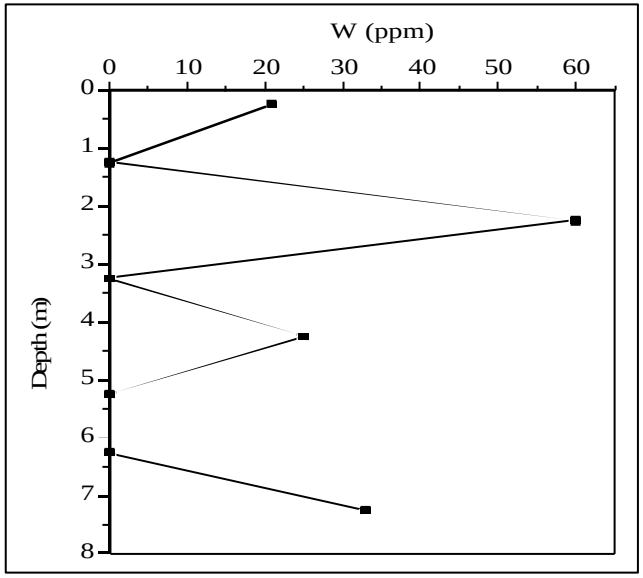






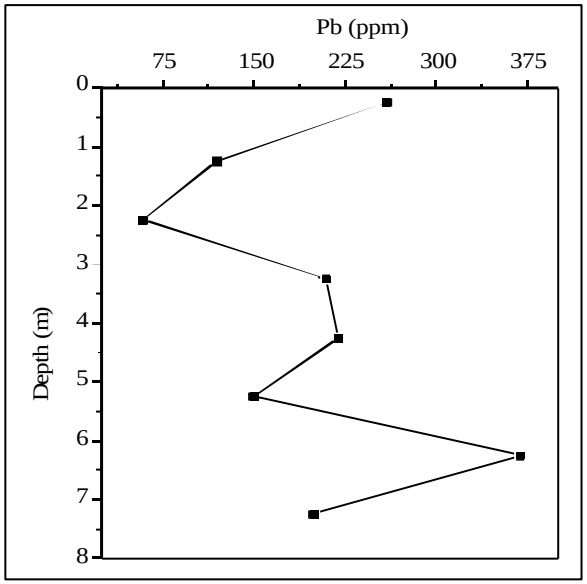


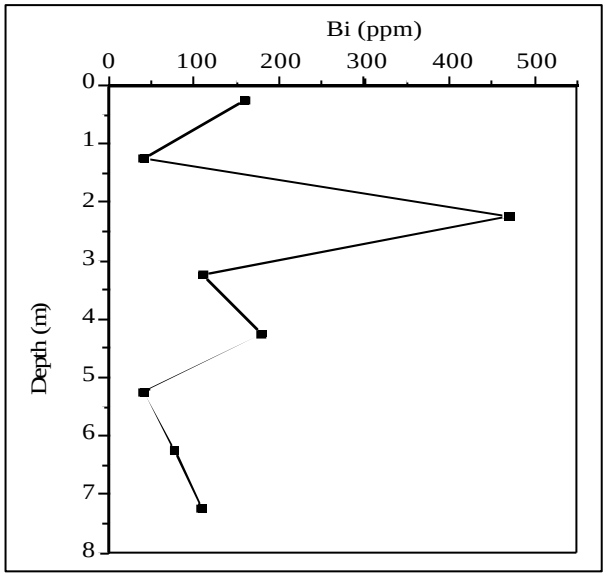


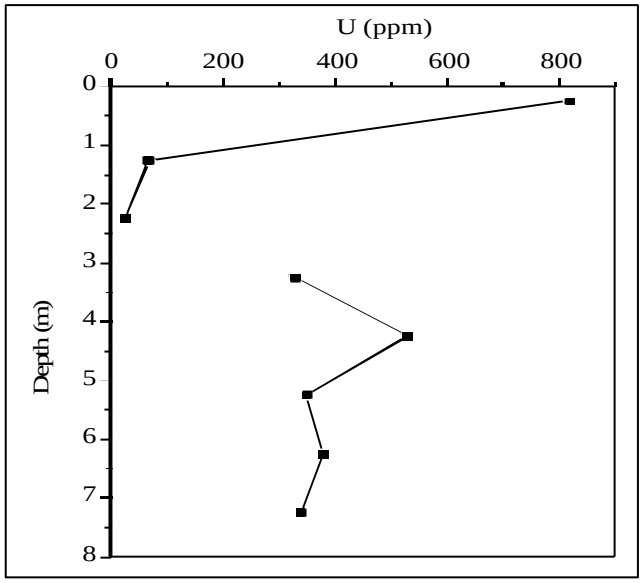


Appendix: 7.4.3.

Trace elements determination; Borehole N°3

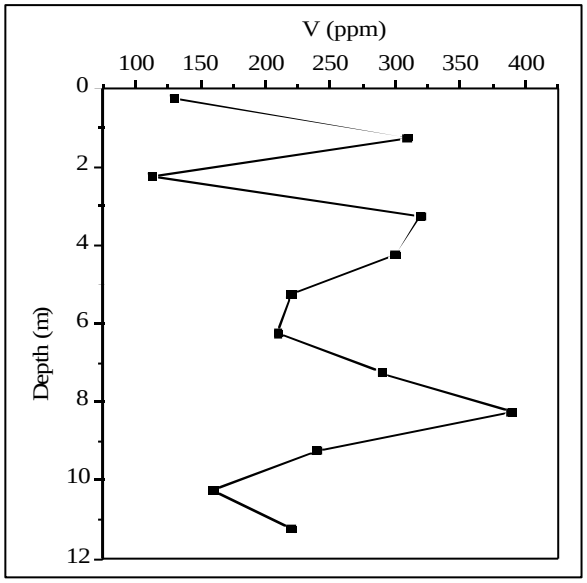


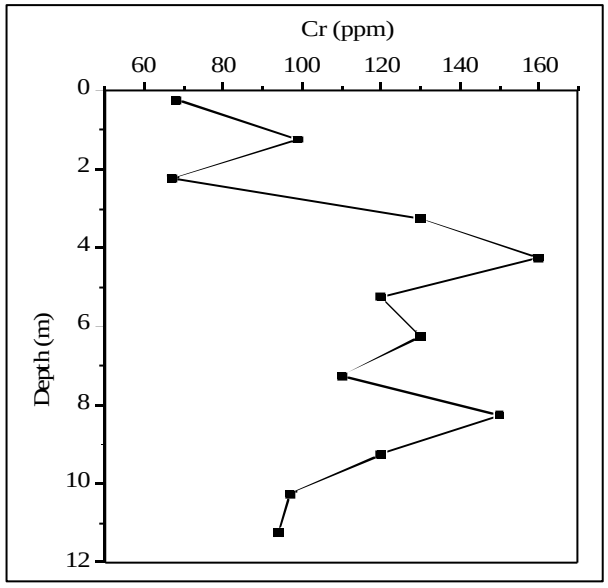


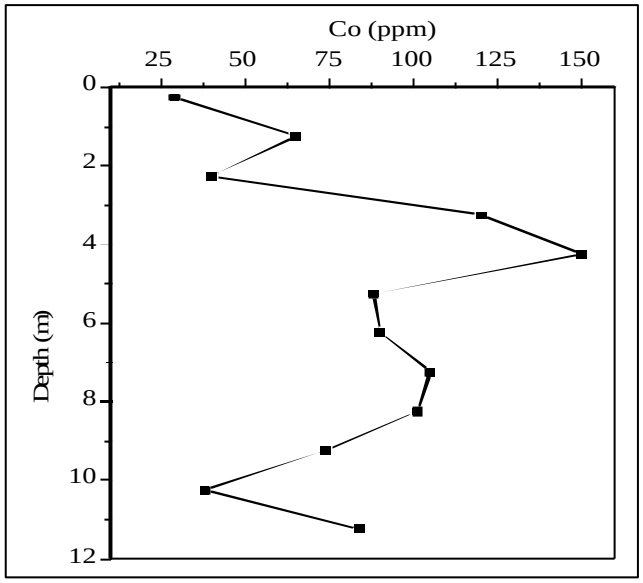


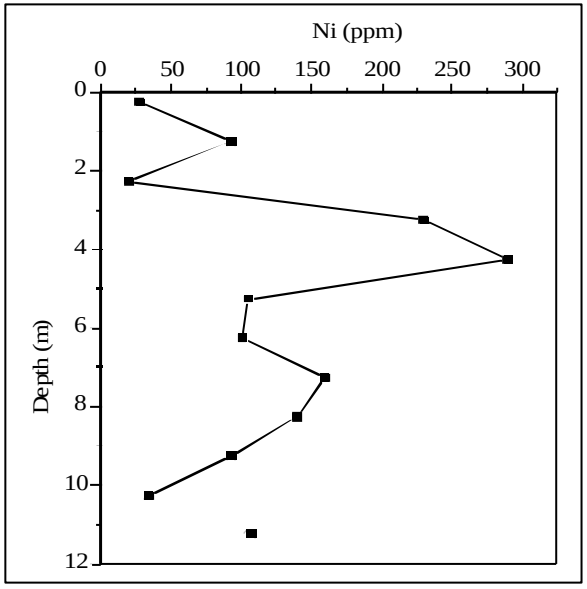
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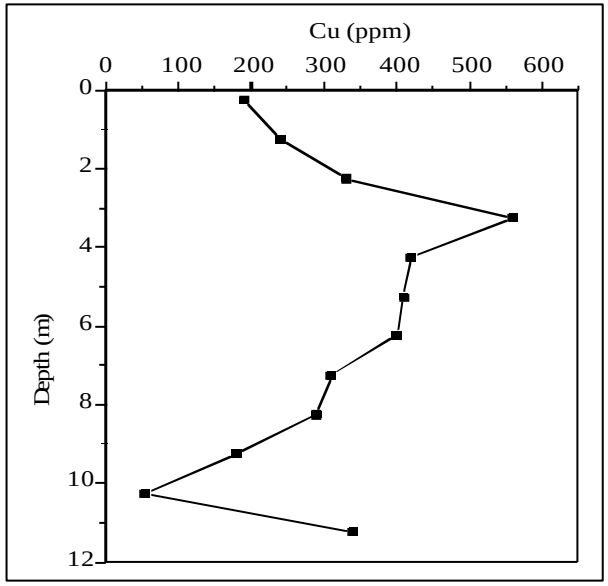
Trace elements determination; Borehole N°4

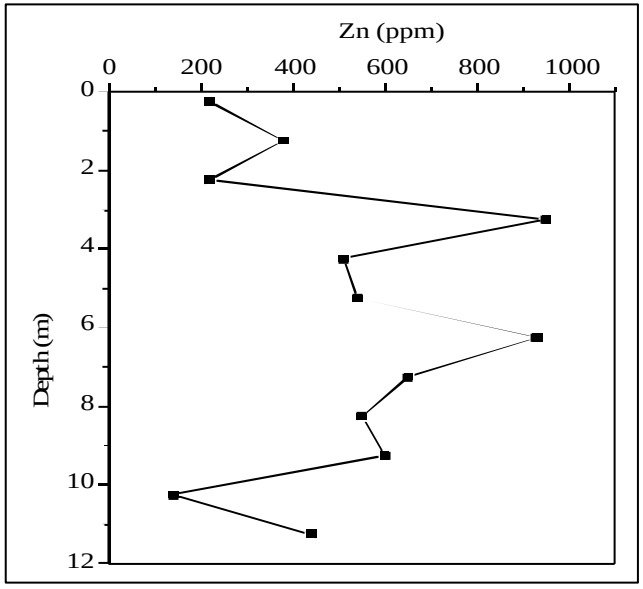






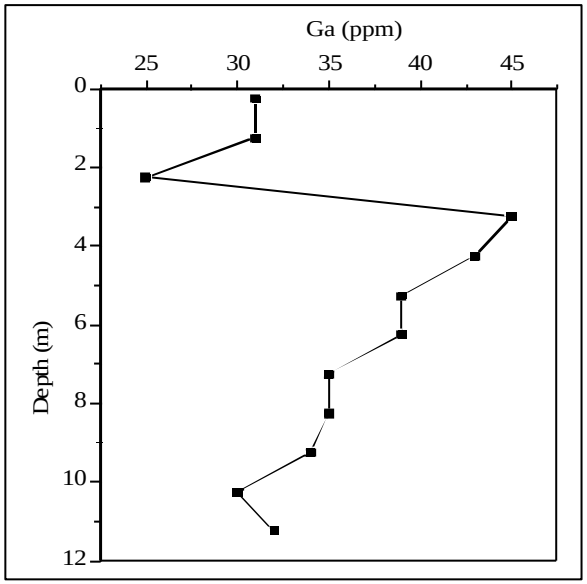


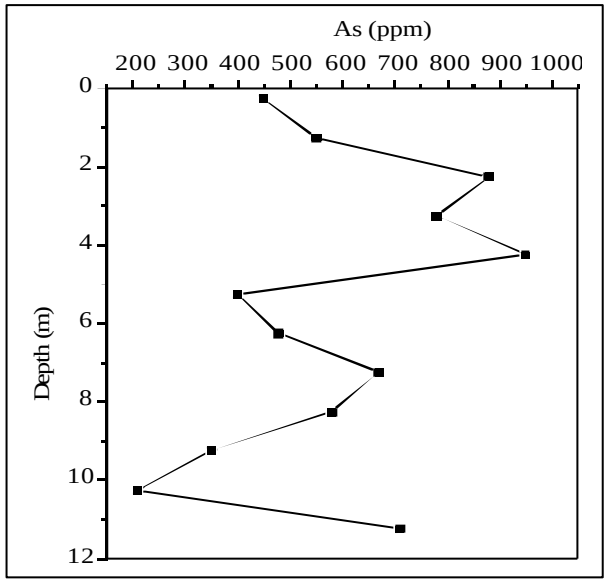


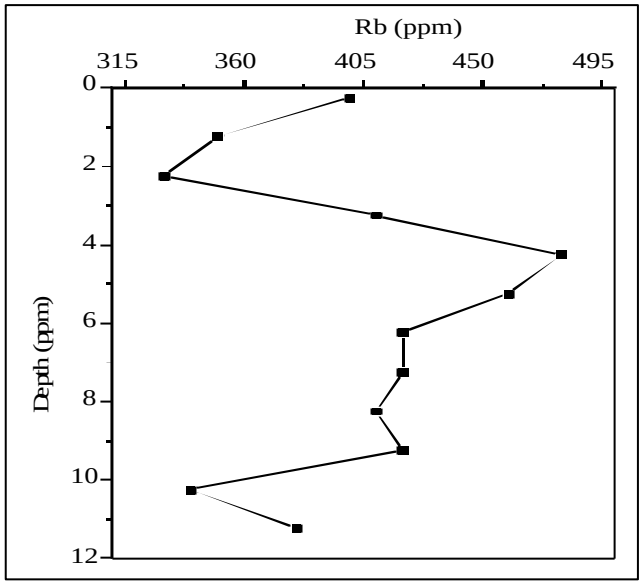


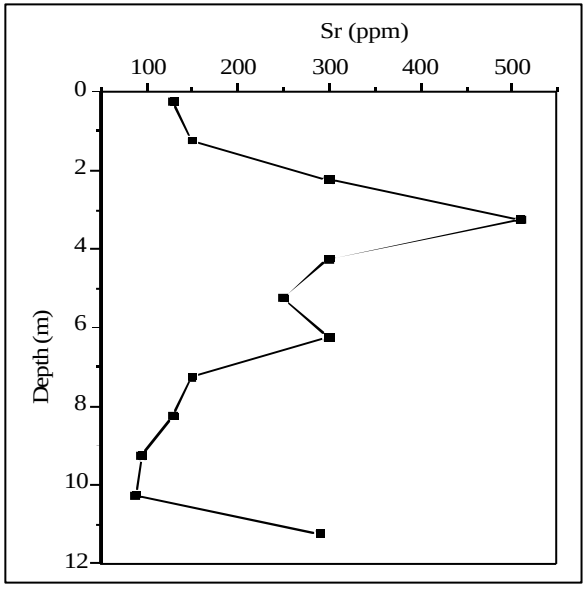
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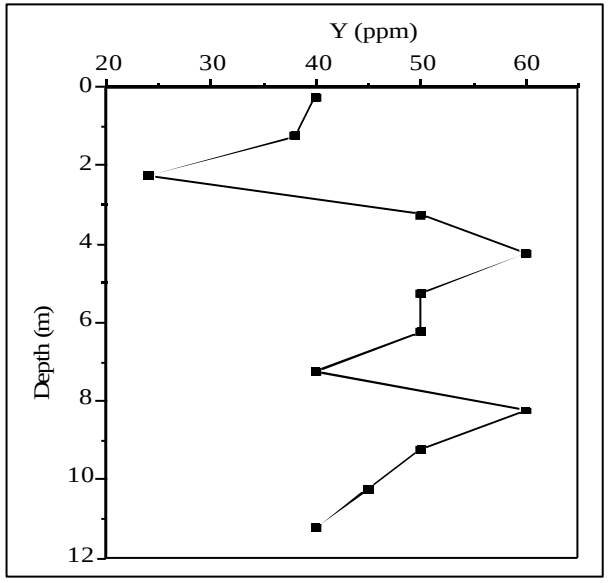
Trace elements determination; Borehole N°4

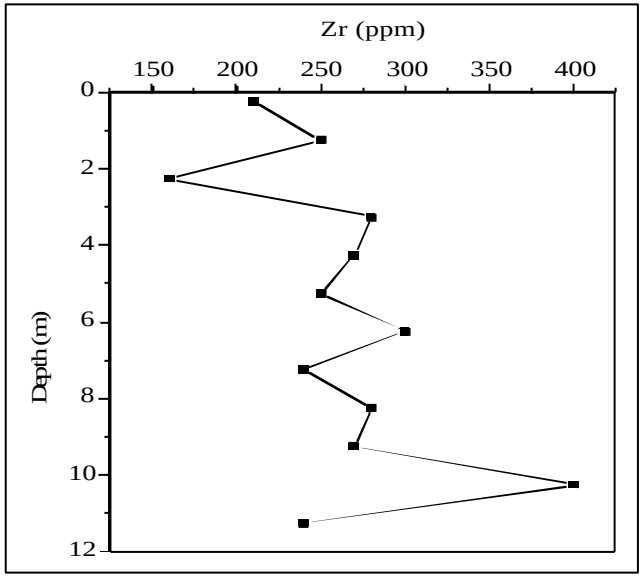






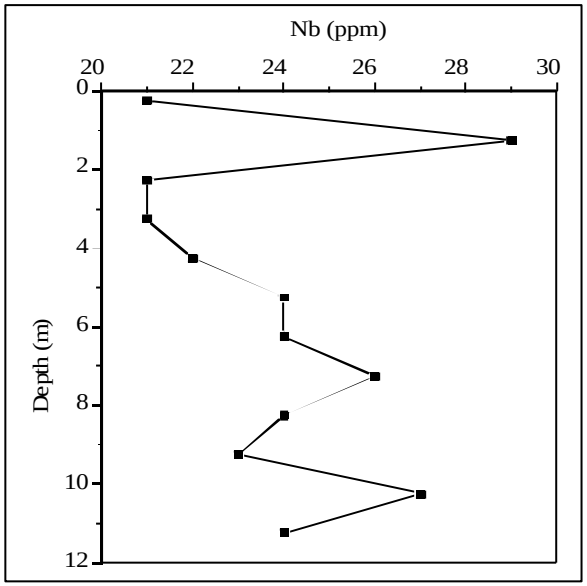


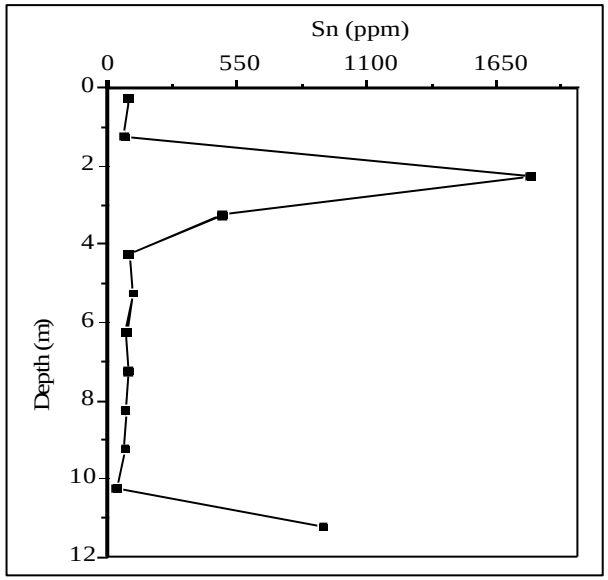


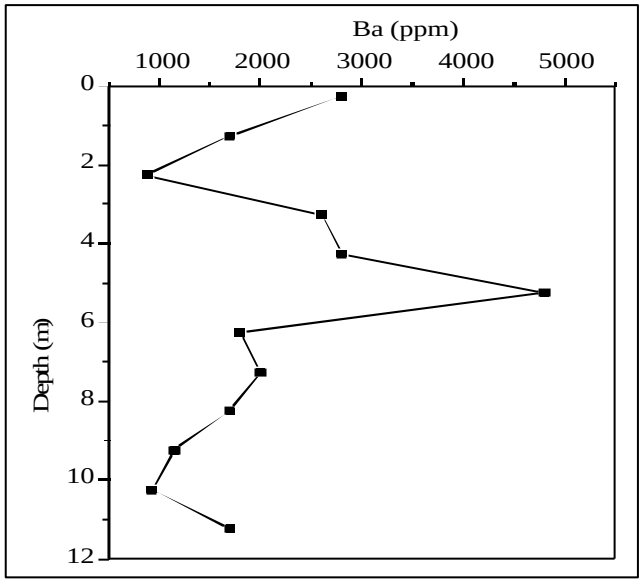


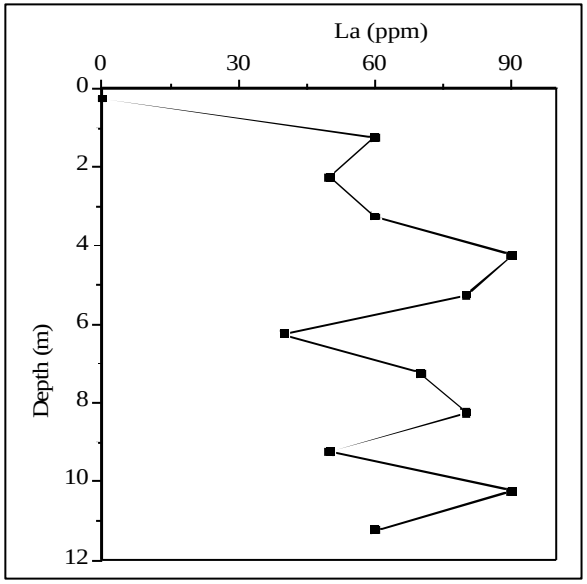
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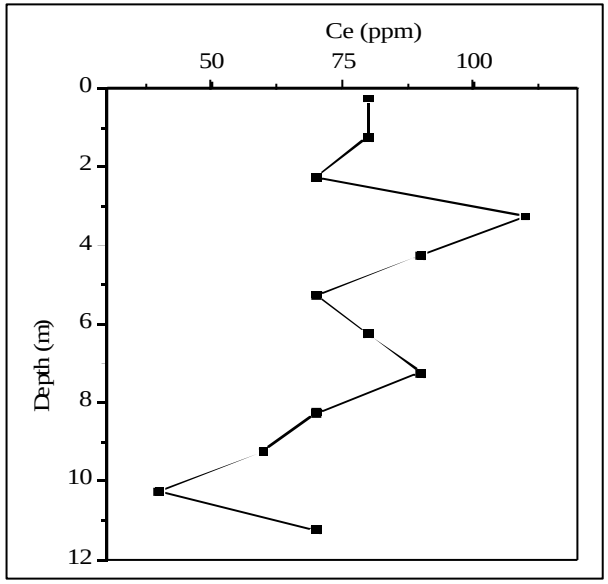
Trace elements determination; Borehole N°4

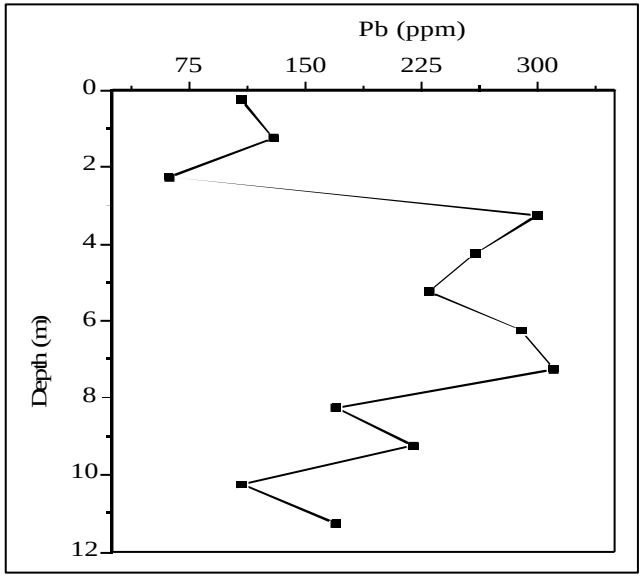




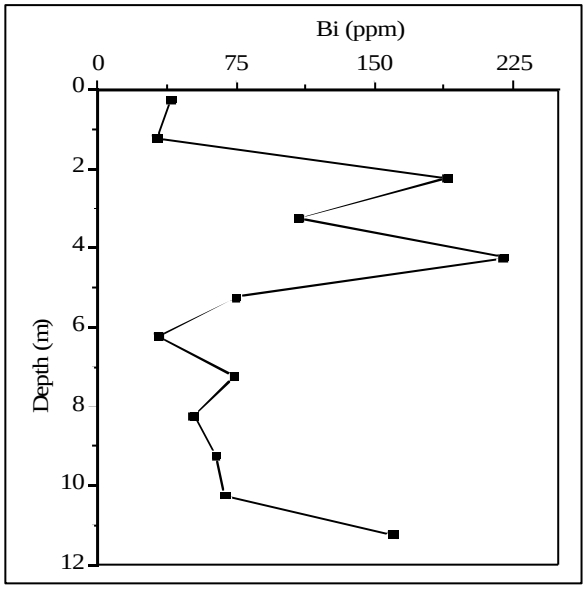


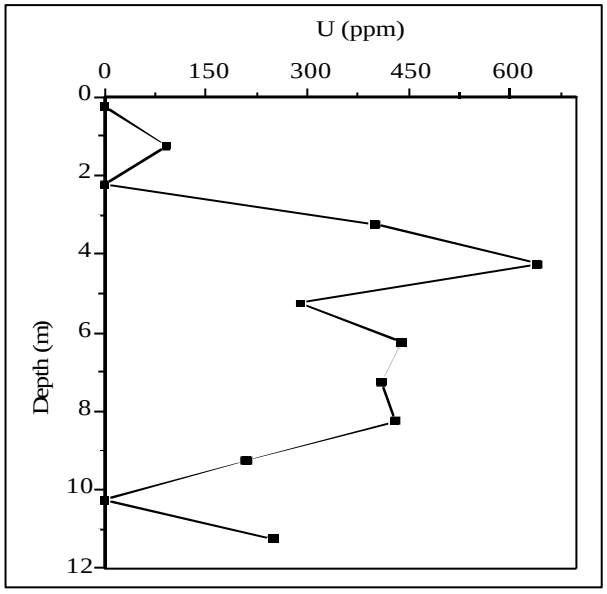




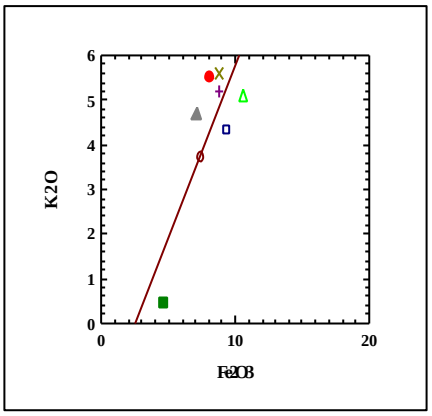


Appendix: 7.4.3. **Trace elements determination; Borehole N°2**

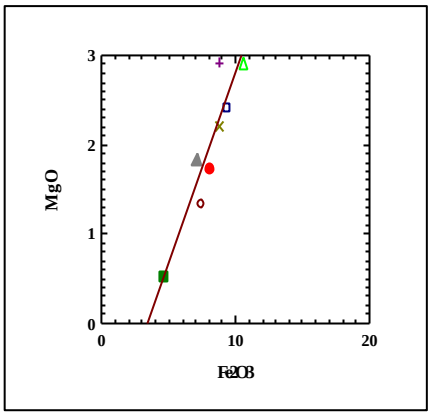




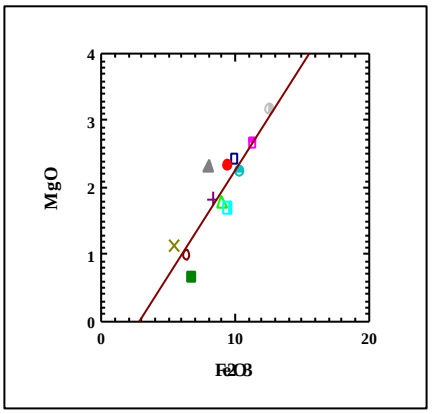
Appendix. 7.4.4. **Relationships between different elements in the tailing sites**



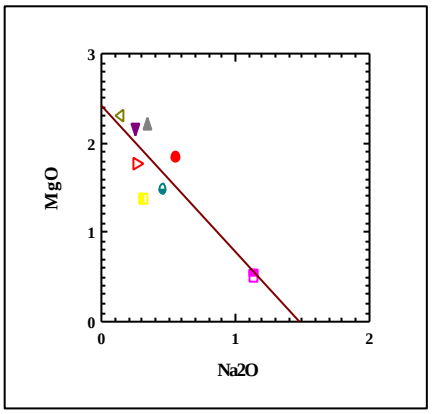
App. 7.4.4.1.: The relationship between iron & potassium oxides in the borehole N°3. (R= 0.80)



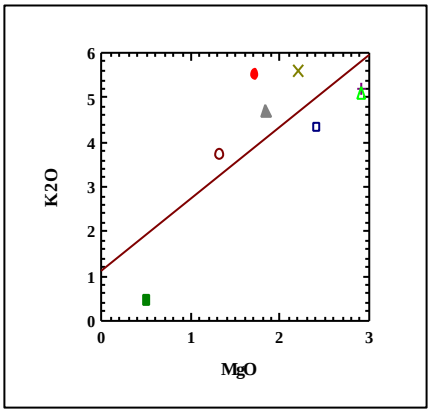
App. 7.4.4.2.: The relationship between iron & magnesium oxides in the borehole N°3. (R= 0.92)



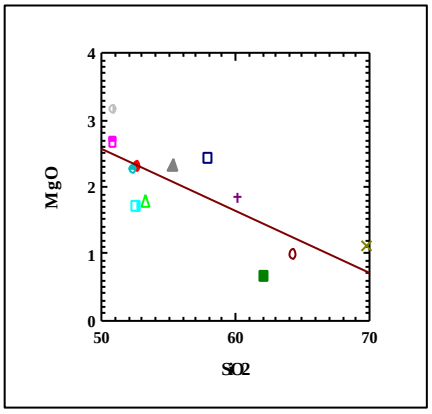
App. 7.4.4.3.: The relationship between iron & magnesium oxides in the borehole N°4. (R= 0.89)



App. 7.4.4.4.: The relationship between magnesium & sodium in the borehole N°1. (R= -0.87)

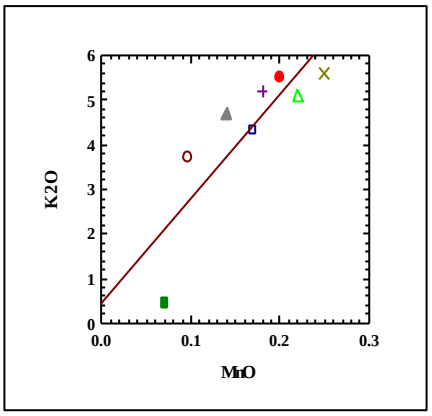


App. 7.4.4.5.: The relationship between magnesium & potassium in the borehole N°3. (R= 0.79)

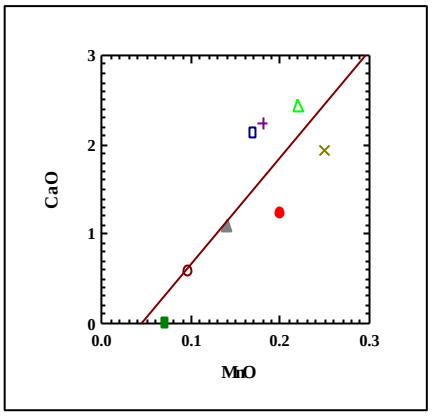


App. 7.4.4.6.: The relationship between magnesium & silicon in the borehole N°4. (R= -0.77)

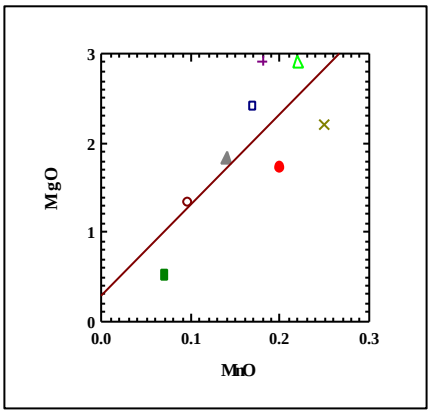
Appendix. 7.4.4. **Relationships between different elements in the tailing sites**



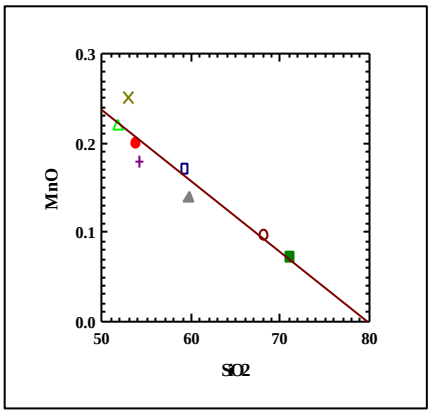
App. 7.4.4.7.: The relationship between manganese & potassium in the borehole N°3. (R = 0.84)



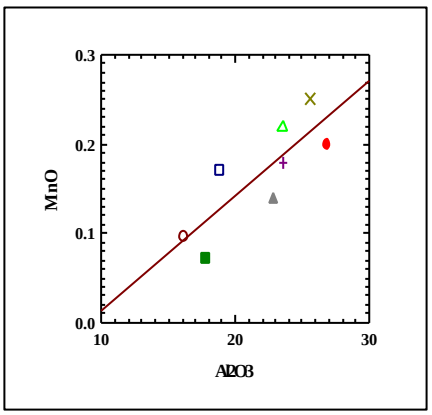
App. 7.4.4.8.: The relationship between manganese & calcium in the borehole N°3. (R= 0.83)



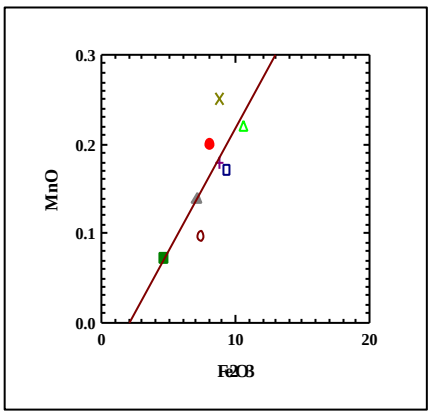
App. 7.4.4.9.: The relationship between manganese & magnesium in the borehole N°3. (R= 0.76)



App. 7.4.4.10.: The relationship between manganese & silicium in the borehole N°3. (R= -0.95)

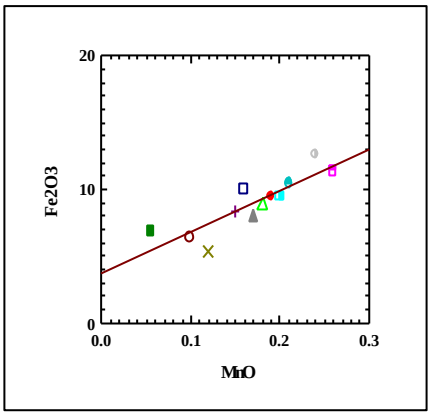


App. 7.4.4.11.: The relationship between manganese & aluminium in the borehole N°3. (R= 0.82)

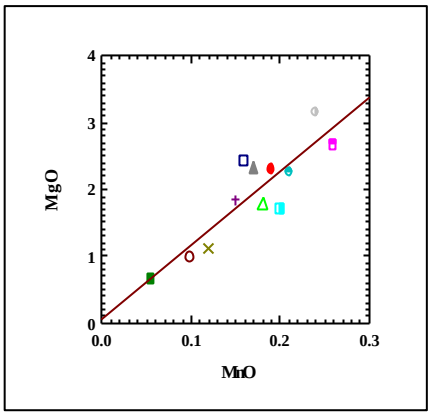


App. 7.4.4.12.: The relationship between manganese & iron in the borehole N°3. (R= 0.81)

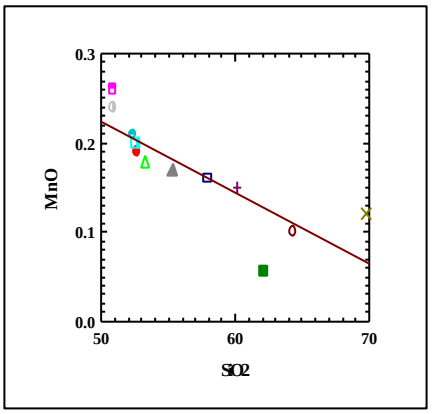
Appendix. 7.4.4. **Relationships between different elements in the tailing sites**



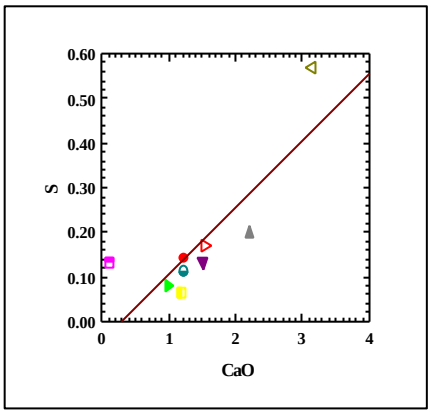
App. 7.4.4.13.: The relationship between iron & manganese in the borehole N°4. (R= 0.87)



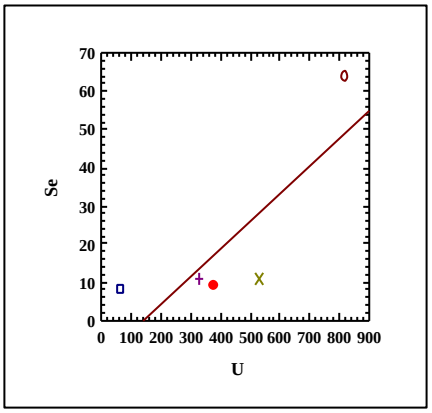
App. 7.4.4.14.: The relationship between manganese & magnesium in the borehole N°4. (R= 0.88)



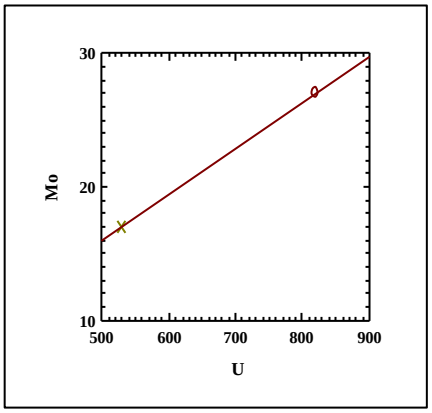
App. 7.4.4.15.: The relationship between manganese & silicon in the borehole N°4. (R= -0.83)



App. 7.4.4.16.: The relationship between calcium & sulfure in the borehole N°1. (R= 0.82)

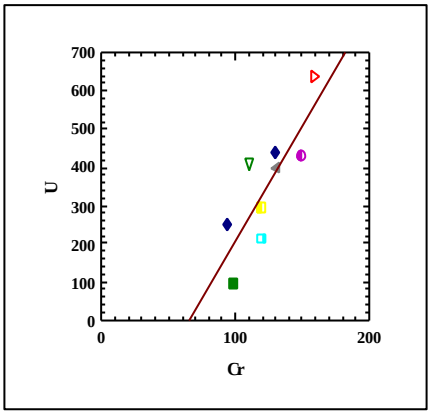


App. 7.4.4.17.: The relationship between uranium & selenium in the borehole N°3. (R= 0.82)

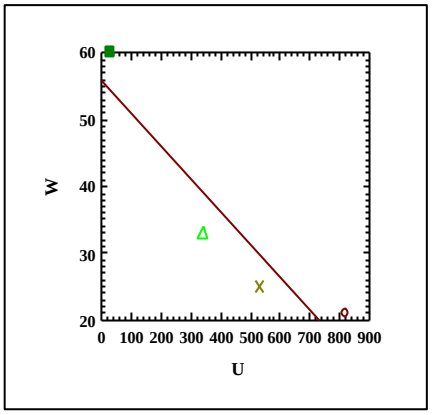


App. 7.4.4.18: The relationship between uranium & molibdenium in the borehole N°3. (R= 1)

Appendix. 7.4.4. **Relationships between different elements in the tailing sites**



App. 7.4.4.19.: The relationship between uranium & chromium in the borehole N°4. (R= 0.82)



App. 7.4.4.20.: The relationship between uranium & tungsten in the borehole N°3. (R= -0.93)

Appendix: 7.4.5. **The non-metals carbon, nitrogen and sulphur**

Borehole N°1

Depth Interv. meter	Nitrogen cont. (%)	Carbon content (%)	Sulphur content (%)
0 - 1	<0.03	0.252	0.102
1.0 - 1.5	0.044	0.925	0.149
1.5 - 2.5	<0.03	0.49	0.196
2.5 - 3.5	<0.03	0.673	0.2
3.5 - 4.5	0.103	2,67	0.79
5.5 - 6.5	<0.03	0.967	0.305
6.5 - 7.5	0.052	0.807	0.265
7.5 - 8.5	0.052	0.647	0.096
8.5 - 9.5	0.076	1,16	0.095

Borehole N°2

Depth Interv. meter	Nitrogen cont. (%)	Carbon content (%)	Sulphur content (%)
0 - 0.5	<0.03	<0.172	0.089
0.5-1.5	<0.03	<0.172	0.079
2.5-3.5	<0.03	0.175	0.122
3.5-4.5	<0.03	0.594	0.195
4.5-5.5	<0.03	0.593	0.202
5.5-6.5	0.126	2.91	1.38
6.5-7.5	<0.03	1.46	0.523
7.5-8.5	<0.03	1.29	0.442
8.5-9.5	<0.03	0.872	0.354
9.5-10.5	<0.03	0.825	0.415
10.5-11.5	0.03	0.88	0.34
11.5-12.5	<0.03	0.842	0.354
12.5-13.5	<0.03	0.753	0.29
13.5-14.5	<0.03	0.594	0.191
14.5-15.5	<0.03	0.332	0.25
15.5-16.5	<0.03	0.507	0.212
16.5-17.5	<0.03	0.46	0.156
17.5-18.5	<0.03	0.554	0.138
18.5-19.5	<0.03	0.689	0.281
19.5-20.2	0.06	0.768	0.037

Appendix: 7.4.5. **The non-metals carbon, nitrogen and sulphur**

Borehole N°3

Depth Interv.	Nitrogen cont.	Carbon content	Sulphur content
meter	(%)	(%)	(%)
0--1	<0.03	0.209	0.193
1--2	<0.03	0.485	0.225
2--3	<0.03	0.332	0.129
3--4	0.038	1.02	0.258
4--5	0.037	0.791	0.203
5--6	<0.03	0.435	0.252
6--7	0.029	0.503	0.126
7--8	<0.03	0.617	0.311

Borehole N°4

Depth Interv.	Nitrogen cont.	Carbon content	Sulphur content
meter	(%)	(%)	(%)
0 - 1	<0.03	0.243	0.073
1.0 -2.0	0.05	0.376	0.252
2.0 - 3.0	0.06	0.578	0.097
3.0 - 4.0	0.081	1.32	0.258
4.0 - 5.0	0.045	0.767	0.247
5.0 - 6.0	<0.03	0.397	0.217
6.0 - 7.0	<0.03	0.374	0.175
7.0- 8.0	<0.03	0.941	0.265
8.0 - 9.0	<0.03	0.613	0.316
9.0 - 10.0	<0.03	0.432	0.329
10.0-11.0	0.063	1.19	0.07
11.0-12.0	<0.03	0.596	0.183

Appendix: 7.4.6. Ignition loss determination

Borehole N°1

Sample N°	I. 0-1m	I. 1-1.5m	I. 1.5-2.5m	I. 2.5-3.5m	I. 3.5-4.5m	I. 5.5-6.5m	I. 6.5-7.5m	I. 7.5-8.5m	I. 8.5-9.5m
saucepan N°	6	3	5	23	23	22	1	22	4
m_B (g)	68.81	64.86	83.71	71.6	71.6	70.16	80.83	70.16	71.7
$m_d + m_B$ (g)	84.1	80.07	99.16	86.71	86.68	85.33	96.09	85.52	87.07
$m_{gl} + m_B$ (g) (1)	83.77	79.53	98.71	86.34	85.81	84.78	95.4	85	86.44
$m_{gl} + m_B$ (g) (2)	83.73	79.48	98.68	86.35	85.74	84.67	95.35	85	86.39
$m_{gl} + m_B$ (g) (3)	83.74	79.48	98.69		85.74	84.67	95.36		86.4
$m_{gl} + m_B$ (g) (4)									
m_d	15.29	15.21	15.45	15.11	15.08	15.17	15.26	15.36	15.37
m_{gl}	14.92	14.62	14.98	14.74	14.14	14.51	14.52	14.84	14.69
V_{gl}	0.0242	0.0388	0.0304	0.0245	0.0623	0.0435	0.0485	0.0339	0.0442
$V_{gl\ (\%)}$	2.42	3.88	3.04	2.45	6.23	4.35	4.85	3.38	4.42

Borehole N°3

Sample N°	III. 0-1m	III. 1-2m	III. 2-3m	III. 3-4m	III. 4-5m	III. 5-6m	III. 6-7m	III. 7-8m
saucepan N°	17	2	5	4	6	3	16	1
m_B (g)	59.96	75.07	68.81	80.84	83.7	71.72	58.32	83.72
$m_d + m_B$ (g)	75.14	90.1	84.11	95.85	98.98	86.81	73.32	98.72
$m_{gl} + m_B$ (g) (1)	74.77	89.47	83.79	94.91	98.13	86.17	72.63	97.91
$m_{gl} + m_B$ (g) (2)	74.77	89.47	83.73	94.84	97.96	86.11	72.56	97.86
$m_{gl} + m_B$ (g) (3)			83.75	94.84	98.05	86.12	72.53	97.86
$m_{gl} + m_B$ (g) (4)							72.47;72.48	
m_d	15.18	15.03	15.3	15.01	15.28	15.09	15	15
m_{gl}	14.81	14.4	14.93	14	14.26	14.4	14.15	14.14
V_{gl}	0.0244	0.0419	0.0242	0.0673	0.0668	0.0457	0.0567	0.0573
$V_{gl\ (\%)}$	2.44	4.19	2.42	6.73	6.68	4.57	5.66	5.73

Appendix: 7.4.6. Ignition loss determination

Borehole N°2

Sample N°	II. 0-0.5m	II. 0.5-1.5m	II. 2.5-3.5m	II. 3.5-4.5m	II. 4.5-5.5m	II. 5.5-6.5m	II. 6.5-7.5m	II. 7.5-8.5m	II. 8.5-9.5m	II. 9.5-10.5m
saucepan N°	25	2	25	24	22	24	23	2	17	16
m_B (g)	71.19	75.08	71.19	66.5	70.17	66.5	71.6	75.1	59.95	58.32
$m_d + m_B$ (g)	86.39	90.48	86.42	81.78	85.33	81.54	86.66	90.16	75.11	73.39
$m_{gl} + m_B$ (g) (1)	86.19	90.03	86.14	81.35	84.94	80.68	85.94	89.22	74.55	72.8
$m_{gl} + m_B$ (g) (2)	86.19	90.02	86.14	81.35	84.91	80.68	85.91	89.17	74.54	72.8
$m_{gl} + m_B$ (g) (3)								89.19		
$m_{gl} + m_B$ (g) (4)										
m_d	15.2	15.4	15.23	15.28	15.16	15.04	15.06	15.06	15.16	15.07
m_{gl}	15	14.94	14.95	14.85	14.75	14.18	14.32	14.08	14.59	14.48
V_{gl}	0.0132	0.0299	0.0184	0.0281	0.0270	0.0572	0.0491	0.0651	0.0376	0.0392
$V_{gl\ (\%)}$	1.32	2.99	1.84	2.81	2.7	5.72	4.91	6.51	3.76	3.92

Sample N°	II. 10.5-11.5m	II. 11.5-12.5m	II. 12.5-13.5m	II. 13.5-14.5m	II. 14.5-15.5m	II. 15.5-16.5m	II. 16.5-17.5m	II. 17.5-18.5m	II. 18.5-19.5m	II. 19.5-20.2m
saucepan N°	4	3	24	17	23	25	16	22	1	17
m_B (g)	71.71	64.86	66.5	59.95	71.6	71.2	58.32	70.16	80.82	59.95
$m_d + m_B$ (g)	86.89	79.88	81.53	75.22	86.62	86.3	73.52	85.16	95.91	74.99
$m_{gl} + m_B$ (g) (1)	86.12	79.14	80.91	74.66	86.16	85.81	72.96	84.66	95.16	74.38
$m_{gl} + m_B$ (g) (2)	86.03	79.06	80.9	74.65	86.16	85.72	72.97	84.64	95.11	74.36
$m_{gl} + m_B$ (g) (3)	86.07	79.09				85.71			95.13	74.36
$m_{gl} + m_B$ (g) (4)										
m_d	15.18	15.02	15.03	15.27	15.02	15.1	15.2	15	15.09	15.04
m_{gl}	14.32	14.2	14.4	14.7	14.56	14.51	14.64	14.48	14.29	14.41
V_{gl}	0.0567	0.0546	0.0419	0.0373	0.0306	0.0391	0.0368	0.0347	0.0530	0.0419
$V_{gl\ (\%)}$	5.67	5.46	4.19	3.73	3.06	3.91	3.68	3.47	5.3	4.19

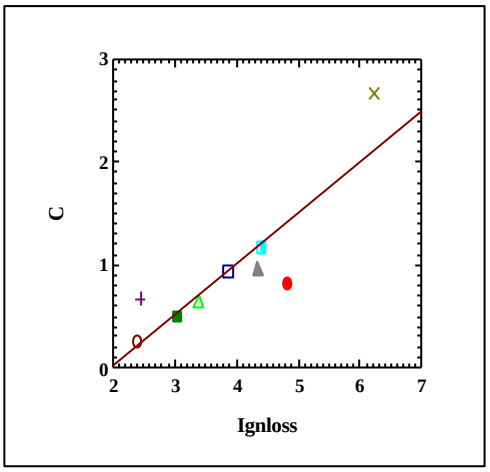
Appendix: 7.4.6. Ignition loss determination

Borehole N°4

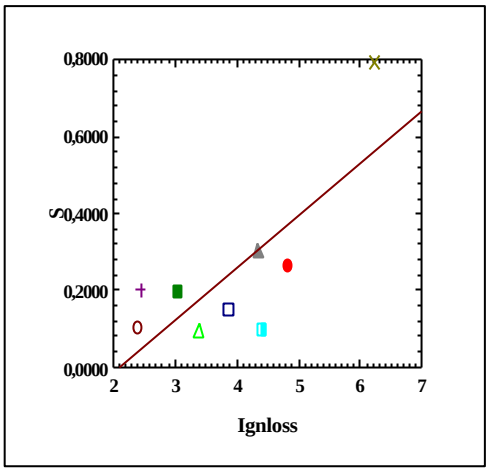
Sample N°	IV. 0-1m	IV. 1-2m	IV. 2-3m	IV. 3-4m	IV. 4-5m	IV. 5-6m	IV. 6-7m	IV. 7-8m
saucepan N°	16	25	22	4	6	24	23	6
m_B (g)	58.33	71.2	70.17	75.07	68.81	66.5	71.6	64.87
$m_d + m_B$ (g)	73.36	86.23	100.19	90.24	84.1	81.52	86.63	80.03
$m_{gl} + m_B$ (g) (1)	73.03	85.84	99.58	89.21	83.32	80.98	85.95	79.31
$m_{gl} + m_B$ (g) (2)	72.94	85.81	99.59	89.2	83.31	80.97	85.94	79.19
$m_{gl} + m_B$ (g) (3)	72.94							79.16
$m_{gl} + m_B$ (g) (4)								
m_d	15.03	15.03	30.02	15.17	15.29	15.02	15.03	15.16
m_{gl}	14.61	14.61	29.42	14.13	14.5	14.47	14.34	14.29
V_{gl}	0.0279	0.0279	0.0200	0.0686	0.0517	0.036617843	0.0459	0.0574
$V_{gl\ (\%)}$	2.79	2.79	2.0	6.86	5.17	3.66	4.59	5.74

Sample N°	IV. 8-9m	IV. 9-10m	IV. 10-11m	IV. 11-12m
saucepan N°	2	5	17	16
m_B (g)	71.71	68.81	59.96	58.32
$m_d + m_B$ (g)	86.72	83.85	75.05	73.35
$m_{gl} + m_B$ (g) (1)	85.86	83.26	74.27	72.83
$m_{gl} + m_B$ (g) (2)	85.85	83.21	74.27	72.83
$m_{gl} + m_B$ (g) (3)		83.19		
$m_{gl} + m_B$ (g) (4)				
m_d	15.01	15.04	15.09	15.03
m_{gl}	14.14	14.38	14.31	14.51
V_{gl}	0.0580	0.0439	0.0517	0.0346
$V_{gl\ (\%)}$	5.8	4.39	5.17	3.46

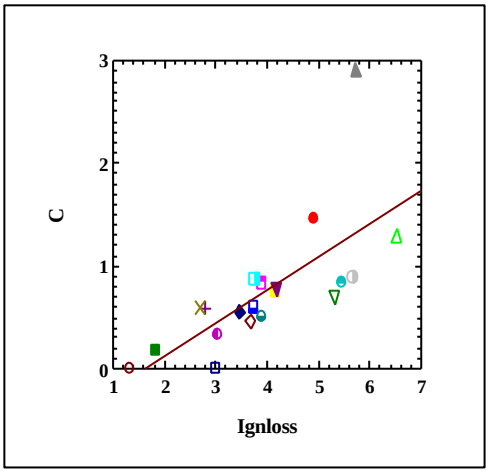
Appendix: 7.4.7. **The relationship between ignition loss & carbon as well as sulphur in different boreholes.**



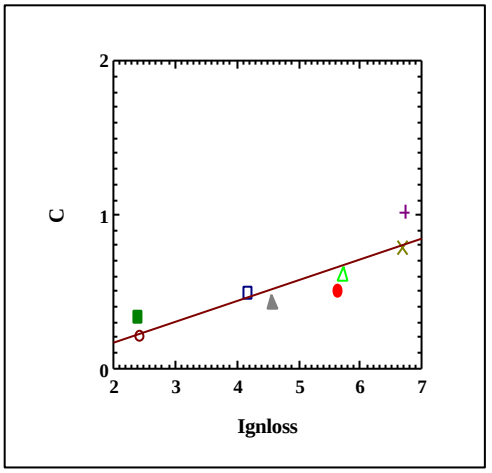
App. 7.4.7.1.: The relationship between ignition loss & carbon in the borehole N°1. (R= 0.87)



App. 7.4.7.2.: The relationship between ignition loss & sulphur in the borehole N°1. (R= 0.76)



App. 7.4.6.3.: The relationship between ignition loss & carbon in the borehole N°2. (R= 0.69)



App. 7.4.6.4.: The relationship between ignition loss & carbon in the borehole N°3. (R= 0.90)

Appendix: 7.4.8. **CO_2 content determination**

Borehole N°1

Sample	Mass(g)	T (°C)	Pabs (mbar)	Pabs (kPa)	reading	T (°K)	V_0	m_{Ca}	Vca	CO_2(%)
I. 0-1m	5.14	23	1022	102.2	21.9	296	20.29	0.091	0.018	1.78
I. 1-1.5m	5.08	24	1023	102.3	22.5	297	20.80	0.094	0.018	1.84
I. 1.5-2.5m	5.16	24	1022	102.2	14	297	12.93	0.058	0.011	1.13
I. 2.5-3.5m	5.02	24	1022	102.2	22.2	297	20.50	0.092	0.018	1.84
I. 3.5-4.5m	2.22	24	1022	102.2	32.4	297	29.92	0.135	0.061	6.06
I. 5.5-6.5	5.02	24	1020.5	102.05	52.6	297	48.51	0.218	0.043	4.35
I. 6.5-7.5m	5.13	24	1020.5	102.05	31.6	297	29.14	0.131	0.026	2.56
I. 7.5-8.5m	5.06	24	1020	102	24.5	297	22.58	0.102	0.020	2.01
I. 8.5-9.5m	5.15	24	1020	102	1.9	297	1.75	0.008	0.002	0.15

Borehole N°2

Sample	Mass(g)	T (°C)	Pabs (mbar)	Pabs (kPa)	reading	T (°K)	V_0	m_{Ca}	Vca	CO_2(%)
II. 0-0.5m	5.15	20	1023	102.3	3.6	293	3.37	0.015	0.003	0.29
II. 0.5-1.5m	5.21	20	1023	102.3	2.6	293	2.44	0.011	0.002	0.21
II. 2.5-3.5m	5.41	20	1023	102.3	3.4	293	3.19	0.014	0.003	0.26
II. 3.5-4.5m	3.26	20	1023	102.3	11	293	10.31	0.046	0.014	1.42
II. 4.5-5.5m	5.07	20	1023	102.3	22.9	293	21.46	0.097	0.019	1.90
II. 5.5-6.5m	3.06	20.5	1023.5	102.35	30	293.5	28.08	0.126	0.041	4.13
II. 6.5-7.5m	5.1	21	1023.5	102.35	77.8	294	72.69	0.327	0.064	6.41
II. 7.5-8.5m	5	19	1028	102.8	50.6	292	47.81	0.215	0.043	4.30
II. 8.5-9.5m	5.08	19	1028	102.8	46	292	43.47	0.195	0.038	3.85
II. 9.5-10.5m	5.1	19	1028	102.8	44	292	41.58	0.187	0.037	3.67
II. 10.5-11.5m	5.2	19	1028	102.8	51.8	292	48.95	0.220	0.042	4.23
II. 11.5-12.5m	5.19	19	1028	102.8	51.8	292	48.95	0.220	0.042	4.24
II. 12.5-13.5m	5.07	19	1028	102.8	43.5	292	41.10	0.185	0.036	3.65
II. 13.5-14.5m	5.04	19	1029	102.9	29.8	292	28.19	0.127	0.025	2.52
II. 14.5-15.5m	5	19	1029	102.9	17.3	292	16.36	0.074	0.015	1.47
II. 15.5-16.5m	5.04	19	1029	102.9	26.4	292	24.97	0.112	0.022	2.23
II. 16.5-17.5m	5.7	19	1029	102.9	26.6	292	25.16	0.113	0.020	1.99
II. 17.5-18.5m	5.08	19	1029	102.9	29.4	292	27.81	0.125	0.025	2.46
II. 18.5-19.5m	5.53	19	1029	102.9	49.6	292	46.91	0.211	0.038	3.82
II. 19.5-20.2m	5.34	19	1029	102.9	6.2	292	5.86	0.026	0.005	0.49

Appendix: 7.4.8. **CO_2 content determination**

Borehole N°3

Sample	Mass(g)	T (°C)	Pabs (mbar)	Pabs (kPa)	reading	T (°K)	V_0	m_{Ca}	Vca	CO_2(%)
III. 0-1m	5.02	23	1016	101.6	7.6	296	7.00	0.031	0.006	0.63
III. 1-2m	2.04	20	1023	102.3	14	293	13.12	0.059	0.029	2.89
III. 2-3m	5.04	23	1016	101.6	6	296	5.53	0.025	0.005	0.49
III. 3-4m	3.07	20	1023	102.3	24.1	293	22.58	0.102	0.033	3.31
III. 4-5m	5.35	23.5	1015	101.5	34.9	296.5	32.07	0.144	0.027	2.70
III. 5-6m	5.06	20	1023.5	102.35	20	293	18.75	0.084	0.017	1.67
III. 6-7m	5.02	23	1016	101.6	19.2	296	17.69	0.080	0.016	1.58
III. 7-8m	5	20.5	1023	102.3	36.6	293.5	34.24	0.154	0.031	3.08

Borehole N°4

Sample	Mass(g)	T (°C)	Pabs (mbar)	Pabs (kPa)	reading	T (°K)	V_0	m_{Ca}	Vca	CO_2(%)
IV. 0-1m	5.04	23	1013	101.3	3.4	296	3.12	0.014	0.003	0.28
IV. 1-2m	5.1	23	1013	101.3	13	296	11.94	0.054	0.011	1.05
IV. 2-3m	5	24	1022	102.2	9.9	297	9.14	0.041	0.008	0.82
IV. 3-4m	2.25	23	1013	101.3	19.1	296	17.54	0.079	0.035	3.51
IV. 4-5m	5.03	23	1013	101.3	21.5	296	19.75	0.089	0.018	1.77
IV. 5-6m	5	24	1022	102.2	16.4	297	15.15	0.068	0.014	1.36
IV. 6-7m	5	23	1013	101.3	18.5	296	16.99	0.076	0.015	1.53
IV. 7-8m	2.08	24	1022	102.2	23.6	297	21.80	0.098	0.047	4.71
IV. 8-9m	5.04	23.5	1022	102.2	28	296.5	25.90	0.117	0.023	2.31
IV. 9-10m	5.02	24	1022	102.2	13	297	12.01	0.054	0.011	1.08
IV. 10-11m	5.1	24	1022	102.2	3.4	297	3.14	0.014	0.003	0.28
IV. 11-12m	5.2	23	1013	101.3	20.9	296	19.20	0.086	0.017	1.66

Appendix: 7.4.9. The Clarke abundance ratio and the weight mean value of different elements in the region Of Ore Mountains

Element	weight mean value: Lithol.-stratigraphic (ppm)	weight mean value: Stratigraphic (ppm)	Clark abundance ratio (ppm)
Al (x)	51400	49560	67000
Ca (x)	6210	6030	20000
Fe (x)	21990	23350	32000
K (x)	12360	11990	18000
Mg (x)	7560	6980	8000
Na (x)	4020	3530	11000
P (x)	800	760	-
Si (x)	249090	253640	330000
Ag	0.27	0.33	0.1
As	25.4	26.8	1.5
B	63	69	10
Ba	410	427	500
Be	6.5	5.1	6
Cd	0.2	0.2	0.5
Co	15	15	8
Cr	103	103	200
Cs (x)	32	29	6
Cu	28	31	20
Ga	32	31	15
I	4.4	3.9	3
Li (x)	181	197	30
Mn	557	575	850
Mo	2.3	2.3	3
Nb	25	24	30
Ni	44	44	40
Pb	105	100	10
Rb (x)	237	211	60
Se	0.23	0.23	0.2
Sn	18	15	10
Ti	5770	6330	5000
V	84	93	100
Y			
Zn	75	72	50
Zr	366	454	300

Appendix: 7.4.10. Results of the test samples from the tailings pond of the Schneckenstein site (former "unit32").

Settling basin (S1)

Sample	Sb	As	Cu	Ag	Bi	Co	Ni	Zn	Pb	Mo	Ge	Cd	Sn	W	V	Cs	Mn	Ti	Cr	Y	Li	Sr	U_1	U_2
1	20	300	2500	6	25	0.1%	1%	1000	500	25	4	8	35	90	0.1%	110	4200	1%	600	500	230	600	1200	290
2	3	300	1400	6	7	300	4000	3800	500	25	5	6	20	40	500	50	3400	1%	600	500	230	1000	700	130
3	3	300	1100	4	30	300	4000	3800	500	15	5	8	35	30	500	50	2100	1%	620	650	230	600	975	160
Ø	9	300	1700	5	21	500	6000	2870	500	22	5	7	30	33	660	73	3230	1%	607	550	230	730	958	193

Settling basin (S2)

Sample	Sb	As	Cu	Ag	Bi	Co	Ni	Zn	Pb	Mo	Ge	Cd	Sn	W	V	Cs	Mn	Ti	Cr	Y	Li	Sr	U_1	U_2
1	8	1000	750	2	30	300	4000	160	250	10	4	-	240	40	500	30	2100	1%	300	400	230	600	240	240
2	1	1900	1100	6	30	300	1%	1000	500	15	5	-	40	60	500	35	2400	1%	875	260	340	600	700	400
3	1	1000	1100	4	25	300	4000	1000	500	15	4	-	240	40	500	30	1800	1%	600	360	230	600	830	370
Ø	3	1300	980	4	28	300	6000	730	420	13	4	-	170	45	500	32	2100	1%	590	340	270	600	590	337

Settling basin (S2a)

Sample	Sb	As	Cu	Ag	Bi	Co	Ni	Zn	Pb	Mo	Ge	Cd	Sn	W	V	Cs	Mn	Ti	Cr	Y	Li	Sr	U_1	U_2
1	40	1%	1800	2	100	5	10	40	15	6	6	-	0.1%	200	75	-	-	3000	30	140	200	1000	35	40
2	3	1900	300	2	30	120	600	400	150	5	4	-	400	20	230	15	2100	1%	280	500	280	130	190	140
3	20	1%	1400	2	300	7	20	120	15	6	5	-	0.1%	140	55	-	450	1700	18	100	180	1000	60	80
Ø	21	7300	1170	2	143	44	210	187	60	6	5	-	800	120	120	5	850	4900	109	247	220	710	95	83

* U_1: radioactivity measured in R/h.
* U_2: uranium content in g/t, (radiometric).

Appendix: 7.4.11. The local and regional Clarke abundance ratio for the Schlema- Alberoda area as well as for the entire Ore Mountains in ppm (Ra in Bq/g at local Clarke).

Element	Local Clarke Schlema- Alberoda	Regional Clarke / (Global Clarke)
Ag	1	(0.07)
As	28	(1.70)
B	10[2)]	32
Ba	81	520
Bi	1.2[4)]	(0.009)
Cd	< 1[4)]	(0.13)
Co	20	9.8
Cu	29	23
Mo	6[1)]	(1.1)
Ni	57	23
Pb	22	23
Ra	0.08[3)]	(10^{-6})
Sb	0.518[4)]	(0.5)
Se	4[4)]	(0.05)
Sn	3	7.5
Sr	52[4)]	110
Th	12	(13)
U	5[3)]	(2.5)
V	58	70
W	< 10[4)]	4.1
Zn	89[4)]	79

The regional Clarke is after PALCHEN & al. (1987), in SEIM & TISCHENDORF (1990).
The Global Clarke is after VINOGRADOV (1962), in SEIM & TISCHENDORF (1990).

[1)]Without lamprophyre.
[2)]Without main quartzite.
[3)]Without lamprophyre and main quartzite.
[4)]Without lamprophyre, main quartzite and granite.

Appendix: 7.4.12. The average elements concentrations in soils covering the most important rock varieties from the Schlema- Alberoda area in ppm (Ra in Bq/g).

Element	A	B	C	D	E
Ag	0.08	0.08	0.08	0.08	0.08
As	87	48	60	23	26
Bi	2	2	2	2	2
Co	49	47	36	20	18
Cu	25	37	51	24	31
Mn	1600	1700	1600	1000	1275
Ni	96	83	110	42	67
Pb	51	44	71	23	55
Ra	<0.025	0.043	<0.025	<0.025	0.038
Th	4.3	5.2	7.8	14.5	16
U	<2	3.5	<2	<2	3.1
Zn	240	160	188	110	120

A: soil covering metadiabase (homogeneous); B: soil covering metadiabase (altered); C: soil covering alum and siliceous schist; D: soil covering dark phyllite; E: soil covering light phyllite.

The local trace elements concentrations in soils in the Schlema- Alberoda area (local Clarke) and in the world-wide in ppm (Ra in Bq/g).

Element	Local soil Clarke	Global soil Clarke
Ag	0.08	
As	32	5
Bi	2	
Co	30	18
Cu	30	20
Mn	1228	850
Ni	65	40
Pb	46	10
Ra	0.03	
Th	12	6
U	2.6	1
Zn	127	50

Factor Loadings (Unrotated) (core1.sta) Extraction: Principal components (Marked loadings are > .700000)					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
V	0,83	-0,31	0,27	0,19	0,20
Cr	0,86	0,13	0,23	-0,33	-0,07
Co	0,94	-0,07	0,09	0,05	0,00
Ni	0,88	-0,26	0,10	0,15	0,00
Cu	0,85	-0,14	-0,32	0,20	0,03
Zn	0,65	-0,20	-0,64	0,09	-0,15
Ga	-0,26	0,02	-0,55	-0,64	0,26
As	0,83	-0,10	0,14	-0,45	0,07
Rb	-0,85	-0,29	-0,34	-0,15	0,00
Sr	0,83	-0,02	-0,42	0,27	0,01
Y	0,95	0,04	0,03	-0,11	-0,13
Zr	0,31	0,74	-0,16	0,47	0,07
Nb	-0,55	-0,65	0,19	-0,34	0,15
Sn	-0,64	-0,56	-0,33	-0,27	-0,21
Ba	0,84	-0,33	0,15	0,21	0,10
La	0,83	-0,06	-0,29	0,00	0,35
Ce	0,65	0,60	-0,29	-0,20	-0,18
W	-0,11	-0,06	0,44	-0,09	-0,69
Pb	0,45	-0,42	-0,68	0,18	-0,11
Bi	0,44	0,21	-0,24	-0,50	0,27
U	0,21	0,05	0,35	-0,42	0,49
SiO_2	-0,90	-0,15	0,11	0,22	-0,04
Al_2O_3	0,71	0,40	-0,40	-0,21	0,04
Fe_2O_3	0,80	0,29	0,30	-0,33	-0,05
MnO	0,73	-0,02	-0,40	-0,16	-0,47
MgO	0,86	-0,29	0,27	-0,12	-0,07
CaO	0,77	-0,56	-0,04	0,18	0,03
Na_2O	-0,85	0,31	0,06	0,11	0,30
K_2O	-0,54	0,06	-0,73	-0,16	0,11
TiO_2	0,73	0,26	0,46	-0,29	-0,03
P_2O_5	0,00	-0,84	0,06	-0,42	-0,06
S	0,52	-0,51	0,10	0,49	0,38
Expl.Var	16,01	4,12	3,71	2,73	1,69
Prp.Totl	0,50	0,13	0,12	0,09	0,05

Factor Loadings (Varimax raw) (core1.sta) Extraction: Principal components (Marked loadings are > .700000)					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
V	0,82	0,02	0,18	0,49	-0,02
Cr	0,21	0,10	0,22	0,91	0,00
Co	0,54	0,17	0,39	0,65	-0,03
Ni	0,67	0,05	0,39	0,51	-0,08
Cu	0,53	0,22	0,66	0,33	0,13
Zn	0,25	0,07	0,88	0,12	0,17
Ga	-0,51	-0,31	0,15	-0,05	0,68
As	0,28	-0,14	0,26	0,86	0,17
Rb	-0,44	-0,48	-0,10	-0,70	0,15
Sr	0,46	0,35	0,71	0,26	0,15
Y	0,35	0,17	0,46	0,75	-0,03
Zr	0,03	0,93	0,11	0,04	0,05
Nb	-0,03	-0,83	-0,35	-0,26	0,07
Sn	-0,36	-0,73	0,14	-0,53	0,00
Ba	0,76	0,02	0,32	0,45	-0,05
La	0,51	0,19	0,47	0,43	0,45
Ce	-0,22	0,54	0,47	0,59	0,14
W	-0,25	-0,21	-0,08	0,18	-0,74
Pb	0,32	-0,10	0,86	-0,13	0,15
Bi	-0,11	0,05	0,20	0,52	0,54
U	0,14	-0,13	-0,40	0,50	0,39
SiO_2	-0,24	-0,22	-0,45	-0,73	-0,22
Al_2O_3	-0,04	0,42	0,53	0,54	0,36
Fe_2O_3	0,13	0,21	0,10	0,92	-0,01
MnO	-0,01	0,06	0,83	0,47	-0,10
MgO	0,54	-0,14	0,28	0,71	-0,13
CaO	0,75	-0,18	0,50	0,30	-0,04
Na_2O	-0,37	0,14	-0,63	-0,58	0,16
K_2O	-0,52	-0,09	0,23	-0,56	0,47
TiO_2	0,17	0,19	-0,05	0,90	-0,09
P_2O_5	0,17	-0,92	0,13	0,08	0,00
S	0,95	-0,02	0,14	-0,01	0,07
Expl.Var	6,19	4,32	6,07	9,36	2,31
Prp.Totl	0,19	0,13	0,19	0,29	0,07

Factor Loadings (Unrotated) (core1.sta) Extraction: Principal components (Marked loadings are > .700000)					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
V	0,82	-0,28	-0,31	0,22	0,22
Cr	0,87	0,13	-0,24	-0,32	-0,07
Co	0,94	-0,07	-0,11	0,07	0,00
Ni	0,87	-0,26	-0,14	0,18	0,00
Cu	0,85	-0,19	0,29	0,21	0,04
Zn	0,65	-0,30	0,59	0,09	-0,13
Ga	-0,25	-0,08	0,53	-0,68	0,22
As	0,83	-0,12	-0,18	-0,44	0,06
Rb	-0,85	-0,33	0,30	-0,16	0,00
Sr	0,83	-0,08	0,41	0,27	0,02
Y	0,95	0,01	-0,04	-0,09	-0,12
Zr	0,32	0,72	0,28	0,43	0,08
Nb	-0,56	-0,62	-0,28	-0,31	0,16
Sn	-0,64	-0,60	0,25	-0,26	-0,21
La	0,83	-0,11	0,27	-0,01	0,35
Ce	0,68	0,52	0,35	-0,22	-0,19
W	-0,12	0,00	-0,44	-0,08	-0,70
Pb	0,45	-0,52	0,61	0,19	-0,09
Bi	0,44	0,16	0,25	-0,54	0,22
U	0,22	0,07	-0,36	-0,41	0,51
SiO_2	-0,91	-0,10	-0,11	0,22	-0,05
Al_2O_3	0,73	0,32	0,44	-0,23	0,04
Fe_2O_3	0,81	0,29	-0,29	-0,32	-0,05
MnO	0,73	-0,11	0,37	-0,15	-0,46
MgO	0,85	-0,28	-0,33	-0,08	-0,06
CaO	0,76	-0,56	-0,04	0,22	0,04
Na_2O	-0,85	0,35	0,00	0,08	0,30
K_2O	-0,53	-0,04	0,73	-0,20	0,11
TiO_2	0,73	0,29	-0,44	-0,27	-0,02
P_2O_5	-0,01	-0,85	-0,19	-0,37	-0,05
S	0,50	-0,47	-0,15	0,51	0,39
Expl.Var	15,32	4,02	3,68	2,69	1,68
Prp.Totl	0,49	0,13	0,12	0,09	0,05

Factor Loadings (Varimax raw) (core1.sta) Extraction: Principal components (Marked loadings are > .700000)					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
V	0,57	0,04	0,44	0,58	0,29
Cr	0,05	-0,11	0,25	0,92	-0,02
Co	0,31	-0,15	0,54	0,70	0,09
Ni	0,44	-0,02	0,58	0,57	0,11
Cu	0,18	-0,20	0,80	0,37	0,19
Zn	-0,11	-0,10	0,92	0,14	0,03
Ga	-0,86	0,25	0,03	-0,08	0,24
As	-0,03	0,13	0,34	0,89	0,12
Rb	-0,40	0,45	-0,21	-0,73	-0,04
Sr	0,13	-0,34	0,83	0,29	0,17
Y	0,14	-0,18	0,53	0,77	-0,02
Zr	0,06	-0,93	0,10	0,03	0,10
Nb	-0,03	0,85	-0,31	-0,25	0,11
Sn	-0,34	0,69	0,03	-0,56	-0,21
La	0,02	-0,17	0,64	0,49	0,47
Ce	-0,36	-0,60	0,35	0,56	-0,13
W	0,19	0,18	-0,23	0,14	-0,76
Pb	-0,04	0,08	0,93	-0,11	0,07
Bi	-0,50	-0,08	0,18	0,52	0,26
U	-0,05	0,16	-0,30	0,53	0,47
SiO_2	0,07	0,24	-0,50	-0,75	-0,14
Al_2O_3	-0,36	-0,46	0,49	0,53	0,13
Fe_2O_3	0,03	-0,22	0,11	0,93	-0,03
MnO	-0,17	-0,12	0,75	0,45	-0,33
MgO	0,37	0,16	0,43	0,76	0,01
CaO	0,45	0,22	0,72	0,37	0,17
Na_2O	-0,17	-0,13	-0,70	-0,61	0,18
K_2O	-0,69	0,03	0,09	-0,61	0,13
TiO_2	0,16	-0,18	-0,02	0,91	-0,03
P_2O_5	0,02	0,92	0,20	0,10	-0,01
S	0,66	0,11	0,46	0,10	0,48
Expl.Var	3,60	4,37	7,69	9,86	1,87
Prp.Totl	0,12	0,14	0,25	0,32	0,06

Factor Loadings (Unrotated) (core1.sta)			
Extraction: Principal components			
(Marked loadings are > .700000)			
	Factor	Factor	Factor
	1	2	3
V	0,84	-0,36	0,25
Cr	0,85	0,20	0,21
Co	0,94	-0,07	0,08
Ni	0,88	-0,28	0,08
Cu	0,86	-0,13	-0,31
Zn	0,65	-0,14	-0,65
Ga	-0,27	0,18	-0,60
As	0,82	-0,01	0,08
Rb	-0,85	-0,24	-0,37
Sr	0,83	-0,02	-0,40
Y	0,94	0,08	0,02
Zr	0,31	0,63	-0,04
Nb	-0,54	-0,59	0,09
Sn	-0,64	-0,45	-0,42
Ba	0,85	-0,37	0,13
La	0,84	-0,04	-0,29
Ce	0,64	0,67	-0,25
W	-0,11	-0,06	0,41
Pb	0,46	-0,38	-0,70
Bi	0,43	0,30	-0,25
U	0,20	0,09	0,32
SiO_2	-0,89	-0,21	0,12
Al_2O_3	0,70	0,48	-0,38
Fe_2O_3	0,79	0,34	0,29
MnO	0,71	0,08	-0,42
MgO	0,86	-0,26	0,22
CaO	0,78	-0,56	-0,08
Na_2O	-0,85	0,24	0,12
K_2O	-0,54	0,13	-0,73
TiO_2	0,72	0,30	0,45
P_2O_5	0,00	-0,72	-0,08
S	0,55	-0,62	0,10
C	0,47	-0,48	0,14
Expl.Var	16,21	4,27	3,72
Prp.Totl	0,49	0,13	0,11

Factor Loadings (Varimax raw) (core1.sta)			
Extraction: Principal components			
(Marked loadings are > .700000)			
	Factor	Factor	Factor
	1	2	3
V	0,91	0,11	0,27
Cr	0,64	0,60	0,18
Co	0,76	0,41	0,40
Ni	0,81	0,19	0,41
Cu	0,52	0,29	0,71
Zn	0,19	0,16	0,89
Ga	-0,59	-0,01	0,34
As	0,65	0,40	0,33
Rb	-0,71	-0,64	-0,03
Sr	0,41	0,37	0,74
Y	0,66	0,53	0,42
Zr	-0,07	0,70	0,04
Nb	-0,09	-0,78	-0,21
Sn	-0,49	-0,73	0,15
Ba	0,85	0,10	0,38
La	0,48	0,36	0,65
Ce	0,04	0,88	0,37
W	0,16	-0,09	-0,39
Pb	0,13	-0,13	0,90
Bi	0,05	0,46	0,35
U	0,28	0,20	-0,20
SiO_2	-0,50	-0,62	-0,48
Al_2O_3	0,11	0,74	0,55
Fe_2O_3	0,58	0,69	0,05
MnO	0,26	0,40	0,68
MgO	0,85	0,20	0,28
CaO	0,77	-0,11	0,57
Na_2O	-0,66	-0,20	-0,56
K_2O	-0,84	-0,18	0,33
TiO_2	0,63	0,63	-0,11
P_2O_5	0,27	-0,64	0,23
S	0,72	-0,27	0,32
C	0,62	-0,18	0,21
Expl.Var	10,51	7,12	6,58
Prp.Totl	0,32	0,22	0,20

Factor Loadings (Unrotated) (core1.sta)					
Extraction: Principal components					
(Marked loadings are > .700000)					
	Factor	Factor	Factor	Factor	Factor
	1	2	3	4	5
V	0,84	-0,36	0,25	0,09	0,16
Cr	0,85	0,20	0,21	-0,35	-0,03
Co	0,94	-0,07	0,08	0,01	-0,01
Ni	0,88	-0,28	0,08	0,07	-0,02
Cu	0,86	-0,13	-0,31	0,19	0,00
Zn	0,65	-0,14	-0,65	0,08	-0,17
Ga	-0,27	0,18	-0,60	-0,50	0,37
As	0,82	-0,01	0,08	-0,48	0,13
Rb	-0,85	-0,24	-0,37	-0,15	0,03
Sr	0,83	-0,02	-0,40	0,28	-0,04
Y	0,94	0,08	0,02	-0,14	-0,12
Zr	0,31	0,63	-0,04	0,62	0,02
Nb	-0,54	-0,59	0,09	-0,46	0,17
Sn	-0,64	-0,45	-0,42	-0,35	-0,19
Ba	0,85	-0,37	0,13	0,13	0,07
La	0,84	-0,04	-0,29	0,05	0,35
Ce	0,64	0,67	-0,25	-0,07	-0,14
W	-0,11	-0,06	0,41	-0,19	-0,65
Pb	0,46	-0,38	-0,70	0,14	-0,15
Bi	0,43	0,30	-0,25	-0,35	0,38
U	0,20	0,09	0,32	-0,40	0,50
SiO_2	-0,89	-0,21	0,12	0,18	-0,07
Al_2O_3	0,70	0,48	-0,38	-0,08	0,08
Fe_2O_3	0,79	0,34	0,29	-0,32	-0,01
MnO	0,71	0,08	-0,42	-0,19	-0,45
MgO	0,86	-0,26	0,22	-0,24	-0,07
CaO	0,78	-0,56	-0,08	0,05	-0,02
Na_2O	-0,85	0,24	0,12	0,22	0,30
K_2O	-0,54	0,13	-0,73	-0,03	0,14
TiO_2	0,72	0,30	0,45	-0,31	-0,02
P_2O_5	0,00	-0,72	-0,08	-0,61	-0,05
S	0,55	-0,62	0,10	0,40	0,31
C	0,47	-0,48	0,14	0,64	0,19
Expl.Var	16,21	4,27	3,72	3,19	1,74
Prp.Totl	0,49	0,13	0,11	0,10	0,05

Factor Loadings (Varimax raw) (core1.sta)					
Extraction: Principal components					
(Marked loadings are > .700000)					
	Factor	Factor	Factor	Factor	Factor
	1	2	3	4	5
V	0,76	-0,01	0,19	0,57	-0,02
Cr	0,11	0,10	0,23	0,92	0,03
Co	0,49	0,16	0,40	0,69	-0,01
Ni	0,62	0,03	0,40	0,57	-0,07
Cu	0,51	0,20	0,67	0,36	0,13
Zn	0,23	0,07	0,89	0,13	0,16
Ga	-0,49	-0,27	0,14	-0,13	0,71
As	0,19	-0,14	0,27	0,87	0,21
Rb	-0,38	-0,46	-0,11	-0,75	0,14
Sr	0,44	0,33	0,72	0,29	0,14
Y	0,27	0,17	0,48	0,77	-0,02
Zr	0,06	0,93	0,11	0,04	0,03
Nb	-0,04	-0,84	-0,34	-0,26	0,06
Sn	-0,34	-0,71	0,14	-0,56	0,00
Ba	0,73	0,00	0,32	0,51	-0,04
La	0,49	0,18	0,47	0,45	0,46
Ce	-0,25	0,56	0,48	0,56	0,16
W	-0,24	-0,19	-0,08	0,16	-0,72
Pb	0,32	-0,11	0,86	-0,11	0,14
Bi	-0,09	0,08	0,19	0,46	0,59
U	0,06	-0,14	-0,38	0,51	0,38
SiO_2	-0,18	-0,22	-0,46	-0,74	-0,24
Al_2O_3	-0,06	0,43	0,53	0,51	0,38
Fe_2O_3	0,04	0,21	0,11	0,93	0,02
MnO	-0,06	0,06	0,84	0,46	-0,08
MgO	0,45	-0,16	0,30	0,77	-0,11
CaO	0,70	-0,21	0,51	0,37	-0,04
Na_2O	-0,30	0,15	-0,65	-0,62	0,14
K_2O	-0,44	-0,06	0,21	-0,64	0,46
TiO_2	0,07	0,18	-0,03	0,93	-0,07
P_2O_5	0,10	-0,93	0,15	0,10	0,00
S	0,96	-0,06	0,14	0,08	0,05
C	0,92	0,19	0,10	-0,05	-0,09
Expl.Var	6,15	4,33	6,20	10,08	2,37
Prp.Totl	0,19	0,13	0,19	0,31	0,07

Factor Loadings (Unrotated) (core2.sta) Extraction: Principal components (Marked loadings are > .700000)			
	Factor	Factor	Factor
	1	2	3
V	0,65	-0,04	0,64
Cr	0,88	-0,17	0,10
Co	0,91	-0,31	0,02
Ni	0,79	-0,42	0,29
Cu	0,74	-0,02	-0,13
Zn	0,43	0,37	-0,50
Ga	0,28	-0,35	-0,60
As	0,10	-0,90	-0,07
Rb	-0,67	-0,58	-0,40
Sr	0,81	-0,15	-0,28
Y	0,86	0,29	0,01
Zr	0,57	0,55	-0,36
Nb	-0,42	-0,39	0,10
Sn	-0,66	-0,62	-0,26
Ba	0,78	-0,16	0,06
La	0,01	0,58	0,07
Ce	0,52	-0,25	0,04
W	0,60	-0,46	0,08
Pb	0,67	0,10	-0,51
Bi	0,52	-0,37	-0,17
U	0,79	-0,23	0,15
SiO_2	-0,84	-0,19	0,40
Al_2O_3	0,47	0,41	-0,70
Fe_2O_3	0,74	0,43	-0,04
MnO	0,77	0,09	-0,31
MgO	0,88	-0,09	0,12
CaO	0,87	-0,36	0,03
Na_2O	0,05	-0,53	-0,44
K_2O	-0,41	-0,14	-0,81
TiO_2	0,60	0,43	0,25
P_2O_5	0,26	-0,85	-0,02
S	0,60	-0,24	0,50
Expl.Var	13,40	5,30	3,84
Prp.Totl	0,42	0,17	0,12

Factor Loadings (Varimax raw) (core2.sta) Extraction: Principal components (Marked loadings are > .700000)			
	Factor	Factor	Factor
	1	2	3
V	0,70	0,56	-0,15
Cr	0,81	0,21	0,33
Co	0,89	0,07	0,35
Ni	0,94	0,12	0,05
Cu	0,55	0,14	0,49
Zn	-0,01	0,11	0,75
Ga	0,25	-0,52	0,47
As	0,56	-0,68	-0,24
Rb	-0,31	-0,88	-0,28
Sr	0,64	-0,02	0,59
Y	0,51	0,49	0,56
Zr	0,05	0,37	0,78
Nb	-0,08	-0,36	-0,45
Sn	-0,24	-0,82	-0,40
Ba	0,72	0,17	0,31
La	-0,30	0,48	0,17
Ce	0,56	0,00	0,16
W	0,75	-0,10	0,09
Pb	0,33	-0,01	0,78
Bi	0,57	-0,21	0,27
U	0,79	0,17	0,22
SiO_2	-0,44	-0,17	-0,82
Al_2O_3	-0,05	0,03	0,94
Fe_2O_3	0,32	0,53	0,59
MnO	0,47	0,13	0,68
MgO	0,77	0,28	0,34
CaO	0,89	0,04	0,30
Na_2O	0,21	-0,63	0,16
K_2O	-0,46	-0,72	0,34
TiO_2	0,30	0,66	0,29
P_2O_5	0,67	-0,56	-0,17
S	0,74	0,31	-0,15
Expl.Var	10,15	5,60	6,78
Prp.Totl	0,32	0,18	0,21

Factor Loadings (Unrotated) (core2.sta) Extraction: Principal components (Marked loadings are > .700000)			
	Factor	Factor	Factor
	1	2	3
V	0,65	-0,05	0,64
Cr	0,88	-0,19	0,11
Co	0,90	-0,33	0,02
Ni	0,79	-0,43	0,30
Cu	0,75	-0,04	-0,13
Zn	0,45	0,36	-0,50
Ga	0,28	-0,35	-0,60
As	0,08	-0,90	-0,07
Rb	-0,68	-0,57	-0,40
Sr	0,81	-0,17	-0,28
Y	0,87	0,27	0,01
Zr	0,59	0,53	-0,36
Nb	-0,43	-0,38	0,10
Sn	-0,67	-0,61	-0,26
La	0,01	0,59	0,07
Ce	0,52	-0,26	0,04
W	0,59	-0,46	0,08
Pb	0,67	0,09	-0,51
Bi	0,52	-0,38	-0,16
U	0,79	-0,25	0,16
SiO_2	-0,84	-0,18	0,40
Al_2O_3	0,48	0,40	-0,70
Fe_2O_3	0,73	0,43	-0,04
MnO	0,78	0,07	-0,30
MgO	0,87	-0,10	0,12
CaO	0,86	-0,37	0,04
Na_2O	0,05	-0,53	-0,43
K_2O	-0,41	-0,14	-0,81
TiO_2	0,60	0,42	0,25
P_2O_5	0,25	-0,86	-0,01
S	0,60	-0,25	0,51
Expl.Var	12,81	5,28	3,83
Prp.Totl	0,41	0,17	0,12

Factor Loadings (Varimax raw) (core2.sta) Extraction: Principal components (Marked loadings are > .700000)			
	Factor	Factor	Factor
	1	2	3
V	0,71	0,57	-0,13
Cr	0,80	0,22	0,34
Co	0,88	0,07	0,37
Ni	0,93	0,12	0,06
Cu	0,56	0,15	0,50
Zn	-0,01	0,11	0,75
Ga	0,24	-0,52	0,48
As	0,56	-0,67	-0,23
Rb	-0,30	-0,88	-0,29
Sr	0,63	-0,02	0,60
Y	0,50	0,49	0,57
Zr	0,04	0,37	0,79
Nb	-0,08	-0,36	-0,45
Sn	-0,22	-0,82	-0,40
La	-0,31	0,47	0,17
Ce	0,56	0,01	0,17
W	0,74	-0,09	0,10
Pb	0,31	-0,01	0,79
Bi	0,57	-0,20	0,28
U	0,79	0,18	0,23
SiO_2	-0,41	-0,17	-0,83
Al_2O_3	-0,07	0,03	0,94
Fe_2O_3	0,30	0,53	0,59
MnO	0,46	0,13	0,68
MgO	0,75	0,29	0,36
CaO	0,88	0,04	0,32
Na_2O	0,22	-0,63	0,16
K_2O	-0,47	-0,72	0,32
TiO_2	0,28	0,66	0,30
P_2O_5	0,69	-0,55	-0,16
S	0,75	0,32	-0,14
Expl.Var	9,50	5,59	6,83
Prp.Totl	0,31	0,18	0,22

Factor Loadings (Unrotated) (core23.sta)			
Extraction: Principal components			
(Marked loadings are > .700000)			
	Factor	Factor	Factor
	1	2	3
V	0,68	0,08	-0,65
Cr	0,88	0,16	-0,03
Co	0,91	0,29	0,05
Ni	0,81	0,43	-0,24
Cu	0,74	0,00	0,16
Zn	0,42	-0,41	0,45
Ga	0,26	0,28	0,67
As	0,10	0,88	0,17
Rb	-0,67	0,56	0,41
Sr	0,80	0,11	0,33
Y	0,86	-0,29	-0,03
Zr	0,56	-0,58	0,31
Nb	-0,42	0,38	-0,02
Sn	-0,66	0,62	0,27
Ba	0,77	0,14	0,01
La	0,01	-0,56	-0,15
Ce	0,53	0,25	0,00
W	0,61	0,45	-0,03
Pb	0,66	-0,15	0,49
Bi	0,52	0,34	0,25
U	0,80	0,24	-0,13
SiO_2	-0,82	0,24	-0,43
Al_2O_3	0,44	-0,47	0,68
Fe_2O_3	0,72	-0,46	0,06
MnO	0,77	-0,11	0,27
MgO	0,87	0,07	-0,04
CaO	0,88	0,34	0,03
Na_2O	0,06	0,51	0,41
K_2O	-0,43	0,09	0,80
TiO_2	0,59	-0,44	-0,20
P_2O_5	0,28	0,85	0,06
S	0,63	0,29	-0,52
C	0,66	0,25	-0,48
Expl.Var	13,81	5,36	4,05
Prp.Totl	0,42	0,16	0,12

Factor Loadings (Varimax raw) (core23.sta)			
Extraction: Principal components			
(Marked loadings are > .700000)			
	Factor	Factor	Factor
	1	2	3
V	0,84	0,41	-0,11
Cr	0,78	0,06	0,44
Co	0,83	-0,09	0,47
Ni	0,94	-0,06	0,15
Cu	0,51	0,06	0,55
Zn	-0,05	0,17	0,72
Ga	0,06	-0,54	0,55
As	0,42	-0,79	-0,12
Rb	-0,44	-0,82	-0,28
Sr	0,54	-0,11	0,67
Y	0,55	0,43	0,58
Zr	0,05	0,41	0,75
Nb	-0,15	-0,39	-0,39
Sn	-0,35	-0,78	-0,40
Ba	0,67	0,03	0,41
La	-0,19	0,54	0,09
Ce	0,53	-0,10	0,23
W	0,70	-0,23	0,18
Pb	0,25	-0,02	0,80
Bi	0,46	-0,31	0,37
U	0,79	0,04	0,29
SiO_2	-0,36	-0,13	-0,87
Al_2O_3	-0,15	0,11	0,92
Fe_2O_3	0,33	0,49	0,62
MnO	0,44	0,10	0,68
MgO	0,73	0,14	0,46
CaO	0,83	-0,12	0,42
Na_2O	0,12	-0,63	0,16
K_2O	-0,63	-0,59	0,30
TiO_2	0,34	0,58	0,35
P_2O_5	0,59	-0,67	-0,08
S	0,85	0,17	-0,11
C	0,83	0,18	-0,05
Expl.Var	10,36	5,31	7,55
Prp.Totl	0,31	0,16	0,23

Factor Loadings (Unrotated) (core2.sta)					
Extraction: Principal components					
(Marked loadings are > .700000)					
	Factor	Factor	Factor	Factor	Factor
	1	2	3	4	5
V	0,68	0,08	-0,65	0,18	-0,03
Cr	0,88	0,16	-0,03	-0,23	0,10
Co	0,91	0,29	0,05	-0,12	0,02
Ni	0,81	0,43	-0,24	0,03	0,07
Cu	0,74	0,00	0,16	0,08	-0,32
Zn	0,42	-0,41	0,45	0,32	-0,31
Ga	0,26	0,28	0,67	-0,35	0,17
As	0,10	0,88	0,17	-0,14	0,00
Rb	-0,67	0,56	0,41	0,09	0,01
Sr	0,80	0,11	0,33	-0,10	0,03
Y	0,86	-0,29	-0,03	0,24	0,00
Zr	0,56	-0,58	0,31	0,13	0,12
Nb	-0,42	0,38	-0,02	-0,58	-0,10
Sn	-0,66	0,62	0,27	0,15	-0,13
Ba	0,77	0,14	0,01	-0,28	0,25
La	0,01	-0,56	-0,15	0,17	0,30
Ce	0,53	0,25	0,00	-0,01	0,48
W	0,61	0,45	-0,03	-0,05	0,32
Pb	0,66	-0,15	0,49	0,29	-0,10
Bi	0,52	0,34	0,25	-0,32	-0,41
U	0,80	0,24	-0,13	0,19	-0,33
SiO_2	-0,82	0,24	-0,43	0,10	-0,03
Al_2O_3	0,44	-0,47	0,68	0,06	0,04
Fe_2O_3	0,72	-0,46	0,06	-0,24	0,06
MnO	0,77	-0,11	0,27	0,42	-0,03
MgO	0,87	0,07	-0,04	-0,39	-0,08
CaO	0,88	0,34	0,03	-0,11	-0,05
Na_2O	0,06	0,51	0,41	0,46	0,35
K_2O	-0,43	0,09	0,80	0,15	0,03
TiO_2	0,59	-0,44	-0,20	-0,56	-0,04
P_2O_5	0,28	0,85	0,06	0,22	-0,12
S	0,63	0,29	-0,52	0,38	-0,09
C	0,66	0,25	-0,48	0,42	0,07
Expl.Var	13,81	5,36	4,05	2,46	1,22
Prp.Totl	0,42	0,16	0,12	0,07	0,04

Factor Loadings (Varimax raw) (core2.sta)					
Extraction: Principal components					
(Marked loadings are > .700000)					
	Factor	Factor	Factor	Factor	Factor
	1	2	3	4	5
V	0,23	0,30	0,00	0,88	-0,01
Cr	0,78	0,25	0,23	0,38	-0,03
Co	0,81	0,08	0,29	0,43	0,05
Ni	0,67	0,00	0,08	0,67	-0,03
Cu	0,42	0,11	0,53	0,34	0,31
Zn	-0,03	0,08	0,83	0,00	0,22
Ga	0,68	-0,24	0,22	-0,44	-0,04
As	0,58	-0,62	-0,30	0,08	0,12
Rb	-0,13	-0,81	-0,29	-0,44	0,04
Sr	0,71	0,05	0,49	0,15	0,03
Y	0,29	0,36	0,64	0,51	-0,07
Zr	0,13	0,40	0,75	-0,01	-0,18
Nb	0,18	-0,12	-0,64	-0,39	0,24
Sn	-0,19	-0,82	-0,35	-0,28	0,16
Ba	0,76	0,24	0,17	0,25	-0,16
La	-0,32	0,40	0,21	0,03	-0,38
Ce	0,55	-0,03	0,10	0,27	-0,43
W	0,68	-0,12	0,03	0,38	-0,24
Pb	0,31	-0,04	0,82	0,12	0,06
Bi	0,65	-0,06	0,15	0,05	0,52
U	0,44	0,02	0,33	0,67	0,32
SiO_2	-0,58	-0,28	-0,71	-0,02	0,00
Al_2O_3	0,21	0,17	0,84	-0,31	-0,06
Fe_2O_3	0,41	0,63	0,47	0,09	-0,04
MnO	0,29	-0,01	0,78	0,40	-0,04
MgO	0,78	0,39	0,21	0,29	0,17
CaO	0,78	0,04	0,26	0,45	0,12
Na_2O	0,19	-0,74	0,23	0,08	-0,36
K_2O	-0,13	-0,58	0,28	-0,65	-0,02
TiO_2	0,43	0,83	0,11	0,04	0,10
P_2O_5	0,45	-0,68	-0,08	0,42	0,16
S	0,20	0,00	0,07	0,93	0,03
C	0,22	0,00	0,12	0,91	-0,13
Expl.Var	7,96	5,17	6,27	6,17	1,32
Prp.Totl	0,24	0,16	0,19	0,19	0,04

Factor Loadings (Unrotated) (core2.sta)				
Extraction: Principal components				
(Marked loadings are > .700000)				
	Factor	Factor	Factor	Factor
	1	2	3	4
V	0,68	0,08	-0,65	0,18
Cr	0,88	0,16	-0,03	-0,23
Co	0,91	0,29	0,05	-0,12
Ni	0,81	0,43	-0,24	0,03
Cu	0,74	0,00	0,16	0,08
Zn	0,42	-0,41	0,45	0,32
Ga	0,26	0,28	0,67	-0,35
As	0,10	0,88	0,17	-0,14
Rb	-0,67	0,56	0,41	0,09
Sr	0,80	0,11	0,33	-0,10
Y	0,86	-0,29	-0,03	0,24
Zr	0,56	-0,58	0,31	0,13
Nb	-0,42	0,38	-0,02	-0,58
Sn	-0,66	0,62	0,27	0,15
Ba	0,77	0,14	0,01	-0,28
La	0,01	-0,56	-0,15	0,17
Ce	0,53	0,25	0,00	-0,01
W	0,61	0,45	-0,03	-0,05
Pb	0,66	-0,15	0,49	0,29
Bi	0,52	0,34	0,25	-0,32
U	0,80	0,24	-0,13	0,19
SiO_2	-0,82	0,24	-0,43	0,10
Al_2O_3	0,44	-0,47	0,68	0,06
Fe_2O_3	0,72	-0,46	0,06	-0,24
MnO	0,77	-0,11	0,27	0,42
MgO	0,87	0,07	-0,04	-0,39
CaO	0,88	0,34	0,03	-0,11
Na_2O	0,06	0,51	0,41	0,46
K_2O	-0,43	0,09	0,80	0,15
TiO_2	0,59	-0,44	-0,20	-0,56
P_2O_5	0,28	0,85	0,06	0,22
S	0,63	0,29	-0,52	0,38
C	0,66	0,25	-0,48	0,42
Expl.Var	13,81	5,36	4,05	2,46
Prp.Totl	0,42	0,16	0,12	0,07

Factor Loadings (Varimax raw) (core2.sta)				
Extraction: Principal components				
(Marked loadings are > .700000)				
	Factor	Factor	Factor	Factor
	1	2	3	4
V	0,22	0,31	0,00	0,88
Cr	0,76	0,26	0,23	0,39
Co	0,81	0,09	0,29	0,43
Ni	0,66	0,00	0,08	0,68
Cu	0,47	0,11	0,49	0,31
Zn	0,02	0,08	0,80	-0,02
Ga	0,67	-0,23	0,23	-0,42
As	0,60	-0,61	-0,31	0,08
Rb	-0,11	-0,81	-0,30	-0,44
Sr	0,71	0,06	0,49	0,16
Y	0,28	0,35	0,65	0,51
Zr	0,10	0,39	0,77	0,01
Nb	0,22	-0,11	-0,66	-0,41
Sn	-0,15	-0,82	-0,37	-0,29
Ba	0,72	0,25	0,19	0,28
La	-0,39	0,39	0,25	0,06
Ce	0,46	-0,02	0,15	0,32
W	0,63	-0,12	0,06	0,41
Pb	0,33	-0,04	0,81	0,12
Bi	0,73	-0,05	0,10	0,01
U	0,50	0,02	0,30	0,64
SiO_2	-0,57	-0,28	-0,71	-0,03
Al_2O_3	0,20	0,16	0,85	-0,30
Fe_2O_3	0,39	0,63	0,48	0,10
MnO	0,29	-0,01	0,78	0,40
MgO	0,80	0,40	0,20	0,29
CaO	0,80	0,04	0,25	0,45
Na_2O	0,13	-0,74	0,26	0,11
K_2O	-0,12	-0,58	0,28	-0,65
TiO_2	0,43	0,83	0,11	0,04
P_2O_5	0,48	-0,67	-0,10	0,41
S	0,21	0,00	0,06	0,93
C	0,20	0,00	0,13	0,92
Expl.Var	7,97	5,15	6,32	6,23
Prp.Totl	0,24	0,16	0,19	0,19

Factor Loadings (Unrotated) (core3.sta) Extraction: Principal components (Marked loadings are > .700000)					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
V	0,87	0,10	0,32	-0,19	0,07
Cr	0,81	0,18	-0,09	-0,35	-0,09
Co	0,85	0,32	0,01	-0,28	0,23
Ni	0,73	0,28	0,14	-0,48	0,23
Cu	-0,68	-0,48	-0,41	-0,18	0,25
Zn	0,63	0,27	-0,57	0,25	0,01
Ga	0,24	0,51	-0,65	0,04	0,03
As	-0,70	0,46	0,05	-0,35	0,36
Se	-0,15	-0,91	-0,10	-0,05	0,30
Rb	0,47	0,02	-0,57	-0,54	0,28
Sr	-0,52	0,54	-0,55	-0,16	-0,11
Y	0,15	-0,89	-0,24	-0,17	0,23
Zr	0,83	0,38	-0,17	0,11	-0,22
Nb	0,27	0,54	0,42	0,59	0,24
Sn	-0,89	0,38	0,02	-0,13	0,07
Ba	0,33	-0,44	0,25	-0,32	-0,69
La	0,86	-0,02	0,21	-0,33	0,21
Ce	-0,22	0,12	0,36	-0,59	-0,54
W	-0,77	0,44	0,10	-0,27	0,21
Pb	0,47	-0,29	-0,70	0,17	0,01
Bi	-0,83	0,24	-0,11	-0,36	0,27
U	0,27	-0,77	-0,42	-0,25	0,10
SiO_2	-0,87	-0,37	0,19	0,06	0,06
Al_2O_3	0,61	0,46	-0,52	-0,08	-0,30
Fe_2O_3	0,90	0,08	0,17	0,06	0,30
MnO	0,83	0,37	-0,28	-0,05	0,15
MgO	0,90	0,16	0,27	-0,15	0,05
CaO	-0,88	0,38	0,06	-0,16	0,09
Na_2O	-0,88	0,40	0,09	-0,11	0,09
K_2O	0,93	-0,07	-0,24	0,05	-0,12
TiO_2	0,82	0,07	0,37	0,32	0,22
P_2O_5	0,73	-0,23	0,49	0,11	0,33
S	0,57	-0,13	0,46	-0,58	-0,01
Expl.Var	16,00	5,55	4,03	2,79	2,01
Prp.Totl	0,48	0,17	0,12	0,08	0,06

Factor Loadings (Varimax raw) (core3.sta) Extraction: Principal components (Marked loadings are > .700000)					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
V	0,84	0,41	0,12	0,15	0,08
Cr	0,66	0,29	0,51	0,00	0,22
Co	0,85	0,17	0,44	0,09	-0,06
Ni	0,91	0,01	0,30	0,03	0,09
Cu	-0,50	-0,40	-0,18	-0,70	-0,10
Zn	0,14	0,38	0,78	0,06	-0,31
Ga	-0,01	-0,10	0,82	0,10	-0,22
As	-0,08	-0,96	-0,11	0,10	-0,08
Se	-0,13	0,19	-0,44	-0,83	-0,13
Rb	0,47	-0,11	0,64	-0,53	-0,02
Sr	-0,45	-0,64	0,52	0,11	0,04
Y	0,05	0,33	-0,19	-0,90	-0,05
Zr	0,42	0,48	0,64	0,33	0,02
Nb	0,25	0,15	-0,09	0,77	-0,52
Sn	-0,45	-0,83	-0,17	0,20	0,03
Ba	0,12	0,50	-0,12	-0,13	0,80
La	0,89	0,32	0,14	-0,09	0,05
Ce	0,06	-0,28	-0,15	0,17	0,84
W	-0,21	-0,90	-0,17	0,18	0,00
Pb	-0,07	0,49	0,57	-0,46	-0,23
Bi	-0,29	-0,92	-0,12	-0,12	-0,01
U	0,06	0,35	0,09	-0,89	0,05
SiO_2	-0,58	-0,37	-0,66	-0,20	0,02
Al_2O_3	0,20	0,22	0,90	0,17	0,12
Fe_2O_3	0,78	0,47	0,18	0,10	-0,27
MnO	0,59	0,26	0,68	0,10	-0,20
MgO	0,83	0,42	0,20	0,19	0,05
CaO	-0,40	-0,84	-0,20	0,20	0,03
Na_2O	-0,41	-0,82	-0,22	0,24	0,00
K_2O	0,46	0,69	0,52	-0,08	0,00
TiO_2	0,64	0,59	-0,03	0,30	-0,32
P_2O_5	0,73	0,53	-0,29	0,02	-0,24
S	0,81	0,15	-0,14	-0,10	0,44
Expl.Var	8,95	8,63	5,90	4,51	2,40
Prp.Totl	0,27	0,26	0,18	0,14	0,07

Factor Loadings (Unrotated) (core3.sta) Extraction: Principal components (Marked loadings are > .700000)					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
V	0,88	0,08	0,32	-0,20	-0,01
Cr	0,82	0,16	-0,13	-0,31	0,10
Co	0,87	0,27	0,00	-0,31	-0,19
Ni	0,75	0,25	0,12	-0,52	-0,11
Cu	-0,69	-0,49	-0,37	-0,21	-0,23
Zn	0,65	0,19	-0,56	0,27	-0,05
Ga	0,27	0,46	-0,67	0,06	-0,16
As	-0,67	0,47	0,02	-0,40	-0,34
Se	-0,19	-0,93	-0,02	-0,12	-0,19
Rb	0,48	-0,05	-0,57	-0,56	-0,24
Sr	-0,49	0,54	-0,60	-0,11	0,01
Y	0,12	-0,92	-0,17	-0,21	-0,12
Zr	0,85	0,34	-0,19	0,16	0,16
Nb	0,30	0,52	0,44	0,52	-0,34
La	0,86	-0,05	0,21	-0,37	-0,14
Ce	-0,22	0,21	0,28	-0,50	0,70
W	-0,74	0,47	0,07	-0,31	-0,18
Pb	0,46	-0,37	-0,66	0,19	0,01
Bi	-0,81	0,25	-0,13	-0,40	-0,25
U	0,24	-0,81	-0,38	-0,25	0,00
SiO_2	-0,89	-0,32	0,21	0,03	-0,05
Al_2O_3	0,63	0,42	-0,57	0,00	0,25
Fe_2O_3	0,91	0,02	0,20	0,00	-0,25
MnO	0,85	0,30	-0,29	-0,06	-0,18
MgO	0,91	0,14	0,26	-0,16	0,00
CaO	-0,86	0,41	0,03	-0,18	-0,10
Na_2O	-0,85	0,43	0,06	-0,13	-0,11
K_2O	0,93	-0,11	-0,24	0,09	0,12
TiO_2	0,82	0,03	0,40	0,26	-0,22
P_2O_5	0,72	-0,26	0,54	0,03	-0,28
S	0,57	-0,11	0,44	-0,59	0,19
Expl.Var	15,14	5,24	3,98	2,71	1,47
Prp.Totl	0,49	0,17	0,13	0,09	0,05

Factor Loadings (Varimax raw) (core3.sta) Extraction: Principal components (Marked loadings are > .700000)					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
V	0,86	0,14	0,12	0,39	-0,03
Cr	0,68	-0,02	0,50	0,26	-0,16
Co	0,85	0,09	0,45	0,14	0,08
Ni	0,90	0,04	0,30	0,01	-0,11
Cu	-0,51	-0,69	-0,17	-0,42	0,10
Zn	0,13	0,06	0,79	0,38	0,26
Ga	-0,02	0,11	0,83	-0,13	0,21
As	-0,11	0,14	-0,10	-0,95	0,00
Se	-0,13	-0,83	-0,44	0,16	0,18
Rb	0,46	-0,52	0,64	-0,15	0,04
Sr	-0,46	0,12	0,52	-0,62	-0,11
Y	0,06	-0,90	-0,18	0,30	0,11
Zr	0,43	0,32	0,64	0,48	0,01
Nb	0,24	0,79	-0,07	0,13	0,50
La	0,91	-0,10	0,14	0,28	0,02
Ce	0,07	0,14	-0,18	-0,19	-0,91
W	-0,24	0,21	-0,17	-0,87	-0,11
Pb	-0,07	-0,46	0,57	0,49	0,21
Bi	-0,31	-0,09	-0,12	-0,91	-0,06
U	0,07	-0,90	0,09	0,33	0,00
SiO_2	-0,58	-0,20	-0,66	-0,36	-0,02
Al_2O_3	0,20	0,16	0,90	0,24	-0,15
Fe_2O_3	0,78	0,10	0,19	0,43	0,29
MnO	0,59	0,11	0,68	0,23	0,21
MgO	0,84	0,18	0,20	0,41	-0,02
CaO	-0,43	0,22	-0,20	-0,82	-0,11
Na_2O	-0,43	0,26	-0,22	-0,80	-0,09
K_2O	0,47	-0,10	0,52	0,67	0,06
TiO_2	0,65	0,30	-0,02	0,55	0,36
P_2O_5	0,74	0,02	-0,28	0,49	0,31
S	0,82	-0,12	-0,15	0,16	-0,42
Expl.Var	9,00	4,50	5,91	7,22	1,92
Prp.Totl	0,29	0,15	0,19	0,23	0,06

Factor Loadings (Unrotated) (core3.sta)			
Extraction: Principal components			
(Marked loadings are > .700000)			
	Factor	Factor	Factor
	1	2	3
V	0,88	-0,09	0,32
Cr	0,83	-0,20	-0,10
Co	0,86	-0,32	0,02
Ni	0,74	-0,29	0,14
Cu	-0,68	0,44	-0,42
Zn	0,63	-0,24	-0,55
Ga	0,25	-0,50	-0,63
As	-0,68	-0,50	0,05
Se	-0,17	0,90	-0,12
Rb	0,48	-0,06	-0,58
Sr	-0,49	-0,58	-0,55
Y	0,14	0,87	-0,26
Zr	0,84	-0,36	-0,15
Nb	0,27	-0,49	0,45
Sn	-0,87	-0,41	0,02
Ba	0,32	0,42	0,23
La	0,86	0,02	0,21
Ce	-0,20	-0,16	0,35
W	-0,76	-0,47	0,10
Pb	0,46	0,31	-0,70
Bi	-0,81	-0,28	-0,12
U	0,26	0,76	-0,44
SiO_2	-0,88	0,35	0,18
Al_2O_3	0,62	-0,46	-0,51
Fe_2O_3	0,90	-0,04	0,18
MnO	0,83	-0,35	-0,27
MgO	0,91	-0,14	0,27
CaO	-0,87	-0,41	0,06
Na_2O	-0,86	-0,42	0,09
K_2O	0,93	0,09	-0,24
TiO_2	0,81	-0,01	0,38
P_2O_5	0,72	0,27	0,49
S	0,58	0,12	0,45
C	0,65	-0,45	-0,08
Expl.Var	16,41	5,74	4,03
Prp.Totl	0,48	0,17	0,12

Factor Loadings (Varimax raw) (core3.sta)			
Extraction: Principal components			
(Marked loadings are > .700000)			
	Factor	Factor	Factor
	1	2	3
V	0,89	0,07	0,30
Cr	0,60	-0,03	0,61
Co	0,68	0,13	0,61
Ni	0,65	0,18	0,44
Cu	-0,74	-0,45	-0,29
Zn	0,18	-0,17	0,84
Ga	-0,21	0,09	0,82
As	-0,60	0,58	-0,15
Se	-0,09	-0,80	-0,45
Rb	0,07	-0,31	0,69
Sr	-0,78	0,33	0,40
Y	0,08	-0,90	-0,18
Zr	0,56	0,08	0,73
Nb	0,41	0,58	0,08
Sn	-0,76	0,52	-0,28
Ba	0,45	-0,31	-0,19
La	0,83	-0,08	0,31
Ce	0,00	0,34	-0,27
W	-0,63	0,59	-0,24
Pb	0,04	-0,68	0,58
Bi	-0,77	0,34	-0,21
U	0,07	-0,91	0,07
SiO_2	-0,58	-0,06	-0,77
Al_2O_3	0,17	0,04	0,91
Fe_2O_3	0,83	-0,04	0,38
MnO	0,49	0,02	0,81
MgO	0,88	0,09	0,37
CaO	-0,73	0,54	-0,31
Na_2O	-0,72	0,57	-0,32
K_2O	0,65	-0,36	0,62
TiO_2	0,88	0,04	0,17
P_2O_5	0,90	-0,13	-0,09
S	0,74	0,00	-0,06
C	0,44	0,23	0,62
Expl.Var	12,49	5,71	7,99
Prp.Totl	0,37	0,17	0,23

Factor Loadings (Unrotated) (core3.sta)					
Extraction: Principal components					
(Marked loadings are > .700000)					
	Factor	Factor	Factor	Factor	Factor
	1	2	3	4	5
V	0,88	-0,09	0,32	0,18	0,07
Cr	0,83	-0,20	-0,10	0,34	-0,09
Co	0,86	-0,32	0,02	0,24	0,23
Ni	0,74	-0,29	0,14	0,43	0,24
Cu	-0,68	0,44	-0,42	0,22	0,25
Zn	0,63	-0,24	-0,55	-0,31	0,01
Ga	0,25	-0,50	-0,63	-0,12	0,04
As	-0,68	-0,50	0,05	0,32	0,37
Se	-0,17	0,90	-0,12	0,12	0,30
Rb	0,48	-0,06	-0,58	0,52	0,29
Sr	-0,49	-0,58	-0,55	0,13	-0,11
Y	0,14	0,87	-0,26	0,23	0,23
Zr	0,84	-0,36	-0,15	-0,14	-0,22
Nb	0,27	-0,49	0,45	-0,61	0,24
Sn	-0,87	-0,41	0,02	0,12	0,07
Ba	0,32	0,42	0,23	0,36	-0,69
La	0,86	0,02	0,21	0,32	0,22
Ce	-0,20	-0,16	0,35	0,58	-0,53
W	-0,76	-0,47	0,10	0,23	0,22
Pb	0,46	0,31	-0,70	-0,18	0,01
Bi	-0,81	-0,28	-0,12	0,36	0,28
U	0,26	0,76	-0,44	0,27	0,10
SiO_2	-0,88	0,35	0,18	0,00	0,05
Al_2O_3	0,62	-0,46	-0,51	0,01	-0,29
Fe_2O_3	0,90	-0,04	0,18	-0,09	0,30
MnO	0,83	-0,35	-0,27	-0,02	0,15
MgO	0,91	-0,14	0,27	0,13	0,06
CaO	-0,87	-0,41	0,06	0,15	0,09
Na_2O	-0,86	-0,42	0,09	0,10	0,10
K_2O	0,93	0,09	-0,24	-0,08	-0,12
TiO_2	0,81	-0,01	0,38	-0,33	0,21
P_2O_5	0,72	0,27	0,49	-0,10	0,33
S	0,58	0,12	0,45	0,57	0,00
C	0,65	-0,45	-0,08	0,46	-0,02
Expl.Var	16,41	5,74	4,03	3,01	2,01
Prp.Totl	0,48	0,17	0,12	0,09	0,06

Factor Loadings (Varimax raw) (core3.sta)					
Extraction: Principal components					
(Marked loadings are > .700000)					
	Factor	Factor	Factor	Factor	Factor
	1	2	3	4	5
V	0,84	0,43	0,08	0,16	-0,07
Cr	0,71	0,29	0,48	0,00	-0,22
Co	0,87	0,21	0,38	0,09	0,09
Ni	0,92	0,06	0,23	0,04	-0,04
Cu	-0,48	-0,43	-0,15	-0,70	0,09
Zn	0,15	0,39	0,77	0,06	0,31
Ga	0,03	-0,09	0,81	0,10	0,24
As	-0,05	-0,96	-0,12	0,11	0,10
Se	-0,17	0,19	-0,44	-0,83	0,12
Rb	0,53	-0,10	0,60	-0,53	0,03
Sr	-0,37	-0,68	0,55	0,10	-0,06
Y	0,03	0,33	-0,19	-0,90	0,04
Zr	0,44	0,49	0,62	0,33	-0,02
Nb	0,22	0,17	-0,09	0,77	0,51
Sn	-0,42	-0,85	-0,14	0,19	-0,03
Ba	0,12	0,49	-0,12	-0,13	-0,81
La	0,89	0,36	0,08	-0,08	-0,02
Ce	0,08	-0,29	-0,16	0,17	-0,82
W	-0,19	-0,90	-0,17	0,19	0,02
Pb	-0,06	0,49	0,57	-0,46	0,22
Bi	-0,25	-0,93	-0,11	-0,12	0,02
U	0,05	0,36	0,07	-0,88	-0,04
SiO_2	-0,60	-0,40	-0,62	-0,20	-0,04
Al_2O_3	0,25	0,22	0,89	0,17	-0,11
Fe_2O_3	0,75	0,51	0,13	0,11	0,29
MnO	0,61	0,30	0,63	0,11	0,22
MgO	0,82	0,45	0,15	0,20	-0,03
CaO	-0,38	-0,86	-0,18	0,19	-0,03
Na_2O	-0,39	-0,84	-0,20	0,24	0,00
K_2O	0,46	0,70	0,49	-0,08	0,01
TiO_2	0,59	0,63	-0,06	0,31	0,33
P_2O_5	0,67	0,57	-0,33	0,03	0,25
S	0,79	0,20	-0,21	-0,09	-0,40
C	0,73	-0,02	0,50	0,11	-0,23
Expl.Var	9,31	9,15	5,78	4,53	2,44
Prp.Totl	0,27	0,27	0,17	0,13	0,07

Factor Loadings (Unrotated) (core3.sta)				
Extraction: Principal components				
(Marked loadings are > .700000)				
	Factor	Factor	Factor	Factor
	1	2	3	4
V	0,88	-0,09	0,32	0,18
Cr	0,83	-0,20	-0,10	0,34
Co	0,86	-0,32	0,02	0,24
Ni	0,74	-0,29	0,14	0,43
Cu	-0,68	0,44	-0,42	0,22
Zn	0,63	-0,24	-0,55	-0,31
Ga	0,25	-0,50	-0,63	-0,12
As	-0,68	-0,50	0,05	0,32
Se	-0,17	0,90	-0,12	0,12
Rb	0,48	-0,06	-0,58	0,52
Sr	-0,49	-0,58	-0,55	0,13
Y	0,14	0,87	-0,26	0,23
Zr	0,84	-0,36	-0,15	-0,14
Nb	0,27	-0,49	0,45	-0,61
Sn	-0,87	-0,41	0,02	0,12
Ba	0,32	0,42	0,23	0,36
La	0,86	0,02	0,21	0,32
Ce	-0,20	-0,16	0,35	0,58
W	-0,76	-0,47	0,10	0,23
Pb	0,46	0,31	-0,70	-0,18
Bi	-0,81	-0,28	-0,12	0,36
U	0,26	0,76	-0,44	0,27
SiO_2	-0,88	0,35	0,18	0,00
Al_2O_3	0,62	-0,46	-0,51	0,01
Fe_2O_3	0,90	-0,04	0,18	-0,09
MnO	0,83	-0,35	-0,27	-0,02
MgO	0,91	-0,14	0,27	0,13
CaO	-0,87	-0,41	0,06	0,15
Na_2O	-0,86	-0,42	0,09	0,10
K_2O	0,93	0,09	-0,24	-0,08
TiO_2	0,81	-0,01	0,38	-0,33
P_2O_5	0,72	0,27	0,49	-0,10
S	0,58	0,12	0,45	0,57
C	0,65	-0,45	-0,08	0,46
Expl.Var	16,41	5,74	4,03	3,01
Prp.Totl	0,48	0,17	0,12	0,09

Factor Loadings (Varimax raw) (core3.sta)				
Extraction: Principal components				
(Marked loadings are > .700000)				
	Factor	Factor	Factor	Factor
	1	2	3	4
V	0,77	0,54	0,06	0,17
Cr	0,78	0,29	0,39	-0,04
Co	0,79	0,32	0,38	0,16
Ni	0,88	0,19	0,18	0,09
Cu	-0,50	-0,43	-0,12	-0,66
Zn	0,11	0,35	0,85	0,09
Ga	0,06	-0,15	0,83	0,12
As	-0,05	-0,87	-0,17	0,19
Se	-0,31	0,26	-0,34	-0,77
Rb	0,54	-0,06	0,57	-0,48
Sr	-0,18	-0,81	0,46	0,06
Y	-0,07	0,38	-0,12	-0,86
Zr	0,49	0,43	0,61	0,29
Nb	-0,01	0,32	0,05	0,89
Sn	-0,33	-0,87	-0,21	0,20
Ba	0,39	0,31	-0,31	-0,35
La	0,79	0,50	0,08	-0,04
Ce	0,40	-0,43	-0,42	-0,02
W	-0,15	-0,85	-0,23	0,23
Pb	-0,09	0,42	0,66	-0,44
Bi	-0,20	-0,90	-0,17	-0,07
U	0,02	0,35	0,11	-0,88
SiO_2	-0,60	-0,39	-0,61	-0,20
Al_2O_3	0,40	0,09	0,82	0,10
Fe_2O_3	0,55	0,67	0,23	0,20
MnO	0,54	0,35	0,67	0,16
MgO	0,76	0,55	0,14	0,21
CaO	-0,30	-0,87	-0,25	0,21
Na_2O	-0,32	-0,84	-0,26	0,26
K_2O	0,44	0,68	0,52	-0,10
TiO_2	0,36	0,78	0,06	0,40
P_2O_5	0,42	0,78	-0,22	0,13
S	0,83	0,28	-0,32	-0,13
C	0,83	-0,01	0,38	0,08
Expl.Var	8,43	10,13	5,96	4,67
Prp.Totl	0,25	0,30	0,18	0,14

Factor Loadings (Unrotated) (core4.sta) Extraction: Principal components (Marked loadings are > .700000)					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
V	0,80	0,16	0,47	-0,03	-0,16
Cr	0,90	0,08	-0,03	-0,29	0,06
Co	0,91	-0,27	0,09	-0,17	-0,02
Ni	0,85	-0,32	0,08	-0,20	-0,17
Cu	0,58	-0,71	-0,05	0,15	-0,13
Zn	0,77	-0,15	-0,17	0,39	0,06
Ga	0,86	-0,20	-0,35	-0,04	-0,22
As	0,24	-0,81	0,43	-0,05	-0,02
Rb	0,78	-0,10	-0,39	-0,03	0,10
Sr	0,30	-0,81	-0,13	0,04	-0,21
Y	0,78	0,25	-0,25	-0,32	0,00
Zr	0,22	0,57	-0,31	-0,47	-0,17
Nb	-0,02	0,70	0,36	-0,09	-0,29
Sn	-0,49	-0,70	0,29	-0,02	0,29
Ba	0,39	-0,20	-0,43	0,04	-0,34
La	0,37	0,16	0,18	-0,79	-0,08
Ce	0,54	-0,55	0,09	0,44	-0,37
W	-0,26	-0,47	0,52	-0,32	0,14
Pb	0,85	-0,08	-0,24	0,22	0,04
Bi	0,00	-0,75	0,16	-0,51	0,18
U	0,91	-0,20	-0,01	-0,12	0,09
SiO_2	-0,91	-0,33	0,03	-0,07	-0,12
Al_2O_3	0,71	0,18	-0,62	-0,03	0,13
Fe_2O_3	0,74	0,46	0,36	0,11	0,18
MnO	0,78	0,07	0,29	0,32	0,35
MgO	0,78	0,09	0,53	0,16	0,07
CaO	0,56	0,01	0,66	0,16	0,01
Na_2O	0,15	0,88	0,21	0,17	0,25
K_2O	0,67	0,25	-0,65	0,01	0,06
TiO_2	0,42	0,65	0,54	0,02	-0,22
P_2O_5	0,43	0,03	0,80	-0,03	-0,28
S	0,68	-0,24	0,03	-0,14	0,53
Expl.Var	13,21	6,34	4,39	2,14	1,37
Prp.Totl	0,41	0,20	0,14	0,07	0,04

Factor Loadings (Varimax raw) (core4.sta) Extraction: Principal components (Marked loadings are > .700000)					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
V	0,34	0,11	0,86	0,19	-0,08
Cr	0,73	0,10	0,47	0,35	0,12
Co	0,62	0,46	0,52	0,23	0,15
Ni	0,56	0,54	0,47	0,28	0,02
Cu	0,38	0,82	0,19	-0,14	0,08
Zn	0,69	0,28	0,35	-0,35	0,05
Ga	0,83	0,43	0,20	0,09	-0,15
As	-0,17	0,83	0,30	0,05	0,30
Rb	0,84	0,21	0,13	0,02	0,11
Sr	0,20	0,87	-0,08	-0,06	0,03
Y	0,79	-0,07	0,26	0,37	-0,02
Zr	0,41	-0,44	-0,06	0,52	-0,28
Nb	-0,18	-0,54	0,41	0,24	-0,41
Sn	-0,62	0,47	-0,23	-0,09	0,49
Ba	0,51	0,35	-0,12	-0,01	-0,31
La	0,19	-0,03	0,27	0,85	0,06
Ce	0,26	0,75	0,36	-0,36	-0,22
W	-0,55	0,36	0,09	0,29	0,38
Pb	0,80	0,24	0,33	-0,18	0,03
Bi	-0,16	0,65	-0,13	0,42	0,50
U	0,70	0,36	0,45	0,16	0,20
SiO_2	-0,77	0,14	-0,58	-0,01	-0,04
Al_2O_3	0,96	-0,08	-0,03	0,02	0,02
Fe_2O_3	0,42	-0,29	0,81	0,00	0,10
MnO	0,47	0,02	0,72	-0,27	0,33
MgO	0,29	0,10	0,90	-0,04	0,13
CaO	0,03	0,15	0,87	-0,04	0,10
Na_2O	0,11	-0,85	0,44	-0,10	-0,02
K_2O	0,95	-0,14	-0,05	-0,01	-0,08
TiO_2	0,05	-0,41	0,80	0,17	-0,30
P_2O_5	-0,18	0,19	0,88	0,20	-0,13
S	0,53	0,21	0,32	0,08	0,62
Expl.Var	9,70	6,20	7,41	2,25	1,90
Prp.Totl	0,30	0,19	0,23	0,07	0,06

Factor Loadings (Unrotated) (core4.sta) Extraction: Principal components (Marked loadings are > .700000)					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
V	0,81	-0,27	-0,40	-0,08	0,12
Cr	0,89	-0,12	0,13	-0,26	-0,04
Co	0,93	0,21	-0,08	-0,18	-0,01
Ni	0,86	0,27	-0,11	-0,25	0,08
Cu	0,61	0,67	-0,07	0,14	0,18
Zn	0,78	0,16	0,16	0,40	0,23
Ga	0,84	0,24	0,32	-0,03	0,24
As	0,30	0,71	-0,55	-0,12	-0,11
Rb	0,76	0,12	0,39	0,04	-0,29
Sr	0,33	0,81	-0,01	0,00	0,37
Y	0,75	-0,23	0,36	-0,27	-0,06
Zr	0,18	-0,50	0,46	-0,46	0,41
Nb	-0,04	-0,76	-0,23	-0,12	0,37
La	0,38	-0,23	-0,07	-0,80	-0,01
Ce	0,55	0,53	-0,26	0,36	0,29
Pb	0,85	0,10	0,25	0,23	0,12
Bi	0,05	0,69	-0,22	-0,53	-0,30
U	0,92	0,16	0,05	-0,10	-0,09
SiO_2	-0,89	0,36	-0,14	-0,11	0,06
Al_2O_3	0,68	-0,10	0,69	0,06	-0,02
Fe_2O_3	0,74	-0,56	-0,22	0,14	-0,18
MnO	0,79	-0,16	-0,22	0,35	-0,31
MgO	0,79	-0,22	-0,47	0,14	-0,11
CaO	0,59	-0,14	-0,64	0,08	0,06
Na_2O	0,12	-0,91	-0,02	0,22	-0,17
K_2O	0,63	-0,15	0,70	0,09	-0,05
TiO_2	0,41	-0,75	-0,40	-0,02	0,20
P_2O_5	0,45	-0,19	-0,78	-0,12	0,09
S	0,71	0,18	0,04	-0,10	-0,34
Expl.Var	12,81	5,68	3,85	2,04	1,25
Prp.Totl	0,44	0,20	0,13	0,07	0,04

Factor Loadings (Varimax raw) (core4.sta) Extraction: Principal components (Marked loadings are > .700000)					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
V	0,34	0,19	0,85	0,03	0,20
Cr	0,76	0,12	0,45	0,19	0,28
Co	0,63	0,42	0,48	0,34	0,12
Ni	0,54	0,49	0,44	0,37	0,19
Cu	0,35	0,81	0,12	0,23	-0,17
Zn	0,65	0,54	0,28	-0,25	-0,15
Ga	0,78	0,53	0,14	0,03	0,18
As	-0,13	0,59	0,27	0,65	-0,23
Rb	0,87	0,11	0,11	0,19	-0,14
Sr	0,14	0,90	-0,14	0,24	-0,01
Y	0,80	-0,05	0,25	0,09	0,34
Zr	0,35	-0,19	-0,06	-0,27	0,80
Nb	-0,22	-0,32	0,44	-0,46	0,49
La	0,22	-0,17	0,31	0,45	0,68
Ce	0,18	0,82	0,30	0,01	-0,27
Pb	0,77	0,41	0,27	-0,12	-0,05
Bi	-0,09	0,28	-0,12	0,89	0,00
U	0,73	0,33	0,42	0,28	0,04
SiO_2	-0,79	0,01	-0,56	0,15	-0,05
Al_2O_3	0,95	0,05	-0,06	-0,16	0,11
Fe_2O_3	0,48	-0,21	0,81	-0,13	-0,03
MnO	0,54	0,04	0,70	0,01	-0,38
MgO	0,34	0,12	0,89	0,06	-0,12
CaO	0,04	0,23	0,86	0,07	-0,04
Na_2O	0,16	-0,67	0,47	-0,49	0,01
K_2O	0,93	-0,02	-0,08	-0,20	0,08
TiO_2	0,05	-0,23	0,82	-0,33	0,31
P_2O_5	-0,16	0,16	0,88	0,17	0,12
S	0,61	0,13	0,30	0,40	-0,12
Expl.Var	8,78	4,71	7,02	2,95	2,17
Prp.Totl	0,30	0,16	0,24	0,10	0,07

Factor Loadings (Unrotated) (core4.sta)			
Extraction: Principal components			
(Marked loadings are > .700000)			
	Factor	Factor	Factor
	1	2	3
V	0,79	-0,23	0,45
Cr	0,91	0,05	0,04
Co	0,90	0,31	0,16
Ni	0,82	0,39	0,21
Cu	0,46	0,76	0,01
Zn	0,73	0,17	-0,23
Ga	0,83	0,38	-0,27
As	0,06	0,69	0,62
Rb	0,72	0,15	-0,46
Sr	0,20	0,86	0,01
Y	0,82	-0,06	-0,22
Zr	0,85	-0,19	-0,24
Nb	0,19	-0,69	0,30
Sn	-0,62	0,52	0,37
Ba	0,26	0,23	-0,47
La	0,63	0,10	0,43
Ce	0,38	0,56	0,15
W	-0,39	0,19	0,54
Pb	0,83	0,17	-0,25
Bi	-0,03	0,74	0,35
U	0,89	0,24	0,02
SiO_2	-0,91	0,30	0,12
Al_2O_3	0,74	0,05	-0,61
Fe_2O_3	0,73	-0,60	0,20
MnO	0,77	-0,35	0,17
MgO	0,76	-0,35	0,49
CaO	0,53	-0,15	0,67
Na_2O	0,23	-0,92	-0,01
K_2O	0,69	-0,03	-0,67
TiO_2	0,48	-0,70	0,39
P_2O_5	0,37	-0,28	0,77
S	0,65	0,26	0,09
C	0,50	0,56	0,41
Expl.Var	13,89	6,63	4,75
Prp.Totl	0,42	0,20	0,14

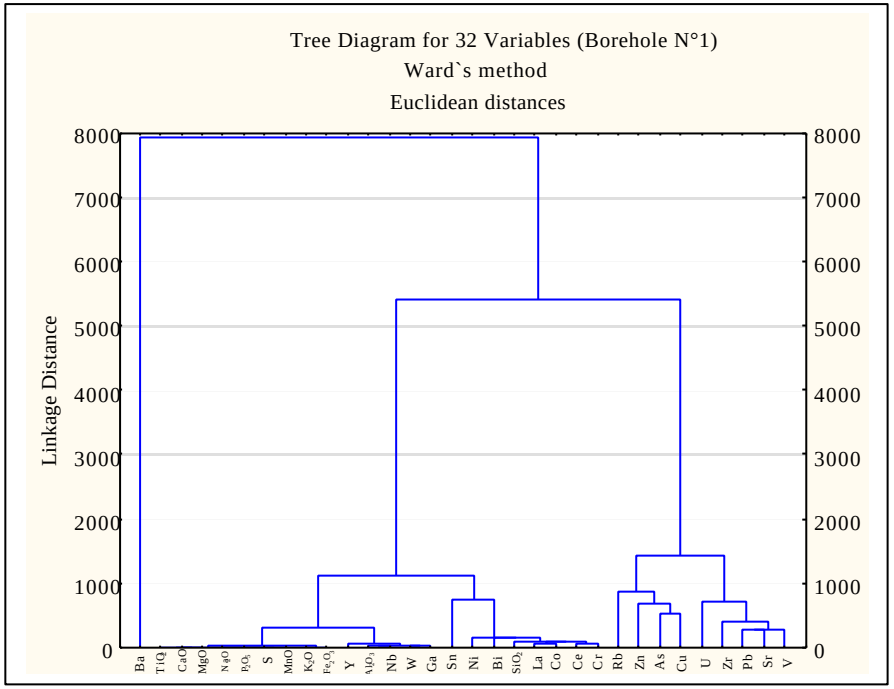
Factor Loadings (Varimax raw) (core4.sta)			
Extraction: Principal components			
(Marked loadings are > .700000)			
	Factor	Factor	Factor
	1	2	3
V	0,33	0,14	0,87
Cr	0,70	0,25	0,53
Co	0,63	0,53	0,49
Ni	0,55	0,60	0,45
Cu	0,42	0,78	-0,05
Zn	0,73	0,21	0,19
Ga	0,85	0,41	0,13
As	-0,27	0,87	0,15
Rb	0,86	0,10	0,03
Sr	0,22	0,81	-0,25
Y	0,78	0,04	0,35
Zr	0,80	-0,08	0,41
Nb	-0,09	-0,46	0,62
Sn	-0,67	0,48	-0,32
Ba	0,51	0,08	-0,27
La	0,25	0,39	0,62
Ce	0,25	0,64	0,08
W	-0,62	0,30	0,07
Pb	0,83	0,23	0,23
Bi	-0,17	0,79	-0,10
U	0,71	0,41	0,42
SiO_2	-0,77	0,12	-0,57
Al_2O_3	0,96	-0,04	-0,02
Fe_2O_3	0,40	-0,30	0,82
MnO	0,47	-0,08	0,72
MgO	0,27	0,04	0,92
CaO	0,00	0,24	0,83
Na_2O	0,11	-0,78	0,53
K_2O	0,95	-0,15	-0,06
TiO_2	0,08	-0,37	0,85
P_2O_5	-0,20	0,13	0,86
S	0,48	0,41	0,33
C	0,19	0,77	0,32
Expl.Var	10,47	6,66	8,14
Prp.Totl	0,32	0,20	0,25

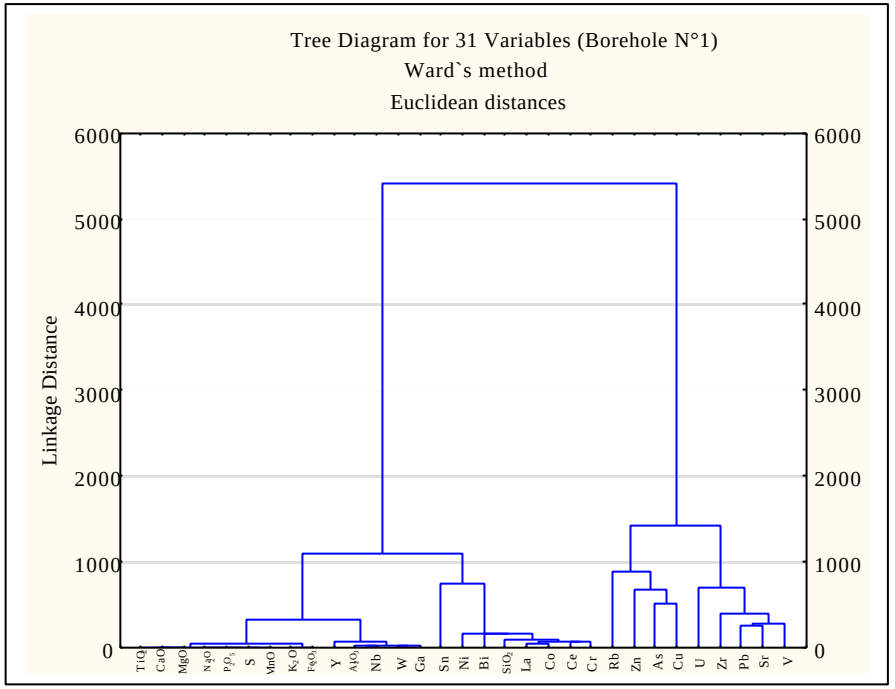
Factor Loadings (Unrotated) (core4.sta)					
Extraction: Principal components					
(Marked loadings are > .700000)					
	Factor	Factor	Factor	Factor	Factor
	1	2	3	4	5
V	0,79	-0,23	0,45	0,04	-0,15
Cr	0,91	0,05	0,04	-0,25	0,05
Co	0,90	0,31	0,16	-0,12	-0,02
Ni	0,82	0,39	0,21	-0,07	-0,15
Cu	0,46	0,76	0,01	0,14	-0,11
Zn	0,73	0,17	-0,23	0,47	0,20
Ga	0,83	0,38	-0,27	0,06	-0,19
As	0,06	0,69	0,62	-0,08	-0,01
Rb	0,72	0,15	-0,46	-0,39	-0,05
Sr	0,20	0,86	0,01	0,27	-0,09
Y	0,82	-0,06	-0,22	-0,30	-0,06
Zr	0,85	-0,19	-0,24	0,13	-0,05
Nb	0,19	-0,69	0,30	0,14	-0,30
Sn	-0,62	0,52	0,37	0,00	0,35
Ba	0,26	0,23	-0,47	-0,31	-0,54
La	0,63	0,10	0,43	-0,52	-0,09
Ce	0,38	0,56	0,15	0,52	-0,40
W	-0,39	0,19	0,54	-0,59	-0,03
Pb	0,83	0,17	-0,25	0,28	0,12
Bi	-0,03	0,74	0,35	-0,43	0,17
U	0,89	0,24	0,02	-0,15	0,07
SiO_2	-0,91	0,30	0,12	0,03	-0,09
Al_2O_3	0,74	0,05	-0,61	-0,08	0,11
Fe_2O_3	0,73	-0,60	0,20	-0,07	0,11
MnO	0,77	-0,35	0,17	0,01	0,38
MgO	0,76	-0,35	0,49	0,02	0,04
CaO	0,53	-0,15	0,67	0,31	0,11
Na_2O	0,23	-0,92	-0,01	0,02	0,19
K_2O	0,69	-0,03	-0,67	-0,11	0,01
TiO_2	0,48	-0,70	0,39	0,07	-0,23
P_2O_5	0,37	-0,28	0,77	-0,03	-0,33
S	0,65	0,26	0,09	-0,10	0,60
C	0,50	0,56	0,41	0,37	0,10
Expl.Var	13,89	6,63	4,75	2,24	1,64
Prp.Totl	0,42	0,20	0,14	0,07	0,05

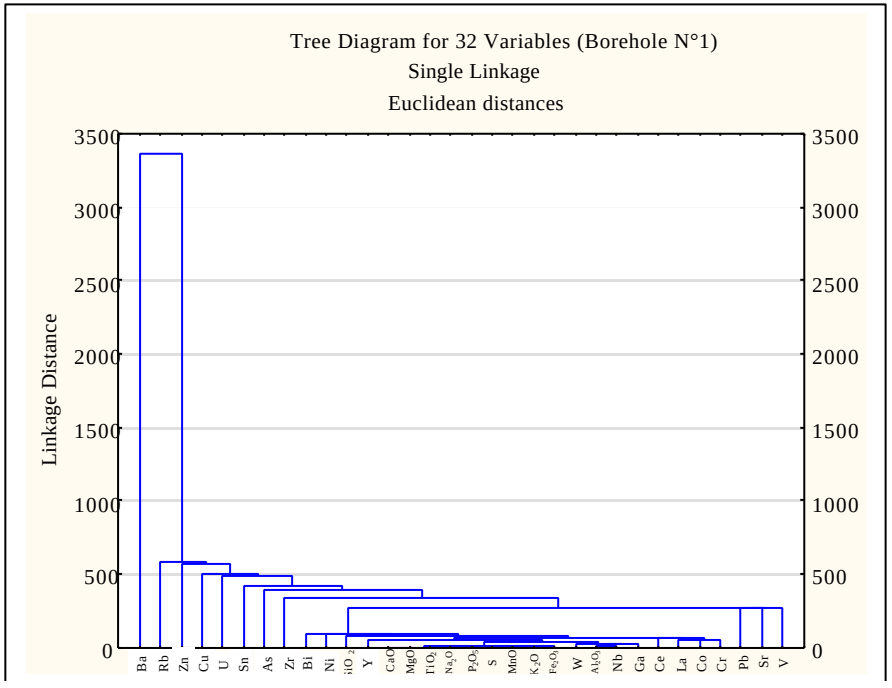
Factor Loadings (Varimax raw) (core4.sta)					
Extraction: Principal components					
(Marked loadings are > .700000)					
	Factor	Factor	Factor	Factor	Factor
	1	2	3	4	5
V	0,36	0,22	0,85	0,04	0,07
Cr	0,78	0,17	0,43	0,19	0,17
Co	0,69	0,47	0,40	0,25	0,16
Ni	0,59	0,58	0,38	0,26	0,05
Cu	0,37	0,80	-0,11	0,18	0,04
Zn	0,56	0,47	0,13	-0,43	0,39
Ga	0,80	0,54	0,09	-0,07	-0,05
As	-0,19	0,64	0,06	0,64	0,13
Rb	0,94	0,03	-0,03	0,10	-0,08
Sr	0,13	0,85	-0,30	0,13	0,05
Y	0,86	0,01	0,30	0,07	-0,02
Zr	0,73	0,13	0,40	-0,34	0,08
Nb	-0,11	-0,25	0,73	-0,28	-0,20
Sn	-0,63	0,21	-0,42	0,45	0,32
Ba	0,56	0,12	-0,20	0,06	-0,61
La	0,45	0,12	0,53	0,62	0,00
Ce	0,09	0,92	0,12	-0,15	-0,14
W	-0,38	-0,13	0,02	0,81	-0,11
Pb	0,71	0,42	0,17	-0,30	0,28
Bi	0,00	0,37	-0,24	0,81	0,16
U	0,76	0,34	0,32	0,19	0,21
SiO_2	-0,77	0,02	-0,52	0,19	-0,20
Al_2O_3	0,93	0,04	-0,07	-0,24	0,11
Fe_2O_3	0,45	-0,25	0,79	-0,12	0,22
MnO	0,49	-0,09	0,61	-0,08	0,51
MgO	0,31	0,07	0,88	0,05	0,25
CaO	-0,03	0,33	0,78	0,00	0,37
Na_2O	0,11	-0,66	0,55	-0,40	0,18
K_2O	0,92	-0,04	-0,08	-0,28	-0,02
TiO_2	0,09	-0,20	0,92	-0,19	-0,09
P_2O_5	-0,12	0,15	0,90	0,23	-0,13
S	0,53	0,21	0,13	0,24	0,69
C	0,11	0,81	0,23	0,12	0,36
Expl.Var	10,20	5,73	7,49	3,57	2,16
Prp.Totl	0,31	0,17	0,23	0,11	0,07

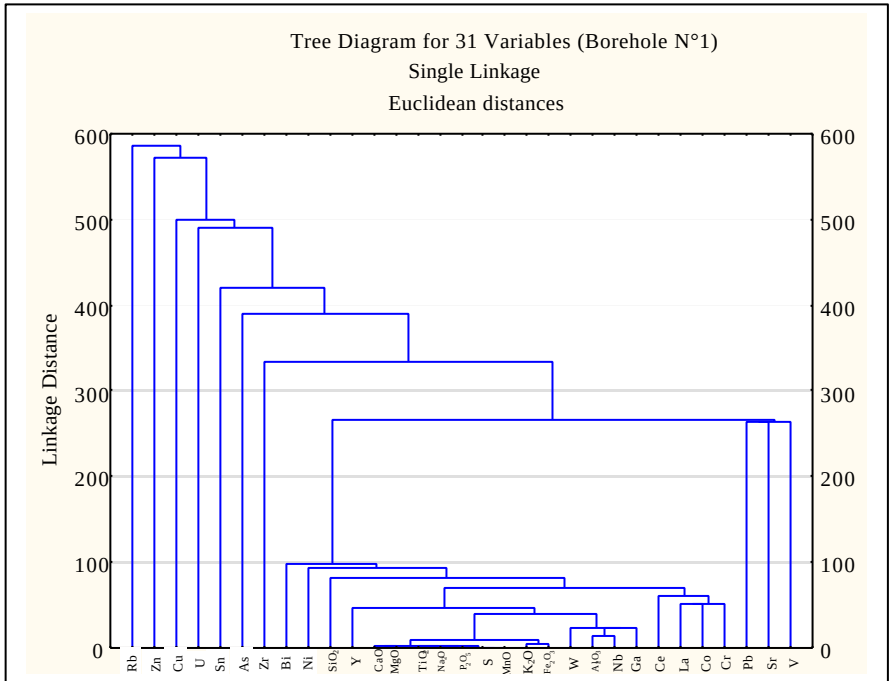
Factor Loadings (Unrotated) (core4.sta)				
Extraction: Principal components				
(Marked loadings are > .700000)				
	Factor	Factor	Factor	Factor
	1	2	3	4
V	0,79	-0,23	0,45	0,04
Cr	0,91	0,05	0,04	-0,25
Co	0,90	0,31	0,16	-0,12
Ni	0,82	0,39	0,21	-0,07
Cu	0,46	0,76	0,01	0,14
Zn	0,73	0,17	-0,23	0,47
Ga	0,83	0,38	-0,27	0,06
As	0,06	0,69	0,62	-0,08
Rb	0,72	0,15	-0,46	-0,39
Sr	0,20	0,86	0,01	0,27
Y	0,82	-0,06	-0,22	-0,30
Zr	0,85	-0,19	-0,24	0,13
Nb	0,19	-0,69	0,30	0,14
Sn	-0,62	0,52	0,37	0,00
Ba	0,26	0,23	-0,47	-0,31
La	0,63	0,10	0,43	-0,52
Ce	0,38	0,56	0,15	0,52
W	-0,39	0,19	0,54	-0,59
Pb	0,83	0,17	-0,25	0,28
Bi	-0,03	0,74	0,35	-0,43
U	0,89	0,24	0,02	-0,15
SiO_2	-0,91	0,30	0,12	0,03
Al_2O_3	0,74	0,05	-0,61	-0,08
Fe_2O_3	0,73	-0,60	0,20	-0,07
MnO	0,77	-0,35	0,17	0,01
MgO	0,76	-0,35	0,49	0,02
CaO	0,53	-0,15	0,67	0,31
Na_2O	0,23	-0,92	-0,01	0,02
K_2O	0,69	-0,03	-0,67	-0,11
TiO_2	0,48	-0,70	0,39	0,07
P_2O_5	0,37	-0,28	0,77	-0,03
S	0,65	0,26	0,09	-0,10
C	0,50	0,56	0,41	0,37
Expl.Var	13,89	6,63	4,75	2,24
Prp.Totl	0,42	0,20	0,14	0,07

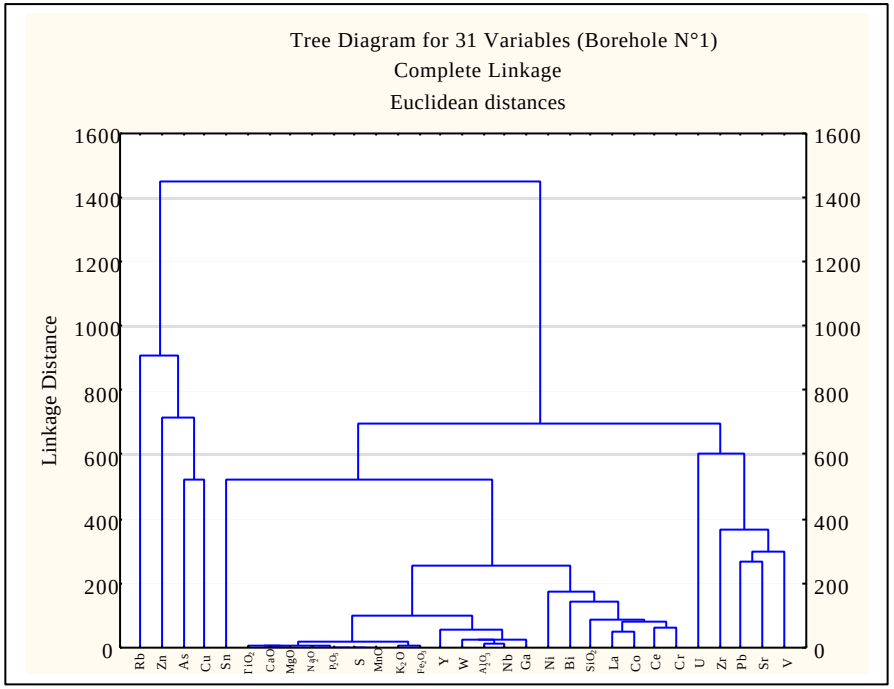
Factor Loadings (Varimax raw) (core4.sta)				
Extraction: Principal components				
(Marked loadings are > .700000)				
	Factor	Factor	Factor	Factor
	1	2	3	4
V	0,34	0,21	0,85	0,05
Cr	0,77	0,20	0,47	0,18
Co	0,68	0,50	0,42	0,24
Ni	0,58	0,58	0,37	0,25
Cu	0,37	0,79	-0,12	0,15
Zn	0,55	0,53	0,21	-0,46
Ga	0,80	0,51	0,08	-0,07
As	-0,20	0,67	0,06	0,61
Rb	0,94	0,02	-0,03	0,11
Sr	0,13	0,85	-0,30	0,10
Y	0,85	0,00	0,31	0,07
Zr	0,72	0,12	0,42	-0,34
Nb	-0,11	-0,32	0,67	-0,24
Sn	-0,63	0,31	-0,36	0,41
Ba	0,58	-0,02	-0,31	0,10
La	0,44	0,13	0,52	0,62
Ce	0,09	0,85	0,07	-0,16
W	-0,38	-0,12	-0,01	0,82
Pb	0,70	0,46	0,23	-0,32
Bi	0,00	0,44	-0,21	0,78
U	0,75	0,39	0,36	0,17
SiO_2	-0,76	-0,01	-0,57	0,20
Al_2O_3	0,93	0,07	-0,03	-0,25
Fe_2O_3	0,43	-0,21	0,83	-0,11
MnO	0,47	0,02	0,72	-0,10
MgO	0,29	0,11	0,91	0,04
CaO	-0,06	0,39	0,83	-0,02
Na_2O	0,10	-0,62	0,60	-0,38
K_2O	0,93	-0,05	-0,06	-0,28
TiO_2	0,08	-0,24	0,89	-0,16
P_2O_5	-0,14	0,10	0,84	0,26
S	0,51	0,38	0,27	0,18
C	0,09	0,88	0,28	0,08
Expl.Var	10,01	6,12	7,94	3,45
Prp.Totl	0,30	0,19	0,24	0,10

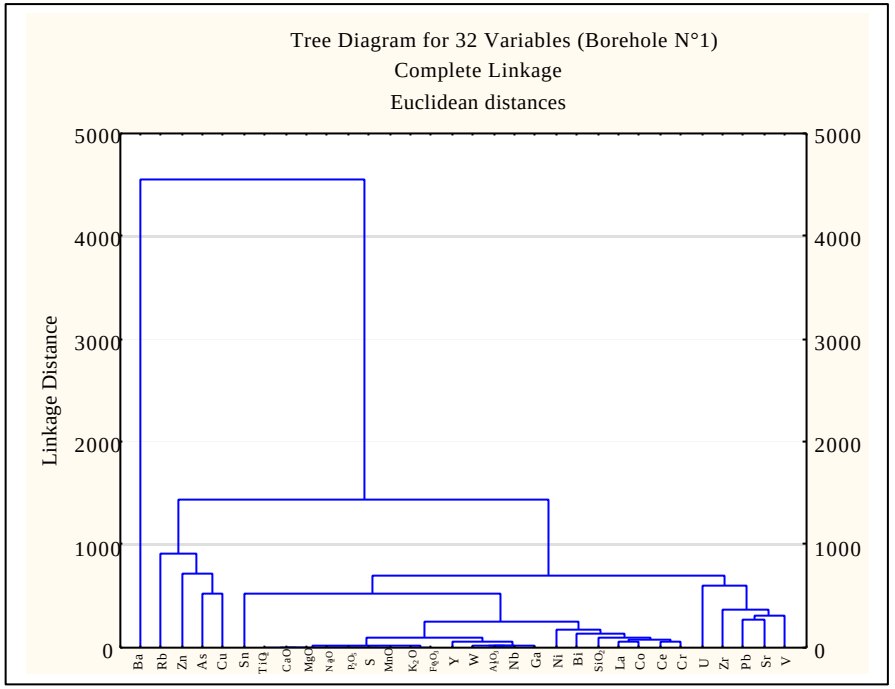

Tree Diagram for 32 Variables (Borehole N°1)
Ward`s method
Euclidean distances
Linkage Distance
0
1000
2000
3000
4000
5000
6000
7000
8000
Ba TiO2 CaO MgO Na2O P2O5 S MnO K2O Fe2O3 Y Al2O3 Nb W Ga Sn Ni Bi SiO2 La Co Ce Cr Rb Zn As Cu U Zr Pb Sr V

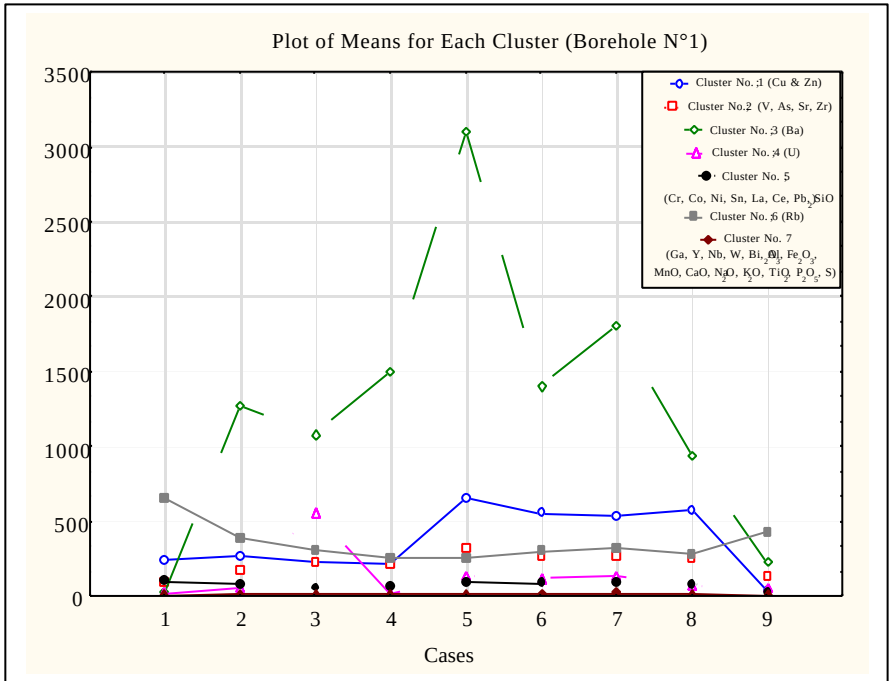

Tree Diagram for 31 Variables (Borehole N°1)
Ward`s method
Euclidean distances
Linkage Distance
0
1000
2000
3000
4000
5000
6000
TiO2 CaO MgO Na2O P2O5 S MnO K2O Fe2O3 Y Al2O3 Nb W Ga Sn Ni Bi SiO2 La Co Ce Cr Rb Zn As Cu U Zr Pb Sr V

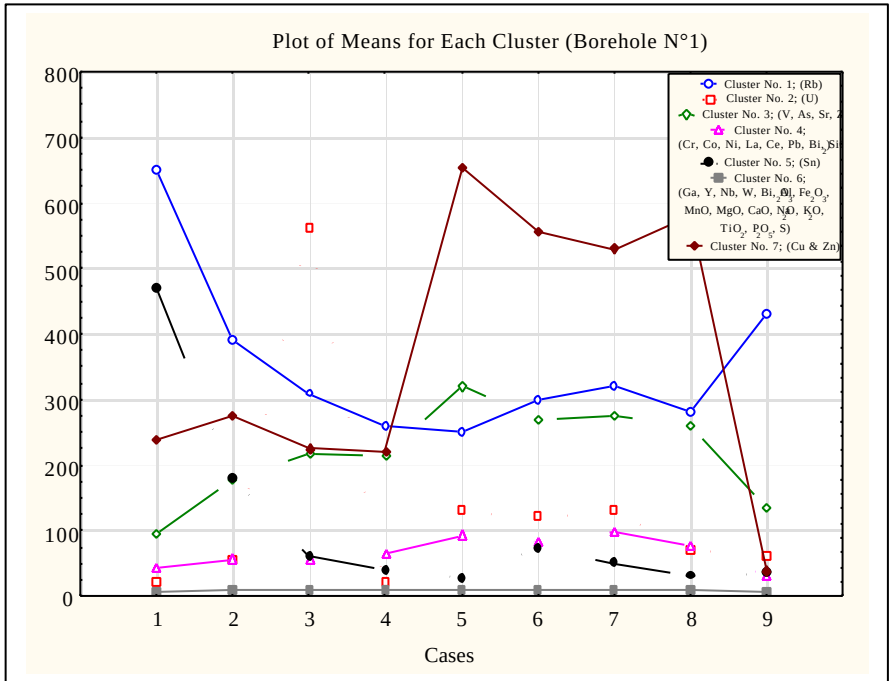

Tree Diagram for 32 Variables (Borehole N°1)
Single Linkage
Euclidean distances
Linkage Distance
0
500
1000
1500
2000
2500
3000
3500
Ba Rb Zn Cu U Sn As Zr Bi Ni SiO2 Y CaO MgO TiO2 Na2O P2O5 S MnO K2O Fe2O3 W Al2O3 Nb Ga Ce La Co Cr Pb Sr V

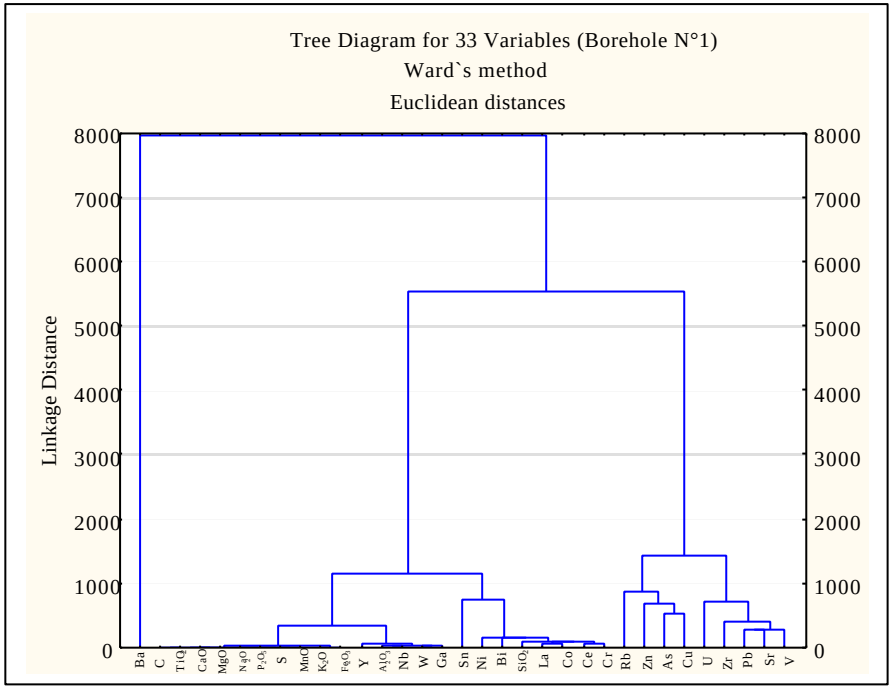

Tree Diagram for 31 Variables (Borehole N°1)
Single Linkage
Euclidean distances
Linkage Distance
0
100
200
300
400
500
600
Rb Zn Cu U Sn As Zr Bi Ni SiO2 Y CaO MgO TiO2 Na2O P2O5 S MnO K2O Fe2O3 W Al2O3 Nb Ga Ce La Co Cr Pb Sr V

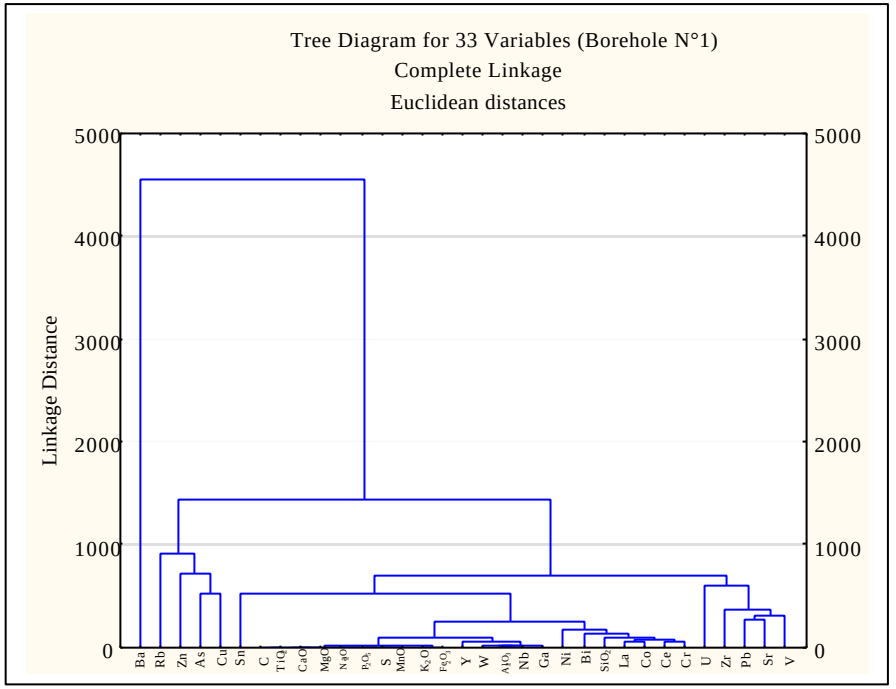

Tree Diagram for 31 Variables (Borehole N°1)
Complete Linkage
Euclidean distances
Linkage Distance
0
200
400
600
800
1000
1200
1400
1600
Rb
Zn
As
Cu
Sn
TiO2
CaO
MgO
Na2O
P2O5
S
MnO
K2O
Fe2O3
Y
W
Al2O3
Nb
Ga
Ni
Bi
SiO2
La
Co
Ce
Cr
U
Zr
Pb
Sr
V

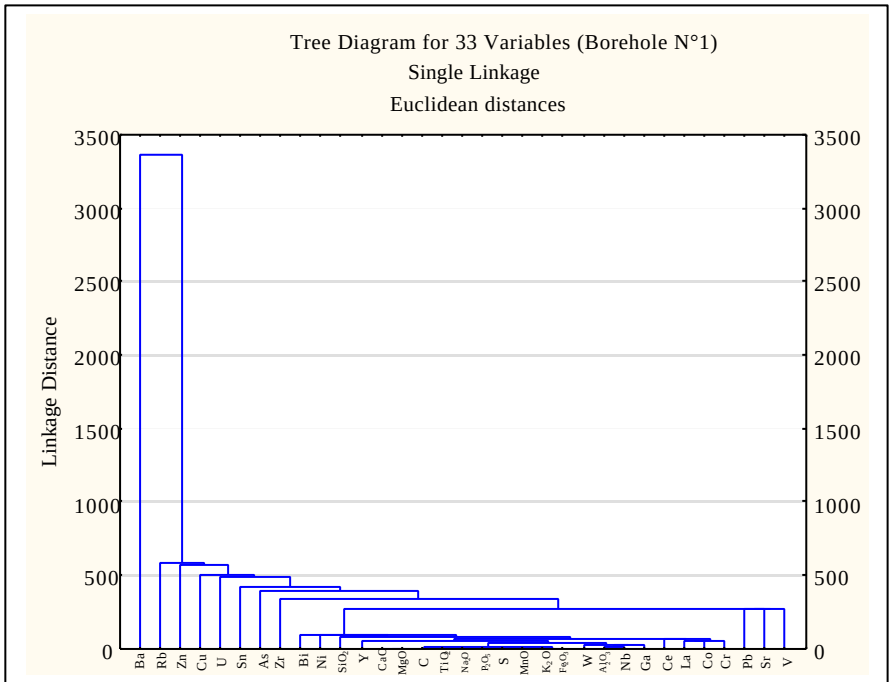

Tree Diagram for 32 Variables (Borehole N°1)
Complete Linkage
Euclidean distances
Linkage Distance
0
1000
2000
3000
4000
5000
Ba
Rb
Zn
As
Cu
Sn
TiO2
CaO
MgO
Na2O
P2O5
S
MnO
K2O
Fe2O3
Y
W
Al2O3
Nb
Ga
Ni
Bi
SiO2
La
Co
Ce
Cr
U
Zr
Pb
Sr
V

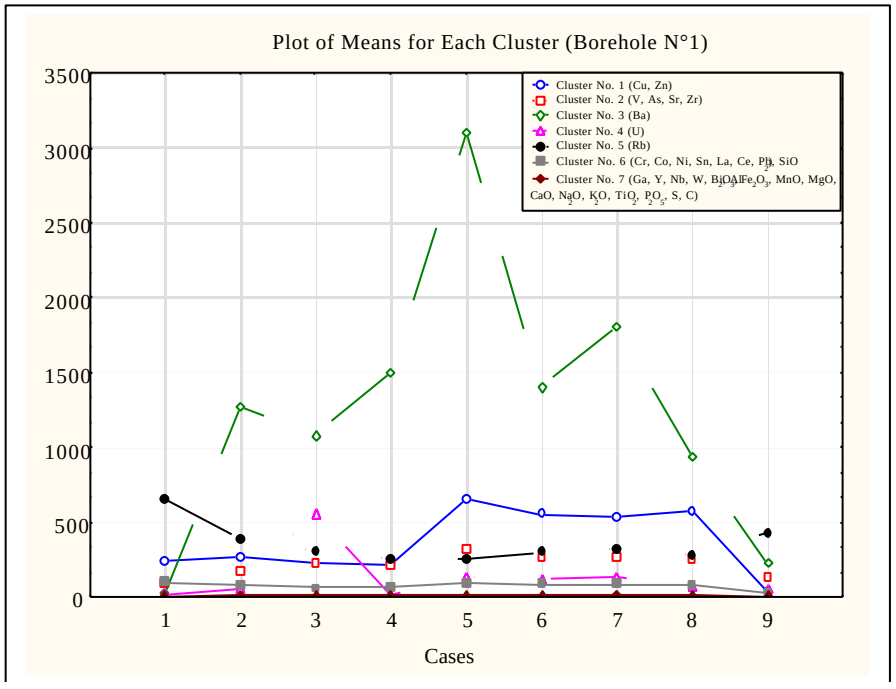

Plot of Means for Each Cluster (Borehole N°1)
Cluster No. 1 (Cu & Zn)
Cluster No. 2 (V, As, Sr, Zr)
Cluster No. 3 (Ba)
Cluster No. 4 (U)
Cluster No. 5
(Cr, Co, Ni, Sn, La, Ce, Pb, Bi2O3, SiO
Cluster No. 6 (Rb)
Cluster No. 7
(Ga, Y, Nb, W, Bi2O3, Fe2O3,
MnO, CaO, Na2O, K2O, TiO2, P2O5, S)
0
500
1000
1500
2000
2500
3000
3500
1
2
3
4
5
6
7
8
9
Cases

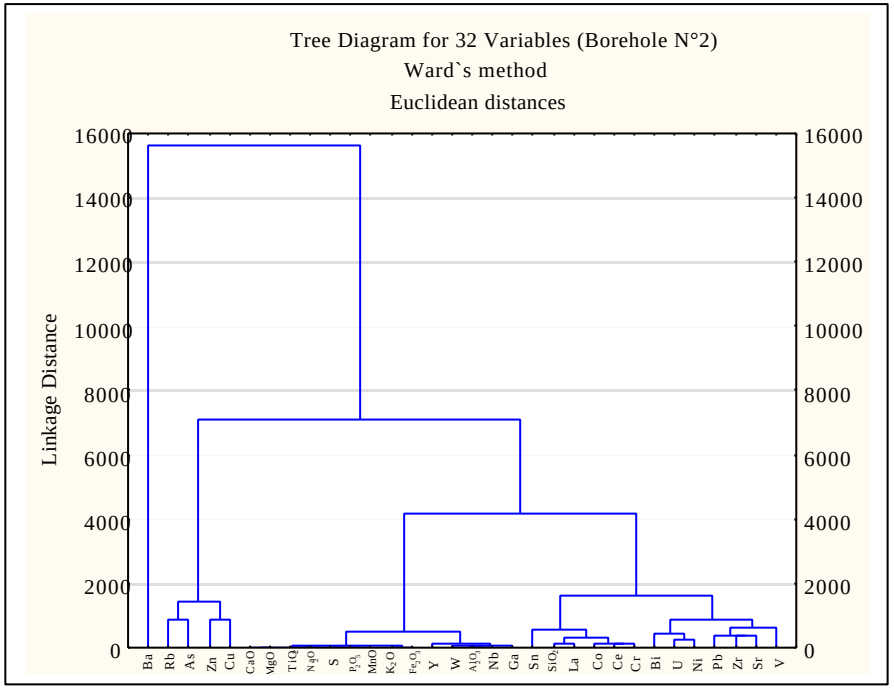

Plot of Means for Each Cluster (Borehole N°1)
Cluster No. 1; (Rb)
Cluster No. 2; (U)
Cluster No. 3; (V, As, Sr,
Cluster No. 4;
(Cr, Co, Ni, La, Ce, Pb, Bi2O3, Si
Cluster No. 5; (Sn)
Cluster No. 6;
(Ga, Y, Nb, W, Bi2O3, Fe2O3,
MnO, MgO, CaO, Na2O, K2O,
TiO2, P2O5, S)
Cluster No. 7; (Cu & Zn)
0
100
200
300
400
500
600
700
800
1
2
3
4
5
6
7
8
9
Cases

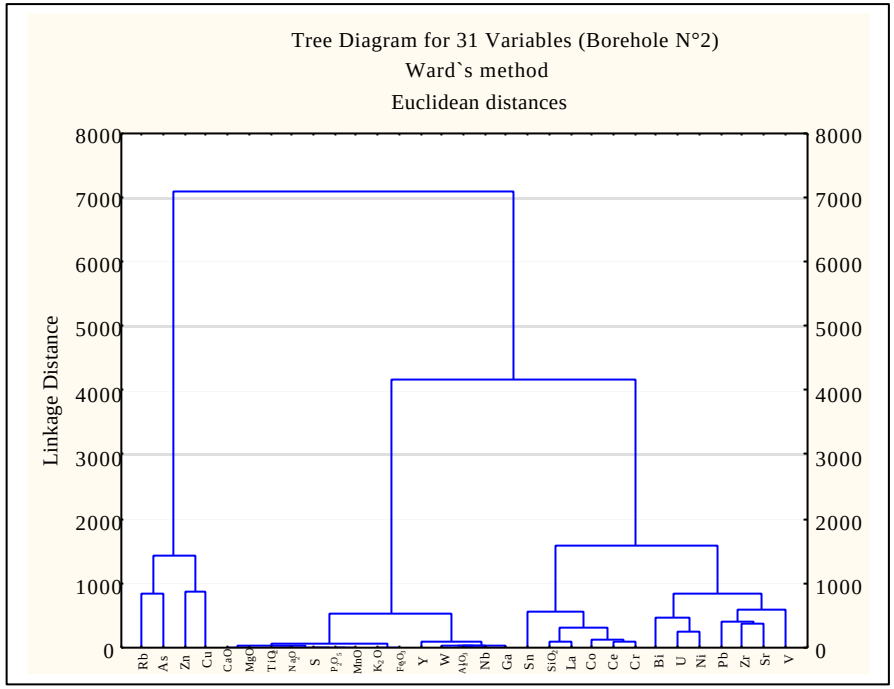

Tree Diagram for 33 Variables (Borehole N°1)
Ward`s method
Euclidean distances
Linkage Distance
0
1000
2000
3000
4000
5000
6000
7000
8000
Ba C TiO2 CaO MgO Na2O P2O5 S MnO K2O Fe2O3 Y Al2O3 Nb W Ga Sn Ni Bi SiO2 La Co Ce Cr Rb Zn As Cu U Zr Pb Sr V

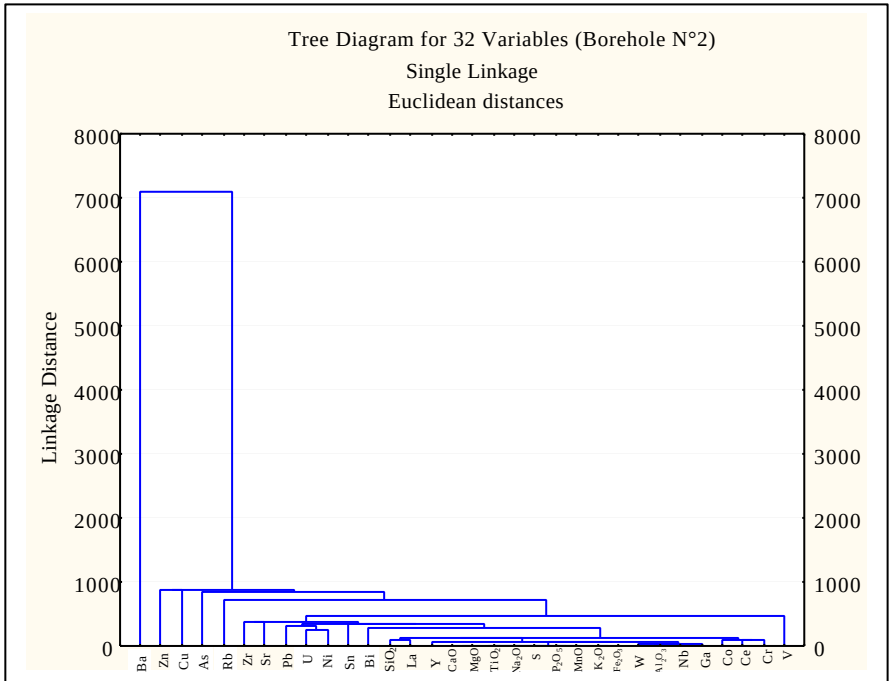

Tree Diagram for 33 Variables (Borehole N°1)
Complete Linkage
Euclidean distances
Linkage Distance
0
1000
2000
3000
4000
5000
Ba Rb Zn As Cu Sn C TiO2 CaO MgO Na2O P2O5 S MnO K2O Fe2O3 Y W Al2O3 Nb Ga Ni Bi SiO2 La Co Ce Cr U Zr Pb Sr V

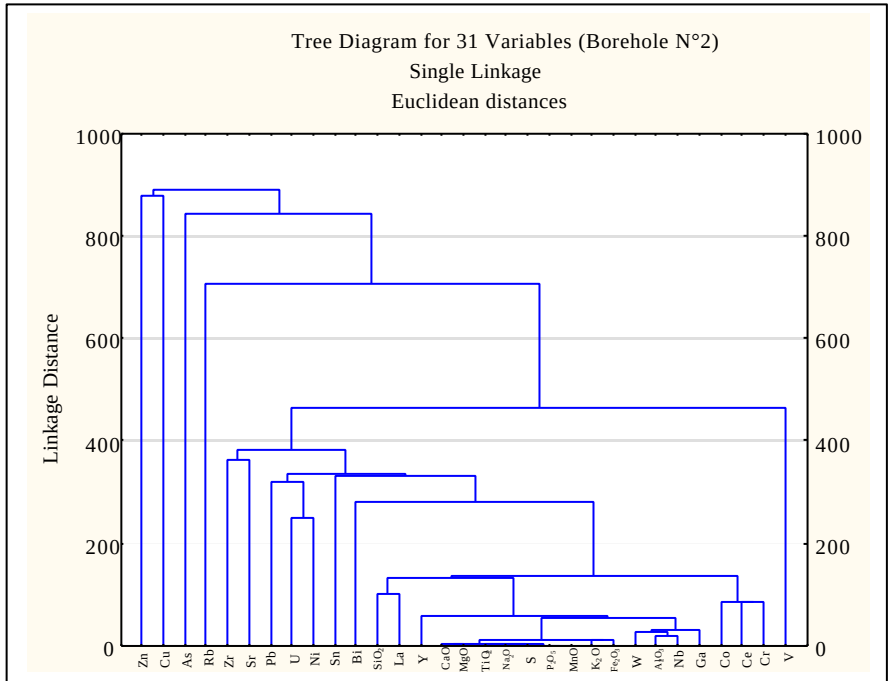

Tree Diagram for 33 Variables (Borehole N°1)
Single Linkage
Euclidean distances
Linkage Distance
0
500
1000
1500
2000
2500
3000
3500
Ba Rb Zn Cu U Sn As Zr Bi Ni SiO2 Y CaO MgO C TiO2 Na2O P2O5 S MnO K2O Fe2O3 W Al2O3 Nb Ga Ce La Co Cr Pb Sr V

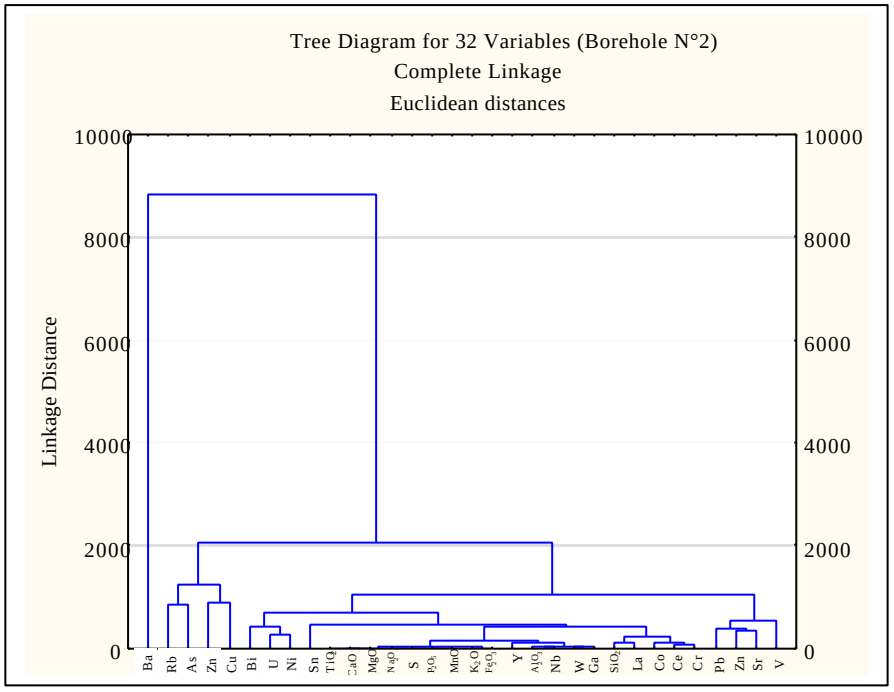

Plot of Means for Each Cluster (Borehole N°1)
Cluster No. 1 (Cu, Zn)
Cluster No. 2 (V, As, Sr, Zr)
Cluster No. 3 (Ba)
Cluster No. 4 (U)
Cluster No. 5 (Rb)
Cluster No. 6 (Cr, Co, Ni, Sn, La, Ce, Pb, SiO2)
Cluster No. 7 (Ga, Y, Nb, W, Bi, Al2O3, Fe2O3, MnO, MgO, CaO, Na2O, K2O, TiO2, P2O5, S, C)
0
500
1000
1500
2000
2500
3000
3500
1 2 3 4 5 6 7 8 9
Cases

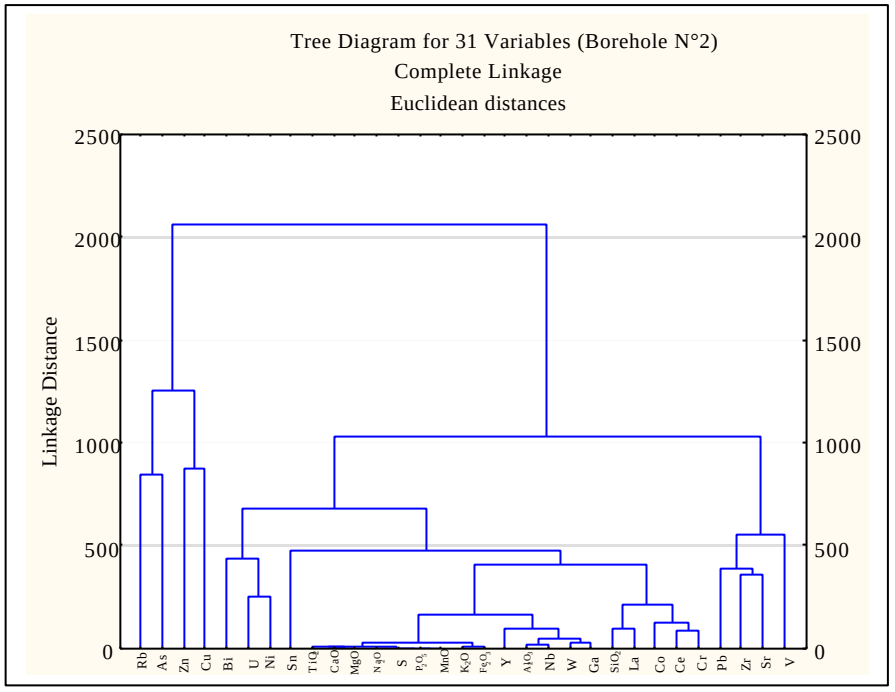

Tree Diagram for 32 Variables (Borehole N°2)
Ward`s method
Euclidean distances
Linkage Distance
16000
14000
12000
10000
8000
6000
4000
2000
0
Ba Rb As Zn Cu CaO MgO TiO2 Na2O S P2O5 MnO K2O Fe2O3 Y W Al2O3 Nb Ga Sn SiO2 La Co Ce Cr Bi U Ni Pb Zr Sr V

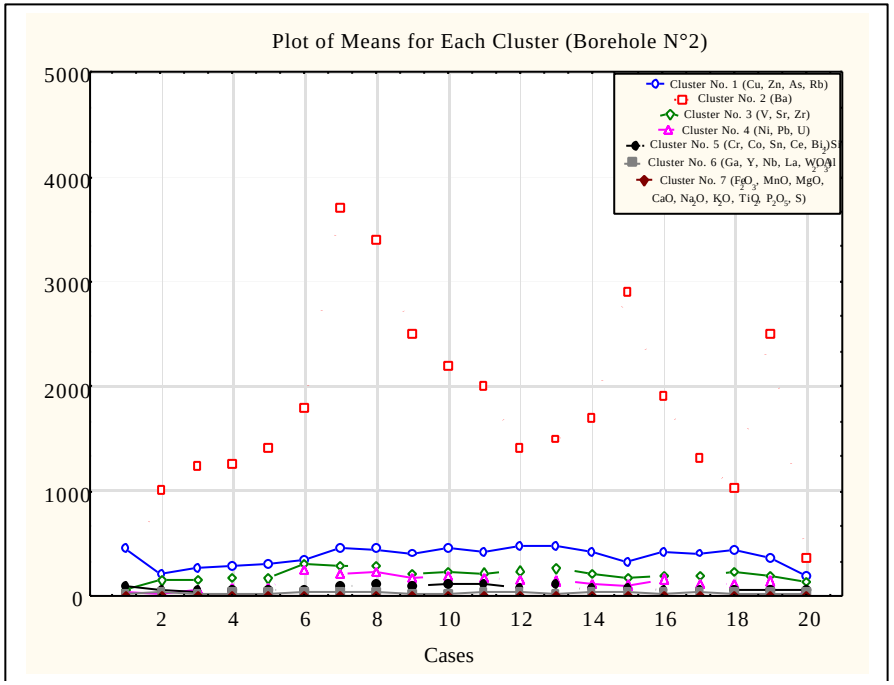

Tree Diagram for 31 Variables (Borehole N°2)
Ward`s method
Euclidean distances
Linkage Distance
8000
7000
6000
5000
4000
3000
2000
1000
0
Rb As Zn Cu CaO MgO TiO2 Na2O S P2O5 MnO K2O Fe2O3 Y W Al2O3 Nb Ga Sn SiO2 La Co Ce Cr Bi U Ni Pb Zr Sr V

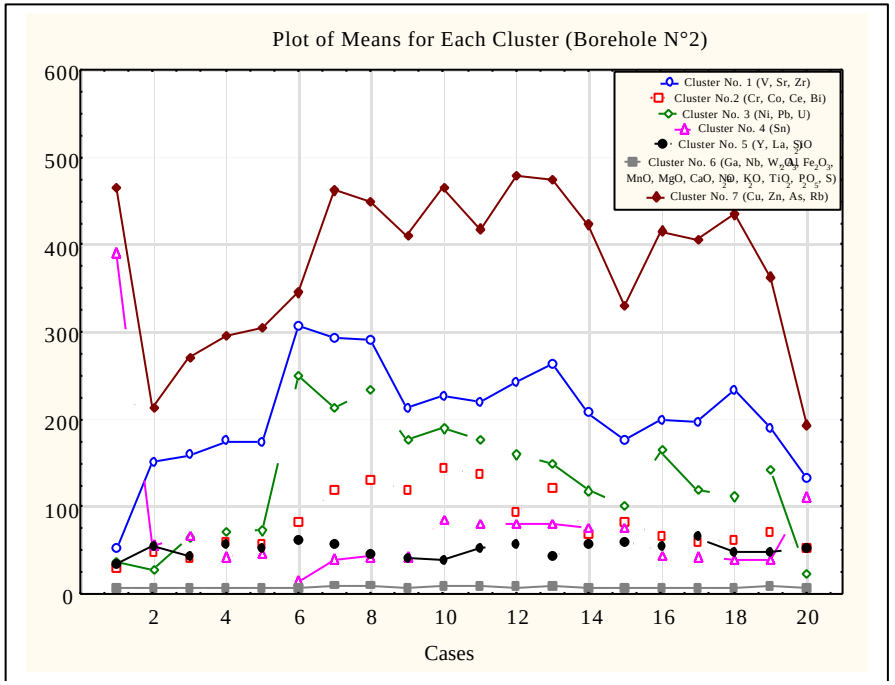

Tree Diagram for 32 Variables (Borehole N°2)
Single Linkage
Euclidean distances
Linkage Distance
8000
7000
6000
5000
4000
3000
2000
1000
0
Ba Zn Cu As Rb Zr Sr Pb U Ni Sn Bi SiO2 La Y CaO MgO TiO2 Na2O S P2O5 MnO K2O Fe2O3 W Al2O3 Nb Ga Co Ce Cr V

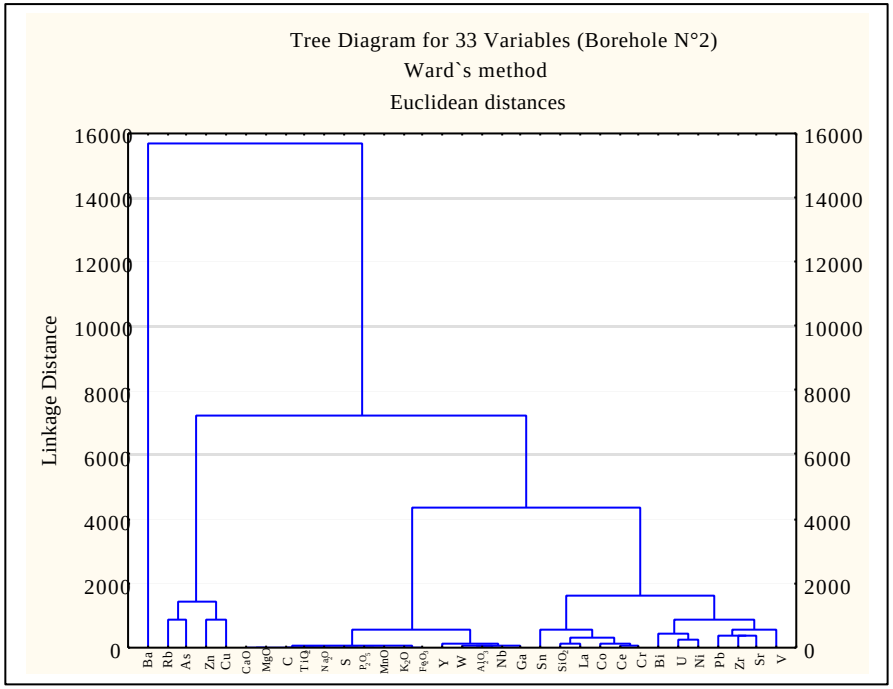

Tree Diagram for 31 Variables (Borehole N°2)
Single Linkage
Euclidean distances
Linkage Distance
1000
800
600
400
200
0
Zn Cu As Rb Zr Sr Pb U Ni Sn Bi SiO2 La Y CaO MgO TiO2 Na2O S P2O5 MnO K2O Fe2O3 W Al2O3 Nb Ga Co Ce Cr V

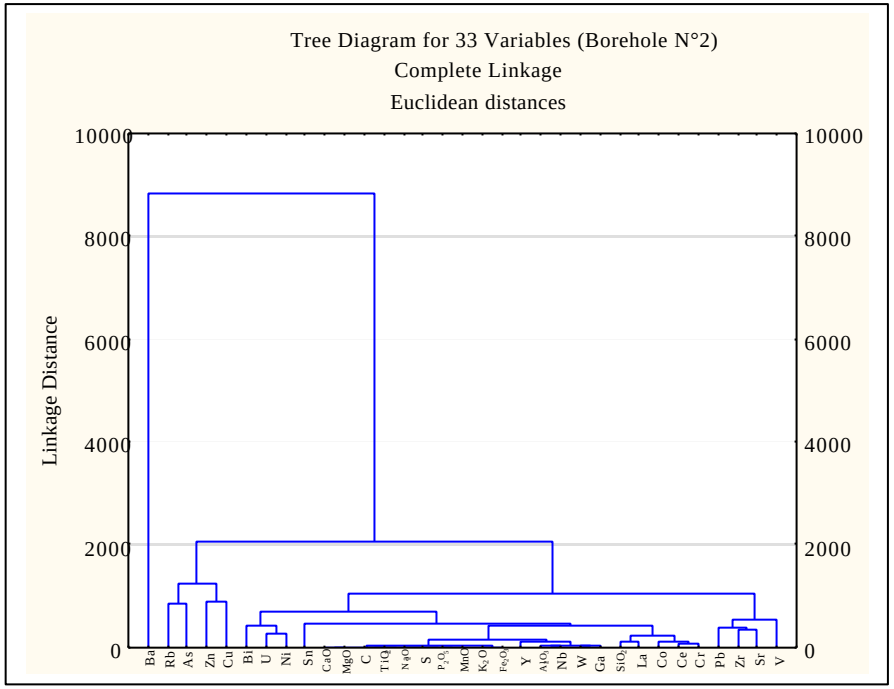

Tree Diagram for 32 Variables (Borehole N°2)
Complete Linkage
Euclidean distances
Linkage Distance
10000
8000
6000
4000
2000
0
Ba
Rb
As
Zn
Cu
Bi
U
Ni
Sn
TiO2
CaO
MgO
Na2O
S
P2O5
MnO
K2O
Fe2O3
Y
Al2O3
Nb
W
Ga
SiO2
La
Co
Ce
Cr
Pb
Zn
Sr
V

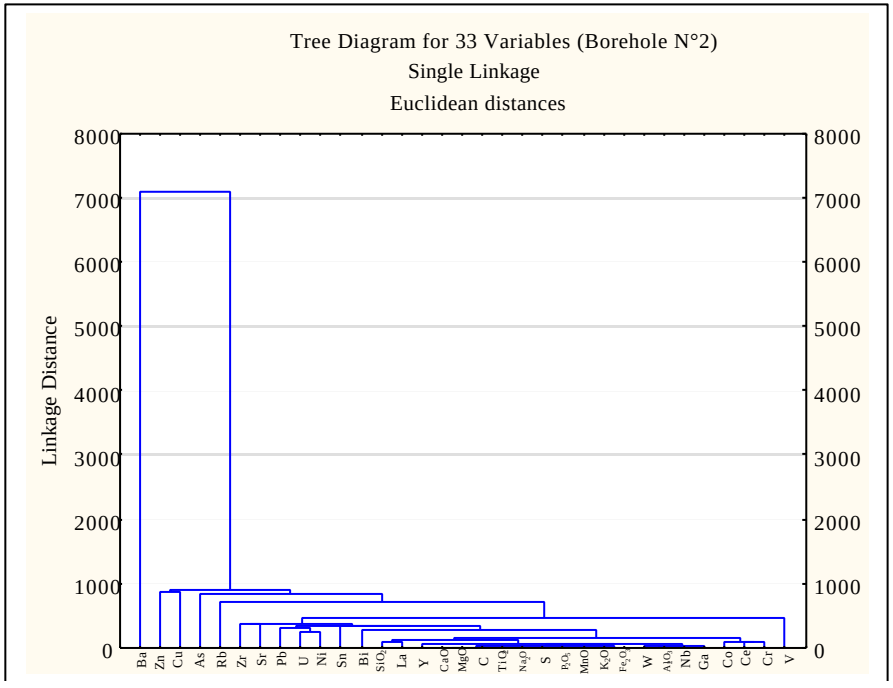

Tree Diagram for 31 Variables (Borehole N°2)
Complete Linkage
Euclidean distances
Linkage Distance
2500
2000
1500
1000
500
0
Rb
As
Zn
Cu
Bi
U
Ni
Sn
TiO2
CaO
MgO
Na2O
S
P2O5
MnO
K2O
Fe2O3
Y
Al2O3
Nb
W
Ga
SiO2
La
Co
Ce
Cr
Pb
Zr
Sr
V

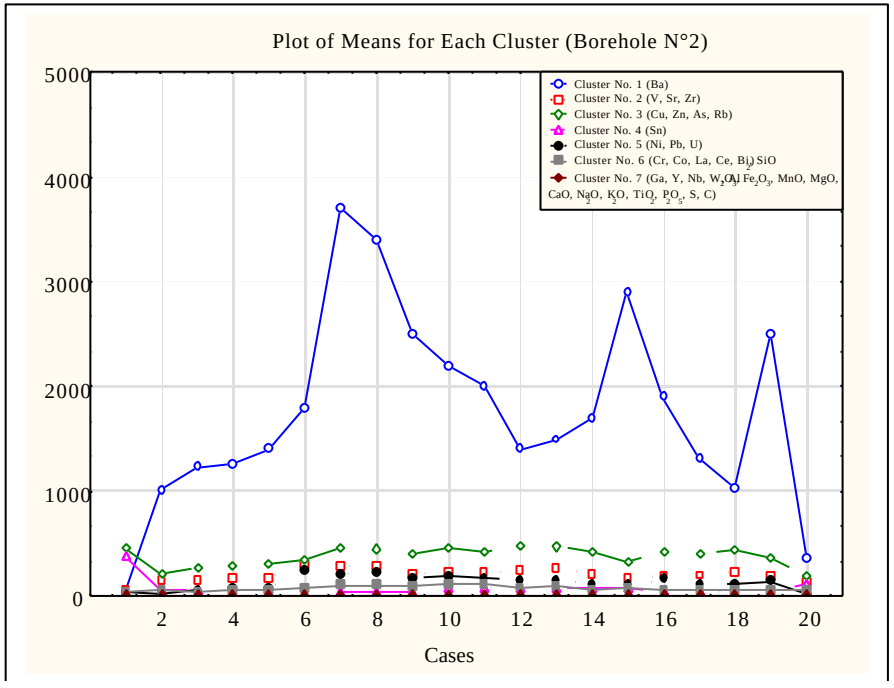

Plot of Means for Each Cluster (Borehole N°2)
Cluster No. 1 (Cu, Zn, As, Rb)
Cluster No. 2 (Ba)
Cluster No. 3 (V, Sr, Zr)
Cluster No. 4 (Ni, Pb, U)
Cluster No. 5 (Cr, Co, Sn, Ce, Bi2)S
Cluster No. 6 (Ga, Y, Nb, La, WO3)
Cluster No. 7 (Fe2O3, MnO, MgO, CaO, Na2O, K2O, TiO2, P2O5, S)
5000
4000
3000
2000
1000
0
2
4
6
8
10
12
14
16
18
20
Cases

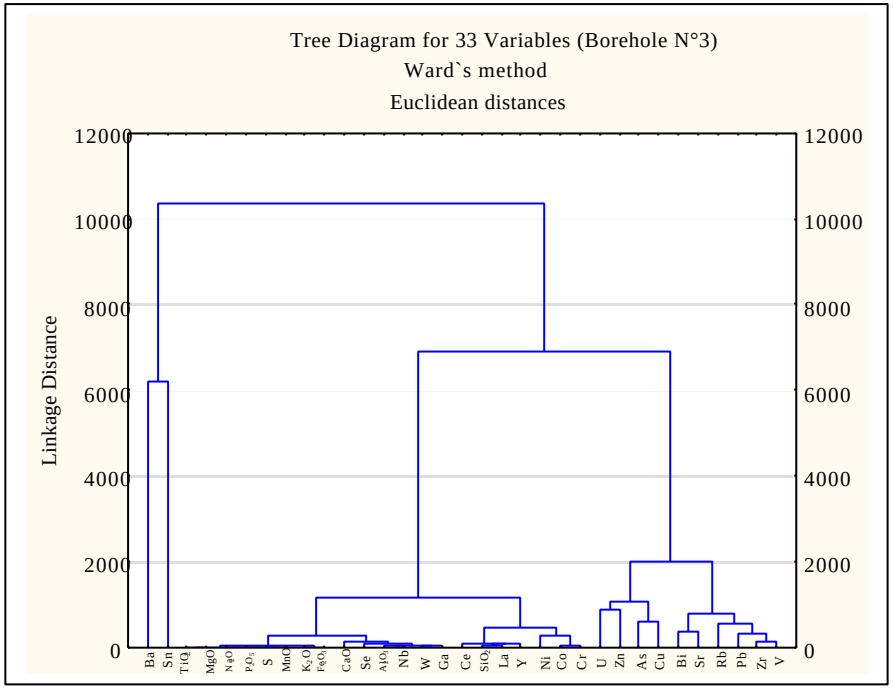

Plot of Means for Each Cluster (Borehole N°2)
Cluster No. 1 (V, Sr, Zr)
Cluster No.2 (Cr, Co, Ce, Bi)
Cluster No. 3 (Ni, Pb, U)
Cluster No. 4 (Sn)
Cluster No. 5 (Y, La, SiO2)
Cluster No. 6 (Ga, Nb, W2O3, Fe2O3, MnO, MgO, CaO, Na2O, K2O, TiO2, P2O5, S)
Cluster No. 7 (Cu, Zn, As, Rb)
600
500
400
300
200
100
0
2
4
6
8
10
12
14
16
18
20
Cases

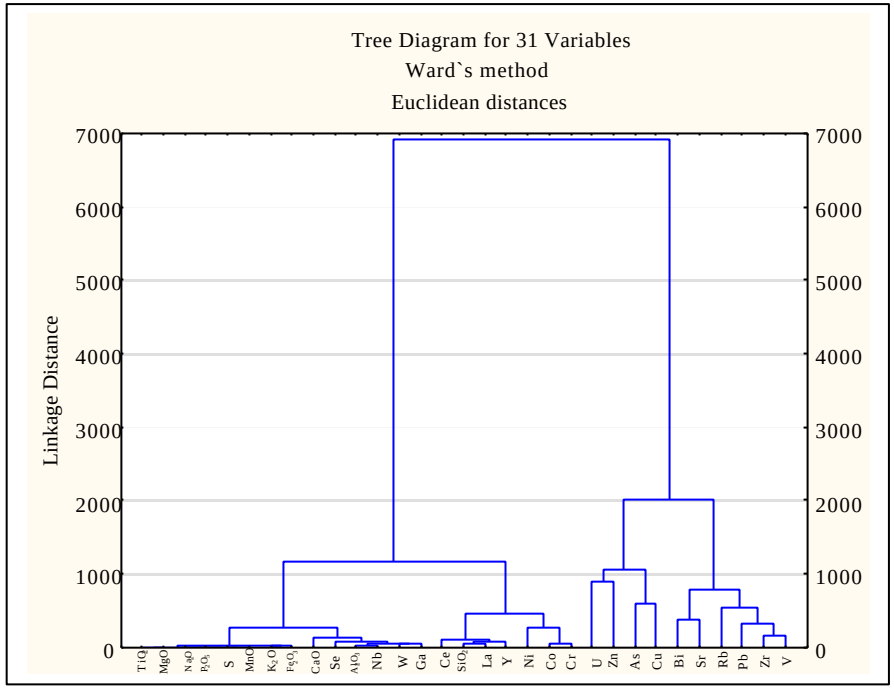

Tree Diagram for 33 Variables (Borehole N°2)
Ward`s method
Euclidean distances
Linkage Distance
16000
14000
12000
10000
8000
6000
4000
2000
0
Ba Rb As Zn Cu CaO MgO C TiO2 Na2O S P2O5 MnO K2O Fe2O3 Y W Al2O3 Nb Ga Sn SiO2 La Co Ce Cr Bi U Ni Pb Zr Sr V

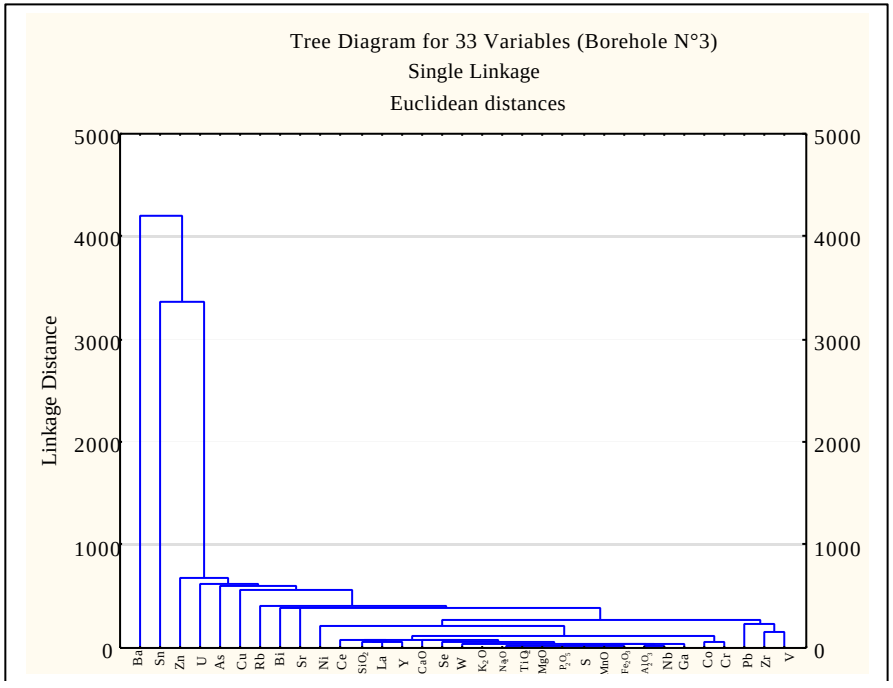

Tree Diagram for 33 Variables (Borehole N°2)
Complete Linkage
Euclidean distances
Linkage Distance
10000
8000
6000
4000
2000
0
Ba Rb As Zn Cu Bi U Ni Sn CaO MgO C TiO2 Na2O S P2O5 MnO K2O Fe2O3 Y Al2O3 Nb W Ga SiO2 La Co Ce Cr Pb Zr Sr V

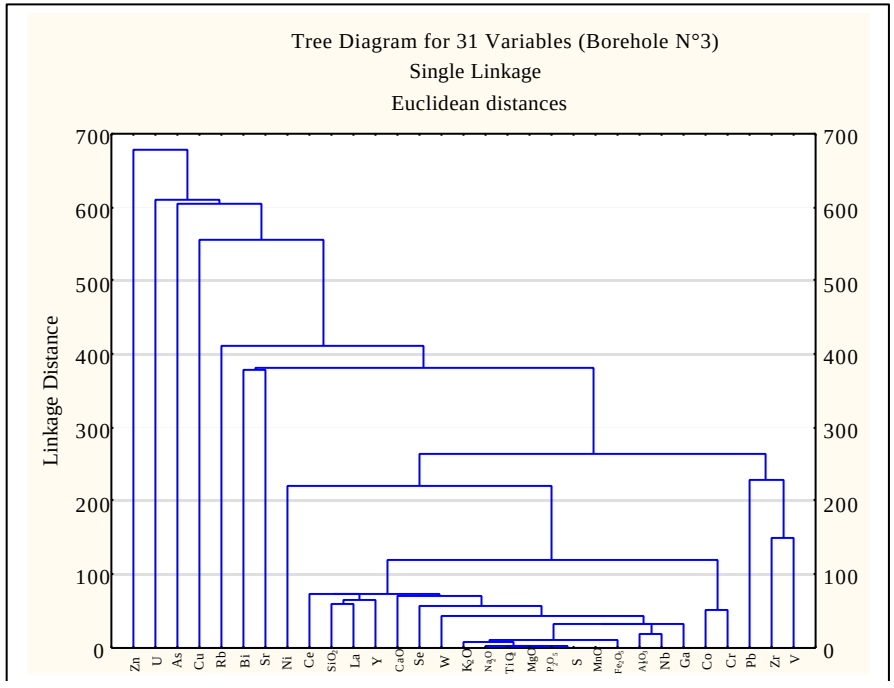

Tree Diagram for 33 Variables (Borehole N°2)
Single Linkage
Euclidean distances
Linkage Distance
8000
7000
6000
5000
4000
3000
2000
1000
0
Ba Zn Cu As Rb Zr Sr Pb U Ni Sn Bi SiO2 La Y CaO MgO C TiO2 Na2O S P2O5 MnO K2O Fe2O3 W Al2O3 Nb Ga Co Ce Cr V

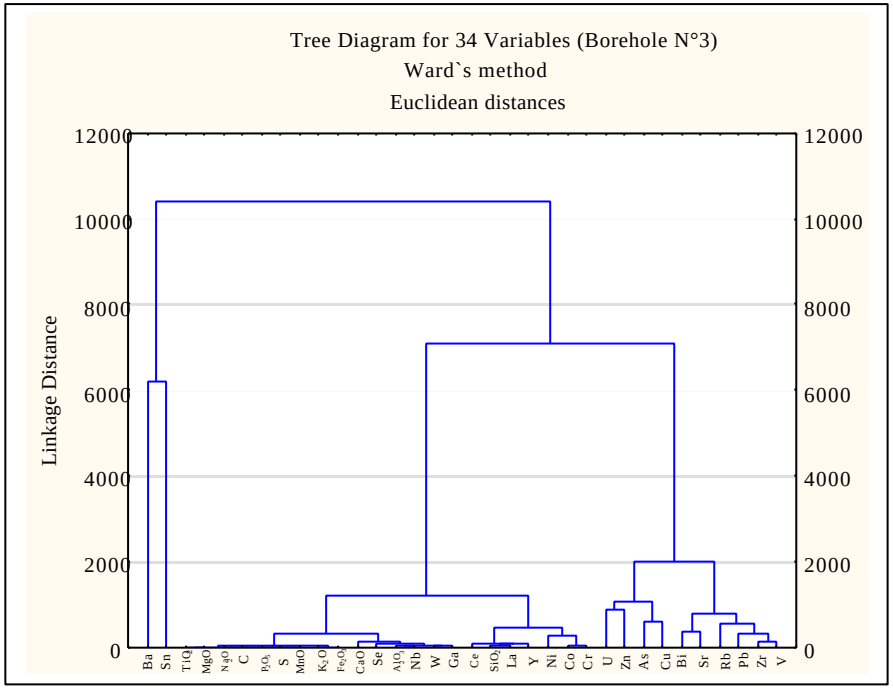

Plot of Means for Each Cluster (Borehole N°2)
Cluster No. 1 (Ba)
Cluster No. 2 (V, Sr, Zr)
Cluster No. 3 (Cu, Zn, As, Rb)
Cluster No. 4 (Sn)
Cluster No. 5 (Ni, Pb, U)
Cluster No. 6 (Cr, Co, La, Ce, Bi, SiO2)
Cluster No. 7 (Ga, Y, Nb, W, Al2O3, Fe2O3, MnO, MgO, CaO, Na2O, K2O, TiO2, P2O5, S, C)
5000
4000
3000
2000
1000
0
2 4 6 8 10 12 14 16 18 20
Cases

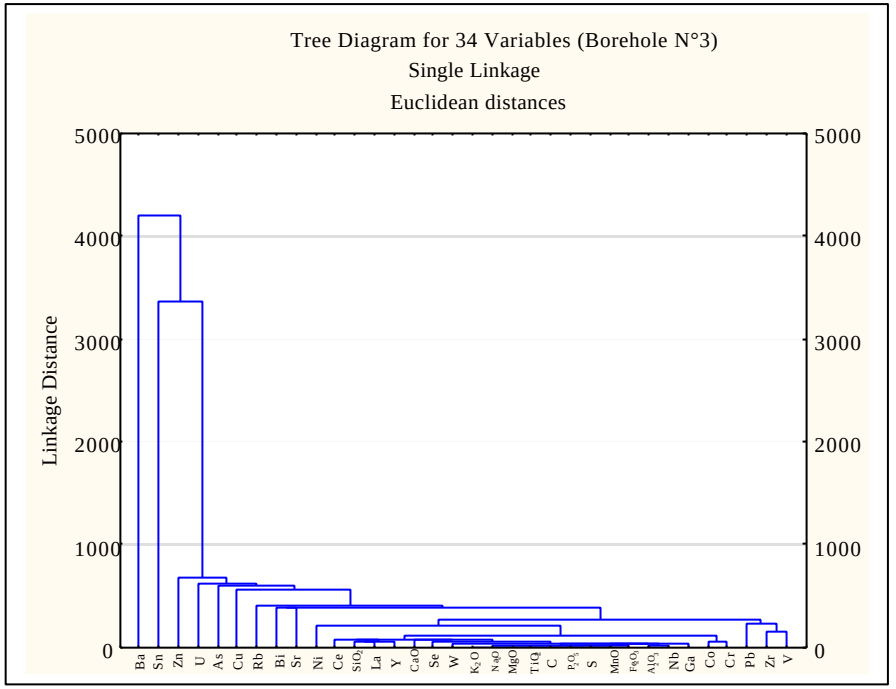

Tree Diagram for 33 Variables (Borehole N°3)
Ward`s method
Euclidean distances
Linkage Distance
12000
10000
8000
6000
4000
2000
0
Ba Sn TiO MgO Na2O P2O5 S MnO K2O Fe2O3 CaO Se Al2O3 Nb W Ga Ce SiO2 La Y Ni Co Cr U Zn As Cu Bi Sr Rb Pb Zr V

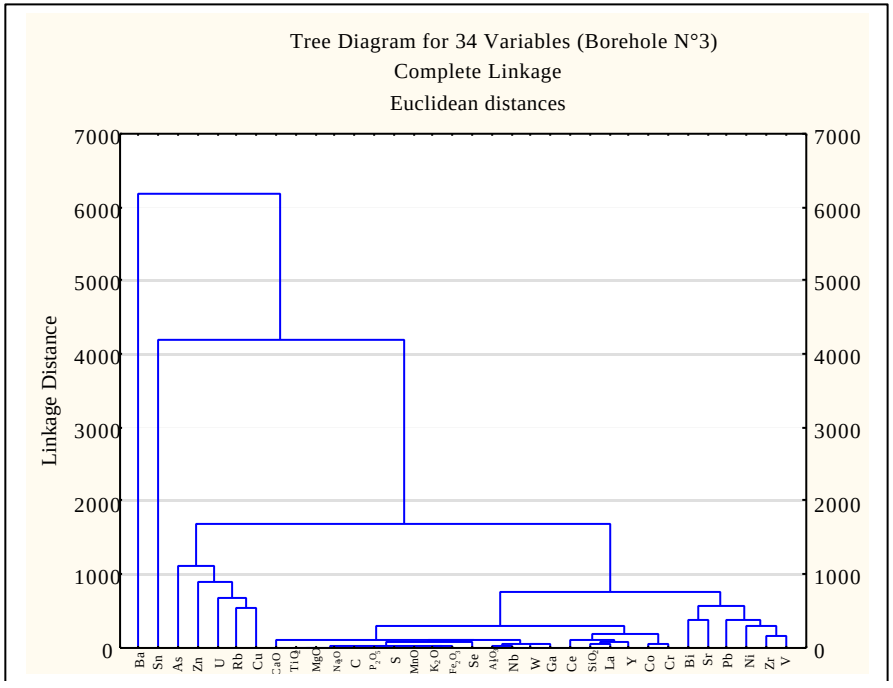

Tree Diagram for 31 Variables
Ward`s method
Euclidean distances
Linkage Distance
7000
6000
5000
4000
3000
2000
1000
0
TiO MgO Na2O P2O5 S MnO K2O Fe2O3 CaO Se Al2O3 Nb W Ga Ce SiO2 La Y Ni Co Cr U Zn As Cu Bi Sr Rb Pb Zr V

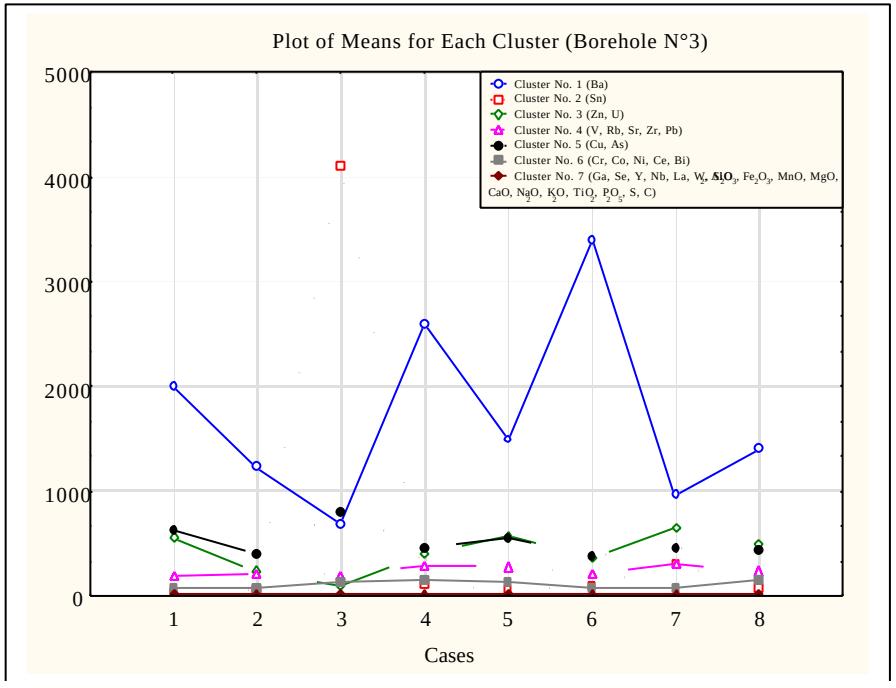

Tree Diagram for 33 Variables (Borehole N°3)
Single Linkage
Euclidean distances
Linkage Distance
5000
4000
3000
2000
1000
0
Ba Sn Zn U As Cu Rb Bi Sr Ni Ce SiO2 La Y CaO Se W K2O Na2O TiO MgO P2O5 S MnO Fe2O3 Al2O3 Nb Ga Co Cr Pb Zr V

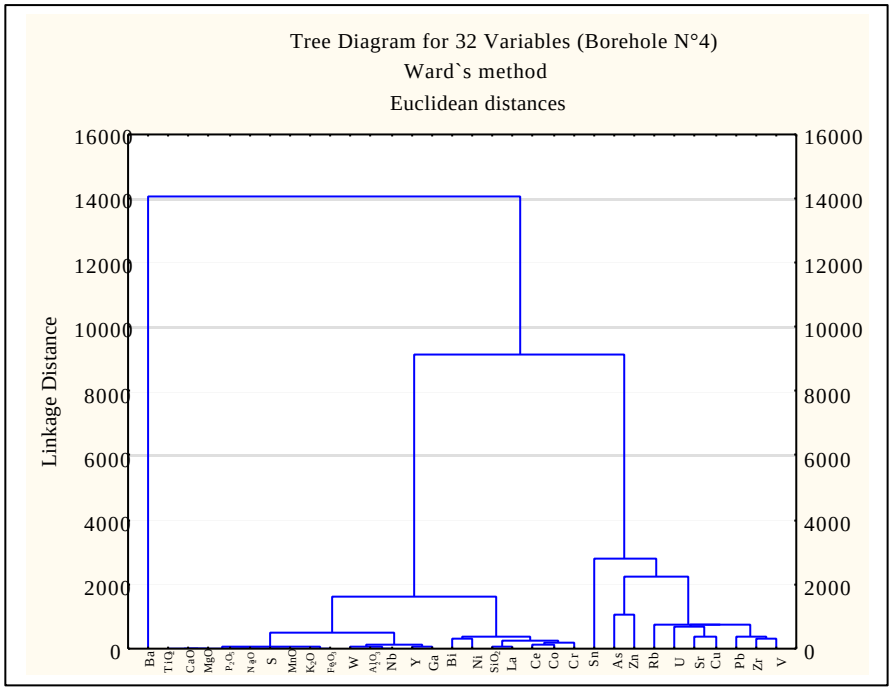

Tree Diagram for 31 Variables (Borehole N°3)
Single Linkage
Euclidean distances
Linkage Distance
700
600
500
400
300
200
100
0
Zn U As Cu Rb Bi Sr Ni Ce SiO2 La Y CaO Se W K2O Na2O TiO MgO P2O5 S MnO Fe2O3 Al2O3 Nb Ga Co Cr Pb Zr V

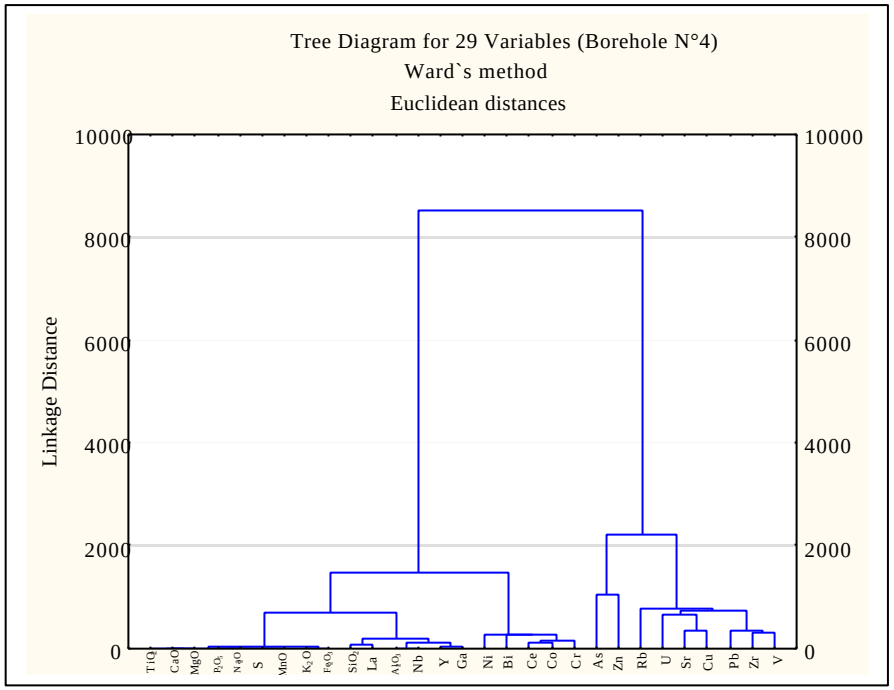

Tree Diagram for 34 Variables (Borehole N°3)
Ward`s method
Euclidean distances
Linkage Distance
12000
10000
8000
6000
4000
2000
0
Ba Sn TiO2 MgO Na2O C P2O5 S MnO K2O Fe2O3 CaO Se Al2O3 Nb W Ga Ce SiO2 La Y Ni Co Cr U Zn As Cu Bi Sr Rb Pb Zr V

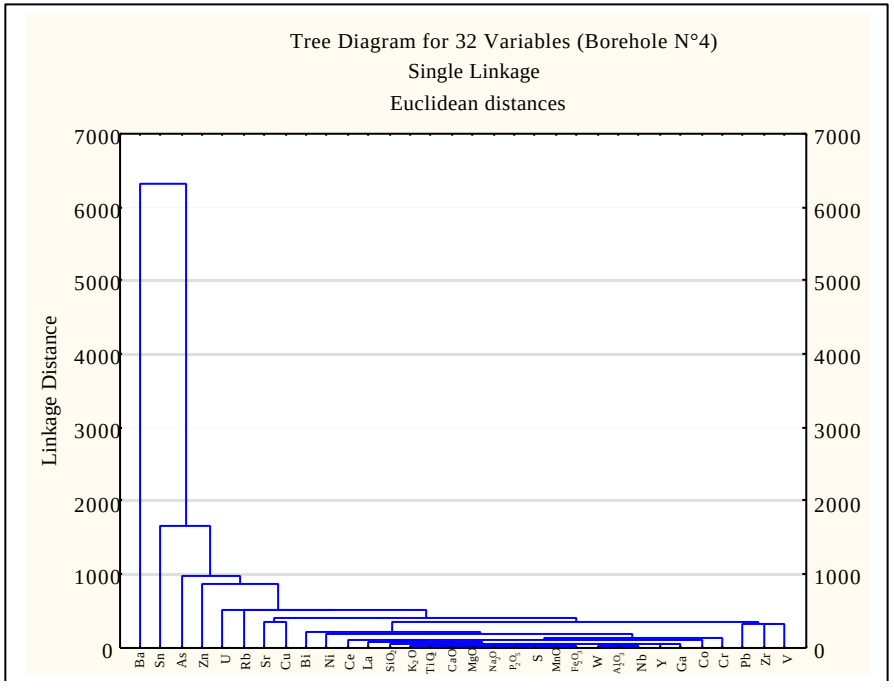

Tree Diagram for 34 Variables (Borehole N°3)
Single Linkage
Euclidean distances
Linkage Distance
5000
4000
3000
2000
1000
0
Ba Sn Zn U As Cu Rb Bi Sr Ni Ce SiO2 La Y CaO Se W K2O Na2O MgO TiO2 C P2O5 S MnO Fe2O3 Al2O3 Nb Ga Co Cr Pb Zr V

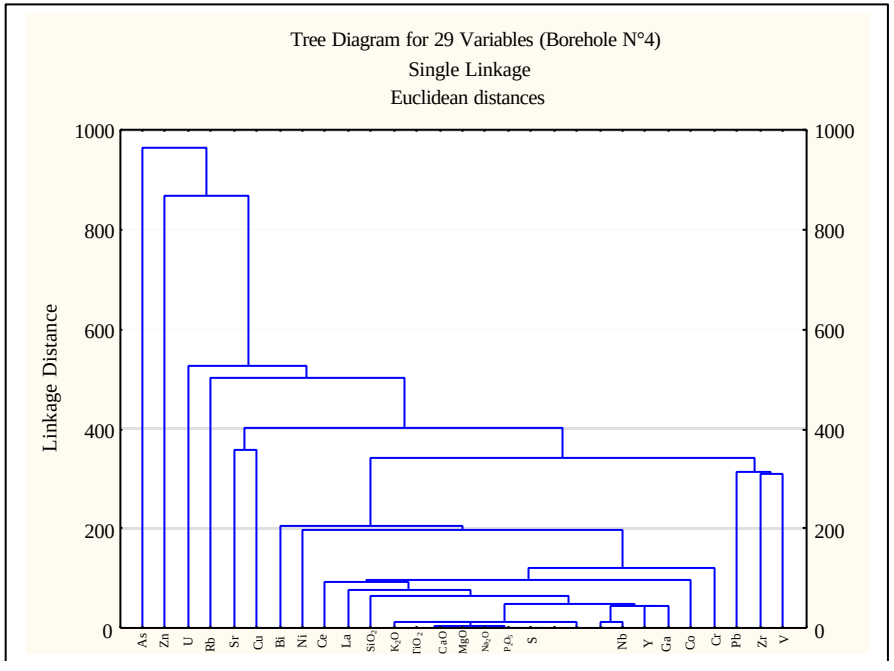

Tree Diagram for 34 Variables (Borehole N°3)
Complete Linkage
Euclidean distances
Linkage Distance
7000
6000
5000
4000
3000
2000
1000
0
Ba Sn As Zn U Rb Cu CaO TiO2 MgO Na2O C P2O5 S MnO K2O Fe2O3 Se Al2O3 Nb W Ga Ce SiO2 La Y Co Cr Bi Sr Pb Ni Zr V

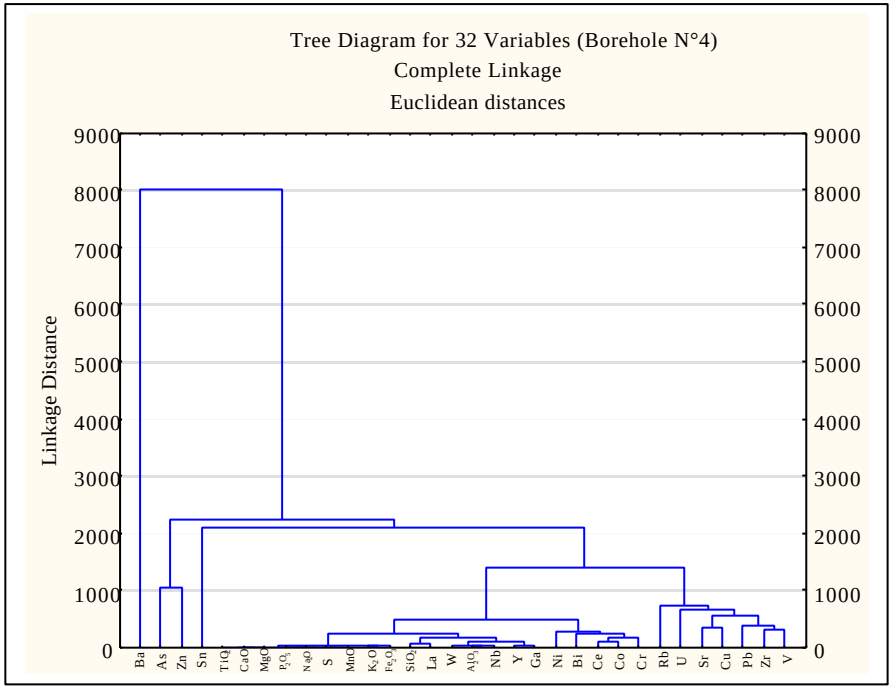

Plot of Means for Each Cluster (Borehole N°3)
Cluster No. 1 (Ba)
Cluster No. 2 (Sn)
Cluster No. 3 (Zn, U)
Cluster No. 4 (V, Rb, Sr, Zr, Pb)
Cluster No. 5 (Cu, As)
Cluster No. 6 (Cr, Co, Ni, Ce, Bi)
Cluster No. 7 (Ga, Se, Y, Nb, La, W, Al2O3, Fe2O3, MnO, MgO, CaO, Na2O, K2O, TiO2, P2O5, S, C)
5000
4000
3000
2000
1000
0
1 2 3 4 5 6 7 8
Cases

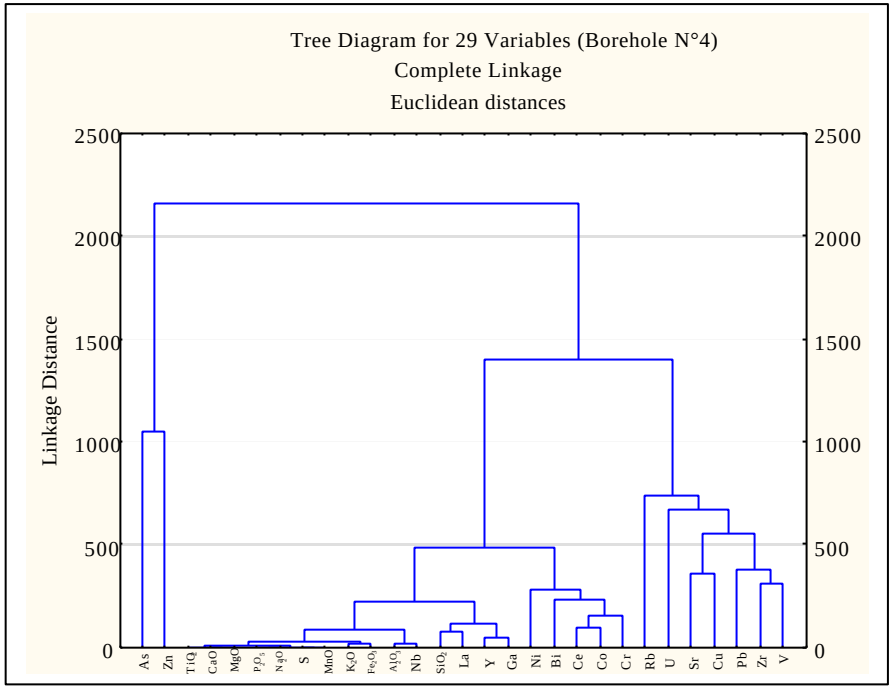

Tree Diagram for 32 Variables (Borehole N°4)
Ward`s method
Euclidean distances
Linkage Distance
16000
14000
12000
10000
8000
6000
4000
2000
0
Ba TiO2 CaO MgO P2O5 Na2O S MnO K2O Fe2O3 W Al2O3 Nb Y Ga Bi Ni SiO2 La Ce Co Cr Sn As Zn Rb U Sr Cu Pb Zr V

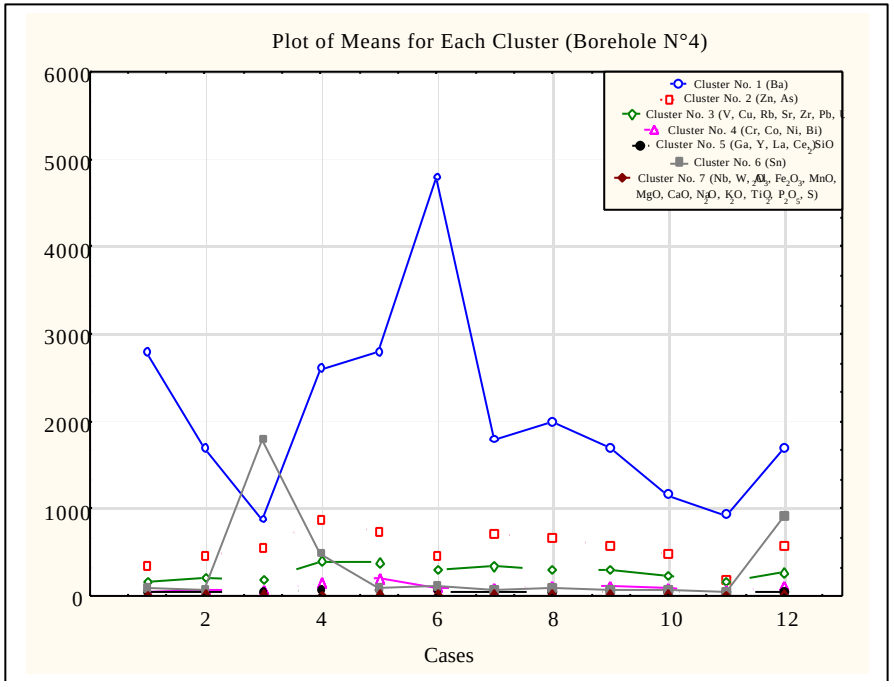

Tree Diagram for 29 Variables (Borehole N°4)
Ward`s method
Euclidean distances
Linkage Distance
10000
8000
6000
4000
2000
0
TiO2 CaO MgO P2O5 Na2O S MnO K2O Fe2O3 SiO2 La Al2O3 Nb Y Ga Ni Bi Ce Co Cr As Zn Rb U Sr Cu Pb Zr V

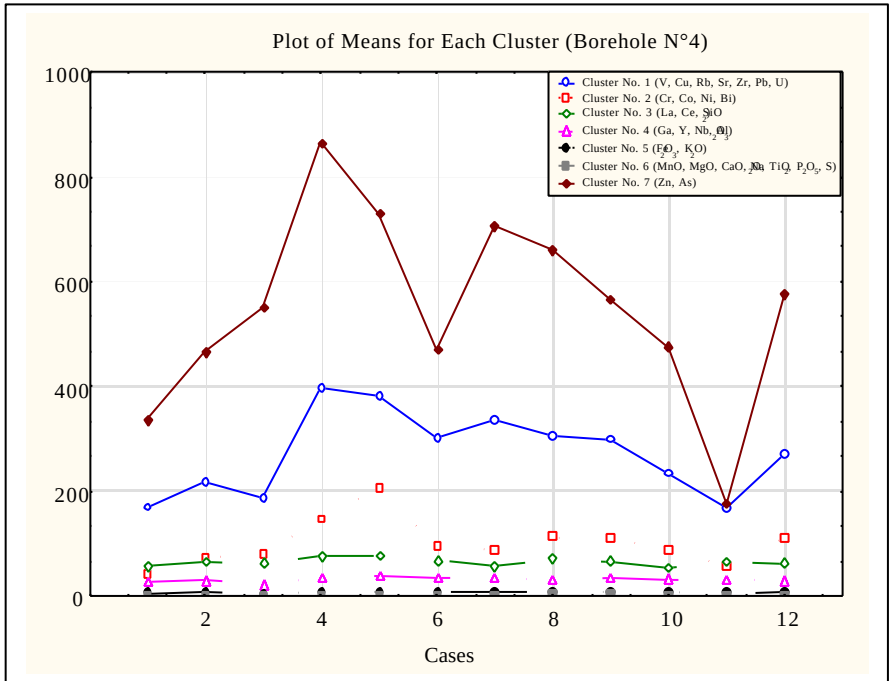

Tree Diagram for 32 Variables (Borehole N°4)
Single Linkage
Euclidean distances
Linkage Distance
7000
6000
5000
4000
3000
2000
1000
0
Ba Sn As Zn U Rb Sr Cu Bi Ni Ce La SiO2 K2O TiO2 CaO MgO Na2O P2O5 S MnO Fe2O3 W Al2O3 Nb Y Ga Co Cr Pb Zr V

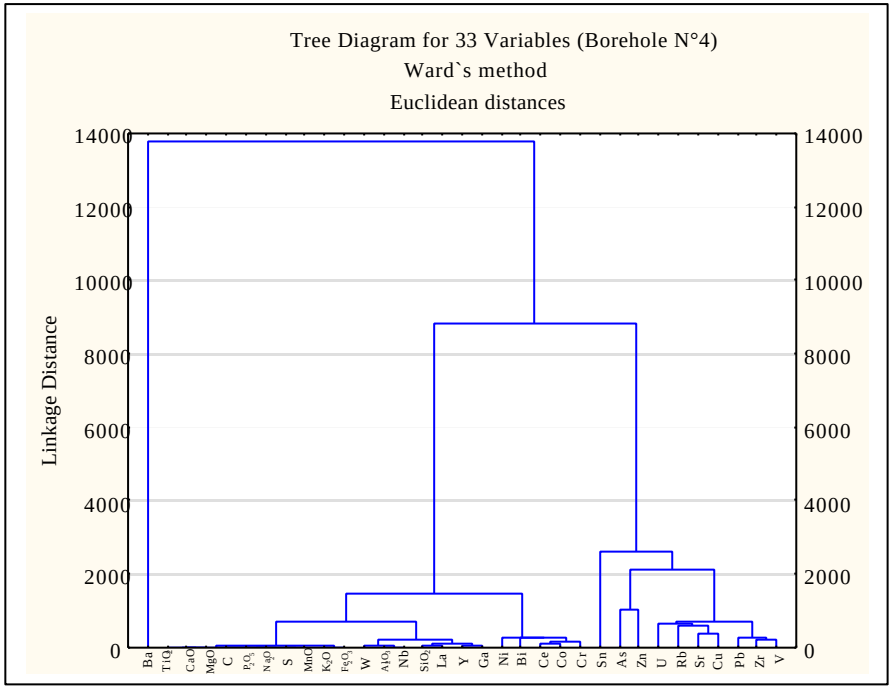

Tree Diagram for 29 Variables (Borehole N°4)
Single Linkage
Euclidean distances
Linkage Distance
1000
800
600
400
200
0
As Zn U Rb Sr Cu Bi Ni Ce La SiO2 K2O TiO2 CaO MgO Na2O P2O5 S Nb Y Ga Co Cr Pb Zr V

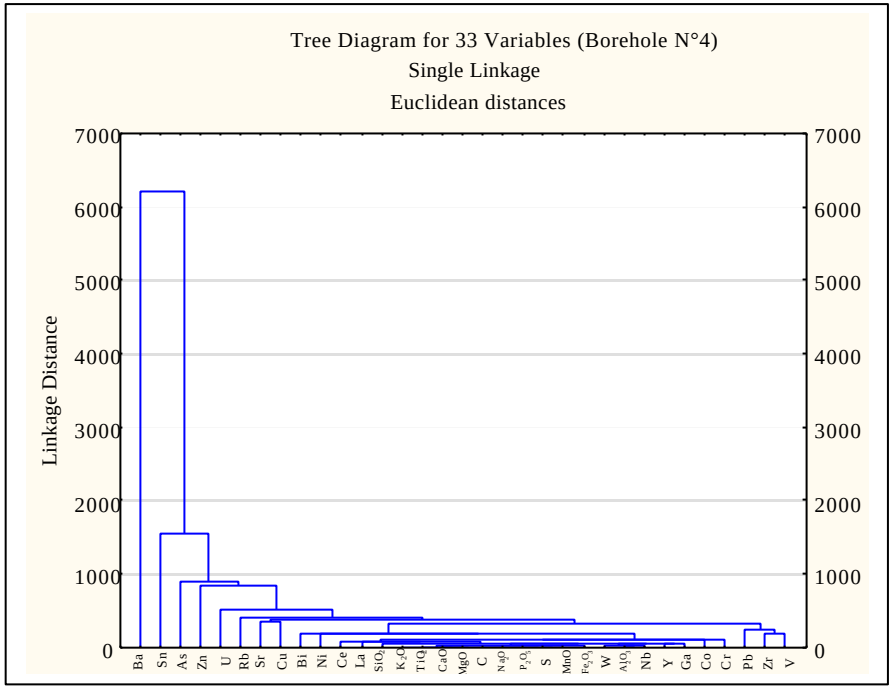

Tree Diagram for 32 Variables (Borehole N°4)
Complete Linkage
Euclidean distances
Linkage Distance
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Ba
As
Zn
Sn
TiO2
CaO
MgO
P2O5
Na2O
S
MnO
K2O
Fe2O3
SiO2
La
W
Al2O3
Nb
Y
Ga
Ni
Bi
Ce
Co
Cr
Rb
U
Sr
Cu
Pb
Zr
V

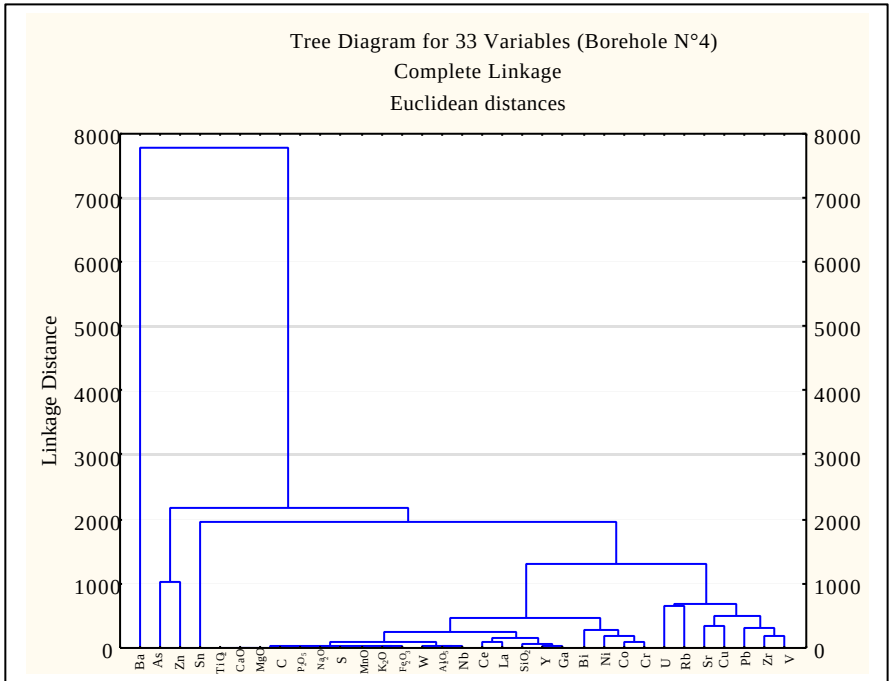

Tree Diagram for 29 Variables (Borehole N°4)
Complete Linkage
Euclidean distances
Linkage Distance
2500
2000
1500
1000
500
0
As
Zn
TiO2
CaO
MgO
P2O5
Na2O
S
MnO
K2O
Fe2O3
Al2O3
Nb
SiO2
La
Y
Ga
Ni
Bi
Ce
Co
Cr
Rb
U
Sr
Cu
Pb
Zr
V

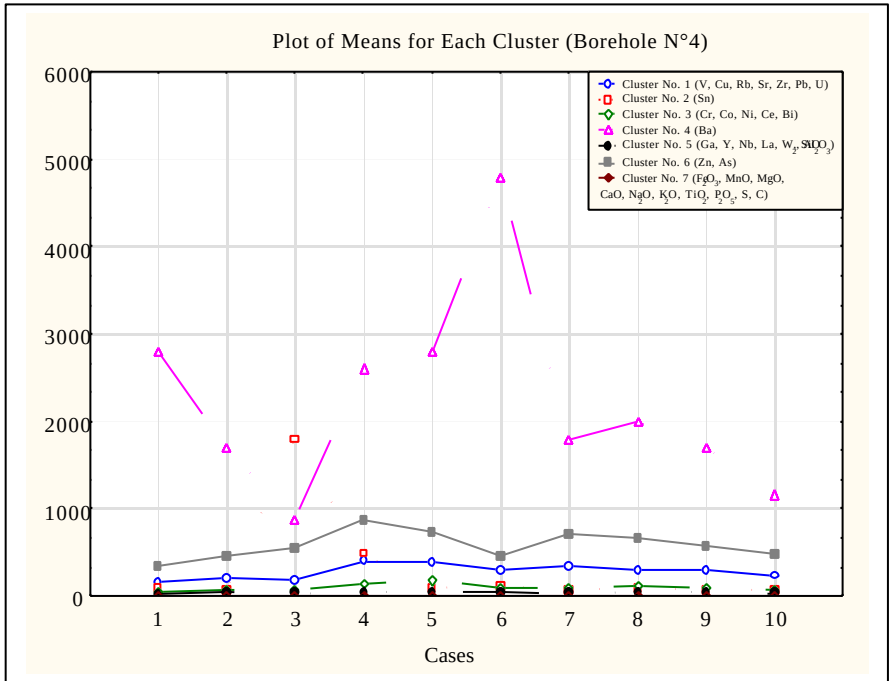

Plot of Means for Each Cluster (Borehole N°4)
Cluster No. 1 (Ba)
Cluster No. 2 (Zn, As)
Cluster No. 3 (V, Cu, Rb, Sr, Zr, Pb,
Cluster No. 4 (Cr, Co, Ni, Bi)
Cluster No. 5 (Ga, Y, La, Ce, SiO
Cluster No. 6 (Sn)
Cluster No. 7 (Nb, W, Al2O3, Fe2O3, MnO,
MgO, CaO, Na2O, K2O, TiO2, P2O5, S)
6000
5000
4000
3000
2000
1000
0
2
4
6
8
10
12
Cases


Plot of Means for Each Cluster (Borehole N°4)
Cluster No. 1 (V, Cu, Rb, Sr, Zr, Pb, U)
Cluster No. 2 (Cr, Co, Ni, Bi)
Cluster No. 3 (La, Ce, SiO
Cluster No. 4 (Ga, Y, Nb, Al)
Cluster No. 5 (Fe2O3, K2O)
Cluster No. 6 (MnO, MgO, CaO, Na2O, TiO2, P2O5, S)
Cluster No. 7 (Zn, As)
1000
800
600
400
200
0
2
4
6
8
10
12
Cases


Tree Diagram for 33 Variables (Borehole N°4)
Ward`s method
Euclidean distances
Linkage Distance
14000
12000
10000
8000
6000
4000
2000
0
Ba TiO2 CaO MgO C P2O5 Na2O S MnO K2O Fe2O3 W Al2O3 Nb SiO2 La Y Ga Ni Bi Ce Co Cr Sn As Zn U Rb Sr Cu Pb Zr V


Tree Diagram for 33 Variables (Borehole N°4)
Single Linkage
Euclidean distances
Linkage Distance
7000
6000
5000
4000
3000
2000
1000
0
Ba Sn As Zn U Rb Sr Cu Bi Ni Ce La SiO2 K2O TiO2 CaO MgO C Na2O P2O5 S MnO Fe2O3 W Al2O3 Nb Y Ga Co Cr Pb Zr V


Tree Diagram for 33 Variables (Borehole N°4)
Complete Linkage
Euclidean distances
Linkage Distance
8000
7000
6000
5000
4000
3000
2000
1000
0
Ba As Zn Sn TiO2 CaO MgO C P2O5 Na2O S MnO K2O Fe2O3 W Al2O3 Nb Ce La SiO2 Y Ga Bi Ni Co Cr U Rb Sr Cu Pb Zr V


Plot of Means for Each Cluster (Borehole N°4)
Cluster No. 1 (V, Cu, Rb, Sr, Zr, Pb, U)
Cluster No. 2 (Sn)
Cluster No. 3 (Cr, Co, Ni, Ce, Bi)
Cluster No. 4 (Ba)
Cluster No. 5 (Ga, Y, Nb, La, W, SiO2, Al2O3)
Cluster No. 6 (Zn, As)
Cluster No. 7 (Fe2O3, MnO, MgO, CaO, Na2O, K2O, TiO2, P2O5, S, C)
6000
5000
4000
3000
2000
1000
0
1 2 3 4 5 6 7 8 9 10
Cases

Appendix: 7.5.1. Sequential extraction; distribution of element portions in different fractions and depth intervals (ppm)

Depth interval in meter (0.5-1.5)

Fraction (ppm)	Al	As	Ba	Cd^+	Co	Cr	Cu	Fe	Mg	Mn	Ni	Pb	Th^+	U^+	V	Zn
Pore water	12	2	2	<0.02	<0.02	<0.02	<0.02	6	27	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Exchangeable	2	1	181	0.1	<0.1	<0.1	1	<2	131	3	<0.1	<0.1	<0.1	1	<0.1	2
Carbonatic	8	<2	83	<0.2	<0.2	<0.2	<0.2	5	--	4	<0.2	<0.2	<0.2	<0.2	<0.2	<2
Easily reducible	1586	84	85	<1	<1	2	14	2253	209	31	4	3	<1	10	5	29
Moderately reducible	284	85	41	<1	<1	<1	14	1650	122	12	1	16	1	5	2	13
Sulfide./Org.	15	<5	44	<0.5	<0.5	2	3	<10	99	5	1	<0.5	<0.5	1	2	<5
Aqua-regia*	22035	75	241	0.1	2	22	41	29384	5244	336	14	28	8	22	44	86
Aqua-regia**	24700	257	716	0.4	4	27	72	30971	5490	369	24	35	8	48	53	120
X-ray fluor. analysis	203000	300	1020	0.58	26	64	74	61000	14300	630	28	45	12.8	50.4	160	170

Depth interval in meter (3.5-4.5)

Fraction (ppm)	Al	As	Ba	Cd^+	Co	Cr	Cu	Fe	Mg	Mn	Ni	Pb	Th^+	U^+	V	Zn
Pore water	13	3	2	<0.02	<0.02	<0.02	<0.02	6	77	<0.02	<0.02	<0.02	<0.02	1	<0.02	<0.2
Exchangeable	2	1	205	0.6	1	<0.1	14	<2	384	42	1	<0.1	<0.1	4	<0.1	13
Carbonatic	15	<2	140	0.3	1	<0.2	5	6	447	57	1	1	<0.2	4	<0.2	14
Easily reducible	1046	27	183	<1	9	1	46	1850	1099	122	19	16	<1	2	5	35
Moderately reducible	1343	161	164	0.0	5	5	50	5890	579	109	20	16	2	27	7	74
Sulfide./Org.	15	<5	37	<0.5	1	<0.5	40	<10	215	6	3	<0.5	<0.5	4	<0.5	24
Aqua-regia*	23382	98	245	0.2	4	41	43	28353	6398	262	23	29	6	7	85	94
Aqua-regia**	24700	283	955	2.0	23	43	245	32771	8394	582	64	81	7	64	91	288
X-ray fluor. analysis	172000	300	1260	2.5	57	77	240	61000	19100	900	67	95	12.7	80.7	230	370

Depth interval in meter (5.5-6.5)

Fraction (ppm)	Al	As	Ba	Cd^+	Co	Cr	Cu	Fe	Mg	Mn	Ni	Pb	Th^+	U^+	V	Zn
Pore water	34	33	1	<0.02	<0.02	<0.02	<0.02	10	25	1	<0.02	<0.02	<0.02	20	2	<0.2
Exchangeable	3	4	161	1	2	0	23	0	231	215	10	0	0	31	0	10
Carbonatic	2	2	96	0	5	0	5	4	828	231	16	1	0	17	0	9
Easily reducible	455	36	277	0	20	0	21	2346	2420	358	58	16	0	3	9	63
Moderately reducible	1713	188	271	0	17	7	102	8560	1037	294	75	41	5	119	12	63
Sulfide./Org.	7	0	43	1	11	1	149	20	388	25	40	0	0	25	0	80
Aqua-regia*	26577	119	521	0	6	49	124	31335	4706	116	47	64	5	28	249	137
Aqua-regia**	27800	363	1240	3	60	52	427	35271	9141	1320	241	133	7	280	247	295
X-ray fluor. analysis	180000	370	1400	3.4	97	100	440	62000	18800	1900	300	140	14.7	336.6	560	380

*Unlock of soil sample after leaching procedure.
** Unlock of original soil sample.
+ The total concentration was determined by means of ICP MS method after an HF unlock of original soil samples.

Appendix: 7.5.1. Sequential extraction; distribution of element portions in different fractions and depth intervals (ppm)

Depth interval in meter (6.5-7.5)

Fraction (ppm)	Al	As	Ba	Cd^+	Co	Cr	Cu	Fe	Mg	Mn	Ni	Pb	Th^+	U^+	V	Zn
Pore water	52	100	2	<0.02	<0.02	<0.02	<0.02	15	24	<0.02	<0.02	<0.02	<0.02	16	1	1
Exchangeable	2	5	320	0.1	2	0.1	10	<2	327	57	9	1	<0.1	9	<0.1	5
Carbonatic	3	7	246	<0.2	10	<0.2	5	6	1226	163	21	3	<0.2	8	<0.2	5
Easily reducible	243	31	645	<1	25	<1	11	2163	4824	378	55	11	<1	<1	4	55
Moderately reducible	2627	399	746	<1	40	13	94	10790	1421	252	120	76	4	40	13	79
Sulfide./Org.	13	<5	140	1	13	1	237	<10	359	18	20	7	<0.5	53	<0.5	99
Aqua-regia*	35242	206	2438	<0.1	5	71	89	30259	8376	193	30	67	8	21	121	144
Aqua-regia**	32900	674	3930	2	92	70	455	35071	14470	1040	246	163	9	177	113	303
X-ray fluor. analysis	201000	690	3700	2.6	130	130	480	65000	28900	1500	290	180	13.9	200.6	270	400

Depth interval in meter (8.5-9.5)

Fraction (ppm)	Al	As	Ba	Cd^+	Co	Cr	Cu	Fe	Mg	Mn	Ni	Pb	Th^+	U^+	V	Zn
Pore water	40	92	2	<0.02	<0.02	<0.02	<0.02	7	15	<0.02	<0.02	<0.02	<0.02	16	1	<0.2
Exchangeable	3	7	381	<0.1	2	<0.1	13	<2	189	58	7	1	<0.1	19	<0.1	4
Carbonatic	7	8	221	<0.2	9	<0.2	4	7	754	147	18	2	<0.2	9	<0.2	4
Easily reducible	506	59	502	<1	28	<1	21	1796	1834	259	51	15	<1	<1	3	39
Moderately reducible	2677	291	466	<1	24	13	70	10590	1607	271	67	27	4	41	15	57
Sulfide./Org.	11	<5	147	1	13	1	214	<10	328	18	18	7	<0.5	52	<0.5	106
Aqua-regia*	29593	199	778	<0.1	5	52	62	31799	7349	274	26	65	8	25	116	125
Aqua-regia**	31600	605	2180	2	79	56	397	37571	10650	1020	184	121	8	181	120	269
X-ray fluor. analysis	196000	600	2500	2.4	120	107	390	68000	23200	1500	210	140	14.8	225.6	260	340

Depth interval in meter (11.5-12.5)

Fraction (ppm)	Al	As	Ba	Cd^+	Co	Cr	Cu	Fe	Mg	Mn	Ni	Pb	Th^+	U^+	V	Zn
Pore water	40	45	1	<0.02	<0.02	<0.02	<0.02	4	4	<0.02	<0.02	<0.02	<0.02	17	1	0.2
Exchangeable	2	3	275	1	1	<0.1	21	<2	249	67	6	1	<0.1	13	<0.1	7
Carbonatic	8	3	178	<0.2	5	<0.2	10	10	976	137	8	7	<0.2	9	<0.2	11
Easily reducible	1533	58	273	<1	27	3	75	3942	3098	398	44	67	<1	10	6	89
Moderately reducible	654	96	57	<1	6	3	59	3060	327	96	13	47	4	48	4	26
Sulfide./Org.	47	<5	28	2	7	<0.5	276	<10	298	19	12	2	<0.5	24	<0.5	147
Aqua-regia*	31830	197	342	<0.1	6	48	161	32806	6615	316	28	56	9	17	81	208
Aqua-regia**	29800	363	988	5	50	46	652	34171	10650	1030	111	156	10	167	76	423
X-ray fluor. analysis	220000	390	1400	4.6	93	104	670	65000	22100	1500	130	180	16.5	212.6	210	550

*Unlock of soil sample after leaching procedure.
** Unlock of original soil sample.
+ The total concentration was determined by means of ICP MS method after an HF unlock of original soil samples.

Appendix: 7.5.1. Sequential extraction; distribution of element portions in different fractions and depth intervals (ppm)

Depth interval in meter (14.5-15.5)

Fraction (ppm)	Al	As	Ba	Cd^+	Co	Cr	Cu	Fe	Mg	Mn	Ni	Pb	Th^+	U^+	V	Zn
Pore water	50	37	1	<0.02	<0.02	<0.02	<0.02	7	2	<0.02	<0.02	<0.02	<0.02	10	1	<0.2
Exchangeable	3	2	416	0.4	1	<0.1	11	7	182	45	2	1	<0.1	10	<0.1	5
Carbonatic	74	4	217	0.3	4	<0.2	15	34	395	84	4	11	<0.2	15	<0.2	9
Easily reducible	1983	46	608	<1	18	3	68	3878	868	277	21	53	<1	8	5	80
Moderately reducible	1157	118	282	<1	3	3	25	7450	469	106	8	14	3	23	6	29
Sulfide./Org.	--	3	173	0.5	4	2	96	<10	175	13	6	1	<0.5	11	1	69
Aqua-regia*	28001	137	1205	0.2	3	30	49	31296	5877	390	21	44	11	16	55	112
Aqua-regia**	28700	326	2610	1.6	34	35	295	37171	7480	871	57	121	11	116	59	251
X-ray fluor. analysis	218000	350	2900	1.99	71	85	310	69000	15200	1300	61	150	16.1	127.6	190	340

Depth interval in meter (17.5-18.5)

Fraction (ppm)	Al	As	Ba	Cd^+	Co	Cr	Cu	Fe	Mg	Mn	Ni	Pb	Th^+	U^+	V	Zn
Pore water	60	29	<0.02	<0.02	<0.02	<0.02	<0.02	10	3	1	<0.02	<0.02	<0.02	16	1	2
Exchangeable	--	1	156	1.7	1	<0.1	13	<2	204	53	1	<0.1	<0.1	4	<0.1	26
Carbonatic	8	1	72	1.3	2	<0.2	7	3	661	145	3	4	<0.2	3	<0.2	46
Easily reducible	1410	11	99	1.3	15	1	67	2985	1715	461	20	88	<1	2	3	302
Moderately reducible	773	85	27	<1	3	2	47	4140	242	104	9	51	5	22	2	97
Sulfide./Org.	--	<5	14	0.8	2	1	57	<10	178	20	4	2	<0.5	7	1	99
Aqua-regia*	29508	113	393	0.4	3	27	91	31237	4868	371	18	36	11	35	38	229
Aqua-regia**	28400	217	650	6.8	25	28	294	35171	7673	1150	50	160	13	90	40	637
X-ray fluor. analysis	230000	240	1040	6.8	61	76	340	65000	16200	1700	59	190	20.5	112.6	150	870

Depth interval in meter (19.5-20.2)

Fraction (ppm)	Al	As	Ba	Cd^+	Co	Cr	Cu	Fe	Mg	Mn	Ni	Pb	Th^+	U^+	V	Zn
Pore water	78	8	<0.02	<0.02	<0.02	<0.02	1	49	3	7	<0.02	<0.02	<0.02	1	1	<0.2
Exchangeable	4	1	8	<0.1	<0.1	<0.1	<0.1	2	18	60	<0.1	<0.1	<0.1	<0.1	<0.1	<1
Carbonatic	106	<2	3	<0.2	<0.2	<0.2	1	36	4	67	<0.2	1	<0.2	1	<0.2	4
Easily reducible	3415	9	17	<1	5	<1	7	2744	69	371	2	6	<1	<1	2	24
Moderately reducible	1275	49	4	<1	3	2	12	4010	87	106	4	2	3	3	3	<10
Sulfide./Org.	3	<5	4	<0.5	1	1	1	<10	97	87	1	<0.5	<0.5	1	1	14
Aqua-regia*	17034	80	97	0,1	<10	12	25	21288	2058	163	<100	18	10	7	13	69
Aqua-regia**	20300	134	111	0,2	9	16	45	26171	2250	752	13	19	10	17	18	73
X-ray fluor. analysis	202000	170	390	0.23	34	64	56	53000	7100	1160	24	40	16.7	11.8	93	110

*Unlock of soil sample after leaching procedure.
** Unlock of original soil sample.
+ The total concentration was determined by means of ICP MS method after an HF unlock of original soil samples.

Appendix: 7.5.2. Sequential extraction; distribution of element portions in different fractions (%)

Aluminium

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.	Resid./aq.-regia	Resid./X-ray.F.A.
0.5-1.5	0.01	0.00	0.00	0.81	0.14	0.01	11.20	87.83
3.5-4.5	0.01	0.00	0.01	0.58	0.75	0.01	13.01	85.64
5.5-6.5	0.02	0.00	0.00	0.24	0.92	0.00	14.26	84.56
6.5-7.5	0.02	0.00	0.00	0.10	1.13	0.01	15.11	83.63
8.5-9.5	0.02	0.00	0.00	0.25	1.31	0.01	14.53	83.88
11.5-12.5	0.02	0.00	0.00	0.61	0.26	0.02	12.64	86.45
14.5-15.5	0.02	0.00	0.03	0.84	0.49	0.00	11.79	86.83
17.5-18.5	0.02	0.00	0.00	0.55	0.30	0.00	11.47	87.65
19.5-20.2	0.04	0.00	0.05	1.57	0.58	0.00	7.81	89.95

Arsenic

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.	Resid./aq.-regia	Resid./X-ray.F.A.
0.5-1.5	0.64	0.35	0.00	29.17	29.51	0.00	26.00	14.33
3.5-4.5	1.14	0.39	0.00	8.90	52.12	0.00	31.78	5.67
5.5-6.5	8.37	0.94	0.62	9.19	48.46	0.00	30.53	1.89
6.5-7.5	13.09	0.70	0.89	4.07	52.03	0.00	26.89	2.32
8.5-9.5	13.98	1.02	1.21	9.01	44.36	0.00	30.42	0.00
11.5-12.5	10.48	0.59	0.73	13.42	22.20	0.00	45.66	6.92
14.5-15.5	9.99	0.43	1.17	12.28	31.73	0.85	36.69	6.86
17.5-18.5	10.85	0.28	0.22	4.30	31.99	0.00	42.78	9.58
19.5-20.2	3.86	0.30	0.20	4.58	24.84	0.22	40.44	25.56

Barium

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.	Resid./aq.-regia	Resid./X-ray.F.A.
0.5-1.5	0.18	18.73	8.64	8.82	4.23	4.56	25.03	29.80
3.5-4.5	0.15	15.94	10.86	14.21	12.76	2.87	19.01	24.21
5.5-6.5	0.07	10.42	6.21	17.88	17.49	2.81	33.70	11.43
6.5-7.5	0.05	7.06	5.42	14.21	16.44	3.09	53.73	0.00
8.5-9.5	0.06	13.29	7.73	17.52	16.29	5.13	27.18	12.80
11.5-12.5	0.04	16.85	10.88	16.72	3.46	1.72	20.91	29.43
14.5-15.5	0.04	12.91	6.73	18.85	8.74	5.35	37.37	10.00
17.5-18.5	0.03	12.84	5.92	8.13	2.17	1.16	32.25	37.50
19.5-20.2	0.08	1.75	0.56	3.66	0.80	0.92	20.70	71.54

Cadmium

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.	Resid./aq.-regia	Resid./X-ray.F.A.
0.5-1.5	0.00	32.50	0.00	0.00	0.00	0.00	33.02	34.48
3.5-4.5	0.00	44.85	23.81	0.00	0.00	0.00	10.54	20.80
5.5-6.5	0.00	18.35	12.49	0.00	0.00	28.97	14.32	25.88
6.5-7.5	0.00	12.85	9.48	0.00	0.00	49.61	12.30	15.77
8.5-9.5	0.00	14.40	11.02	0.00	0.00	42.06	15.44	17.08
11.5-12.5	0.00	18.63	10.78	0.00	0.00	66.02	2.40	2.17
14.5-15.5	0.00	24.04	16.44	0.00	0.00	29.77	12.15	17.59
17.5-18.5	0.00	31.12	22.64	23.59	0.00	15.27	6.94	0.44
19.5-20.2	0.00	0.00	0.00	0.00	0.00	0.00	86.96	13.04

Appendix: 7.5.2 Sequential extraction; distribution of element portions in different fractions (%)

Cobalt

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.	Resid./aq.-regia	Resid./X-ray.F.A.
0.5-1.5	0.00	0.00	0.00	0.00	0.00	1.54	14.61	83.85
3.5-4.5	0.00	1.54	2.52	16.55	9.96	2.37	7.58	59.47
5.5-6.5	0.07	2.00	5.50	20.11	17.39	11.02	5.78	38.14
6.5-7.5	0.11	1.37	7.12	18.92	29.74	9.58	3.93	29.23
8.5-9.5	0.05	1.27	7.35	22.45	19.76	10.62	4.42	34.08
11.5-12.5	0.00	1.49	5.52	27.39	6.36	6.93	5.86	46.45
14.5-15.5	0.04	1.12	5.45	25.99	4.89	6.08	4.32	52.11
17.5-18.5	0.04	0.91	3.11	24.19	4.44	3.68	4.78	58.85
19.5-20.2	0.10	0.00	0.00	15.45	8.06	1.83	0.00	74.56

Chromium

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.	Resid./aq.-regia	Resid./X-ray.F.A.
0.5-1.5	0.00	0.00	0.00	2.75	0.00	3.31	36.13	57.81
3.5-4.5	0.00	0.00	0.00	1.65	6.26	0.00	47.93	44.16
5.5-6.5	0.05	0.26	0.00	0.00	6.46	0.83	43.89	48.50
6.5-7.5	0.06	0.17	0.00	0.00	7.95	0.64	44.86	46.31
8.5-9.5	0.03	0.00	0.00	0.00	10.00	1.06	41.35	47.57
11.5-12.5	0.03	0.00	0.00	2.80	2.54	0.00	38.48	56.15
14.5-15.5	0.00	0.00	0.34	3.03	2.98	1.84	32.76	59.06
17.5-18.5	0.05	0.28	0.33	1.30	2.24	1.29	30.70	63.82
19.5-20.2	0.33	0.00	0.59	0.63	2.72	0.81	19.15	75.78

Copper

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.	Resid./aq.-regia	Resid./X-ray.F.A.
0.5-1.5	0.11	0.98	0.57	18.88	18.35	3.84	54.15	3.11
3.5-4.5	0.11	6.86	2.29	23.13	25.21	20.49	21.90	0.00
5.5-6.5	0.08	5.31	1.24	4.72	23.37	33.95	28.37	2.95
6.5-7.5	0.09	2.18	0.99	2.25	19.88	50.40	18.99	5.21
8.5-9.5	0.10	3.40	1.06	5.53	18.27	55.43	16.22	0.00
11.5-12.5	0.03	3.40	1.60	12.07	9.50	44.62	26.11	2.69
14.5-15.5	0.06	3.92	5.36	24.52	8.83	34.72	17.75	4.84
17.5-18.5	0.13	3.92	2.21	20.50	14.50	17.41	27.80	13.53
19.5-20.2	2.30	0.56	1.31	12.06	21.15	1.72	41.80	19.11

Iron

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.	Resid./aq.-regia	Resid./X-ray.F.A.
0.5-1.5	0.01	0.00	0.01	3.44	2.52	0.00	44.81	49.23
3.5-4.5	0.01	0.00	0.01	2.75	8.76	0.00	42.19	46.28
5.5-6.5	0.01	0.00	0.01	3.16	11.52	0.03	42.17	43.11
6.5-7.5	0.02	0.00	0.01	2.70	13.47	0.00	37.76	46.04
8.5-9.5	0.01	0.00	0.01	2.25	13.24	0.00	39.75	44.75
11.5-12.5	0.01	0.00	0.01	5.20	4.04	0.00	43.31	47.43
14.5-15.5	0.01	0.01	0.04	4.90	9.41	0.00	39.51	46.13
17.5-18.5	0.01	0.00	0.00	4.21	5.84	0.00	44.04	45.89
19.5-20.2	0.09	0.00	0.06	4.82	7.04	0.00	37.37	50.62

Appendix: 7.5.2. Sequential extraction; distribution of element portions in different fractions (%)

Thorium

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.	Resid./aq.-regia	Resid./X-ray.F.A.
0.5-1.5	0.00	0.00	0.00	0.00	8.34	0.00	55.41	36.25
3.5-4.5	0.00	0.00	0.00	0.00	16.69	0.00	41.58	41.73
5.5-6.5	0.00	0.00	0.00	0.00	26.70	0.00	23.30	50.00
6.5-7.5	0.00	0.00	0.00	0.00	20.49	0.00	40.73	38.78
8.5-9.5	0.00	0.00	0.00	0.00	15.72	0.00	36.51	47.77
11.5-12.5	0.00	0.00	0.00	0.00	17.02	0.00	40.98	42.00
14.5-15.5	0.00	0.00	0.00	0.00	15.68	0.00	51.41	32.92
17.5-18.5	0.00	0.00	0.00	0.00	19.57	0.00	45.31	35.12
19.5-20.2	0.35	0.00	0.00	0.00	12.61	0.00	49.32	37.72

Uranium

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.	Resid./aq.-regia	Resid./X-ray.F.A.
0.5-1.5	0.18	2.43	4.13	23.80	11.97	2.33	50.20	4.96
3.5-4.5	1.44	5.86	5.93	3.99	44.03	6.11	12.20	20.45
5.5-6.5	6.72	10.51	6.01	0.89	41.05	8.42	9.57	16.82
6.5-7.5	9.49	5.66	4.59	0.00	23.84	32.06	12.61	11.76
8.5-9.5	8.11	9.25	4.69	0.00	20.06	25.86	12.26	19.77
11.5-12.5	9.54	7.43	5.26	5.90	27.31	13.63	9.50	21.45
14.5-15.5	10.14	9.67	14.79	8.00	22.09	10.70	15.52	9.09
17.5-18.5	14.08	3.53	2.80	1.56	19.90	6.58	31.64	19.89
19.5-20.2	5.51	2.11	10.44	0.00	19.95	4.94	57.05	0.00

Vanadium

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.	Resid./aq.-regia	Resid./X-ray.F.A.
0.5-1.5	0.05	0.00	0.00	2.88	1.45	1.01	27.73	66.88
3.5-4.5	0.06	0.00	0.00	1.98	2.79	0.00	34.51	60.65
5.5-6.5	0.27	0.00	0.00	1.43	1.87	0.00	40.54	55.89
6.5-7.5	0.33	0.00	0.00	1.28	3.78	0.00	36.46	58.15
8.5-9.5	0.36	0.00	0.00	1.12	4.95	0.00	39.73	53.85
11.5-12.5	0.32	0.00	0.00	2.48	1.54	0.00	31.80	63.86
14.5-15.5	0.30	0.00	0.00	2.14	2.91	0.40	25.30	68.95
17.5-18.5	0.35	0.00	0.00	1.73	1.37	0.33	22.62	73.60
19.5-20.2	0.85	0.00	0.00	1.86	3.22	0.62	12.80	80.65

Zinc

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.	Resid./aq.-regia	Resid./X-ray.F.A.
0.5-1.5	0.00	1.16	0.00	15.69	7.23	0.00	46.51	29.41
3.5-4.5	0.11	3.86	4.17	10.90	22.61	7.35	28.83	22.16
5.5-6.5	0.11	2.22	2.00	13.45	13.47	17.07	29.31	22.37
6.5-7.5	0.11	0.96	1.06	10.69	15.47	19.36	28.10	24.25
8.5-9.5	0.07	0.99	0.91	9.20	13.47	25.05	29.42	20.88
11.5-12.5	0.03	1.14	1.78	14.03	4.04	23.12	32.76	23.09
14.5-15.5	0.08	1.15	2.26	19.40	6.98	16.72	27.22	26.18
17.5-18.5	0.17	2.35	4.17	27.62	8.88	9.04	20.98	26.78
19.5-20.2	0.12	0.00	2.36	14.43	0.00	8.17	41.47	33.45

Appendix: 7.5.2. Sequential extraction; distribution of element portions in different fractions (%)

Magnesium

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.	Resid./aq.-regia	Resid./X-ray.F.A.
0.5-1.5	0.18	0.87	0.00	1.37	0.81	0.65	34.52	61.61
3.5-4.5	0.37	1.83	2.14	5.25	2.77	1.03	30.57	56.05
5.5-6.5	0.13	1.17	4.18	12.21	5.23	1.96	23.75	51.38
6.5-7.5	0.07	0.99	3.71	14.59	4.30	1.09	25.33	49.93
8.5-9.5	0.06	0.72	2.86	6.97	6.11	1.25	27.94	54.09
11.5-12.5	0.02	1.04	4.06	12.91	1.36	1.24	27.56	51.81
14.5-15.5	0.02	1.12	2.44	5.36	2.89	1.08	36.30	50.79
17.5-18.5	0.02	1.23	3.98	10.32	1.46	1.07	29.30	52.64
19.5-20.2	0.04	0.25	0.05	0.94	1.17	1.32	27.92	68.31

Manganese

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.	Resid./aq.-regia	Resid./X-ray.F.A.
0.5-1.5	0.02	0.51	0.62	4.66	1.73	0.79	50.24	41.43
3.5-4.5	0.04	4.54	6.20	13.19	11.75	0.62	28.33	35.33
5.5-6.5	0.07	12.06	12.95	20.03	16.44	1.41	6.51	30.53
6.5-7.5	0.03	3.71	10.63	24.71	16.46	1.18	12.62	30.67
8.5-9.5	0.02	3.84	9.75	17.13	17.93	1.22	18.10	32.00
11.5-12.5	0.01	4.44	9.13	26.46	6.37	1.26	21.00	31.33
14.5-15.5	0.01	3.27	6.16	20.29	7.74	0.94	28.60	33.00
17.5-18.5	0.03	3.08	8.49	27.02	6.11	1.18	21.74	32.35
19.5-20.2	0.50	4.49	5.05	27.97	8.01	6.53	12.27	35.17

Nickel

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.	Resid./aq.-regia	Resid./X-ray.F.A.
0.5-1.5	0.11	0.00	0.00	17.89	5.90	2.07	58.32	15.71
3.5-4.5	0.15	1.88	1.52	27.07	27.77	4.19	32.95	4.48
5.5-6.5	0.11	3.27	5.29	18.93	24.39	12.93	15.41	19.67
6.5-7.5	0.14	2.85	6.88	18.37	39.84	6.80	9.94	15.17
8.5-9.5	0.09	3.21	8.68	23.81	31.29	8.23	12.32	12.38
11.5-12.5	0.05	4.21	6.49	33.89	9.72	9.33	21.69	14.62
14.5-15.5	0.06	2.51	5.24	31.74	12.37	9.07	32.13	6.89
17.5-18.5	0.11	2.22	4.06	30.62	14.34	5.78	28.29	14.58
19.5-20.2	0.80	0.00	1.41	13.87	29.98	7.68	0.00	46.25

Lead

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.	Resid./aq.-regia	Resid./X-ray.F.A.
0.5-1.5	0.00	0.00	0.00	5.06	26.90	0.00	46.04	22.00
3.5-4.5	0.07	0.60	1.80	22.13	22.00	0.00	39.08	14.32
5.5-6.5	0.13	0.19	0.64	12.52	31.87	0.00	49.66	5.00
6.5-7.5	0.16	0.35	1.44	6.09	41.77	3.96	36.79	9.44
8.5-9.5	0.06	0.41	1.49	11.24	19.80	5.18	48.26	13.57
11.5-12.5	0.03	0.48	3.17	32.30	22.78	0.76	27.15	13.33
14.5-15.5	0.04	0.61	7.14	34.77	8.92	0.51	28.68	19.33
17.5-18.5	0.06	0.22	2.01	40.61	23.57	1.01	16.73	15.79
19.5-20.2	0.20	0.12	1.28	10.62	4.18	0.00	30.85	52.75

Appendix: 7.5.3. Sequential extraction;
distribution of element portions in different fractions (%)

Aluminium

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.
0.5-1.5	0.61	0.13	0.43	83.18	14.88	0.76
3.5-4.5	0.55	0.07	0.62	42.97	55.16	0.62
5.5-6.5	1.54	0.12	0.11	20.55	77.36	0.33
6.5-7.5	1.77	0.08	0.11	8.26	89.34	0.44
8.5-9.5	1.24	0.08	0.23	15.58	82.53	0.34
11.5-12.5	1.75	0.09	0.34	67.11	28.62	2.08
14.5-15.5	1.53	0.10	2.27	60.69	35.41	0.00
17.5-18.5	2.68	0.01	0.34	62.64	34.32	0.00
19.5-20.2	1.60	0.09	2.17	69.97	26.13	0.05

Arsenic

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.
0.5-1.5	1.06	0.59	0.00	48.88	49.46	0.00
3.5-4.5	1.82	0.63	0.00	14.23	83.33	0.00
5.5-6.5	12.39	1.39	0.92	13.59	71.70	0.00
6.5-7.5	18.50	0.99	1.26	5.76	73.50	0.00
8.5-9.5	20.10	1.47	1.74	12.94	63.75	0.00
11.5-12.5	22.10	1.25	1.53	28.31	46.81	0.00
14.5-15.5	17.70	0.76	2.08	21.75	56.21	1.51
17.5-18.5	22.78	0.58	0.46	9.03	67.16	0.00
19.5-20.2	11.36	0.89	0.60	13.46	73.05	0.64

Barium

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.
0.5-1.5	0.40	41.47	19.14	19.53	9.36	10.10
3.5-4.5	0.26	28.07	19.12	25.03	22.47	5.05
5.5-6.5	0.12	19.00	11.31	32.59	31.87	5.11
6.5-7.5	0.10	15.25	11.72	30.71	35.53	6.68
8.5-9.5	0.10	22.14	12.88	29.18	27.13	8.55
11.5-12.5	0.08	33.92	21.90	33.66	6.97	3.46
14.5-15.5	0.08	24.54	12.79	35.82	16.61	10.17
17.5-18.5	0.10	42.44	19.58	26.88	7.19	3.82
19.5-20.2	0.99	22.48	7.18	47.15	10.36	11.84

Cadmium

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.
0.5-1.5	0.00	100.00	0.00	0.00	0.00	0.00
3.5-4.5	0.00	65.32	34.68	0.00	0.00	0.00
5.5-6.5	0.00	30.68	20.88	0.00	0.00	48.44
6.5-7.5	0.00	17.86	13.18	0.00	0.00	68.97
8.5-9.5	0.00	21.34	16.33	0.00	0.00	62.33
11.5-12.5	0.00	19.52	11.29	0.00	0.00	69.18
14.5-15.5	0.00	34.22	23.40	0.00	0.00	42.38
17.5-18.5	0.00	33.60	24.44	25.47	0.00	16.49
19.5-20.2	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: 7.5.3. Sequential extraction;
distribution of element portions in different fractions (%)

Cobalt

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.
0.5-1.5	0.00	0.00	0.00	0.00	0.00	100
3.5-4.5	0.00	4.67	7.66	50.24	30.23	7.20
5.5-6.5	0.12	3.56	9.81	35.87	31.00	19.65
6.5-7.5	0.16	2.06	10.65	28.30	44.50	14.34
8.5-9.5	0.07	2.07	11.95	36.51	32.13	17.26
11.5-12.5	0.00	3.12	11.57	57.43	13.34	14.53
14.5-15.5	0.09	2.58	12.52	59.65	11.21	13.95
17.5-18.5	0.11	2.49	8.56	66.51	12.20	10.13
19.5-20.2	0.39	0.00	0.00	60.74	31.69	7.18

Chromium

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.
0.5-1.5	0.00	0.00	0.00	45.38	0.00	54.62
3.5-4.5	0.00	0.00	0.00	20.90	79.10	0.00
5.5-6.5	0.66	3.48	0.00	0.00	85.00	10.86
6.5-7.5	0.70	1.96	0.00	0.00	90.05	7.29
8.5-9.5	0.26	0.00	0.00	0.00	90.22	9.52
11.5-12.5	0.49	0.00	0.00	52.14	47.36	0.00
14.5-15.5	0.00	0.00	4.11	37.06	36.38	22.45
17.5-18.5	0.89	5.15	5.98	23.69	40.80	23.49
19.5-20.2	6.43	0.00	11.64	12.35	53.55	16.03

Copper

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.
0.5-1.5	0.26	2.29	1.32	44.18	42.95	8.99
3.5-4.5	0.15	8.78	2.94	29.62	32.28	26.24
5.5-6.5	0.11	7.74	1.81	6.88	34.03	49.44
6.5-7.5	0.12	2.87	1.30	2.97	26.23	66.50
8.5-9.5	0.12	4.06	1.27	6.60	21.80	66.16
11.5-12.5	0.04	4.77	2.24	16.95	13.34	62.66
14.5-15.5	0.08	5.06	6.93	31.67	11.41	44.85
17.5-18.5	0.23	6.68	3.77	34.95	24.71	29.67
19.5-20.2	5.88	1.44	3.34	30.84	54.09	4.41

Iron

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.
0.5-1.5	0.14	0.00	0.12	57.58	42.17	0.00
3.5-4.5	0.08	0.00	0.08	23.86	75.97	0.00
5.5-6.5	0.09	0.00	0.03	21.44	78.25	0.18
6.5-7.5	0.12	0.00	0.05	16.67	83.16	0.00
8.5-9.5	0.06	0.00	0.06	14.48	85.40	0.00
11.5-12.5	0.06	0.00	0.14	56.19	43.62	0.00
14.5-15.5	0.06	0.06	0.30	34.09	65.49	0.00
17.5-18.5	0.14	0.00	0.04	41.82	58.00	0.00
19.5-20.2	0.72	0.03	0.53	40.11	58.61	0.00

Appendix: 7.5.3. Sequential extraction;
distribution of element portions in different fractions (%)

Magnesium

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.
0.5-1.5	4.54	22.35	0.00	35.47	20.80	16.84
3.5-4.5	2.76	13.70	15.95	39.23	20.67	7.68
5.5-6.5	0.51	4.69	16.79	49.10	21.04	7.87
6.5-7.5	0.29	3.99	14.99	58.97	17.37	4.39
8.5-9.5	0.32	3.99	15.94	38.80	34.00	6.94
11.5-12.5	0.08	5.04	19.70	62.58	6.60	6.01
14.5-15.5	0.12	8.71	18.90	41.52	22.41	8.35
17.5-18.5	0.09	6.79	22.02	57.12	8.05	5.93
19.5-20.2	1.09	6.57	1.29	24.89	31.13	35.02

Manganese

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.
0.5-1.5	0.27	6.17	7.39	55.93	20.80	9.45
3.5-4.5	0.12	12.50	17.05	36.28	32.33	1.72
5.5-6.5	0.11	19.16	20.56	31.82	26.11	2.24
6.5-7.5	0.06	6.54	18.74	43.57	29.02	2.08
8.5-9.5	0.04	7.70	19.54	34.34	35.94	2.44
11.5-12.5	0.02	9.32	19.15	55.51	13.35	2.64
14.5-15.5	0.03	8.50	16.04	52.83	20.15	2.44
17.5-18.5	0.07	6.70	18.49	58.86	13.31	2.58
19.5-20.2	0.94	8.55	9.62	53.22	15.25	12.42

Nickel

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.
0.5-1.5	0.44	0.00	0.00	68.90	22.71	7.96
3.5-4.5	0.24	3.00	2.43	43.26	44.38	6.70
5.5-6.5	0.16	5.04	8.15	29.16	37.57	19.91
6.5-7.5	0.19	3.81	9.19	24.53	53.20	9.08
8.5-9.5	0.12	4.26	11.52	31.62	41.55	10.93
11.5-12.5	0.08	6.61	10.19	53.21	15.26	14.65
14.5-15.5	0.09	4.12	8.59	52.04	20.28	14.88
17.5-18.5	0.20	3.89	7.11	53.58	25.10	10.12
19.5-20.2	1.49	0.00	2.63	25.81	55.78	14.29

Lead

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.
0.5-1.5	0.00	0.00	0.00	15.84	84.16	0.00
3.5-4.5	0.16	1.30	3.86	47.49	47.20	0.00
5.5-6.5	0.29	0.41	1.42	27.60	70.29	0.00
6.5-7.5	0.29	0.64	2.68	11.32	77.70	7.37
8.5-9.5	0.17	1.07	3.90	29.44	51.86	13.57
11.5-12.5	0.04	0.81	5.33	54.27	38.28	1.28
14.5-15.5	0.08	1.17	13.73	66.88	17.16	0.98
17.5-18.5	0.09	0.32	2.98	60.18	34.93	1.50
19.5-20.2	1.21	0.74	7.82	64.72	25.51	0.00

Appendix: 7.5.3. Sequential extraction;
distribution of element portions in different fractions (%)

Thorium

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.
0.5-1.5	0.00	0.00	0.00	0.00	100.00	0.00
3.5-4.5	0.00	0.00	0.00	0.00	100.00	0.00
5.5-6.5	0.00	0.00	0.00	0.00	100.00	0.00
6.5-7.5	0.00	0.00	0.00	0.00	100.00	0.00
8.5-9.5	0.00	0.00	0.00	0.00	100.00	0.00
11.5-12.5	0.00	0.00	0.00	0.00	100.00	0.00
14.5-15.5	0.00	0.00	0.00	0.00	100.00	0.00
17.5-18.5	0.00	0.00	0.00	0.00	100.00	0.00
19.5-20.2	2.72	0.00	0.00	0.00	97.28	0.00

Uranium

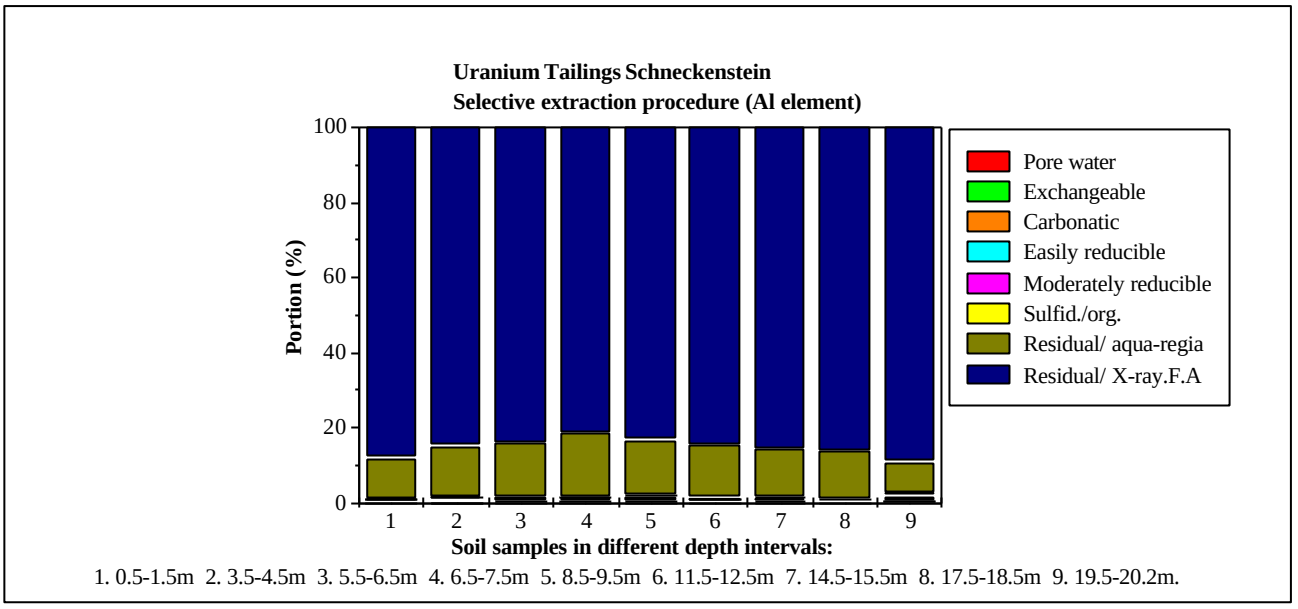
Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.
0.5-1.5	0.41	5.43	9.20	53.07	26.69	5.20
3.5-4.5	2.14	8.70	8.80	5.92	65.37	9.07
5.5-6.5	9.13	14.28	8.16	1.21	55.77	11.44
6.5-7.5	12.54	7.48	6.07	0.00	31.52	42.39
8.5-9.5	11.94	13.61	6.89	0.00	29.51	38.04
11.5-12.5	13.81	10.76	7.61	8.54	39.55	19.73
14.5-15.5	13.45	12.83	19.62	10.61	29.30	14.20
17.5-18.5	29.06	7.29	5.78	3.21	41.07	13.57
19.5-20.2	12.84	4.91	24.31	0.00	46.44	11.49

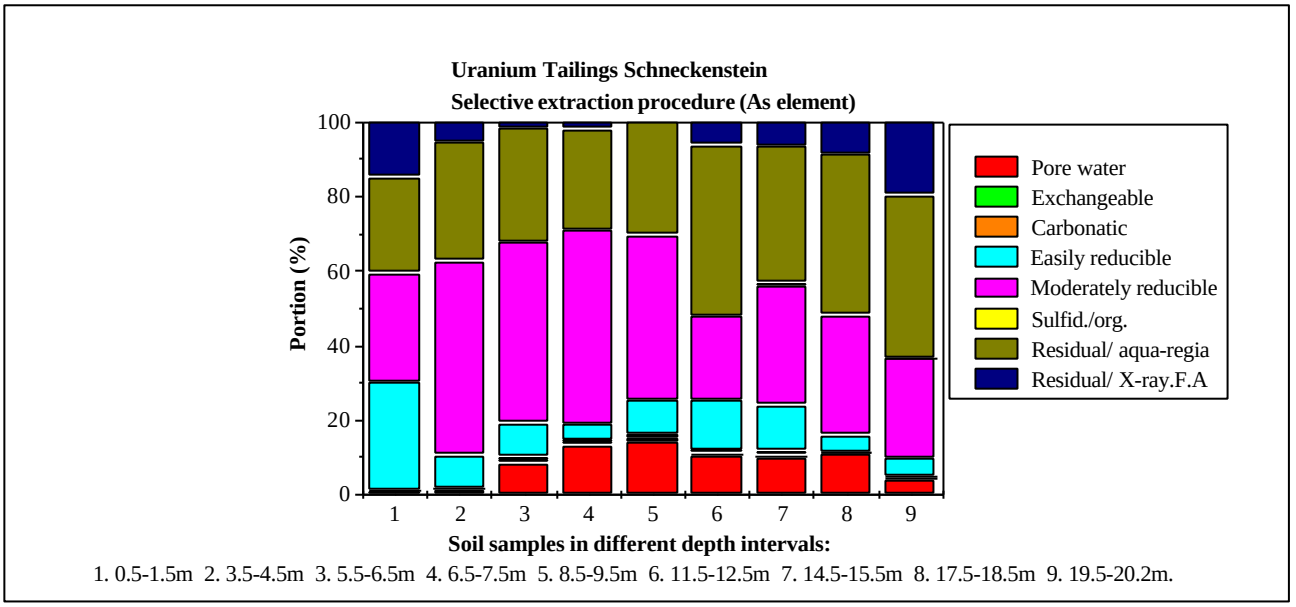
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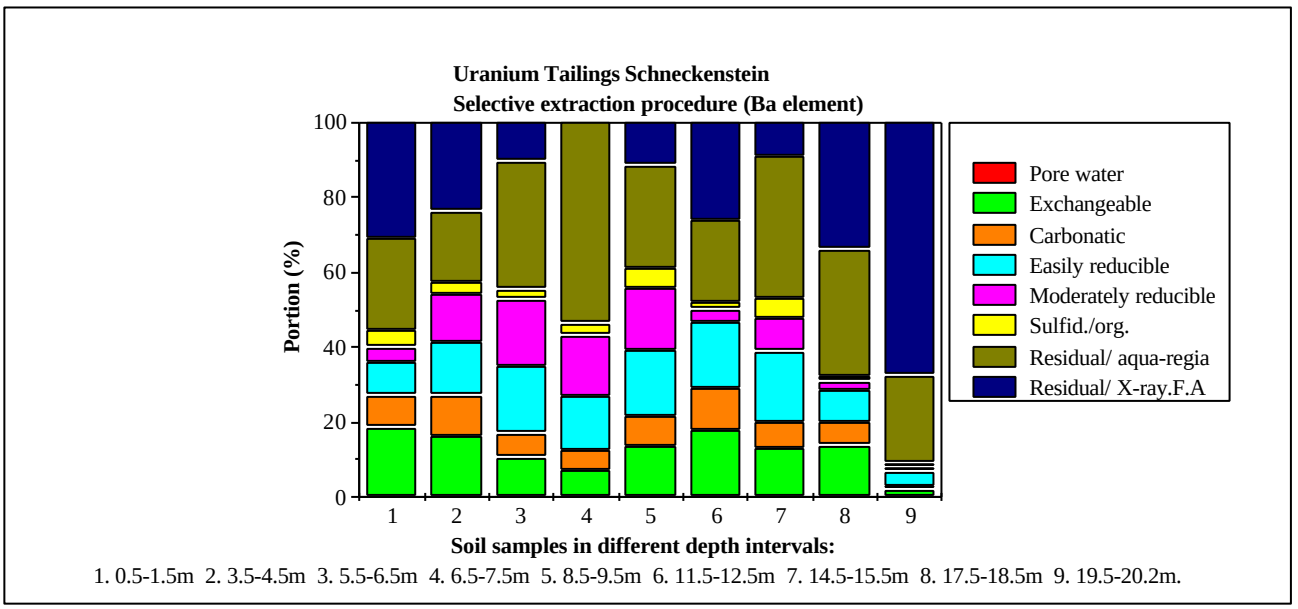
Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.
0.5-1.5	1.01	0.00	0.00	53.42	26.94	18.63
3.5-4.5	1.29	0.00	0.00	41.02	57.68	0.00
5.5-6.5	7.48	0.00	0.00	39.98	52.55	0.00
6.5-7.5	6.17	0.00	0.00	23.81	70.02	0.00
8.5-9.5	5.60	0.00	0.00	17.46	76.94	0.00
11.5-12.5	7.38	0.00	0.00	57.18	35.44	0.00
14.5-15.5	5.18	0.00	0.00	37.31	50.57	6.94
17.5-18.5	9.18	0.00	0.00	45.73	36.34	8.75
19.5-20.2	13.02	0.00	0.00	28.33	49.13	9.52

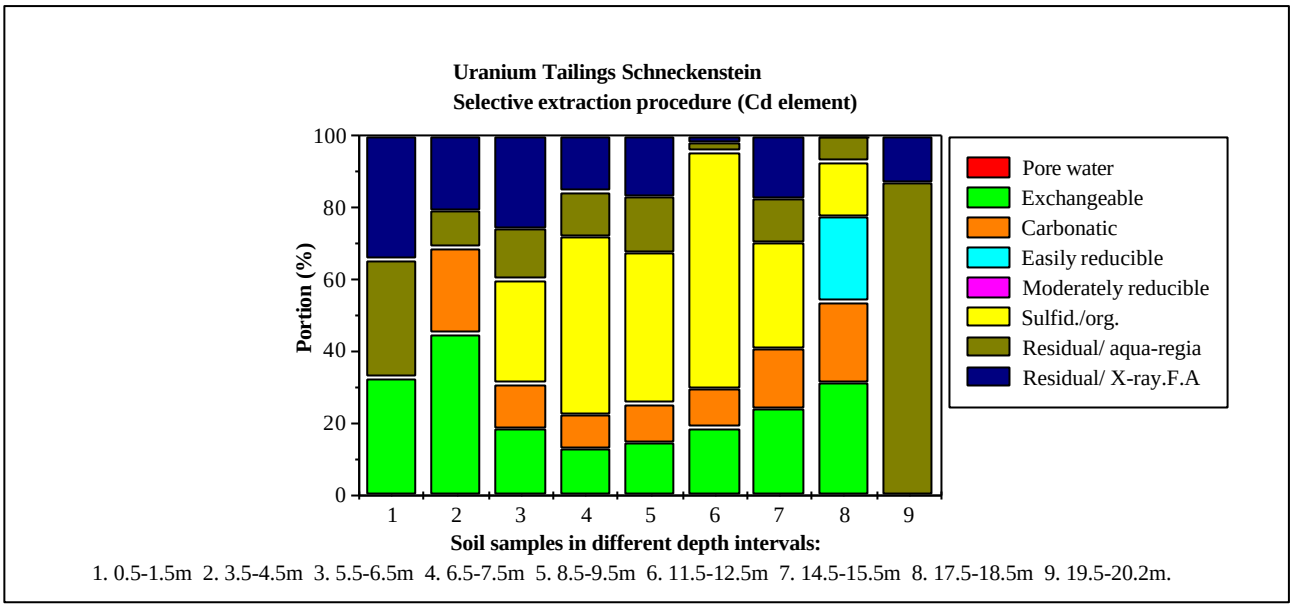
Zinc

Depth int.	Pore water	Exchangeable	Carbonatic	Easily reducible	Mod. reducible	Sulfid./org.
0.5-1.5	0.00	4.84	0.00	65.16	30.00	0.00
3.5-4.5	0.23	7.88	8.51	22.24	46.13	15.00
5.5-6.5	0.22	4.60	4.14	27.83	27.88	35.33
6.5-7.5	0.23	2.01	2.22	22.44	32.46	40.63
8.5-9.5	0.15	2.00	1.84	18.52	27.10	50.40
11.5-12.5	0.07	2.59	4.04	31.79	9.15	52.36
14.5-15.5	0.17	2.47	4.86	41.64	14.98	35.88
17.5-18.5	0.32	4.51	7.98	52.88	17.01	17.30
19.5-20.2	0.48	0.00	9.40	57.55	0.00	32.58

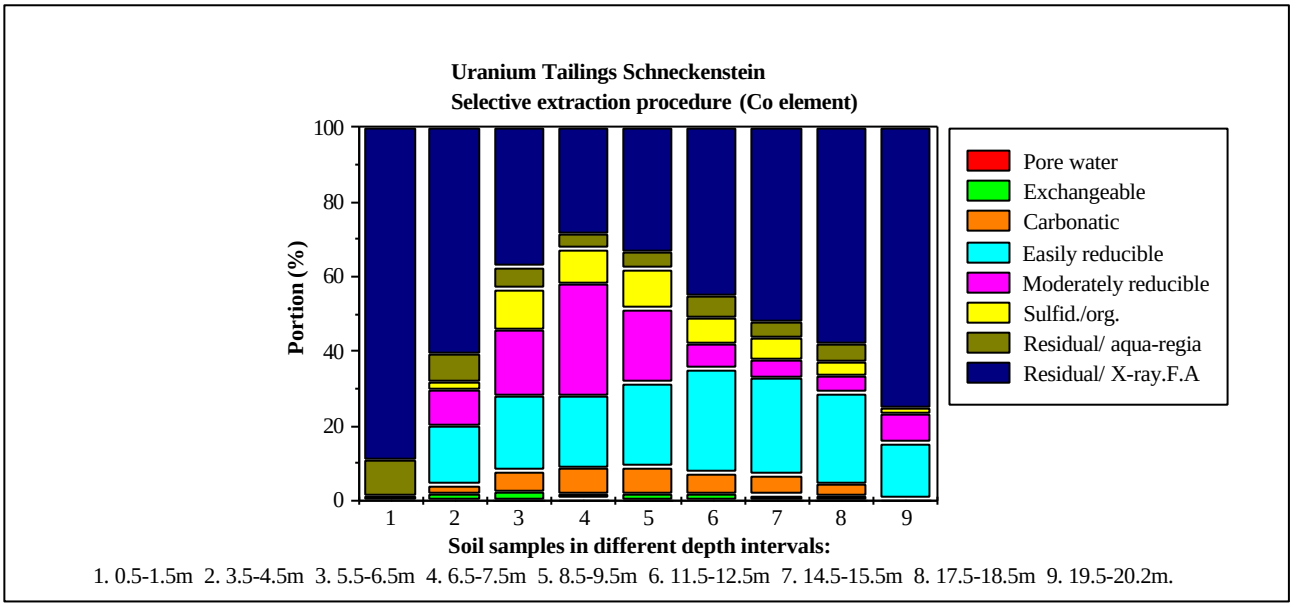

Uranium Tailings Schneckenstein
Selective extraction procedure (Al element)
Portion (%)
0
20
40
60
80
100
1
2
3
4
5
6
7
8
9
Pore water
Exchangeable
Carbonatic
Easily reducible
Moderately reducible
Sulfid./org.
Residual/ aqua-regia
Residual/ X-ray.F.A
Soil samples in different depth intervals:
1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.


Uranium Tailings Schneckenstein
Selective extraction procedure (As element)
Portion (%)
0
20
40
60
80
100
1
2
3
4
5
6
7
8
9
Pore water
Exchangeable
Carbonatic
Easily reducible
Moderately reducible
Sulfid./org.
Residual/ aqua-regia
Residual/ X-ray.F.A
Soil samples in different depth intervals:
1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.

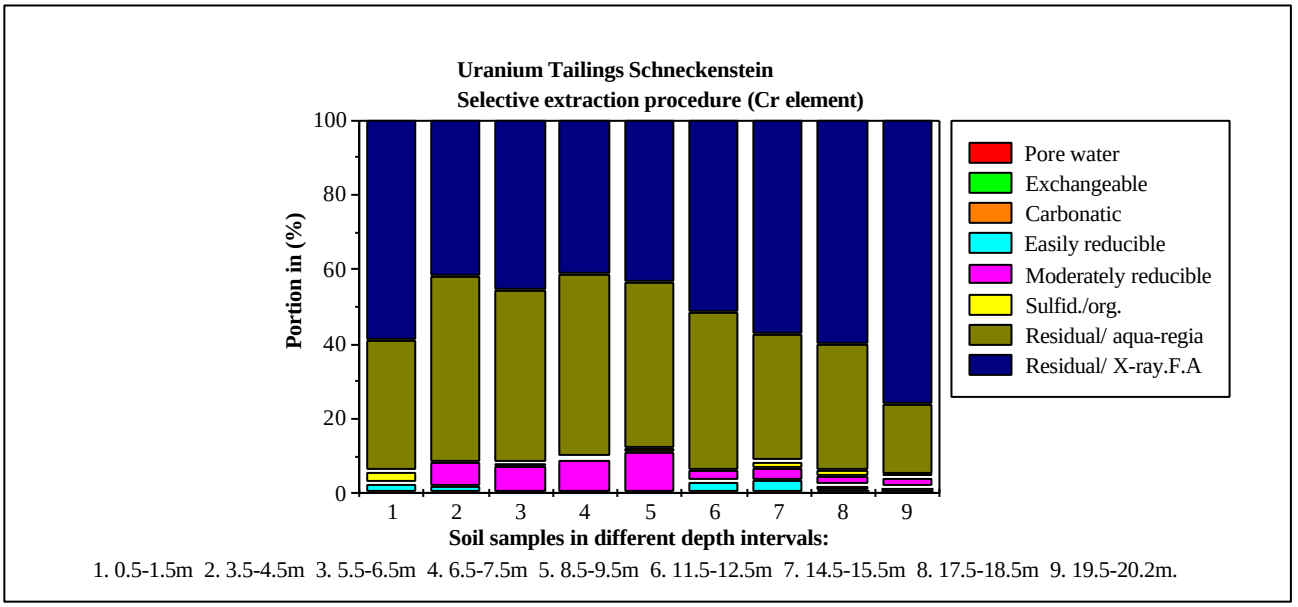

Uranium Tailings Schneckenstein
Selective extraction procedure (Ba element)
Portion (%)
0
20
40
60
80
100
1
2
3
4
5
6
7
8
9
Pore water
Exchangeable
Carbonatic
Easily reducible
Moderately reducible
Sulfid./org.
Residual/ aqua-regia
Residual/ X-ray.F.A
Soil samples in different depth intervals:
1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.



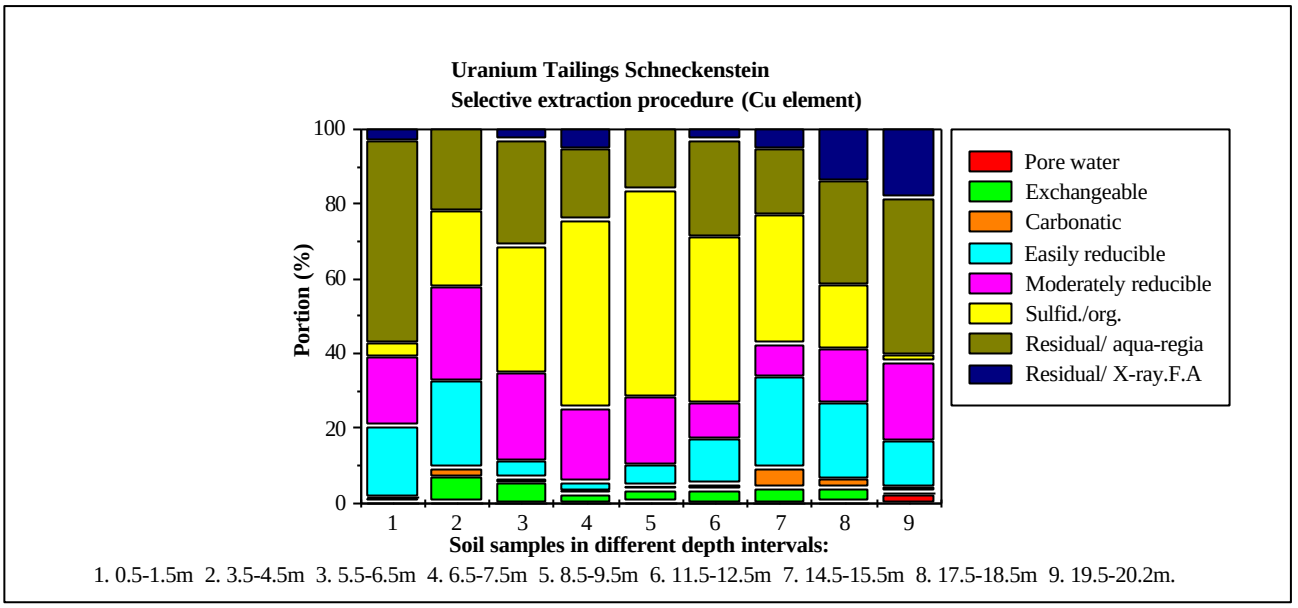
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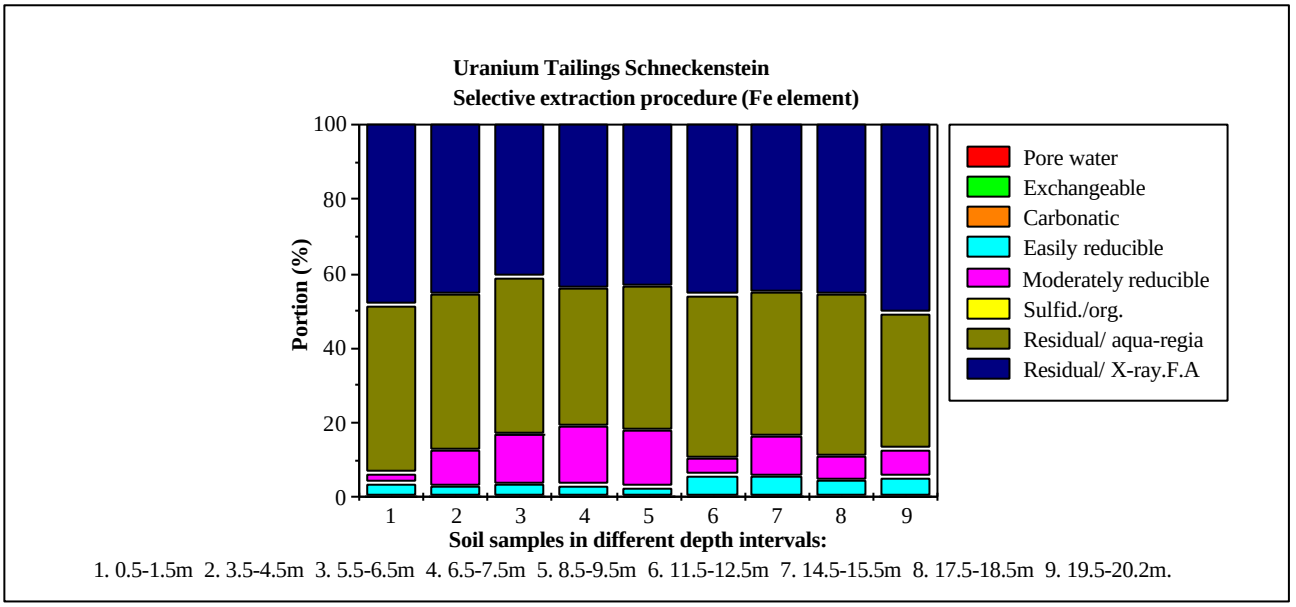
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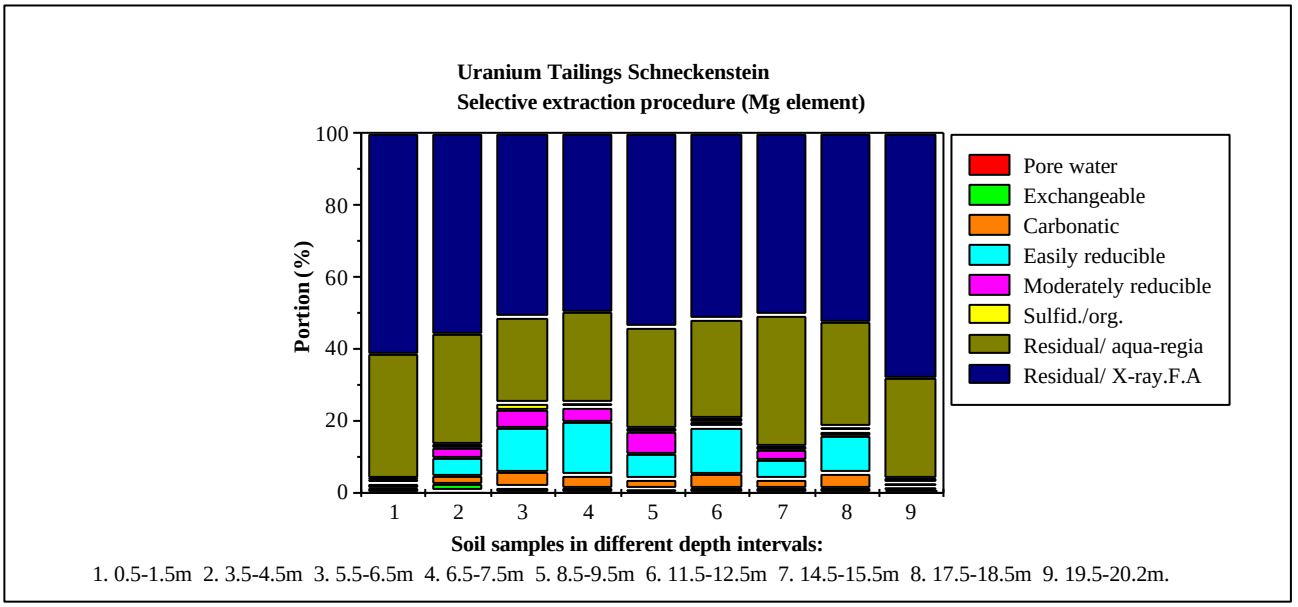
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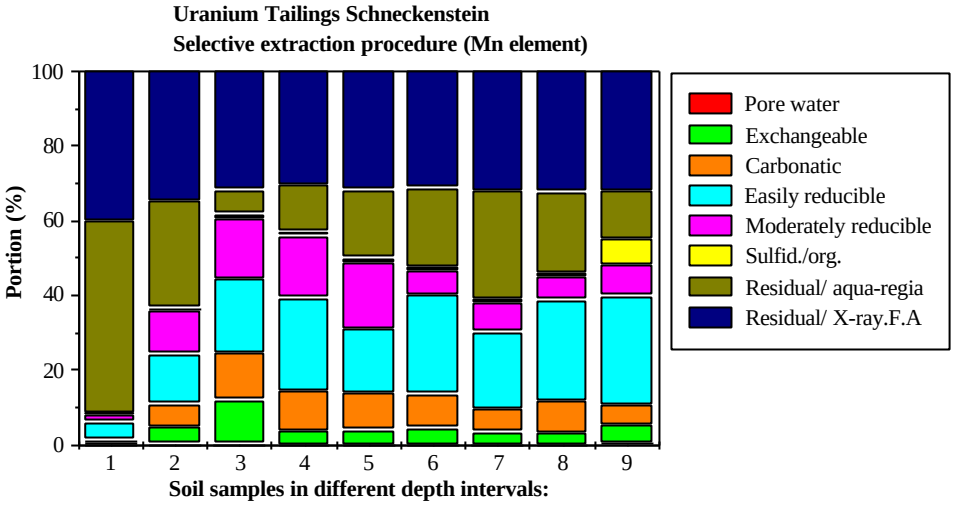
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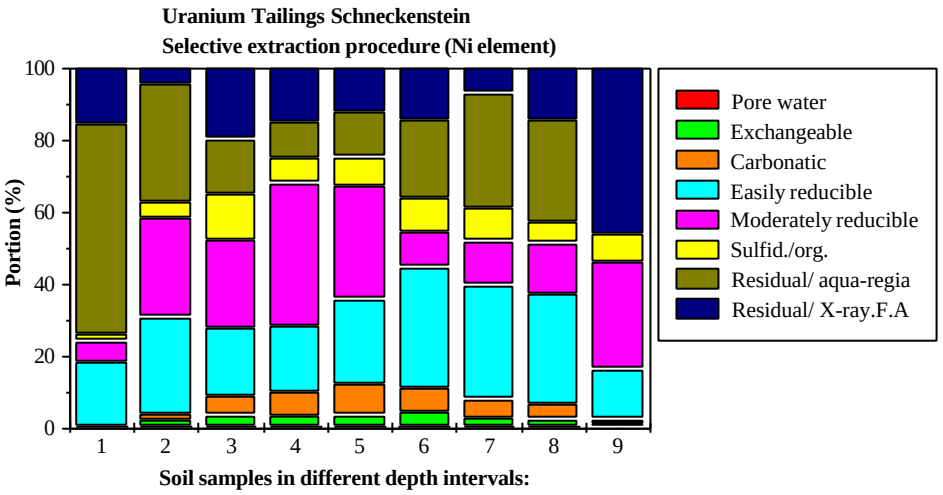
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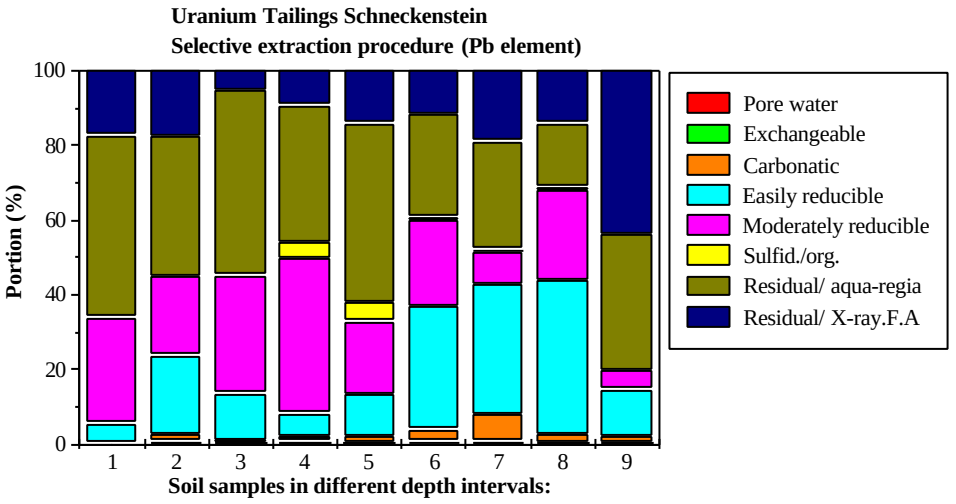
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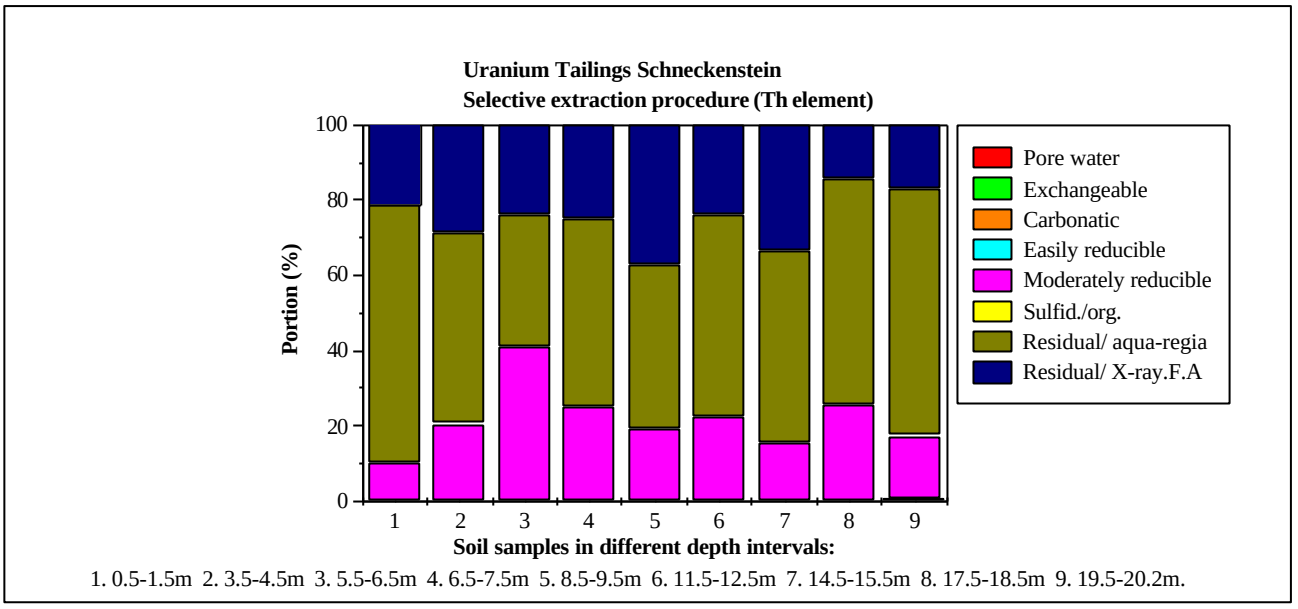
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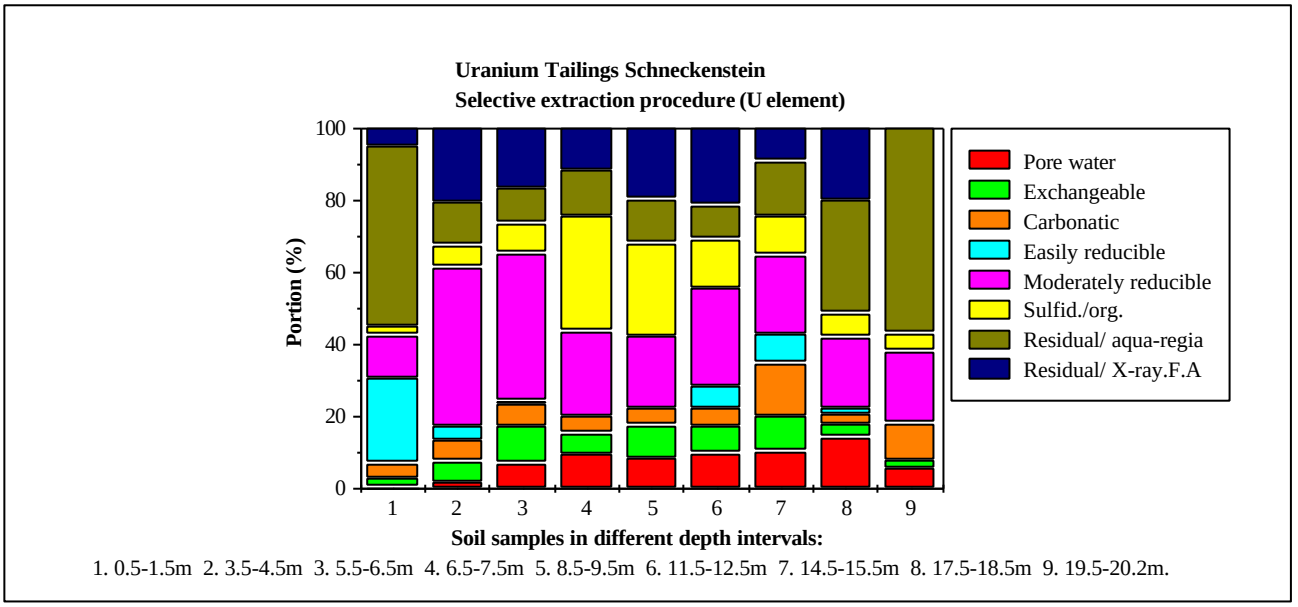
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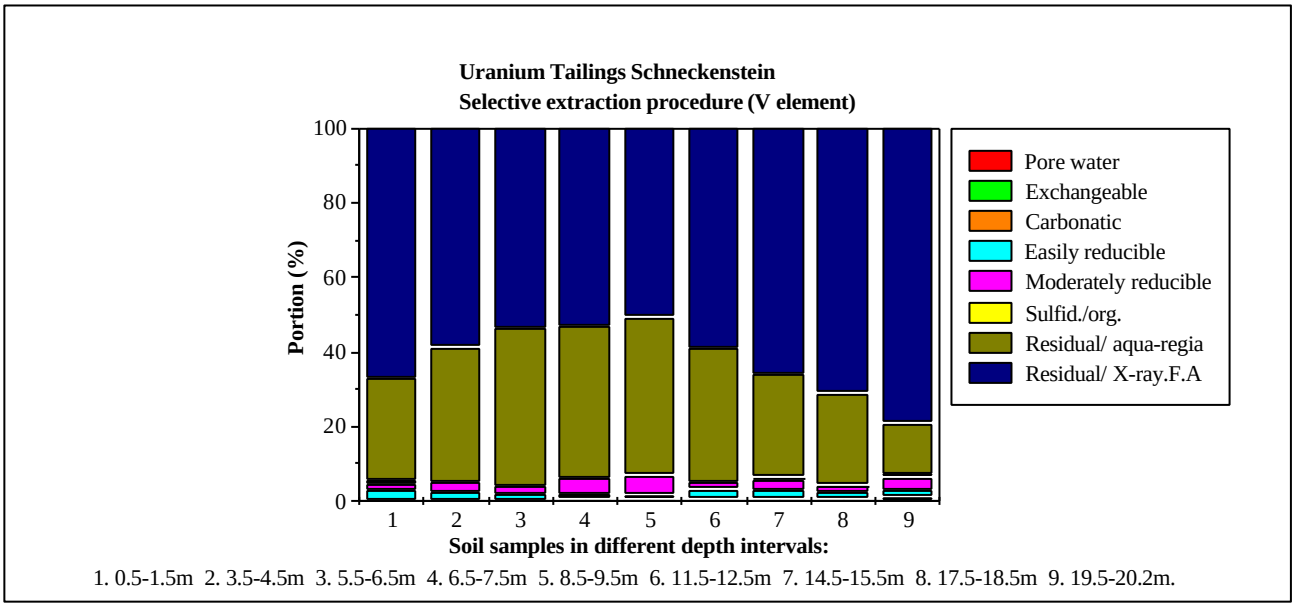
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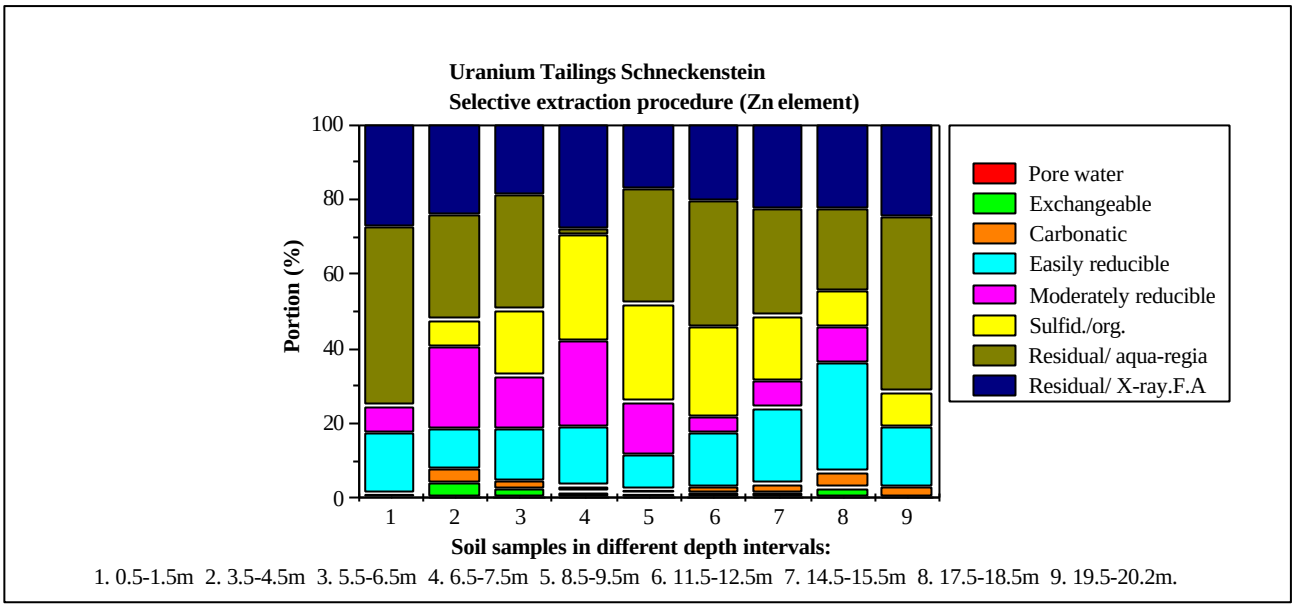
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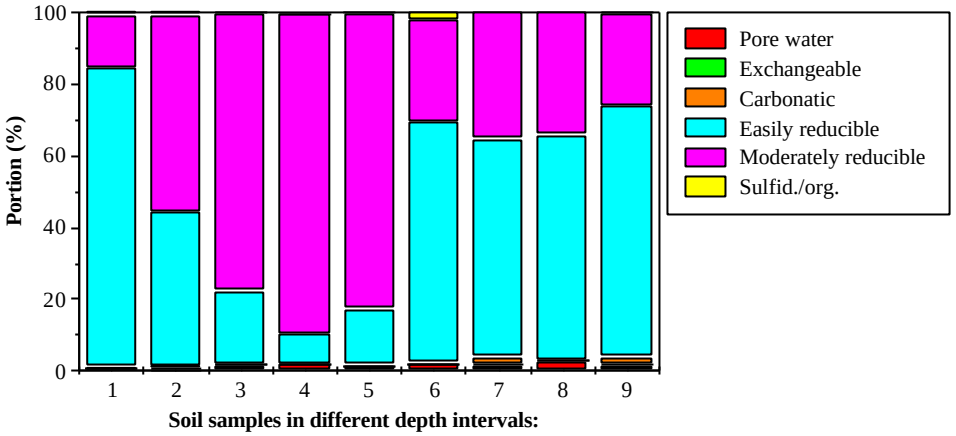
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1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.


Uranium Tailings Schneckenstein
Selective extraction procedure (Zn element)
Portion (%)
100
80
60
40
20
0
1
2
3
4
5
6
7
8
9
Pore water
Exchangeable
Carbonatic
Easily reducible
Moderately reducible
Sulfid./org.
Residual/ aqua-regia
Residual/ X-ray.F.A
Soil samples in different depth intervals:
1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.

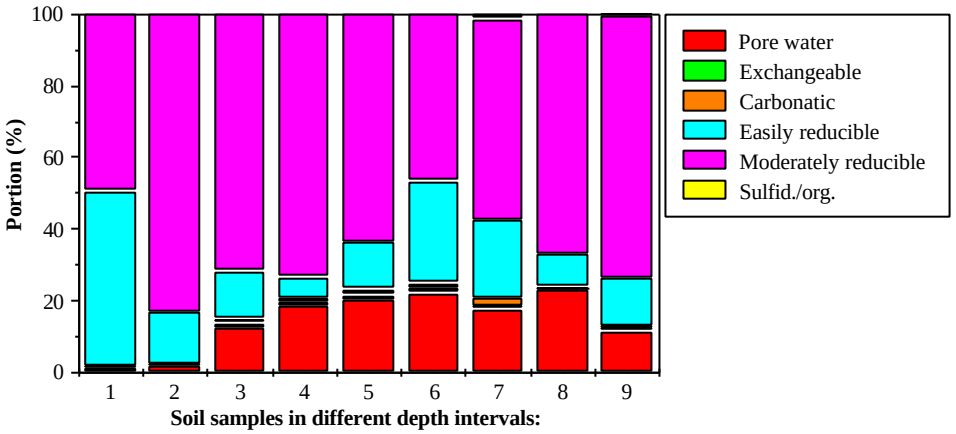
Uranium Tailings Schneckenstein
Selective extraction procedure (Al element)



Soil samples in different depth intervals:

1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.

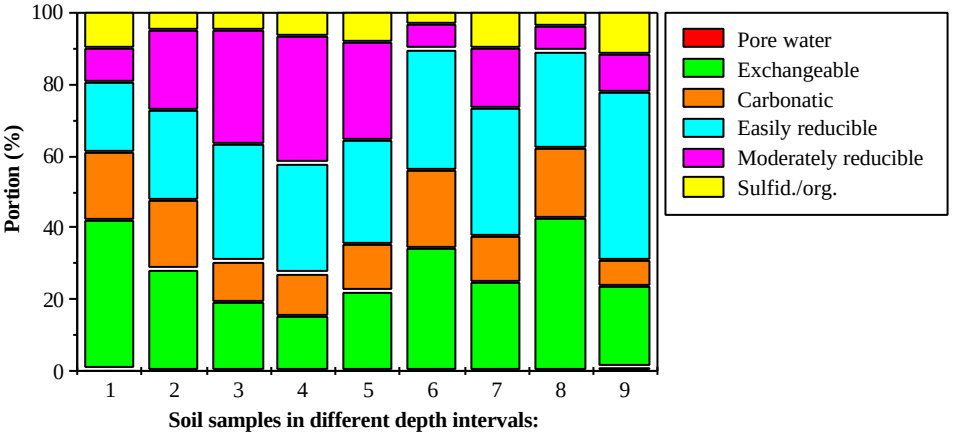
Uranium Tailings Schneckenstein
Selective extraction procedure (As element)



Soil samples in different depth intervals:

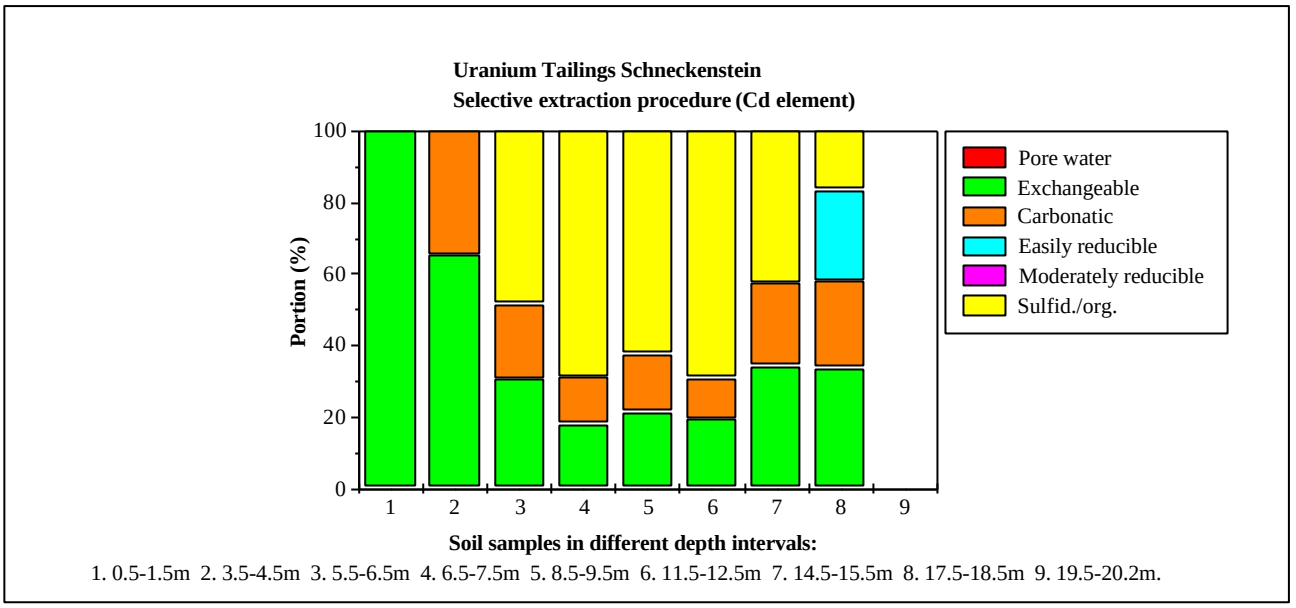
1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.

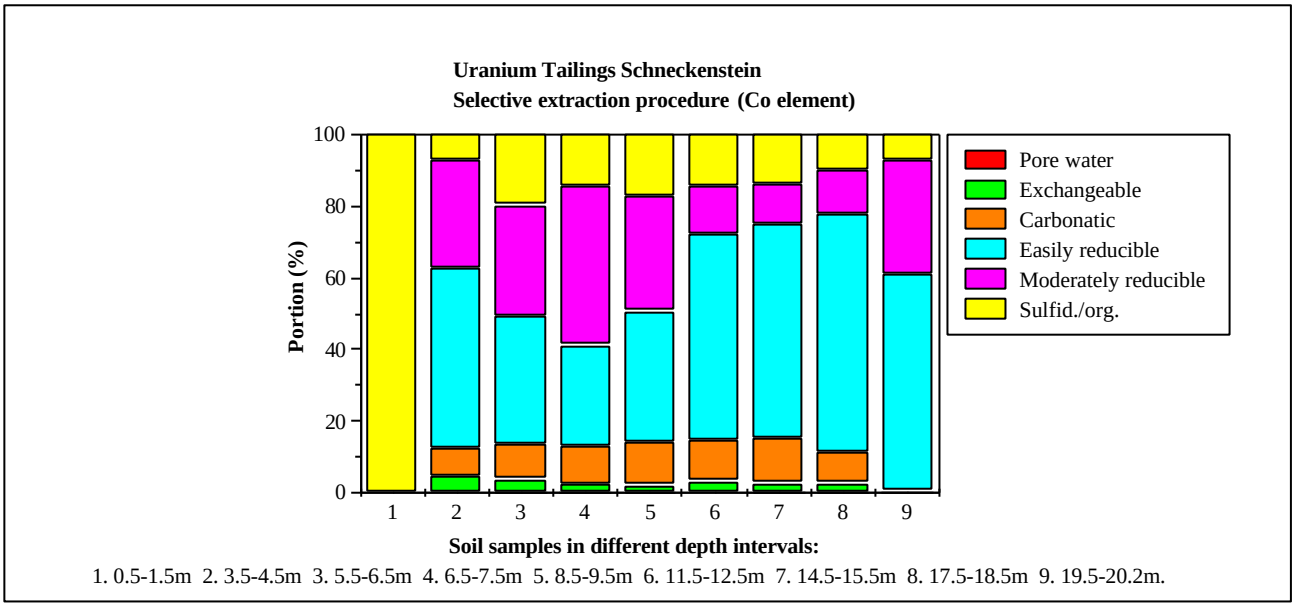
Uranium Tailings Schneckenstein
Selective extraction procedure (Ba element)

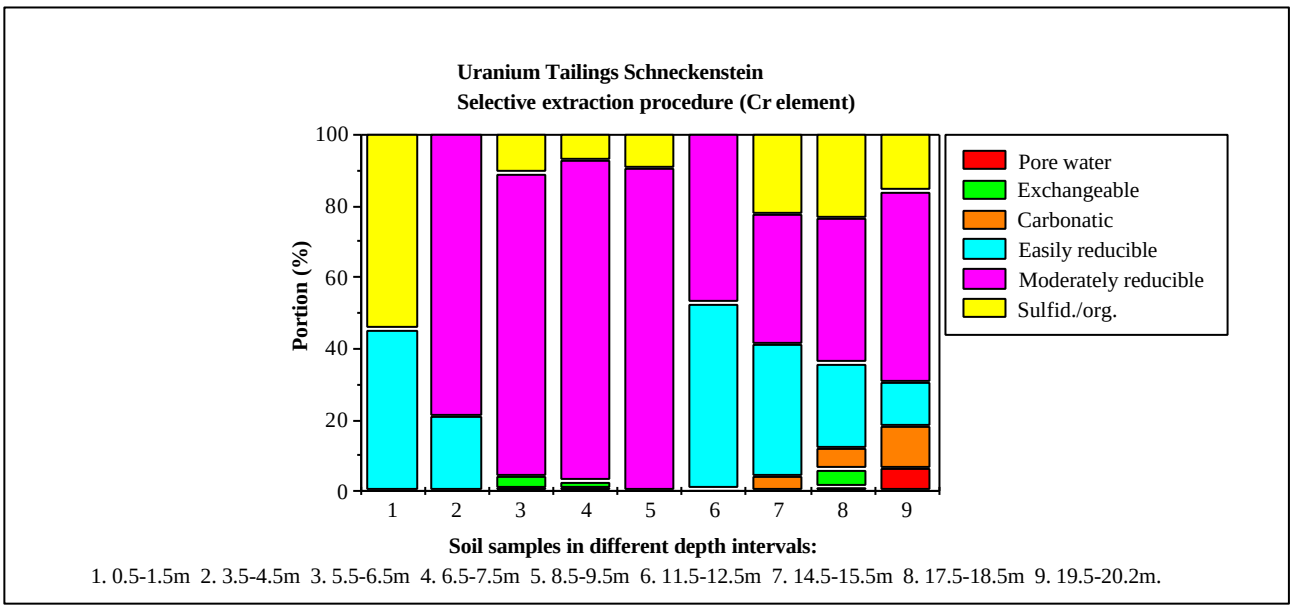


Soil samples in different depth intervals:

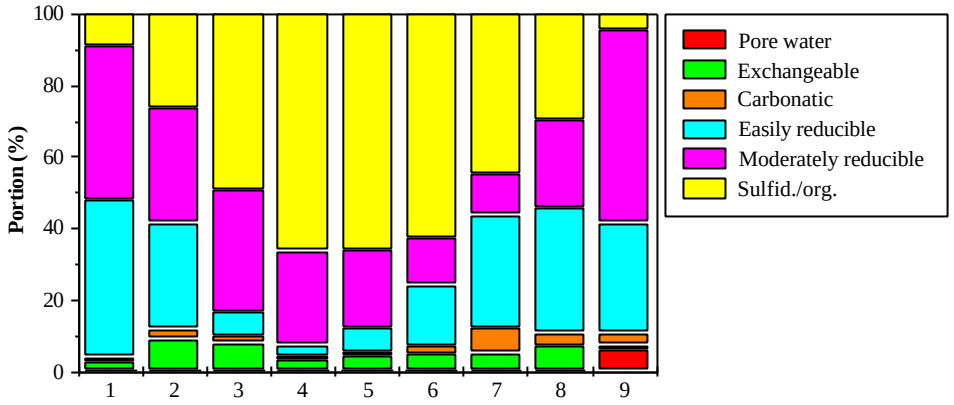
1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.


Uranium Tailings Schneckenstein
Selective extraction procedure (Cd element)
Portion (%)
100
80
60
40
20
0
1
2
3
4
5
6
7
8
9
Pore water
Exchangeable
Carbonatic
Easily reducible
Moderately reducible
Sulfid./org.
Soil samples in different depth intervals:
1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.


Uranium Tailings Schneckenstein
Selective extraction procedure (Co element)
Portion (%)
100
80
60
40
20
0
1
2
3
4
5
6
7
8
9
Pore water
Exchangeable
Carbonatic
Easily reducible
Moderately reducible
Sulfid./org.
Soil samples in different depth intervals:
1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.


Uranium Tailings Schneckenstein
Selective extraction procedure (Cr element)
Portion (%)
100
80
60
40
20
0
1
2
3
4
5
6
7
8
9
Pore water
Exchangeable
Carbonatic
Easily reducible
Moderately reducible
Sulfid./org.
Soil samples in different depth intervals:
1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.

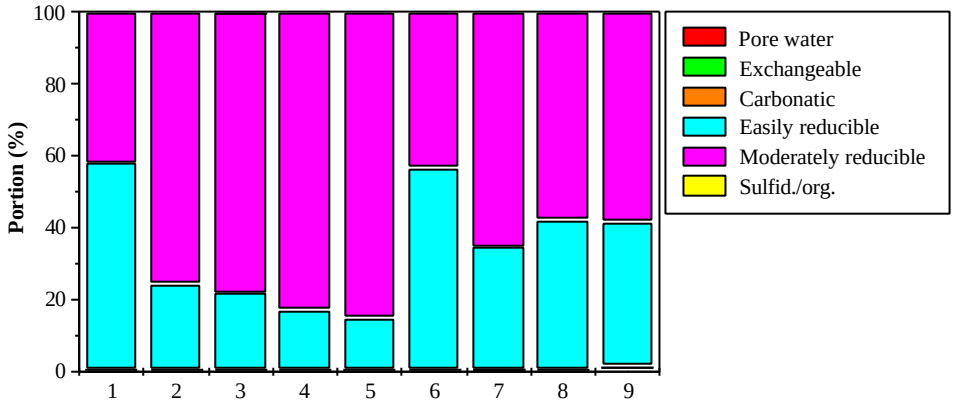
Uranium Tailings Schneckenstein
Selective extraction procedure (Cu element)



Soil samples in different depth intervals:

1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.

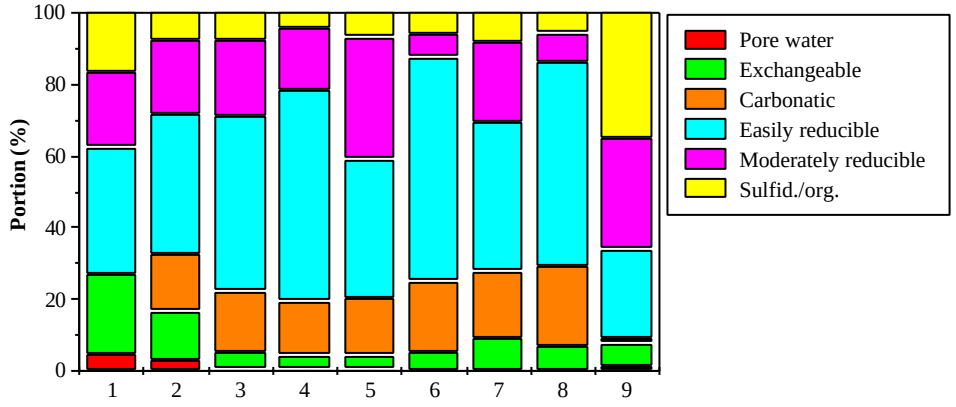
Uranium Tailings Schneckenstein
Selective extraction procedure (Fe element)



Soil samples in different depth intervals:

1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.

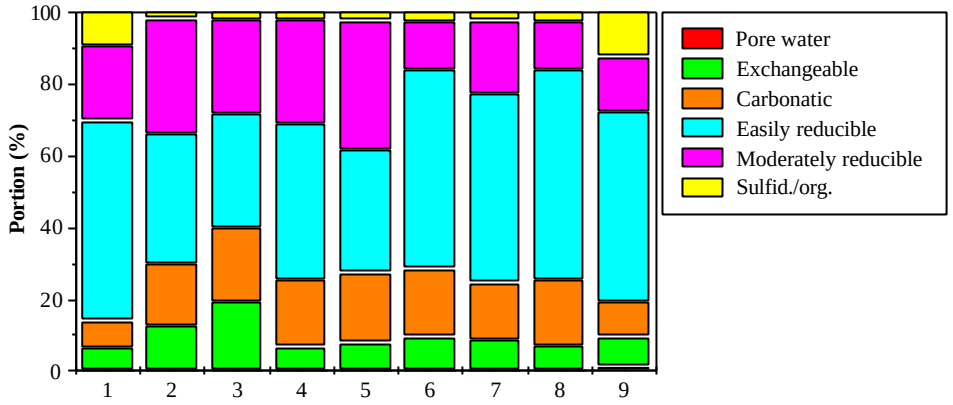
Uranium Tailings Schneckenstein
Selective extraction procedure (Mg element)



Soil samples in different depth intervals:

1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.

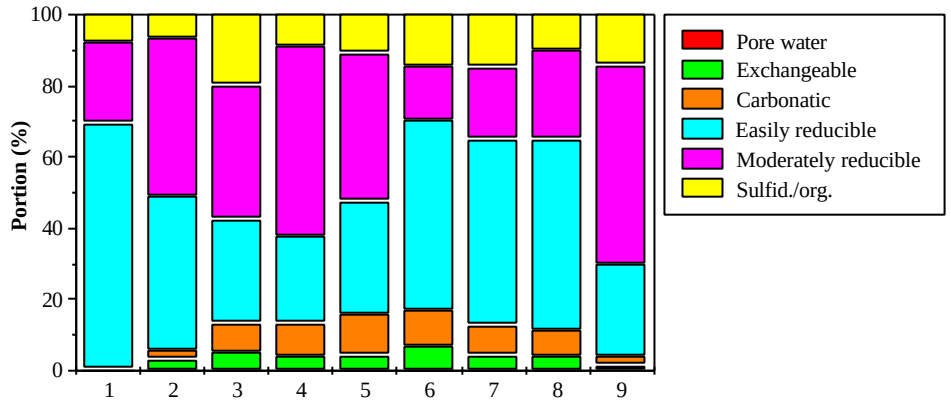
Uranium Tailings Schneckenstein
Selective extraction procedure (Mn element)



Soil samples in different depth intervals:

1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.

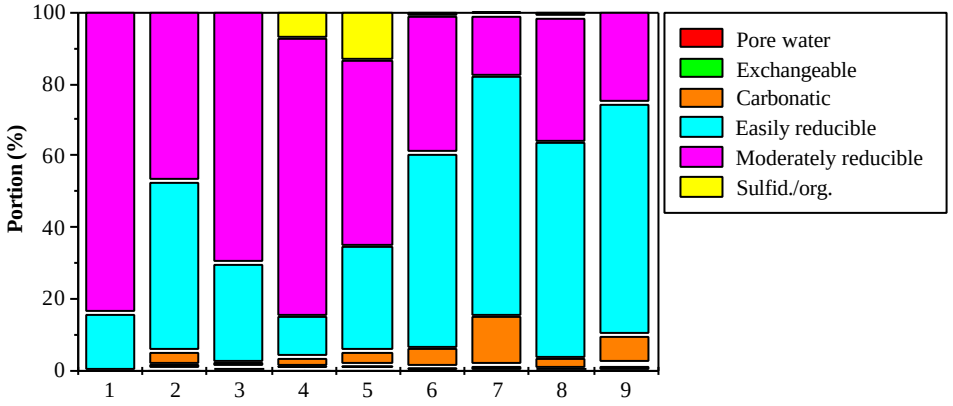
Uranium Tailings Schneckenstein
Selective extraction procedure (Ni element)



Soil samples in different depth intervals:

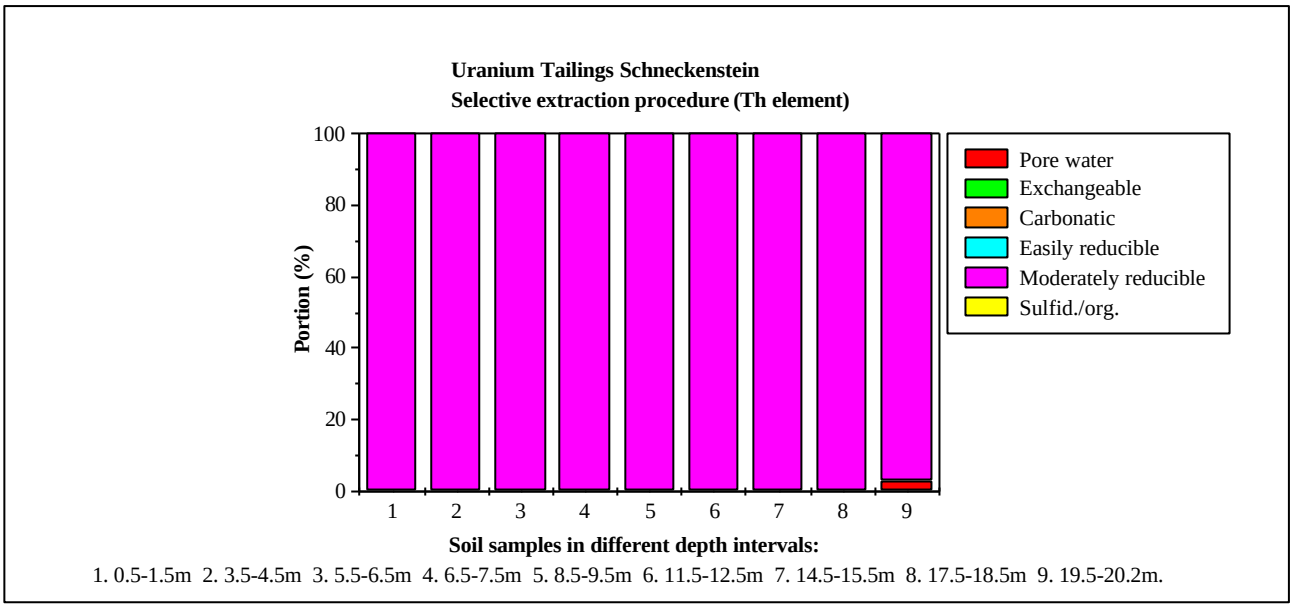
1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.

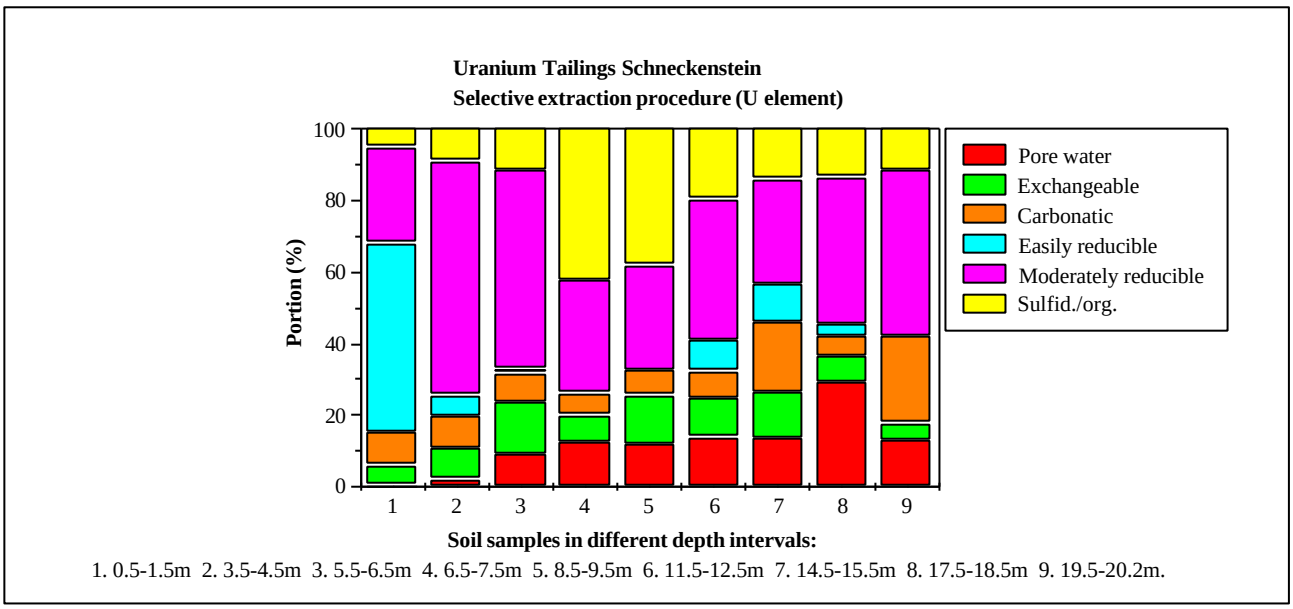
Uranium Tailings Schneckenstein
Selective extraction procedure (Pb element)

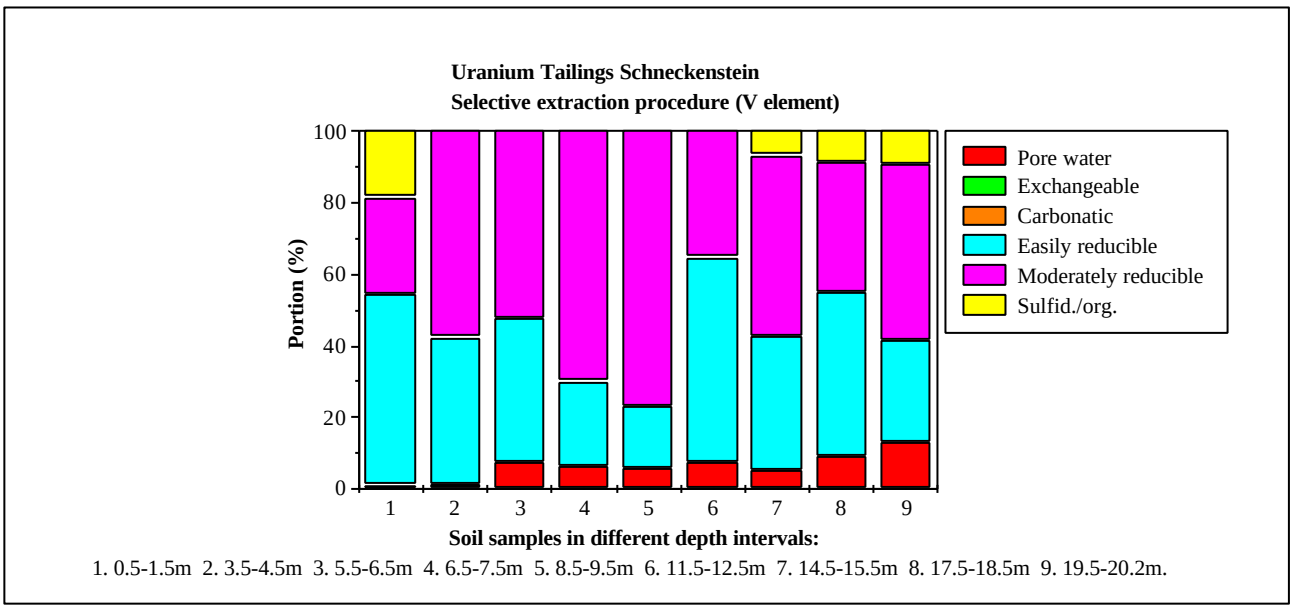


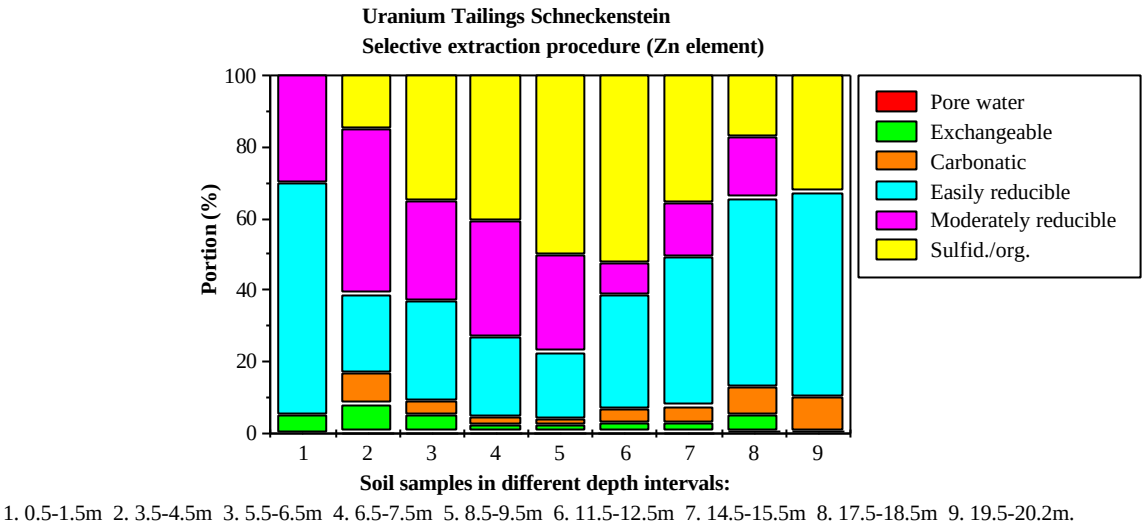
Soil samples in different depth intervals:

1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.

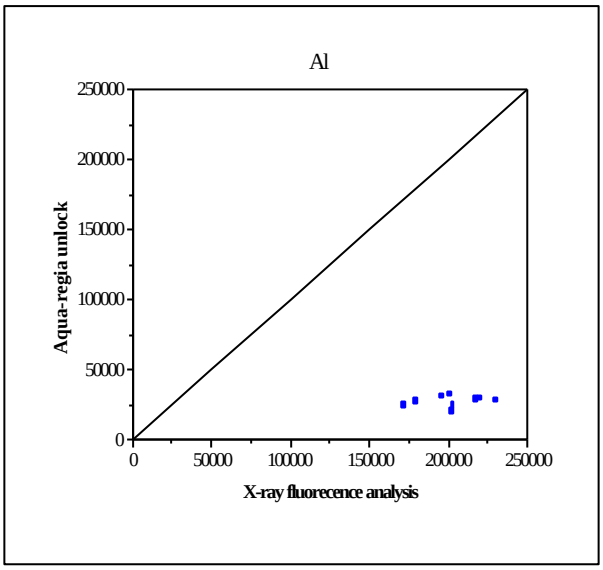

Uranium Tailings Schneckenstein
Selective extraction procedure (Th element)
Portion (%)
0
20
40
60
80
100
1
2
3
4
5
6
7
8
9
Pore water
Exchangeable
Carbonatic
Easily reducible
Moderately reducible
Sulfid./org.
Soil samples in different depth intervals:
1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.

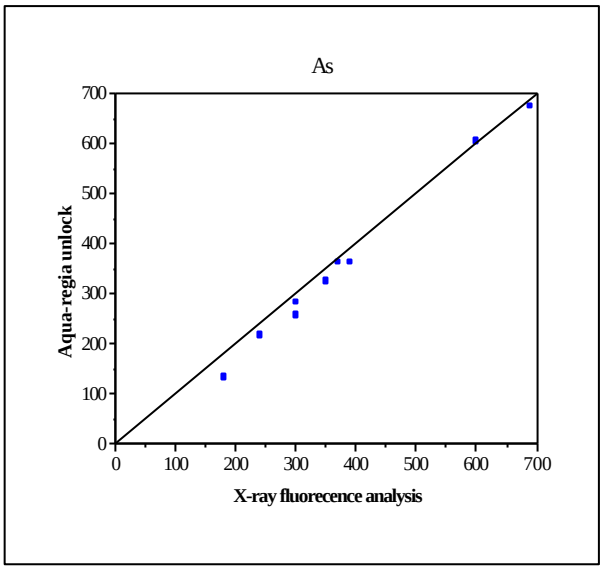

Uranium Tailings Schneckenstein
Selective extraction procedure (U element)
Portion (%)
0
20
40
60
80
100
1
2
3
4
5
6
7
8
9
Pore water
Exchangeable
Carbonatic
Easily reducible
Moderately reducible
Sulfid./org.
Soil samples in different depth intervals:
1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.

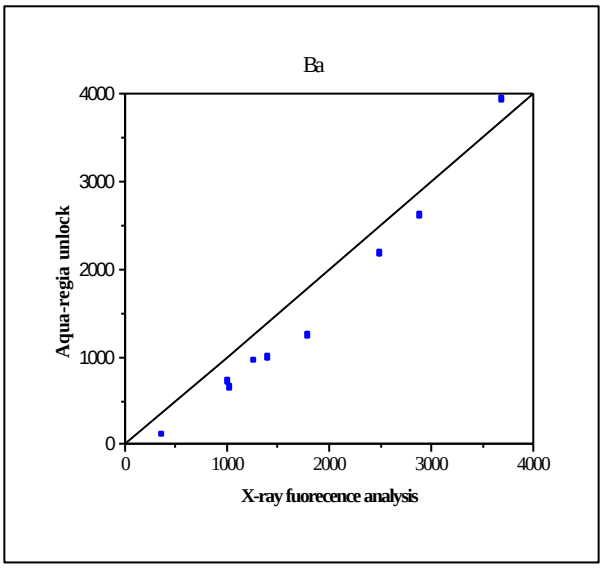

Uranium Tailings Schneckenstein
Selective extraction procedure (V element)
Portion (%)
0
20
40
60
80
100
1
2
3
4
5
6
7
8
9
Pore water
Exchangeable
Carbonatic
Easily reducible
Moderately reducible
Sulfid./org.
Soil samples in different depth intervals:
1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.

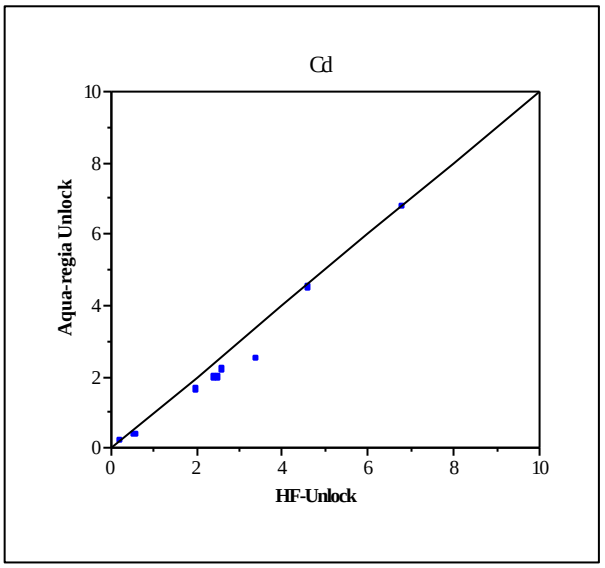

Uranium Tailings Schneckenstein
Selective extraction procedure (Zn element)
Portion (%)
100
80
60
40
20
0
1
2
3
4
5
6
7
8
9
Pore water
Exchangeable
Carbonatic
Easily reducible
Moderately reducible
Sulfid./org.
Soil samples in different depth intervals:
1. 0.5-1.5m 2. 3.5-4.5m 3. 5.5-6.5m 4. 6.5-7.5m 5. 8.5-9.5m 6. 11.5-12.5m 7. 14.5-15.5m 8. 17.5-18.5m 9. 19.5-20.2m.

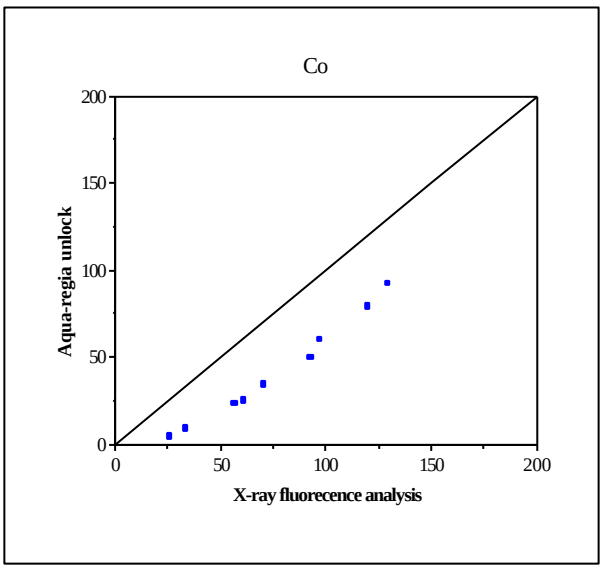
Appendix: 7.5.6. The comparison between the two procedures; aqua regia unlock & X-ray F.A.

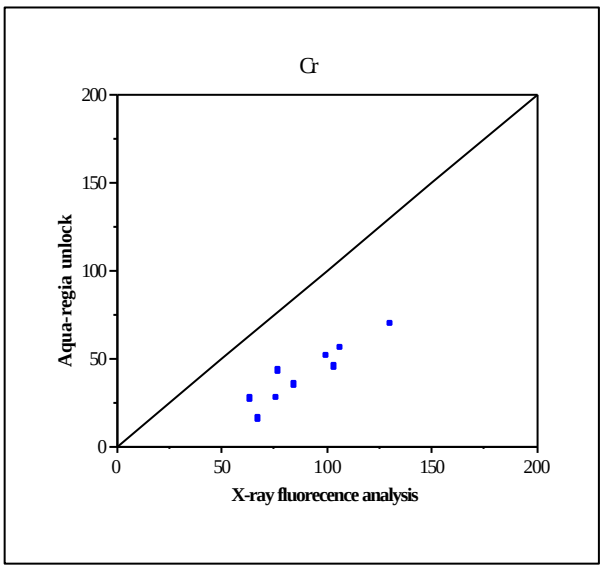




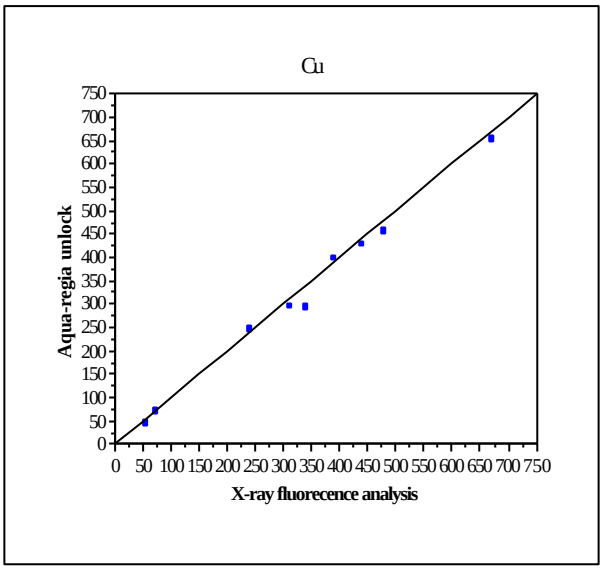


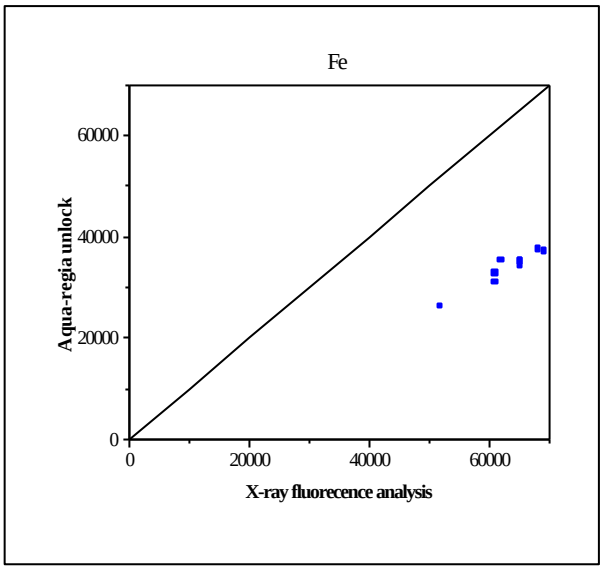


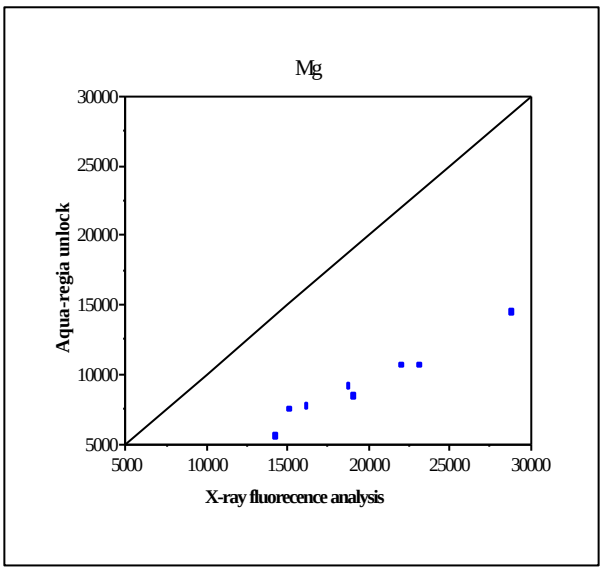


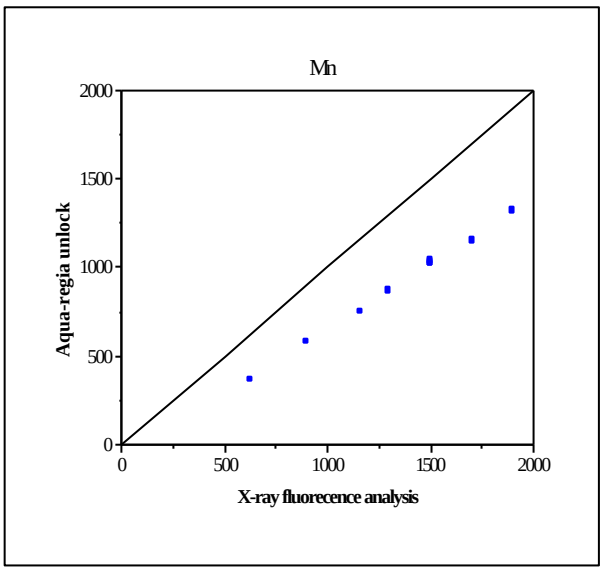


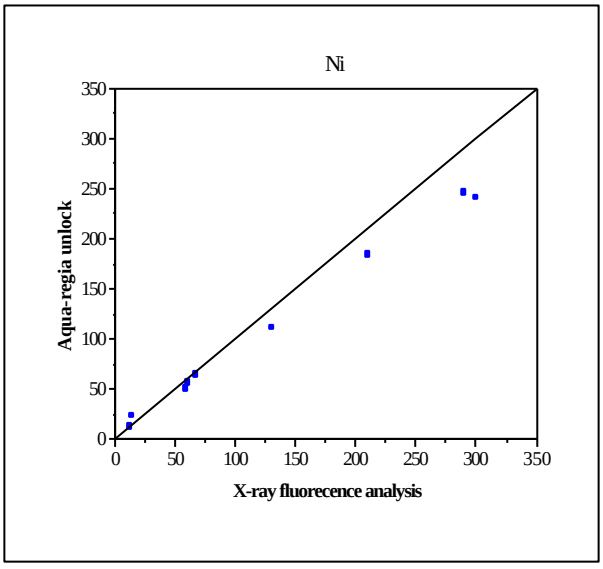
Appendix: 7.5.6. The conparison between the two procedures; aqua regia unlock & X-ray F.A.

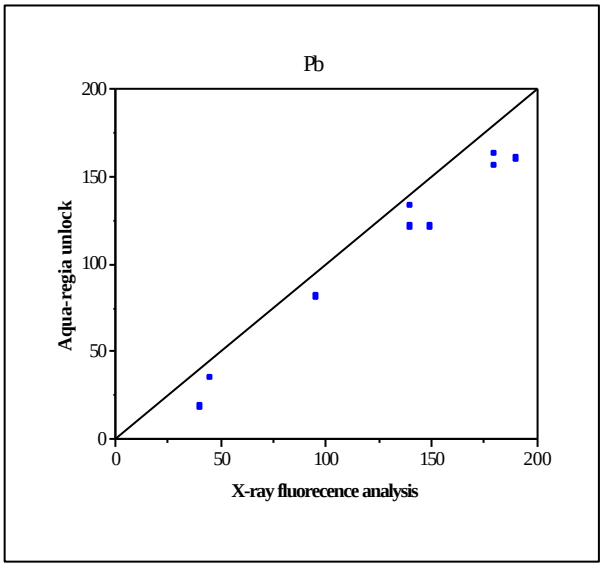




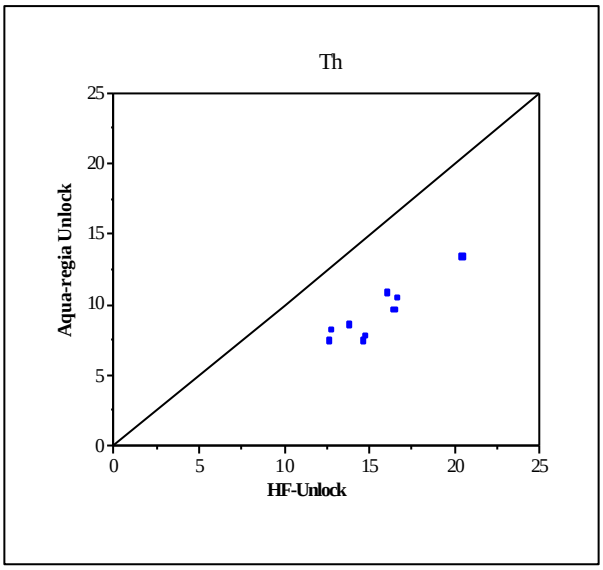


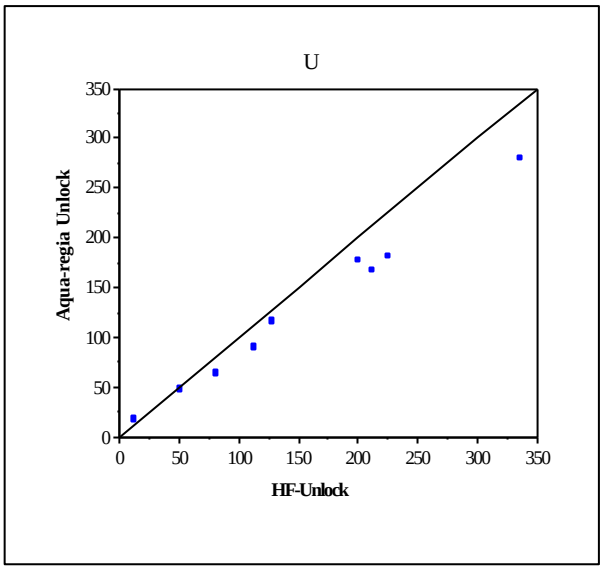


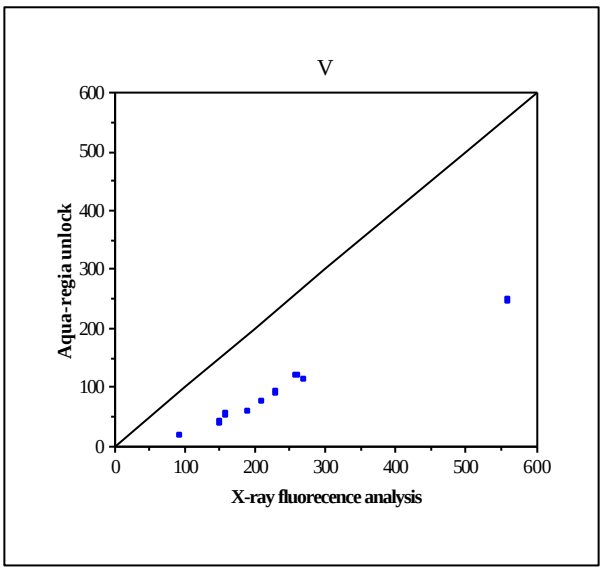


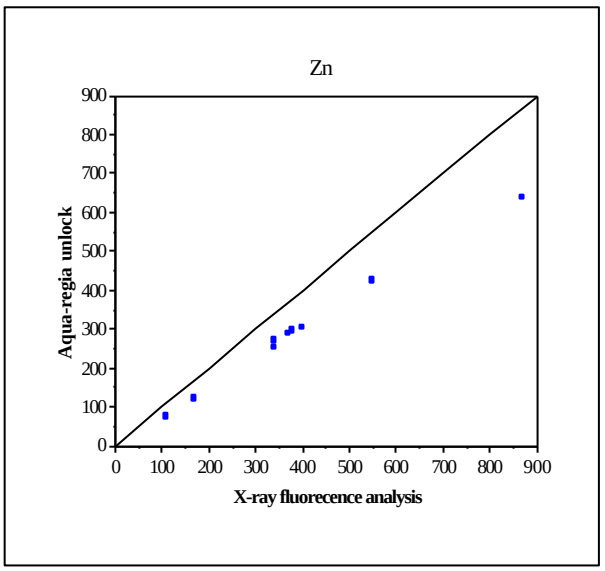


Appendix: 7.5.6. The comparison between the two procedures; aqua regia unlock & X-ray F.A.









Appendix: 7.5.7. The relative mobility of elements in different depth intervals (%)

Aluminium

Depth int.	High	Medium	Low
0.5-1.5	0.1	7.8	92.1
3.5-4.5	0.1	9.3	92.1
5.5-6.5	0.1	7.5	92.3
6.5-7.5	0.2	7.5	92.3
8.5-9.5	0.2	9.7	90.2
11.5-12.5	0.1	6.4	93.4
14.5-15.5	0.4	10.0	89.5
17.5-18.5	0.2	6.9	92.9
19.5-20.2	0.9	21.4	77.7

Arsenic

Depth int.	High	Medium	Low
0.5-1.5	1.2	68.5	30.4
3.5-4.5	1.6	64.7	33.7
5.5-6.5	10.1	58.8	31.1
6.5-7.5	15.0	57.4	27.5
8.5-9.5	16.2	53.4	30.4
11.5-12.5	12.7	38.3	49.1
14.5-15.5	12.4	47.2	40.3
17.5-18.5	12.5	40.1	47.3
19.5-20.2	5.9	39.5	54.6

Barium

Depth int.	High	Medium	Low
0.5-1.5	39.3	18.6	42.1
3.5-4.5	35.6	35.6	28.9
5.5-6.5	18.8	39.9	41.2
6.5-7.5	12.5	30.6	56.8
8.5-9.5	24.2	38.8	37.1
11.5-12.5	39.3	28.6	32.1
14.5-15.5	21.9	30.7	47.5
17.5-18.5	30.1	16.5	53.4
19.5-20.2	8.4	15.7	76.0

Cadmium

Depth int.	High	Medium	Low
0.5-1.5	49.6	0.0	50.4
3.5-4.5	86.7	0.0	13.3
5.5-6.5	41.6	0.0	58.4
6.5-7.5	26.5	0.0	73.5
8.5-9.5	30.7	0.0	69.3
11.5-12.5	30.1	0.0	69.9
14.5-15.5	49.1	0.0	50.9
17.5-18.5	54.0	23.7	22.3
19.5-20.2	0.0	0.0	100.0

Appendix: 7.5.7. The relative mobility of elements in different depth intervals (%)

Cobalt

Depth int.	High	Medium	Low
0.5-1.5	0.0	0.0	100.0
3.5-4.5	10.0	65.4	24.6
5.5-6.5	12.2	60.6	27.1
6.5-7.5	12.2	68.8	19.1
8.5-9.5	13.1	64.0	22.8
11.5-12.5	13.1	63.0	23.9
14.5-15.5	13.8	64.5	21.7
17.5-18.5	9.9	69.6	20.6
19.5-20.2	0.4	92.4	7.2

Chromium

Depth int.	High	Medium	Low
0.5-1.5	0.0	6.5	93.5
3.5-4.5	0.0	14.2	85.8
5.5-6.5	0.6	12.6	86.8
6.5-7.5	0.4	14.8	84.8
8.5-9.5	0.1	19.1	80.9
11.5-12.5	0.1	12.2	87.8
14.5-15.5	0.8	14.7	84.5
17.5-18.5	1.8	9.8	88.4
19.5-20.2	3.8	13.8	82.4

Copper

Depth int.	High	Medium	Low
0.5-1.5	1.7	38.4	59.9
3.5-4.5	9.3	48.3	42.4
5.5-6.5	6.8	28.9	64.2
6.5-7.5	3.4	23.4	73.2
8.5-9.5	4.6	23.8	71.6
11.5-12.5	5.2	22.2	72.7
14.5-15.5	9.8	35.0	55.1
17.5-18.5	7.2	40.5	52.3
19.5-20.2	5.2	41.0	53.8

Iron

Depth int.	High	Medium	Low
0.5-1.5	0.0	11.7	88.2
3.5-4.5	0.0	21.4	78.5
5.5-6.5	0.0	25.8	74.2
6.5-7.5	0.0	30.0	70.0
8.5-9.5	0.0	28.0	71.9
11.5-12.5	0.0	17.6	82.4
14.5-15.5	0.1	26.5	73.3
17.5-18.5	0.0	18.6	81.4
19.5-20.2	0.3	24.0	75.7

Appendix: 7.5.7. The relative mobility of elements in different depth intervals (%)

Magnesium

Depth int.	High	Medium	Low
0.5-1.5	2,7	5,7	91,6
3.5-4.5	9,9	18,2	71,9
5.5-6.5	11,2	35,9	52,9
6.5-7.5	9,5	37,7	52,8
8.5-9.5	7,9	28,5	63,6
11.5-12.5	10,6	29,6	59,8
14.5-15.5	7,3	16,8	76,0
17.5-18.5	11,0	24,9	64,1
19.5-20.2	1,1	6,7	92,3

Manganese

Depth int.	High	Medium	Low
0.5-1.5	2,0	10,9	87,1
3.5-4.5	16,7	38,6	44,8
5.5-6.5	36,1	52,5	11,4
6.5-7.5	20,7	59,4	19,9
8.5-9.5	20,0	51,6	28,4
11.5-12.5	19,8	47,8	32,4
14.5-15.5	14,1	41,8	44,1
17.5-18.5	17,1	49,0	33,9
19.5-20.2	15,5	55,5	29,0

Nickel

Depth int.	High	Medium	Low
0.5-1.5	0,1	28,2	71,6
3.5-4.5	3,7	57,4	38,9
5.5-6.5	10,8	53,9	35,3
6.5-7.5	11,6	68,6	19,7
8.5-9.5	13,7	62,9	23,5
11.5-12.5	12,6	51,1	36,3
14.5-15.5	8,4	47,4	44,2
17.5-18.5	7,5	52,6	39,9
19.5-20.2	4,1	81,6	14,3

Lead

Depth int.	High	Medium	Low
0.5-1.5	0,0	41,0	59,0
3.5-4.5	2,9	51,5	45,6
5.5-6.5	1,0	46,7	52,3
6.5-7.5	2,1	52,8	45,0
8.5-9.5	2,3	35,9	61,8
11.5-12.5	4,2	63,6	32,2
14.5-15.5	9,7	54,2	36,2
17.5-18.5	2,7	76,2	21,1
19.5-20.2	3,4	31,3	65,3

Appendix: 7.5.7. The relative mobility of elements in different depth intervals (%)

Thorium

Depth int.	High	Medium	Low
0.5-1.5	0,0	13,1	86,9
3.5-4.5	0,0	28,6	71,4
5.5-6.5	0,0	53,4	46,6
6.5-7.5	0,0	33,5	66,5
8.5-9.5	0,0	30,1	69,9
11.5-12.5	0,0	29,4	70,6
14.5-15.5	0,0	23,4	76,6
17.5-18.5	0,0	30,2	69,8
19.5-20.2	0,6	20,2	79,2

Uranium

Depth int.	High	Medium	Low
0.5-1.5	7,1	37,6	55,3
3.5-4.5	16,6	60,4	23,0
5.5-6.5	27,9	50,4	21,6
6.5-7.5	22,4	27,0	50,6
8.5-9.5	27,5	25,0	47,5
11.5-12.5	28,3	42,3	29,4
14.5-15.5	38,1	33,1	28,8
17.5-18.5	25,5	26,8	47,7
19.5-20.2	18,1	19,9	62,0

Vanadium

Depth int.	High	Medium	Low
0.5-1.5	0,2	13,1	86,7
3.5-4.5	0,2	12,1	87,7
5.5-6.5	0,6	7,5	91,9
6.5-7.5	0,8	12,1	87,1
8.5-9.5	0,8	13,1	86,1
11.5-12.5	0,9	11,1	88,0
14.5-15.5	1,0	16,3	82,8
17.5-18.5	1,3	11,8	86,9
19.5-20.2	4,4	26,2	69,4

Zinc

Depth int.	High	Medium	Low
0.5-1.5	1,7	32,5	65,9
3.5-4.5	10,5	43,0	46,5
5.5-6.5	5,6	34,7	59,7
6.5-7.5	2,8	34,5	62,6
8.5-9.5	2,5	28,7	68,8
11.5-12.5	3,8	23,5	72,7
14.5-15.5	4,7	35,7	59,5
17.5-18.5	9,1	49,9	41,0
19.5-20.2	3,7	21,7	74,6

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°1 m=121,5 0-1m n.WD 18.-19.7.97

Detector :	36 % p-type
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**tai_50**	m(Sample)/g=	121,5		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	07-18-97	t(live)/s=	96996,9	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,5	4,89E-02	1,51E-03	2,40E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**423,5**	**16,1**	**Th-234**
1001,0	7,17E-03	5,05E-04	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**489,8**	**39,5**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,5	7,15E-03	1,22E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**481,3**	**94,1**	**U-235***
205,5	7,34E-03	1,09E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**476,4**	**79,8**	**U-235***
								Mean value of U-238 :		**452,3**	**16,1**	
							from U-235/Ra-226 with Ra via Rn-Product :			**495,4**	**18,6**	**U-235***
186,1	1,30E-01	1,92E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**325,0**	**6,6**	U-235/Ra
#NV	#NV	#NV	#NV	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00			**Th-230**
							from U-235/Ra-226 with U via Mean value of U-238 :			**229,4**	**23,7**	**Ra-226**
295,4	1,68E-01	1,59E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**198,0**	**2,9**	**Rn-Product.**
352,1	2,85E-01	1,93E-03	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**197,4**	**2,4**	**Rn-Product.**
609,5	2,00E-01	1,56E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**196,1**	**2,6**	**Rn-Product.**
1120,3	4,15E-02	8,35E-04	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**196,7**	**5,0**	**Rn-Product.**
								Mean value of the Rn-Product :		**197,1**	**2,4**	**Rn-Product.**
46,5	5,21E-03	1,61E-03	3,67E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**177,6**	**56,1**	**Pb-210**
154,3	4,63E-03	1,25E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**236,7**	**66,4**	**Ra-223***
270,4	1,42E-02	1,32E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**280,5**	**28,2**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,1	2,64E-02	7,11E-04	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**53,7**	**2,5**	**Ac-228**
727,4	7,67E-03	5,77E-04	7,44E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**48,6**	**4,6**	**Bi-212**
583,4	3,68E-02	8,45E-04	8,18E-02	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00	**52,9**	**2,3**	**Tl-208**
							Mean value of the Thorium-Chain			**52,4**	**2,3**	**Th-Chain**
										Potassium:		
1461,1	1,39E-01	1,27E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**1013,3**	**17,4**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Borehole N°1 m=160.53g 1-1,5m n.WD v.8.7.97

Detector :	36 % p-type
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**tai_51**	m(Sample)/g=	160,53		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	07-19-97	t(live)/s=	131040,3	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium Chain:		
63,5	2,16E-01	3,56E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1571,7**	**39,8**	**Th-234**
1001,1	3,48E-02	1,14E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1857,5**	**88,7**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,5	3,09E-02	2,91E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**1677,2**	**222,2**	**U-235***
205,6	3,63E-02	2,80E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**1890,4**	**200,1**	**U-235***
									Mean value of U-238 :	**1698,2**	**39,8**	
								from U-235/Ra-226 with Ra via Rn-Product :		**2036,3**	**77,7**	**U-235***
186,2	1,09E+00	4,69E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**2182,3**	**24,0**	U-235/Ra
67,8	4,57E-02	3,80E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**2803,7**	**330,5**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**2545,8**	**72,0**	**Ra-226**
295,5	2,43E+00	4,99E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**2289,5**	**18,2**	**Rn-Product.**
352,2	4,17E+00	6,12E-03	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**2297,2**	**16,3**	**Rn-Product.**
609,6	2,96E+00	5,01E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**2292,0**	**17,0**	**Rn-Product.**
1120,3	6,19E-01	2,45E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**2286,7**	**24,4**	**Rn-Product.**
								Mean value of the Rn-Product :		**2291,8**	**16,3**	**Rn-Product.**
46,7	6,46E-02	2,78E-03	3,64E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**1919,5**	**118,3**	**Pb-210**
154,4	5,91E-02	3,42E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**2440,3**	**209,4**	**Ra-223***
269,8	1,66E-01	3,40E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**2628,7**	**91,0**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,2	3,01E-02	1,30E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**47,9**	**3,0**	**Ac-228**
727,4	8,80E-03	8,47E-04	7,44E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**43,7**	**5,1**	**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**46,4**	**3,0**	**Th-Chain**
										Potassium:		
1461,0	1,84E-01	1,57E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**1041,1**	**17,4**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°1 m=196.12g 2,5-3,5m n.WD v.8.7.97

Detector : 36 % p-type
Geometry of Measurement : new WD
Covered Surface/ cm² = 38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**tai_53**	m(Sample)/g=	196,12		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	07-22-97	t(live)/s=	87641,4	U: RGU-1	4940	25	136,3	Spektrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,4	1,00E-01	3,07E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**653,9**	**24,8**	**Th-234**
1001,0	2,05E-02	1,14E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**920,6**	**61,7**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,4	2,12E-02	3,18E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**994,2**	**177,3**	**U-235***
205,5	1,84E-02	2,74E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**826,9**	**138,3**	**U-235***
									Mean value of U-238 :	**784,7**	**24,8**	
									from U-235/Ra-226 with Ra via Rn-Product :	**996,4**	**46,0**	**U-235***
186,2	6,30E-01	4,50E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**1093,2**	**14,5**	U-235/Ra
67,9	1,55E-02	2,61E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**851,7**	**161,5**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**1324,9**	**44,0**	**Ra-226**
295,5	1,44E+00	4,76E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**1165,9**	**10,4**	**Rn-Folg.**
352,2	2,48E+00	5,82E-03	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**1168,0**	**9,1**	**Rn-Product.**
609,6	1,78E+00	4,71E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**1163,9**	**9,5**	**Rn-Product.**
1120,3	3,75E-01	2,48E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**1165,3**	**14,9**	**Rn-Product.**
									Mean value of the Rn-Product :	**1165,9**	**9,1**	**Rn-Product.**
46,7	4,86E-02	3,02E-03	3,64E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**1336,6**	**103,4**	**Pb-210**
154,3	3,51E-02	4,04E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**1257,7**	**167,3**	**Ra-223***
269,8	1,01E-01	3,11E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**1370,6**	**58,3**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,2	2,77E-02	1,16E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**37,1**	**2,3**	**Ac-228**
727,4	9,47E-03	1,19E-03	7,44E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**39,8**	**5,8**	**Bi-212**
583,5	3,24E-02	1,26E-03	8,18E-02	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00	**31,0**	**1,8**	**Tl-208**
									Mean value of the Thorium-Chain	**35,0**	**1,8**	**Th-Chain**
										Potassium:		
1461,0	1,80E-01	1,72E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**854,7**	**15,0**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°1 m=182.34g 3,5-4,5m n.WD v.8.7.97

Detector :	36 % p-type
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**tai_54**	m(Sample)/g=	182,34		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	07-24-97	t(live)/s=	82439,2	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,6	2,11E-01	5,56E-03	2,40E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1425,9**	**48,4**	**Th-234**
1001,3	3,16E-02	1,80E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1510,3**	**102,8**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,6	2,47E-02	4,74E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**1222,7**	**263,2**	**U-235***
205,8	3,48E-02	4,59E-03	1,24E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**1645,0**	**250,2**	**U-235***
									Mean value of U-238 :	**1457,3**	**48,4**	
								from U-235/Ra-226 with Ra via Rn-Product :		**1732,6**	**108,7**	**U-235***
186,4	1,51E+00	7,87E-03	1,29E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**2763,6**	**32,3**	U-235/Ra
68,0	5,51E-02	4,96E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**3142,5**	**386,4**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**3744,7**	**92,9**	**Ra-226**
295,7	4,16E+00	8,05E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**3547,1**	**27,9**	**Rn-Product.**
352,4	7,12E+00	1,01E-02	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**3547,1**	**25,1**	**Rn-Product.**
609,8	5,07E+00	8,21E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**3530,4**	**26,0**	**Rn-Product.**
1120,6	1,07E+00	4,06E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**3521,2**	**37,3**	**Rn-Product.**
									Mean value of the Rn-Product :	**3537,7**	**25,1**	**Rn-Product.**
46,8	1,11E-01	4,99E-03	3,63E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**3116,0**	**197,1**	**Pb-210**
154,4	8,69E-02	5,60E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**3271,3**	**296,7**	**Ra-223***
269,9	2,58E-01	5,58E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**3686,7**	**130,8**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,4	3,74E-02	1,97E-03	6,68E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**53,2**	**3,9**	**Ac-228**
#NV	#NV	#NV	#NV	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
									Mean value of the Thorium-Chain	**53,2**	**3,9**	**Th-Chain**
										Potassium:		
1461,4	1,73E-01	2,20E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**873,2**	**17,8**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°1 m=200,87¦4,5-5,5m n.WD v.25.-26.7.97

Detector :	36 % p-type
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample
Spectrum: **tai_55** m(Sample)/g= 200,87
Mes-date.: 07-25-97 t(live)/s= 97700,3

S t a n d a r d s

	A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g
U: RGU-1	4940	25	136,3
Th: RGTh-1	3246	65	127,5
K: RGK-1	13843	93	175,9

Background
Mes-date: 16.05.97
Spectrum: NE160597.CHN

Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,6	2,14E-01	4,72E-03	2,40E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1378,6**	**41,4**	**Th-234**
1001,3	3,38E-02	1,50E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1487,8**	**85,1**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,6	3,04E-02	3,99E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**1404,0**	**227,5**	**U-235***
205,7	3,29E-02	3,86E-03	1,24E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**1452,9**	**202,0**	**U-235***
									Mean value of U-238 :	**1419,1**	**41,4**	
								from U-235/Ra-226 with Ra via Rn-Product :		**1574,8**	**82,9**	**U-235***
186,4	1,27E+00	6,25E-03	1,29E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**2173,6**	**24,9**	U-235/Ra
67,9	4,91E-02	4,66E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**2656,2**	**336,7**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**2740,3**	**74,7**	**Ra-226**
295,6	3,30E+00	6,64E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**2617,1**	**20,8**	**Rn-Product.**
352,4	5,68E+00	8,31E-03	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**2628,8**	**18,7**	**Rn-Product.**
#NV	#NV	#NV	#NV	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04			**Rn-Product.**
1120,6	8,63E-01	3,37E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**2623,1**	**27,9**	**Rn-Product.**
									Mean value of the Rn-Product :	**2623,2**	**18,7**	**Rn-Product.**
46,8	8,31E-02	3,74E-03	3,63E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**2266,1**	**143,1**	**Pb-210**
154,5	7,91E-02	4,72E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**2785,5**	**242,6**	**Ra-223***
269,9	2,27E-01	4,71E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**3025,9**	**105,3**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,5	3,82E-02	1,86E-03	6,68E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**50,2**	**3,5**	**Ac-228**
#NV	#NV	#NV	#NV	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
									Mean value of the Thorium-Chain	**50,2**	**3,5**	**Th-Chain**
										Potassium:		
1461,4	1,80E-01	1,94E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**834,3**	**15,6**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°1 m=193.91g 5,5-6,5m n.WD v.8.7.97

Detector :	36 % p-type
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**tai_56**	m(Sample)/g=	193,91		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	07-26-97	t(live)/s=	139048,9	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,5	2,21E-01	4,44E-03	2,40E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1447,7**	**41,1**	**Th-234**
1001,3	3,74E-02	1,42E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1694,8**	**87,7**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,5	4,00E-02	3,80E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**1892,3**	**252,1**	**U-235***
205,6	4,07E-02	3,67E-03	1,24E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**1844,6**	**214,2**	**U-235***
								Mean value of U-238 :		**1610,9**	**41,1**	
								from U-235/Ra-226 with Ra via Rn-Product :		**1878,0**	**102,9**	**U-235***
186,3	1,63E+00	5,95E-03	1,29E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**2857,9**	**30,1**	U-235/Ra
67,9	6,56E-02	3,96E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**3619,9**	**370,0**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**3794,4**	**83,6**	**Ra-226**
295,6	4,42E+00	6,55E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**3604,1**	**27,3**	**Rn-Product.**
352,3	7,56E+00	8,02E-03	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**3590,4**	**24,5**	**Rn-Product.**
609,7	5,42E+00	6,54E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**3585,1**	**25,5**	**Rn-Product.**
1120,5	1,15E+00	3,34E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**3595,8**	**35,9**	**Rn-Product.**
								Mean value of the Rn-Product :		**3593,5**	**24,5**	**Rn-Product.**
46,7	1,25E-01	3,98E-03	3,64E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**3464,4**	**185,9**	**Pb-210**
154,4	1,05E-01	4,49E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**3788,2**	**287,2**	**Ra-223***
269,8	2,73E-01	4,48E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**3727,8**	**119,3**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,4	3,99E-02	1,47E-03	6,68E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**53,9**	**3,1**	**Ac-228**
#NV	#NV	#NV	#NV	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**53,9**	**3,1**	**Th-Chain**
										Potassium:		
1461,2	2,09E-01	1,85E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**998,9**	**16,9**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°1 m=163.85g 7,5-8,5m n.WD v.8.7.97

Detector :	36 % p-type
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**tai_58**	m(Sample)/g=	163,85		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	07-30-97	t(live)/s=	144534,2	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,7	1,45E-01	4,73E-03	2,40E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1041,2**	**41,4**	**Th-234**
1001,4	2,01E-02	1,29E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1053,6**	**78,6**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,8	1,88E-02	3,72E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**1006,0**	**221,9**	**U-235***
205,9	2,38E-02	3,60E-03	1,24E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**1219,1**	**207,2**	**U-235***
									Mean value of U-238 :	**1062,7**	**41,4**	
									from U-235/Ra-226 with Ra via Rn-Product :	**1237,9**	**115,6**	**U-235***
186,6	1,53E+00	5,78E-03	1,29E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**3016,1**	**32,1**	U-235/Ra
68,1	5,81E-02	5,27E-03	2,27E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**3520,9**	**434,6**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**4483,0**	**87,3**	**Ra-226**
295,8	4,69E+00	6,57E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**4350,0**	**32,8**	**Rn-Product.**
#NV	#NV	#NV	#NV	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04			**Rn-Product.**
609,9	5,70E+00	6,54E-03	8,02E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**4336,2**	**30,6**	**Rn-Product.**
1120,7	1,21E+00	3,34E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**4373,0**	**43,4**	**Rn-Product.**
									Mean value of the Rn-Product :	**4351,0**	**30,6**	**Rn-Product.**
47,0	1,25E-01	3,92E-03	3,61E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**3666,4**	**195,7**	**Pb-210**
154,6	1,04E-01	3,94E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**4243,1**	**309,3**	**Ra-223***
270,1	2,67E-01	4,39E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**4148,8**	**132,8**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,6	4,06E-02	1,47E-03	6,68E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**63,3**	**3,6**	**Ac-228**
#NV	#NV	#NV	#NV	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
									Mean value of the Thorium-Chain	**63,3**	**3,6**	**Th-Chain**
										Potassium:		
1461,5	2,05E-01	1,82E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**1135,9**	**19,3**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°1 m=165.37g 8,5-9,5m n.WD 1.-3.8.97

Detector :	36 % p-type
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**tai_59**	m(Sample)/g=	165,37		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	08.01.97	t(live)/s=	207895,4	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,7	2,90E-01	3,47E-03	2,40E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**2071,7**	**45,3**	**Th-234**
1001,3	4,45E-02	1,19E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**2311,8**	**100,0**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,8	4,31E-02	3,26E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**2284,0**	**273,3**	**U-235***
205,8	4,45E-02	2,79E-03	1,24E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**2267,3**	**216,1**	**U-235***
									Mean value of U-238 :	**2178,6**	**45,3**	
									from U-235/Ra-226 with Ra via Rn-Product :	**2256,2**	**106,3**	**U-235***
186,5	1,57E+00	4,88E-03	1,29E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**3073,6**	**31,4**	U-235/Ra
68,0	6,15E-02	3,03E-03	2,27E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**3708,7**	**355,1**	**Th-230**
							from U-235/Ra-226 with U via		**Mean value of U-238 :**	**3745,8**	**89,0**	**Ra-226**
295,7	4,01E+00	5,17E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**3690,5**	**27,6**	**Rn-Product.**
352,4	6,86E+00	6,22E-03	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**3689,8**	**24,9**	**Rn-Product.**
609,8	4,88E+00	5,07E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**3683,1**	**25,8**	**Rn-Product.**
1120,6	1,02E+00	2,53E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**3685,2**	**35,9**	**Rn-Product.**
									Mean value of the Rn-Product :	**3687,3**	**24,9**	**Rn-Product.**
46,8	1,06E-01	3,39E-03	3,62E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**3091,2**	**166,5**	**Pb-210**
154,5	9,77E-02	3,42E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**3947,7**	**281,9**	**Ra-223***
270,0	2,57E-01	3,61E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**3966,0**	**121,4**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,5	2,97E-02	1,20E-03	6,68E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**46,0**	**2,8**	**Ac-228**
#NV	#NV	#NV	#NV	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
									Mean value of the Thorium-Chain	**46,0**	**2,8**	**Th-Chain**
										Potassium:		
1461,3	1,94E-01	1,44E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**1067,5**	**16,8**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°4 m=205.42g 1-2m n.WD v.17.07.98

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**ta_71**	m(Sample)/g=	205,42		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	26.07.98	t(live)/s=	74211,6	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,5	1,33E-01	4,12E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**844,6**	**32,4**	**Th-234**
1001,1	2,26E-02	1,47E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**975,0**	**73,7**	**Pa-234m**
#NV	#NV	#NV	#NV	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00			**U-235***
205,6	2,44E-02	3,73E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**1060,3**	**181,5**	**U-235***
									Mean value of U-238 :	**910,7**	**32,4**	
									from U-235/Ra-226 with Ra via Rn-Product :	**1385,6**	**67,7**	**U-235***
186,2	9,79E-01	6,48E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**1644,3**	**21,1**	U-235/Ra
67,8	3,59E-02	3,54E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**1922,7**	**249,4**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**2195,2**	**61,3**	**Ra-226**
295,5	2,36E+00	7,02E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**1843,1**	**16,0**	**Rn-Product.**
352,2	4,06E+00	8,14E-03	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**1845,0**	**13,9**	**Rn-Product.**
609,6	2,90E+00	6,62E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**1830,2**	**14,4**	**Rn-Product.**
1120,3	6,15E-01	3,40E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**1834,3**	**21,8**	**Rn-Product.**
									Mean value of the Rn-Product :	**1838,5**	**13,9**	**Rn-Product.**
46,6	6,27E-02	4,12E-03	3,65E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**1704,0**	**137,0**	**Pb-210**
235,9	9,08E-02	2,39E-03	1,19E-01	236,0	1,54E-01	5,32E-03	1,19E-01	0,00E+00	0,00E+00	**2126,5**	**102,9**	**Th-227***
#NV	#NV	#NV	#NV	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00			**Ra-223***
269,8	1,64E-01	4,57E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**2153,8**	**86,4**	**Ra-223 + Rn-**
									Mean value of the Ac-227-Product :	**2141,4**	**86,4**	
										Thorium-Chain:		
#NV	#NV	#NV	#NV	794,8	2,66E-01	2,89E-03	7,11E-02	0,00E+00	0,00E+00			**Ac-228**
911,2	2,71E-02	1,60E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**34,9**	**2,8**	**Ac-228**
969,0	1,63E-02	1,35E-03	6,48E-02	968,9	9,64E-01	4,23E-03	6,48E-02	0,00E+00	0,00E+00	**36,2**	**3,7**	**Ac-228**
									Mean value of the Ac-228 (Ra-228-Product) :	**35,5**	**2,8**	
239,2	1,22E-01	1,13E-03	1,18E-01	238,6	8,19E+00	1,18E-02	1,19E-01	0,00E+00	0,00E+00	**33,6**	**1,0**	**Pb-212**
727,5	6,58E-03	1,46E-03	7,44E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**26,6**	**6,4**	**Bi-212**
583,6	3,73E-02	1,21E-03	8,18E-02	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00	**34,4**	**1,8**	**Tl-208**
860,5	5,20E-03	1,17E-03	6,87E-02	860,5	2,81E-01	2,67E-03	6,87E-02	0,00E+00	0,00E+00	**39,8**	**9,8**	**Tl-208**
									Mean value of the Th-228-Product :	**33,8**	**1,0**	
									Mean value of the Thorium-Chain	**34,6**	**1,0**	**Th-Chain**
										Potassium:		
1461,0	2,01E-01	2,34E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**915,0**	**17,8**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°4 m=217,77g 2-3m n.WD v.17.7.98

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**ta_72**	m(Sample)/g=	217,77		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	27.07.98	t(live)/s=	170746,4	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,4	5,08E-02	1,59E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**314,6**	**12,1**	**Th-234**
1000,8	8,45E-03	5,68E-04	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**347,7**	**27,0**	**Pa-234m**
#NV	#NV	#NV	#NV	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00			**U-235***
205,3	6,34E-03	9,43E-04	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**264,6**	**44,3**	**U-235***
									Mean value of U-238 :	**317,5**	**12,1**	
									from U-235/Ra-226 with Ra via Rn-Product :	**494,6**	**22,7**	**U-235***
186,2	3,12E-01	2,69E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**504,1**	**7,4**	U-235/Ra
67,7	8,60E-03	1,36E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**447,6**	**80,8**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**644,3**	**22,0**	**Ra-226**
295,4	6,88E-01	2,48E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**514,3**	**4,7**	**Rn-Product.**
352,1	1,18E+00	3,11E-03	1,02E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**515,3**	**4,1**	**Rn-Product.**
609,4	8,36E-01	2,38E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**503,8**	**4,2**	**Rn-Product.**
1120,1	1,80E-01	1,28E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**512,2**	**6,8**	**Rn-Product.**
									Mean value of the Rn-Product :	**511,3**	**4,1**	**Rn-Product.**
46,6	1,80E-02	1,56E-03	3,66E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**479,4**	**47,6**	**Pb-210**
235,7	2,90E-02	7,26E-04	1,19E-01	236,0	1,54E-01	5,32E-03	1,19E-01	0,00E+00	0,00E+00	**652,3**	**31,1**	**Th-227***
#NV	#NV	#NV	#NV	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00			**Ra-223***
270,3	5,72E-02	1,84E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**718,0**	**31,4**	**Ra-223 + Rn-**
									Mean value of the Ac-227-Product :	**686,5**	**31,1**	
										Thorium-Chain:		
794,8	3,98E-03	5,56E-04	7,11E-02	794,8	2,66E-01	2,89E-03	7,11E-02	0,00E+00	0,00E+00	**30,8**	**4,9**	**Ac-228**
911,0	3,04E-02	8,49E-04	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**37,3**	**1,8**	**Ac-228**
968,8	1,86E-02	6,50E-04	6,48E-02	968,9	9,64E-01	4,23E-03	6,48E-02	0,00E+00	0,00E+00	**39,5**	**2,2**	**Ac-228**
									Mean value of the Ac-228 (Ra-228-Product) :	**37,3**	**1,8**	
239,0	1,43E-01	8,67E-04	1,19E-01	238,6	8,19E+00	1,18E-02	1,19E-01	0,00E+00	0,00E+00	**37,7**	**1,0**	**Pb-212**
727,3	8,60E-03	5,21E-04	7,44E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**33,2**	**2,7**	**Bi-212**
583,7	4,46E-02	7,79E-04	8,18E-02	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00	**39,3**	**1,5**	**Tl-208**
860,3	4,73E-03	5,10E-04	6,87E-02	860,5	2,81E-01	2,67E-03	6,87E-02	0,00E+00	0,00E+00	**34,5**	**4,4**	**Tl-208**
									Mean value of the Th-228-Product :	**37,2**	**1,0**	
									Mean value of the Thorium-Chain	**37,3**	**1,0**	**Th-Chain**
										Potassium:		
1460,9	1,42E-01	1,08E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**612,4**	**9,7**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°4 m=169,06g 3-4m n.WD v.17.7.98

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**ta_73**	m(Sample)/g=	169,06		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	29.07.98	t(live)/s=	70406	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,4	1,43E-01	4,74E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1010,3**	**40,7**	**Th-234**
1000,9	2,20E-02	1,52E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1124,6**	**89,0**	**Pa-234m**
#NV	#NV	#NV	#NV	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00			**U-235***
205,6	2,21E-02	4,79E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**1105,9**	**255,8**	**U-235***
									Mean value of U-238 :	**1054,7**	**40,7**	
									from U-235/Ra-226 with Ra via Rn-Product :	**1196,5**	**85,4**	**U-235***
186,2	9,58E-01	7,95E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**1850,9**	**26,5**	U-235/Ra
67,9	3,43E-02	3,72E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**2039,4**	**280,9**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**2448,8**	**76,9**	**Ra-226**
295,4	2,56E+00	7,81E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**2316,9**	**20,2**	**Rn-Product.**
352,1	4,42E+00	9,20E-03	1,02E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**2339,0**	**17,7**	**Rn-Product.**
609,4	3,17E+00	7,20E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**2347,1**	**18,5**	**Rn-Product.**
1120,1	6,73E-01	3,64E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**2373,8**	**28,0**	**Rn-Product.**
									Mean value of the Rn-Product :	**2342,2**	**17,7**	**Rn-Product.**
46,6	6,83E-02	5,64E-03	3,66E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**1993,4**	**190,3**	**Pb-210**
235,7	9,10E-02	2,44E-03	1,19E-01	236,0	1,54E-01	5,32E-03	1,19E-01	0,00E+00	0,00E+00	**2460,1**	**119,9**	**Th-227***
#NV	#NV	#NV	#NV	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00			**Ra-223***
269,7	1,55E-01	4,50E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**2357,6**	**96,8**	**Ra-223 + Rn-**
									Mean value of the Ac-227-Product :	**2404,4**	**96,8**	
										Thorium-Chain:		
#NV	#NV	#NV	#NV	794,8	2,66E-01	2,89E-03	7,11E-02	0,00E+00	0,00E+00			**Ac-228**
911,1	3,28E-02	1,83E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**49,8**	**3,8**	**Ac-228**
968,8	2,02E-02	1,32E-03	6,48E-02	968,9	9,64E-01	4,23E-03	6,48E-02	0,00E+00	0,00E+00	**52,9**	**4,5**	**Ac-228**
									Mean value of the Ac-228 (Ra-228-Product) :	**51,3**	**3,8**	
239,0	1,52E-01	1,83E-03	1,19E-01	238,6	8,19E+00	1,18E-02	1,19E-01	0,00E+00	0,00E+00	**48,1**	**1,5**	**Pb-212**
727,3	1,06E-02	1,42E-03	7,44E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**50,4**	**7,8**	**Bi-212**
583,7	5,03E-02	1,45E-03	8,18E-02	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00	**54,4**	**2,7**	**Tl-208**
860,4	2,12E-03	1,25E-03	6,87E-02	860,5	2,81E-01	2,67E-03	6,87E-02	0,00E+00	0,00E+00	**19,1**	**11,6**	**Tl-208**
									Mean value of the Th-228-Product :	**49,7**	**1,5**	
									Mean value of the Thorium-Chain	**50,5**	**1,5**	**Th-Chain**
										Potassium:		
1460,8	1,31E-01	2,05E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**703,7**	**16,4**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°4 m=146,94g 4-5m n.WD v.17.7.98

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**ta_74**	m(Sample)/g=	146,94		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	30.07.98	t(live)/s=	112873,8	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
	6,34E+01	7,86E-01	5,84E-03	0,2	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**6029,9**	**114,7**	**Th-234**
	1,00E+03	1,13E-01	2,60E-03	0,1	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**6524,0**	**265,2**	**Pa-234m**
	#NV	#NV	#NV	#NV	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00			**U-235***
	2,05E+02	1,12E-01	5,07E-03	0,1	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**6229,5**	**524,5**	**U-235***
									Mean value of U-238 :	**6193,0**	**114,7**	
								from U-235/Ra-226 with Ra via Rn-Product :		**6742,3**	**235,5**	**U-235***
	1,86E+02	3,33E+00	9,52E-03	0,1	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**7151,2**	**71,9**	U-235/Ra
	6,77E+01	9,27E-02	4,80E-03	0,2	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**6012,7**	**584,4**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**7870,8**	**212,0**	**Ra-226**
	2,95E+02	7,35E+00	9,82E-03	0,1	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**7436,5**	**55,8**	**Rn-Product.**
	3,52E+02	1,27E+01	1,25E-02	0,1	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**7503,9**	**50,9**	**Rn-Product.**
	6,09E+02	8,90E+00	9,64E-03	0,1	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**7422,6**	**52,2**	**Rn-Product.**
	1,12E+03	1,87E+00	5,03E-03	0,1	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**7469,7**	**73,7**	**Rn-Product.**
									Mean value of the Rn-Product :	**7458,1**	**50,9**	**Rn-Product.**
	4,66E+01	1,89E-01	5,63E-03	0,4	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**5868,1**	**307,3**	**Pb-210**
	2,36E+02	2,53E-01	3,68E-03	0,1	1,54E-01	5,32E-03	1,19E-01	0,00E+00	0,00E+00	**7630,8**	**324,0**	**Th-227***
	#NV	#NV	#NV	#NV	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00			**Ra-223***
	2,70E+02	4,33E-01	6,48E-03	0,1	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**7325,5**	**228,1**	**Ra-223 + Rn-**
									Mean value of the Ac-227-Product :	**7454,6**	**228,1**	
										Thorium-Chain:		
	7,94E+02	5,79E-03	1,42E-03	0,1	2,66E-01	2,89E-03	7,11E-02	0,00E+00	0,00E+00	**62,4**	**16,6**	**Ac-228**
	9,11E+02	3,18E-02	2,26E-03	0,1	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**54,6**	**5,0**	**Ac-228**
	9,69E+02	2,10E-02	1,49E-03	0,1	9,64E-01	4,23E-03	6,48E-02	0,00E+00	0,00E+00	**62,4**	**5,7**	**Ac-228**
									Mean value of the Ac-228 (Ra-228-Product) :	**59,1**	**5,0**	
	2,39E+02	1,28E-01	3,00E-03	0,1	8,19E+00	1,18E-02	1,19E-01	0,00E+00	0,00E+00	**45,4**	**2,0**	**Pb-212**
	7,27E+02	8,03E-03	1,48E-03	0,1	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**43,1**	**8,8**	**Bi-212**
	5,84E+02	4,63E-02	1,84E-03	0,1	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00	**56,4**	**3,4**	**Tl-208**
	8,60E+02	6,11E-03	1,44E-03	0,1	2,81E-01	2,67E-03	6,87E-02	0,00E+00	0,00E+00	**62,2**	**16,0**	**Tl-208**
									Mean value of the Th-228-Product :	**50,3**	**2,0**	
									Mean value of the Thorium-Chain	**54,7**	**UGG?**	**Th-Chain**
										Potassium:		
	1,46E+03	1,96E-01	2,61E-03	0,1	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**8155581,6**	**96275,5**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°4 m=150,18g 5-6m n.WD v.17.7.98

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**ta_75**	m(Sample)/g=	150,18		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	31.07.98	t(live)/s=	87466,9	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,4	3,58E-01	5,04E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**2705,8**	**63,5**	**Th-234**
1001,0	5,42E-02	2,10E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**3064,2**	**160,8**	**Pa-234m**
163,5	4,93E-02	5,62E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**2811,1**	**415,9**	**U-235***
205,5	4,93E-02	4,84E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**2702,4**	**331,5**	**U-235***
									Mean value of U-238 :	**2803,9**	**63,5**	
									from U-235/Ra-226 with Ra via Rn-Product :	**3383,2**	**141,3**	**U-235***
186,2	1,84E+00	8,21E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**3889,5**	**43,2**	U-235/Ra
67,8	6,13E-02	4,22E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**3923,6**	**422,6**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**4704,7**	**123,3**	**Ra-226**
295,4	4,29E+00	8,53E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**4264,4**	**33,7**	**Rn-Product.**
352,1	7,38E+00	1,06E-02	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**4295,5**	**30,4**	**Rn-Product.**
609,5	5,20E+00	8,24E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**4255,6**	**31,3**	**Rn-Product.**
1120,2	1,09E+00	4,29E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**4257,7**	**45,4**	**Rn-Product.**
									Mean value of the Rn-Product :	**4269,5**	**30,4**	**Rn-Product.**
46,6	1,27E-01	5,06E-03	3,65E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**3890,2**	**230,8**	**Pb-210**
236,0	1,56E-01	3,18E-03	1,19E-01	236,0	1,54E-01	5,32E-03	1,19E-01	0,00E+00	0,00E+00	**4617,4**	**208,3**	**Th-227***
#NV	#NV	#NV	#NV	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00			**Ra-223***
269,7	2,60E-01	5,30E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**4324,4**	**149,6**	**Ra-223 + Rn-**
									Mean value of the Ac-227-Product :	**4451,6**	**149,6**	
										Thorium-Chain:		
#NV	#NV	#NV	#NV	794,8	2,66E-01	2,89E-03	7,11E-02	0,00E+00	0,00E+00			**Ac-228**
911,1	2,96E-02	2,14E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**49,9**	**4,6**	**Ac-228**
969,1	1,86E-02	1,45E-03	6,48E-02	968,9	9,64E-01	4,23E-03	6,48E-02	0,00E+00	0,00E+00	**54,2**	**5,3**	**Ac-228**
									Mean value of the Ac-228 (Ra-228-Product) :	**52,0**	**4,6**	
239,0	1,44E-01	1,86E-03	1,19E-01	238,6	8,19E+00	1,18E-02	1,19E-01	0,00E+00	0,00E+00	**50,0**	**1,7**	**Pb-212**
727,4	1,01E-02	1,83E-03	7,44E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**53,1**	**10,7**	**Bi-212**
583,7	4,42E-02	1,34E-03	8,18E-02	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00	**52,8**	**2,7**	**Tl-208**
860,4	6,73E-03	1,66E-03	6,87E-02	860,5	2,81E-01	2,67E-03	6,87E-02	0,00E+00	0,00E+00	**67,2**	**17,9**	**Tl-208**
									Mean value of the Th-228-Product :	**52,3**	**1,7**	
									Mean value of the Thorium-Chain	**52,1**	**1,7**	**Th-Chain**
										Potassium		
1460,9	1,80E-01	2,50E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**1079,0**	**23,3**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°4 m=150,38g 6-7m n.WD v.04.08.98

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**ta_76**	m(Sample)/g=	150,38		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	04.08.98	t(live)/s=	103503	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,3	5,42E-01	6,54E-03	2,41E-01	63,3	6,58E-01	1,15E-02	2,40E-01	0,00E+00	0,00E+00	**3829,2**	**100,7**	**Th-234**
1000,9	7,69E-02	2,26E-03	6,36E-02	1001,0	8,16E-02	3,72E-03	6,36E-02	0,00E+00	0,00E+00	**4266,5**	**253,0**	**Pa-234m**
163,4	6,88E-02	5,52E-03	1,36E-01	163,3	8,53E-02	9,24E-03	1,36E-01	0,00E+00	0,00E+00	**3692,6**	**516,1**	**U-235***
205,5	9,21E-02	5,91E-03	1,25E-01	205,3	9,02E-02	7,95E-03	1,24E-01	0,00E+00	0,00E+00	**4669,3**	**532,5**	**U-235***
								Mean value of U-238 :		**4023,6**	**100,7**	
								from U-235/Ra-226 with Ra via Rn-Product :		**4529,5**	**238,7**	**U-235***
186,2	2,98E+00	9,88E-03	1,30E-01	185,9	2,23E+00	1,30E-02	1,30E-01	0,00E+00	0,00E+00	**6108,6**	**71,8**	U-235/Ra
67,7	9,23E-02	5,04E-03	2,28E-01	67,7	7,71E-02	3,92E-03	2,27E-01	0,00E+00	0,00E+00	**5567,9**	**443,5**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**7674,4**	**201,3**	**Ra-226**
295,4	7,64E+00	1,03E-02	1,08E-01	295,2	4,81E+00	1,38E-02	1,08E-01	4,40E-04	1,20E-04	**7239,7**	**59,5**	**Rn-Product.**
352,1	1,31E+01	1,31E-02	1,02E-01	351,9	8,18E+00	1,65E-02	1,01E-01	1,30E-04	1,20E-04	**7318,8**	**53,5**	**Rn-Product.**
609,4	9,25E+00	9,98E-03	8,03E-02	609,3	5,76E+00	1,35E-02	8,03E-02	3,10E-04	1,10E-04	**7290,5**	**55,7**	**Rn-Product.**
1120,2	1,94E+00	5,26E-03	6,08E-02	1120,3	1,20E+00	6,72E-03	6,08E-02	0,00E+00	0,00E+00	**7335,7**	**82,8**	**Rn-Product.**
								Mean value of the Rn-Product :		**7294,0**	**53,5**	**Rn-Product.**
46,6	2,08E-01	7,68E-03	3,66E-01	46,5	1,42E-01	8,28E-03	3,64E-01	0,00E+00	0,00E+00	**6940,5**	**515,1**	**Pb-210**
235,7	2,58E-01	3,88E-03	1,19E-01	236,0	1,77E-01	7,81E-03	1,19E-01	0,00E+00	0,00E+00	**6672,4**	**345,6**	**Th-227***
#NV	#NV	#NV	#NV	154,2				0,00E+00	0,00E+00			**Ra-223***
269,7	4,11E-01	6,07E-03	1,13E-01	270,0	2,84E-01	8,09E-03	1,13E-01	0,00E+00	0,00E+00	**6596,6**	**244,7**	**Ra-223 + Rn-**
								Mean value of the Ac-227-Product :		**6628,2**	**244,7**	
										Thorium-Chain:		
#NV	#NV	#NV	#NV	794,8	2,67E-01	4,65E-03	7,11E-02	0,00E+00	0,00E+00			**Ac-228**
911,1	3,99E-02	2,75E-03	6,69E-02	911,2	1,69E+00	8,38E-03	6,68E-02	0,00E+00	0,00E+00	**66,2**	**5,9**	**Ac-228**
968,9	2,86E-02	2,04E-03	6,48E-02	968,9	1,01E+00	6,50E-03	6,48E-02	0,00E+00	0,00E+00	**79,6**	**7,3**	**Ac-228**
								Mean value of the Ac-228 (Ra-228-Product) :		**72,8**	**5,9**	
239,0	1,88E-01	2,20E-03	1,19E-01	238,6	8,39E+00	1,98E-02	1,19E-01	0,00E+00	0,00E+00	**63,7**	**2,0**	**Pb-212**
727,2	1,39E-02	2,23E-03	7,45E-02	727,3	5,50E-01	6,43E-03	7,44E-02	0,00E+00	0,00E+00	**70,8**	**12,9**	**Bi-212**
583,6	6,02E-02	1,99E-03	8,18E-02	583,2	2,42E+00	1,07E-02	8,18E-02	0,00E+00	0,00E+00	**69,9**	**3,7**	**Tl-208**
#NV	#NV	#NV	#NV	860,5	2,99E-01	4,36E-03	6,87E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Th-228-Product :		**66,5**	**2,0**	
								Mean value of the Thorium-Chain		**69,7**	**UGG?**	**Th-Chain**
										Potassium:		
1460,8	2,20E-01	2,71E-03	5,28E-02	1460,8	2,70E+00	9,47E-03	5,28E-02	4,08E-04	5,50E-05	**1297,4**	**25,4**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°4 m=152,86 7-8m n.WD v.17.7.98

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**ta_77**	m(Sample)/g=	152,86		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	05.08.98	t(live)/s=	84994,4	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,3	6,23E-01	7,77E-03	2,41E-01	63,3	6,58E-01	1,15E-02	2,40E-01	0,00E+00	0,00E+00	**4360,1**	**115,6**	**Th-234**
1000,8	8,99E-02	3,04E-03	6,36E-02	1001,0	8,16E-02	3,72E-03	6,36E-02	0,00E+00	0,00E+00	**4913,0**	**303,6**	**Pa-234m**
#NV	#NV	#NV	#NV	163,3	8,53E-02	9,24E-03	1,36E-01	0,00E+00	0,00E+00			**U-235***
205,5	9,29E-02	5,15E-03	1,25E-01	205,3	9,02E-02	7,95E-03	1,24E-01	0,00E+00	0,00E+00	**4649,5**	**507,5**	**U-235***
									Mean value of U-238 :	**4544,1**	**115,6**	
									from U-235/Ra-226 with Ra via Rn-Product :	**5300,1**	**201,3**	**U-235***
186,1	2,63E+00	9,72E-03	1,30E-01	185,9	2,23E+00	1,30E-02	1,30E-01	0,00E+00	0,00E+00	**5314,2**	**63,5**	U-235/Ra
67,9	7,32E-02	4,89E-03	2,28E-01	67,7	7,71E-02	3,92E-03	2,27E-01	0,00E+00	0,00E+00	**4366,4**	**388,8**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**5892,5**	**198,1**	**Ra-226**
295,3	5,65E+00	9,77E-03	1,08E-01	295,2	4,81E+00	1,38E-02	1,08E-01	4,40E-04	1,20E-04	**5282,4**	**44,4**	**Rn-Product.**
352,0	9,74E+00	1,24E-02	1,02E-01	351,9	8,18E+00	1,65E-02	1,01E-01	1,30E-04	1,20E-04	**5354,7**	**39,9**	**Rn-Product.**
609,4	6,85E+00	9,55E-03	8,03E-02	609,3	5,76E+00	1,35E-02	8,03E-02	3,10E-04	1,10E-04	**5326,7**	**41,5**	**Rn-Product.**
1120,1	1,43E+00	5,00E-03	6,08E-02	1120,3	1,20E+00	6,72E-03	6,08E-02	0,00E+00	0,00E+00	**5333,4**	**62,2**	**Rn-Product.**
									Mean value of the Rn-Product :	**5324,7**	**39,9**	**Rn-Product.**
46,6	1,51E-01	6,26E-03	3,66E-01	46,5	1,42E-01	8,28E-03	3,64E-01	0,00E+00	0,00E+00	**4993,4**	**383,4**	**Pb-210**
235,7	2,06E-01	3,19E-03	1,19E-01	236,0	1,77E-01	7,81E-03	1,19E-01	0,00E+00	0,00E+00	**5273,4**	**273,8**	**Th-227***
#NV	#NV	#NV	#NV	154,2				0,00E+00	0,00E+00			**Ra-223***
269,7	3,44E-01	6,22E-03	1,13E-01	270,0	2,84E-01	8,09E-03	1,13E-01	0,00E+00	0,00E+00	**5444,4**	**211,1**	**Ra-223 + Rn-**
									Mean value of the Ac-227-Product :	**5371,3**	**211,1**	
										Thorium-Chain:		
#NV	#NV	#NV	#NV	794,8	2,67E-01	4,65E-03	7,11E-02	0,00E+00	0,00E+00			**Ac-228**
911,0	2,60E-02	2,64E-03	6,69E-02	911,2	1,69E+00	8,38E-03	6,68E-02	0,00E+00	0,00E+00	**42,6**	**5,2**	**Ac-228**
968,8	1,77E-02	1,53E-03	6,48E-02	968,9	1,01E+00	6,50E-03	6,48E-02	0,00E+00	0,00E+00	**48,5**	**5,2**	**Ac-228**
									Mean value of the Ac-228 (Ra-228-Product) :	**45,7**	**5,2**	
239,0	1,46E-01	2,11E-03	1,19E-01	238,6	8,39E+00	1,98E-02	1,19E-01	0,00E+00	0,00E+00	**49,0**	**1,7**	**Pb-212**
727,3	7,81E-03	1,84E-03	7,44E-02	727,3	5,50E-01	6,43E-03	7,44E-02	0,00E+00	0,00E+00	**39,4**	**10,1**	**Bi-212**
583,6	4,96E-02	1,53E-03	8,18E-02	583,2	2,42E+00	1,07E-02	8,18E-02	0,00E+00	0,00E+00	**56,8**	**2,9**	**Tl-208**
860,4	4,66E-03	1,31E-03	6,87E-02	860,5	2,99E-01	4,36E-03	6,87E-02	0,00E+00	0,00E+00	**43,1**	**13,0**	**Tl-208**
									Mean value of the Th-228-Product :	**50,7**	**1,7**	
									Mean value of the Thorium-Chain	**48,2**	**1,7**	**Th-Chain**
										Potassium:		
1460,8	1,99E-01	2,69E-03	5,28E-02	1460,8	2,70E+00	9,47E-03	5,28E-02	4,08E-04	5,50E-05	**1152,4**	**23,9**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°4 m=147,8g 8-9m n.WD v.17.7.98

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample
Spectrum: **ta_78** m(Sample)/g= 147,8
Mes-date.: 06.08.98 t(live)/s= 72940,8

S t a n d a r d s

	A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g
U: RGU-1	4940	25	136,3
Th: RGTh-1	3246	65	127,5
K: RGK-1	13843	93	175,9

Background
Mes-date: 16.05.97
Spectrum: NE160597.CHN

Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,3	5,48E-01	5,18E-03	2,41E-01	63,3	6,58E-01	1,15E-02	2,40E-01	0,00E+00	0,00E+00	**3914,2**	**97,6**	**Th-234**
1000,8	7,98E-02	2,39E-03	6,36E-02	1001,0	8,16E-02	3,72E-03	6,36E-02	0,00E+00	0,00E+00	**4493,5**	**267,7**	**Pa-234m**
163,4	8,10E-02	6,88E-03	1,36E-01	163,3	8,53E-02	9,24E-03	1,36E-01	0,00E+00	0,00E+00	**4405,4**	**628,5**	**U-235***
205,4	7,69E-02	5,39E-03	1,25E-01	205,3	9,02E-02	7,95E-03	1,24E-01	0,00E+00	0,00E+00	**3948,0**	**464,4**	**U-235***
									Mean value of U-238 :	**4100,0**	**97,6**	
									from U-235/Ra-226 with Ra via Rn-Product :	**4732,0**	**173,3**	**U-235***
186,1	2,13E+00	1,02E-02	1,30E-01	185,9	2,23E+00	1,30E-02	1,30E-01	0,00E+00	0,00E+00	**4432,1**	**55,8**	U-235/Ra
67,7	5,41E-02	4,66E-03	2,28E-01	67,7	7,71E-02	3,92E-03	2,27E-01	0,00E+00	0,00E+00	**3296,7**	**346,6**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**4681,5**	**171,0**	**Ra-226**
295,3	4,35E+00	9,21E-03	1,08E-01	295,2	4,81E+00	1,38E-02	1,08E-01	4,40E-04	1,20E-04	**4182,9**	**36,1**	**Rn-Product.**
352,0	7,49E+00	1,19E-02	1,02E-01	351,9	8,18E+00	1,65E-02	1,01E-01	1,30E-04	1,20E-04	**4234,6**	**32,3**	**Rn-Product.**
609,4	5,23E+00	9,14E-03	8,03E-02	609,3	5,76E+00	1,35E-02	8,03E-02	3,10E-04	1,10E-04	**4186,5**	**33,4**	**Rn-Product.**
1120,1	1,10E+00	4,69E-03	6,08E-02	1120,3	1,20E+00	6,72E-03	6,08E-02	0,00E+00	0,00E+00	**4228,1**	**51,2**	**Rn-Product.**
									Mean value of the Rn-Product :	**4207,0**	**32,3**	**Rn-Product.**
46,6	1,23E-01	5,98E-03	3,66E-01	46,5	1,42E-01	8,28E-03	3,64E-01	0,00E+00	0,00E+00	**4146,3**	**336,1**	**Pb-210**
235,7	1,65E-01	3,02E-03	1,19E-01	236,0	1,77E-01	7,81E-03	1,19E-01	0,00E+00	0,00E+00	**4332,2**	**229,3**	**Th-227***
#NV	#NV	#NV	#NV	154,2				0,00E+00	0,00E+00			**Ra-223***
269,7	2,89E-01	5,88E-03	1,13E-01	270,0	2,84E-01	8,09E-03	1,13E-01	0,00E+00	0,00E+00	**4693,4**	**187,9**	**Ra-223 + Rn-**
									Mean value of the Ac-227-Product :	**4537,8**	**187,9**	
										Thorium-Chain:		
794,8	3,58E-03	1,40E-03	7,11E-02	794,8	2,67E-01	4,65E-03	7,11E-02	0,00E+00	0,00E+00	**38,1**	**15,7**	**Ac-228**
911,0	2,43E-02	3,21E-03	6,69E-02	911,2	1,69E+00	8,38E-03	6,68E-02	0,00E+00	0,00E+00	**41,0**	**6,2**	**Ac-228**
968,9	1,57E-02	1,70E-03	6,48E-02	968,9	1,01E+00	6,50E-03	6,48E-02	0,00E+00	0,00E+00	**44,4**	**5,7**	**Ac-228**
									Mean value of the Ac-228 (Ra-228-Product) :	**42,1**	**5,7**	
239,0	1,21E-01	2,02E-03	1,19E-01	238,6	8,39E+00	1,98E-02	1,19E-01	0,00E+00	0,00E+00	**41,6**	**1,5**	**Pb-212**
727,4	6,27E-03	1,89E-03	7,44E-02	727,3	5,50E-01	6,43E-03	7,44E-02	0,00E+00	0,00E+00	**32,5**	**10,5**	**Bi-212**
583,6	3,95E-02	1,45E-03	8,18E-02	583,2	2,42E+00	1,07E-02	8,18E-02	0,00E+00	0,00E+00	**46,5**	**2,7**	**Tl-208**
860,4	5,92E-03	1,85E-03	6,87E-02	860,5	2,99E-01	4,36E-03	6,87E-02	0,00E+00	0,00E+00	**56,5**	**18,8**	**Tl-208**
									Mean value of the Th-228-Product :	**43,6**	**1,5**	
									Mean value of the Thorium-Chain	**42,9**	**1,5**	**Th-Chain**
										Potassium:		
1460,7	1,88E-01	2,80E-03	5,28E-02	1460,8	2,70E+00	9,47E-03	5,28E-02	4,08E-04	5,50E-05	**1126,3**	**24,8**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°4 m=155,96g 9-10m n.WD v.17.7.98

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**ta_79**	m(Sample)/g=	155,96		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	07.08.98	t(live)/s=	174632,8	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,4	4,49E-01	4,15E-03	2,41E-01	63,3	6,58E-01	1,15E-02	2,40E-01	0,00E+00	0,00E+00	**3104,2**	**77,1**	**Th-234**
1001,0	7,44E-02	1,65E-03	6,36E-02	1001,0	8,16E-02	3,72E-03	6,36E-02	0,00E+00	0,00E+00	**3997,8**	**223,0**	**Pa-234m**
163,5	7,44E-02	3,42E-03	1,36E-01	163,3	8,53E-02	9,24E-03	1,36E-01	0,00E+00	0,00E+00	**3884,9**	**476,6**	**U-235***
205,5	6,95E-02	3,25E-03	1,25E-01	205,3	9,02E-02	7,95E-03	1,24E-01	0,00E+00	0,00E+00	**3424,7**	**358,9**	**U-235***
									Mean value of U-238 :	**3439,3**	**77,1**	
									from U-235/Ra-226 with Ra via Rn-Product :	**3892,2**	**133,8**	**U-235***
186,1	1,82E+00	6,15E-03	1,30E-01	185,9	2,23E+00	1,30E-02	1,30E-01	0,00E+00	0,00E+00	**3634,7**	**42,8**	U-235/Ra
68,0	4,98E-02	3,21E-03	2,27E-01	67,7	7,71E-02	3,92E-03	2,27E-01	0,00E+00	0,00E+00	**2934,7**	**255,7**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**3781,5**	**132,8**	**Ra-226**
295,4	3,72E+00	5,65E-03	1,08E-01	295,2	4,81E+00	1,38E-02	1,08E-01	4,40E-04	1,20E-04	**3422,6**	**28,4**	**Rn-Product.**
352,1	6,40E+00	7,15E-03	1,01E-01	351,9	8,18E+00	1,65E-02	1,01E-01	1,30E-04	1,20E-04	**3459,5**	**25,5**	**Rn-Product.**
609,5	4,49E+00	5,48E-03	8,03E-02	609,3	5,76E+00	1,35E-02	8,03E-02	3,10E-04	1,10E-04	**3431,8**	**26,4**	**Rn-Product.**
1120,2	9,44E-01	2,88E-03	6,08E-02	1120,3	1,20E+00	6,72E-03	6,08E-02	0,00E+00	0,00E+00	**3453,5**	**39,5**	**Rn-Product.**
									Mean value of the Rn-Product :	**3441,4**	**25,5**	**Rn-Product.**
46,6	1,01E-01	3,93E-03	3,65E-01	46,5	1,42E-01	8,28E-03	3,64E-01	0,00E+00	0,00E+00	**3311,6**	**249,4**	**Pb-210**
235,9	1,43E-01	2,43E-03	1,19E-01	236,0	1,77E-01	7,81E-03	1,19E-01	0,00E+00	0,00E+00	**3595,2**	**188,6**	**Th-227***
#NV	#NV	#NV	#NV	154,2				0,00E+00	0,00E+00			**Ra-223***
269,7	2,38E-01	3,54E-03	1,13E-01	270,0	2,84E-01	8,09E-03	1,13E-01	0,00E+00	0,00E+00	**3704,2**	**137,7**	**Ra-223 + Rn-**
									Mean value of the Ac-227-Product :	**3659,0**	**137,7**	
										Thorium-Chain:		
#NV	#NV	#NV	#NV	794,8	2,67E-01	4,65E-03	7,11E-02	0,00E+00	0,00E+00			**Ac-228**
911,1	2,71E-02	1,51E-03	6,69E-02	911,2	1,69E+00	8,38E-03	6,68E-02	0,00E+00	0,00E+00	**43,6**	**3,3**	**Ac-228**
968,9	1,70E-02	8,88E-04	6,48E-02	968,9	1,01E+00	6,50E-03	6,48E-02	0,00E+00	0,00E+00	**45,9**	**3,3**	**Ac-228**
									Mean value of the Ac-228 (Ra-228-Product) :	**44,8**	**3,3**	
239,2	1,40E-01	8,42E-04	1,18E-01	238,6	8,39E+00	1,98E-02	1,19E-01	0,00E+00	0,00E+00	**46,2**	**1,2**	**Pb-212**
727,3	9,00E-03	9,62E-04	7,44E-02	727,3	5,50E-01	6,43E-03	7,44E-02	0,00E+00	0,00E+00	**44,6**	**5,7**	**Bi-212**
583,8	4,40E-02	1,12E-03	8,18E-02	583,2	2,42E+00	1,07E-02	8,18E-02	0,00E+00	0,00E+00	**49,5**	**2,3**	**Tl-208**
#NV	#NV	#NV	#NV	860,5	2,99E-01	4,36E-03	6,87E-02	0,00E+00	0,00E+00			**Tl-208**
									Mean value of the Th-228-Product :	**47,1**	**1,2**	
									Mean value of the Thorium-Chain	**45,9**	**1,2**	**Th-Chain**
										Potassium:		
1460,9	2,03E-01	1,78E-03	5,28E-02	1460,8	2,70E+00	9,47E-03	5,28E-02	4,08E-04	5,50E-05	**1157,5**	**18,7**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°4 m=175,35 11-12m n.WD v17.7.98

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample
Spectrum: **ta_81** m(Sample)/g= 175,35
Mes-date.: 10.08.98 t(live)/s= 107601,2

Standards

	A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g
U: RGU-1	4940	25	136,3
Th: RGTh-1	3246	65	127,5
K: RGK-1	13843	93	175,9

Background
Mes-date: 16.05.97
Spectrum: NE160597.CHN

Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,4	3,02E-01	5,45E-03	2,41E-01	63,3	6,58E-01	1,15E-02	2,40E-01	0,00E+00	0,00E+00	**1955,0**	**58,9**	**Th-234**
1001,0	4,91E-02	1,65E-03	6,36E-02	1001,0	8,16E-02	3,72E-03	6,36E-02	0,00E+00	0,00E+00	**2381,4**	**147,1**	**Pa-234m**
163,4	5,01E-02	4,24E-03	1,36E-01	163,3	8,53E-02	9,24E-03	1,36E-01	0,00E+00	0,00E+00	**2399,9**	**341,8**	**U-235***
205,5	4,76E-02	3,65E-03	1,25E-01	205,3	9,02E-02	7,95E-03	1,24E-01	0,00E+00	0,00E+00	**2145,3**	**261,5**	**U-235***
								Mean value of U-238 :		**2134,4**	**58,9**	
								from U-235/Ra-226 with Ra via Rn-Product :		**2643,4**	**110,8**	**U-235***
186,2	1,53E+00	7,15E-03	1,30E-01	185,9	2,23E+00	1,30E-02	1,30E-01	0,00E+00	0,00E+00	**2790,4**	**34,9**	U-235/Ra
#NV	#NV	#NV	#NV	67,7	7,71E-02	3,92E-03	2,27E-01	0,00E+00	0,00E+00			**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**3283,0**	**105,4**	**Ra-226**
295,5	3,44E+00	6,95E-03	1,08E-01	295,2	4,81E+00	1,38E-02	1,08E-01	4,40E-04	1,20E-04	**2885,7**	**24,7**	**Rn-Product.**
352,2	5,92E+00	8,69E-03	1,01E-01	351,9	8,18E+00	1,65E-02	1,01E-01	1,30E-04	1,20E-04	**2916,9**	**22,0**	**Rn-Product.**
609,6	4,17E+00	6,73E-03	8,03E-02	609,3	5,76E+00	1,35E-02	8,03E-02	3,10E-04	1,10E-04	**2889,6**	**22,8**	**Rn-Product.**
1120,3	8,82E-01	3,39E-03	6,08E-02	1120,3	1,20E+00	6,72E-03	6,08E-02	0,00E+00	0,00E+00	**2913,1**	**34,5**	**Rn-Product.**
								Mean value of the Rn-Product :		**2900,8**	**22,0**	**Rn-Product.**
46,7	8,52E-02	4,84E-03	3,65E-01	46,5	1,42E-01	8,28E-03	3,64E-01	0,00E+00	0,00E+00	**2662,6**	**230,5**	**Pb-210**
235,9	1,30E-01	1,93E-03	1,19E-01	236,0	1,77E-01	7,81E-03	1,19E-01	0,00E+00	0,00E+00	**2986,9**	**154,5**	**Th-227***
#NV	#NV	#NV	#NV	154,2				0,00E+00	0,00E+00			**Ra-223***
269,8	2,19E-01	4,41E-03	1,13E-01	270,0	2,84E-01	8,09E-03	1,13E-01	0,00E+00	0,00E+00	**3120,0**	**124,5**	**Ra-223 + Rn-**
								Mean value of the Ac-227-Product :		**3062,0**	**124,5**	
										Thorium-Chain:		
#NV	#NV	#NV	#NV	794,8	2,67E-01	4,65E-03	7,11E-02	0,00E+00	0,00E+00			**Ac-228**
911,2	3,37E-02	1,66E-03	6,69E-02	911,2	1,69E+00	8,38E-03	6,68E-02	0,00E+00	0,00E+00	**49,0**	**3,4**	**Ac-228**
969,0	2,10E-02	1,41E-03	6,48E-02	968,9	1,01E+00	6,50E-03	6,48E-02	0,00E+00	0,00E+00	**51,1**	**4,5**	**Ac-228**
								Mean value of the Ac-228 (Ra-228-Product) :		**49,9**	**3,4**	
239,2	1,61E-01	1,09E-03	1,18E-01	238,6	8,39E+00	1,98E-02	1,19E-01	0,00E+00	0,00E+00	**48,3**	**1,3**	**Pb-212**
#NV	#NV	#NV	#NV	727,3	5,50E-01	6,43E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
583,8	4,86E-02	1,29E-03	8,18E-02	583,2	2,42E+00	1,07E-02	8,18E-02	0,00E+00	0,00E+00	**49,7**	**2,3**	**Tl-208**
860,5	4,80E-03	1,27E-03	6,87E-02	860,5	2,99E-01	4,36E-03	6,87E-02	0,00E+00	0,00E+00	**39,5**	**11,3**	**Tl-208**
								Mean value of the Th-228-Product :		**48,3**	**1,3**	
								Mean value of the Thorium-Chain		**49,1**	**1,3**	**Th-Chain**
										Potassium:		
1461,0	1,92E-01	2,09E-03	5,28E-02	1460,8	2,70E+00	9,47E-03	5,28E-02	4,08E-04	5,50E-05	**982,7**	**17,9**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°4 m=191,71g 10-11m n.WD v.17.7.98

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**			
Spectrum:	**ta_80**	m(Sample)/g=	191,71		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97				
Mes-date.:	09.08.98	t(live)/s=	68182,6	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN				
				Th: RGTh-1	3246	65	127,5						
				K: RGK-1	13843	93	175,9						
Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak / (g/cm²)⁻¹	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg		
										Uranium-Chain:			
63,4	2,75E-02	2,05E-03	2,41E-01	63,3	6,58E-01	1,15E-02	2,40E-01	0,00E+00	0,00E+00	**169,6**	**13,9**	**Th-234**	
1000,8	4,72E-03	6,60E-04	6,36E-02	1001,0	8,16E-02	3,72E-03	6,36E-02	0,00E+00	0,00E+00	**212,3**	**32,3**	**Pa-234m**	
#NV	#NV	#NV	#NV	163,3	8,53E-02	9,24E-03	1,36E-01	0,00E+00	0,00E+00			**U-235***	
#NV	#NV	#NV	#NV	205,3	9,02E-02	7,95E-03	1,24E-01	0,00E+00	0,00E+00			**U-235***	
									Mean value of U-238 :	**184,5**	**13,9**		
									from U-235/Ra-226 with Ra via Rn-Product :	**215,2**	**15,4**	**U-235***	
186,1	1,10E-01	2,49E-03	1,30E-01	185,9	2,23E+00	1,30E-02	1,30E-01	0,00E+00	0,00E+00	**188,1**	**5,4**	U-235/Ra	
#NV	#NV	#NV	#NV	67,7	7,71E-02	3,92E-03	2,27E-01	0,00E+00	0,00E+00			**Th-230**	
									from U-235/Ra-226 with U via Mean value of U-238 :	**190,8**	**19,8**	**Ra-226**	
295,3	2,11E-01	2,41E-03	1,08E-01	295,2	4,81E+00	1,38E-02	1,08E-01	4,40E-04	1,20E-04	**165,5**	**2,8**	**Rn-Product.**	
352,0	3,66E-01	2,73E-03	1,02E-01	351,9	8,18E+00	1,65E-02	1,01E-01	1,30E-04	1,20E-04	**168,2**	**2,2**	**Rn-Product.**	
609,4	2,63E-01	2,23E-03	8,03E-02	609,3	5,76E+00	1,35E-02	8,03E-02	3,10E-04	1,10E-04	**169,2**	**2,3**	**Rn-Product.**	
1120,1	5,46E-02	1,26E-03	6,08E-02	1120,3	1,20E+00	6,72E-03	6,08E-02	0,00E+00	0,00E+00	**167,0**	**4,8**	**Rn-Product.**	
									Mean value of the Rn-Product :	**167,7**	**2,2**	**Rn-Product.**	
46,5	1,26E-02	2,32E-03	3,67E-01	46,5	1,42E-01	8,28E-03	3,64E-01	0,00E+00	0,00E+00	**383,4**	**75,7**	**Pb-210**	
235,7	7,35E-03	7,92E-04	1,19E-01	236,0	1,77E-01	7,81E-03	1,19E-01	0,00E+00	0,00E+00	**158,2**	**19,2**	**Th-227***	
#NV	#NV	#NV	#NV	154,2				0,00E+00	0,00E+00			**Ra-223***	
#NV	#NV	#NV	#NV	270,0	2,84E-01	8,09E-03	1,13E-01	0,00E+00	0,00E+00			**Ra-223 + Rn-**	
									Mean value of the Ac-227-Product :	**158,2**	**19,2**		
										Thorium-Chain:			
794,7	7,64E-03	9,09E-04	7,11E-02	794,8	2,67E-01	4,65E-03	7,11E-02	0,00E+00	0,00E+00	**65,3**	**9,2**	**Ac-228**	
911,0	4,83E-02	1,25E-03	6,69E-02	911,2	1,69E+00	8,38E-03	6,68E-02	0,00E+00	0,00E+00	**65,1**	**3,0**	**Ac-228**	
968,8	2,64E-02	8,51E-04	6,48E-02	968,9	1,01E+00	6,50E-03	6,48E-02	0,00E+00	0,00E+00	**59,4**	**3,1**	**Ac-228**	
									Mean value of the Ac-228 (Ra-228-Product) :	**62,9**	**3,0**		
239,1	2,21E-01	1,67E-03	1,18E-01	238,6	8,39E+00	1,98E-02	1,19E-01	0,00E+00	0,00E+00	**62,3**	**1,7**	**Pb-212**	
727,2	1,39E-02	8,51E-04	7,44E-02	727,3	5,50E-01	6,43E-03	7,44E-02	0,00E+00	0,00E+00	**57,8**	**4,8**	**Bi-212**	
583,3	6,72E-02	1,35E-03	8,19E-02	583,2	2,42E+00	1,07E-02	8,18E-02	0,00E+00	0,00E+00	**63,9**	**2,6**	**Tl-208**	
860,4	7,66E-03	8,21E-04	6,87E-02	860,5	2,99E-01	4,36E-03	6,87E-02	0,00E+00	0,00E+00	**58,4**	**7,5**	**Tl-208**	
									Mean value of the Th-228-Product :	**61,7**	**1,7**		
									Mean value of the Thorium-Chain	**62,3**	**1,7**	**Th-Chain**	
										Potassium:			
1460,8	2,03E-01	1,83E-03	5,28E-02	1460,8	2,70E+00	9,47E-03	5,28E-02	4,08E-04	5,50E-05	**963,3**	**15,8**	**K-40**	

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°4 m=175,35 11-12m n.WD v17.7.98

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample
Spectrum: **ta_81** m(Sample)/g= 175,35
Mes-date.: 10.08.98 t(live)/s= 107601,2

Standards

	A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g
U: RGU-1	4940	25	136,3
Th: RGTh-1	3246	65	127,5
K: RGK-1	13843	93	175,9

Background
Mes-date: 16.05.97
Spectrum: NE160597.CHN

Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,4	3,02E-01	5,45E-03	2,41E-01	63,3	6,58E-01	1,15E-02	2,40E-01	0,00E+00	0,00E+00	**1955,0**	**58,9**	**Th-234**
1001,0	4,91E-02	1,65E-03	6,36E-02	1001,0	8,16E-02	3,72E-03	6,36E-02	0,00E+00	0,00E+00	**2381,4**	**147,1**	**Pa-234m**
163,4	5,01E-02	4,24E-03	1,36E-01	163,3	8,53E-02	9,24E-03	1,36E-01	0,00E+00	0,00E+00	**2399,9**	**341,8**	**U-235***
205,5	4,76E-02	3,65E-03	1,25E-01	205,3	9,02E-02	7,95E-03	1,24E-01	0,00E+00	0,00E+00	**2145,3**	**261,5**	**U-235***
								Mean value of U-238 :		**2134,4**	**58,9**	
								from U-235/Ra-226 with Ra via Rn-Product :		**2643,4**	**110,8**	**U-235***
186,2	1,53E+00	7,15E-03	1,30E-01	185,9	2,23E+00	1,30E-02	1,30E-01	0,00E+00	0,00E+00	**2790,4**	**34,9**	U-235/Ra
#NV	#NV	#NV	#NV	67,7	7,71E-02	3,92E-03	2,27E-01	0,00E+00	0,00E+00			**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**3283,0**	**105,4**	**Ra-226**
295,5	3,44E+00	6,95E-03	1,08E-01	295,2	4,81E+00	1,38E-02	1,08E-01	4,40E-04	1,20E-04	**2885,7**	**24,7**	**Rn-Product.**
352,2	5,92E+00	8,69E-03	1,01E-01	351,9	8,18E+00	1,65E-02	1,01E-01	1,30E-04	1,20E-04	**2916,9**	**22,0**	**Rn-Product.**
609,6	4,17E+00	6,73E-03	8,03E-02	609,3	5,76E+00	1,35E-02	8,03E-02	3,10E-04	1,10E-04	**2889,6**	**22,8**	**Rn-Product.**
1120,3	8,82E-01	3,39E-03	6,08E-02	1120,3	1,20E+00	6,72E-03	6,08E-02	0,00E+00	0,00E+00	**2913,1**	**34,5**	**Rn-Product.**
								Mean value of the Rn-Product :		**2900,8**	**22,0**	**Rn-Product.**
46,7	8,52E-02	4,84E-03	3,65E-01	46,5	1,42E-01	8,28E-03	3,64E-01	0,00E+00	0,00E+00	**2662,6**	**230,5**	**Pb-210**
235,9	1,30E-01	1,93E-03	1,19E-01	236,0	1,77E-01	7,81E-03	1,19E-01	0,00E+00	0,00E+00	**2986,9**	**154,5**	**Th-227***
#NV	#NV	#NV	#NV	154,2				0,00E+00	0,00E+00			**Ra-223***
269,8	2,19E-01	4,41E-03	1,13E-01	270,0	2,84E-01	8,09E-03	1,13E-01	0,00E+00	0,00E+00	**3120,0**	**124,5**	**Ra-223 + Rn-**
								Mean value of the Ac-227-Product :		**3062,0**	**124,5**	
										Thorium-Chain:		
#NV	#NV	#NV	#NV	794,8	2,67E-01	4,65E-03	7,11E-02	0,00E+00	0,00E+00			**Ac-228**
911,2	3,37E-02	1,66E-03	6,69E-02	911,2	1,69E+00	8,38E-03	6,68E-02	0,00E+00	0,00E+00	**49,0**	**3,4**	**Ac-228**
969,0	2,10E-02	1,41E-03	6,48E-02	968,9	1,01E+00	6,50E-03	6,48E-02	0,00E+00	0,00E+00	**51,1**	**4,5**	**Ac-228**
								Mean value of the Ac-228 (Ra-228-Product) :		**49,9**	**3,4**	
239,2	1,61E-01	1,09E-03	1,18E-01	238,6	8,39E+00	1,98E-02	1,19E-01	0,00E+00	0,00E+00	**48,3**	**1,3**	**Pb-212**
#NV	#NV	#NV	#NV	727,3	5,50E-01	6,43E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
583,8	4,86E-02	1,29E-03	8,18E-02	583,2	2,42E+00	1,07E-02	8,18E-02	0,00E+00	0,00E+00	**49,7**	**2,3**	**Tl-208**
860,5	4,80E-03	1,27E-03	6,87E-02	860,5	2,99E-01	4,36E-03	6,87E-02	0,00E+00	0,00E+00	**39,5**	**11,3**	**Tl-208**
								Mean value of the Th-228-Product :		**48,3**	**1,3**	
								Mean value of the Thorium-Chain		**49,1**	**1,3**	**Th-Chain**
										Potassium:		
1461,0	1,92E-01	2,09E-03	5,28E-02	1460,8	2,70E+00	9,47E-03	5,28E-02	4,08E-04	5,50E-05	**982,7**	**17,9**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Borehole N°2 4.5-5.5 m dried m=127.81g v.17.9.97 WD

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_1**	m(Sample)/g=	127,81		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	10.01.97	t(live)/s=	80297,6	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,0	1,14E-01	3,64E-03	2,42E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**957,5**	**37,4**	**Th-234**
999,7	1,59E-02	1,02E-03	6,37E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1037,9**	**77,7**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,0	1,43E-02	2,64E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**921,5**	**192,8**	**U-235***
205,0	1,45E-02	2,91E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**900,8**	**195,3**	**U-235***
									Mean value of U-238 :	**970,7**	**37,4**	
									from U-235/Ra-226 with Ra via Rn-Product :	**1116,2**	**71,6**	**U-235***
185,7	6,70E-01	5,09E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**1607,1**	**22,0**	**U-235/Ra**
67,5	2,34E-02	3,97E-03	2,29E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**1663,8**	**318,0**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**2085,0**	**66,6**	**Ra-226**
294,8	1,75E+00	5,26E-03	1,09E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**1986,0**	**17,3**	**Rn-Product.**
351,5	2,99E+00	6,53E-03	1,02E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**1985,7**	**15,2**	**Rn-Product.**
608,6	2,08E+00	5,33E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**1960,7**	**15,9**	**Rn-Product.**
1118,9	4,35E-01	2,64E-03	6,09E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**1967,4**	**24,2**	**Rn-Product.**
									Mean value of the Rn-Product :	**1975,6**	**15,2**	**Rn-Product.**
46,3	5,22E-02	3,25E-03	3,70E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**1740,8**	**134,7**	**Pb-210**
153,9	3,89E-02	3,18E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**1911,3**	**199,3**	**Ra-223***
269,3	1,11E-01	3,56E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**2103,7**	**91,8**	**Ra-223 + Rn-**
										Thorium-Chain:		
910,1	2,15E-02	1,25E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**41,9**	**3,3**	**Ac-228**
726,4	7,63E-03	1,08E-03	7,45E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**46,3**	**7,5**	**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
									Mean value of the Thorium-Chain	**43,3**	**3,3**	**Th-Chain**
										Potassium:		
1459,3	1,45E-01	1,81E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**1009,0**	**20,4**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 2.5-3.5m wet m=206.23g 11.4.-14.4.97

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_2**	m(Sample)/g=	206,23		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	04.11.97	t(live)/s=	243036,9	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,2	1,32E-01	2,05E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**837,8**	**20,6**	**Th-234**
1000,6	2,11E-02	6,91E-04	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**906,4**	**43,2**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,2	1,87E-02	1,85E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**850,1**	**115,7**	**U-235***
205,2	2,20E-02	1,76E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**952,7**	**103,0**	**U-235***
								Mean value of U-238 :		**870,9**	**20,6**	
								from U-235/Ra-226 with Ra via Rn-Product :		**1250,2**	**38,2**	**U-235***
185,9	6,66E-01	2,81E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**1116,2**	**12,2**	**U-235/Ra**
67,6	1,76E-02	1,78E-03	2,29E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**943,3**	**124,0**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**1300,4**	**36,9**	**Ra-226**
295,2	1,31E+00	2,79E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**1021,2**	**8,2**	**Rn-Product.**
351,9	2,25E+00	3,33E-03	1,02E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**1021,9**	**7,3**	**Rn-Product.**
609,2	1,60E+00	2,72E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**1007,5**	**7,5**	**Rn-Product.**
1119,9	3,40E-01	1,43E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**1010,5**	**11,0**	**Rn-Product.**
								Mean value of the Rn-Product :		**1015,7**	**7,3**	**Rn-Product.**
46,4	3,68E-02	1,77E-03	3,69E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**1004,6**	**66,0**	**Pb-210**
154,1	3,72E-02	1,94E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**1285,3**	**105,3**	**Ra-223***
269,5	9,15E-02	1,94E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**1195,9**	**42,0**	**Ra-223 + Rn-**
										Thorium-Chain:		
910,8	2,68E-02	7,20E-04	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**34,5**	**1,6**	**Ac-228**
727,1	9,06E-03	6,38E-04	7,45E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**36,6**	**3,3**	**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**35,2**	**1,6**	**Th-Chain**
										Potassium:		
1460,5	1,92E-01	1,07E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**868,7**	**12,4**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 10.5-11.5m dried m=170.87g

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_6b**	m(Sample)/g=	170,87		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	07.10.97	t(live)/s=	27689,4	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,5	2,84E-01	1,17E-02	2,40E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1989,6**	**95,2**	**Th-234**
1001,1	4,27E-02	3,50E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**2155,9**	**197,4**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,6	6,59E-02	1,35E-02	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**3414,4**	**777,9**	**U-235***
#NV	#NV	#NV	#NV	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00			**U-235***
									Mean value of U-238 :	**2212,5**	**95,2**	
									from U-235/Ra-226 with Ra via Rn-Product :	**2502,2**	**196,5**	**U-235***
186,3	2,26E+00	1,75E-02	1,29E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**4332,1**	**59,8**	**U-235/Ra**
68,0	9,48E-02	1,03E-02	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**5606,0**	**773,7**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**5923,9**	**176,2**	**Ra-226**
295,5	6,39E+00	1,75E-02	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**5734,2**	**48,6**	**Rn-Product.**
352,2	1,09E+01	2,15E-02	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**5713,6**	**42,8**	**Rn-Product.**
609,6	7,74E+00	1,74E-02	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**5683,0**	**44,6**	**Rn-Product.**
1120,3	1,63E+00	8,63E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**5689,1**	**66,5**	**Rn-Product.**
									Mean value of the Rn-Product :	**5705,9**	**42,8**	**Rn-Product.**
46,8	1,80E-01	1,05E-02	3,64E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**5202,9**	**384,8**	**Pb-210**
154,4	1,31E-01	1,05E-02	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**5186,3**	**533,4**	**Ra-223***
269,8	3,94E-01	1,17E-02	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**5922,0**	**246,7**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,2	2,72E-02	3,83E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**41,0**	**6,6**	**Ac-228**
#NV	#NV	#NV	#NV	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
									Mean value of the Thorium-Chain	**41,0**	**6,6**	**Th-Chain**
										Potassium:		
1460,9	1,91E-01	4,51E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**1020,3**	**31,6**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 11.5-12.5m wet m= 252.46 g 9.-10.5.97

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_10**	m(Sample)/g=	252,46		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	05.09.97	t(live)/s=	68027	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,4	3,30E-01	7,76E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1916,0**	**60,1**	**Th-234**
1001,0	6,14E-02	2,57E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**2240,0**	**123,2**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,5	4,66E-02	7,36E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**1855,9**	**343,1**	**U-235***
205,6	5,61E-02	6,31E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**2118,9**	**285,8**	**U-235***
								Mean value of U-238 :		**2028,5**	**60,1**	
								from U-235/Ra-226 with Ra via Rn-Product :		**2993,4**	**128,2**	**U-235***
186,2	2,40E+00	1,09E-02	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**3518,3**	**39,3**	**U-235/Ra**
67,7	9,52E-02	6,91E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**4626,1**	**510,2**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**4637,2**	**113,9**	**Ra-226**
295,4	5,81E+00	1,11E-02	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**3912,6**	**30,8**	**Rn-Product.**
352,1	1,00E+01	1,33E-02	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**3928,0**	**27,5**	**Rn-Product.**
609,5	7,23E+00	1,09E-02	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**3886,6**	**28,3**	**Rn-Product.**
1120,2	1,56E+00	5,62E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**3926,0**	**41,0**	**Rn-Product.**
								Mean value of the Rn-Product :		**3912,4**	**27,5**	**Rn-Product.**
46,6	1,63E-01	6,85E-03	3,65E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**4178,1**	**254,4**	**Pb-210**
154,3	1,55E-01	7,78E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**4698,6**	**378,5**	**Ra-223***
269,7	4,07E-01	7,72E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**4615,0**	**155,1**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,1	4,35E-02	2,59E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**47,3**	**3,8**	**Ac-228**
727,5	9,41E-03	1,84E-03	7,44E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**32,3**	**7,0**	**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**43,3**	**3,8**	**Th-Chain**
										Potassium:		
1460,9	2,11E-01	2,81E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**804,1**	**16,9**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 11.5-12.5m dried m=197.55g

Detektor :	36 % p-type
Meßgeometrie :	neue WD
Bedeckte Fläche/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_10b**	m(Sample)/g=	197,55		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	07.10.97	t(live)/s=	57294,3	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,5	3,69E-01	8,50E-03	2,40E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**2396,8**	**74,2**	**Th-234**
1001,1	5,42E-02	2,71E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**2418,7**	**149,8**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,6	6,23E-02	8,12E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**2909,5**	**469,1**	**U-235***
205,6	6,04E-02	7,00E-03	1,24E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**2696,7**	**371,9**	**U-235***
								Mean value of U-238 :		**2489,0**	**74,2**	
								from U-235/Ra-226 with Ra via Rn-Product :		**3170,0**	**165,7**	**U-235***
186,3	2,54E+00	1,21E-02	1,29E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**4388,5**	**49,7**	**U-235/Ra**
67,9	1,00E-01	8,43E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**5482,0**	**649,3**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**5815,1**	**142,7**	**Ra-226**
295,5	6,61E+00	1,25E-02	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**5314,4**	**41,7**	**Rn-Product.**
352,3	1,14E+01	1,53E-02	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**5322,0**	**37,3**	**Rn-Product.**
609,6	8,12E+00	1,25E-02	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**5294,3**	**38,7**	**Rn-Product.**
1120,3	1,71E+00	6,25E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**5273,6**	**55,2**	**Rn-Product.**
								Mean value of the Rn-Product :		**5303,3**	**37,3**	**Rn-Product.**
46,8	1,87E-01	7,61E-03	3,63E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**5114,3**	**306,7**	**Pb-210**
154,4	1,63E-01	8,57E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**5808,9**	**476,8**	**Ra-223***
269,8	4,41E-01	8,50E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**5943,3**	**201,0**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,1	4,34E-02	3,33E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**57,8**	**5,6**	**Ac-228**
#NV	#NV	#NV	#NV	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**57,8**	**5,6**	**Th-Chain**
										Potassium:		
1460,9	2,14E-01	3,16E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**1005,3**	**22,5**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik **Naamoun** **Bore hole N°2** **9.5-10.5m** **wet** **m=246.86g** **14.4.-15.4.97** **n.WD**

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_11**	m(Sample)/g=	246,86		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	04-14-97	t(live)/s=	47859,9	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,1	3,74E-01	9,49E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**2196,9**	**72,5**	**Th-234**
1000,7	6,24E-02	3,13E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**2315,3**	**144,0**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,2	4,63E-02	1,09E-02	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**1870,4**	**476,6**	**U-235***
205,3	6,03E-02	7,61E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**2314,3**	**339,7**	**U-235***
								Mean value of U-238 :		**2221,8**	**72,5**	
								from U-235/Ra-226 with Ra via Rn-Product :		**2622,6**	**138,3**	**U-235***
186,0	2,37E+00	1,31E-02	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**3524,2**	**42,0**	**U-235/Ra**
67,6	9,18E-02	8,42E-03	2,29E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**4509,7**	**560,6**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**4502,3**	**128,1**	**Ra-226**
295,2	6,21E+00	1,36E-02	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**4247,0**	**34,2**	**Rn-Product.**
351,9	1,06E+01	1,65E-02	1,02E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**4224,9**	**30,3**	**Rn-Product.**
609,2	7,60E+00	1,34E-02	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**4158,5**	**31,1**	**Rn-Product.**
1119,9	1,63E+00	6,77E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**4164,9**	**45,1**	**Rn-Product.**
								Mean value of the Rn-Product :		**4201,0**	**30,3**	**Rn-Product.**
46,4	1,46E-01	8,32E-03	3,68E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**3795,2**	**276,1**	**Pb-210**
154,0	1,29E-01	9,36E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**3959,7**	**384,5**	**Ra-223***
269,5	3,73E-01	9,32E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**4296,3**	**162,9**	**Ra-223 + Rn-**
										Thorium-Chain:		
910,7	3,88E-02	3,38E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**43,1**	**4,6**	**Ac-228**
727,2	9,40E-03	2,24E-03	7,45E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**32,9**	**8,5**	**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**40,1**	**4,6**	**Th-Chain**
										Potassium:		
1460,5	2,24E-01	3,57E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**869,7**	**20,5**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 9.5-10.5m dried m=183.90g n.WD

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_11b**	m(Sample)/g=	183,9		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	07.11.97	t(live)/s=	28135,3	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,5	3,69E-01	1,14E-02	2,40E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**2487,2**	**94,9**	**Th-234**
1001,1	5,33E-02	3,84E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**2529,7**	**207,5**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,5	4,80E-02	9,60E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**2359,6**	**525,3**	**U-235***
205,7	5,96E-02	9,28E-03	1,24E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**2802,2**	**486,9**	**U-235***
								Mean value of U-238 :		**2523,3**	**94,9**	
								from U-235/Ra-226 with Ra via Rn-Product :		**3173,9**	**178,1**	**U-235***
186,3	2,30E+00	1,61E-02	1,29E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**4183,9**	**55,1**	**U-235/Ra**
67,9	8,80E-02	1,01E-02	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**4997,1**	**711,5**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**5431,0**	**167,8**	**Ra-226**
295,5	5,81E+00	1,67E-02	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**4927,7**	**42,3**	**Rn-Product.**
352,3	9,97E+00	2,04E-02	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**4933,3**	**37,3**	**Rn-Product.**
609,6	7,15E+00	1,67E-02	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**4938,0**	**39,1**	**Rn-Product.**
1120,3	1,52E+00	8,25E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**4982,1**	**58,8**	**Rn-Product.**
								Mean value of the Rn-Product :		**4942,2**	**37,3**	**Rn-Product.**
46,7	1,60E-01	1,02E-02	3,64E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**4513,4**	**353,6**	**Pb-210**
154,4	1,51E-01	1,25E-02	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**5651,8**	**595,9**	**Ra-223***
269,8	3,73E-01	1,06E-02	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**5304,4**	**214,9**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,2	2,75E-02	3,38E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**38,9**	**5,6**	**Ac-228**
#NV	#NV	#NV	#NV	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**38,9**	**5,6**	**Th-Chain**
										Potassium:		
1461,0	2,00E-01	4,30E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**1002,8**	**28,9**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 3.5-4.5m dried m=143.08g n.WD v.17.9.97

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_13**	m(Sample)/g=	143,08		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	10.04.97	t(live)/s=	260525,2	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,0	1,09E-01	2,11E-03	2,42E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**854,0**	**23,6**	**Th-234**
999,6	1,52E-02	7,33E-04	6,37E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**897,0**	**54,2**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
162,8	1,63E-02	1,75E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**962,4**	**137,5**	**U-235***
204,9	1,73E-02	1,88E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**983,3**	**129,8**	**U-235***
									Mean value of U-238 :	**890,4**	**23,6**	
									from U-235/Ra-226 with Ra via Rn-Product :	**1076,4**	**58,1**	**U-235***
185,6	7,20E-01	2,95E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**1579,9**	**17,1**	**U-235/Ra**
67,5	2,67E-02	2,08E-03	2,30E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**1765,1**	**201,4**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**2097,8**	**47,8**	**Ra-226**
294,7	1,90E+00	3,11E-03	1,09E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**1969,0**	**15,1**	**Rn-Product.**
351,3	3,25E+00	3,87E-03	1,02E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**1966,5**	**13,6**	**Rn-Product.**
608,4	2,28E+00	3,12E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**1943,7**	**14,0**	**Rn-Product.**
1118,6	4,77E-01	1,56E-03	6,09E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**1951,0**	**19,9**	**Rn-Product.**
									Mean value of the Rn-Product :	**1958,0**	**13,6**	**Rn-Product.**
46,2	4,96E-02	1,89E-03	3,71E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**1569,2**	**91,1**	**Pb-210**
153,7	4,39E-02	2,08E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**1978,8**	**155,6**	**Ra-223***
269,0	1,14E-01	2,21E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**1973,4**	**66,8**	**Ra-223 + Rn-**
										Thorium-Chain:		
909,7	2,42E-02	7,79E-04	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**42,5**	**2,2**	**Ac-228**
726,2	8,06E-03	7,41E-04	7,45E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**44,3**	**5,0**	**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
									Mean value of the Thorium-Chain	**43,1**	**2,2**	**Th-Chain**
										Potassium:		
1458,9	1,53E-01	9,98E-04	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**959,8**	**14,4**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 7.5-8.5 m wet m= 205g n.WD 10.-11.5.97

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_14**	m(Sample)/g=	205		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	05.10.97	t(live)/s=	85144,2	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,3	2,95E-01	6,45E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1883,7**	**56,3**	**Th-234**
1000,9	4,38E-02	2,17E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1896,8**	**116,9**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,4	4,84E-02	6,14E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**2207,1**	**349,4**	**U-235***
205,2	4,43E-02	7,00E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**1926,8**	**339,0**	**U-235***
								Mean value of U-238 :		**1924,2**	**56,3**	
								from U-235/Ra-226 with Ra via Rn-Product :		**2433,2**	**128,0**	**U-235***
186,1	2,05E+00	9,04E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**3448,3**	**38,2**	**U-235/Ra**
67,7	8,99E-02	6,45E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**4821,0**	**528,9**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**4592,8**	**109,2**	**Ra-226**
295,3	5,38E+00	9,49E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**4207,3**	**32,7**	**Rn-Product.**
352,0	9,25E+00	1,14E-02	1,02E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**4213,3**	**29,2**	**Rn-Product.**
609,4	6,64E+00	9,31E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**4197,5**	**30,3**	**Rn-Product.**
1120,1	1,41E+00	4,78E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**4228,2**	**43,5**	**Rn-Product.**
								Mean value of the Rn-Product :		**4210,3**	**29,2**	**Rn-Product.**
46,6	1,46E-01	5,72E-03	3,66E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**3973,5**	**233,6**	**Pb-210**
154,2	1,36E-01	6,47E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**4735,6**	**372,8**	**Ra-223***
269,6	3,45E-01	6,44E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**4533,3**	**151,4**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,1	3,64E-02	2,20E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**46,9**	**3,8**	**Ac-228**
727,4	1,21E-02	1,86E-03	7,44E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**49,2**	**8,5**	**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**47,7**	**3,8**	**Th-Chain**
										Potassium:		
1460,8	1,79E-01	2,37E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**817,5**	**17,1**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik **Naamoun** **Bore hole N°2** **7.5-8.5m** **dried** **m=163.05g** **11.-13.7.97**

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample
Spectrum: **taii_14b** m(Sample)/g= 163,05
Mes-date.: 07.11.97 t(live)/s= 171366,6

S t a n d a r d s

	A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g
U: RGU-1	4940	25	136,3
Th: RGTh-1	3246	65	127,5
K: RGK-1	13843	93	175,9

Background
Mes-date: 16.05.97
Spectrum: NE160597.CHN

Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,5	3,23E-01	4,52E-03	2,40E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**2325,1**	**54,3**	**Th-234**
1001,2	4,76E-02	1,46E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**2507,5**	**115,4**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,6	5,64E-02	4,31E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**3026,4**	**363,5**	**U-235***
205,7	5,38E-02	3,72E-03	1,24E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**2768,0**	**276,3**	**U-235***
								Mean value of U-238 :		**2496,9**	**54,3**	
								from U-235/Ra-226 with Ra via Rn-Product :		**2886,0**	**151,2**	**U-235***
186,3	2,21E+00	6,10E-03	1,29E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**4381,2**	**43,8**	**U-235/Ra**
67,9	8,89E-02	4,01E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**5404,0**	**505,9**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**5796,3**	**117,5**	**Ra-226**
295,6	5,93E+00	6,77E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**5520,5**	**40,9**	**Rn-Product.**
352,3	1,01E+01	8,33E-03	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**5503,7**	**36,9**	**Rn-Product.**
609,7	7,19E+00	6,77E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**5492,8**	**38,2**	**Rn-Product.**
1120,4	1,51E+00	3,38E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**5497,4**	**53,0**	**Rn-Product.**
								Mean value of the Rn-Product :		**5503,8**	**36,9**	**Rn-Product.**
46,8	1,75E-01	4,06E-03	3,63E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**5149,4**	**250,1**	**Pb-210**
154,4	1,37E-01	4,55E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**5573,5**	**393,0**	**Ra-223***
269,8	3,81E-01	4,24E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**5942,1**	**173,1**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,4	3,54E-02	1,57E-03	6,68E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**55,4**	**3,6**	**Ac-228**
#NV	#NV	#NV	#NV	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**55,4**	**3,6**	**Th-Chain**
										Potassium:		
1461,1	1,86E-01	1,70E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**1034,7**	**17,8**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 8.5-9.5 m wet m=263.75g 15.4.97

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_21**	m(Sample)/g=	263,75		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	04-15-97	t(live)/s=	40750,5	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,1	1,95E-01	9,10E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1114,9**	**59,3**	**Th-234**
1000,8	3,53E-02	3,07E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1243,0**	**119,4**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,2	5,29E-02	9,67E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**2049,0**	**424,4**	**U-235***
205,4	4,91E-02	8,32E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**1803,8**	**336,5**	**U-235***
								Mean value of U-238 :		**1357,0**	**59,3**	
								from U-235/Ra-226 with Ra via Rn-Product :		**1467,6**	**109,1**	**U-235***
186,0	1,73E+00	1,26E-02	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**2470,4**	**33,1**	**U-235/Ra**
67,6	5,31E-02	8,17E-03	2,29E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**2535,7**	**448,2**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**3306,6**	**102,5**	**Ra-226**
295,2	4,95E+00	1,33E-02	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**3235,9**	**27,3**	**Rn-Product.**
351,9	8,51E+00	1,58E-02	1,02E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**3230,8**	**23,9**	**Rn-Product.**
609,2	6,17E+00	1,30E-02	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**3211,8**	**24,8**	**Rn-Product.**
1120,0	1,32E+00	6,72E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**3211,2**	**37,0**	**Rn-Product.**
								Mean value of the Rn-Product :		**3223,2**	**23,9**	**Rn-Product.**
46,4	1,08E-01	8,10E-03	3,68E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**2755,0**	**244,2**	**Pb-210**
154,0	1,00E-01	9,20E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**2958,6**	**334,1**	**Ra-223***
269,5	3,00E-01	9,20E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**3297,8**	**140,1**	**Ra-223 + Rn-**
										Thorium-Chain:		
910,8	3,62E-02	3,14E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**38,1**	**4,1**	**Ac-228**
727,0	7,93E-03	2,21E-03	7,45E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**26,3**	**7,9**	**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**35,0**	**4,1**	**Th-Chain**
										Potassium:		
1460,6	2,10E-01	3,46E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**773,0**	**18,5**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 8.5-9.5m dried m=133.95g

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_21b**	m(Sample)/g=	133,95		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	07-13-97	t(live)/s=	59202,3	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,5	2,22E-01	7,69E-03	2,40E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1803,5**	**75,1**	**Th-234**
1001,3	3,47E-02	2,08E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**2174,8**	**153,9**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,7	3,40E-02	6,00E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**2116,1**	**426,1**	**U-235***
205,7	3,51E-02	7,04E-03	1,24E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**2107,4**	**454,7**	**U-235***
								Mean value of U-238 :		**1975,3**	**75,1**	
								from U-235/Ra-226 with Ra via Rn-Product :		**2156,5**	**158,4**	**U-235***
186,4	1,69E+00	9,37E-03	1,29E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**3910,6**	**46,7**	**U-235/Ra**
68,0	7,04E-02	6,99E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**4836,1**	**630,2**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**5364,1**	**138,1**	**Ra-226**
295,6	4,74E+00	1,04E-02	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**5173,0**	**41,7**	**Rn-Product.**
352,3	8,10E+00	1,27E-02	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**5175,7**	**37,1**	**Rn-Product.**
609,7	5,82E+00	1,04E-02	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**5256,7**	**39,4**	**Rn-Product.**
1120,5	1,23E+00	5,20E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**5337,6**	**58,0**	**Rn-Product.**
								Mean value of the Rn-Product :		**5227,6**	**37,1**	**Rn-Product.**
46,8	1,17E-01	6,28E-03	3,63E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**3780,6**	**265,0**	**Pb-210**
154,5	1,15E-01	7,11E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**5423,5**	**482,1**	**Ra-223***
269,9	2,77E-01	7,52E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**5062,9**	**200,2**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,4	3,86E-02	2,58E-03	6,68E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**71,8**	**6,3**	**Ac-228**
#NV	#NV	#NV	#NV	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**71,8**	**6,3**	**Th-Chain**
										Potassium:		
1461,1	1,90E-01	2,69E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**1264,2**	**27,5**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 5.5-6.5m wet m=265.9g

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_22b**	m(Sample)/g=	265,9		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	05.11.97	t(live)/s=	185550,8	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,4	4,58E-01	6,26E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**2603,5**	**60,2**	**Th-234**
1001,1	7,50E-02	2,08E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**2623,3**	**115,2**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,5	7,10E-02	6,10E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**2736,0**	**346,5**	**U-235***
205,6	8,27E-02	5,24E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**3021,8**	**289,4**	**U-235***
								Mean value of U-238 :		**2673,1**	**60,2**	
								from U-235/Ra-226 with Ra via Rn-Product :		**2627,7**	**179,9**	**U-235***
186,3	3,64E+00	8,76E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**5156,3**	**50,6**	**U-235/Ra**
67,8	1,50E-01	5,64E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**7133,7**	**642,2**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**7021,3**	**133,8**	**Ra-226**
295,5	1,09E+01	9,23E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**7057,5**	**51,4**	**Rn-Product.**
352,2	1,87E+01	1,10E-02	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**7049,8**	**46,5**	**Rn-Product.**
609,6	1,36E+01	9,05E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**7038,5**	**48,1**	**Rn-Product.**
1120,4	2,94E+00	4,67E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**7080,2**	**66,2**	**Rn-Product.**
								Mean value of the Rn-Product :		**7054,7**	**46,5**	**Rn-Product.**
46,6	2,45E-01	5,58E-03	3,65E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**6190,0**	**299,2**	**Pb-210**
154,3	2,51E-01	6,42E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**7396,4**	**494,9**	**Ra-223***
269,7	6,80E-01	6,41E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**7443,3**	**211,4**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,3	3,33E-02	1,95E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**34,9**	**2,7**	**Ac-228**
#NV	#NV	#NV	#NV	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**34,9**	**2,7**	**Th-Chain**
										Potassium:		
1461,1	1,64E-01	2,07E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**598,8**	**12,2**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 5.5-6.5m dried m=204.35g

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_22b**	m(Sample)/g=	204,35		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	07-14-97	t(live)/s=	15195,2	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,5	4,98E-01	2,33E-02	2,40E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**3180,5**	**169,4**	**Th-234**
1001,4	7,46E-02	7,17E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**3235,2**	**339,8**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,5	4,70E-02	2,05E-02	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**2145,6**	**963,5**	**U-235***
205,9	9,23E-02	1,94E-02	1,24E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**4023,0**	**906,1**	**U-235***
								Mean value of U-238 :		**3236,5**	**169,4**	
								from U-235/Ra-226 with Ra via Rn-Product :		**3741,0**	**299,9**	**U-235***
186,4	3,92E+00	3,01E-02	1,29E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**6612,2**	**90,9**	**U-235/Ra**
68,0	1,73E-01	2,13E-02	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**9303,8**	**1389,5**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**9147,4**	**286,4**	**Ra-226**
295,6	1,12E+01	3,15E-02	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**8791,2**	**75,0**	**Rn-Product.**
352,3	1,92E+01	3,87E-02	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**8768,2**	**66,0**	**Rn-Product.**
609,7	1,38E+01	3,15E-02	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**8729,8**	**68,8**	**Rn-Product.**
1120,5	2,93E+00	1,57E-02	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**8791,5**	**103,2**	**Rn-Product.**
								Mean value of the Rn-Product :		**8767,8**	**66,0**	**Rn-Product.**
46,8	2,68E-01	1,91E-02	3,63E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**7261,4**	**618,9**	**Pb-210**
154,5	2,59E-01	2,40E-02	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**9003,3**	**1021,2**	**Ra-223***
269,9	7,04E-01	2,29E-02	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**9251,6**	**407,0**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,3	3,11E-02	6,19E-03	6,68E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**40,2**	**8,8**	**Ac-228**
#NV	#NV	#NV	#NV	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**40,2**	**8,8**	**Th-Chain**
										Potassium:		
1461,2	1,63E-01	6,19E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**745,0**	**33,6**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 18.5-19.5m dried m=157.13g WD 2.-4.10.97

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_24**	m(Sample)/g=	157,13		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	10.02.97	t(live)/s=	153394,7	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,0	2,72E-01	3,91E-03	2,42E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**2007,9**	**47,5**	**Th-234**
999,7	4,65E-02	1,34E-03	6,37E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**2530,8**	**113,2**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,0	4,36E-02	3,66E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**2403,2**	**300,9**	**U-235***
205,0	4,39E-02	3,81E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**2326,0**	**263,5**	**U-235***
								Mean value of U-238 :		**2224,8**	**47,5**	
								from U-235/Ra-226 with Ra via Rn-Product :		**2856,9**	**112,5**	**U-235***
185,7	1,61E+00	5,56E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**3279,1**	**34,2**	**U-235/Ra**
67,5	5,33E-02	3,81E-03	2,29E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**3322,9**	**363,8**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**4070,9**	**95,5**	**Ra-226**
294,8	3,75E+00	5,70E-03	1,09E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**3596,2**	**27,4**	**Rn-Product.**
351,4	6,41E+00	7,01E-03	1,02E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**3595,6**	**24,6**	**Rn-Product.**
608,6	4,56E+00	5,70E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**3591,4**	**25,6**	**Rn-Product.**
1118,9	9,58E-01	2,89E-03	6,09E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**3603,2**	**36,3**	**Rn-Product.**
								Mean value of the Rn-Product :		**3596,1**	**24,6**	**Rn-Product.**
46,3	9,39E-02	3,10E-03	3,70E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**2843,8**	**155,0**	**Pb-210**
153,8	8,50E-02	3,44E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**3568,0**	**265,4**	**Ra-223***
269,1	2,44E-01	4,07E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**3911,0**	**125,9**	**Ra-223 + Rn-**
										Thorium-Chain:		
909,9	3,21E-02	1,28E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**52,0**	**3,1**	**Ac-228**
726,5	1,07E-02	1,13E-03	7,45E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**54,4**	**6,8**	**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**52,8**	**3,1**	**Th-Chain**
										Potassium:		
1459,2	1,81E-01	1,64E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**1040,5**	**17,9**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 6.5-7.5m wet m=266.73g 15.4.-16.4.97

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_25b**	m(Sample)/g=	266,73		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	04-15-97	t(live)/s=	45110,6	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,2	2,79E-01	1,09E-02	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1586,7**	**72,9**	**Th-234**
1000,7	5,29E-02	3,68E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1844,4**	**147,2**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,1	3,39E-02	1,08E-02	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**1306,3**	**436,2**	**U-235***
205,3	5,25E-02	9,22E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**1917,3**	**368,5**	**U-235***
								Mean value of U-238 :		**1683,5**	**72,9**	
								from U-235/Ra-226 with Ra via Rn-Product :		**1780,2**	**159,7**	**U-235***
186,0	2,74E+00	1,55E-02	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**3873,9**	**46,6**	**U-235/Ra**
67,6	1,22E-01	9,89E-03	2,29E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**5786,0**	**673,6**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**5519,0**	**136,4**	**Ra-226**
295,2	8,45E+00	1,65E-02	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**5483,6**	**43,2**	**Rn-Product.**
351,9	1,45E+01	1,96E-02	1,02E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**5454,4**	**38,3**	**Rn-Product.**
609,2	1,05E+01	1,61E-02	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**5417,4**	**39,6**	**Rn-Product.**
1119,9	2,26E+00	8,29E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**5423,6**	**56,9**	**Rn-Product.**
								Mean value of the Rn-Product :		**5445,8**	**38,3**	**Rn-Product.**
46,4	1,81E-01	9,84E-03	3,68E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**4618,6**	**326,0**	**Pb-210**
154,1	2,00E-01	1,13E-02	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**5874,0**	**499,0**	**Ra-223***
269,4	4,98E-01	1,13E-02	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**5446,0**	**197,4**	**Ra-223 + Rn-**
										Thorium-Chain:		
910,9	4,03E-02	3,75E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**42,0**	**4,8**	**Ac-228**
727,4	1,21E-02	2,66E-03	7,44E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**40,0**	**9,6**	**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**41,4**	**4,8**	**Th-Chain**
										Kalium:		
1460,6	2,09E-01	3,86E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**761,7**	**19,7**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik **Naamoun** **Bore hole N°2** **6.5-7.5m** **dried** **m=190.68g** **n.WD** **v.26.6.97**

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_25b**	m(Sample)/g=	190,68		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	07-14-97	t(live)/s=	65519,7	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,6	3,05E-01	8,55E-03	2,40E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**2018,1**	**71,5**	**Th-234**
1001,2	4,02E-02	2,56E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1850,2**	**137,6**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,8	5,37E-02	1,02E-02	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**2570,0**	**550,3**	**U-235***
205,6	6,88E-02	7,25E-03	1,24E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**3153,9**	**406,0**	**U-235***
								Mean value of U-238 :		**2187,1**	**71,5**	
								from U-235/Ra-226 with Ra via Rn-Product :		**2310,6**	**190,2**	**U-235***
186,4	2,78E+00	1,23E-02	1,29E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**4926,1**	**54,6**	**U-235/Ra**
67,9	1,15E-01	7,71E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**6416,6**	**682,8**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**6983,1**	**149,3**	**Ra-226**
295,6	8,36E+00	1,31E-02	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**6900,0**	**52,7**	**Rn-Product.**
352,4	1,43E+01	1,59E-02	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**6880,0**	**47,2**	**Rn-Product.**
609,8	1,03E+01	1,31E-02	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**6890,8**	**49,2**	**Rn-Product.**
1120,5	2,17E+00	6,59E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**6888,9**	**69,4**	**Rn-Product.**
								Mean value of the Rn-Product :		**6889,7**	**47,2**	**Rn-Product.**
46,8	2,11E-01	6,96E-03	3,63E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**5854,0**	**318,7**	**Pb-210**
154,5	1,80E-01	8,88E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**6570,5**	**525,2**	**Ra-223***
269,9	5,14E-01	8,81E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**7108,9**	**230,6**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,3	3,69E-02	2,99E-03	6,68E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**50,6**	**5,1**	**Ac-228**
#NV	#NV	#NV	#NV	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**50,6**	**5,1**	**Th-Chain**
										Potassium:		
1461,3	1,93E-01	3,14E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**938,5**	**22,3**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik **Naamoun** **Bore hole N°2** **17.5-18.5m** **wet** **m=259.9g** **30.-31.5.97**

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_43**	m(Sample)/g=	259,9		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	05-30-97	t(live)/s=	116887,7	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,4	2,08E-01	5,49E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1191,7**	**40,6**	**Th-234**
1000,8	3,43E-02	1,82E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1221,2**	**79,1**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,4	2,69E-02	5,27E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**1050,7**	**230,3**	**U-235***
205,4	3,91E-02	4,50E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**1449,4**	**198,9**	**U-235***
								Mean value of U-238 :		**1221,5**	**40,6**	
								from U-235/Ra-226 with Ra via Rn-Product :		**1708,8**	**101,0**	**U-235***
186,2	1,90E+00	7,68E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**2732,3**	**29,5**	**U-235/Ra**
67,7	7,82E-02	4,97E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**3752,7**	**391,4**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**3866,9**	**82,2**	**Ra-226**
295,4	5,37E+00	8,10E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**3546,4**	**27,0**	**Rn-Product.**
352,1	9,22E+00	9,68E-03	1,02E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**3535,9**	**24,1**	**Rn-Product.**
609,4	6,58E+00	7,92E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**3460,9**	**24,6**	**Rn-Product.**
1120,1	1,40E+00	4,07E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**3445,2**	**34,4**	**Rn-Product.**
								Mean value of the Rn-Product :		**3500,7**	**24,1**	**Rn-Product.**
46,6	1,56E-01	4,93E-03	3,65E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**3964,2**	**212,4**	**Pb-210**
154,2	1,22E-01	5,57E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**3651,9**	**282,9**	**Ra-223***
269,7	3,40E-01	5,51E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**3775,3**	**120,3**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,0	4,96E-02	1,92E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**52,7**	**3,1**	**Ac-228**
727,4	1,43E-02	1,34E-03	7,44E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**47,9**	**5,5**	**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**51,1**	**3,1**	**Th-Chain**
										Potassium:		
1460,7	2,29E-01	2,14E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**853,7**	**14,8**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 17.5-18.5m dried m=178.77g v.26.6.97

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_43b**	m(Sample)/g=	178,77		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	07-16-97	t(live)/s=	2598,9	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,5	2,30E-01	3,54E-02	2,40E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1571,9**	**250,9**	**Th-234**
1001,2	2,19E-02	8,85E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1066,2**	**436,6**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
#NV	#NV	#NV	#NV	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00			**U-235***
#NV	#NV	#NV	#NV	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00			**U-235***
									Mean value of U-238 :	**1430,1**	**250,9**	
									from U-235/Ra-226 with Ra via Rn-Product :	**2540,9**	**308,5**	**U-235***
186,4	1,78E+00	4,66E-02	1,29E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**3291,6**	**104,0**	**U-235/Ra**
68,0	2,31E-02	3,92E-02	2,27E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**1330,3**	**2270,5**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**4689,6**	**370,5**	**Ra-226**
295,5	4,47E+00	4,77E-02	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**3874,6**	**61,7**	**Rn-Product.**
352,3	7,59E+00	5,85E-02	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**3841,9**	**49,5**	**Rn-Product.**
609,7	5,43E+00	4,77E-02	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**3839,8**	**53,8**	**Rn-Product.**
1120,5	1,15E+00	2,39E-02	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**3878,4**	**101,3**	**Rn-Product.**
									Mean value of the Rn-Product :	**3855,1**	**49,5**	**Rn-Product.**
46,7	1,23E-01	3,19E-02	3,65E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**3496,6**	**936,5**	**Pb-210**
154,4	6,16E-02	3,27E-02	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**2350,8**	**1267,7**	**Ra-223***
269,9	2,78E-01	3,23E-02	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**4036,4**	**497,9**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,0	4,77E-02	1,08E-02	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**69,1**	**17,0**	**Ac-228**
#NV	#NV	#NV	#NV	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
									Mean value of the Thorium-Chain	**69,1**	**17,0**	**Th-Chain**
										Potassium:		
1461,1	2,02E-01	1,31E-02	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**1037,9**	**74,5**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 16.5-17.5m wet m=241.53g WD

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample
Spectrum: **taii_44** m(Sample)/g= 241,53
Mes-date.: 06.04.97 t(live)/s= 69952,3

S t a n d a r d s

	A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g
U: RGU-1	4940	25	136,3
Th: RGTh-1	3246	65	127,5
K: RGK-1	13843	93	175,9

Background
Mes-date: 16.05.97
Spectrum: NE160597.CHN

Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,4	2,11E-01	6,53E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1247,2**	**47,6**	**Th-234**
1001,0	3,63E-02	2,19E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1373,1**	**97,6**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,5	2,55E-02	6,22E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**1044,4**	**275,1**	**U-235***
205,6	3,83E-02	5,33E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**1491,5**	**236,4**	**U-235***
								Mean value of U-238 :		**1297,7**	**47,6**	
								from U-235/Ra-226 with Ra via Rn-Product :		**1406,1**	**96,2**	**U-235***
186,3	1,57E+00	9,05E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**2362,8**	**28,7**	**U-235/Ra**
67,8	6,98E-02	6,55E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**3458,4**	**435,3**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**3162,7**	**86,0**	**Ra-226**
295,5	4,48E+00	9,56E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**3109,6**	**24,9**	**Rn-Product.**
352,2	7,67E+00	1,14E-02	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**3097,4**	**22,0**	**Rn-Product.**
609,6	5,50E+00	9,35E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**3056,4**	**22,7**	**Rn-Product.**
1120,3	1,17E+00	4,83E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**3053,9**	**33,0**	**Rn-Product.**
								Mean value of the Rn-Product :		**3081,1**	**22,0**	**Rn-Product.**
46,7	1,23E-01	5,82E-03	3,65E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**3192,9**	**207,2**	**Pb-210**
154,3	1,07E-01	6,55E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**3339,4**	**294,6**	**Ra-223***
269,8	2,71E-01	6,48E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**3166,2**	**117,5**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,2	4,83E-02	2,27E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**54,5**	**3,7**	**Ac-228**
#NV	#NV	#NV	#NV	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**54,5**	**3,7**	**Th-Chain**
										Potassium:		
1461,0	2,15E-01	2,59E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**850,8**	**16,9**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 16.5-17.5m dried m=178.87g n.WD

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_44b**	m(Sample)/g=	178,87		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	07-16-97	t(live)/s=	9141,3	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,5	2,16E-01	1,32E-02	2,40E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1477,1**	**99,7**	**Th-234**
1001,1	2,80E-02	5,03E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1360,8**	**254,2**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
#NV	#NV	#NV	#NV	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00			**U-235***
#NV	#NV	#NV	#NV	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00			**U-235***
								Mean value of U-238 :		**1446,2**	**99,7**	
								from U-235/Ra-226 with Ra via Rn-Product :		**2591,2**	**181,6**	**U-235***
186,3	1,67E+00	2,24E-02	1,29E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**3087,4**	**59,1**	**U-235/Ra**
67,9	7,36E-02	1,29E-02	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**4243,4**	**832,7**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**4320,0**	**178,3**	**Ra-226**
295,5	4,01E+00	2,43E-02	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**3470,4**	**39,8**	**Rn-Product.**
352,3	6,82E+00	2,91E-02	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**3451,9**	**33,0**	**Rn-Product.**
609,6	4,88E+00	2,41E-02	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**3448,2**	**35,4**	**Rn-Product.**
1120,4	1,04E+00	1,20E-02	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**3478,7**	**60,3**	**Rn-Product.**
								Mean value of the Rn-Product :		**3460,0**	**33,0**	**Rn-Product.**
46,6	1,41E-01	1,49E-02	3,65E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**4024,1**	**469,7**	**Pb-210**
154,5	8,39E-02	1,48E-02	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**3202,3**	**608,0**	**Ra-223***
269,8	2,82E-01	1,65E-02	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**4099,0**	**276,1**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,1	2,83E-02	4,05E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**41,0**	**6,7**	**Ac-228**
#NV	#NV	#NV	#NV	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**41,0**	**6,7**	**Th-Chain**
										Potassium:		
1461,0	2,09E-01	7,00E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**1072,5**	**43,6**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik **Naamoun** **Bore hole N°2** **15.5-16.5m** **wet** **m=265.37g** **31.5.-1.6.97**

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_45**	m(Sample)/g=	265,37		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	05-31-97	t(live)/s=	75400,8	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,3	2,26E-01	6,60E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1288,6**	**47,1**	**Th-234**
1000,8	3,81E-02	2,23E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1334,6**	**92,8**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,3	4,24E-02	6,35E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**1635,7**	**291,0**	**U-235***
205,4	3,84E-02	5,44E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**1404,7**	**226,0**	**U-235***
								Mean value of U-238 :		**1350,8**	**47,1**	
								from U-235/Ra-226 with Ra via Rn-Product :		**1628,5**	**97,8**	**U-235***
186,1	1,76E+00	9,24E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**2495,9**	**29,3**	**U-235/Ra**
67,7	7,59E-02	5,92E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**3613,0**	**412,1**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**3355,8**	**86,6**	**Ra-226**
295,3	4,88E+00	9,67E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**3176,0**	**25,1**	**Rn-Product.**
352,0	8,36E+00	1,15E-02	1,02E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**3157,8**	**22,2**	**Rn-Product.**
609,3	6,04E+00	9,44E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**3124,9**	**22,9**	**Rn-Product.**
1120,0	1,29E+00	4,91E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**3124,5**	**33,0**	**Rn-Product.**
								Mean value of the Rn-Product :		**3147,1**	**22,2**	**Rn-Product.**
46,5	1,25E-01	5,86E-03	3,67E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**3173,8**	**205,4**	**Pb-210**
154,2	1,13E-01	6,68E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**3319,2**	**288,3**	**Ra-223***
269,7	2,93E-01	6,66E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**3213,7**	**116,4**	**Ra-223 + Rn-**
										Thorium-Chain:		
910,9	4,45E-02	2,29E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**46,6**	**3,3**	**Ac-228**
727,2	1,81E-02	1,59E-03	7,44E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**59,8**	**6,5**	**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**51,9**	**3,3**	**Th-Chain**
										Potassium:		
1460,6	2,34E-01	2,61E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**857,7**	**16,3**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 15.5-16.5m dried m=178.68g n.WD

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_45b**	m(Sample)/g=	178,68		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	07-16-97	t(live)/s=	2794,4	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,6	1,83E-01	3,11E-02	2,40E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1253,6**	**219,9**	**Th-234**
#NV	#NV	#NV	#NV	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00			**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
#NV	#NV	#NV	#NV	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00			**U-235***
#NV	#NV	#NV	#NV	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00			**U-235***
								Mean value of U-238 :		**1253,6**	**219,9**	
								from U-235/Ra-226 with Ra via Rn-Product :		**2010,0**	**295,4**	**U-235***
186,4	1,66E+00	4,44E-02	1,29E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**3079,5**	**98,8**	**U-235/Ra**
67,9	2,33E-02	3,47E-02	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**1341,2**	**2010,9**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**4450,8**	**338,2**	**Ra-226**
295,6	4,52E+00	4,65E-02	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**3920,7**	**61,0**	**Rn-Folg.**
352,3	7,59E+00	5,69E-02	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**3840,2**	**48,8**	**Rn-Folg.**
#NV	#NV	#NV	#NV	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04			**Rn-Folg.**
1120,5	1,16E+00	2,33E-02	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**3904,7**	**99,5**	**Rn-Folg.**
								Mean value of the Rn-Product :		**3882,5**	**48,8**	**Rn-Folg.**
46,9	1,41E-01	2,79E-02	3,61E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**3985,5**	**824,6**	**Pb-210**
154,6	1,26E-01	3,83E-02	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**4810,9**	**1511,7**	**Ra-223***
269,8	2,33E-01	2,97E-02	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**3381,0**	**454,8**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,2	3,08E-02	8,95E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**44,6**	**13,9**	**Ac-228**
#NV	#NV	#NV	#NV	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**44,6**	**13,9**	**Th-Chain**
										Potassium:		
1461,3	2,01E-01	1,36E-02	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**1033,7**	**77,2**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 14.5-15.5m wet m=247.8g WD

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_46**	m(Sample)/g=	247,8		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	06.03.97	t(live)/s=	97832,6	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,4	1,63E-01	5,14E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**952,1**	**36,9**	**Th-234**
1000,9	2,94E-02	1,72E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1087,9**	**75,6**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,4	2,83E-02	4,95E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**1138,1**	**227,7**	**U-235***
205,5	2,90E-02	4,25E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**1110,1**	**183,5**	**U-235***
								Mean value of U-238 :		**1027,1**	**36,9**	
								from U-235/Ra-226 with Ra via Rn-Product :		**1350,6**	**80,9**	**U-235***
186,2	1,40E+00	7,21E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**2076,5**	**24,1**	**U-235/Ra**
67,7	4,77E-02	4,62E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**2335,4**	**299,7**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**2864,5**	**70,0**	**Ra-226**
295,4	3,86E+00	7,55E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**2636,1**	**20,8**	**Rn-Product.**
352,1	6,64E+00	8,99E-03	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**2631,3**	**18,5**	**Rn-Product.**
609,5	4,79E+00	7,39E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**2610,9**	**19,1**	**Rn-Product.**
1120,2	1,02E+00	3,81E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**2602,1**	**27,4**	**Rn-Product.**
								Mean value of the Rn-Product :		**2621,4**	**18,5**	**Rn-Product.**
46,6	9,65E-02	4,61E-03	3,66E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**2487,3**	**162,5**	**Pb-210**
154,3	9,17E-02	5,21E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**2814,9**	**239,6**	**Ra-223***
269,7	2,49E-01	5,18E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**2859,1**	**99,7**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,1	5,15E-02	1,83E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**56,9**	**3,2**	**Ac-228**
727,4	1,70E-02	1,66E-03	7,44E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**59,2**	**7,0**	**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**57,6**	**3,2**	**Th-Chain**
										Potassium:		
1460,8	2,05E-01	2,11E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**794,4**	**14,5**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 14.5-15.5m dried m=193.77g

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_46b**	m(Sample)/g=	193,77		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	07-16-97	t(live)/s=	2564,3	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,7	1,47E-01	3,24E-02	2,40E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**962,9**	**217,2**	**Th-234**
#NV	#NV	#NV	#NV	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00			**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
#NV	#NV	#NV	#NV	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00			**U-235***
#NV	#NV	#NV	#NV	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00			**U-235***
								Mean value of U-238 :		**962,9**	**217,2**	
								from U-235/Ra-226 with Ra via Rn-Product :		**1592,2**	**254,1**	**U-235***
186,4	1,35E+00	4,17E-02	1,29E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**2363,5**	**85,6**	**U-235/Ra**
68,2	2,89E-02	2,30E-02	2,27E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**1589,4**	**1281,0**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**3415,4**	**313,0**	**Ra-226**
295,6	3,53E+00	4,25E-02	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**2878,5**	**49,7**	**Rn-Product.**
352,4	6,23E+00	5,38E-02	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**2960,6**	**40,9**	**Rn-Product.**
609,7	4,51E+00	4,41E-02	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**2985,2**	**44,7**	**Rn-Product.**
1120,5	9,34E-01	2,18E-02	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**2930,1**	**84,3**	**Rn-Product.**
								Mean value of the Rn-Product :		**2942,6**	**40,9**	**Rn-Product.**
46,9	2,00E-01	3,16E-02	3,61E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**5513,0**	**920,0**	**Pb-210**
154,6	1,02E-01	2,65E-02	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**3672,3**	**997,4**	**Ra-223***
270,1	2,32E-01	2,92E-02	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**3167,5**	**421,6**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,2	5,19E-02	9,36E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**70,2**	**14,1**	**Ac-228**
#NV	#NV	#NV	#NV	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**70,2**	**14,1**	**Th-Chain**
										Potassium:		
1461,1	2,03E-01	1,25E-02	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**972,6**	**66,6**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experiomental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 13.5-14.5m wet m=243.3g WD

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_47**	m(Sample)/g=	243,3		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	06.01.97	t(live)/s=	65700,1	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,3	2,36E-01	6,68E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1389,5**	**49,7**	**Th-234**
1000,6	3,63E-02	2,21E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1365,3**	**97,7**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,1	3,73E-02	6,33E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**1518,9**	**296,8**	**U-235***
205,4	4,24E-02	5,42E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**1640,1**	**243,5**	**U-235***
								Mean value of U-238 :		**1426,9**	**49,7**	
								from U-235/Ra-226 with Ra via Rn-Product :		**2432,5**	**99,9**	**U-235***
186,1	1,77E+00	9,38E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**2656,8**	**31,2**	**U-235/Ra**
67,7	6,60E-02	5,25E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**3258,8**	**375,5**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**3580,4**	**92,0**	**Ra-226**
295,3	4,08E+00	9,51E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**2817,0**	**23,0**	**Rn-Product.**
352,0	7,02E+00	1,13E-02	1,02E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**2821,3**	**20,3**	**Rn-Product.**
609,3	5,11E+00	9,32E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**2824,3**	**21,2**	**Rn-Product.**
1119,9	1,10E+00	4,81E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**2843,0**	**31,2**	**Rn-Product.**
								Mean value of the Rn-Product :		**2825,1**	**20,3**	**Rn-Product.**
46,5	1,16E-01	5,94E-03	3,67E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**3005,2**	**204,7**	**Pb-210**
154,1	1,06E-01	6,68E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**3292,0**	**295,0**	**Ra-223***
269,5	3,10E-01	6,68E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**3603,8**	**127,6**	**Ra-223 + Rn-**
										Thorium-Chain:		
910,8	4,56E-02	2,27E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**51,2**	**3,6**	**Ac-228**
726,9	7,61E-03	1,61E-03	7,45E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**26,9**	**6,2**	**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**45,6**	**3,6**	**Th-Chain**
										Potassium:		
1460,5	2,16E-01	2,60E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**850,2**	**16,9**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik **Naamoun** **Bore hole N°2** **13.5-14.5m** **dried** **m=184.72g** **30.6.97**

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_47b**	m(Probe)/g=	184,72		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	07-16-97	t(live)/s=	56813	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Schwäch. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Schwäch. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,6	2,58E-01	7,39E-03	2,40E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1730,7**	**62,5**	**Th-234**
1001,2	3,48E-02	2,38E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1646,6**	**129,3**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,6	4,11E-02	7,13E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**2014,9**	**400,0**	**U-235***
205,6	3,88E-02	6,14E-03	1,24E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**1819,8**	**320,5**	**U-235***
									Mean value of U-238 :	**1747,6**	**62,5**	
									from U-235/Ra-226 with Ra via Rn-Product :	**1948,1**	**135,0**	**U-235***
186,4	1,83E+00	1,05E-02	1,29E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**3319,9**	**40,2**	**U-235/Ra**
67,9	8,59E-02	6,60E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**4865,1**	**550,9**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**4500,8**	**117,3**	**Ra-226**
295,6	5,17E+00	1,10E-02	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**4365,4**	**35,0**	**Rn-Product.**
352,3	8,78E+00	1,35E-02	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**4332,9**	**31,0**	**Rn-Product.**
609,7	6,31E+00	1,11E-02	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**4341,6**	**32,4**	**Rn-Product.**
1120,5	1,34E+00	5,67E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**4366,7**	**47,5**	**Rn-Product.**
									Mean value of the Rn-Product :	**4349,9**	**31,0**	**Rn-Product.**
46,8	1,47E-01	7,34E-03	3,63E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**4121,4**	**276,6**	**Pb-210**
154,5	1,20E-01	8,33E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**4473,1**	**422,6**	**Ra-223***
269,9	3,27E-01	7,45E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**4629,3**	**168,0**	**Ra-223 + Rn-**
										Thorium-Chain:		
911,3	4,19E-02	2,80E-03	6,68E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**59,0**	**5,1**	**Ac-228**
#NV	#NV	#NV	#NV	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00			**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
									Mean value of the Thorium-Chain	**59,0**	**5,1**	**Th-Chain**
										Potassium:		
1461,1	2,09E-01	2,92E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**1043,9**	**22,6**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°2 12.5-13.5m wet m=257.29g WD

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taii_48**	m(Sample)/g=	257,29		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	06.02.97	t(live)/s=	82698,1	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,3	3,06E-01	6,97E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**1763,2**	**54,1**	**Th-234**
1000,8	5,32E-02	2,31E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1910,7**	**107,5**	**Pa-234m**
#NV	#NV	#NV	#NV	143,8	2,69E-01	6,65E-03	1,43E-01	0,00E+00	0,00E+00			**U-235***
163,4	4,93E-02	6,64E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**1940,5**	**319,7**	**U-235***
205,4	4,73E-02	5,68E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**1767,7**	**250,1**	**U-235***
								Mean value of U-238 :		**1822,0**	**54,1**	
								from U-235/Ra-226 with Ra via Rn-Product :		**2464,6**	**118,5**	**U-235***
186,1	2,24E+00	9,73E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**3238,1**	**35,7**	**U-235/Ra**
67,7	8,30E-02	5,47E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**4000,8**	**423,2**	**Th-230**
								from U-235/Ra-226 with U via Mean value of U-238 :		**4301,6**	**103,2**	**Ra-226**
295,3	5,76E+00	1,01E-02	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**3834,4**	**29,7**	**Rn-Product.**
352,0	9,90E+00	1,20E-02	1,02E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**3823,0**	**26,5**	**Rn-Product.**
609,4	7,18E+00	9,84E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**3802,5**	**27,4**	**Rn-Product.**
1120,0	1,54E+00	5,08E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**3815,3**	**39,0**	**Rn-Product.**
								Mean value of the Rn-Product :		**3818,8**	**26,5**	**Rn-Product.**
46,6	1,52E-01	6,15E-03	3,66E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**3890,4**	**232,2**	**Pb-210**
154,2	1,39E-01	6,99E-03	1,39E-01	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00	**4184,1**	**336,7**	**Ra-223***
269,6	3,66E-01	6,95E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**4090,9**	**137,7**	**Ra-223 + Rn-**
										Thorium-Chain:		
910,9	4,37E-02	2,33E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**46,9**	**3,4**	**Ac-228**
727,1	9,26E-03	1,67E-03	7,45E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**31,4**	**6,3**	**Bi-212**
#NV	#NV	#NV	#NV	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00			**Tl-208**
								Mean value of the Thorium-Chain		**42,7**	**3,4**	**Th-Chain**
										Potassium:		
1460,6	2,19E-01	2,56E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**822,6**	**16,0**	**K-40**

*-Value for U-238, that results from the stated lines,

Appendix 7.6.1.: Experimental results of the gamma spectrometric measurements

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°3 0-1m m=181.9g n.WD v270198

Detector : 36 % p-type
Geometry of Measurement : new WD
Covered Surface/ cm² = 38,50

Natural Radionuclide:

Sample
Spectrum: **taiii_60** m(Sample)/g= 181,9
Mes-date.: 29.01.98 t(live)/s= 102694,7

S t a n d a r d s

	A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g
U: RGU-1	4940	25	136,3
Th: RGTh-1	3246	65	127,5
K: RGK-1	13843	93	175,9

Background
Mes-date: 16.05.97
Spectrum: NE160597.CHN

Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,2	0,1	3,05E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**822,2**	**27,0**	**Th-234**
1000,5	1,89E-02	1,28E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**907,2**	**70,5**	**Pa-234m**
#NV	#NV	#NV	#NV	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00			**U-235***
205,3	1,78E-02	2,16E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**845,1**	**120,5**	**U-235***
									Mean value of U-238 :	**847,1**	**27,0**	
									from U-235/Ra-226 with Ra via Rn-Product :	**1146,8**	**58,5**	**U-235***
186,0	7,58E-01	5,36E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**1388,4**	**18,4**	U-235/Ra
67,6	2,22E-02	2,98E-03	2,29E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**1267,6**	**202,3**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**1794,9**	**52,4**	**Ra-226**
295,1	1,84E+00	5,13E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**1577,1**	**13,4**	**Rn-Product.**
351,8	3,15E+00	6,22E-03	1,02E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**1572,5**	**11,8**	**Rn-Product.**
609,1	2,23E+00	5,06E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**1557,8**	**12,2**	**Rn-Product.**
1119,7	4,75E-01	2,59E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**1573,7**	**18,6**	**Rn-Product.**
									Mean value of the Rn-Product :	**1569,9**	**11,8**	**Rn-Product.**
46,5	5,09E-02	3,04E-03	3,67E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**1446,4**	**108,8**	**Pb-210**
236,0	5,87E-02	1,40E-03	1,19E-01	236,0	1,54E-01	5,32E-03	1,19E-01	0,00E+00	0,00E+00	**1501,5**	**70,6**	**Th-227***
#NV	#NV	#NV	#NV	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00			**Ra-223***
270,1	1,20E-01	3,36E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**1722,0**	**69,3**	**Ra-223 + Rn-**
									Mean value of the Ac-227-Product :	**1620,3**	**69,3**	
										Thorium-Chain:		
794,0	6,07E-03	8,28E-04	7,11E-02	794,8	2,66E-01	2,89E-03	7,11E-02	0,00E+00	0,00E+00	**54,5**	**8,6**	**Ac-228**
910,6	3,45E-02	1,43E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**49,2**	**3,0**	**Ac-228**
968,4	2,08E-02	1,13E-03	6,48E-02	968,9	9,64E-01	4,23E-03	6,48E-02	0,00E+00	0,00E+00	**51,4**	**3,8**	**Ac-228**
									Mean value of the Ac-228 (Ra-228-Product) :	**50,9**	**3,0**	
238,8	1,55E-01	1,71E-03	1,19E-01	238,6	8,19E+00	1,18E-02	1,19E-01	0,00E+00	0,00E+00	**46,5**	**1,5**	**Pb-212**
727,0	1,10E-02	1,11E-03	7,45E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**49,1**	**6,0**	**Bi-212**
583,2	4,66E-02	1,19E-03	8,19E-02	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00	**47,4**	**2,2**	**Tl-208**
860,0	6,09E-03	1,06E-03	6,87E-02	860,5	2,81E-01	2,67E-03	6,87E-02	0,00E+00	0,00E+00	**51,5**	**10,0**	**Tl-208**
									Mean value of the Th-228-Product :	**47,5**	**1,5**	
									Mean value of the Thorium-Chain	**49,2**	**UGG?**	**Th-Chain**
										Potassium:		
1460,3	2,24E-01	1,89E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**1133,7**	**18,8**	**K-40**

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°3 m=156,3g 2-3m n.WD 30.1.-1.2.98

Detector :	36 % p-type
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taiii_62**	m(Sample)/g=	156,3		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date:	30.01.98	t(live)/s=	156939,8	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,2	1,22E-01	2,01E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**900,7**	**22,9**	**Th-234**
1000,3	2,03E-02	8,09E-04	6,37E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**1110,8**	**59,2**	**Pa-234m**
#NV	#NV	#NV	#NV	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00			**U-235***
205,1	2,03E-02	1,74E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**1077,5**	**121,3**	**U-235***
									Mean value of U-238 :	**982,9**	**22,9**	
									from U-235/Ra-226 with Ra via Rn-Product :	**1255,4**	**43,7**	**U-235***
185,8	5,42E-01	3,61E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**1111,5**	**14,3**	U-235/Ra
67,5	1,66E-02	1,66E-03	2,29E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**1040,4**	**135,6**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**1208,0**	**42,2**	**Ra-226**
295,1	1,03E+00	3,29E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**989,6**	**8,8**	**Rn-Product.**
351,7	1,79E+00	3,94E-03	1,02E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**1010,5**	**7,8**	**Rn-Product.**
609,0	1,27E+00	3,06E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**1007,0**	**8,0**	**Rn-Product.**
1119,5	2,66E-01	1,55E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**1005,5**	**12,2**	**Rn-Product.**
									Mean value of the Rn-Product :	**1003,4**	**7,8**	**Rn-Product.**
46,4	2,86E-02	1,92E-03	3,68E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**867,0**	**70,6**	**Pb-210**
236,0	3,44E-02	8,86E-04	1,19E-01	236,0	1,54E-01	5,32E-03	1,19E-01	0,00E+00	0,00E+00	**989,4**	**47,6**	**Th-227***
#NV	#NV	#NV	#NV	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00			**Ra-223***
270,0	7,02E-02	2,11E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**1131,4**	**47,4**	**Ra-223 + Rn-**
									Mean value of the Ac-227-Product :	**1065,2**	**47,4**	
										Thorium-Chain:		
#NV	#NV	#NV	#NV	794,8	2,66E-01	2,89E-03	7,11E-02	0,00E+00	0,00E+00			**Ac-228**
910,5	4,46E-02	1,00E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**72,5**	**3,1**	**Ac-228**
968,2	2,50E-02	7,65E-04	6,48E-02	968,9	9,64E-01	4,23E-03	6,48E-02	0,00E+00	0,00E+00	**70,2**	**3,6**	**Ac-228**
									Mean value of the Ac-228 (Ra-228-Product) :	**71,4**	**3,1**	
238,6	1,97E-01	1,08E-03	1,19E-01	238,6	8,19E+00	1,18E-02	1,19E-01	0,00E+00	0,00E+00	**66,5**	**1,7**	**Pb-212**
726,8	1,30E-02	8,47E-04	7,45E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**66,1**	**5,7**	**Bi-212**
583,2	6,17E-02	9,56E-04	8,19E-02	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00	**71,3**	**2,5**	**Tl-208**
859,7	7,02E-03	7,39E-04	6,87E-02	860,5	2,81E-01	2,67E-03	6,87E-02	0,00E+00	0,00E+00	**67,7**	**8,5**	**Tl-208**
									Mean value of the Th-228-Product :	**68,1**	**1,7**	
									Mean value of the Thorium-Chain	**69,8**	**UGG?**	**Th-Chain**
										Potassium:		
1460,1	1,41E-01	1,24E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**816,7**	**13,8**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°3 m=137,57g 3-4m n.WD v.29.01.98

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**ta_63**	m(Sample)/g=	137,57		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	09.07.96			
Mes-date.:	29.01.98	t(live)/s=	80792,2	U: RGU-1	4940	25	136,3	Spectrum:	NE_K0796.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,5	2,31E+00	1,16E-02	2,40E-01	63,3	1,46E+00	7,86E-03	2,40E-01	0,00E+00	0,00E+00	**7779,2**	**96,8**	**Th-234**
1000,8	1,67E-01	4,25E-03	6,36E-02	1001,0	9,22E-02	2,40E-03	6,36E-02	0,00E+00	0,00E+00	**8872,0**	**367,5**	**Pa-234m**
163,5	1,84E-01	8,91E-03	1,36E-01	163,3	1,05E-01	6,24E-03	1,36E-01	0,00E+00	0,00E+00	**8627,4**	**705,6**	**U-235***
205,4	1,67E-01	7,40E-03	1,25E-01	205,3	9,91E-02	5,58E-03	1,24E-01	0,00E+00	0,00E+00	**8261,1**	**634,0**	**U-235***
									Mean value of U-238 :	**8110,7**	**96,8**	
									from U-235/Ra-226 with Ra via Rn-Product :	**9735,7**	**270,3**	**U-235***
186,1	4,43E+00	1,45E-02	1,30E-01	185,9	2,50E+00	9,02E-03	1,30E-01	0,00E+00	0,00E+00	**8687,5**	**86,3**	U-235/Ra
67,9	2,87E-01	1,01E-02	2,28E-01	67,7	1,87E-01	6,04E-03	2,27E-01	0,00E+00	0,00E+00	**7536,7**	**397,6**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**9120,6**	**223,8**	**Ra-226**
295,2	8,28E+00	1,29E-02	1,08E-01	295,2	5,18E+00	8,34E-03	1,08E-01	0,00E+00	0,00E+00	**7832,3**	**57,2**	**Rn-Product.**
351,9	1,41E+01	1,50E-02	1,02E-01	351,9	8,78E+00	9,76E-03	1,02E-01	0,00E+00	0,00E+00	**7847,1**	**51,8**	**Rn-Product.**
609,1	9,92E+00	1,23E-02	8,03E-02	609,3	6,11E+00	7,81E-03	8,03E-02	2,02E-04	8,57E-05	**7962,1**	**54,5**	**Rn-Product.**
1120,3	2,09E+00	6,72E-03	6,08E-02	1120,3	1,28E+00	4,50E-03	6,08E-02	0,00E+00	0,00E+00	**8013,8**	**78,7**	**Rn-Product.**
1764,9	1,75E+00	5,26E-03	4,81E-02	1764,5	1,09E+00	3,42E-03	4,81E-02	1,39E-04	4,79E-05	**7871,6**	**74,1**	**Rn-Product.**
									Mean value of the Rn-Product :	**7900,6**	**51,8**	**Rn-Product.**
46,8	1,32E+00	8,81E-03	3,63E-01	46,5	9,79E-01	6,36E-03	3,61E-01	4,59E-04	1,19E-04	**6672,7**	**95,9**	**Pb-210**
236,0	3,24E-01	7,74E-03	1,19E-01	236,0	1,79E-01	4,71E-03	1,19E-01	0,00E+00	0,00E+00	**8884,8**	**360,5**	**Th-227***
#NV	#NV	#NV	#NV	154,2	1,25E-01	5,47E-03	1,39E-01	0,00E+00	0,00E+00			**Ra-223***
269,5	5,69E-01	8,87E-03	1,13E-01	270,0	3,28E-01	5,81E-03	1,13E-01	0,00E+00	0,00E+00	**8496,7**	**243,5**	**Ra-223 + Rn-**
									Mean value of the Ac-227-Product :	**8657,3**	**243,5**	
										Thorium-Chain:		
#NV	#NV	#NV	#NV	794,8	2,92E-01	2,16E-03	7,11E-02	0,00E+00	0,00E+00			**Ac-228**
910,9	3,36E-02	3,50E-03	6,69E-02	911,2	1,84E+00	3,71E-03	6,69E-02	0,00E+00	0,00E+00	**55,5**	**6,9**	**Ac-228**
968,6	2,12E-02	2,69E-03	6,48E-02	968,9	1,07E+00	2,96E-03	6,48E-02	0,00E+00	0,00E+00	**59,9**	**8,8**	**Ac-228**
									Mean value of the Ac-228 (Ra-228-Product) :	**57,5**	**6,9**	
238,9	1,31E-01	4,17E-03	1,19E-01	238,6	8,92E+00	8,53E-03	0,118553	2,41E-04	1,42E-04	**44,9**	**2,3**	**Pb-212**
#NV	#NV	#NV	#NV	727,3	5,83E-01	2,96E-03	7,45E-02	0,00E+00	0,00E+00			**Bi-212**
583,0	4,92E-02	3,11E-03	8,19E-02	583,2	2,57E+00	4,88E-03	8,19E-02	0,00E+00	0,00E+00	**58,1**	**4,8**	**Tl-208**
#NV	#NV	#NV	#NV	860,5	3,13E-01	2,03E-03	6,87E-02	0,00E+00	0,00E+00			**Tl-208**
2614,4	1,51E-02	6,06E-04	3,96E-02	2614,5	9,07E-01	2,62E-03	3,96E-02	3,04E-04	4,21E-05	**49,4**	**3,0**	**Tl-208**
									Mean value of the Th-228-Product :	**49,8**	**2,3**	**Tl-208**
									Mean value of the Thorium-Chain	**53,6**	**UGG?**	**Th-Chain**
										Potassium:		
1461,2	1,97E-01	3,59E-03	5,28E-02	1460,8	2,89E+00	7,29E-03	5,28E-02	4,92E-04	5,96E-05	**1177,7**	**29,6**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°3 m=128,35g 4-5m n.WD v.27.1.98

Detector :	36 % p-type
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taiii_64**	m(Sample)/g=	128,35		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	01.02.98	t(live)/s=	186436,5	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^2)^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,3	5,97E-01	3,56E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**4990,2**	**91,3**	**Th-234**
1000,4	8,35E-02	1,74E-03	6,37E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**5430,0**	**213,5**	**Pa-234m**
#NV	#NV	#NV	#NV	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00			**U-235***
205,1	9,54E-02	3,55E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**5925,6**	**472,8**	**U-235***
									Mean value of U-238 :	**5237,5**	**91,3**	
									from U-235/Ra-226 with Ra via Rn-Product :	**6033,2**	**212,5**	**U-235***
185,9	2,74E+00	6,69E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**6557,4**	**64,4**	U-235/Ra
67,6	8,61E-02	5,65E-03	2,29E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**6096,4**	**644,2**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**7548,6**	**181,3**	**Ra-226**
295,1	6,14E+00	6,95E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**6938,4**	**51,3**	**Rn-Product.**
351,7	1,05E+01	8,70E-03	1,02E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**6978,8**	**46,8**	**Rn-Product.**
609,0	7,39E+00	6,68E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**6922,3**	**48,0**	**Rn-Product.**
1119,6	1,55E+00	3,60E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**6967,0**	**67,4**	**Rn-Product.**
									Mean value of the Rn-Product :	**6950,9**	**46,8**	**Rn-Product.**
46,4	1,88E-01	5,57E-03	3,68E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**6243,7**	**326,5**	**Pb-210**
235,5	1,87E-01	2,57E-03	1,19E-01	236,0	1,54E-01	5,32E-03	1,19E-01	0,00E+00	0,00E+00	**6280,8**	**264,9**	**Th-227***
#NV	#NV	#NV	#NV	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00			**Ra-223***
269,4	3,52E-01	4,25E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**6654,5**	**196,9**	**Ra-223 + Rn-**
									Mean value of the Ac-227-Product :	**6500,4**	**196,9**	
										Thorium-Chain:		
794,2	5,74E-03	1,65E-03	7,11E-02	794,8	2,66E-01	2,89E-03	7,11E-02	0,00E+00	0,00E+00	**69,7**	**21,5**	**Ac-228**
910,5	3,17E-02	2,03E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**61,4**	**5,2**	**Ac-228**
968,3	1,82E-02	1,16E-03	6,48E-02	968,9	9,64E-01	4,23E-03	6,48E-02	0,00E+00	0,00E+00	**61,0**	**5,1**	**Ac-228**
									Mean value of the Ac-228 (Ra-228-Product) :	**62,2**	**5,1**	
238,8	1,29E-01	9,65E-04	1,19E-01	238,6	8,19E+00	1,18E-02	1,19E-01	0,00E+00	0,00E+00	**50,8**	**1,4**	**Pb-212**
727,0	8,57E-03	1,27E-03	7,45E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**51,7**	**8,7**	**Bi-212**
583,2	4,17E-02	1,32E-03	8,19E-02	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00	**57,0**	**3,0**	**Tl-208**
859,9	4,90E-03	1,78E-03	6,87E-02	860,5	2,81E-01	2,67E-03	6,87E-02	0,00E+00	0,00E+00	**56,2**	**21,6**	**Tl-208**
									Mean value of the Th-228-Product :	**53,0**	**1,4**	
									Mean value of the Thorium-Chain	**57,6**	**UGG?**	**Th-Chain**
										Potassium:		
1460,2	1,97E-01	1,89E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**1360,7**	**24,0**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°3 m=177,01g 5-6m n.WD v.01.02.98

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**ta_65**	m(Sample)/g=	177,01		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	09.07.96			
Mes-date.:	01.02.98	t(live)/s=	93831,4	U: RGU-1	4940	25	136,3	Spectrum:	NE_K0796.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,3	6,69E-01	6,62E-03	2,41E-01	63,3	1,46E+00	7,86E-03	2,40E-01	0,00E+00	0,00E+00	**1948,2**	**31,8**	**Th-234**
1000,3	5,27E-02	2,21E-03	6,37E-02	1001,0	9,22E-02	2,40E-03	6,36E-02	0,00E+00	0,00E+00	**2245,7**	**122,0**	**Pa-234m**
163,3	5,85E-02	6,07E-03	1,36E-01	163,3	1,05E-01	6,24E-03	1,36E-01	0,00E+00	0,00E+00	**2267,5**	**282,9**	**U-235***
205,2	5,97E-02	5,65E-03	1,25E-01	205,3	9,91E-02	5,58E-03	1,24E-01	0,00E+00	0,00E+00	**2433,4**	**280,3**	**U-235***
									Mean value of U-238 :	**2075,3**	**31,8**	
									from U-235/Ra-226 with Ra via Rn-Product :	**2238,7**	**93,9**	**U-235***
185,9	1,59E+00	8,27E-03	1,30E-01	185,9	2,50E+00	9,02E-03	1,30E-01	0,00E+00	0,00E+00	**2570,0**	**29,3**	U-235/Ra
67,6	1,14E-01	5,93E-03	2,29E-01	67,7	1,87E-01	6,04E-03	2,27E-01	0,00E+00	0,00E+00	**2569,8**	**170,1**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**2941,5**	**75,2**	**Ra-226**
295,0	3,57E+00	8,20E-03	1,08E-01	295,2	5,18E+00	8,34E-03	1,08E-01	0,00E+00	0,00E+00	**2768,4**	**21,8**	**Rn-Product.**
351,6	6,09E+00	9,09E-03	1,02E-01	351,9	8,78E+00	9,76E-03	1,02E-01	0,00E+00	0,00E+00	**2771,1**	**19,2**	**Rn-Product.**
608,8	4,41E+00	7,58E-03	8,03E-02	609,3	6,11E+00	7,81E-03	8,03E-02	2,02E-04	8,57E-05	**2857,6**	**20,6**	**Rn-Product.**
1119,5	9,44E-01	4,17E-03	6,08E-02	1120,3	1,28E+00	4,50E-03	6,08E-02	0,00E+00	0,00E+00	**2893,9**	**31,0**	**Rn-Product.**
1763,8	7,88E-01	3,29E-03	4,81E-02	1764,5	1,09E+00	3,42E-03	4,81E-02	1,39E-04	4,79E-05	**2827,5**	**29,1**	**Rn-Product.**
									Mean value of the Rn-Product :	**2818,7**	**19,2**	**Rn-Product.**
46,5	5,28E-01	5,18E-03	3,67E-01	46,5	9,79E-01	6,36E-03	3,61E-01	4,59E-04	1,19E-04	**2398,1**	**40,4**	**Pb-210**
235,8	1,18E-01	4,07E-03	1,19E-01	236,0	1,79E-01	4,71E-03	1,19E-01	0,00E+00	0,00E+00	**2665,6**	**128,9**	**Th-227***
#NV	#NV	#NV	#NV	154,2	1,25E-01	5,47E-03	1,39E-01	0,00E+00	0,00E+00			**Ra-223***
269,3	2,25E-01	6,15E-03	1,13E-01	270,0	3,28E-01	5,81E-03	1,13E-01	0,00E+00	0,00E+00	**2757,4**	**103,7**	**Ra-223 + Rn-**
									Mean value of the Ac-227-Product :	**2717,2**	**103,7**	
										Thorium-Chain:		
#NV	#NV	#NV	#NV	794,8	2,92E-01	2,16E-03	7,11E-02	0,00E+00	0,00E+00			**Ac-228**
910,5	3,32E-02	1,97E-03	6,69E-02	911,2	1,84E+00	3,71E-03	6,69E-02	0,00E+00	0,00E+00	**44,0**	**3,5**	**Ac-228**
968,3	2,67E-02	1,94E-03	6,48E-02	968,9	1,07E+00	2,96E-03	6,48E-02	0,00E+00	0,00E+00	**60,6**	**5,6**	**Ac-228**
									Mean value of the Ac-228 (Ra-228-Product) :	**51,6**	**3,5**	
238,5	1,55E-01	3,12E-03	1,19E-01	238,6	8,92E+00	8,53E-03	0,118553	2,41E-04	1,42E-04	**43,4**	**1,8**	**Pb-212**
726,8	1,03E-02	1,77E-03	7,45E-02	727,3	5,83E-01	2,96E-03	7,45E-02	0,00E+00	0,00E+00	**43,5**	**8,3**	**Bi-212**
582,7	5,47E-02	2,21E-03	8,19E-02	583,2	2,57E+00	4,88E-03	8,19E-02	0,00E+00	0,00E+00	**52,2**	**3,2**	**Tl-208**
#NV	#NV	#NV	#NV	860,5	3,13E-01	2,03E-03	6,87E-02	0,00E+00	0,00E+00			**Tl-208**
2612,5	1,92E-02	5,33E-04	3,96E-02	2614,5	9,07E-01	2,62E-03	3,96E-02	3,04E-04	4,21E-05	**50,0**	**2,4**	**Tl-208**
									Mean value of the Th-228-Product :	**47,6**	**1,8**	**Tl-208**
									Mean value of the Thorium-Chain	**49,6**	**UGG?**	**Th-Chain**
										Potassium:		
1460,3	1,94E-01	2,90E-03	5,28E-02	1460,8	2,89E+00	7,29E-03	5,28E-02	4,92E-04	5,96E-05	**921,1**	**20,2**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°3 m=153,26g 6-7m n.WD v.19.02.98

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taiii_66**	m(Probe)/g=	153,26		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	19.02.98	t(live)/s=	90881,7	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak / (g/cm²)⁻¹	Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak / (g/cm²)⁻¹	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,2	4,92E-01	6,54E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**3684,1**	**84,1**	**Th-234**
1000,9	6,91E-02	2,39E-03	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**3842,3**	**188,4**	**Pa-234m**
#NV	#NV	#NV	#NV	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00			**U-235***
205,6	7,40E-02	4,73E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**3992,9**	**383,8**	**U-235***
									Mean value of U-238 :	**3770,4**	**84,1**	
									from U-235/Ra-226 with Ra via Rn-Product :	**5328,1**	**208,6**	**U-235***
186,2	2,85E+00	1,15E-02	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**5931,5**	**64,1**	U-235/Ra
67,8	1,27E-01	5,72E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**8044,5**	**752,2**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**7554,6**	**175,5**	**Ra-226**
295,4	6,52E+00	1,03E-02	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**6374,5**	**48,7**	**Rn-Product.**
352,1	1,12E+01	1,30E-02	1,02E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**6429,9**	**44,3**	**Rn-Product.**
609,4	7,88E+00	9,90E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**6342,0**	**45,2**	**Rn-Product.**
1120,2	1,66E+00	5,18E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**6391,9**	**64,7**	**Rn-Product.**
									Mean value of the Rn-Product :	**6384,6**	**44,3**	**Rn-Product.**
46,6	2,15E-01	8,26E-03	3,65E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**6529,8**	**380,5**	**Pb-210**
235,7	2,35E-01	3,30E-03	1,19E-01	236,0	1,54E-01	5,32E-03	1,19E-01	0,00E+00	0,00E+00	**6843,3**	**289,4**	**Th-227***
#NV	#NV	#NV	#NV	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00			**Ra-223***
269,7	4,25E-01	6,04E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**6965,4**	**213,8**	**Ra-223 + Rn-**
									Mean value of the Ac-227-Product :	**6914,0**	**213,8**	
										Thorium-Chain:		
794,8	5,93E-03	1,67E-03	7,11E-02	794,8	2,66E-01	2,89E-03	7,11E-02	0,00E+00	0,00E+00	**61,7**	**18,6**	**Ac-228**
911,1	4,43E-02	2,41E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**73,3**	**5,5**	**Ac-228**
968,9	2,21E-02	1,44E-03	6,48E-02	968,9	9,64E-01	4,23E-03	6,48E-02	0,00E+00	0,00E+00	**63,1**	**5,4**	**Ac-228**
									Mean value of the Ac-228 (Ra-228-Product) :	**67,7**	**5,4**	
239,0	1,78E-01	2,22E-03	1,19E-01	238,6	8,19E+00	1,18E-02	1,19E-01	0,00E+00	0,00E+00	**60,9**	**2,0**	**Pb-212**
727,3	1,43E-02	1,72E-03	7,44E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**73,8**	**10,4**	**Bi-212**
583,7	6,13E-02	1,79E-03	8,18E-02	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00	**72,0**	**3,6**	**Tl-208**
860,8	3,94E-03	2,01E-03	6,87E-02	860,5	2,81E-01	2,67E-03	6,87E-02	0,00E+00	0,00E+00	**38,6**	**20,5**	**Tl-208**
									Mean value of the Th-228-Product :	**65,5**	**2,0**	
									Mean value of the Thorium-Chain	**66,6**	**2,0**	**Th-Chain**
										Potassium:		
1461,0	2,22E-01	2,66E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**1308,4**	**25,9**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°3 m=148,5g 7-8m n.WD v.02.02.98

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**ta_67**	m(Sample)/g=	148,5		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	09.07.96			
Mes-date.:	02.02.98	t(live)/s=	78456,4	U: RGU-1	4940	25	136,3	Spectrum:	NE_K0796.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^{c})^{-1}$	Peak-En. / keV	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	Weak. / $(g/cm^{c})^{-1}$	dN/dt / s^{-1}	1σ dN/dt / s^{-1}	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,3	1,11E+00	8,93E-03	2,41E-01	63,3	1,46E+00	7,86E-03	2,40E-01	0,00E+00	0,00E+00	**3574,9**	**52,7**	**Th-234**
1000,4	8,28E-02	3,02E-03	6,36E-02	1001,0	9,22E-02	2,40E-03	6,36E-02	0,00E+00	0,00E+00	**4114,4**	**205,1**	**Pa-234m**
163,3	9,28E-02	6,31E-03	1,36E-01	163,3	1,05E-01	6,24E-03	1,36E-01	0,00E+00	0,00E+00	**4095,9**	**391,0**	**U-235***
205,3	8,45E-02	5,61E-03	1,25E-01	205,3	9,91E-02	5,58E-03	1,24E-01	0,00E+00	0,00E+00	**3936,6**	**362,7**	**U-235***
									Mean value of U-238 :	**3760,0**	**52,7**	
									from U-235/Ra-226 with Ra via Rn-Product :	**4103,5**	**152,9**	**U-235***
186,0	2,36E+00	1,12E-02	1,30E-01	185,9	2,50E+00	9,02E-03	1,30E-01	0,00E+00	0,00E+00	**4360,4**	**48,0**	U-235/Ra
67,7	1,52E-01	6,56E-03	2,28E-01	67,7	1,87E-01	6,04E-03	2,27E-01	0,00E+00	0,00E+00	**3810,9**	**224,3**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**4811,4**	**123,6**	**Ra-226**
295,1	5,08E+00	1,00E-02	1,08E-01	295,2	5,18E+00	8,34E-03	1,08E-01	0,00E+00	0,00E+00	**4515,1**	**34,3**	**Rn-Product.**
351,7	8,59E+00	1,18E-02	1,02E-01	351,9	8,78E+00	9,76E-03	1,02E-01	0,00E+00	0,00E+00	**4501,4**	**30,8**	**Rn-Product.**
608,9	6,14E+00	9,78E-03	8,03E-02	609,3	6,11E+00	7,81E-03	8,03E-02	2,02E-04	8,57E-05	**4613,5**	**32,8**	**Rn-Product.**
1119,7	1,30E+00	5,40E-03	6,08E-02	1120,3	1,28E+00	4,50E-03	6,08E-02	0,00E+00	0,00E+00	**4637,2**	**48,7**	**Rn-Product.**
1764,1	1,07E+00	4,17E-03	4,81E-02	1764,5	1,09E+00	3,42E-03	4,81E-02	1,39E-04	4,79E-05	**4515,2**	**45,4**	**Rn-Product.**
									Mean value of the Rn-Product :	**4553,4**	**30,8**	**Rn-Product.**
46,6	7,28E-01	7,83E-03	3,66E-01	46,5	9,79E-01	6,36E-03	3,61E-01	4,59E-04	1,19E-04	**3555,2**	**62,7**	**Pb-210**
235,8	1,81E-01	4,79E-03	1,19E-01	236,0	1,79E-01	4,71E-03	1,19E-01	0,00E+00	0,00E+00	**4673,5**	**198,0**	**Th-227***
#NV	#NV	#NV	#NV	154,2	1,25E-01	5,47E-03	1,39E-01	0,00E+00	0,00E+00			**Ra-223***
269,3	3,23E-01	7,61E-03	1,13E-01	270,0	3,28E-01	5,81E-03	1,13E-01	0,00E+00	0,00E+00	**4543,0**	**156,8**	**Ra-223 + Rn-**
									Mean value of the Ac-227-Product :	**4601,6**	**156,8**	
										Thorium-Chain:		
#NV	#NV	#NV	#NV	794,8	2,92E-01	2,16E-03	7,11E-02	0,00E+00	0,00E+00			**Ac-228**
910,6	3,21E-02	2,61E-03	6,69E-02	911,2	1,84E+00	3,71E-03	6,69E-02	0,00E+00	0,00E+00	**49,6**	**5,0**	**Ac-228**
968,6	2,14E-02	2,29E-03	6,48E-02	968,9	1,07E+00	2,96E-03	6,48E-02	0,00E+00	0,00E+00	**56,6**	**7,2**	**Ac-228**
									Mean value of the Ac-228 (Ra-228-Product) :	**52,7**	**5,0**	
238,6	1,29E-01	4,04E-03	1,19E-01	238,6	8,92E+00	8,53E-03	0,118553	2,41E-04	1,42E-04	**41,3**	**2,1**	**Pb-212**
#NV	#NV	#NV	#NV	727,3	5,83E-01	2,96E-03	7,45E-02	0,00E+00	0,00E+00			**Bi-212**
582,8	4,60E-02	2,31E-03	8,19E-02	583,2	2,57E+00	4,88E-03	8,19E-02	0,00E+00	0,00E+00	**50,9**	**3,6**	**Tl-208**
#NV	#NV	#NV	#NV	860,5	3,13E-01	2,03E-03	6,87E-02	0,00E+00	0,00E+00			**Tl-208**
2613,0	1,53E-02	5,23E-04	3,96E-02	2614,5	9,07E-01	2,62E-03	3,96E-02	3,04E-04	4,21E-05	**46,7**	**2,6**	**Tl-208**
									Mean value of the Th-228-Product :	**45,8**	**2,1**	**Tl-208**
									Mean value of the Thorium-Chain	**49,3**	**UGG?**	**Th-Chain**
										Potassium:		
1460,5	2,06E-01	3,30E-03	5,28E-02	1460,8	2,89E+00	7,29E-03	5,28E-02	4,92E-04	5,96E-05	**1145,8**	**26,3**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°3 m=198.34g 0-1m n.WD v.20.02.98

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**taiii_68**	m(Sample)/g=	198,34		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	20.02.98	t(live)/s=	63824,8	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,3	4,10E-02	2,26E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**265,8**	**16,3**	**Th-234**
1000,8	6,60E-03	7,05E-04	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**293,5**	**33,9**	**Pa-234m**
#NV	#NV	#NV	#NV	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00			**U-235***
205,2	5,70E-03	1,39E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**254,1**	**65,6**	**U-235***
									Mean value of U-238 :	**272,6**	**16,3**	
									from U-235/Ra-226 with Ra via Rn-Folger :	**358,5**	**23,7**	**U-235***
186,0	1,79E-01	3,90E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**308,3**	**8,4**	U-235/Ra
67,6	4,21E-03	1,46E-03	2,29E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**230,1**	**82,6**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**335,1**	**26,9**	**Ra-226**
295,3	3,40E-01	3,15E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**271,7**	**4,0**	**Rn-Product.**
352,0	5,86E-01	3,56E-03	1,02E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**273,6**	**3,1**	**Rn-Product.**
609,3	4,13E-01	2,77E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**268,4**	**3,2**	**Rn-Product.**
1120,0	8,68E-02	1,55E-03	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**266,7**	**6,2**	**Rn-Product.**
									Mean value of the Rn-Product :	**270,6**	**3,1**	**Rn-Product.**
46,5	1,24E-02	1,97E-03	3,67E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**343,0**	**57,6**	**Pb-210**
236,0	1,23E-02	6,74E-04	1,19E-01	236,0	1,54E-01	5,32E-03	1,19E-01	0,00E+00	0,00E+00	**294,2**	**20,6**	**Th-227***
#NV	#NV	#NV	#NV	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00			**Ra-223***
270,2	3,33E-02	2,46E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**447,9**	**36,7**	**Ra-223 + Rn-**
									Mean value of the Ac-227-Product :	**365,0**	**20,6**	
										Thorium-Chain:		
#NV	#NV	#NV	#NV	794,8	2,66E-01	2,89E-03	7,11E-02	0,00E+00	0,00E+00			**Ac-228**
910,9	3,29E-02	1,08E-03	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**43,6**	**2,3**	**Ac-228**
968,7	1,73E-02	8,46E-04	6,48E-02	968,9	9,64E-01	4,23E-03	6,48E-02	0,00E+00	0,00E+00	**39,6**	**2,7**	**Ac-228**
									Mean value of the Ac-228 (Ra-228-Product) :	**41,9**	**2,3**	
238,8	1,47E-01	1,61E-03	1,19E-01	238,6	8,19E+00	1,18E-02	1,19E-01	0,00E+00	0,00E+00	**41,5**	**1,3**	**Pb-212**
727,2	1,11E-02	8,77E-04	7,44E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**46,3**	**4,6**	**Bi-212**
583,4	4,40E-02	1,19E-03	8,18E-02	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00	**41,8**	**2,0**	**Tl-208**
860,3	4,58E-03	7,52E-04	6,87E-02	860,5	2,81E-01	2,67E-03	6,87E-02	0,00E+00	0,00E+00	**36,0**	**6,7**	**Tl-208**
									Mean value of the Th-228-Product :	**41,9**	**1,3**	
									Mean value of the Thorium-Chain	**41,9**	**1,3**	**Th-Chain**
										Potassium:		
1460,7	2,11E-01	2,01E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**990,3**	**17,3**	**K-40**

*-Value for U-238, that results from the stated lines,

GAMMA SPECTROMETRIC MEASUREMENT

Taoufik Naamoun Bore hole N°4 m=178,3g 0-1m n.WD v.24.07.98

Detector :	38 % n-type Keller, 16k
Geometry of Measurement :	new WD
Covered Surface/ cm² =	38,50

Natural Radionuclide:

Sample				**S t a n d a r d s**				**Background**		**Results**		
Spectrum:	**ta_70**	m(Sample)/g=	178,3		A/m/Bq/kg	Δ/Bq/kg	m(Stand.)/g	Mes-date:	16.05.97			
Mes-date.:	24.07.98	t(live)/s=	193467,9	U: RGU-1	4940	25	136,3	Spectrum:	NE160597.CHN			
				Th: RGTh-1	3246	65	127,5					
				K: RGK-1	13843	93	175,9					
Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	Peak-En. / keV	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	Weak. / (g/cm²)⁻¹	dN/dt / s⁻¹	1σ dN/dt / s⁻¹	spec. Act. / Bq/kg	Δ sp. Act. Bq/kg	
										Uranium-Chain:		
63,4	5,67E-02	1,32E-03	2,41E-01	63,3	6,15E-01	7,27E-03	2,40E-01	0,00E+00	0,00E+00	**388,8**	**12,1**	**Th-234**
1000,9	7,59E-03	4,45E-04	6,36E-02	1001,0	8,01E-02	2,18E-03	6,36E-02	0,00E+00	0,00E+00	**370,0**	**25,8**	**Pa-234m**
163,4	6,98E-03	1,28E-03	1,36E-01	163,3	8,04E-02	6,92E-03	1,36E-01	0,00E+00	0,00E+00	**350,6**	**72,9**	**U-235***
205,6	6,10E-03	1,02E-03	1,25E-01	205,3	8,35E-02	5,41E-03	1,24E-01	0,00E+00	0,00E+00	**293,5**	**54,1**	**U-235***
									Mean value of U-238 :	**371,6**	**12,1**	
									from U-235/Ra-226 with Ra via Rn-Product :	**456,4**	**17,3**	**U-235***
186,1	1,97E-01	2,04E-03	1,30E-01	185,9	2,17E+00	8,87E-03	1,30E-01	0,00E+00	0,00E+00	**365,2**	**5,9**	U-235/Ra
67,7	3,11E-03	1,27E-03	2,28E-01	67,7	7,27E-02	5,54E-03	2,28E-01	0,00E+00	0,00E+00	**179,6**	**75,7**	**Th-230**
									from U-235/Ra-226 with U via Mean value of U-238 :	**360,5**	**19,5**	**Ra-226**
295,4	3,44E-01	1,66E-03	1,08E-01	295,2	4,59E+00	9,39E-03	1,08E-01	4,40E-04	1,20E-04	**298,6**	**3,1**	**Rn-Product.**
352,1	5,90E-01	1,99E-03	1,01E-01	351,9	7,84E+00	1,11E-02	1,01E-01	1,30E-04	1,20E-04	**298,9**	**2,6**	**Rn-Product.**
609,5	4,16E-01	1,57E-03	8,03E-02	609,3	5,55E+00	9,14E-03	8,03E-02	3,10E-04	1,10E-04	**294,5**	**2,7**	**Rn-Product.**
1120,2	8,74E-02	8,79E-04	6,08E-02	1120,3	1,16E+00	4,62E-03	6,08E-02	0,00E+00	0,00E+00	**294,4**	**4,7**	**Rn-Product.**
									Mean value of the Rn-Product :	**296,8**	**2,6**	**Rn-Product.**
46,7	1,03E-02	1,26E-03	3,64E-01	46,5	1,54E-01	5,67E-03	3,64E-01	0,00E+00	0,00E+00	**292,9**	**39,0**	**Pb-210**
235,7	1,48E-02	5,17E-04	1,19E-01	236,0	1,54E-01	5,32E-03	1,19E-01	0,00E+00	0,00E+00	**384,1**	**20,8**	**Th-227***
#NV	#NV	#NV	#NV	154,2	1,06E-01	5,96E-03	1,39E-01	0,00E+00	0,00E+00			**Ra-223***
270,3	3,39E-02	1,24E-03	1,13E-01	270,0	2,75E-01	5,86E-03	1,13E-01	0,00E+00	0,00E+00	**493,4**	**23,4**	**Ra-223 + Rn-**
									Mean value of the Ac-227-Product :	**442,4**	**20,8**	
										Thorium-Chain:		
#NV	#NV	#NV	#NV	794,8	2,66E-01	2,89E-03	7,11E-02	0,00E+00	0,00E+00			**Ac-228**
911,1	3,84E-02	6,82E-04	6,69E-02	911,2	1,67E+00	5,18E-03	6,68E-02	0,00E+00	0,00E+00	**55,7**	**2,1**	**Ac-228**
968,9	2,32E-02	5,48E-04	6,48E-02	968,9	9,64E-01	4,23E-03	6,48E-02	0,00E+00	0,00E+00	**58,3**	**2,6**	**Ac-228**
									Mean value of the Ac-228 (Ra-228-Product) :	**56,9**	**2,1**	
239,1	1,82E-01	9,61E-04	1,18E-01	238,6	8,19E+00	1,18E-02	1,19E-01	0,00E+00	0,00E+00	**55,3**	**1,4**	**Pb-212**
727,4	1,19E-02	5,53E-04	7,44E-02	727,3	5,34E-01	3,65E-03	7,44E-02	0,00E+00	0,00E+00	**54,0**	**3,6**	**Bi-212**
583,4	5,41E-02	8,01E-04	8,18E-02	583,2	2,36E+00	6,41E-03	8,18E-02	0,00E+00	0,00E+00	**56,0**	**2,0**	**Tl-208**
860,5	6,19E-03	4,60E-04	6,87E-02	860,5	2,81E-01	2,67E-03	6,87E-02	0,00E+00	0,00E+00	**53,3**	**5,1**	**Tl-208**
									Mean value of the Th-228-Product :	**55,1**	**1,4**	
									Mean value of the Thorium-Chain	**56,0**	**1,4**	**Th-Chain**
										Potassium:		
1461,0	1,97E-01	1,11E-03	5,28E-02	1460,8	2,65E+00	1,35E-02	5,28E-02	4,08E-04	5,50E-05	**1013,8**	**14,5**	**K-40**

*-Value for U-238, that results from the stated lines,

Borehole N°1

Depth	^{238}U	^{230}Th	^{226}Ra	^{210}Pb	^{232} Th	^{227}Ac	^{40}K	^{238}U/^{226}Ra	^{230}Th/^{226}Ra	^{210}Pb/^{226}Ra	^{227}Ac/^{226}Ra	^{227}Ac/^{226}Ra	^{227}Ac/^{226}Ra
Interval (m)	(Bq/kg)	(Bq/kg)	(Bq/kg)	(Bq/kg)	(Bq/kg)	(Bq/kg)	(Bq/kg)					(1)	(2)
0.0-1.0	452	--	229	177	52	12	1013	2.0	--	0.8	0.054	1.4	1.2
1.0-1.5	1698	2804	2546	1919	46	118	1041	0.7	1.0	0.8	0.047	1.6	1.0
1.5-2.5	1269	2590	3106	2225	51	146	1076	0.4	0.8	0.7	0.047	1.0	1.0
2.5-3.5	785	852	1325	1336	35	62	855	0.6	0.6	1.0	0.047	1.2	1.0
3.5-4.5	1457	3142	3745	3116	53	164	873	0.4	0.8	0.8	0.044	1.5	1.0
4.5-5.5	1419	2656	2740	2266	50	136	834	0.5	1.0	0.8	0.050	1.4	1.1
5.5-6.5	1611	3620	3794	3464	54	172	999	0.4	1.0	0.9	0.045	1.4	1.0
6.5-7.5	1664	4028	3884	3139	53	182	995	0.4	1.0	0.8	0.047	1.6	1.0
7.5-8.5	1063	3521	4483	3666	63	192	1136	0.2	0.8	0.8	0.043	1.3	0.9
8.5-9.5	2178	3709	3746	3091	46	182	1067	0.6	1.0	0.8	0.049	1.3	1.1

(1) Calculated by means of the measured 238U/ 235U ratio.
(2) Calculated by means of the published 238U/ 235U ratio.

Appendix 7.6.2.: Analytical results of the gamma spectrometric measurements

Borehole N°2

Depth Interval (m)	^{238}U (Bq/kg)	^{230}Th (Bq/kg)	^{226}Ra (Bq/kg)	^{210}Pb (Bq/kg)	^{232}Th (Bq/kg)	^{40}K (Bq/kg)	^{227}Ac (Bq/kg)	$^{238}U/^{226}Ra$	$^{230}Th/^{226}Ra$	$^{210}Pb/^{226}Ra$	$^{227}Ac/^{226}Ra$	$^{227}Ac/^{226}Ra$ (1)	$^{227}Ac/^{226}Ra$ (2)
0-0.5	326	480	339	230	48	1077	21	1.0	1.4	0.7	0.064	2.3	1.4
0.5-1.5	451	546	734	601	43	1290	36	0.6	0.7	0.8	0.049	1.4	1.1
2.5-3.5	1069	1188	1609	1213	43	1073	67	0.7	0.7	0.7	0.042	1.1	0.9
3.5-4.5	890	1765	2098	1569	43	960	91	0.4	0.8	0.7	0.043	1.8	0.9
4.5-5.5	971	1664	2085	1741	43	1009	94	0.5	0.8	0.8	0.045	1.2	1.0
5.5-6.5	3288	9010	8866	7519	42	742	423	0.4	1.0	0.8	0.048	1.4	1.0
6.5-7.5	2162	6845	6980	5847	51	950	322	0.3	1.0	0.8	0.046	1.1	1.0
7.5-8.5	2464	5706	5786	5080	57	1031	267	0.4	1.0	0.9	0.046	3.5	1.0
8.5-9.5	1849	4135	4815	3639	60	1125	213	0.4	0.9	0.7	0.044	1.9	1.0
9.5-10.5	2644	5307	5503	4607	45	1043	244	0.5	1.0	0.8	0.044	1.6	1.0
10.5-11.5	2182	5485	5780	5173	50	984	268	0.4	1.0	0.9	0.046	1.1	1.0
11.5-12.5	2494	5594	5764	5130	55	998	267	0.4	1.0	0.9	0.046	1.3	1.0
12.5-13.5	2329	5168	5400	4856	58	1028	243	0.4	1.0	0.9	0.045	1.7	1.0
13.5-14.5	1752	4442	4454	3912	57	1045	205	0.4	1.0	0.9	0.046	1.1	1.0
14.5-15.5	1265	2794	3611	3837	73	1007	164	0.4	0.8	1.0	0.046	1.4	1.0
15.5-16.5	1620	4301	4267	3978	61	1066	184	0.4	1.0	0.9	0.043	1.5	0.9
16.5-17.5	1569	4312	4118	4023	60	1072	184	0.4	1.1	1.0	0.045	1.4	1.0
17.5-18.5	1516	4515	4818	4728	65	1065	207	0.3	0.9	1.0	0.043	1.2	0.9
18.5-19.5	2225	3323	4071	2844	53	1040	175	0.5	0.8	0.7	0.043	1.5	0.9
19.5-20.2	2815	3724	3928	3483	53	1044	176	0.7	1.0	0.9	0.045	1.2	1.0

(1) Calculated by means of the measured $^{238}U/^{235}U$ ratio.
(2) Calculated by means of the published $^{238}U/^{235}U$ ratio.

Appendix 7.6.2.: Analytical results of the gamma spectrometric measurements

Borehole N°3

Depth	^{238}U	^{230}Th	^{226}Ra	^{210}Pb	^{227}Ac	^{232}Th	^{40}K	$^{238}U/^{226}Ra$	$^{230}Th/^{226}Ra$	$^{210}Pb/^{226}Ra$	$^{227}Ac/^{226}Ra$	$^{227}Ac/^{226}Ra$	$^{227}Ac/^{226}Ra$
Interval (m)	(Bq/kg)	(Bq/kg)	(Bq/kg)	(Bq/kg)	(Bq/kg)	(Bq/kg)	(Bq/kg)					(1)	(2)
0-1	847	1267	1795	1446	74	49	1134	0.5	0.7	0.8	0.042	0.9	0.9
1-2	1124	2025	2626	2006	122	39	1008	0.4	0.8	0.7	0.047	2.2	1.0
2-3	983	1040	1208	867	49	70	817	0.8	0.9	0.7	0.041	0.7	0.9
3-4	8111	7537	9120	6673	398	53	1177	0.9	0.8	0.7	0.044	1.4	1.0
4-5	5237	6096	7548	6244	299	57	1361	0.7	0.8	0.8	0.040	0.9	0.9
5-6	2075	2570	2941	2398	125	49	921	0.7	0.9	0.8	0.043	1.0	0.9
6-7	3770	8044	7554	6530	318	66	1308	0.5	1.1	0.8	0.042	1.2	0.9
7-8	3760	3811	4811	3555	212	49	1146	0.8	0.8	0.7	0.044	1.5	1.0
X1(o-1)	272	230	335	343	17	42	990	0.8	0.7	1.0	0.050	1.6	1.1

(1) Calculated by means of the measured $^{238}U/^{235}U$ ratio.
(2) Calculated by means of the published $^{238}U/^{235}U$ ratio.

Appendix 7.6.2.: Analytical results of the gamma spectrometric measurements

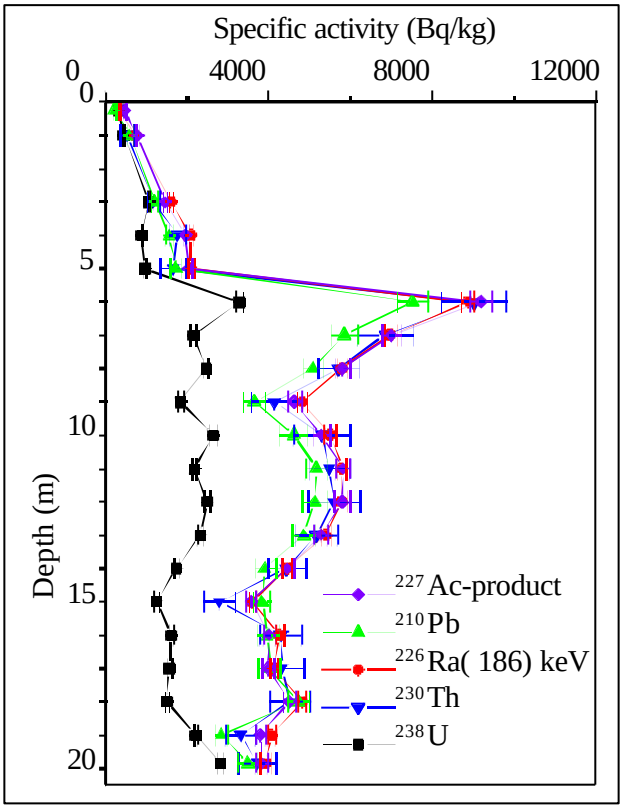
Borehole N°4

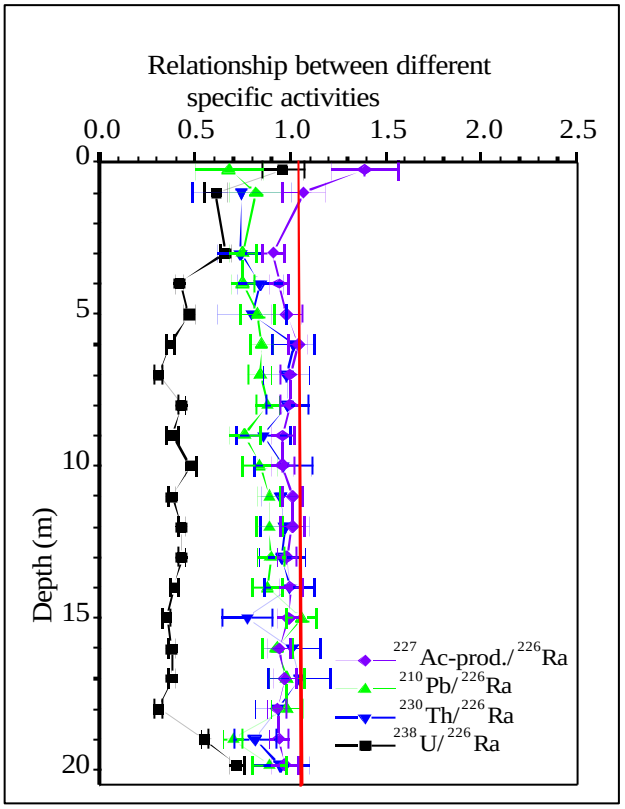
Depth	^{238}U	^{230}Th	$R^{226}a$	^{210}Pb	^{232}Th	^{40}K	^{227}Ac	U^{238}/Ra^{226}	Th^{230}/Ra^{226}	$^{210}Pb/^{226}Ra$	$^{227}Ac/^{226}Ra$	$^{227}Ac/^{226}Ra$	$^{227}Ac/^{226}Ra$
Interval (m)	(Bq/kg)	(Bq/kg)	(Bq/kg)	(Bq/kg)	(Bq/kg)	(Bq/kg)	(Bq/kg)					(1)	(2)
0-1	371	179	360	293	56	1014	20	1.0	0.5	0.8	0.057	1.0	1.2
1-2	911	1923	2195	1704	34	915	98	0.4	0.9	0.8	0.045	1.0	1.0
2-3	317	447	644	479	37	612	31	0.5	0.7	0.7	0.049	1.4	1.1
3-4	1055	2039	2449	1993	50	704	111	0.4	0.8	0.8	0.045	0.8	1.0
4-5	6193	6013	7871	5868	54	1202	343	0.8	0.8	0.7	0.044	1.1	1.0
5-6	2804	3923	4705	3890	52	1079	205	0.6	0.8	0.8	0.044	1.0	1.0
6-7	4023	5568	7674	6940	70	1297	305	0.5	0.7	0.9	0.040	0.8	0.9
7-8	4544	4366	5892	4993	48	1152	247	0.8	0.7	0.8	0.042	0.9	0.9
8-9	4100	3297	4681	4146	43	1126	209	0.9	0.7	0.9	0.045	1.7	1.0
9-10	3439	2935	3781	3311	46	1157	168	0.9	0.8	0.9	0.045	1.3	1.0
10-11	184	--	191	383	62	963	7	1.0	--	2.0	0.038	2.5	0.8
11-12	2134	--	3283	2662	49	983	141	0.7	--	0.8	0.043	2.4	0.9

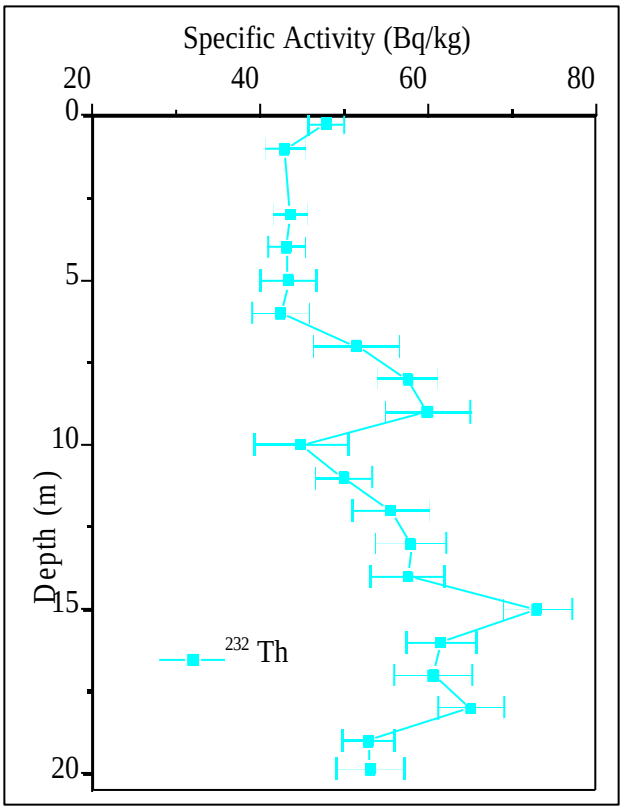
(1) Calculated by means of the measured 238U/ 235U ratio.
(2) Calculated by means of the published 238U/ 235U ratio.

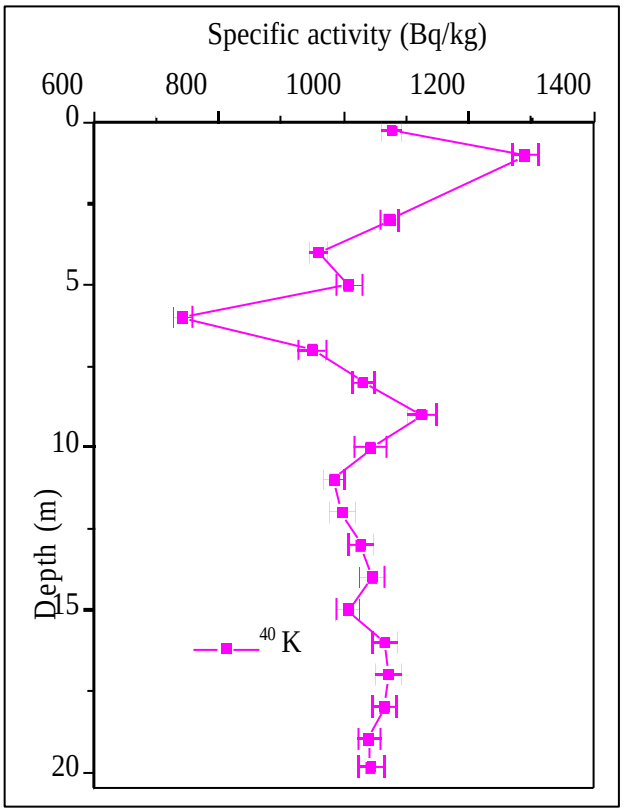
Appendix 7.6.2.: Analytical results of the gamma spectrometric measurements

Appendix 7.6.3.: The changes of the concentration of the main radioactive nuclides with the depth (Borehole N°2)

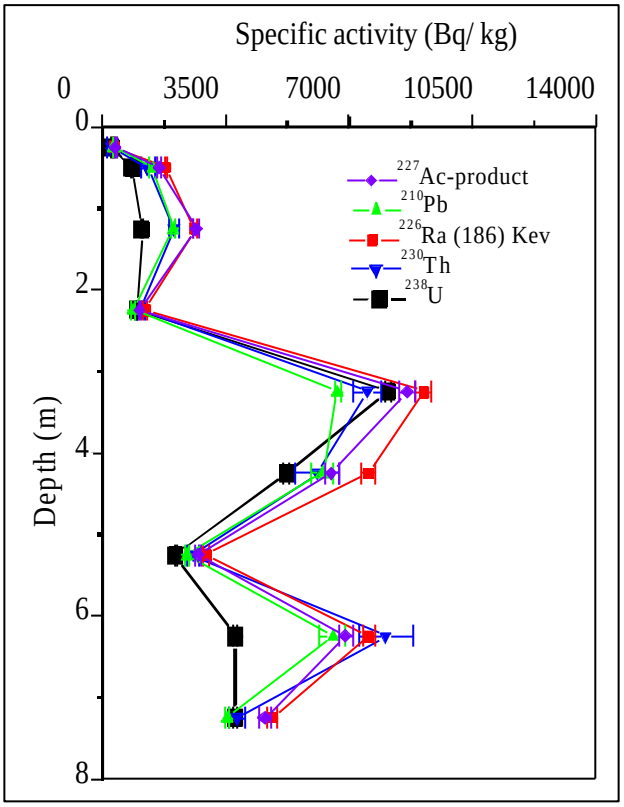


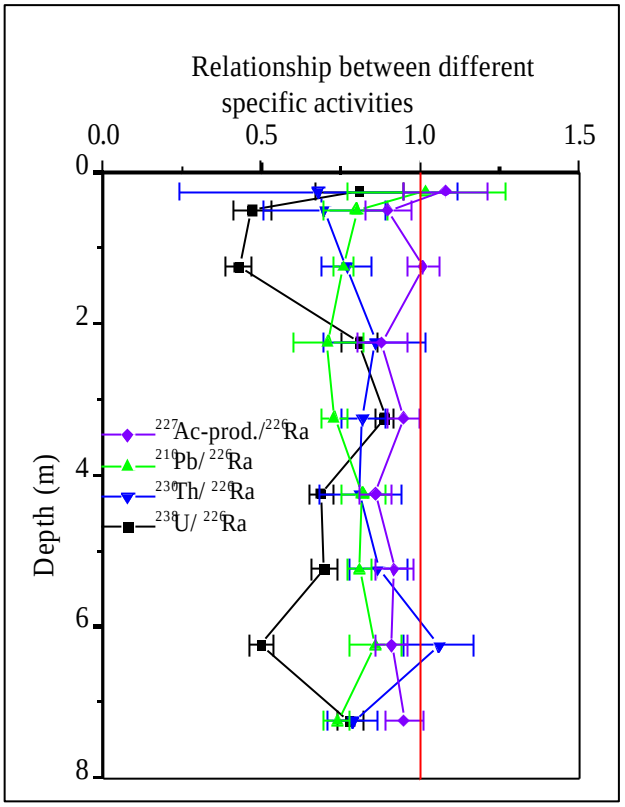


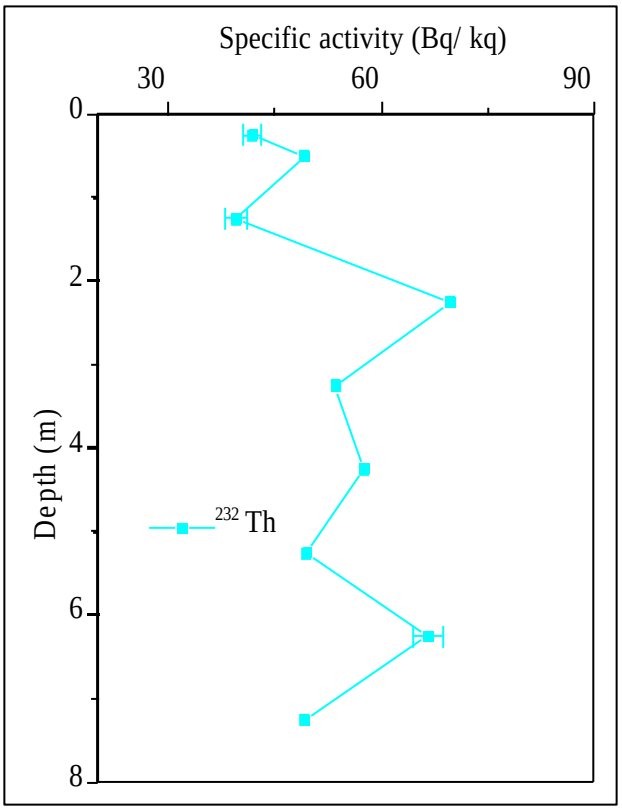


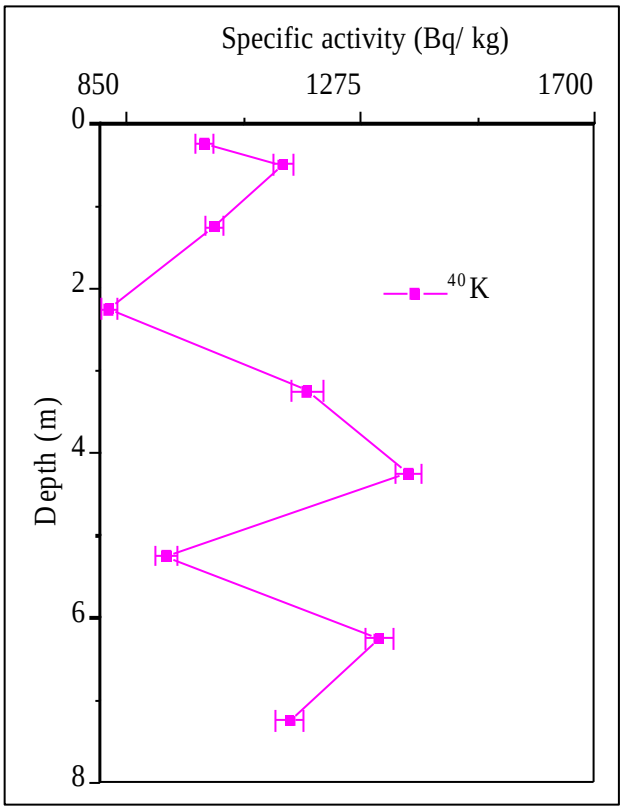


Appendix 7.6.3.: The changes of the concentration of the main radioactive nuclides with the depth (Borehole N°3)

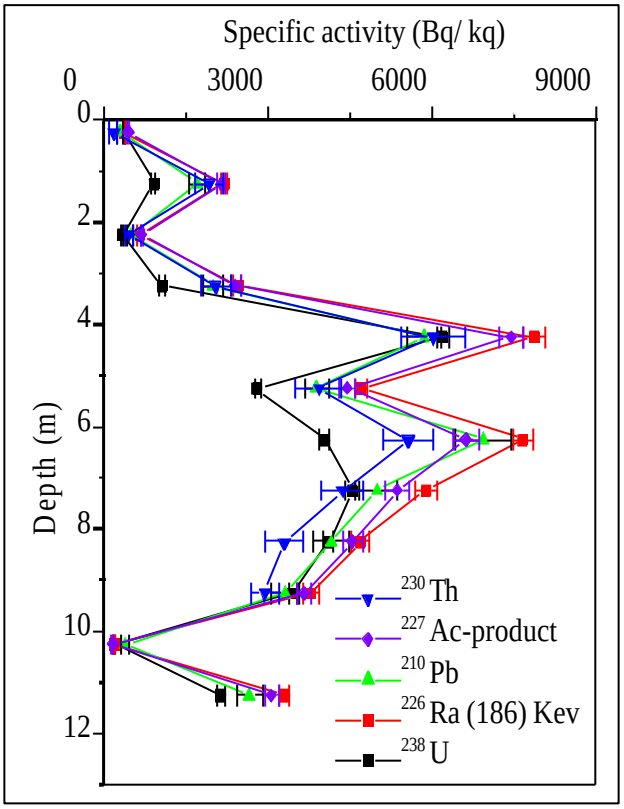


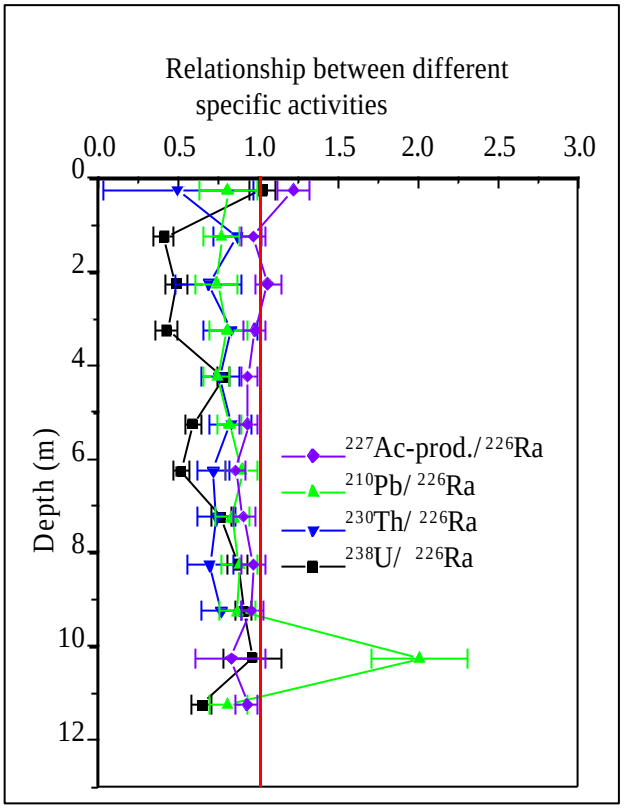


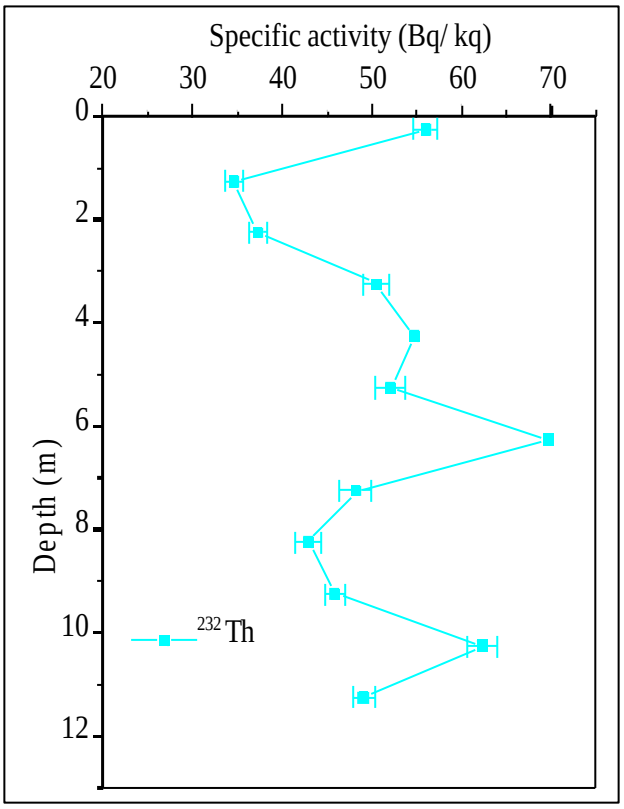


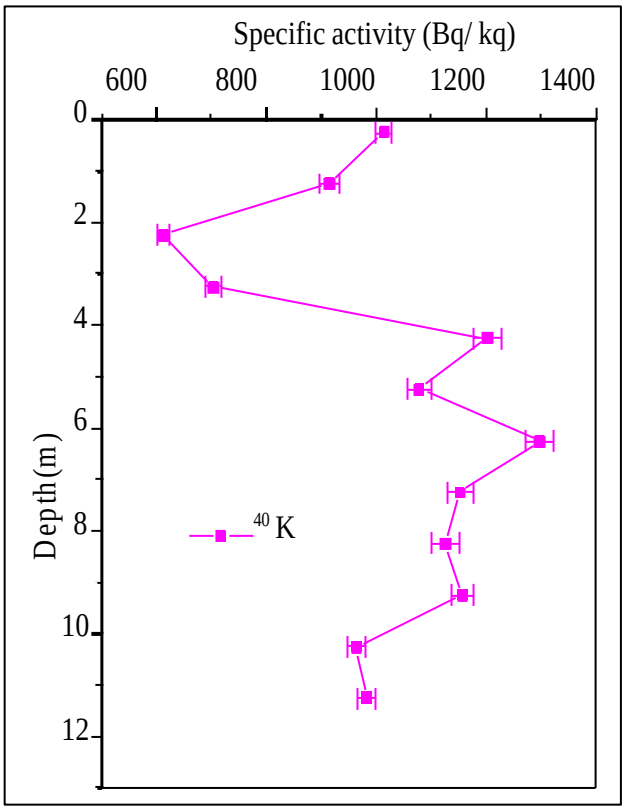


Appendix 7.6.3.: The changes of the concentration of the main radioactive nuclides with the depth (Borehole N°4)

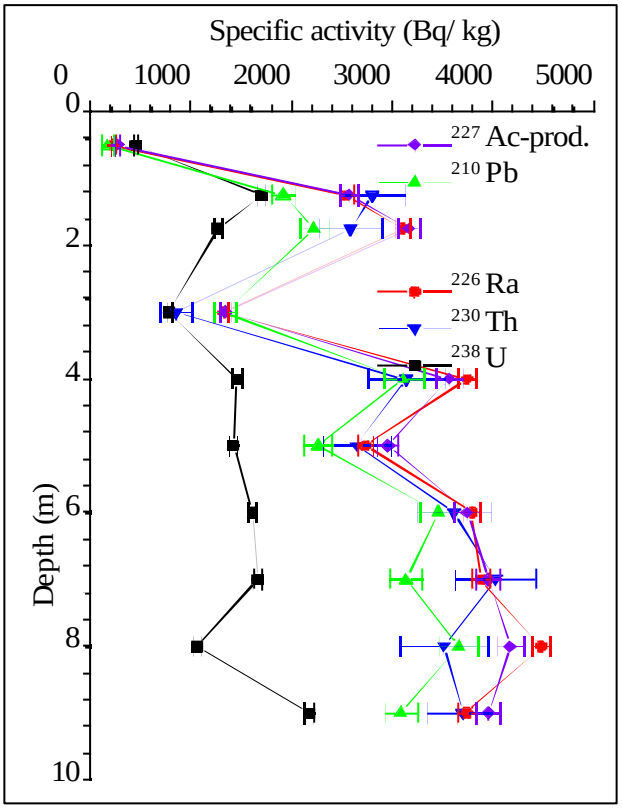


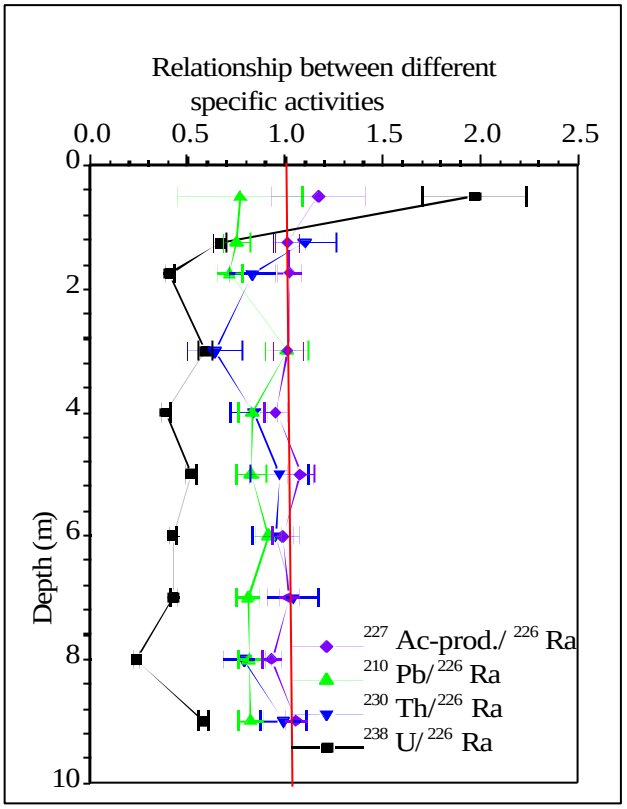


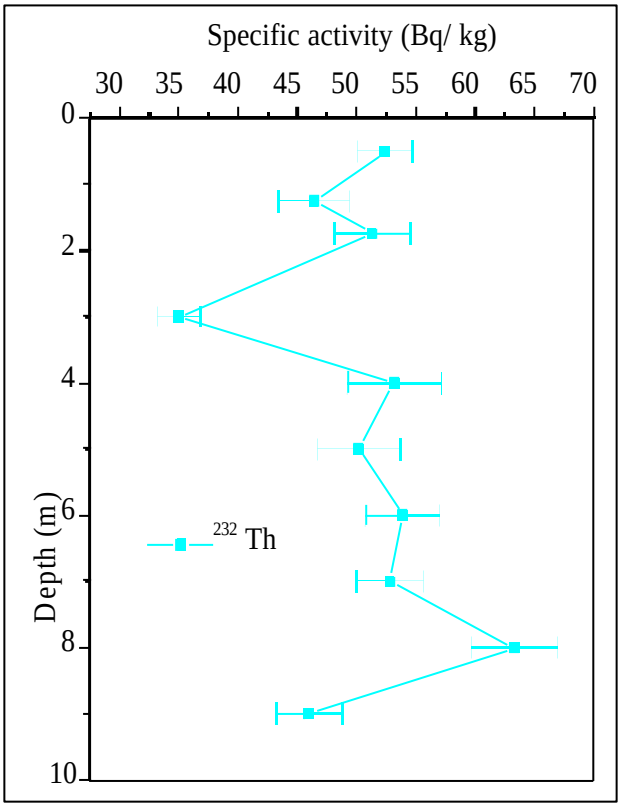


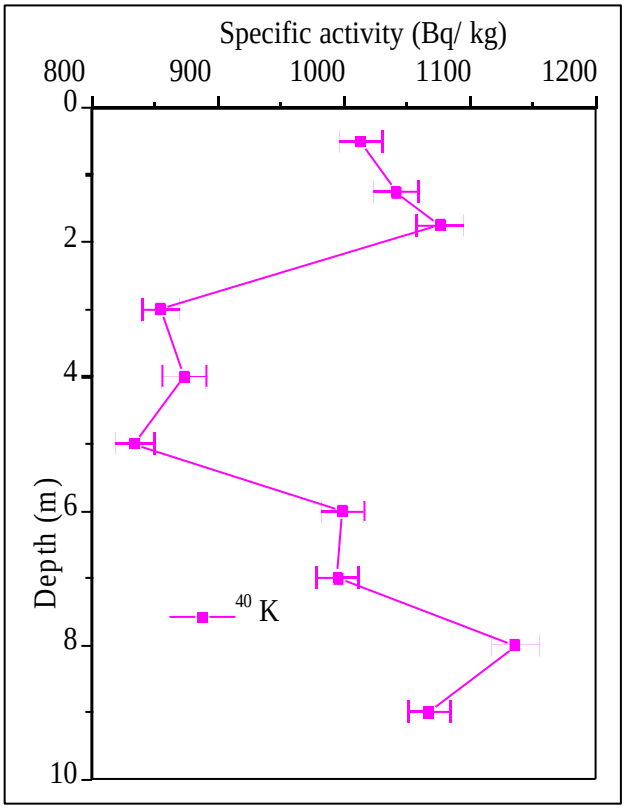


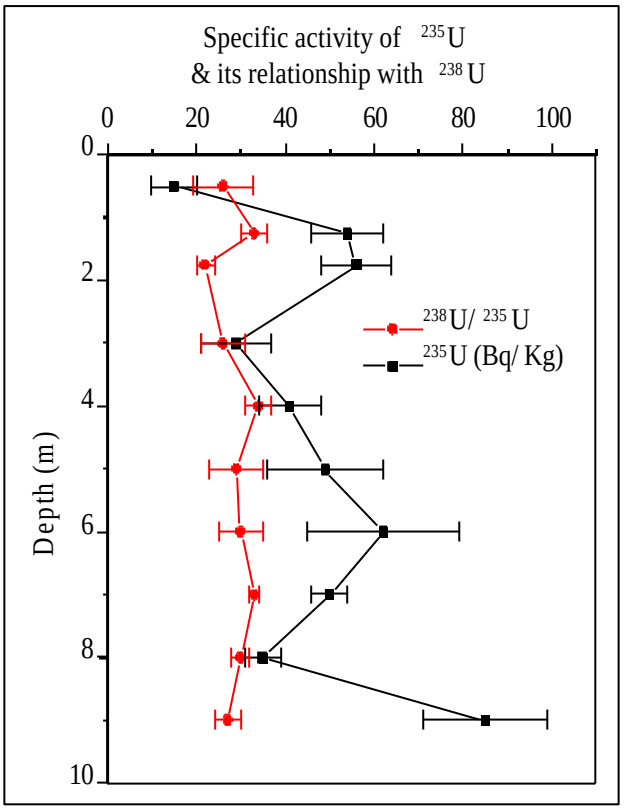
Appendix 7.6.3.: The changes of the concentration of the main radioactive nuclides with the depth (Borehole N°1)

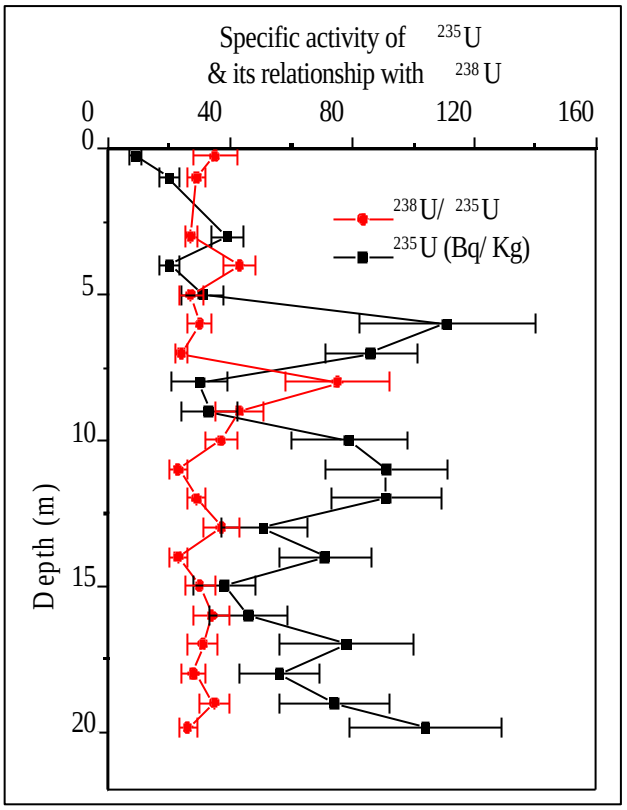


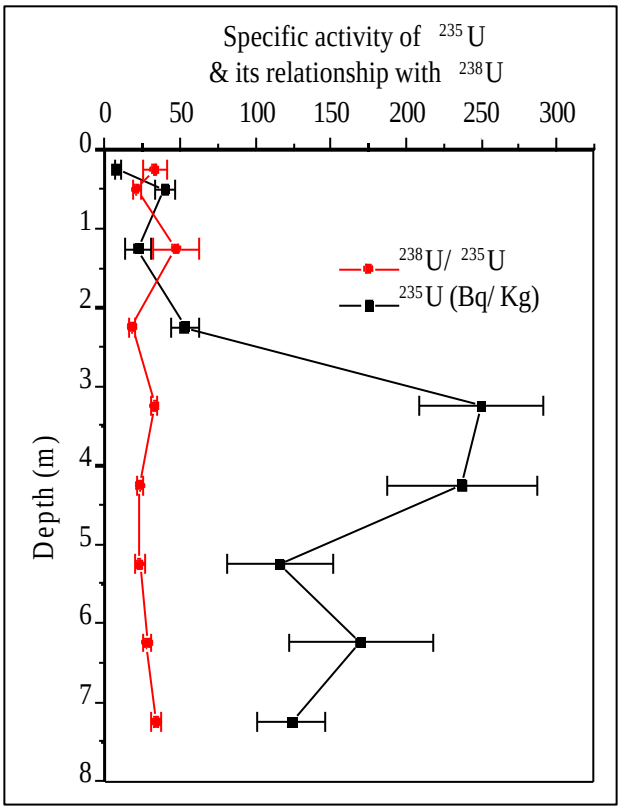


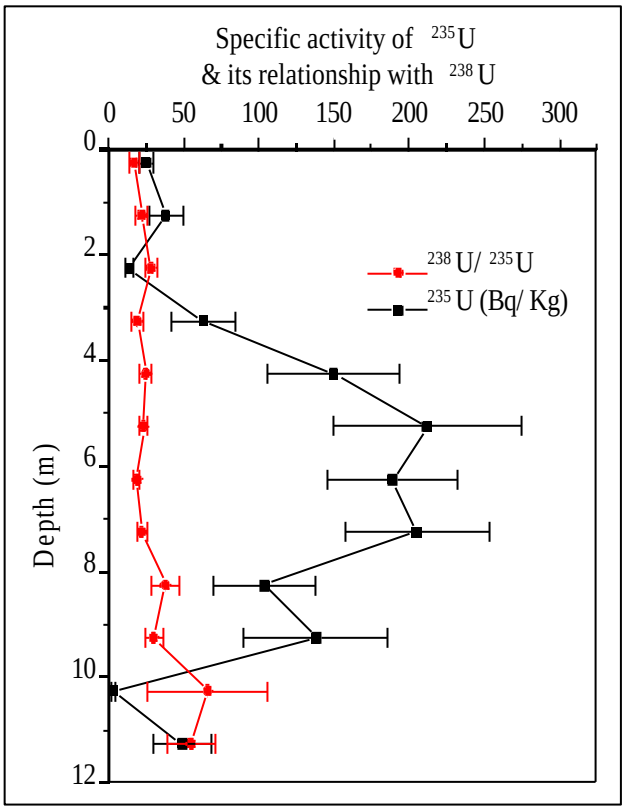





Specific activity of 235U
& its relationship with 238U
0
20
40
60
80
100
0
2
4
6
8
10
Depth (m)
238U/ 235U
235U (Bq/ Kg)


Specific activity of 235U
& its relationship with 238U
0
40
80
120
160
0
5
10
15
20
Depth (m)
238U/ 235U
235U (Bq/ Kg)


Specific activity of 235U
& its relationship with 238U
0
50
100
150
200
250
300
0
1
2
3
4
5
6
7
8
Depth (m)
238U/ 235U
235U (Bq/ Kg)


Specific activity of 235U
& its relationship with 238U
0
50
100
150
200
250
300
0
2
4
6
8
10
12
Depth (m)
238U/ 235U
235U (Bq/ Kg)

BoreholeN°1

Depth Interval (m)	^{238}U (1) (Bq/kg)	?U/U (%)	^{238}U (2) (Bq/kg)	?U/U (%)	^{238}U (3) (ppm)	^{238}U (4) (%)	^{234}U (Bq/kg)	?U/U (%)	^{235}U (Bq/kg)	?U/U (%)	$^{238}U/^{234}U$	$^{238}U/^{235}U$
0-1	452	3	387	6	31	0.003	397	7	15	33	1.0	26
1-1.5	1698	2	1777	6	144	0.014	1669	6	53	16	1.1	33
1.5-2.5	1269	3	1243	6	100	0.010	1252	6	56	14	1.0	22
2.5-3.5	785	3	745	9	60	0.006	735	9	29	27	1.0	26
3.5-4.5	1457	3	1382	6	112	0.011	1302	6	41	17	1.1	33
4.5-5.5	1419	3	1421	5	115	0.011	1319	10	49	26	1.1	29
5.5-6.5	1611	2	1878	10	152	0.015	1662	10	62	27	1.1	30
6.5-7.5	1664	2	1672	9	135	0.014	1833	9	50	7	0.9	33
7.5-8.5	1063	4	1046	4	84	0.008	1100	4	35	12	1.0	30
8.5-9.5	2178	2	2307	7	187	0.019	2236	7	85	17	1.0	27

(1) Measured by means of a semiconductor gamma spectrometer

(2) Measured by means of a semiconductor alpha spectrometer

Appendix 7.6.4.: Analytical results of the alpha spectrometric measurements

Borehole N°2

Depth	^{238}U (1)	?U/U	^{238}U (2)	?U/U	^{238}U (3)	?U/U	^{238}U (4)	?U/U	^{238}U	^{238}U	^{234}U	?U/U	^{235}U	?U/U	$^{238}U/^{234}U$	$^{238}U/^{235}U$
Interval (m)	(Bq/kg)	(%)	(Bq/kg)	(%)	(Bq/kg)	(%)	(Bq/kg)	(%)	(ppm)	(%)	(Bq/kg)	(%)	(Bq/kg)	(%)		
0-0.5	326	5	319	6	276	5	327	5	26	0.003	325	5	9	26	1.0	35
0.5-1.5	451	5	474	6	405	5	582	4	47	0.005	610	4	20	14	1.0	29
2.5-3.5	1069	2	1050	3	871	2	1049	5	85	0.008	1038	5	39	13	1.0	27
3.5-4.5	890	2	890	2	--	--	863	4	70	0.007	900	4	20	15	1.0	43
4.5-5.5	971	4	971	4	--	--	849	8	69	0.007	852	8	31	23	1.0	27
5.5-6.5	3288	2	3236	5	2673	2	3340	13	270	0.027	3379	13	111	26	1.0	30
6.5-7.5	2162	3	2187	3	1683	4	2073	8	168	0.017	1983	13	86	17	1.0	24
7.5-8.5	2464	2	2497	2	1924	3	2252	9	182	0.018	1969	15	30	31	1.1	75
8.5-9.5	1850	4	1975	4	1357	4	1449	9	117	0.012	1347	8	33	28	1.1	43
9.5-10.5	2644	3	2523	4	2222	3	2928	11	237	0.024	2751	9	79	25	1.1	37
10.5-11.5	2182	2	2212	4	1755	2	2097	10	170	0.017	2086	9	91	22	1.0	23
11.5-12.5	2494	3	2489	3	2028	3	2637	9	213	0.021	2315	11	91	20	1.1	29
12.5-13.5	2329	3	1953	2	1822	3	1896	10	153	0.015	1807	10	51	27	1.1	37
13.5-14.5	1752	3	1747	3	1427	3	1649	9	133	0.013	1607	9	71	21	1.0	23
14.5-15.5	1265	4	963	22	1027	3	1107	9	89	0.009	1099	10	37	27	1.0	29
15.5-16.5	1620	3	1253	17	1351	3	1559	11	126	0.013	1622	9	46	28	1.0	34
16.5-17.5	1569	4	1446	7	1298	4	2387	13	193	0.019	2382	9	78	28	1.0	30
17.5-18.5	1516	3	1430	17	1221	3	1536	10	124	0.012	1611	10	56	24	1.0	27
18.5-19.5	2225	2	2225	2	--	--	2578	10	208	0.021	2621	12	74	24	1.0	35
19.5-20.2	2815	2	2834	2	2145	3	2690	11	218	0.022	2552	10	104	24	1.1	26

(1) Calculated mean values of specific activities of samples measured by means of a semiconductor gamma spectrometer.
(2) The specific activities of dried samples measured by means of a semiconductor gamma spectrometer.
(3) The specific activities of wet samples measured by means of a semiconductor gamma spectrometer.
(4) The specific activities of dried samples measured by means of a semiconductor alpha spectrometer.

Appendix 7.6.4.: Analytical results of the alpha spectrometric measurements

Borehole N°3

Depth	^{238}U(1)	?U/U	^{238}U(2)	?U/U	^{238}U(3)	^{238}U(4)	^{234}U	?U/U	^{235}U	?U/U	$^{238}U/^{234}U$	$^{238}U/^{235}U$
Interval (m)	(Bq/kg)	(%)	(Bq/kg)	(%)	(ppm)	(%)	(Bq/kg)	(%)	(Bq/kg)	(%)		
0-1	847	6	864	5	70	0.007	942	5	40	16	0.9	21
1-2	1124	3	1040	10	84	0.008	1092	10	22	42	1.0	47
2-3	983	2	947	6	76	0.008	875	6	53	17	1.1	18
3-4	8111	2	8200	9	663	0.066	8132	9	250	16	1.0	33
4-5	5237	1	5506	13	445	0.045	5455	13	237	21	1.0	23
5-6	2075	2	2690	15	217	0.022	2667	15	116	30	1.0	23
6-7	3770	2	4660	17	377	0.038	4731	17	169	28	1.0	27
7-8	3760	2	4241	9	343	0.034	4127	9	124	18	1.0	34
X1(o-1)	272	1	263	6	21	0.002	278	6	8	30	0.9	33

(1) Measured by means of a semiconductor gamma spectrometer
(2) Measured by means of a semiconductor alpha spectrometer

Appendix 7.6.4.: Analytical results of the alpha spectrometric measurements

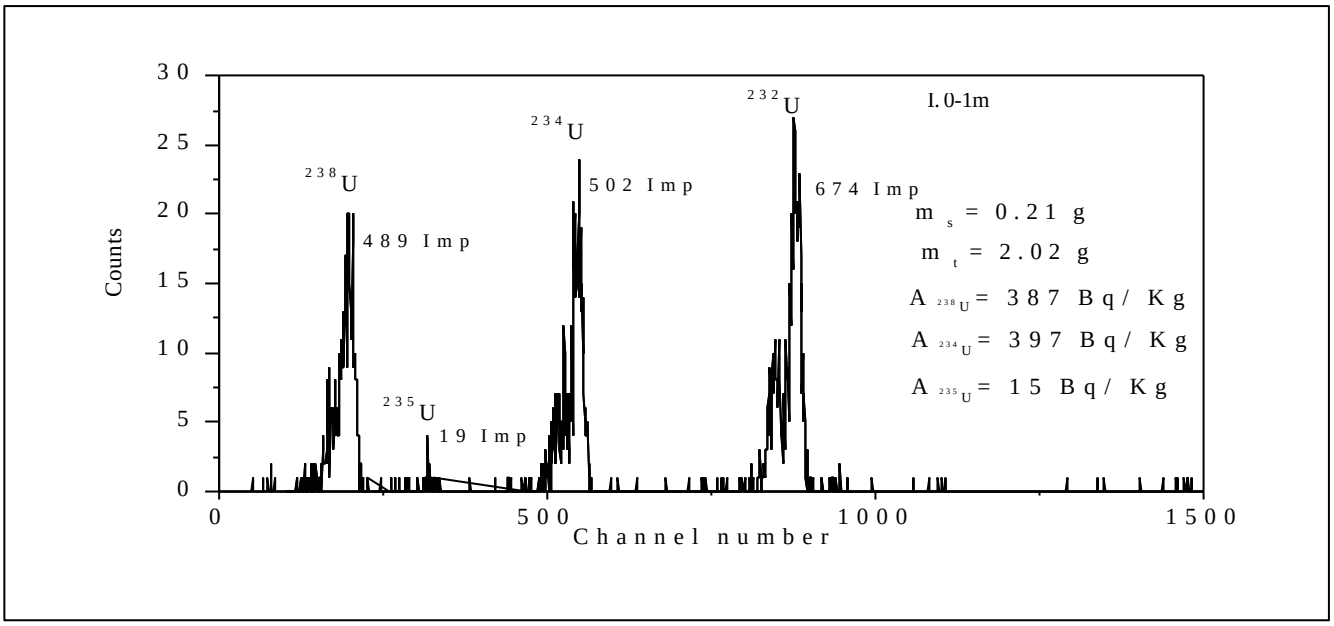
Borehole N°4

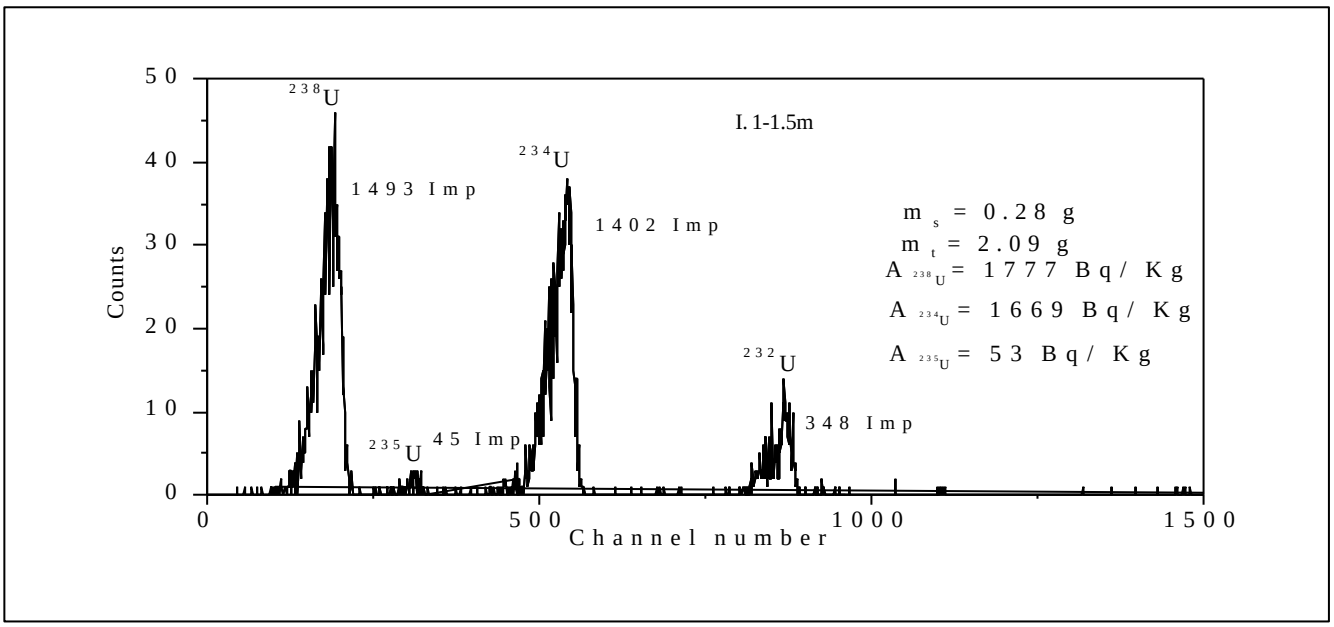
Depth	^{238}U	^{230}Th	$R^{226}a$	^{210}Pb	^{232}Th	^{40}K	^{227}Ac	U^{238}/Ra^{226}	Th^{230}/Ra^{226}	$^{210}Pb/^{226}Ra$	$^{227}Ac/^{226}Ra$	$^{227}Ac/^{226}Ra$	$^{227}Ac/^{226}Ra$
Interval (m)	(Bq/kg)	(Bq/kg)	(Bq/kg)	(Bq/kg)	(Bq/kg)	(Bq/kg)	(Bq/kg)					(1)	(2)
0-1	371	179	360	293	56	1014	20	1.0	0.5	0.8	0.057	1.0	1.2
1-2	911	1923	2195	1704	34	915	98	0.4	0.9	0.8	0.045	1.0	1.0
2-3	317	447	644	479	37	612	31	0.5	0.7	0.7	0.049	1.4	1.1
3-4	1055	2039	2449	1993	50	704	111	0.4	0.8	0.8	0.045	0.8	1.0
4-5	6193	6013	7871	5868	54	1202	343	0.8	0.8	0.7	0.044	1.1	1.0
5-6	2804	3923	4705	3890	52	1079	205	0.6	0.8	0.8	0.044	1.0	1.0
6-7	4023	5568	7674	6940	70	1297	305	0.5	0.7	0.9	0.040	0.8	0.9
7-8	4544	4366	5892	4993	48	1152	247	0.8	0.7	0.8	0.042	0.9	0.9
8-9	4100	3297	4681	4146	43	1126	209	0.9	0.7	0.9	0.045	1.7	1.0
9-10	3439	2935	3781	3311	46	1157	168	0.9	0.8	0.9	0.045	1.3	1.0
10-11	184	--	191	383	62	963	7	1.0	--	2.0	0.038	2.5	0.8
11-12	2134	--	3283	2662	49	983	141	0.7	--	0.8	0.043	2.4	0.9

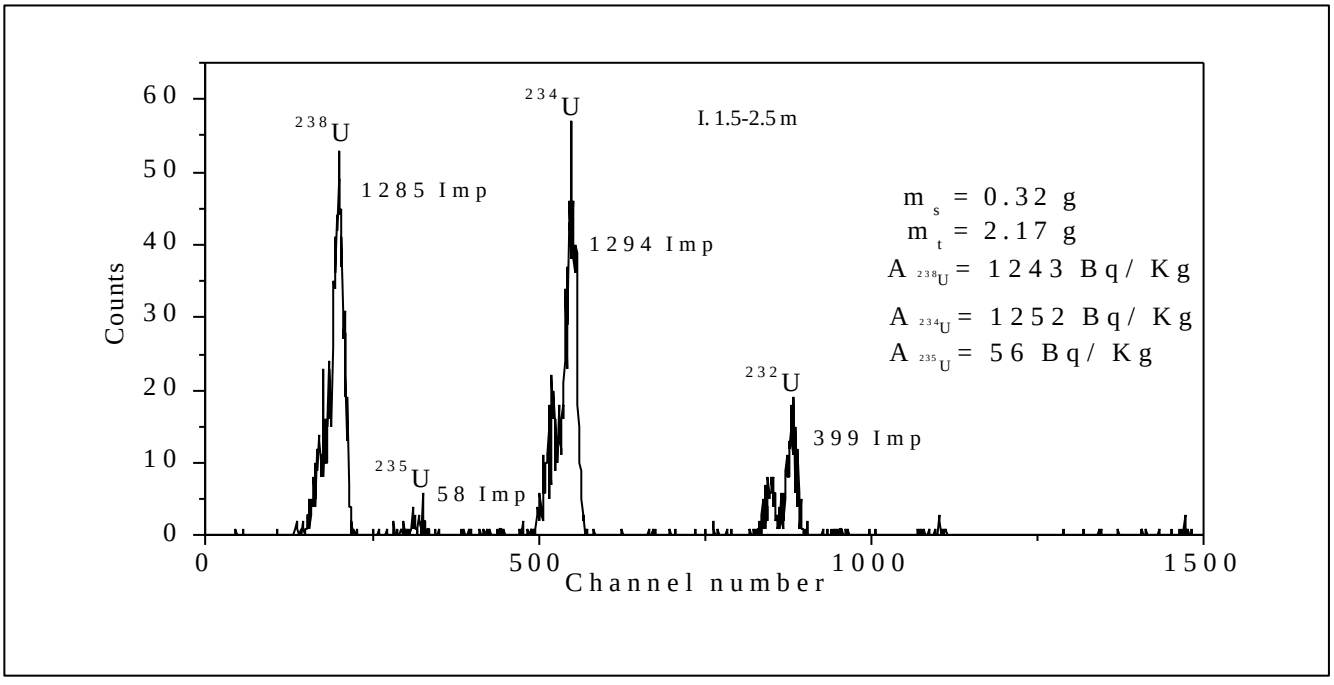
(1) Calculated by means of the measured 238U/ 235U ratio.
(2) Calculated by means of the published 238U/ 235U ratio.

Appendix 7.6.2.: Analytical results of the gamma spectrometric measurements

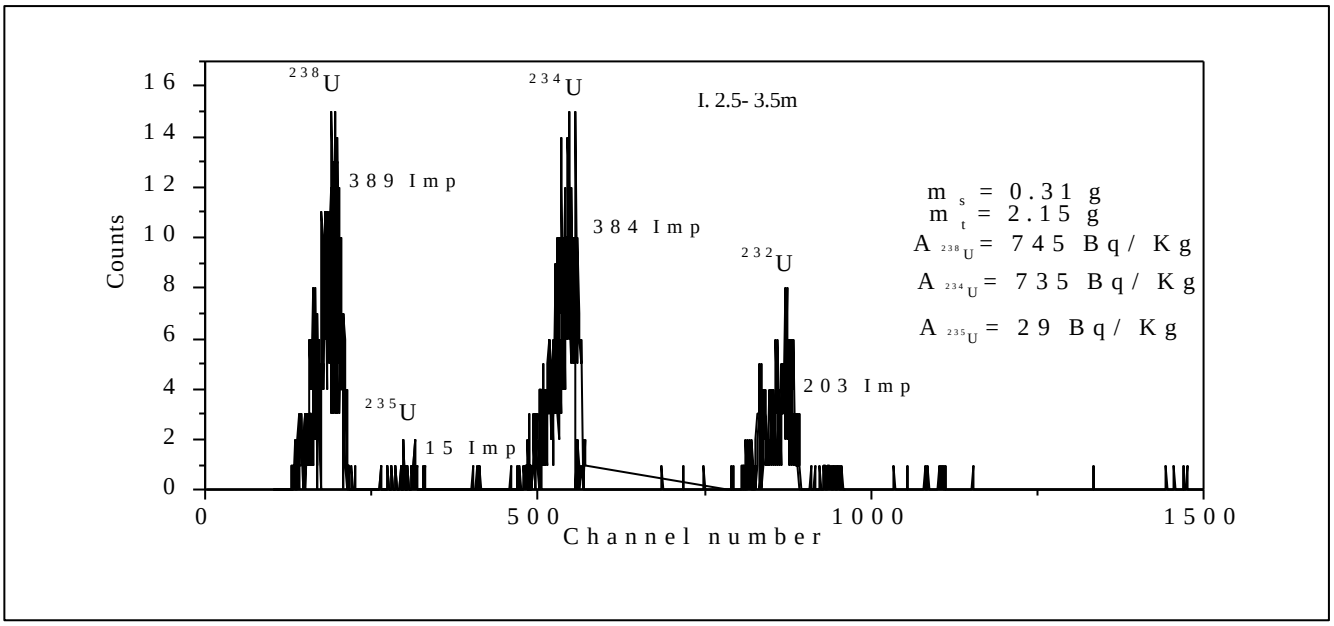
Appendix 7.6.5.: Alpha spectrum of each analysed sample

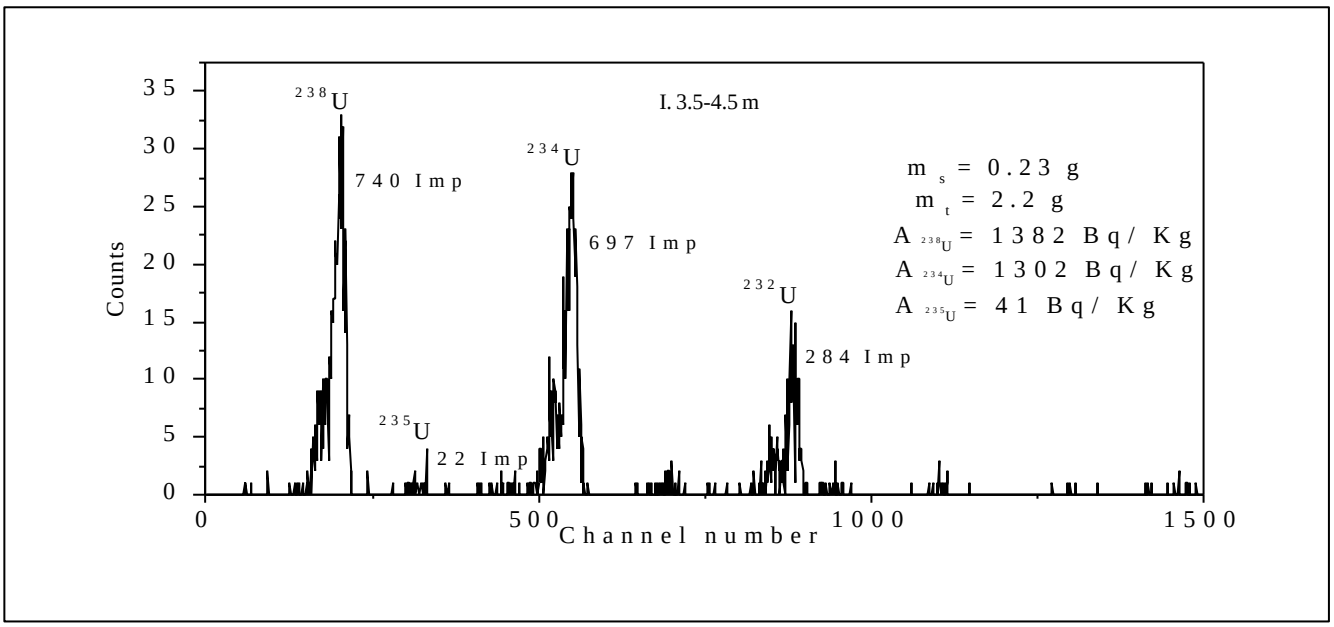


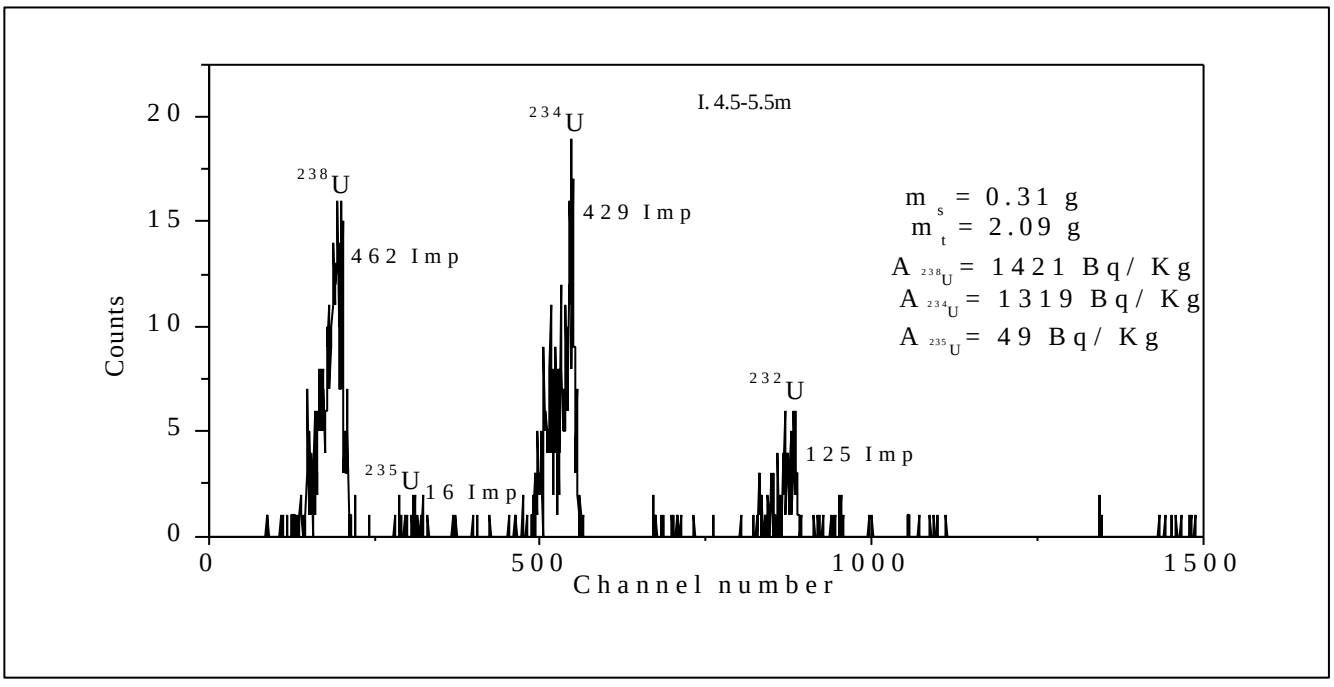




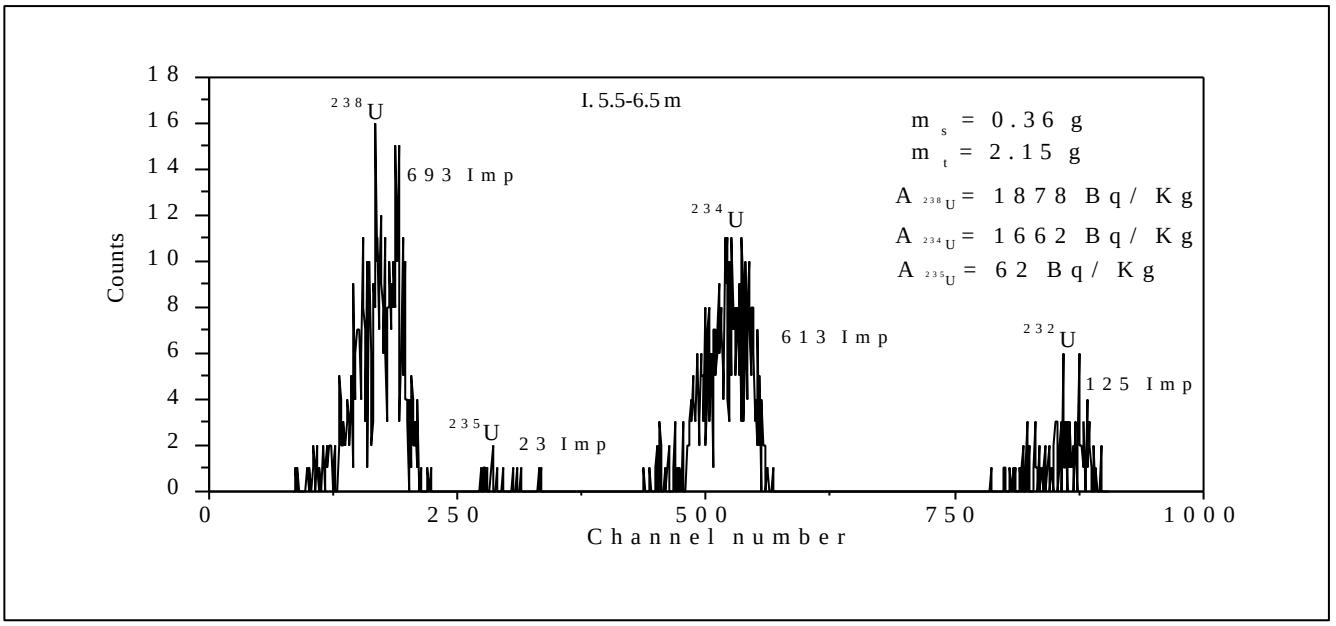
Appendix 7.6.5.: Alpha spectrum of each analysed sample

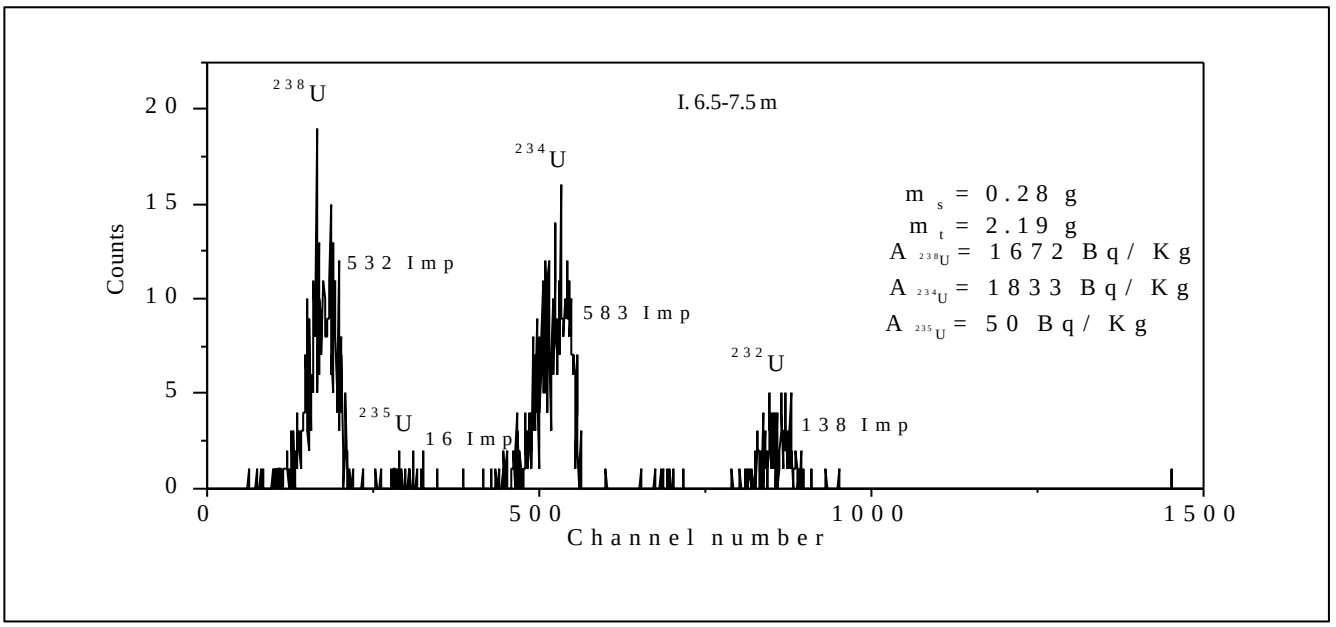


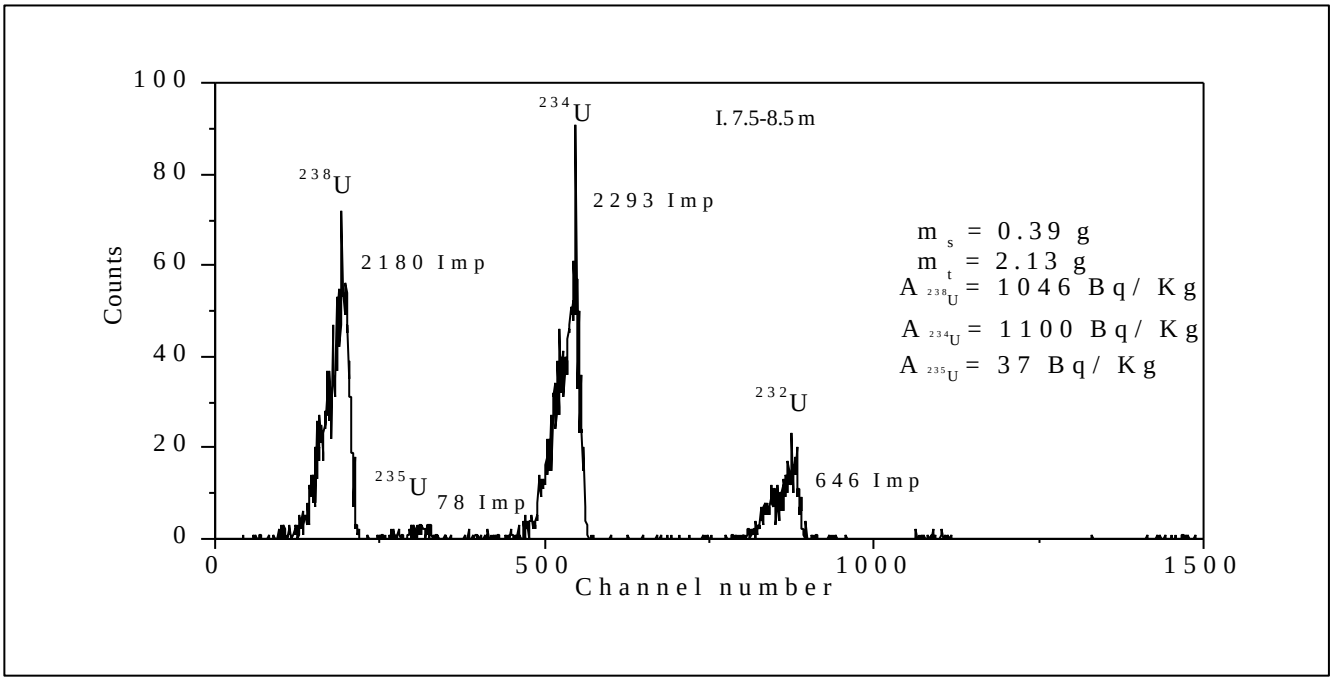




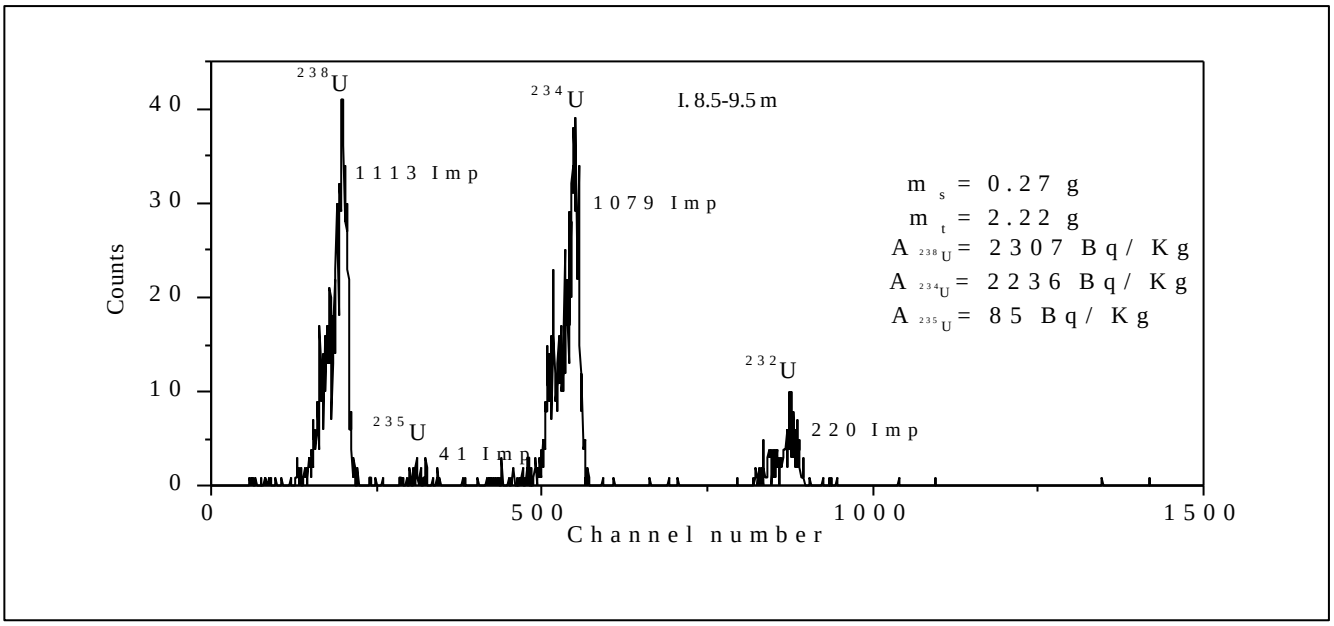
Appendix 7.6.5.: Alpha spectrum of each analysed sample



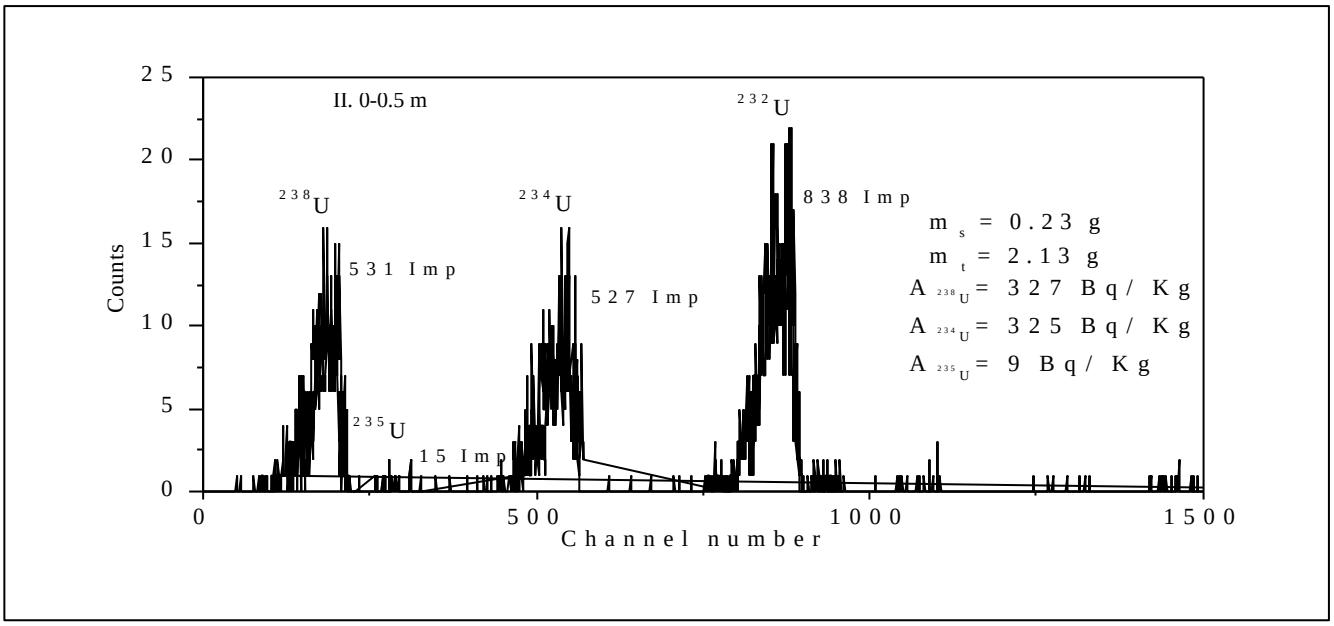


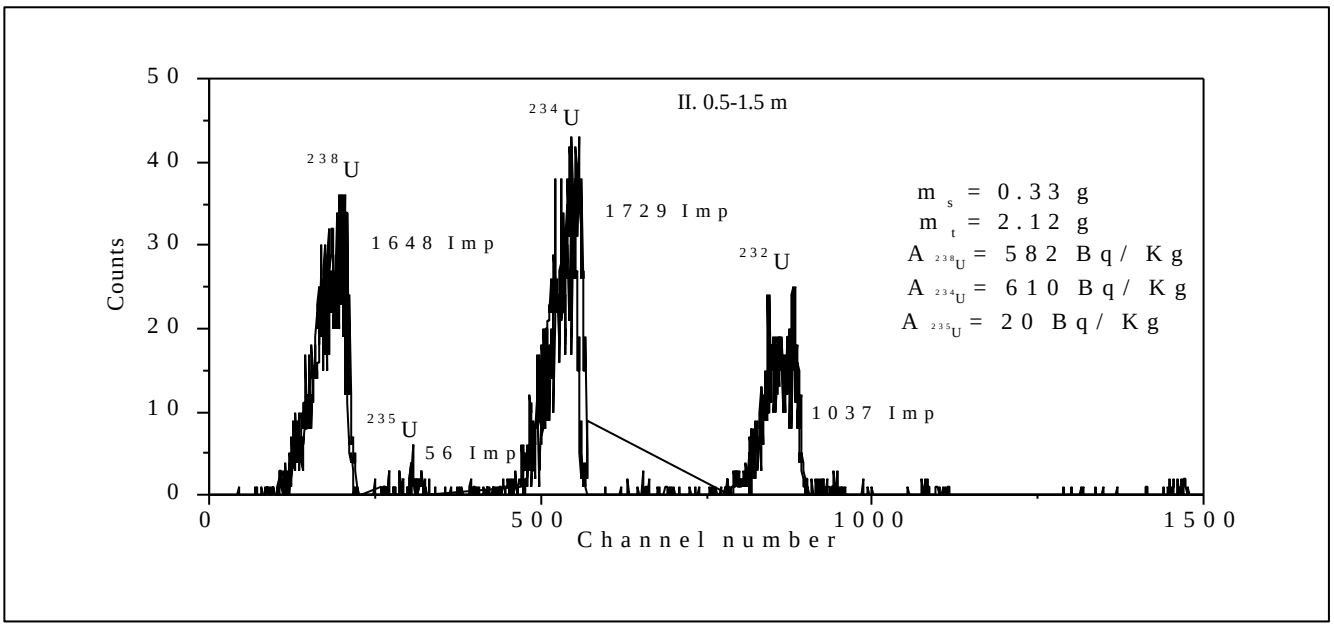


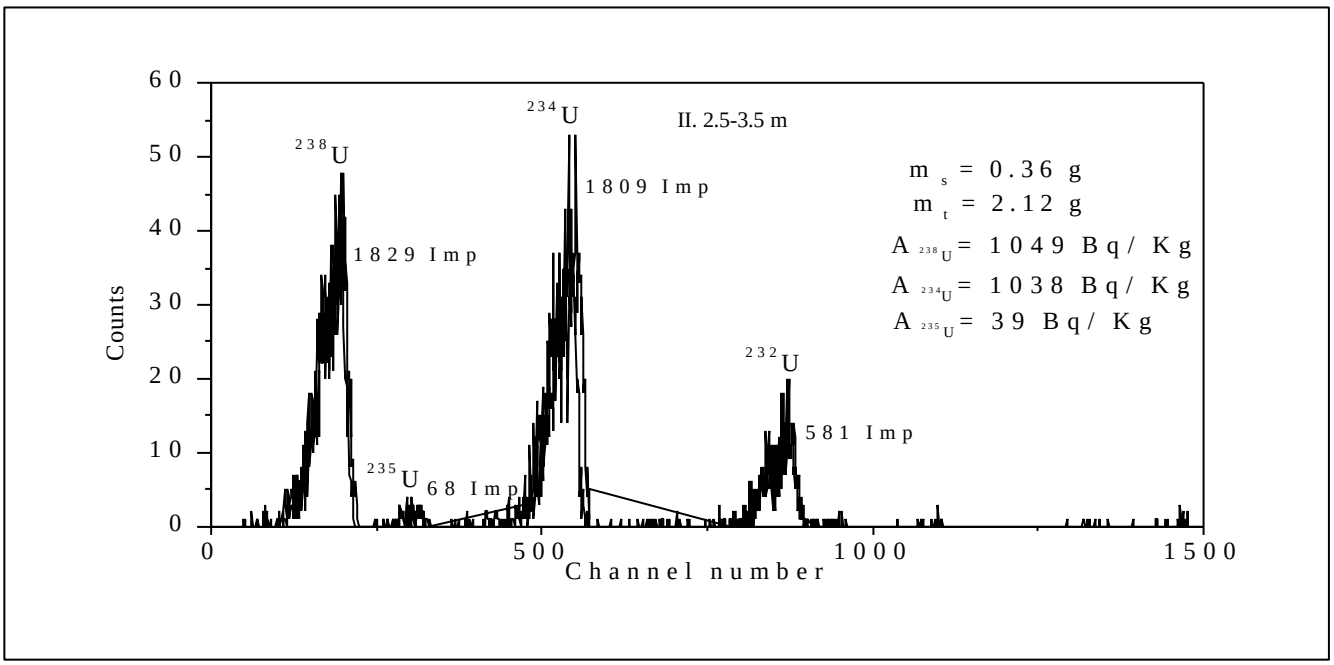
Appendix 7.6.5.: Alpha spectrum of each analysed sample



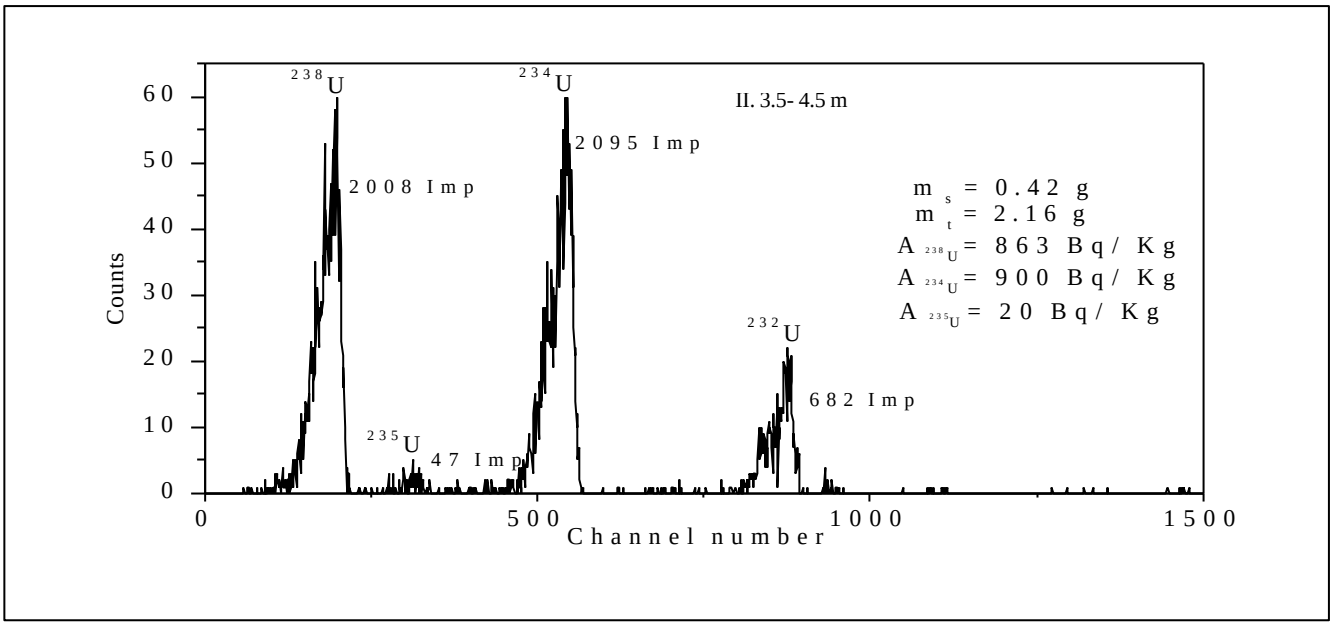
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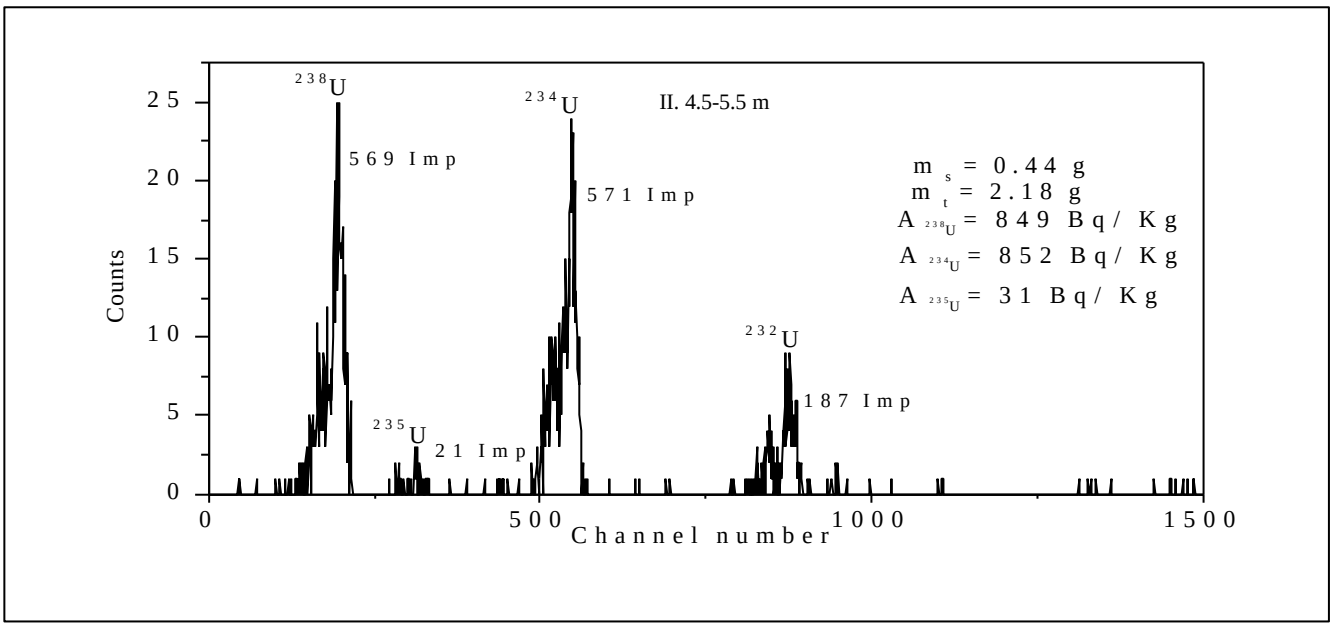


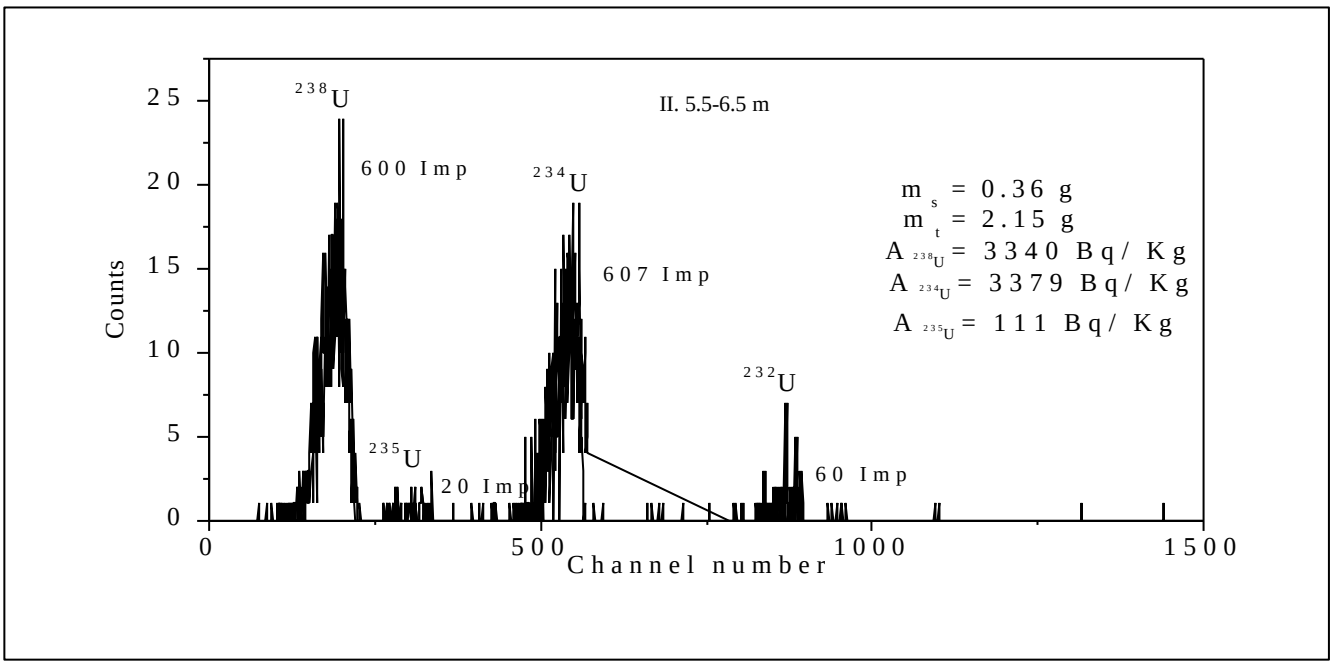




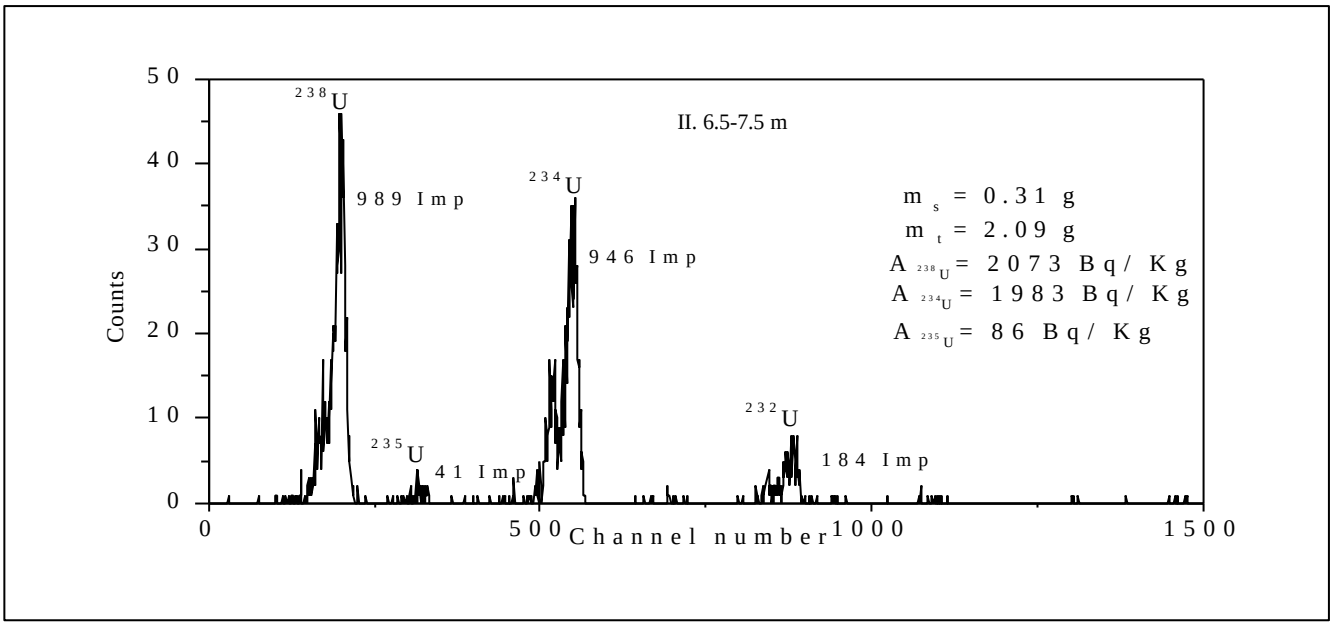
Appendix 7.6.5.: Alpha spectrum of each analysed sample

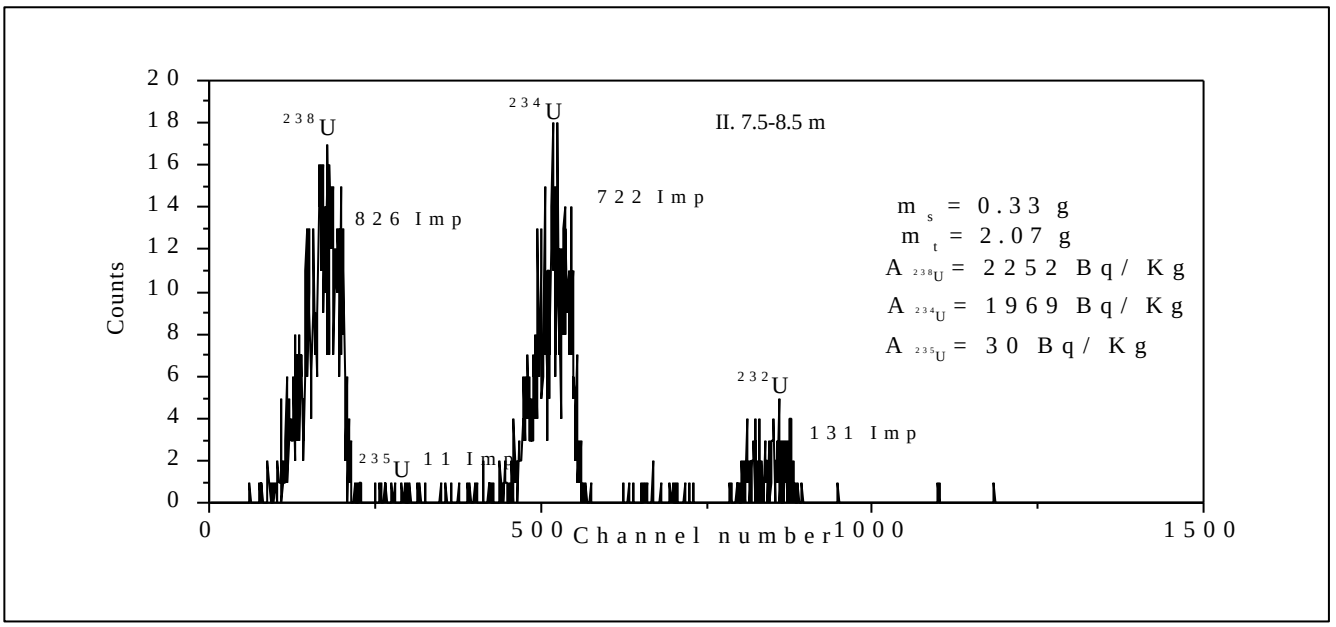


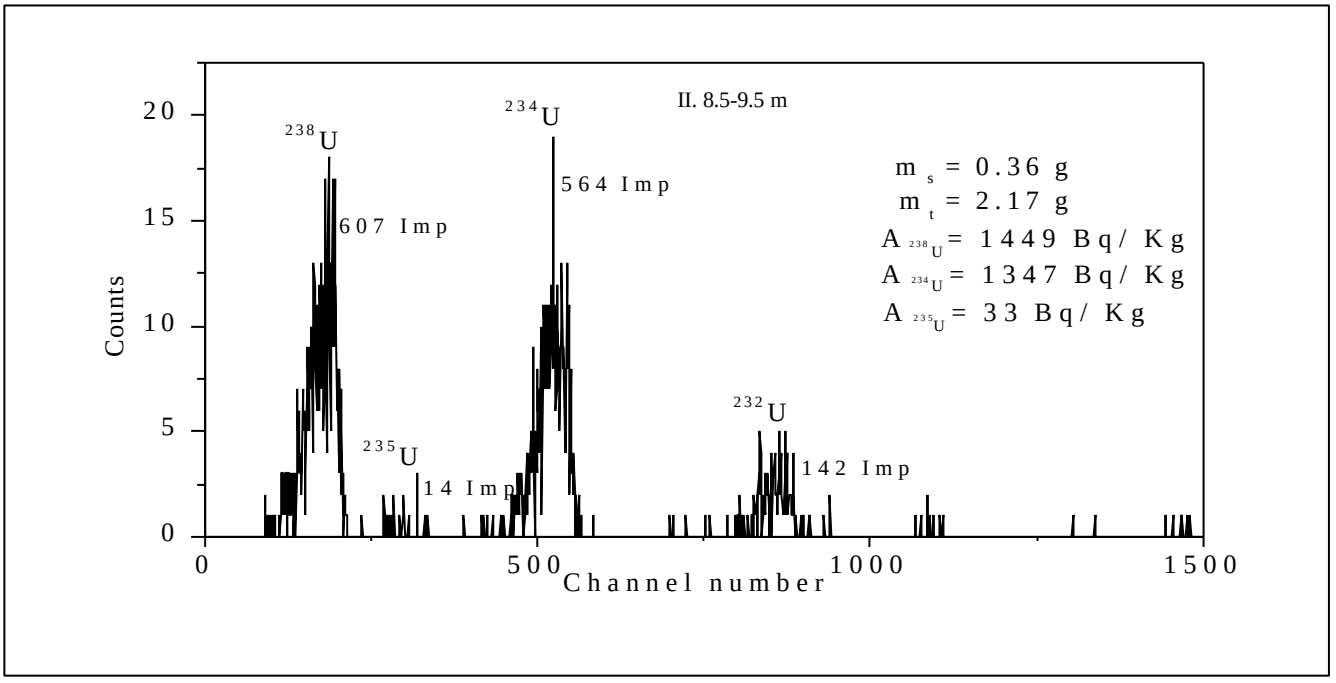




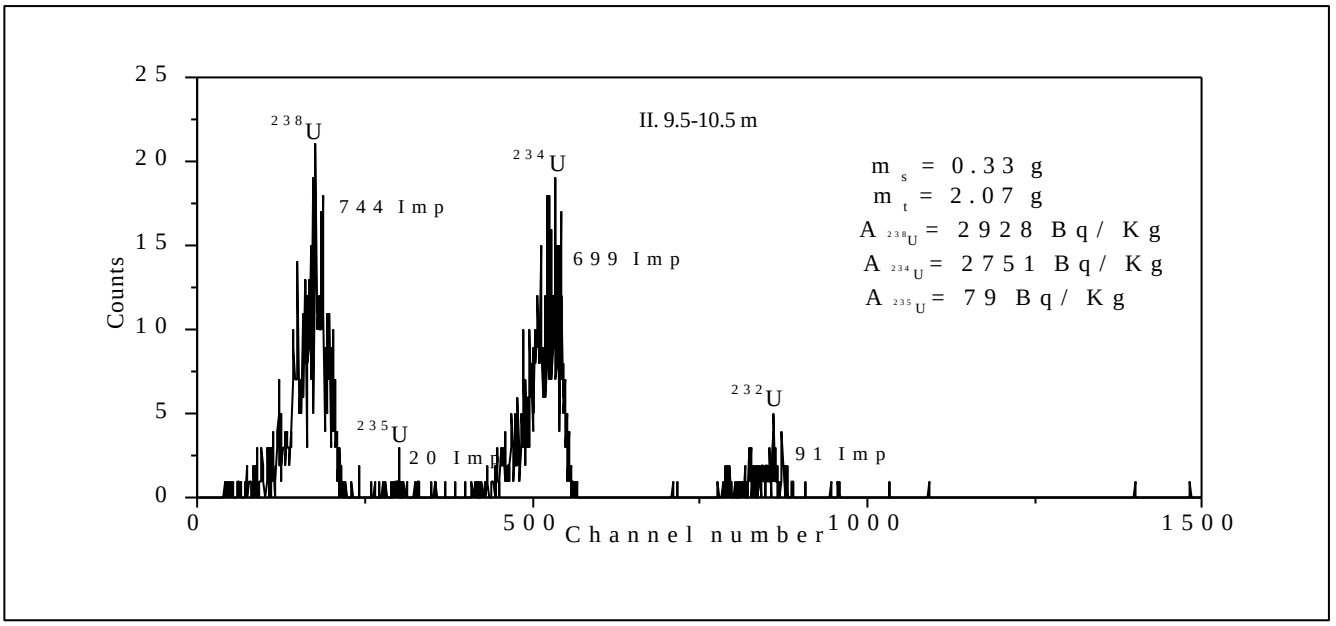
Appendix 7.6.5.: Alpha spectrum of each analysed sample

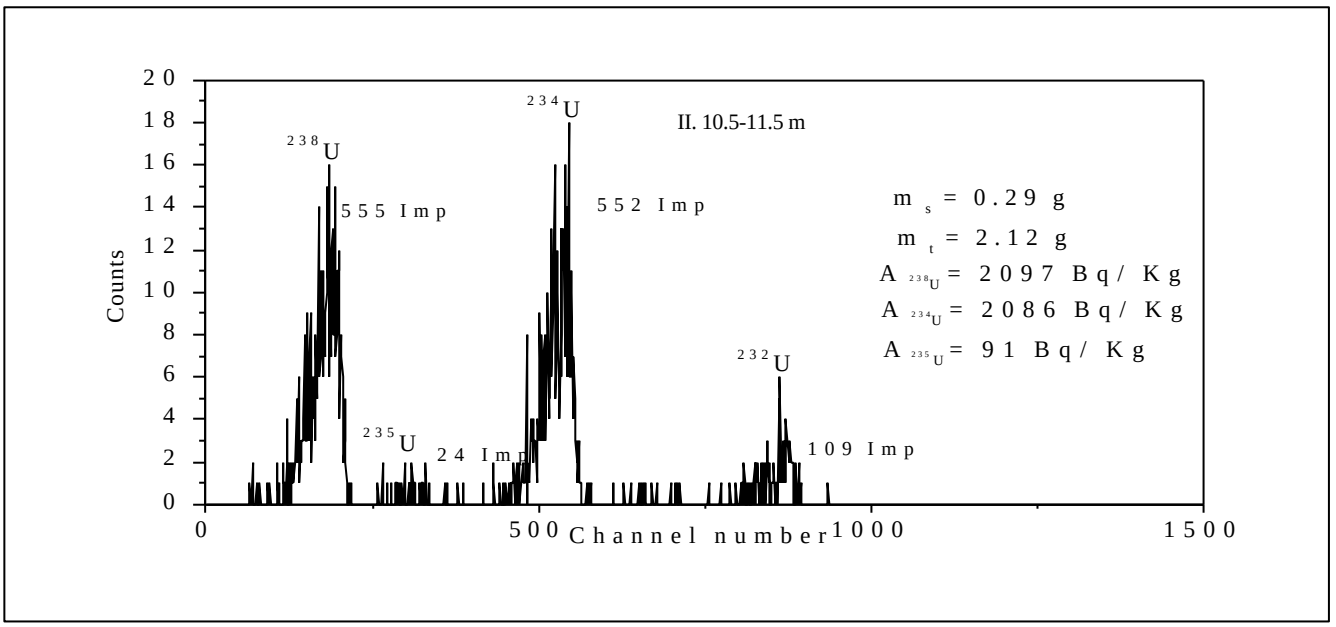


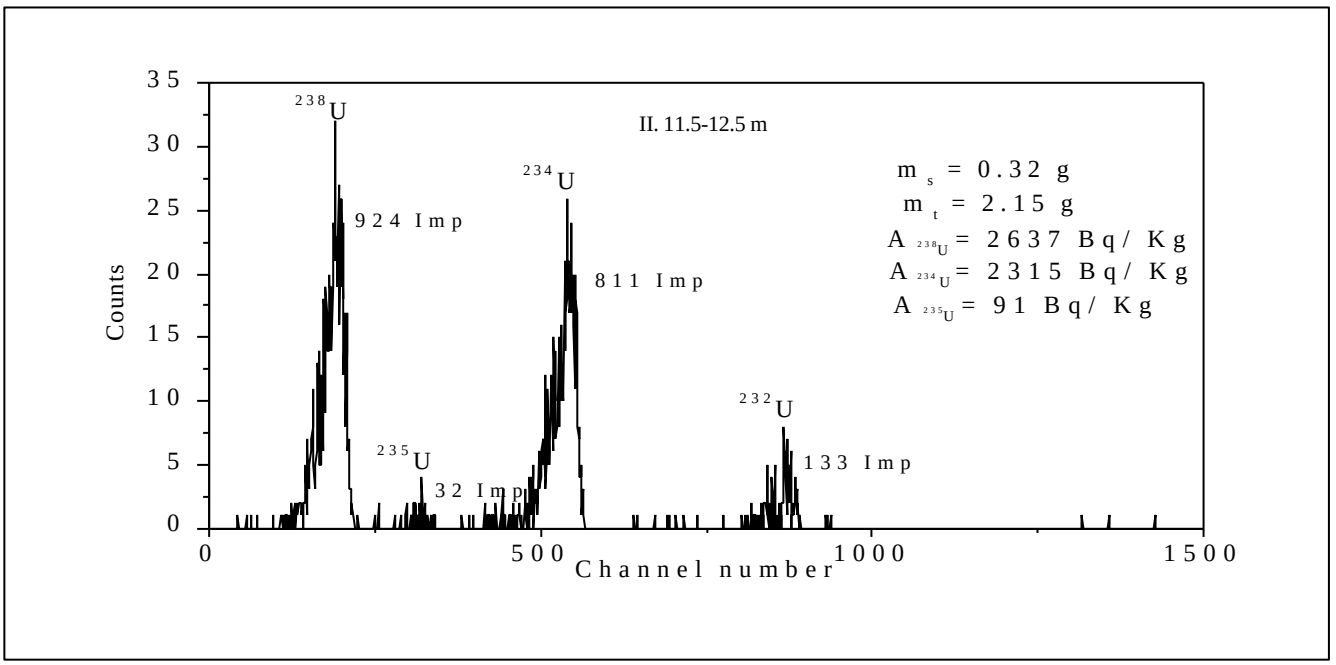




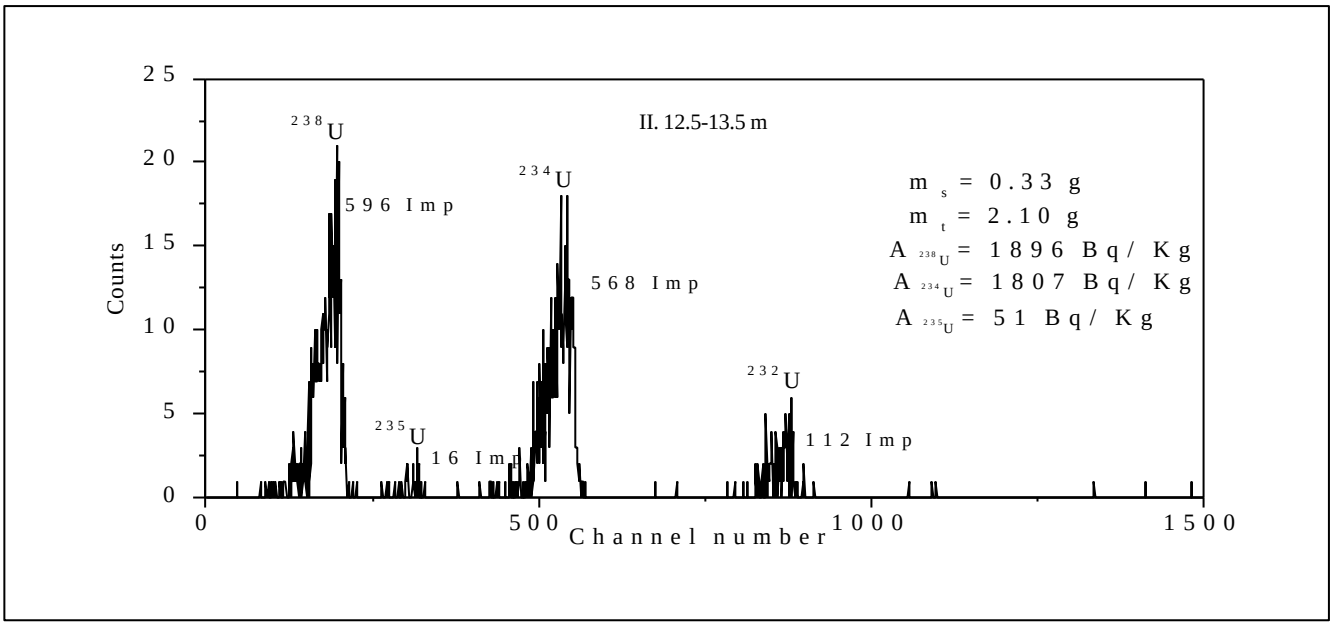
Appendix 7.6.5.: Alpha spectrum of each analysed sample

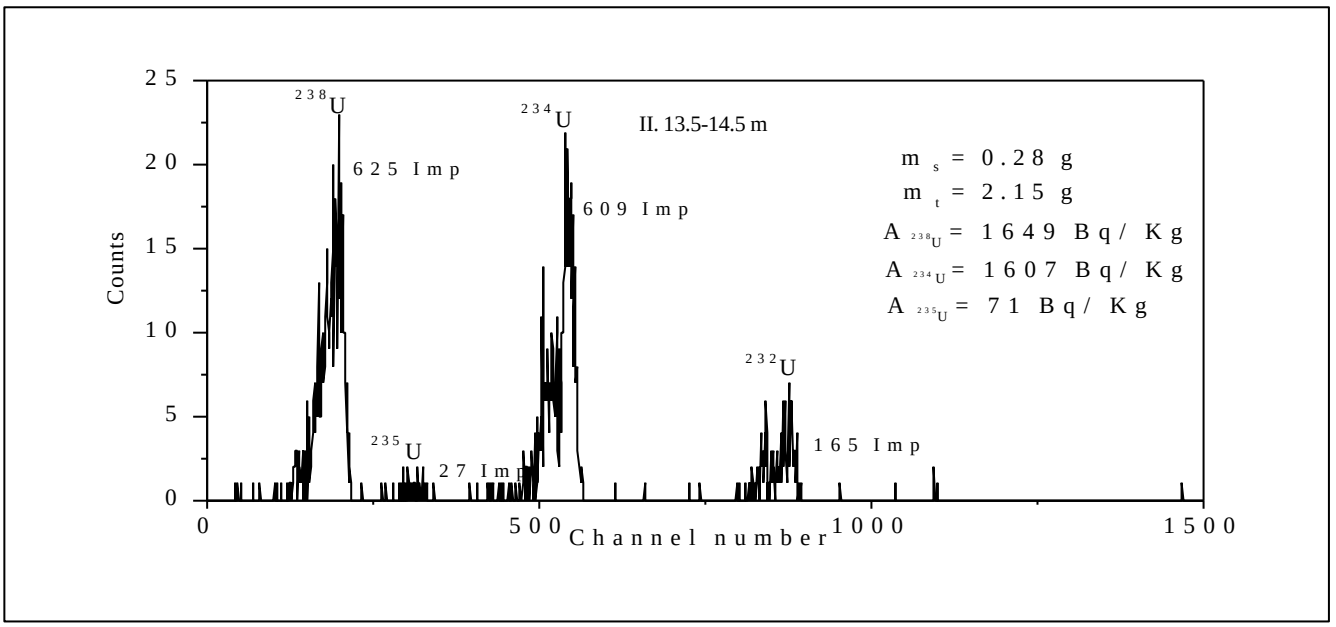


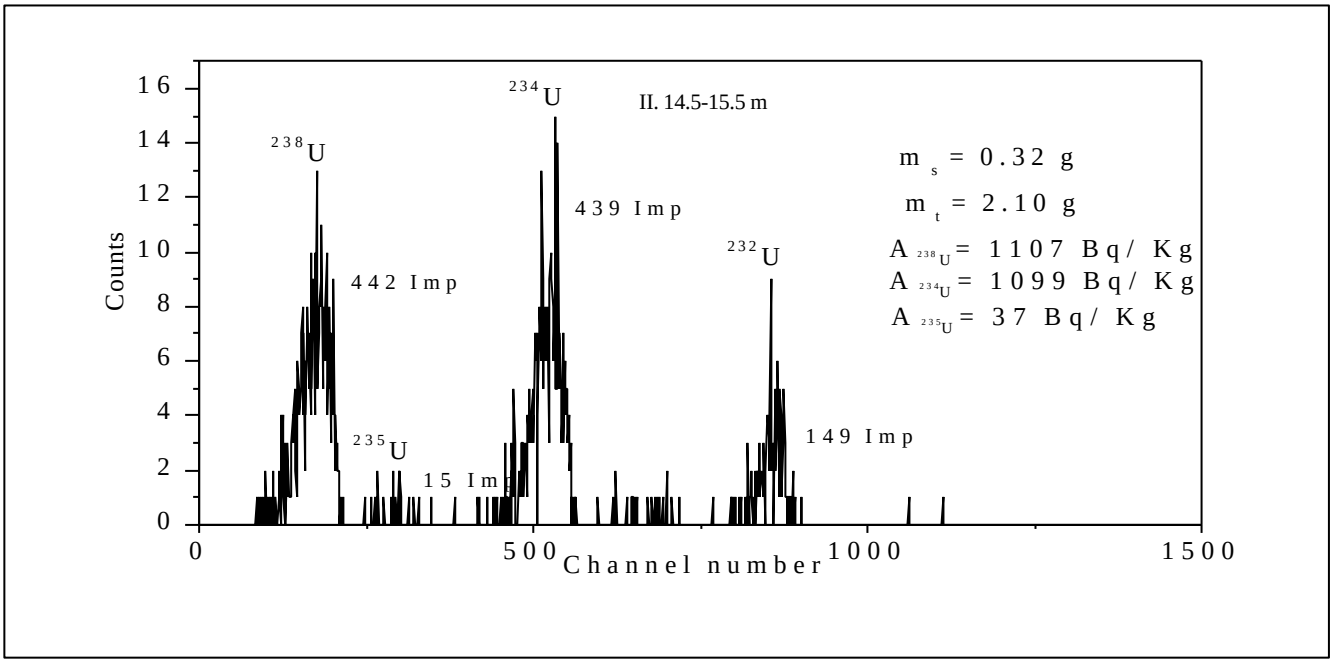




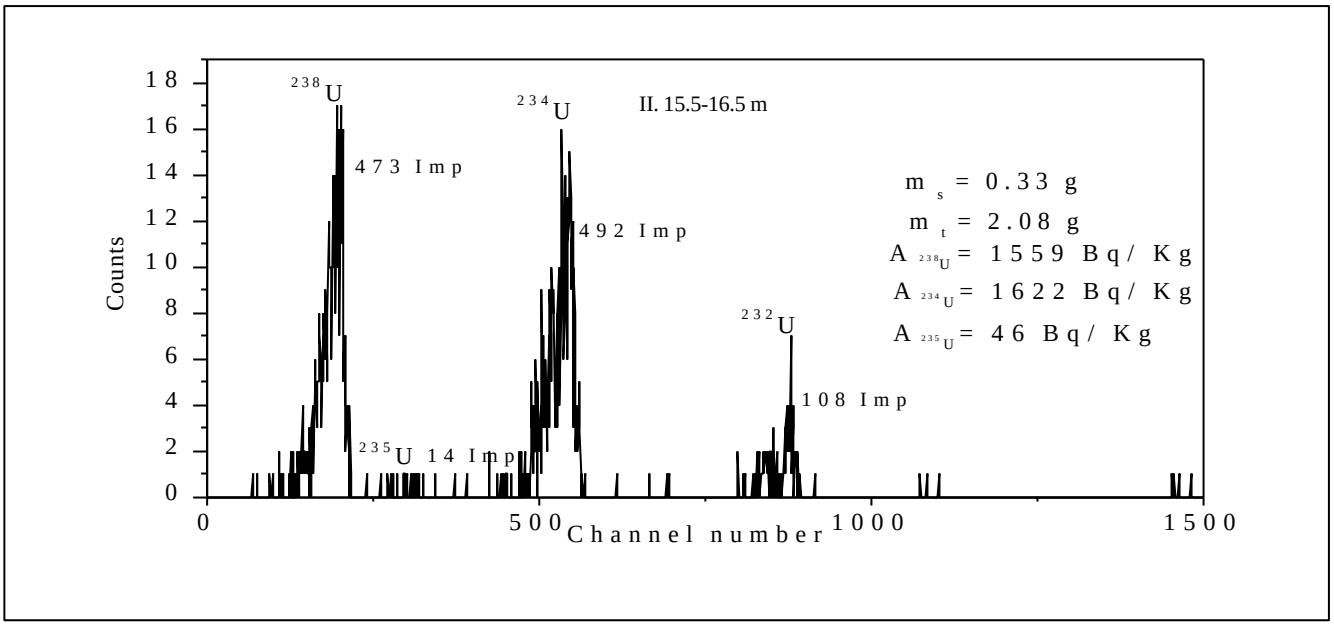
Appendix 7.6.5.: Alpha spectrum of each analysed sample

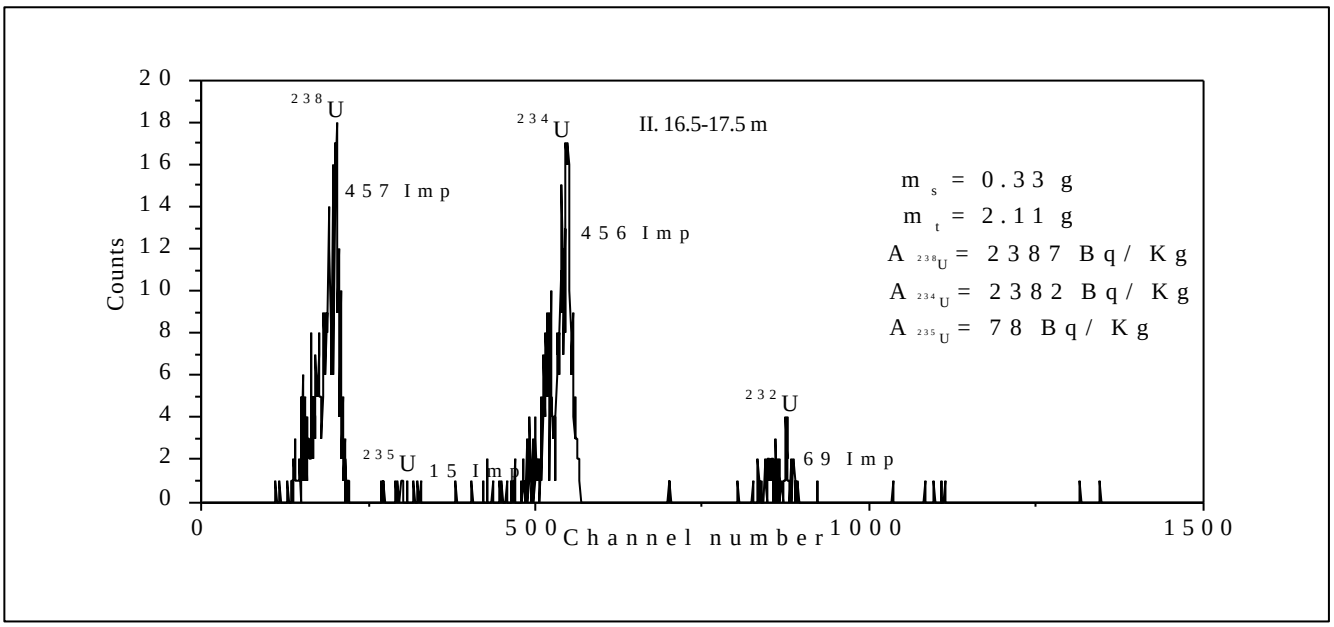


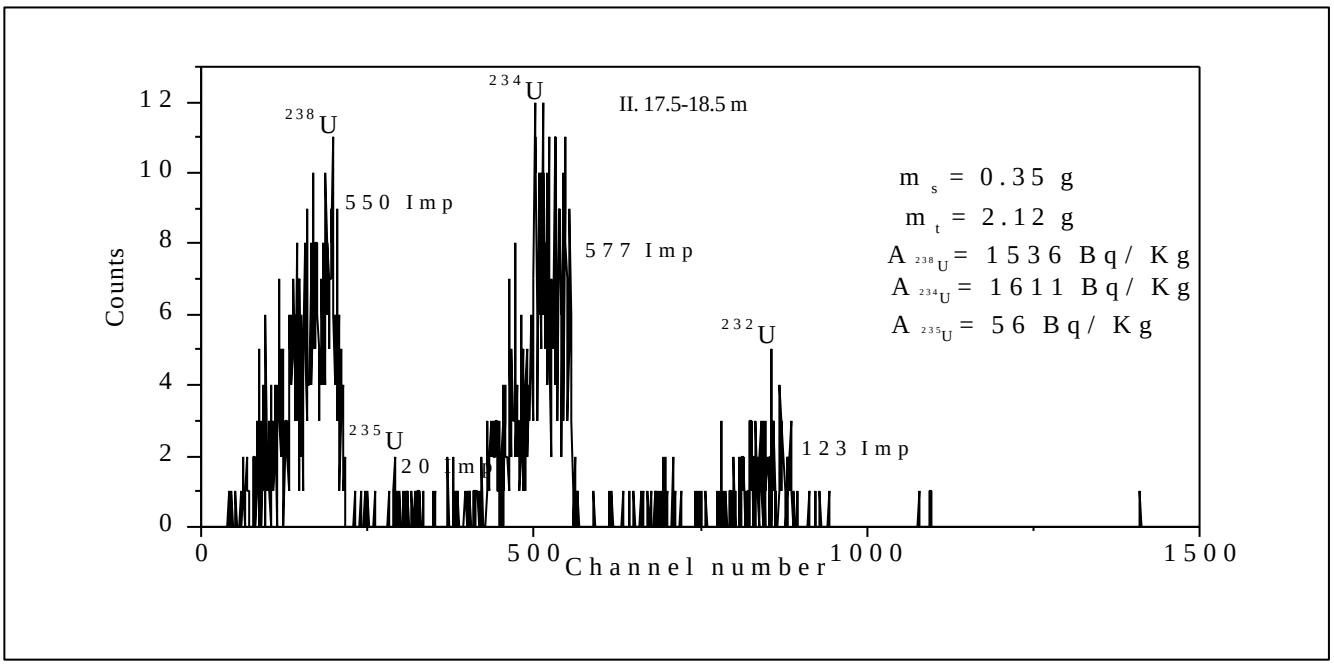




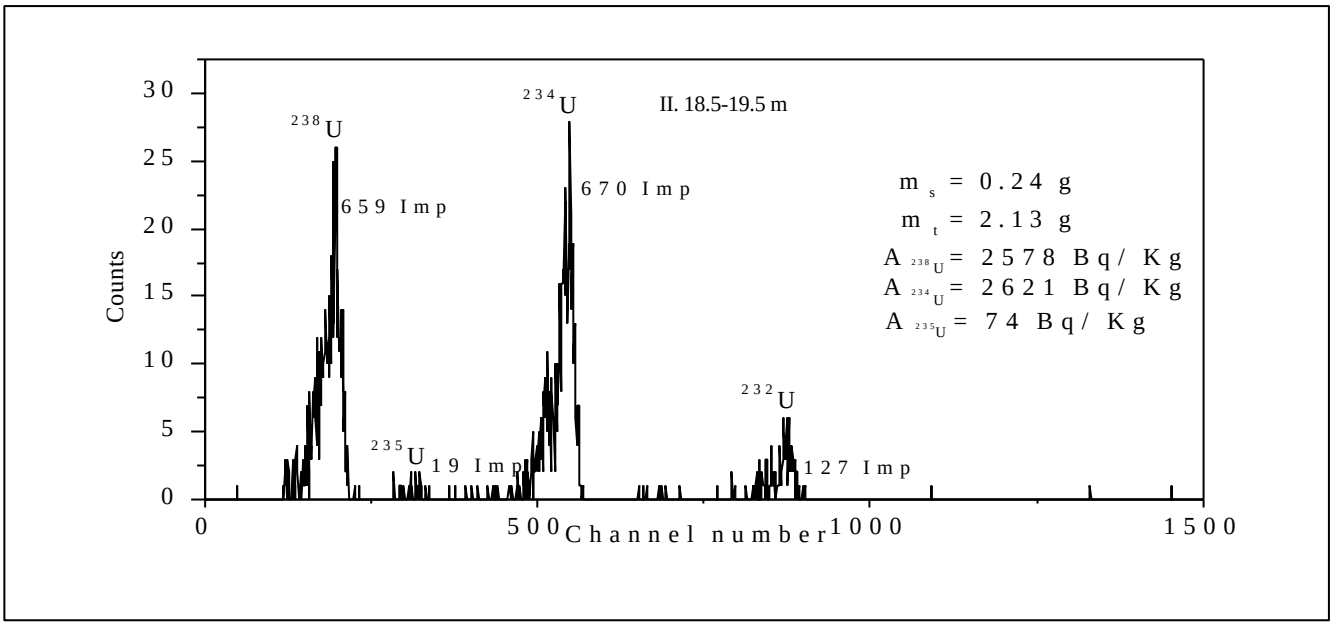
Appendix 7.6.5.: Alpha spectrum of each analysed sample

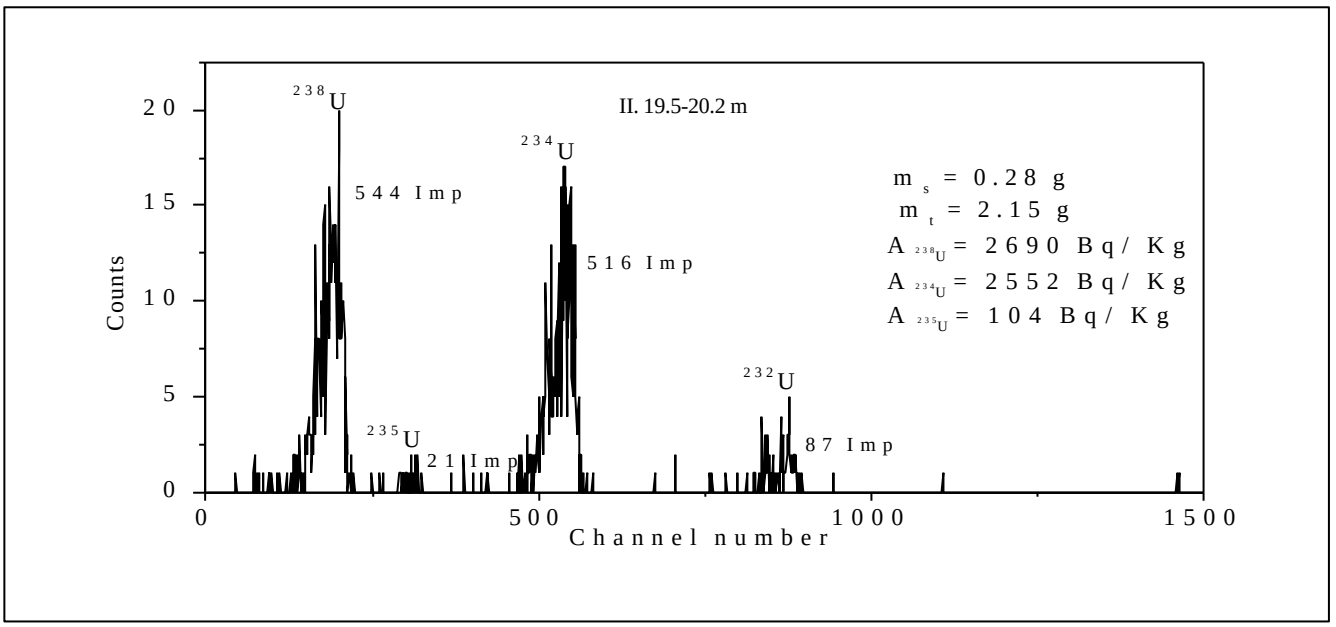




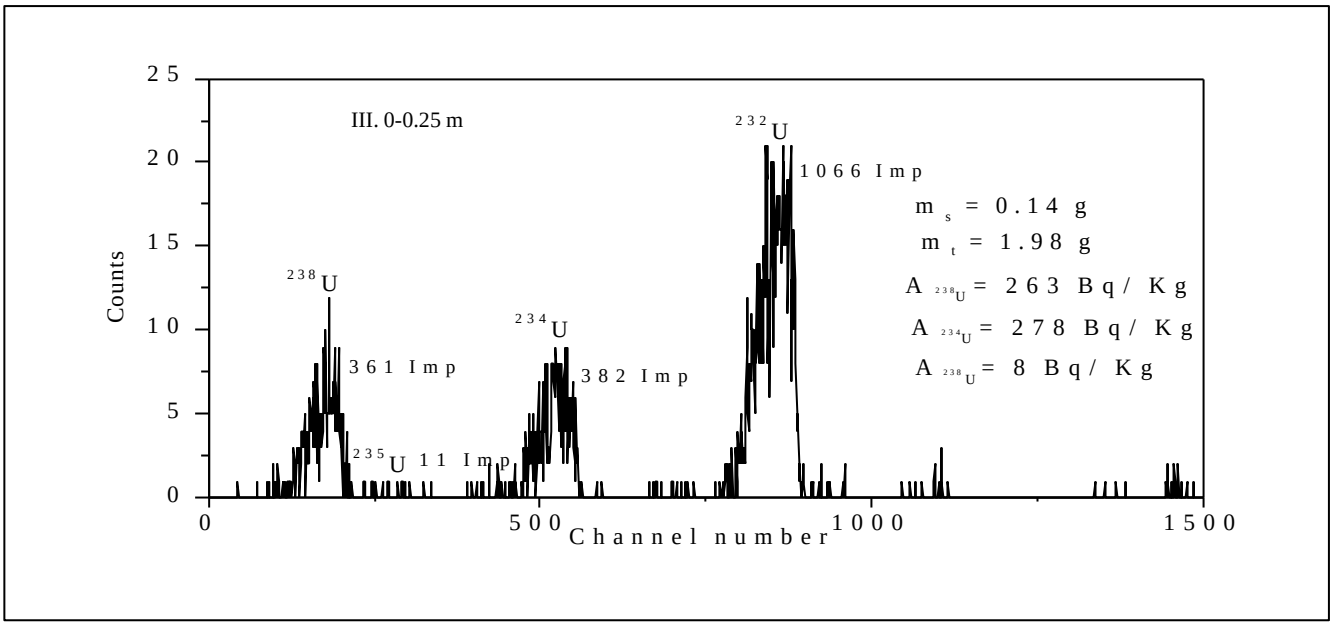


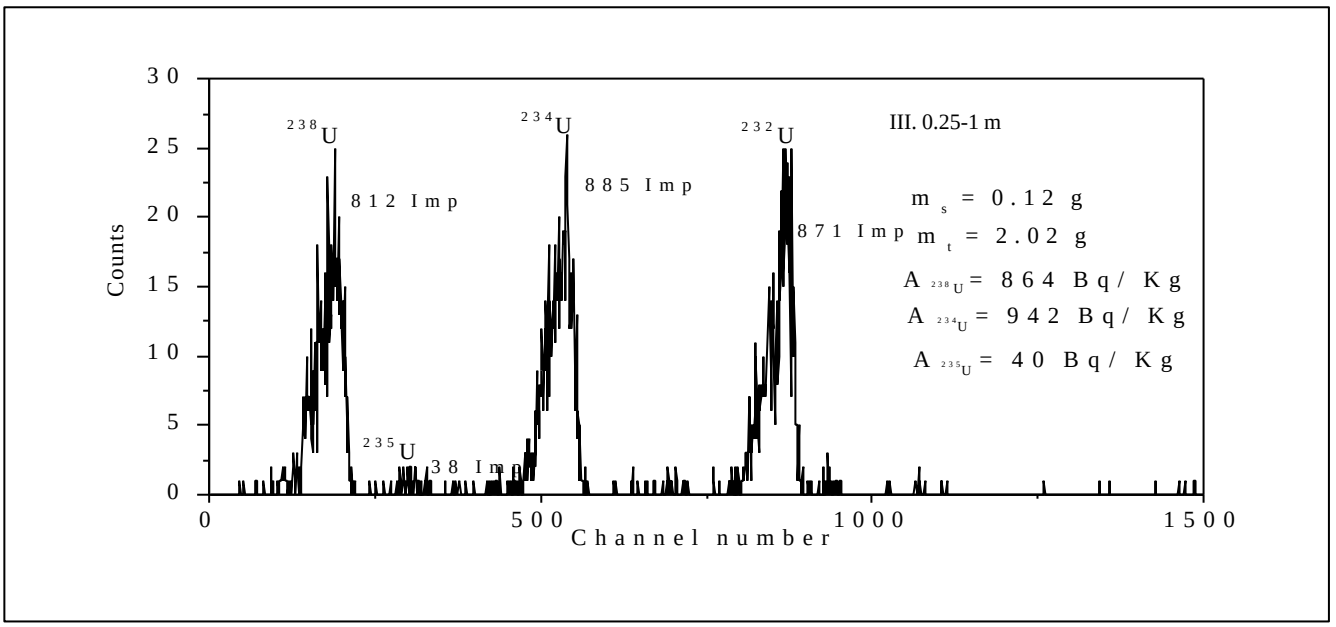
Appendix 7.6.5.: Alpha spectrum of each analysed sample

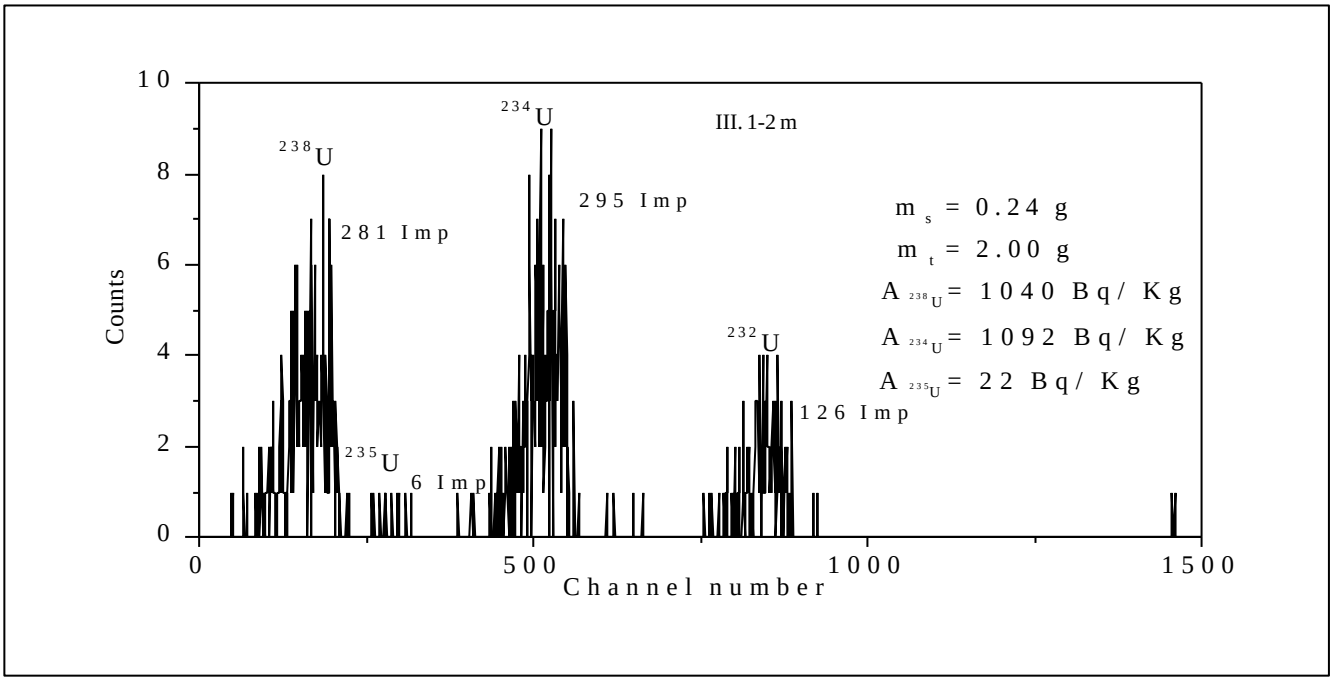




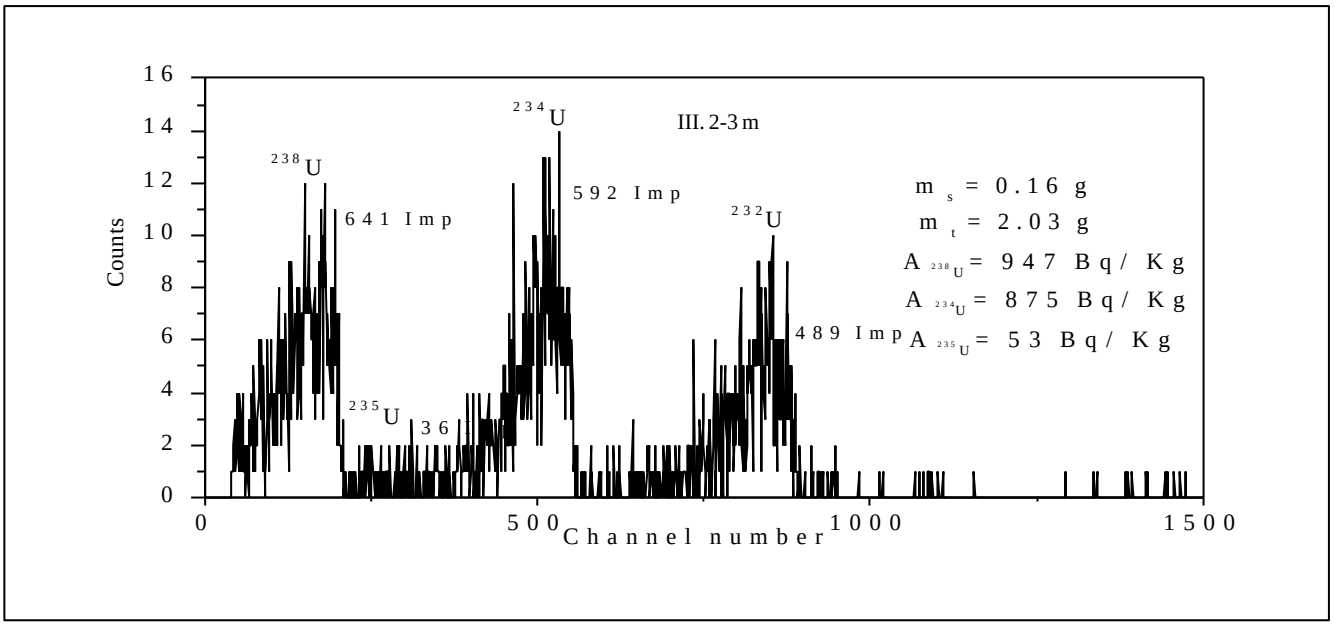
Appendix 7.6.5.: Alpha spectrum of each analysed sample

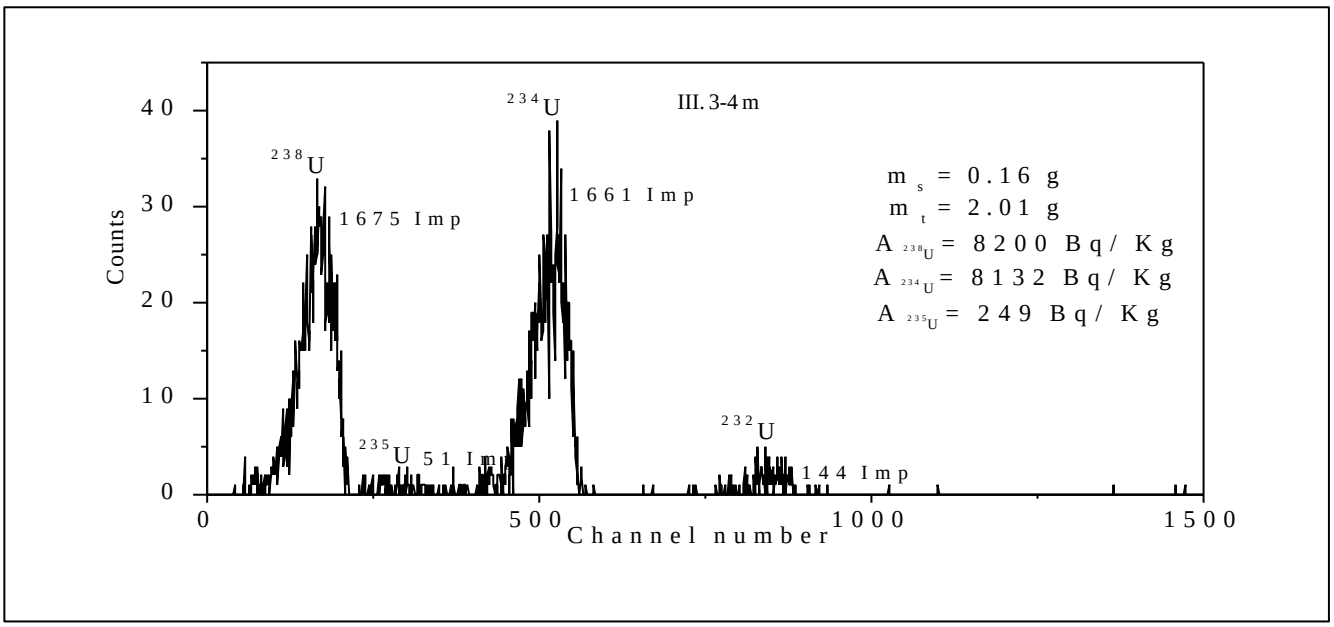


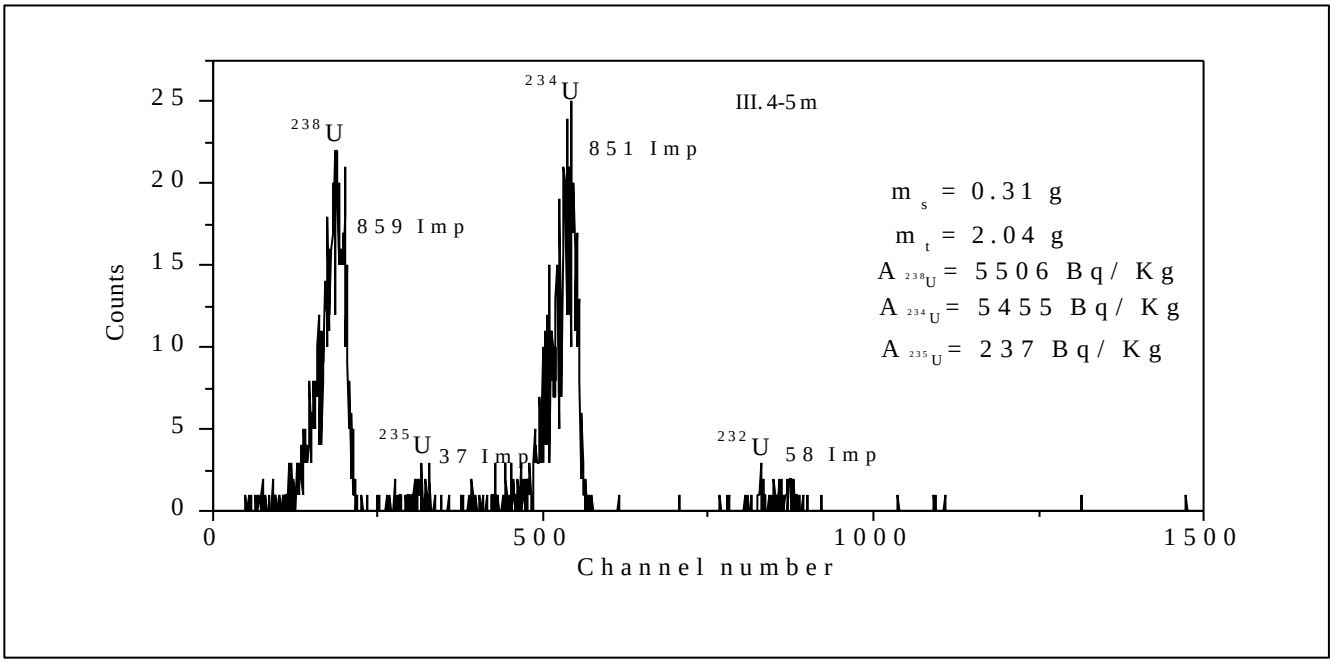




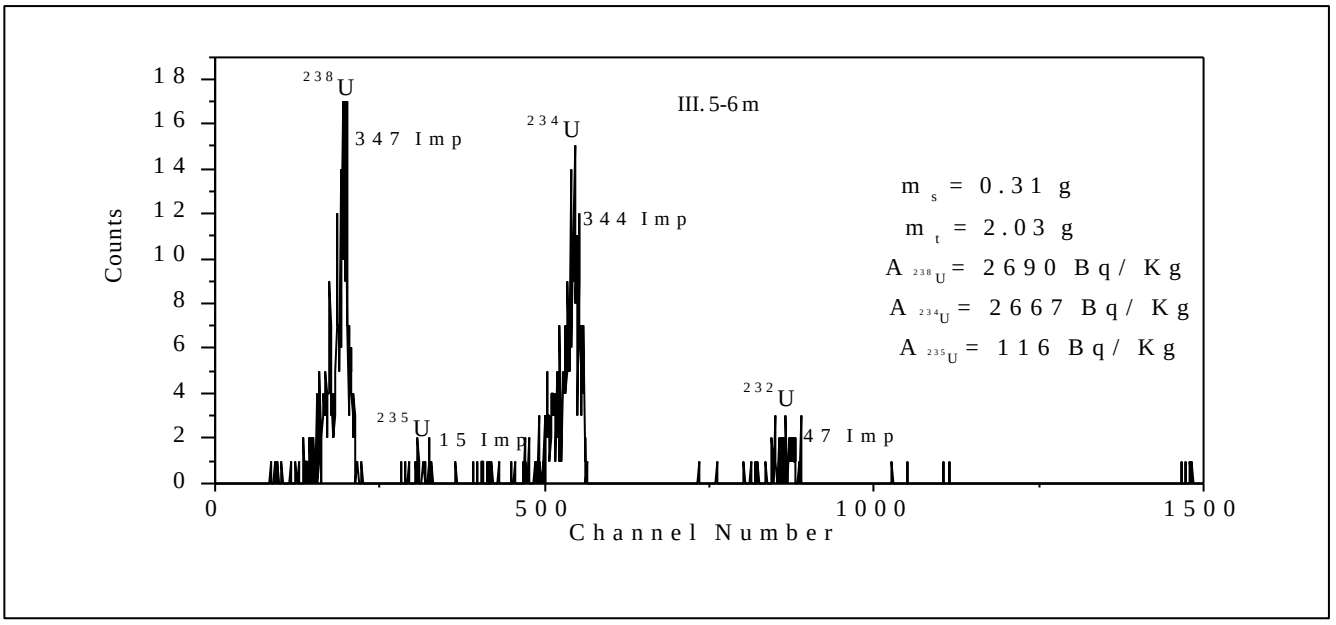
Appendix 7.6.5.: Alpha spectrum of each analysed sample

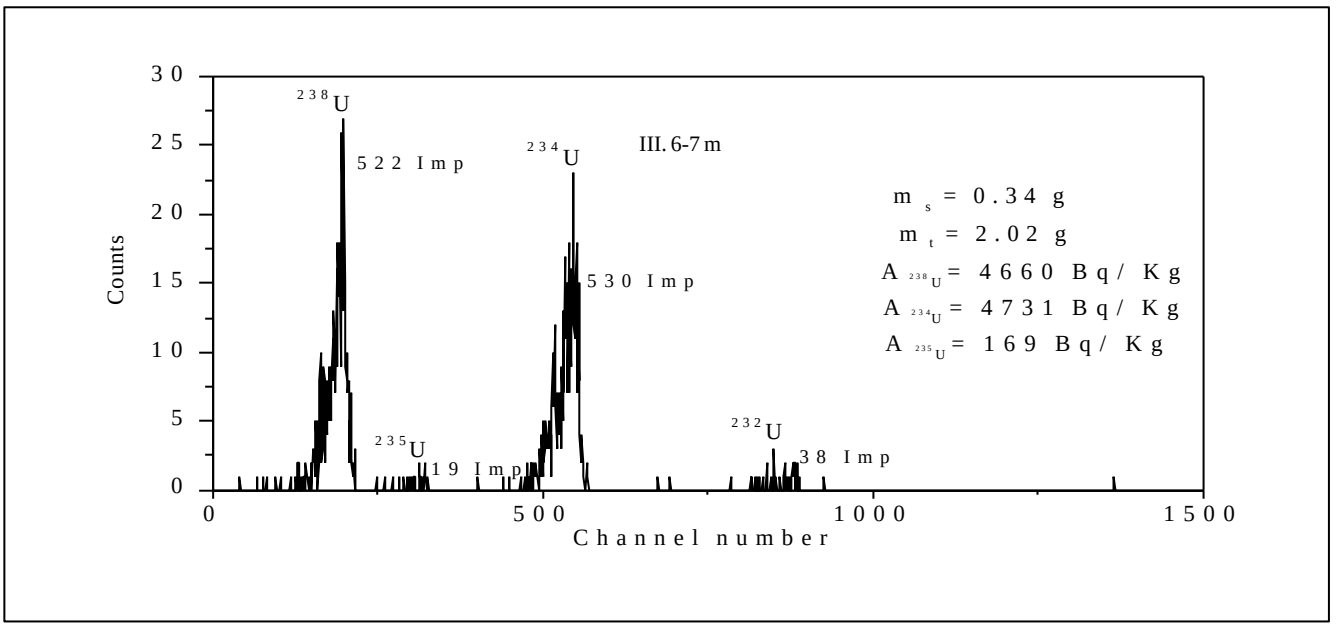


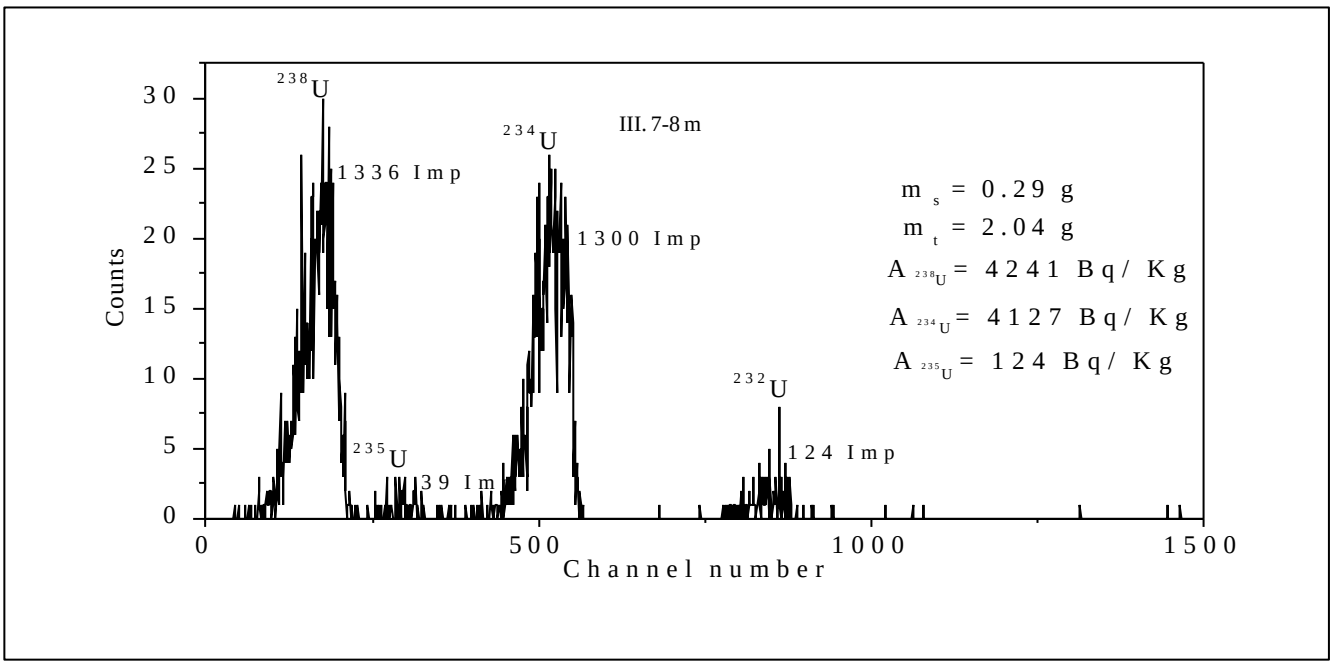




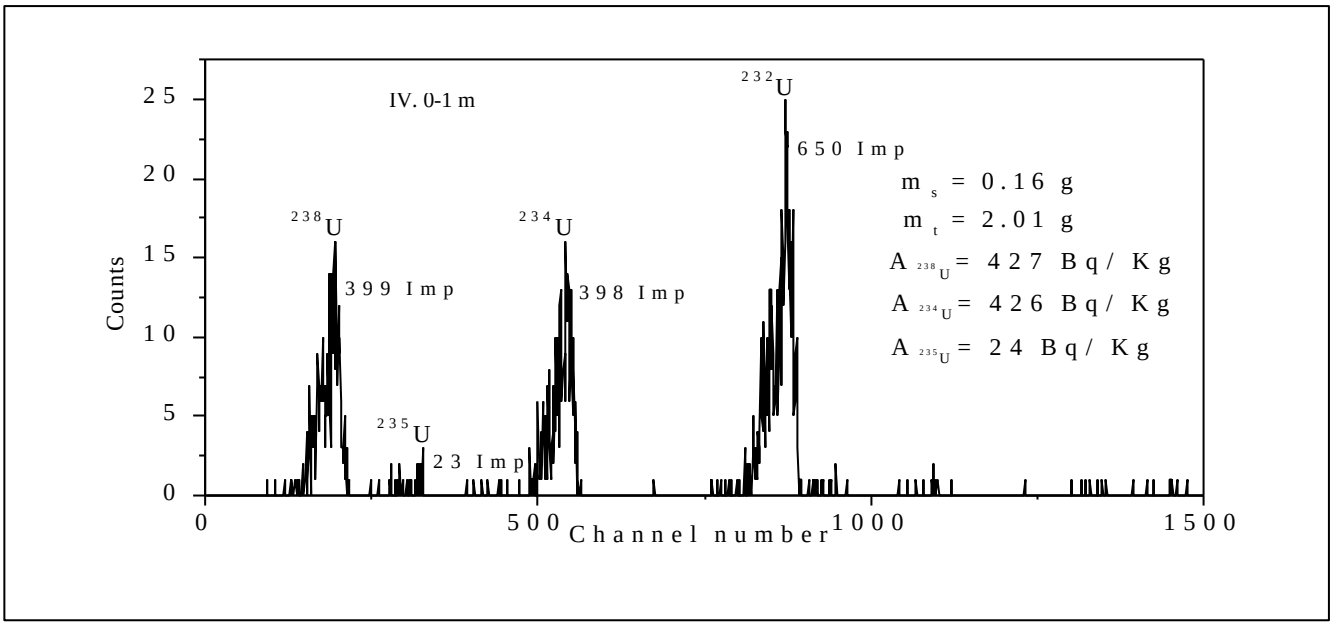
Appendix 7.6.5.: Alpha spectrum of each analysed sample

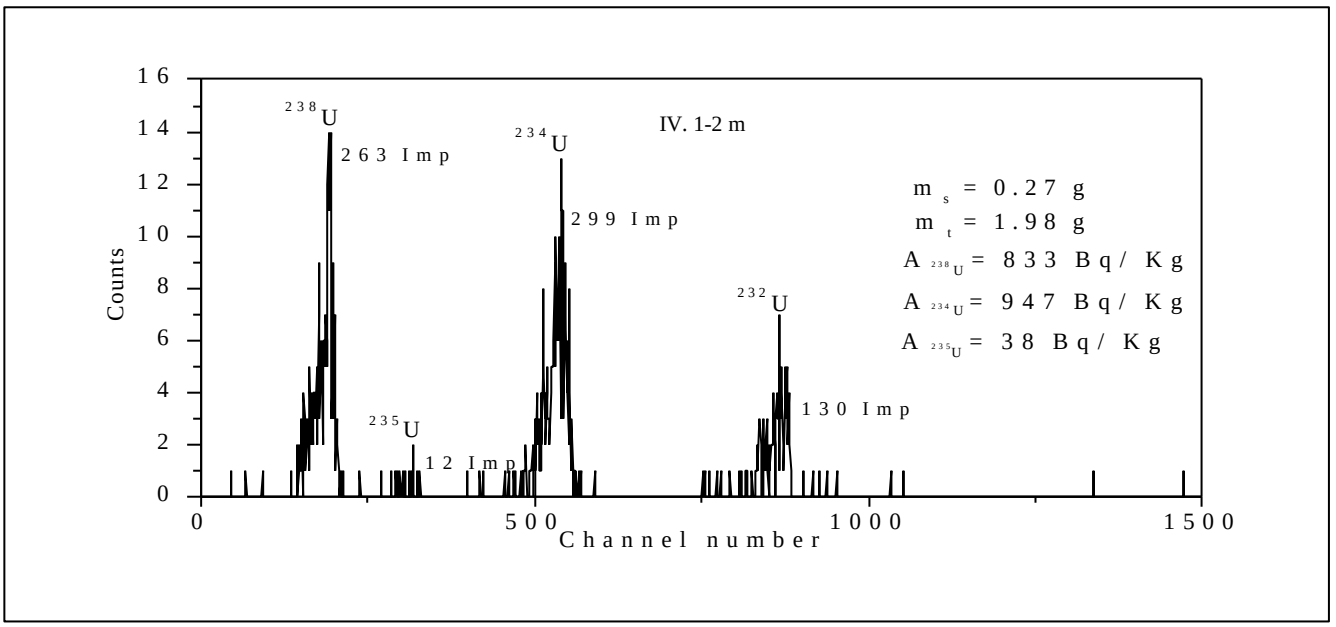


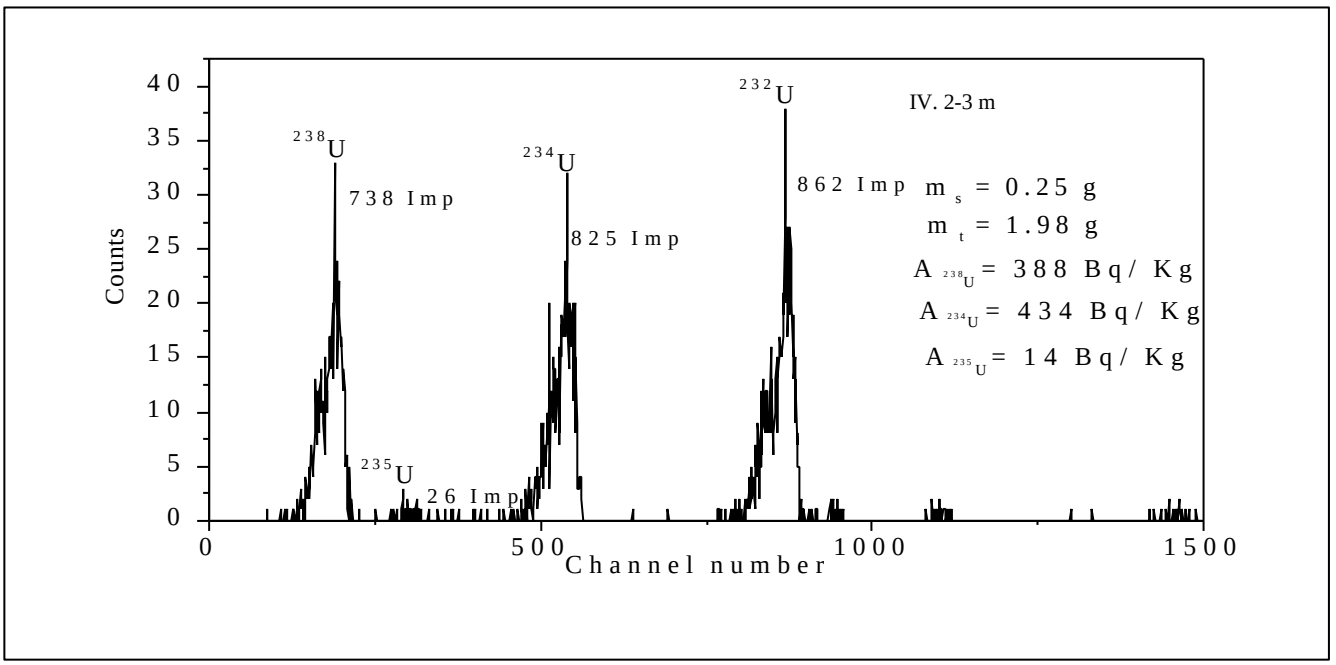




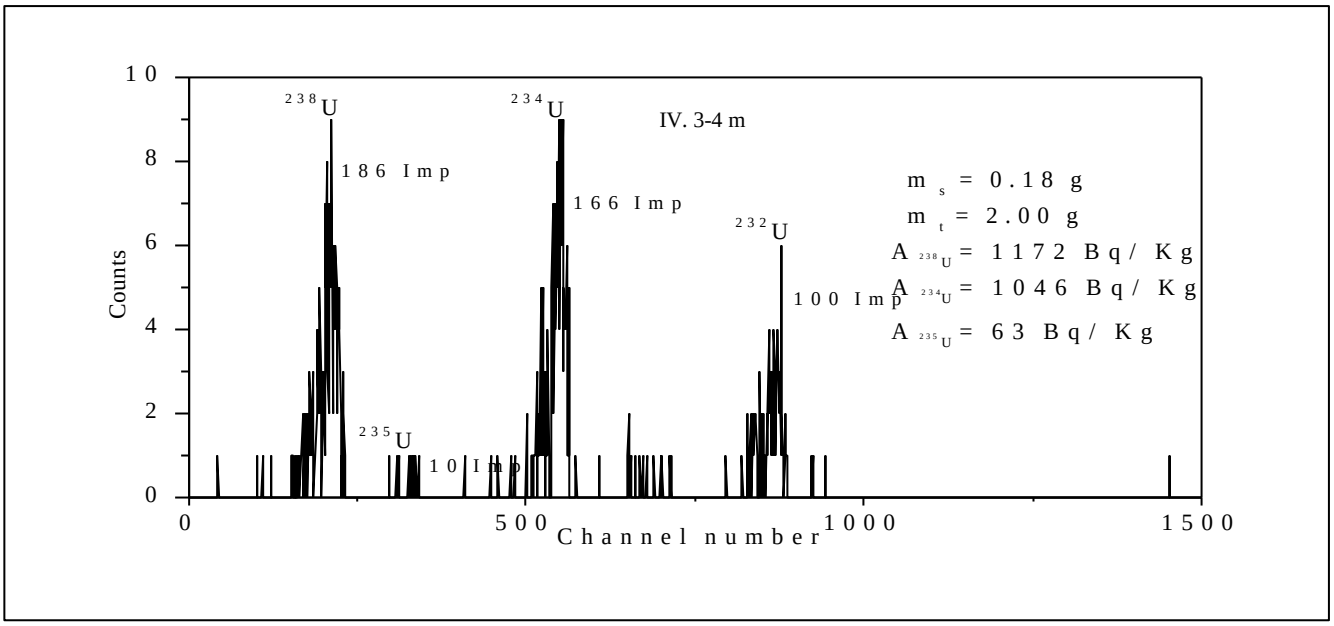
Appendix 7.6.5.: Alpha spectrum of each analysed sample

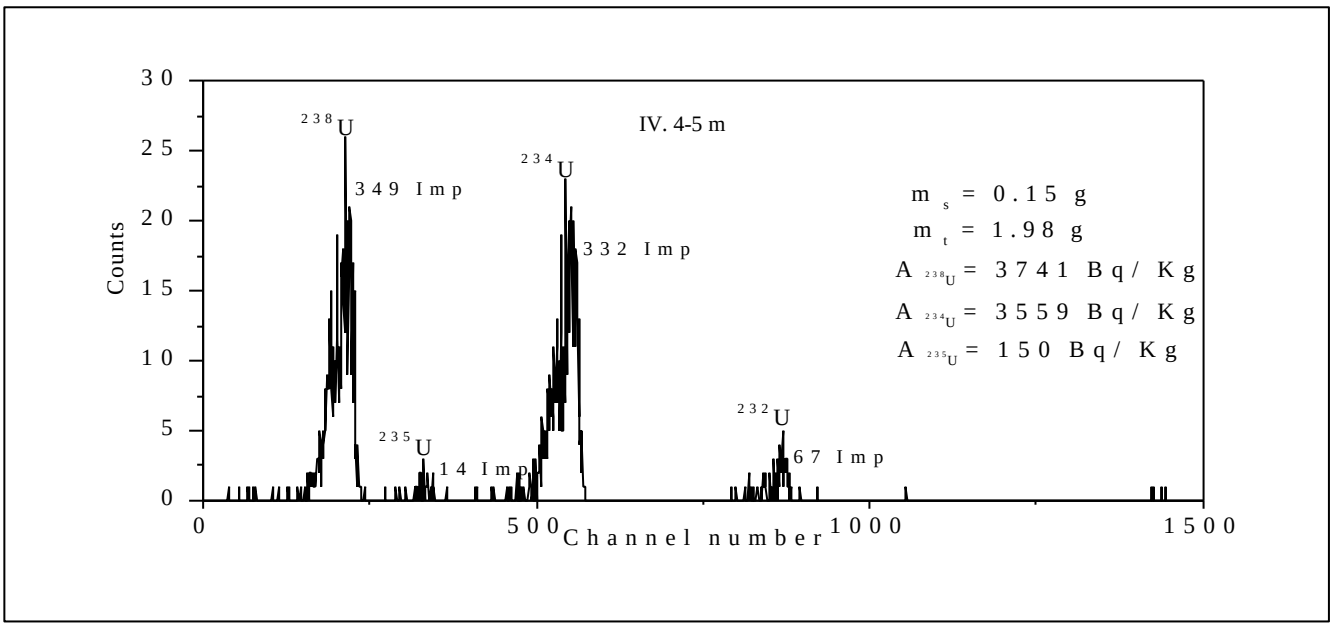


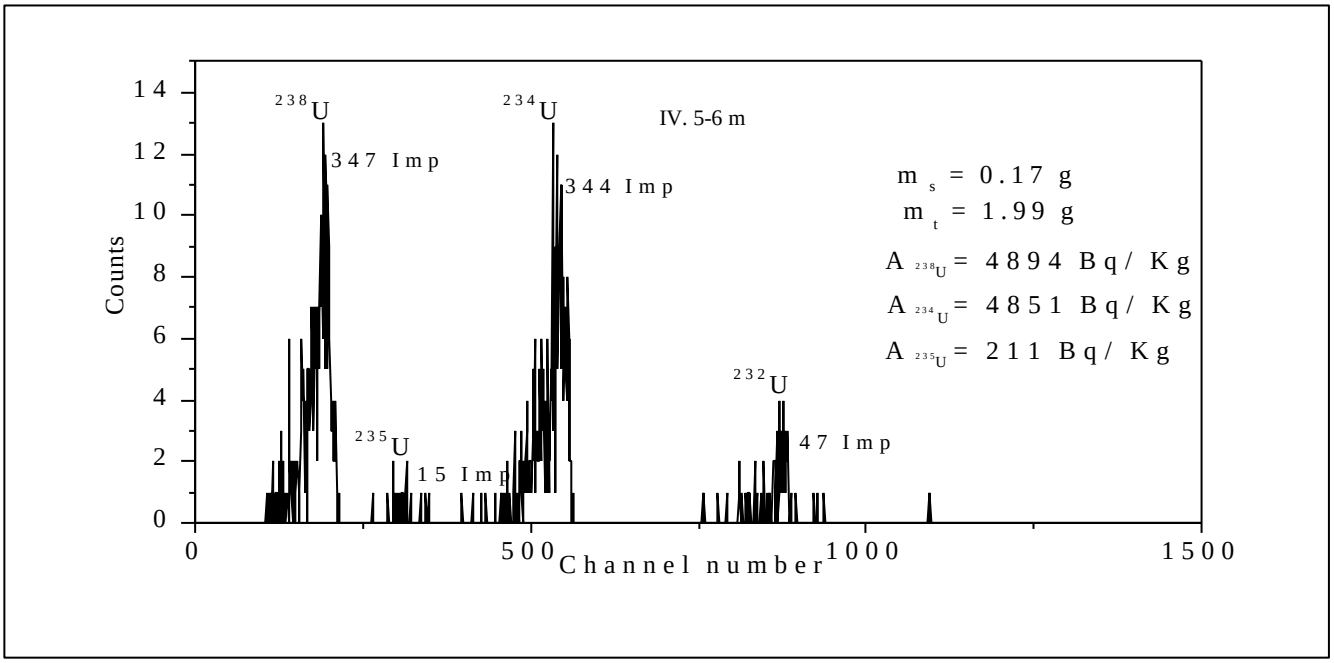




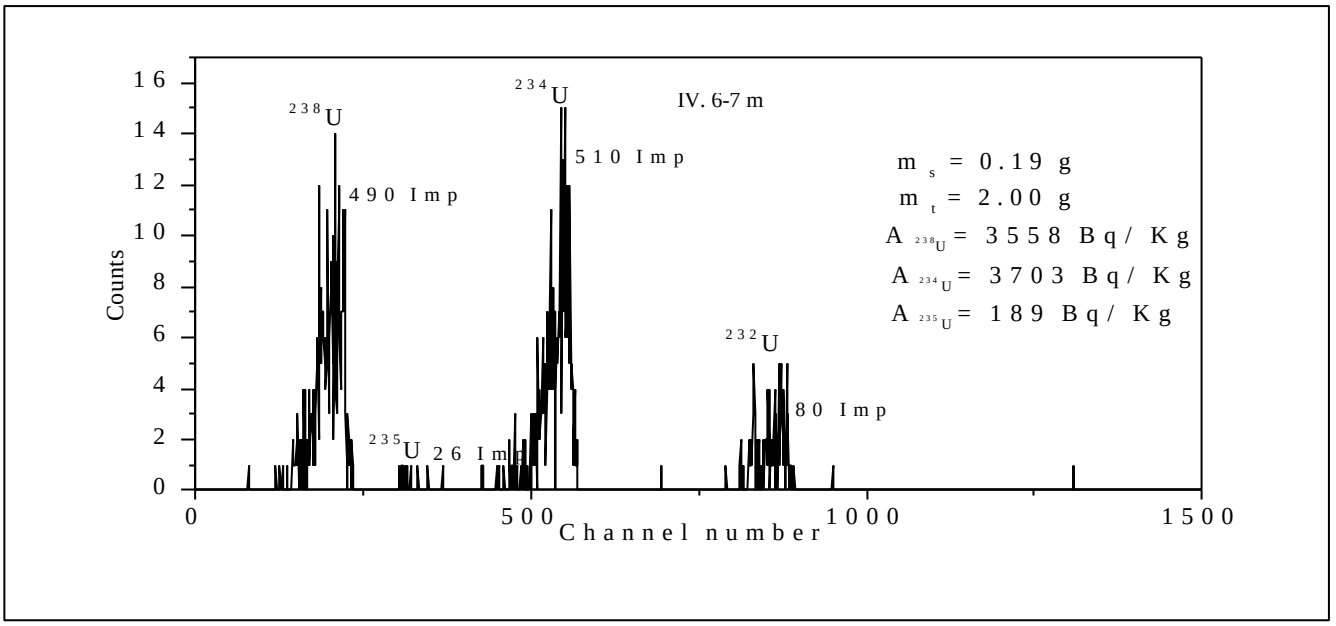
Appendix 7.6.5.: Alpha spectrum of each analysed sample

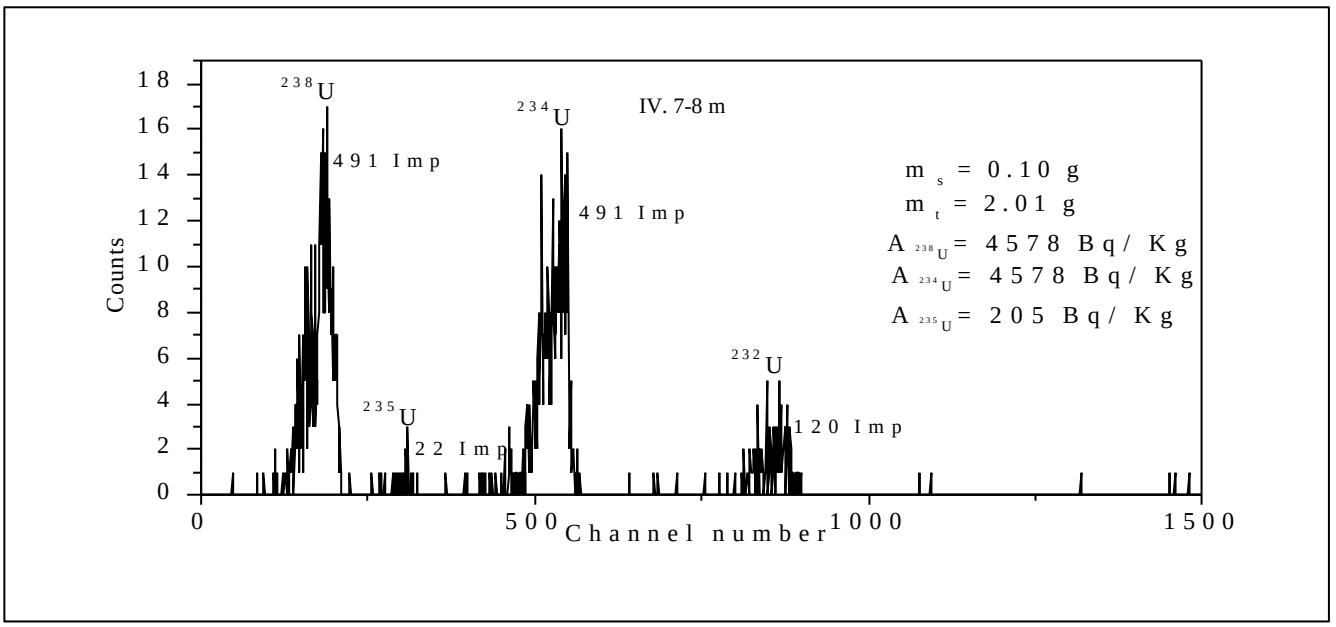


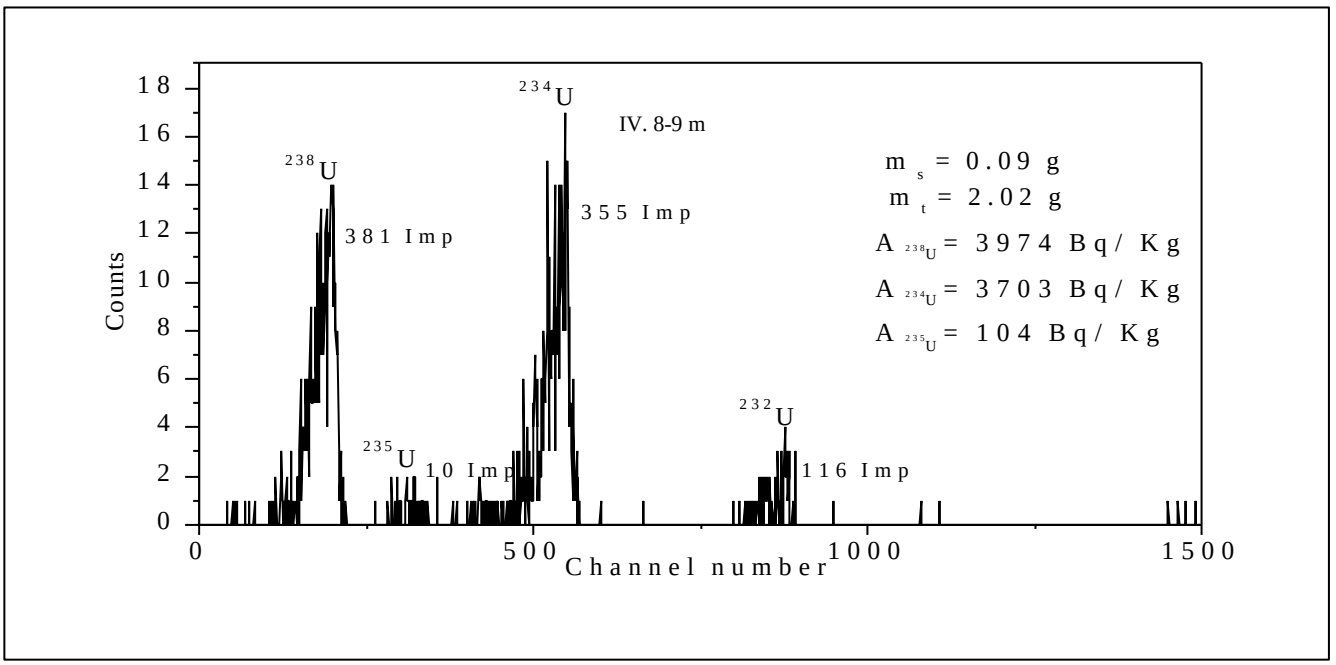




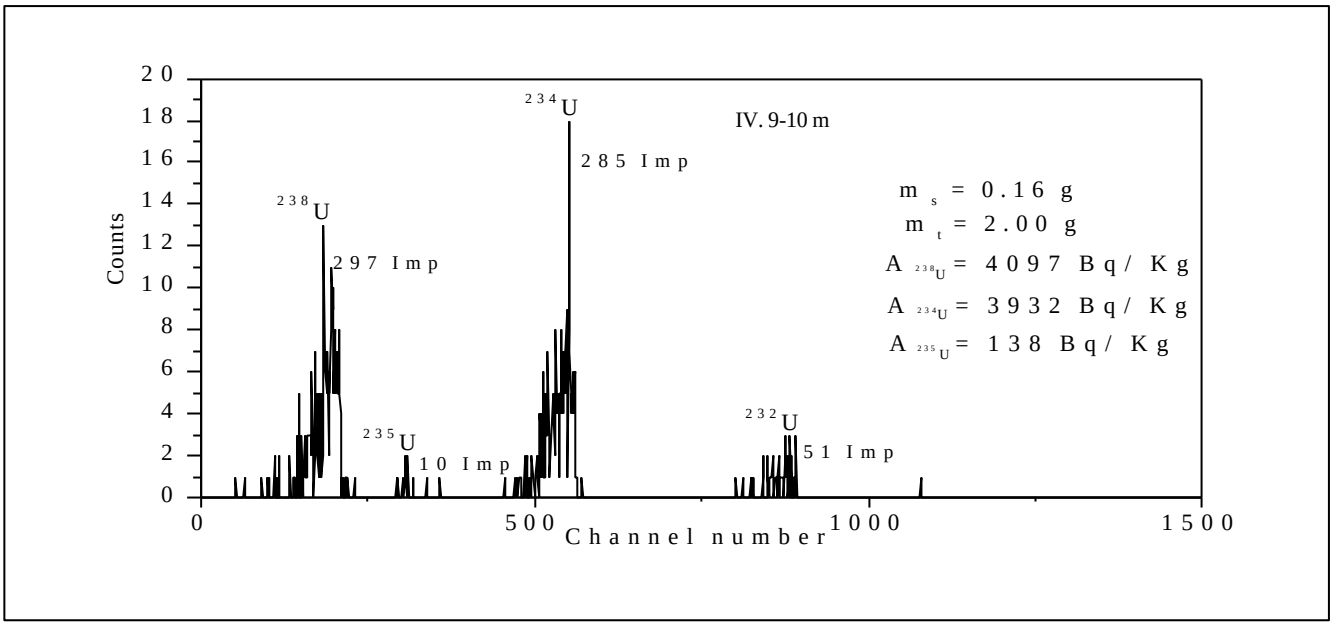
Appendix 7.6.5.: Alpha spectrum of each analysed sample

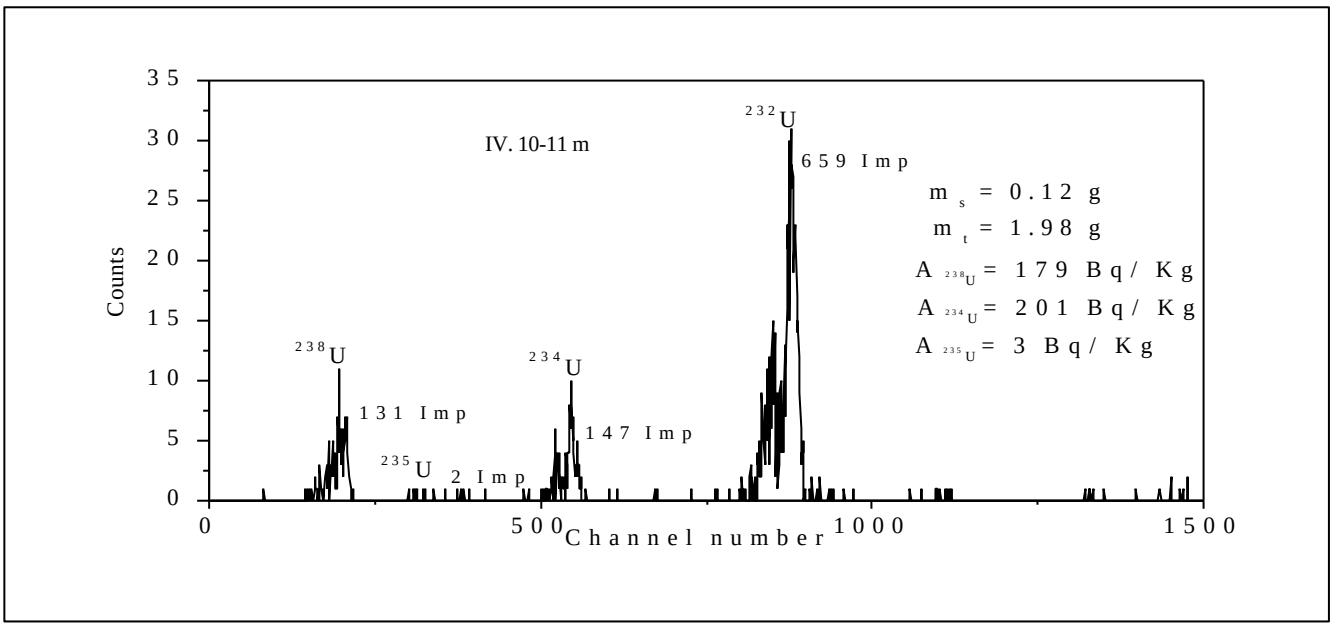


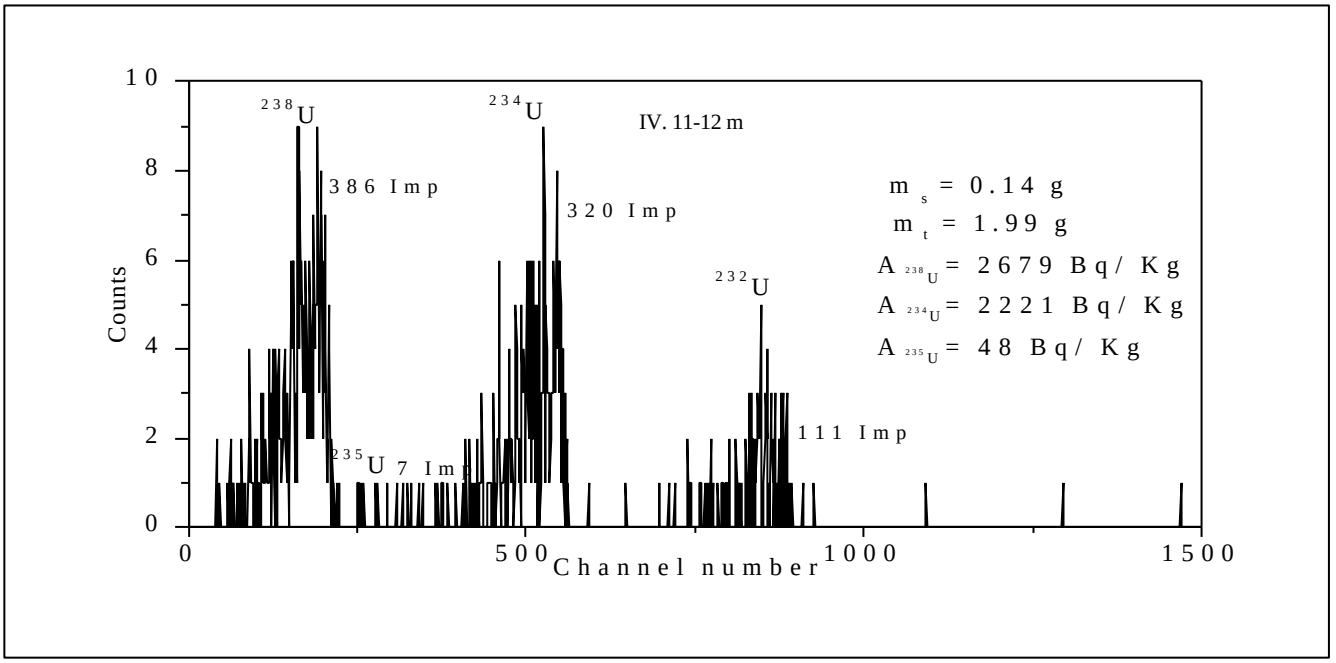




Appendix 7.6.5.: Alpha spectrum of each analysed sample







Appendix: 7.7.1. The Geographical Position of Sampling points

Sampling point	Coordinate (Bessel)	Altitude (m; a.s.l)	Description
PNP1	4532825 5587620	815	Hanggraben
PNP2	4532825 5587590	825	GWM1
PNP3	4532440 5588360	765	GWM2
PNP4	4532530 5588510	741	GWM3
PNP5	4532490 5588450	752	Spring
PNP6	4532680 5588430	772	Drainage IAAI
PNP7	4532655 5588435	764	Drainage IAAI
PNP8	4532590 5588480	748	Drainage IAAI*
PNP9	4532560 5588485	745	Drainage IAAI*
PNP10	4532540 5588480	745	Drainage IAAI/Spring*
PNP11	4532510 5588470	747	Drainage IAAI/Spring*
PNP12	4532450 5588330	764	Drainage IAAI
PNP13	4532540 5588540	740	Bodabach “ middle-sprint”
PNP14	4532580 5588580	732	Bodabach “lower reaches”
PNP15	4532660 5588180	780	Drainage IAAII
PNP16	4532680 5587940	805	Influx Hanggraben
PNP17	4532920 5588660	774	Bach Vergleichstal
PNP18	4532670 5588670	722	Spring
PNP19	4532630 5586890	810	Spring
PNP20	4532555 5587535	735	Spring
PNP21	4532845 5588240	693	Spring
PNP23	4532725 5587375	753	Hanggraben

Appendix: 7.7.2. The Temperature Change around the year (GOTSCHALK, 1997; KUTSCHKE, 1998)

PNP1					
	Minimum	Maximum	Average	Std. Dev.	
T (°C)	02.04.96 **5,3**	08.08.96 **7,4**	**6,1**	**0,72**	1
	27.02.97 **2,8**	28.08.97 **8,9**	**6,2**	**1,9**	2

PNP2					
	Minimum	Maximum	Average	Std. Dev.	
T (°C)	01.02.96 **5,7**	18.11.96 **5,9**	**5,8**	**0,12**	1
	14.04.97 **5,5**	19.12.97 **5,9**	**5,7**	**0,1**	2

PNP3					
	Minimum	Maximum	Average	Std. Dev.	
T (°C)	01.02.96 **5,9**	18.11.96 **7,2**	**6,5**	**0,56**	1
	14.04.97 **5,6**	18.11.97 **7,2**	**6,5**	**0,6**	2

PNP4					
	Minimum	Maximum	Average	Std. Dev.	
T (°C)	01.02.96 **3,9**	18.11.96 **6,0**	**4,6**	**0,85**	1
	27.02.97 **3,9**	10.09.97 **8,7**	**5,7**	**1,8**	2

PNP7					
	Minimum	Maximum	Average	Std. Dev.	
T (°C)	25.04.96 **4,3**	08.08.96 **6,4**	**5,4**	**1,5**	1

PNP8					
	Minimum	Maximum	Average	Std. Dev.	
T (°C)	31.01.96 **4,4**	08.08.96 **6,5**	**6,1**	**0,68**	1
	20.11.97 **6,2**	12.06.97 **7,0**	**6,5**	**0,2**	2

PNP9					
	Minimum	Maximum	Average	Std. Dev.	
T (°C)	31.01.96 **3,4**	08.08.96 **6,8**	**5,7**	**1,1**	1
	27.02.97 **5,8**	28.08.97 **7,0**	**6,4**	**0,5**	2

PNP10					
	Minimum	Maximum	Average	Std. Dev.	
T (°C)	31.01.96 **5,1**	02.04.96 **6,5**	**6**	**0,55**	1
	26.03.97 **6,2**	30.07.97 **8,5**	**6,5**	**0,7**	2

PNP11					
	Minimum	Maximum	Average	Std. Dev.	
T (°C)	25.04.96 **5,9**	08.08.96 **6,5**	**6,2**	**0,42**	1
	30.04.97 **6,2**	26.06.97 **7,2**	**6,5**	**0,3**	2

Appendix: 7.7.2. The Temperature Change around the year (GOTSCHALK, 1997; KUTSCHKE, 1998)

PNP12					
	Minimum	Maximum	Average	Std. Dev.	
T (°C)	02.04.96 **2,8**	08.08.96 **6,9**	**5,9**	**1,4**	1
	26.03.97 **6,2**	28.08.97 **8,8**	**7,2**	**0,9**	2

PNP13					
	Minimum	Maximum	Average	Std. Dev.	
T (°C)	31.01.96 **0,4**	27.02.96 **1,1**	**0,7**	**0,36**	1
	27.02.97 **3,1**	30.07.97 **11,9**	**8,7**	**4**	2

PNP14					
	Minimum	Maximum	Average	Std. Dev.	
T (°C)	31.01.96 **3,9**	08.08.96 **7,7**	**5,5**	**1,3**	1
	27.02.97 **3,2**	30.07.97 **9,1**	**6,5**	**1,9**	2

PNP15					
	Minimum	Maximum	Average	Std. Dev.	
T (°C)	18.11.96 **6,1**	08.08.96 **6,5**	**6,3**	**0,28**	1
	26.03.97 **5,8**	30.07.97 **8,1**	**6,9**	**0,9**	2

PNP18					
	Minimum	Maximum	Average	Std. Dev.	
T (°C)			18.11.96 **5,6**		1
	27.02.97 **5,2**	30.04.97 **8,4**	**6,4**	**1**	2

	PNP5	PNP6	PNP16	PNP17	
Date	25.04.96	08.08.96	08.08.96	08.08.96	
T (°C)	4,4	7,1	6,3	10,4	1

Appendix: 7.7.3. The pH Change around the year (GOTSCHALK, 1997; KUTSCHKE, 1998)

PNP1					
	Minimum	Maximum	Average	Std. Dev.	
pH	31.01.96 **5,4**	25.04.96 **6,0**	**5,7**	**0,2**	1
	26.06.97 **5,4**	27.02.97 **6,3**	**5,8**	**0,2**	2

PNP2					
	Minimum	Maximum	Average	Std. Dev.	
pH	18.11.96 **4,9**	01.02.96 **5,0**	**4,9**	**0,1**	1
	14.04.97 **4,8**	31.01.97 **5,0**	**4,9**	**0,1**	2

PNP3					
	Minimum	Maximum	Average	Std. Dev.	
pH	18.11.96 **4,6**	01.02.96 **5,0**	**4,8**	**0,2**	1
	18.11.97 **4,6**	01.02.97 **5,0**	**4,8**	**0,1**	2

PNP4					
	Minimum	Maximum	Average	Std. Dev.	
pH	01.02.96 **5,4**	27.02.96 **7,7**	**6,4**	**1**	1
	14.04.97 **5,2**	27.02.97 **7,7**	**5,9**	**0,9**	2

PNP7					
	Minimum	Maximum	Average	Std. Dev.	
pH	25.04.96 **6,6**	08.08.96 **6,9**	**6,8**	**0,2**	1

PNP8					
	Minimum	Maximum	Average	Std. Dev.	
pH	08.08.96 **6,4**	27.02.96 **7,6**	**6,8**	**0,4**	1
	26.03.97 **6,6**	28.08.97 **7,1**	**6,7**	**0,1**	2

PNP9					
	Minimum	Maximum	Average	Std. Dev.	
pH	5,8	27.02.96 **7,6**	**6,6**	**0,5**	1
	30.04.97 **6,3**	27.02.97 **6,7**	**6,6**	**0,1**	2

PNP10					
	Minimum	Maximum	Average	Std. Dev.	
pH	25.04.96 **5,8**	27.02.96 **7,6**	**6,3**	**0,6**	1
	26.03.97 **5,7**	28.08.97 **6,2**	**6,1**	**0,1**	2

PNP11					
	Minimum	Maximum	Average	Std. Dev.	
pH	25.04.96 **5,4**	08.08.96 **5,5**	**5,5**	**0,1**	1
	30.04.97 **5,4**	28.08.97 **5,7**	**5,6**	**0,1**	2

Appendix: 7.7.3. The pH Change around the year (GOTSCHALK, 1997; KUTSCHKE, 1998)

PNP12					
	Minimum	Maximum	Average	Std. Dev.	
pH	25.04.96 **5,8**	27.02.96 **7,7**	**6,4**	**0,7**	1
	26.03.97 **5,7**	12.06.97 **6,4**	**6,1**	**0,3**	2

PNP13					
	Minimum	Maximum	Average	Std. Dev.	
pH	31.01.96 **5,4**	27.02.96 **7,7**	**6,2**	**1,3**	1
	27.02.97 **4,6**	25.09.97 **5,5**	**5,2**	**0.4**	2

PNP14					
	Minimum	Maximum	Average	Std. Dev.	
pH	08.08.96 **6,4**	27.02.96 **7,7**	**6,8**	**0,5**	1
	23.01.97 **6,3**	26.06.97 **7,1**	**6,5**	**1,9**	2

PNP15					
	Minimum	Maximum	Average	Std. Dev.	
pH	18.11.96 **4,7**	08.08.96 **5,4**	**5,1**	**0,5**	1
	30.04.97 **5,5**	25.09.97 **6,4**	**5,8**	**0,4**	2

PNP18					
	Minimum	Maximum	Average	Std. Dev.	
pH			18.11.96 **6,2**		1
	30.04.97 **5,1**	23.01.97 **6,3**	**5,5**	**1**	2

	PNP5	PNP6	PNP16	PNP17	
Date	25.04.96	08.08.96	08.08.96	08.08.96	
pH	**5,07**	**7,2**	**6,6**	**6,6**	1

Appendix: 7.7.4. The EC Change around the year (GOTSCHALK, 1997; KUTSCHKE, 1998)

PNP1					
	Minimum	Maximum	Average	Std. Dev.	
EC	27.02.96 **75**	25.04.96 **97**	**83**	**8,6**	1
	25.09.97 **48**	27.02.97 **111**	**82**	**18**	2

PNP2					
	Minimum	Maximum	Average	Std. Dev.	
EC	18.11.96 **45**	01.02.96 **48**	**47**	**1,5**	1
	14.04.97 **33**	31.01.97 **48**	**43**	**1**	2

PNP3					
	Minimum	Maximum	Average	Std. Dev.	
EC	18.11.96 **166**	02.04.96 **260**	**219**	**39,0**	1
	14.04.97 **120**	02.04.97 **260**	**204**	**46**	2

PNP4					
	Minimum	Maximum	Average	Std. Dev.	
EC	27.02.96 **157**	25.04.96 **164**	**160**	**3,3**	1
	14.04.97 **114**	25.04.97 **164**	**151**	**18**	2

PNP7					
	Minimum	Maximum	Average	Std. Dev.	
EC	08.08.96 **572**	25.04.96 **656**	**614**	**59,0**	1

PNP8					
	Minimum	Maximum	Average	Std. Dev.	
EC	02.04.96 **623**	08.08.96 **788**	**705**	**78,0**	1
	25.09.97 **520**	30.04.97 **754**	**682**	**73**	2

PNP9					
	Minimum	Maximum	Average	Std. Dev.	
EC	18.11.96 **555**	25.04.96 **831**	**721**	**94,0**	1
	25.09.97 **454**	31.03.97 **780**	**673**	**93**	2

PNP10					
	Minimum	Maximum	Average	Std. Dev.	
EC	02.04.96 **226**	277	**246**	**20,0**	1
	25.09.97 **135**	31.03.97 **290**	**183**	**46**	2

PNP11					
	Minimum	Maximum	Average	Std. Dev.	
EC	08.08.96 **361**	25.04.96 **363**	**362**	**1,4**	1
	25.09.97 **241**	26.06.97 **388**	**328**	**46**	2

Appendix: 7.7.4. The EC Change around the year (GOTSCHALK, 1997; KUTSCHKE, 1998)

PNP12					
	Minimum	Maximum	Average	Std. Dev.	
EC	310	02.04.96 **426**	**364**	**39,0**	1
	25.09.97 **251**	26.06.97 **415**	**361**	**48**	2

PNP13					
	Minimum	Maximum	Average	Std. Dev.	
EC	27.02.96 **108**	02.04.96 **135**	**122**	**19**	1
	25.09.97 **66**	30.07.97 **101**	**85**	**18**	2

PNP14					
	Minimum	Maximum	Average	Std. Dev.	
EC	18.11.96 **225**	27.02.96 **310**	**270**	**37,0**	1
	27.02.97 **173**	26.06.97 **296**	**234**	**42**	2

PNP15					
	Minimum	Maximum	Average	Std. Dev.	
EC	18.11.96 **192**	08.08.96 **196**	**194,0**	**2,8**	1
	12.06.97 **186**	31.03.97 **312**	**238**	**46**	2

PNP18					
	Minimum	Maximum	Average	Std. Dev.	
EC			18.11.96 **130**		1
	30.04.97 **82**	27.02.97 **156**	**121**	**18**	2

	PNP5	PNP6	PNP16	PNP17	
Date	25.04.96	08.08.96	08.08.96	08.08.96	
EC	**161**	**843**	**133**	**123**	1

Appendix: 7.7.5. The Oxygen Content around the year (GOTSCHALK, 1997; KUTSCHKE, 1998)

PNP1					
	Minimum	Maximum	Average	Std. Dev.	
O_2	**7.2**	18.11.96 **12.1**	**9.6**	**1.7**	1
	20.11.97 **7.4**	27.02.97 **13.3**	**9.6**	**1.8**	2

PNP2					
	Minimum	Maximum	Average	Std. Dev.	
O_2	**7.2**	18.11.96 **10.9**	**8.6**	**2.0**	1
	19.12.97 **7.2**	18.11.97 **10.9**	**9.1**	**2.0**	2

PNP3					
	Minimum	Maximum	Average	Std. Dev.	
O_2	**5.9**	27.02.96 **10.8**	**8.0**	**2.0**	1
	19.12.97 **5.9**	27.02.97 **10.8**	**7.9**	**1.6**	2

PNP4					
	Minimum	Maximum	Average	Std. Dev.	
O_2	**4.2**	02.04.96 **4.9**	**4.5**	**0.3**	1
	20.12.97 **4.2**	10.09.97 **6.8**	**5.1**	**0.9**	2

PNP7					
	Minimum	Maximum	Average	Std. Dev.	
O_2	08.08.96 **6.2**	25.04.96 **11**	**8.6**	**3.4**	1

PNP8					
	Minimum	Maximum	Average	Std. Dev.	
O_2	31.01.96 **4.1**	02.04.96 **5.1**	**4.4**	**0.37**	1
	31.03.97 **3.6**	20.11.97 **5.7**	**4.9**	**0.8**	2

PNP9					
	Minimum	Maximum	Average	Std. Dev.	
O_2	**2.5**	18.11.96 **12.1**	**7.8**	**3.1**	1
	31.03.97 **8.2**	27.02.97 **11.3**	**9.7**	**1.0**	2

PNP10					
	Minimum	Maximum	Average	Std. Dev.	
O_2	**3.9**	27.02.96 **10.4**	**7.2**	**2.2**	1
	31.03.97 **4.9**	30.04.97 **12.0**	**9.1**	**2.5**	2

PNP11					
	Minimum	Maximum	Average	Std. Dev.	
O_2	08.08.96 **8.2**	25.04.96 **9.2**	**8.7**	**0.71**	1
	25.09.97 **8.2**	30.04.97 **9.6**	**8.9**	**0.6**	2

Appendix: 7.7.5. The Oxygen Content around the year (GOTSCHALK, 1997; KUTSCHKE, 1998)

PNP12					
	Minimum	Maximum	Average	Std. Dev.	
O_2	**7.9**	25.04.96 **10.7**	**9.3**	**0.95**	1
	25.09.97 **7.9**	27.02.97 **11.9**	**9.8**	**1.3**	2

PNP13					
	Minimum	Maximum	Average	Std. Dev.	
O_2	02.04.96 **10.8**	27.02.96 **15.1**	**13**	**2.2**	1
	30.07.97 **9.4**	27.02.97 **13.4**	**11.0**	**2.1**	2

PNP14					
	Minimum	Maximum	Average	Std. Dev.	
O_2	**6.7**	**15.3**	**10**	**3.2**	1
	31.03.97 **9.4**	20.11.97 **11.7**	**10.8**	**0.9**	2

PNP15					
	Minimum	Maximum	Average	Std. Dev.	
O_2	08.08.96 **7.7**	18.11.96 **10.0**	**8.8**	**1.6**	1
	26.06.97 **6.4**	30.07.97 **8.5**	**7.2**	**0.9**	2

PNP18					
	Minimum	Maximum	Average	Std. Dev.	
O_2			18.11.96 **11.9**		1
	31.03.97 **9.2**	27.02.97 **10.9**	**9.8**	**0.6**	2

	PNP5	PNP6	PNP16	PNP17	
Date	25.04.96	08.08.96	08.08.96	08.08.96	
O_2	**10.9**	**10**	**10**	**7.5**	1

Appendix: 7.7.6. The E_h Change around the year (GOTSCHALK, 1997; KUTSCHKE, 1998)

PNP1					
	Minimum	Maximum	Average	Std. Dev.	
E_h	08.08.96 **121**	18.11.96 **547**	**429**	**159**	1
	26.03.97 **370**	31.03.97 **491**	**416**	**39**	2

PNP2					
	Minimum	Maximum	Average	Std. Dev.	
E_h	**378**	01.02.96 **484**	**431**	**75**	1
	19.12.97 **378**	14.04.97 **520**	**461**	**74**	2

PNP3					
	Minimum	Maximum	Average	Std. Dev.	
E_h	**277**	01.02.96 **547**	**456**	**95**	1
	19.12.97 **277**	14.04.97 **590**	**464**	**112**	2

PNP4					
	Minimum	Maximum	Average	Std. Dev.	
E_h	**277**	27.02.96 **481**	**397**	**78**	1
	04.03.97 **262**	22.10.97 **550**	**398**	**100**	2

PNP7					
	Minimum	Maximum	Average	Std. Dev.	
E_h	08.08.96 **185**	25.04.96 **316**	**251**	**93**	1

PNP8					
	Minimum	Maximum	Average	Std. Dev.	
E_h	08.08.96 **255**	18.11.96 **480**	**376**	**81**	1
	26.03.97 **362**	20.11.97 **444**	**400**	**20**	2

PNP9					
	Minimum	Maximum	Average	Std. Dev.	
E_h	**244**	18.11.96 **500**	**408**	**106**	1
	26.03.97 **460**	20.11.97 **511**	**491**	**15**	2

PNP10					
	Minimum	Maximum	Average	Std. Dev.	
Eh	**263**	18.11.96 **512**	**412**	**90**	1
	26.03.97 **352**	20.11.97 **496**	**434**	**33**	2

PNP11					
	Minimum	Maximum	Average	Std. Dev.	
Eh	08.08.96 **276**	25.04.96 **556**	**416**	**198**	1
	26.03.97 **366**	20.11.97 **546**	**430**	**64**	2

Appendix: 7.7.6. The E_h Change around the year (GOTSCHALK, 1997; KUTSCHKE, 1998)

PNP12					
	Minimum	Maximum	Average	Std. Dev.	
E_h	08.08.96 **246**	25.04.96 **527**	**419**	**114**	1
	26.06.97 **358**	31.03.97 **509**	**385**	**45**	2

PNP13					
	Minimum	Maximum	Average	Std. Dev.	
E_h	02.04.96 **389**	31.01.96 **483**	**443**	**48**	1
	27.02.97 **527**	27.02.97 **570**	**545**	**19**	2

PNP14					
	Minimum	Maximum	Average	Std. Dev.	
E_h	08.08.96 **257**	18.11.96 **473**	**364**	**101**	1
	31.03.97 **422**	23.01.97 **522**	**484**	**34**	2

PNP15					
	Minimum	Maximum	Average	Std. Dev.	
E_h	08.08.96 **179**	18.11.96 **527**	**353**	**246**	1
	26.03.97 **310**	31.03.97 **454**	**404**	**43**	2

PNP18					
	Minimum	Maximum	Average	Std. Dev.	
E_h			18.11.96 **522**		1
	26.03.97 **462**	30.04.97 **590**	**561**	**36**	2

	PNP5	PNP6	PNP16	PNP17	
Date	25.04.96	08.08.96	08.08.96	08.08.96	
E_h	**299**	**238**	**138**	**270**	1

Appendix: 7.7.7. The Recorded Physical and Chemical Characteristics at Different Sampling points.

PNP1

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)				
T (°C)	2.8	8.9	6.2	1.9
pH	5.4	6.3	5.8	0.2
E_h (mV)	370	491	416	39
EC (µs/ cm)	48	111	82	18
O_2 (mg/ l)	7.4	13.3	9.6	1.8
O_2 (%)	63	99	85	13
DOC (mg/l)	0.7	4.3	1.9	1

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	<0.2	0.2	<0.2		<0.01	<0.01	
Cl	2.4	6.1	4.2	1.2	0.12	0.12	5.9
NO_3	8	11	9.3	0.8	0.12	0.24	11.9
SO_4	19	26	21	2.4	0.22	0.44	21.9
HCO_3			16.5		0.27	0.27	13.5
Na	2	4.4	2.9	0.7	0.13	0.13	6.3
K	1.2	2.6	2	0.4	0.05	0.05	2.6
Ca	7	14	9.6	2	0.24	0.48	24.0
Mg	2.8	3.8	3.4	0.3	0.14	0.28	14.0
			68.9			2.00	100.0

PNP2

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)				
T (°C)	5.5	5.9	5.7	0.1
pH	4.8	5	4.9	0.1
E_h (mV)	378	520	461	74
EC (µs/ cm)	33	48	43	1
O_2 (mg/ l)	7.2	10.9	9.1	2
DOC (mg/ l)	0.8	5.3	2.8	2.3

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	<0.2	<0.2	<0.2		<0.01	<0.01	
Cl	2.1	2.9	2.5	0.4	0.07	0.07	8.0
NO_3	11	12.6	11.8	0.8	0.15	0.30	34.1
SO_4	0.9	1.8	1.4	0.5	0.02	0.03	3.3
HCO_3			8.1		0.13	0.13	15.0
Na	1.3	1.7	1.5	0.3	0.07	0.07	7.3
K	0.4	0.8	0.6	0.3	0.02	0.02	1.7
Ca	2.7	3	2.8	0.2	0.07	0.14	15.8
Mg	1.5	1.8	1.6	0.2	0.07	0.13	14.9
			30.3			0.89	100.0

Appendix: 7.7.7. The Recorded Physical and Chemical Characteristics at Different Sampling points.

PNP3

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)				
T (°C)	5.6	7.2	6.5	0.6
pH	4.6	5	4.8	0.1
Eh (mV)	277	590	464	112
EC (µs/ cm)	166	260	219	39
O_2 (mg/ l)	5.9	10.8	7.9	1.6
O_2 (%)	61	77	68	8.3
DOC (mg/l)	0.9	4.8	2.1	1.5

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	<0.2	0.7	<0.2		<0.01	<0.01	
Cl	3.9	9	7.2	2.4	0.20	0.20	5.1
NO_3	5.6	10.1	8	1.3	0.10	0.21	5.2
SO_4	49	82	69.1	11	0.72	1.44	36.4
HCO_3			18.3		0.30	0.30	7.6
Na	5.6	15.4	11.5	4.1	0.50	0.50	12.7
K	1.2	2.9	2.3	0.6	0.06	0.06	1.5
Ca	12	17	14.7	1.7	0.37	0.73	18.6
Mg	4.6	7.4	6.2	0.9	0.26	0.51	12.9
			137.3			3.95	100.0

PNP4

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)				
T (°C)	3.9	8.7	5.7	1.8
pH	5.2	7.7	5.9	0.9
E_h (mV)	262	550	398	100
EC (µs/ cm)	114	164	151	18
O_2 (mg/ l)	4.2	6.8	5.1	0.9
O_2 (%)	44	62	52	9
DOC (mg/l)	0.7	4.6	2.0	1.4

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	<0.2	0.5	<0.2		<0.01	<0.01	
Cl	4.8	6.2	5.7	0.6	0.16	0.16	5.2
NO_3	4.8	6.6	5.9	0.7	0.08	0.15	4.9
SO_4	41	47	45	2	0.47	0.94	30.5
HCO_3			21.4		0.35	0.35	11.4
Na	9	10.5	9.5	0.5	0.41	0.41	13.5
K	1.9	3.2	2.5	0.5	0.06	0.06	2.1
Ca	12	14	13	1	0.32	0.65	21.1
Mg	4	4.4	4.2	0.2	0.17	0.35	11.3
			107.2			3.07	100.0

Appendix: 7.7.7. The Recorded Physical and Chemical Characteristics at Different Sampling points.

PNP8

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)				
T (°C)	6.2	7	6.5	0.2
pH	6.6	7.1	6.7	0.1
E_h (mV)	362	444	400	20
EC (µs/ cm)	520	754	682	73
O_2 (mg/ l)	3.6	5.7	4.9	0.8
O_2 (%)	32	49	43	6
DOC (mg/l)	5.4	15.6	11.1	2.9

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	<0.2	2.1	1.3	0.3	0.07	0.07	0.5
Cl	13	18	15.3	1.5	0.43	0.43	3.0
NO_3	<1	4	3	0.7	0.04	0.08	0.5
SO_4	170	244	201	22	2.09	4.19	28.8
HCO_3			151		2.48	2.48	17.0
Na	83	119	97	10	4.22	4.22	29.0
K	3.5	6.8	5.3	1.1	0.14	0.14	0.9
Ca	29	48	39	6.2	0.97	1.95	13.4
Mg	9	15	12	2	0.49	0.99	6.8
			524.9			14.53	100.0

PNP9

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)				
T (°C)	5.8	7	6.4	0.5
pH	6.3	6.7	6.6	0.1
E_h (mV)	460	511	491	15
EC (µs/ cm)	454	780	673	93
O_2 (mg/ l)	8.2	11.3	9.7	1
O_2 (%)	69	91	84	8
DOC (mg/l)	1.9	3.8	2.8	0.5

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	1.5	2.4	1.9	0.3	0.10	0.10	0.7
Cl	7.5	10	8.8	0.7	0.25	0.25	1.7
NO_3	2.8	4.6	4	0.5	0.05	0.10	0.7
SO_4	230	330	262	31	2.73	5.46	37.2
HCO_3			76		1.25	1.25	8.5
Na	51	68	59	6	2.57	2.57	17.5
K	2.3	4.8	4.1	0.6	0.11	0.11	0.7
Ca	51	86	66	10	1.65	3.29	22.4
Mg	16	25	19	3	0.78	1.56	10.6
						14.68	100.0

Appendix: 7.7.7. The Recorded Physical and Chemical Characteristics at Different Sampling points.

PNP10

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)				
T (°C)	6.2	8.5	6.5	0.7
pH	5.7	6.2	6.1	0.1
E_h (mV)	352	496	434	33
EC (µs/ cm)	135	290	183	46
O_2 (mg/ l)	4.9	12	9.1	2.5
O_2 (%)	43	100	78	19
DOC (mg/l)	1.6	3.5	2.4	0.6

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	<0.2	0.4	0.3	0.1	0.02	0.02	0.3
Cl	5.4	7.4	6.1	0.6	0.17	0.17	3.4
NO_3	6.3	8.3	7.6	0.6	0.10	0.19	3.8
SO_4	50	73	58	7	0.60	1.21	23.8
HCO_3			62		1.02	1.02	20.0
Na	19	20	19	0.5	0.83	0.83	16.3
K	1.2	2.8	2.4	0.4	0.06	0.06	1.2
Ca	19	31	24	3.5	0.60	1.20	23.6
Mg	3.7	6.1	4.6	0.7	0.19	0.38	7.5
			184			5.07	100.0

PNP11

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)				
T (°C)	6.2	7.2	6.5	0.3
pH	5.4	5.7	5.6	0.1
E_h (mV)	366	546	430	64
EC (µs/ cm)	241	388	328	46
O_2 (mg/ l)	8.2	9.6	8.9	0.6
O_2 (%)	72	83	78	5
DOC (mg/l)	0.9	2.9	1.7	0.7

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	<0.2	<0.2	<0.2		<0.01	<0.01	
Cl	7.1	11	9.6	1.4	0.27	0.27	4.2
NO_3	5	7.1	6	0.7	0.08	0.15	2.4
SO_4	104	135	122	10	1.27	2.54	39.0
HCO_3			16		0.26	0.26	4.0
Na	19	32	27	5	1.17	1.17	18.0
K	1.2	3.2	2.7	0.6	0.07	0.07	1.1
Ca	23	27	25	1.5	0.62	1.25	19.2
Mg	8.8	11	9.6	0.7	0.40	0.79	12.1
			217.9			6.51	100.0

Appendix: 7.7.7. The Recorded Physical and Chemical Characteristics at Different Sampling points.

PNP12

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)				
T (°C)	6,2	8,8	7,2	0,9
pH	5,7	6,4	6,1	0,3
E_h (mV)	358	509	385	45
EC (µs/ cm)	251	415	361	48
O_2 (mg/ l)	7,9	11,9	9,8	1,3
O_2 (%)	73	96	87	9
DOC (mg/l)	1,5	7,3	2,7	1,7

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	<0,2	0,7	0,5	0,1	0,03	0,03	0,4
Cl	9	12	11	0,8	0,31	0,31	4,2
NO_3	7,7	9,6	8,7	0,7	0,11	0,22	3,0
SO_4	102	140	125	13	1,30	2,60	34,8
HCO_3			36,6		0,60	0,60	8,0
Na	21	29	25	3	1,09	1,09	14,6
K	2,3	4,3	3,3	0,7	0,08	0,08	1,1
Ca	26	39	31	4	0,77	1,55	20,7
Mg	10	13	12	1,3	0,49	0,99	13,2
			253,1			7,47	100,0

PNP13

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)				
T (°C)	3,1	11,9	8,7	4
pH	4,6	5,5	5,2	0.4
E_h (mV)	527	570	545	19
EC (µs/ cm)	66	101	85	18
O_2 (mg/ l)	9,4	13,4	11	2,1
O_2 (%)	92	98	95	3
DOC (mg/l)	1,1	3	2,1	0,8

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	<0,3	<0,3	<0,3		<0,02		
Cl	3,6	5,1	4,2	0,7	0,12	0,12	6,2
NO_3	5	15	9,2	4,4	0,12	0,24	12,3
SO_4	26	29	27	1	0,28	0,56	29,3
HCO_3			4,6		0,08	0,08	3,9
Na	4,4	5,1	4,7	0,3	0,20	0,20	10,6
K	1,5	1,6	1,6	0	0,04	0,04	2,1
Ca	7,6	8,6	8,2	0,5	0,21	0,41	21,3
Mg	3	3,4	3,3	0,2	0,14	0,27	14,1
			62,8			1,92	100,0

Appendix: 7.7.7. The Recorded Physical and Chemical Characteristics at Different Sampling points.

PNP14

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)				
T (°C)	3,2	9,1	6,5	1,9
pH	6,3	7,1	6,5	1,9
E_h (mV)	422	522	484	34
EC (µs/ cm)	173	296	234	42
O_2 (mg/ l)	9,4	11,7	10,8	0,9
O_2 (%)	83	100	95	6
DOC (mg/l)	1,5	4,2	2,3	0,8

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	0,3	0,6	0,5	0,1	0,03	0,03	0,5
Cl	4,3	7,2	6	0,9	0,17	0,17	3,4
NO_3	5,8	11,5	7,7	1,5	0,10	0,20	4,0
SO_4	43	83	70	13	0,73	1,46	29,4
HCO_3			37,2		0,61	0,61	12,3
Na	8	25	19	6,5	0,83	0,83	16,6
K	1,7	2,7	2,4	0,3	0,06	0,06	1,2
Ca	14	28	23	3,6	0,57	1,15	23,1
Mg	4,2	6,3	5,7	0,6	0,23	0,47	9,4
			171,5			4,96	100,0

PNP15

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)				
T (°C)	5,8	8,1	6,9	0,9
pH	5,5	6,4	5,8	0,4
E_h (mV)	310	454	404	43
EC (µs/ cm)	186	312	238	46
O_2 (mg/ l)	6,4	8,5	7,2	0,9
O_2 (%)	56	75	64	7
DOC (mg/l)	0,9	2,5	1,6	0,6

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	<0,3	<0,3	<0,3		<0,02		
Cl	4	5,5	4,6	0,5	0,13	0,13	3,1
NO_3	7,3	9,3	8,7	0,7	0,11	0,22	5,3
SO_4	54	70	67	9	0,70	1,40	33,1
HCO_3			20,6		0,34	0,34	8,0
Na	4,8	7	5,7	0,8	0,25	0,25	5,9
K	1,8	2,9	2,1	0,4	0,05	0,05	1,3
Ca	22	31	25	3	0,62	1,25	29,6
Mg	6	9,2	7,1	1,1	0,29	0,58	13,8
			140,8			4,22	100,0

Appendix: 7.7.7. The Recorded Physical and Chemical Characteristics at Different Sampling points.

PNP18

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)				
T (°C)	5.2	8.4	6.4	1
pH	5.1	6.3	5.5	1
E_h (mV)	462	590	561	36
EC (µs/ cm)	82	156	121	18
O_2 (mg/ l)	9.2	10.9	9.8	0.6
O_2 (%)	78	91	86	5
DOC (mg/l)	0.7	3	1.6	0.8

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	<0.3	<0.3	<0.3		<0.02	<0.02	
Cl	3	4	3.5	0.3	0.10	0.10	4.1
NO_3	5.1	8.7	7.7	1	0.10	0.20	8.2
SO_4	33	38	36	1	0.37	0.75	31.3
HCO_3			12.2		0.20	0.20	8.3
Na	4.9	7.5	5.9	0.8	0.26	0.26	10.7
K	1.9	2.4	2.2	0.2	0.06	0.06	2.3
Ca	12	14	12	1	0.30	0.60	25.0
Mg	2.7	3.2	2.9	0.2	0.12	0.24	10.0
			82.4			2.40	100.0

PNP19

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)	0	0.5	0.2	0.2
T (°C)	3.8	6.9	5	1.3
pH	6	6.3	6.1	0.1
E_h (mV)	323	480	401	56
EC (µs/ cm)	54	132	102	37
O_2 (mg/ l)	7.2	11.1	8.5	1.6
O_2 (%)	63	94	72	13
DOC (mg/l)	0.8	2.8	1.8	0.9

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	<0.3	<0.3	<0.3		<0.02	<0.02	
Cl	2.7	4.2	3.6	0.7	0.10	0.10	4.3
NO_3	9.8	12	11.1	0.9	0.14	0.28	12.2
SO_4	16	25	21	4	0.22	0.44	18.7
HCO_3			24.4		0.40	0.40	17.1
Na	2.7	4.8	3.7	1	0.16	0.16	6.9
K	1.5	2.9	2.1	0.5	0.05	0.05	2.3
Ca	9	17	13	4	0.32	0.65	27.7
Mg	2.8	3.4	3.1	0.2	0.13	0.26	10.9
			82			2.34	100.0

Appendix: 7.7.7. The Recorded Physical and Chemical Characteristics at Different Sampling points.

PNP20

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)	0.1	0.8	0.3	0.2
T (°C)	4	8.4	6.3	1.7
pH	5.4	5.7	5.6	0.1
E_h (mV)	428	509	485	27
EC (µs/ cm)	129	199	165	24
O_2 (mg/ l)	6.4	7.9	6.8	0.6
O_2 (%)	57	66	60	3
DOC (mg/l)	0.6	2.3	1.3	0.6

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	<0.3	0.5	<0.3		<0.02	<0.02	
Cl	4.5	6.1	5.3	0.5	0.15	0.15	4.4
NO_3	4.7	6.3	5.6	0.5	0.07	0.14	4.2
SO_4	46	60	54	5	0.56	1.12	33.1
HCO_3			18.3		0.30	0.30	8.8
Na	7.7	12	10.2	1.7	0.44	0.44	13.1
K	1.6	2.4	2	0.3	0.05	0.05	1.5
Ca	13	18	15	1	0.37	0.75	22.0
Mg	4.7	5.9	5.3	0.4	0.22	0.44	12.8
			115.7			3.40	100.0

PNP21

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)	13	20	15	2
T (°C)	1.6	10.7	7.6	3.5
pH	6.3	7.1	6.9	0.3
E_h (mV)	360	509	432	47
EC (µs/ cm)	138	207	177	24
O_2 (mg/ l)	8.2	9.4	8.8	0.6
O_2 (%)	74	79	77	2
DOC (mg/l)	1.2	2.8	2	0.8

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	0.3	0.5	0.5	0.1	0.03	0.03	0.7
Cl	4.2	5.4	4.8	0.4	0.14	0.14	3.6
NO_3	5.5	7.8	6.9	0.9	0.09	0.18	4.8
SO_4	48	60	55	3.78	0.57	1.15	30.8
HCO_3			18.3		0.30	0.30	8.1
Na	8	16	13	3	0.57	0.57	15.2
K	2.1	2.8	2.3	0.3	0.06	0.06	1.6
Ca	17	22	19	2	0.47	0.95	25.5
Mg	4.2	4.7	4.4	0.2	0.18	0.36	9.7
			124.2			3.72	100.0

Appendix: 7.7.7. The Recorded Physical and Chemical Characteristics at Different Sampling points.

PNP23

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)	<0.01	<0.01	<0.01	
T (°C)	3.5	8.8	6.5	2.2
pH	6.8	7.1	7	0.1
E_h (mV)	393	458	433	31
EC (µs/ cm)	456	798	629	129
O_2 (mg/ l)	4.4	7.7	6.4	1.4
O_2 (%)	41	64	57	11
DOC (mg/l)	3.4	4.6	4.2	0.4

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	1.1	2.6	2.2	0.6	0.12	0.12	0.7
Cl	1.6	3.8	2.7	0.8	0.08	0.08	0.5
NO_3	<1	1.1	0			0.00	0.0
SO_4	160	204	178	30	1.85	3.71	23.0
HCO_3			244		4.00	4.00	24.9
Na	18	40	27	9	1.17	1.17	7.3
K	3.2	5.1	4	0.7	0.10	0.10	0.6
Ca	77	114	99	14	2.47	4.94	30.7
Mg	19	28	24	4	0.99	1.97	12.3
			580.9			16.09	100.0

IV

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)				
T (°C)	6.3	6.5	6.4	0.1
pH	5.5	6.1	5.9	0.3
E_h (mV)	195	532	377	161
EC (µs/ cm)	107	138	123	16
O_2 (mg/ l)	3.6	5.2	4.5	0.8
O_2 (%)	33	45	40	6
DOC (mg/l)	2.6	3	2.8	0.2

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	<0.3	<0.3	<0.3		<0.02	<0.02	
Cl	3.7	4.6	4.2	0.4	0.12	0.12	4.1
NO_3	7	7.6	7.3	0.2	0.09	0.19	6.5
SO_4	30	36	32	3	0.33	0.67	23.2
HCO_3			29		0.48	0.48	16.5
Na	13	15	14	1	0.61	0.61	21.2
K	2	2.5	2.2	0.2	0.06	0.06	2.0
Ca	8.7	12	11	1.6	0.27	0.55	19.1
Mg	2.4	3	2.6	0.3	0.11	0.21	7.4
			102.3			2.88	100.0

Appendix: 7.7.7. The Recorded Physical and Chemical Characteristics at Different Sampling points.

PNP1

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)	0	3	2,5	0,72
T (°C)	5,3	7,4	6,1	0,72
pH	5,4	6	5,7	0,2
Eh (mV)	121	547	429	159
EC (µs/ cm)	75	97	83	8,6
O2 (mg/ l)	7,2	12,1	9,6	1,7

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	0	0,3	0,1	0,2	0,01	0,01	0,3
Cl	2.5	2.9	2,6	0,2	0,07	0,07	4,3
NO3	8,1	10,2	8,9	0,8	0,11	0,23	13,3
SO4	16	19	17	1,3	0,18	0,35	20,7
HCO3	18.3	27,45	20,8	4,1	0,34	0,34	19,9
Na	2	3,3	2,4	0,5	0,10	0,10	6,1
K	1.4	1.8	1,6	0,1	0,04	0,04	2,4
Ca	6,8	7,9	7,2	0,5	0,18	0,36	21,0
Mg	2,3	2.7	2,5	0,1	0,10	0,21	12,0
			63,1			1,71	

PNP2

Parameter	Minimum	Maximum	Average	Std. Dev.
T (°C)	5,7	5,9	5,8	0,12
pH	4,9	5	4,9	0,1
Eh	378	484	431	75
EC	45	48	47	1,5
O2	7,2	10,9	8,6	2

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F			0			0	0,0
Cl	2,1	2,9	2,1	0,6	0,059	0,059	5,2
NO3	11	12	11,5	0,7	0,147	0,295	25,9
SO4	0,9	1,8	1,8	0,6	0,019	0,037	3,3
HCO3	0	24,4	24,4	17,3	0,4	0,4	35,2
Na	1,3	1,7	1,7	0,3	0,074	0,074	6,5
K	0,4	0,8	0,4	0,3	0,01	0,01	0,9
Ca	2,8	3	2,8	0,1	0,07	0,14	12,3
Mg	1,5	1,6	1,5	0,1	0,062	0,123	10,8
			46,2			1,14	

Appendix: 7.7.7. The Recorded Physical and Chemical Characteristics at Different Sampling points.

PNP3

Parameter	Minimum	Maximum	Average	Std. Dev.
T (°C)	5,9	7,2	6,5	0,56
pH	4,6	5	4,8	0,2
Eh	277	547	456	95
EC	166	260	219	39
O2	5.9	10,8	8	2

Major ions

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	0	0,7	0,3	0,3	0,02	0,02	0,4
Cl	4,2	8,7	6,9	2,0	0,20	0,20	4,9
NO3	5,6	10,1	8,1	1,7	0,10	0,21	5,2
SO4	53	82	70,2	11,8	0,73	1,46	36,5
HCO3	12,2	30,5	21,4	7,5	0,35	0,35	8,8
Na	6	15,4	11,3	3,7	0,49	0,49	12,3
K	2,2	2,5	2,4	0,1	0,06	0,06	1,5
Ca	12	15,8	14,5	1,6	0,36	0,72	18,1
Mg	4,6	6,7	6,1	0,9	0,25	0,50	12,5
			141,1			4,01	

PNP4

Parameter	Minimum	Maximum	Average	Std. Dev.
T (°C)	3,9	6	4,6	0,85
pH	5,4	7,7	6,4	1
Eh	277	481	397	78
EC	157	164	160	3,3
O2	4,2	4,9	4,5	0,3

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	0	0,34	0,2	0,2	0,01	0,01	0,3
Cl	4,8	6,7	5,5	0,8	0,16	0,16	5,1
NO3	2,4	6,4	4,9	1,7	0,06	0,13	4,2
SO4	44	49	45,8	2,4	0,48	0,95	31,6
HCO3	12,2	36,6	22,9	10,4	0,38	0,38	12,4
Na	8,3	9,2	8,8	0,4	0,38	0,38	12,7
K	2	2,8	2,2	0,4	0,06	0,06	1,9
Ca	12	12,8	12,4	0,4	0,31	0,62	20,5
Mg	4	4,2	4,1	0,1	0,17	0,34	11,2
			106,6			3,02	

Appendix: 7.7.7. The Recorded Physical and Chemical Characteristics at Different Sampling points.

PNP5

Parameter	Average
Q (l/s)	0,75
T (°C)	4,4
pH	5,07
Eh	299
EC	161
O2	10,9

	Average	mmol/ l	meq/ l	%
F	0,4	0,02	0,02	0,7
Cl	5,7	0,16	0,16	5,5
NO3	5,9	0,08	0,15	5,2
SO4	46	0,48	0,96	32,7
HCO3	18,3	0,30	0,30	10,2
Na	7,8	0,34	0,34	11,6
K	1,9	0,05	0,05	1,7
Ca	11,2	0,28	0,56	19,1
Mg	4,8	0,20	0,40	13,5
	102		2,93	100,0

PNP6

Parameter	Average
Q (l/s)	0,01
T (°C)	7,1
pH	7,2
E_h	238
EC	843
O_2	10

	Average	mmol/ l	meq/ l	%
F	0		0,00	0,0
Cl	8,1	0,23	0,23	1,3
NO3	4,5	0,06	0,12	0,7
SO4	330	3,44	6,87	39,1
HCO3	109,8	1,80	1,80	10,2
Na	100	4,35	4,35	24,7
K	6,5	0,17	0,17	0,9
Ca	55	1,37	2,75	15,6
Mg	16	0,66	1,32	7,5
	629,9		17,59	

Appendix: 7.7.7. The Recorded Physical and Chemical Characteristics at Different Sampling points.

PNP7

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)	0	0,01	0,005	
T (°C)	4,3	6,4	5,4	1,5
pH	6,6	6,9	6,8	0,2
Eh	185	316	251	93
EC	572	656	614	59
O2	6,2	11	8,6	3,4

	Average	mmol/ l	meq/ l	%
F	1,3	0,07	0,07	0,6
Cl	8,8	0,25	0,25	2,0
NO3	0		0,00	0,0
SO4	180	1,87	3,75	30,5
HCO3	122	2,00	2,00	16,3
Na	94	4,09	4,09	33,3
K	4	0,10	0,10	0,8
Ca	29	0,72	1,45	11,8
Mg	7,1	0,29	0,58	4,8
	446,2		12,29	

PNP8

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)	0,5	0,8	0,65	
T (°C)	4,4	6,5	6,1	0,68
pH	6,4	7,6	6,8	0,4
Eh	255	480	376	81
EC	623	788	705	78
O2	4,1	5,1	4,4	0,37

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	0	1,6	0,9	1,2	0,05	0,05	0,3
Cl	13	17	14,5	1,7	0,41	0,41	2,9
NO3	2,2	4	3	0,7	0,04	0,08	0,5
SO4	160	250	209,0	33,7	2,18	4,35	30,7
HCO3	115,9	164,7	139,3	17,4	2,28	2,28	16,1
Na	75	104	89,8	9,6	3,91	3,91	27,6
K	5	6,5	5,6	0,7	0,14	0,14	1,0
Ca	34	55	40,2	7,9	1,00	2,01	14,2
Mg	9,2	15	11,3	2,2	0,47	0,93	6,6
			513,6			14,15	

Appendix: 7.7.7. The Recorded Physical and Chemical Characteristics at Different Sampling points.

PNP9

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)	0,7	1,5	1,1	
T (°C)	3,4	6,8	5,7	1,1
pH	5,8	7,6	6,6	0,5
Eh	244	500	408	106
EC	555	831	721	94
O2	2,5	12,1	7,8	3,1

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	2	3	2,5	0,5	0,13	0,13	0,9
Cl	5,2	8,8	8,4	2,6	0,24	0,24	1,6
NO3	3,2	4,6	3,8	0,5	0,05	0,10	0,6
SO4	270	330	293,3	27,5	3,05	6,11	40,2
HCO3	45,75	91,5	62,5	16,3	1,02	1,02	6,7
Na	39	56	50,5	6,1	2,20	2,20	14,5
K	4	7,3	4,8	1,3	0,12	0,12	0,8
Ca	64	88	71,3	9,4	1,78	3,56	23,4
Mg	19	26	20,8	2,6	0,86	1,71	11,3
			518,0			15,19	

PNP10

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)	4	7	5,5	
T (°C)	5,1	6,5	6	0,55
pH	5,8	7,6	6,3	0,6
Eh	263	512	412	90
EC	226	277	246	20
O2	3,9	10,4	7,2	2,2

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	0	0,9	0,4	0,3	0,02	0,02	0,4
Cl	4,6	5,6	5,2	0,4	0,15	0,15	3,1
NO3	6,8	8,3	7,7	0,6	0,10	0,20	4,2
SO4	49	61	55,7	5,4	0,58	1,16	24,4
HCO3	24,4	67,1	50,8	15,3	0,83	0,83	17,5
Na	16	20	17,5	1,4	0,76	0,76	16,0
K	2	3	2,4	0,4	0,06	0,06	1,3
Ca	21	30	24,8	3,8	0,62	1,24	26,0
Mg	3,6	4,7	4,1	0,4	0,17	0,34	7,1
			168,6			4,76	

Appendix: 7.7.7. The Recorded Physical and Chemical Characteristics at Different Sampling points.

PNP11

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)	0	2,5	1	
T (°C)	5,9	6,5	6,2	0,42
pH	5,4	5,5	5,5	0,1
Eh	276	556	416	198
EC	361	363	362	1,4
O2	8,2	9,2	8,7	0,71

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F		0,64	0,32	0,5	0,02	0,02	0,2
Cl	8,5	9,1	8,8	0,4	0,25	0,25	3,6
NO3	6,7	6,8	6,8	0,1	0,09	0,17	2,5
SO4	120	125	122,5	3,5	1,28	2,55	36,8
HCO3	30,5	42,7	36,6	8,6	0,60	0,60	8,7
Na	24	26	25,0	1,4	1,09	1,09	15,7
K	2,6	3,5	3,1	0,6	0,08	0,08	1,1
Ca	26	28	27,0	1,4	0,67	1,35	19,4
Mg	9,8	10,1	10,0	0,2	0,41	0,82	11,9
			240,0			6,93	

PNP12

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)	0,1	0,4	0,3	
T (°C)	2,8	6,9	5,9	1,4
pH	5,8	7,7	6,4	0,7
Eh	246	527	419	114
EC	310	426	364	39
O2	7,9	10,7	9,3	0,95

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F	0	0,9	0,6	0,3	0,03	0,03	0,4
Cl	10	13	11,3	1,2	0,32	0,32	4,5
NO3	8,3	11	9,4	0,9	0,12	0,24	3,4
SO4	114	144	126,5	10,6	1,32	2,63	36,8
HCO3	18,3	48,8	25,4	11,8	0,42	0,42	5,8
Na	22	31	26,5	3,9	1,15	1,15	16,1
K	3	4	3,5	0,3	0,09	0,09	1,3
Ca	25	35	28,8	3,3	0,72	1,44	20,1
Mg	9	11	10,1	0,8	0,42	0,83	11,6
			242,2			7,15	

Appendix: 7.7.7. The Recorded Physical and Chemical Characteristics at Different Sampling points.

PNP13

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)	0,2	2	1,2	
T (°C)	0,4	1,1	0,7	0,36
pH	5,4	7,7	6,2	1,3
Eh	389	483	443	48
EC	108	135	122	19
O2	10,8	15,1	13	2,2

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F		0,3	0,1	0,2	0,01	0,01	0,2
Cl	3,4	11,8	3,4	4,7	0,10	0,10	4,1
NO3	7,7	8,9	8,3	0,6	0,11	0,21	9,0
SO4	28	31	28	1,7	0,29	0,58	24,7
HCO3		30,5	30,5	17,6	0,50	0,50	21,2
Na	3,6	6,7	3,6	1,7	0,16	0,16	6,7
K	1,3	1,7	1,7	0,2	0,04	0,04	1,8
Ca	9,6	10,4	9,6	0,4	0,24	0,48	20,3
Mg	3	3,4	3,4	0,2	0,14	0,28	11,9
			88,6			2,36	

PNP14

Parameter	Minimum	Maximum	Average	Std. Dev.
Q (l/s)	7	20	12	
T (°C)	3,9	7,7	5,5	1,3
pH	6,4	7,7	6,8	0,5
Eh	257	473	364	101
EC	225	310	270	37
O2	6,7	15,3	10	3,2

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F		1,2	0,6	0,4	0,03	0,03	0,6
Cl	4,4	7,5	6,0	1,4	0,17	0,17	3,0
NO3	6,4	8,4	7,3	0,8	0,09	0,19	3,3
SO4	60	93	80,0	13,5	0,83	1,67	29,6
HCO3	48,8	61	53,7	5,1	0,88	0,88	15,6
Na	12	24	19,6	5,4	0,85	0,85	15,1
K	2,4	2,8	2,5	0,2	0,06	0,06	1,1
Ca	20	31	26,0	4,1	0,65	1,30	23,0
Mg	4,8	6,7	5,9	0,7	0,24	0,49	8,6
			201,6			5,63	

Appendix: 7.7.7. The Recorded Physical and Chemical Characteristics at Different Sampling points.

PNP15

Parameter	Average
Q (l/s)	1,5
T (°C)	6,5
pH	5,4
Eh	179
EC	196
O2	7,7

	Minimum	Maximum	Average	Std. Dev.	mmol/ l	meq/ l	%
F			0			0,00	0,0
Cl	3,4	3,7	3,6	0,2	0,10	0,10	2,8
NO3	8,7	10	9,4	0,9	0,12	0,24	6,7
SO4	50	56	53,0	4,2	0,55	1,10	30,8
HCO3	12,2	30,5	21,4	12,9	0,35	0,35	9,8
Na	4,4	4,9	4,7	0,4	0,20	0,20	5,7
K	1,3	1,8	1,6	0,4	0,04	0,04	1,1
Ca	22	22	22,0	0,0	0,55	1,10	30,6
Mg	5,3	5,4	5,4	0,1	0,22	0,44	12,4
			120,9			3,59	

PNP16

Parameter	Average
Q (l/s)	0,15
T (°C)	6,3
pH	6,6
Eh	138
EC	133
O2	10

	Average	mmol/ l	meq/ l	%
F	0		0,00	0,0
Cl	2,4	0,07	0,07	2,5
NO3	9,5	0,12	0,24	8,8
SO4	30,0	0,31	0,63	22,6
HCO3	30,5	0,50	0,50	18,1
Na	3,8	0,17	0,17	6,0
K	3,6	0,09	0,09	3,3
Ca	18,0	0,45	0,90	32,5
Mg	2,1	0,09	0,17	6,3
	99,9		2,76	

Appendix: 7.7.7. The Recorded Physical and Chemical Characteristics at Different Sampling points.

PNP17

Parameter	Average
Q (l/s)	0,1
T (°C)	10,4
pH	6,6
Eh	270
EC	123
O2	7,5

	Average	mmol/ l	meq/ l	%
F	0		0,00	0,0
Cl	1,9	0,05	0,05	3,3
NO3	3,9	0,05	0,10	6,1
SO4	33,0	0,34	0,69	41,8
HCO3	0		0,00	0,0
Na	3,2	0,14	0,14	8,5
K	1,3	0,03	0,03	2,0
Ca	9,5	0,24	0,47	28,9
Mg	1,9	0,08	0,16	9,5

PNP18

Parameter	Average
Q (l/s)	2
T (°C)	5,6
pH	6,2
Eh	522
EC	130
O2	11,9

	Average	mmol/ l	meq/ l	%
F	0		0,00	0,0
Cl	3,3	0,09	0,09	3,9
NO3	7,5	0,10	0,19	8,1
SO4	35,0	0,36	0,73	30,6
HCO3	18,3	0,30	0,30	12,6
Na	5,0	0,22	0,22	9,1
K	1,4	0,04	0,04	1,5
Ca	12,0	0,30	0,60	25,2
Mg	2,6	0,11	0,21	9,0
	85,1		2,38	

Appendix: 7.7.8. The Concentration Change with time of Heavy and Trace Metals at Different Sampling Points around the year (GOTSCHALK, 1997)

PNP1

Date/El.Con.(µg/l)	19.12.95	31.01.96	27.02.96	02.04.96	25.04.96	08.08.96	18.11.96
^{75}As	9,4	10,53	9,65	16,97	14,44	n.d.	13,08
^{138}Ba	15,88	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
^{111}Cd	0,84	0,45	0,48	n.d.	n.d.	n.d.	n.d.
^{114}Cd	1,03	0,2	0,21	1,04	1,54	0,04	0,52
^{52}Cr	0,17	0,35	<0,5	4,18	3,14	0,44	0,27
^{65}Cu	133,74	124,92	109,44	222,2	146,45	119,92	119,27
^{55}Mn	53,6	n.d.	n.d.	n.d.	n.d.	52,09	59,06
^{60}Ni	3,78	4,98	4,78	12,22	18,99	5,13	4,97
^{204}Pb	n.d.	n.d.	n.d.	150,49	n.d.	n.d.	n.d.
^{208}Pb	0,53	<0,5	<0,5	n.d.	0,71	0,43	1,05
^{232}Th	0,07	<0,5	<0,5	n.d.	n.d.	0,02	0,05
^{238}U	1,01	0,54	0,58	1,36	3,93	0,86	1,23
^{64}Zn	60,53	61,65	61,44	104,03	150,49	55,86	n.d.
^{66}Zn	55,01	58,49	59,81	103,02	149,48	53,84	60,41

PNP2

Date/El.Con.(µg/l)	19.12.95	01.02.96	18.11.96
^{75}As	0,68	0,54	1,25
^{138}Ba	27,19	n.d.	n.d.
^{111}Cd	0,75	0,42	n.d.
^{114}Cd	0,71	0,24	0,93
^{52}Cr	0,47	0,36	0,4
^{65}Cu	8,2	7,85	7,31
^{55}Mn	96,28	n.d.	79,41
^{60}Ni	2,25	4,07	3,35
^{204}Pb	n.d.	n.d.	n.d.
^{208}Pb	1,45	0,46	2,47
^{232}Th	0,06	<0,5	0,05
^{238}U	0,59	<0,5	0,21
^{64}Zn	30,09	37,55	n.d.
^{66}Zn	30,09	37,55	n.d.

Appendix: 7.7.8. The Concentration Change with time of Heavy and Trace Metals at Different Sampling Points around the year (GOTSCHALK, 1997)

PNP3

Date/El.Con.(µg/l)	19.12.95	01.02.96	27.02.96	02.04.96	25.04.96	18.11.96
^{75}As	4,21	4,28	3,98	9,08	7,51	5,37
^{138}Ba	21,63	n.d.	n.d.	n.d.	n.d.	n.d.
^{111}Cd	2	1,83	1,93	n.d.	n.d.	n.d.
^{114}Cd	1,87	1,69	1,72	3,01	2,99	2,61
^{52}Cr	0,71	0,6	0,28	2,94	2,79	0,43
^{65}Cu	81,99	77,47	74,73	132,31	121,2	69,68
^{55}Mn	562,12	n.d.	n.d.	n.d.	n.d.	555,38
^{60}Ni	43,9	42,97	40,28	73,73	68,48	39,42
^{204}Pb	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
^{208}Pb	1	0,64	0,8	1,72	0,88	3,03
^{232}Th	0,1	<0,5	<0,5	n.d.	n.d.	0,05
^{238}U	6,97	7,61	7,85	10,2	9,7	7,27
^{64}Zn	204,28	218,21	216,16	355,52	332,29	n.d.
^{66}Zn	187,01	212,72	212,04	334,31	322,19	208,86

PNP4

Date/El.Con.(µg/l)	20.12.95	01.02.96	27.02.96	02.04.96	25.04.96
^{75}As	3,87	14,19	4	7,16	10,9
^{138}Ba	29,42	n.d.	n.d.	n.d.	n.d.
^{111}Cd	1,89	1,89	1,76	n.d.	n.d.
^{114}Cd	1,89	1,71	1,55	2,9	2,74
^{52}Cr	0,34	0,65	0,1	3,15	2,55
^{65}Cu	9,03	10,24	8,72	11,72	15,76
^{55}Mn	93,91	n.d.	n.d.	n.d.	n.d.
^{60}Ni	9,19	11,68	9,52	17,47	16,56
^{204}Pb	n.d.	n.d.	n.d.	n.d.	n.d.
^{208}Pb	0,6	21245?	0,24	0,86	29221?
^{232}Th	0,07	<0,5	<0,5	n.d.	n.d.
^{238}U	2,4	6,89	3,04	4,33	5,44
^{64}Zn	145,7	168,67	148,24	216,14	237,35
^{66}Zn	145,7	168,67	148,24	216,14	237,35

Appendix: 7.7.8. The Concentration Change with time of Heavy and Trace Metals at Different Sampling Points around the year (GOTSCHALK, 1997)

	PNP5	PNP6	PNP7	PNP7
Date/El.Con.(µg/l)	25.04.96	08.08.96	25.04.96	08.08.96
^{75}As	7,07	n.d.	126,25	n.d.
^{138}Ba	n.d.	n.d.	n.d.	n.d.
^{111}Cd	n.d.	n.d.	n.d.	n.d.
^{114}Cd	2,08	4,11	4,86	4,24
^{52}Cr	2,96	0,82	3,94	2,68
^{65}Cu	61	345,37	284,82	183,69
^{55}Mn	n.d.	402,68	n.d.	1220,2
^{60}Ni	33,73	181,05	129,28	57,86
^{204}Pb	n.d.	n.d.	n.d.	n.d.
^{208}Pb	0,52	n.d.	10,4	13,5
^{232}Th	n.d.	0,16	n.d.	0,39
^{238}U	11,21	767,6	453,49	384,1
^{64}Zn	210,08	523,76	306,03	185,01
^{66}Zn	199,98	576,64	28,78	166,12

PNP8

Date/El.Con.(µg/l)	31.01.96	27.02.96	02.04.96	25.04.96	08.08.96	18.11.96
^{75}As	84,37	123,53	115,14	148,47	n.d.	92,77
^{138}Ba	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
^{111}Cd	<0,5	32540?	n.d.	n.d.	n.d.	n.d.
^{114}Cd	<0,5	2,63	3,71	6,18	3,66	3,56
^{52}Cr	<0,5	1,59	2,68	2,47	1,19	2,08
^{65}Cu	94,42	94,4	127,26	241,39	410,41	216,83
^{55}Mn	n.d.	n.d.	n.d.	n.d.	741,66	722,17
^{60}Ni	79,91	62,57	124,23	290,88	154,18	146,97
^{204}Pb	<0,5	n.d.	n.d.	n.d.	n.d.	n.d.
^{208}Pb	2	4,15	2,35	4,14	3,64	3,87
^{232}Th	<0,5	0,27	n.d.	n.d.	0,16	0,2
^{238}U	1344,85	1442,29	1444,3	1504,9	809,45	978,74
^{64}Zn	271,55	207,84	350,47	949,4	471,81	n.d.
^{66}Zn	240,11	194,29	327,24	938,29	524,36	406,81

Appendix: 7.7.8. The Concentration Change with time of Heavy and Trace Metals at Different Sampling Points around the year (GOTSCHALK, 1997)

PNP9

Date/El.Con.(µg/l)	20.12.95	31.01.96	27.02.96	02.04.96	25.04.96	08.08.96	18.11.96
^{75}As	126,63	4,17	3,41	9,88	16,46	n.d.	6,53
^{138}Ba	25,82	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
^{111}Cd	3,46	3,42	3,32	n.d.	n.d.	n.d.	n.d.
^{114}Cd	3,35	3,31	3,12	5,49	6,07	4,67	4,2
^{52}Cr	2,39	0,58	n.d.	2,55	1,89	0,59	1,45
^{65}Cu	182,02	159,19	129,35	219,17	262,6	316,61	198,14
^{55}Mn	740,87	n.d.	n.d.	n.d.	n.d.	412,68	331,89
^{60}Ni	139,39	201,29	173,38	315,12	395,92	294,75	235,2
^{204}Pb	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
^{208}Pb	5,17	<0,5	<0,5	0,9	1,24	0,66	1,48
^{232}Th	0,41	<0,5	<0,5	n.d.	n.d.	0,05	0,1
^{238}U	590,23	910,83	1057,5	1191,8	1343,3	674,24	791,86
^{64}Zn	375,88	481,21	411,93	677,71	929,2	763,53	n.d.
^{66}Zn	337,87	440,66	386,99	648,42	919,1	860,72	609,14

PNP10

Date/El.Con.(µg/l)	19.12.95	31.01.96	27.02.96	02.04.96	25.04.96	08.08.96	18.11.96
^{75}As	23,48	25,45	24,59	41,81	36,06		30,62
^{138}Ba	27,04	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
^{111}Cd	1,87	1,59	1,41	n.d.	n.d.	n.d.	n.d.
^{114}Cd	1,81	1,43	1,28	2,69	2,71	1,31	1,92
^{52}Cr	0,63	0,9	0,32	0,32	2,64	0,51	3,81
^{65}Cu	21,97	18,41	18,73	34,34	28,31	21,46	18,49
^{55}Mn	42,28	n.d.	n.d.	n.d.	n.d.	45,08	43,32
^{60}Ni	4,23	6,14	4,99	11,01	9,29	6,26	5,6
^{204}Pb	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
^{208}Pb	0,83	0,29	0,43	1,46	1	0,92	1,92
^{232}Th	0,08	<0,5	<0,5	n.d.	n.d.	0,03	0,06
^{238}U	146,19	141,11	151,03	186,85	156,55	144,95	154,59
^{64}Zn	151,92	145	136,11	234,32	233,31	166,21	n.d.
^{66}Zn	135,05	141,54	133	225,23	227,25	159,94	165,84

Appendix: 7.7.8. The Concentration Change with time of Heavy and Trace Metals at Different Sampling Points around the year (GOTSCHALK, 1997)

PNP11

Date/El.Con.(µg/l)	25.04.96	08.08.96
^{75}As	11628?	n.d.
^{138}Ba	n.d.	n.d.
^{111}Cd	n.d.	n.d.
^{114}Cd	2,91	1,55
^{52}Cr	2,57	0,47
^{65}Cu	97,97	67,08
^{55}Mn	n.d.	330,55
^{60}Ni	98,68	74,31
^{204}Pb	n.d.	0,5
^{208}Pb	<0,5	0,5
^{232}Th	n.d.	0,02
^{238}U	80,3	50,54
^{64}Zn	368,65	279,56
^{66}Zn	350,47	267,99

PNP12

Date/El.Con.(µg/l)	08.01.96	31.01.96	27.02.96	02.04.96	25.04.96	08.08.96	18.11.96
^{75}As	1,49	0,2	0,41	5,3	8,32	n.d.	10,45
^{138}Ba	24,17	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
^{111}Cd	1,9	1,72	1,9	n.d.	n.d.	n.d.	n.d.
^{114}Cd	1,92	1,58	1,75	3,31	3	1,35	1,87
^{52}Cr	0,1	0,35	0,08	2,73	2,54	0,55	0,47
^{65}Cu	116,16	69,57	124,83	129,28	176,75	105,34	97,03
^{55}Mn	384,82	n.d.	n.d.	n.d.	n.d.	510,93	530,45
^{60}Ni	52,88	49,64	45,31	83,22	76,15	47,64	48
^{204}Pb	n.d.	n.d.	n.d.	n.d.	n.d.	0,56	n.d.
^{208}Pb	0,4	<0,5	<0,5	<0,5	0,58	0,56	1,49
^{232}Th	0,05	<0,5	<0,5	n.d.	n.d.	0,02	0,06
^{238}U	149,99	158,19	265,85	270,68	328,25	263,82	513,26
^{64}Zn	259,43	227,26	250,86	404	390,87	238,77	n.d.
^{66}Zn	230,88	217,11	242,92	378,75	372,69	228,15	237,31

Appendix: 7.7.8. The Concentration Change with time of Heavy and Trace Metals at Different Sampling Points around the year (GOTSCHALK, 1997)

PNP13

Date/El.Con.(µg/l)	31.01.96	27.02.96	02.04.96
^{75}As	1,55	1,67	5,45
^{138}Ba	n.d.	n.d.	n.d.
^{111}Cd	1,08	0,93	n.d.
^{114}Cd	0,83	0,79	1,84
^{52}Cr	<0,5	<0,5	2,85
^{65}Cu	8,32	8,35	13,43
^{55}Mn	n.d.	n.d.	n.d.
^{60}Ni	8,13	7,35	13,74
^{204}Pb	n.d.	n.d.	n.d.
^{208}Pb	<0,5	0,02	<0,5
^{232}Th	<0,5	<0,5	n.d.
^{238}U	2,02	2,22	3,02
^{64}Zn	105,29	102,86	172,71
^{66}Zn	101,24	100	163,62

PNP14

Date/El.Con.(µg/l)	20.12.95	31.01.96	27.02.96	02.04.96	08.08.96
^{75}As	20,94	18,7	18,02	28,18	n.d.
^{138}Ba	26,57	n.d.	n.d.	n.d.	n.d.
^{111}Cd	1,72	1,84	1,64	n.d.	n.d.
^{114}Cd	1,55	1,57	1,36	2,72	1,23
^{52}Cr	<0,1	0,4	0,13	2,58	0,45
^{65}Cu	71,48	35,96	32,23	52,22	54,34
^{55}Mn	134,76	n.d.	n.d.	n.d.	117,77
^{60}Ni	35,02	35,02	36,17	29,36	35,7
^{204}Pb	n.d.	n.d.	n.d.	n.d.	n.d.
^{208}Pb	0,79	0,26	0,2	0,93	0,83
^{232}Th	0,1	<0,5	<0,5	n.d.	0,03
^{238}U	140,56	202,82	248,74	260,58	111,05
^{64}Zn	186,72	186,72	165,43	285,83	210
^{66}Zn	165,8	181,86	163,27	270,68	203,35

Appendix: 7.7.8. The Concentration Change with time of Heavy and Trace Metals at Different Sampling Points around the year (GOTSCHALK, 1997)

	PNP15	PNP15	PNP16	PNP17	PNP18
Date/El.Con.(µg/l)	08.08.96	18.11.96	08.08.96	08.08.96	18.11.96
^{75}As	n.d.	4,36	n.d.	n.d.	9,78
^{138}Ba	n.d.	n.d.	n.d.	n.d.	n.d.
^{111}Cd	n.d.	n.d.	n.d.	n.d.	n.d.
^{114}Cd	0,53	1,02	0,6	7,66	4,4
^{52}Cr	0,54	0,39	1,04	0,55	0,35
^{65}Cu	44,48	41,71	121,06	15,81	20,65
^{55}Mn	152,44	159,3	108,55	88,64	26,14
^{60}Ni	14,61	13,42	6,86	3,31	6
^{204}Pb	n.d.	n.d.	n.d.	n.d.	n.d.
^{208}Pb	0,74	1,45	0,33	2,76	1,33
^{232}Th	0,02	0,06	0,02	0,08	0,05
^{238}U	40,36	54	5,76	6,81	4,88
^{64}Zn	149,72	n.d.	148,8	546,3	n.d.
^{66}Zn	143,97	145,43	147,85	664,32	317,71

Appendix: 7.7.8. The Concentration Change with time of Heavy and Trace Metals at Different Sampling Points around the year (KUTSCHKE, 1998)

PNP1

Element\Conc.	Minimum	Maximum	Average	Std.deviation
Aluminium	0,2	0,41	0,37	0,06
Arsenic	0,008	0,026	0,013	0,004
Barium	0,04	0,12	0,06	0,03
Cadmium	0,0002	0,0015	0,0007	0,0004
Cobalt	0,001	0,006	0,002	0,002
Chromium	0	0,004	0,001	0,002
Copper	0,059	0,222	0,125	0,033
Manganese	0,05	0,25	0,085	0,05
Nickel	0,004	0,019	0,008	0,005
Lead	0,0004	0,0012	0,0008	0,0004
Uranium	0,0005	0,0056	0,0018	0,0017
Zinc	0,04	0,15	0,071	0,027

PNP8

Element\Conc.	Minimum	Maximum	Average	Std.deviation
Aluminium	1,07	2,06	1,5	0,35
Arsenic	0,06	0,25	0,11	0,05
Barium	0,06	0,09	0,08	0,01
Cadmium	<0,0005	0,006	0,004	0,001
Cobalt	0,028	0,064	0,047	0,017
Chromium	<0,0005	0,003	0,002	0,001
Copper	0,06	0,41	0,16	0,1
Manganese	0,43	1,23	0,75	0,2
Nickel	0,06	0,29	0,13	0,07
Lead	0,002	0,02	0,006	0,006
Uranium	0,81	1,54	1,19	0,25
Zinc	0,19	0,94	0,36	0,22

PNP9

Element\Conc.	Minimum	Maximum	Average	Std.deviation
Aluminium	0,24	0,67	0,44	0,13
Arsenic	0,004	0,017	0,006	0,003
Barium	0,03	0,06	0,04	0,01
Cadmium	0,003	0,006	0,004	0,001
Cobalt	0,03	0,081	0,058	0,023
Chromium	0,0004	0,0026	0,0015	0,001
Copper	0,1	0,32	0,18	0,05
Manganese	0,11	0,75	0,28	0,18
Nickel	0,14	0,4	0,23	0,07
Lead	0,001	0,002	0,002	0,002
Uranium	0,59	1,34	0,85	0,19
Zinc	0,34	0,92	0,55	0,17

Appendix: 7.7.8. The Concentration Change with time of Heavy and Trace Metals at Different Sampling Points around the year (KUTSCHKE, 1998)

PNP10

Element\Conc.	Minimum	Maximum	Average	Std.deviation
Aluminium	0,15	0,23	0,2	0,03
Arsenic	0,018	0,065	0,027	0,013
Barium	0,07	0,11	0,08	0,01
Cadmium	0,001	0,003	0,002	0,001
Cobalt	0,004	0,008	0,006	0,002
Chromium	0	0,004	0,001	0,001
Copper	0,016	0,034	0,022	0,006
Manganese	0,04	0,06	0,05	0,01
Nickel	0,004	0,011	0,006	0,002
Lead	0	0,002	0,001	0,001
Uranium	0,1	0,19	0,13	0,03
Zinc	0,13	0,23	0,16	0,03

PNP11

Element\Conc.	Minimum	Maximum	Average	Std.deviation
Aluminium	0,64	0,93	0,74	0,09
Arsenic	0,004	0,005	0,005	0,0004
Barium	0,05	0,09	0,06	0,01
Cadmium	n.d.	n.d.	-	-
Cobalt	n.d.	n.d.	-	-
Chromium	n.d.	n.d.	n.d.	n.d.
Copper	0,067	0,098	0,082	0,022
Manganese	0,33	0,44	0,4	0,04
Nickel	0,074	0,099	0,086	0,017
Lead	n.d.	n.d.	-	-
Uranium	0,04	0,08	0,06	0,01
Zinc	0,23	0,35	0,26	0,03

PNP12

Element\Conc.	Minimum	Maximum	Average	Std.deviation
Aluminium	0,21	0,74	0,45	0,2
Arsenic	<0,001	0,048	0,009	0,019
Barium	0,06	0,08	0,07	0,01
Cadmium	n.d.	n.d.	-	-
Cobalt	n.d.	n.d.	-	-
Chromium	n.d.	n.d.	-	-
Copper	0,08	0,19	0,11	0,03
Manganese	0,58	0,7	0,64	0,04
Nickel	<0,04	0,07	0,05	0,01
Lead	n.d.	n.d.	-	-
Uranium	0,21	0,67	0,37	0,15
Zinc	0,22	0,25	0,24	0,01

Appendix: 7.7.8. The Concentration Change with time of Heavy and Trace Metals at Different Sampling Points around the year (KUTSCHKE, 1998)

PNP13

Element\Conc.	Minimum	Maximum	Average	Std.deviation
Aluminium	0,21	0,47	0,33	0,13
Arsenic	<0,001	0,005	0,003	0,002
Barium	0,15	0,23	0,18	0,04
Cadmium	0,001	0,002	0,001	0,001
Cobalt	n.d.	n.d.	-	-
Chromium	<0,0005	0,011	0,007	0,006
Copper	0,008	0,02	0,013	0,006
Manganese	0,06	0,334	0,137	0,106
Nickel	0,007	0,015	0,011	0,004
Lead	n.d.	n.d.	-	-
Uranium	0,002	0,004	0,003	0,001
Zinc	0,02	0,164	0,091	0,04

PNP14

Element\Conc.	Minimum	Maximum	Average	Std.deviation
Aluminium	0,09	0,32	0,23	0,06
Arsenic	0,001	0,028	0,014	0,007
Barium	0,07	0,14	0,09	0,02
Cadmium	0,0005	0,0018	0,0014	0,0004
Cobalt	0,003	0,007	0,005	0,002
Chromium	0,0001	0,0026	0,0007	0,0008
Copper	0,017	0,072	0,042	0,017
Manganese	0,083	0,215	0,13	0,037
Nickel	0,019	0,036	0,03	0,006
Lead	0,0005	0,0018	0,001	0,0004
Uranium	0,031	0,261	0,153	0,061
Zinc	0,129	0,271	0,185	0,031

PNP15

Element\Conc.	Minimum	Maximum	Average	Std.deviation
Aluminium	0,19	0,56	0,31	0,14
Arsenic	0,002	0,005	0,003	0,001
Barium	0,1	0,12	0,11	0,01
Cadmium	0,0005	0,001	0,0008	0,0003
Cobalt	0,001	0,003	0,002	0,001
Chromium	0,0004	0,0006	0,0005	0,0001
Copper	0,02	0,06	0,038	0,013
Manganese	0,05	0,26	0,15	0,06
Nickel	0,008	0,015	0,012	0,003
Lead	0,0006	0,0015	0,0009	0,0004
Uranium	0,018	0,13	0,064	0,03
Zinc	0,09	0,17	0,13	0,02

Appendix: 7.7.8. The Concentration Change with time of Heavy and Trace Metals at Different Sampling Points around the year (KUTSCHKE, 1998)

PNP18

Element\Conc.	Minimum	Maximum	Average	Std.deviation
Aluminium	0,31	0,42	0,35	0,03
Arsenic	0,007	0,008	0,008	
Barium	0,12	0,14	0,13	0,01
Cadmium	n.d.	n.d.	-	-
Cobalt	n.d.	n.d.	-	-
Chromium	n.d.	n.d.	-	-
Copper	0,02	0,03	0,02	-
Manganese	0,02	0,04	0,03	0,01
Nickel	<0,04	<0,04	<0,04	-
Lead	n.d.	n.d.	-	-
Uranium	<0,02	<0,02	<0,02	-
Zinc	0,04	0,32	0,28	0,09

PNP19

Element\Conc.	Minimum	Maximum	Average	Std.deviation
Aluminium	0,15	0,34	0,25	0,09
Arsenic	0,002	0,015	0,008	0,01
Barium	0,08	0,13	0,1	0,02
Cadmium	n.d.	n.d.	-	-
Cobalt	n.d.	n.d.	-	-
Chromium	n.d.	n.d.	-	-
Copper	0,04	0,16	0,11	0,06
Manganese	0,07	0,1	0,08	0,01
Nickel	<0,04	<0,04	<0,04	-
Lead	n.d.	n.d.	-	-
Uranium	<0,02	<0,02	<0,02	-
Zinc	0,07	0,07	0,07	-

PNP20

Element\Conc.	Minimum	Maximum	Average	Std.deviation
Aluminium	0,48	0,48	0,51	0,03
Arsenic	0,003	0,004	0,004	
Barium	0,1	0,13	0,11	0,01
Cadmium	n.d.	n.d.	-	-
Cobalt	n.d.	n.d.	-	-
Chromium	n.d.	n.d.	-	-
Copper	0,02	0,03	0,03	-
Manganese	0,11	0,18	0,16	0,02
Nickel	<0,04	<0,04	<0,04	-
Lead	n.d.	n.d.	-	-
Uranium	<0,02	<0,02	<0,02	-
Zinc	0,14	0,17	0,16	0,01

Appendix: 7.7.8. The Concentration Change with time of Heavy and Trace Metals at Different Sampling Points around the year (KUTSCHKE, 1998)

PNP21

Element\Conc.	Minimum	Maximum	Average	Std.deviation
Aluminium	<0,04	0,17	0,11	0,04
Arsenic	0,001	0,006	0,005	
Barium	0,11	0,13	0,12	0,01
Cadmium	n.d.	n.d.	-	-
Cobalt	n.d.	n.d.	-	-
Chromium	n.d.	n.d.	-	-
Copper	<0,02	0,02	<0,02	-
Manganese	0,07	0,11	0,09	0,02
Nickel	<0,04	<0,04	<0,04	-
Lead	n.d.	n.d.	-	-
Uranium	0,03	0,62	0,14	0,23
Zinc	0,22	0,22	0,23	0,01

PNP23

Element\Conc.	Minimum	Maximum	Average	Std.deviation
Aluminium	<0,04	0,08	0,05	0,01
Arsenic	0,021	0,026	0,024	
Barium	0,07	0,08	0,08	0,01
Cadmium	n.d.	n.d.	-	-
Cobalt	n.d.	n.d.	-	-
Chromium	n.d.	n.d.	-	-
Copper	<0,02	0,02	0,02	-
Manganese	0,22	0,33	0,28	0,04
Nickel	<0,04	0,04	0,04	-
Lead	n.d.	n.d.	-	-
Uranium	0,95	1,57	1,43	0,28
Zinc	0,26	0,37	0,3	0,04

GWMI

Element\Conc.	Minimum	Maximum	Average	Std.deviation
Aluminium	n.d.	n.d.	-	-
Arsenic	0,54	0,68	0,61	-
Barium	0,027	0,027	-	-
Cadmium	0,24	0,71	0,48	-
Cobalt	n.d.	n.d.	0,76	-
Chromium	0,36	0,47	0,41	-
Copper	7,8	8,2	8	-
Manganese	n.d.	n.d.	96,3	-
Nickel	2,25	4,1	3,18	-
Lead	0,46	1,45	0,95	-
Uranium	<0,5	0,59	0,59	-
Zinc	30,2	35,9	33	-

Appendix: 7.7.8. The Concentration Change with time of Heavy and Trace Metals at Different Sampling Points around the year (KUTSCHKE, 1998)

GWMII

Element\Conc.	Minimum	Maximum	Average	Std.deviation
Aluminium	0,91	1	0,97	0,05
Arsenic	0,004	0,009	0,005	0,002
Barium	0,02	0,07	0,05	0,02
Cadmium	n.d.	n.d.	-	-
Cobalt	n.d.	n.d.	-	-
Chromium	n.d.	n.d.	-	-
Copper	0,07	0,13	0,08	0,02
Manganese	0,06	0,65	0,5	0,25
Nickel	0,04	0,07	0,05	0,01
Lead	n.d.	n.d.	-	-
Uranium	<0,02	0,01	0,008	0,001
Zinc	0,19	0,33	0,24	0,05

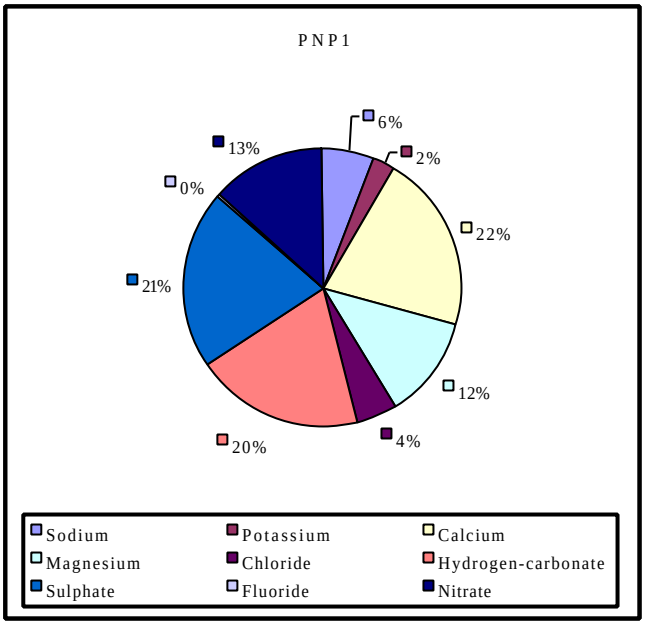
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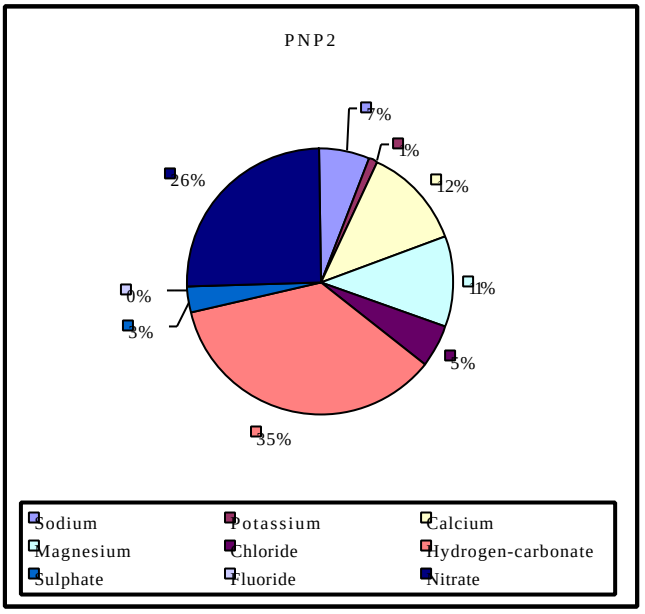
Element\Conc.	Minimum	Maximum	Average	Std.deviation
Aluminium	0,28	0,33	0,31	0,03
Arsenic	0,005	0,008	0,006	0,002
Barium	n.d.	n.d.	-	-
Cadmium	n.d.	n.d.	-	-
Cobalt	n.d.	n.d.	-	-
Chromium	n.d.	n.d.	-	-
Copper	n.d.	n.d.	-	-
Manganese	0,2	0,35	0,3	0,08
Nickel	n.d.	n.d.	-	-
Lead	n.d.	n.d.	-	-
Uranium	n.d.	n.d.	-	-
Zinc	0,17	0,22	0,19	0,03

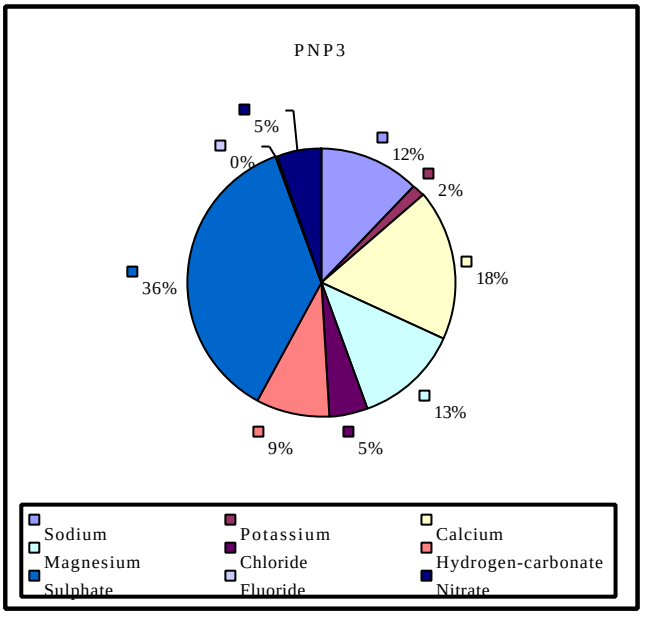
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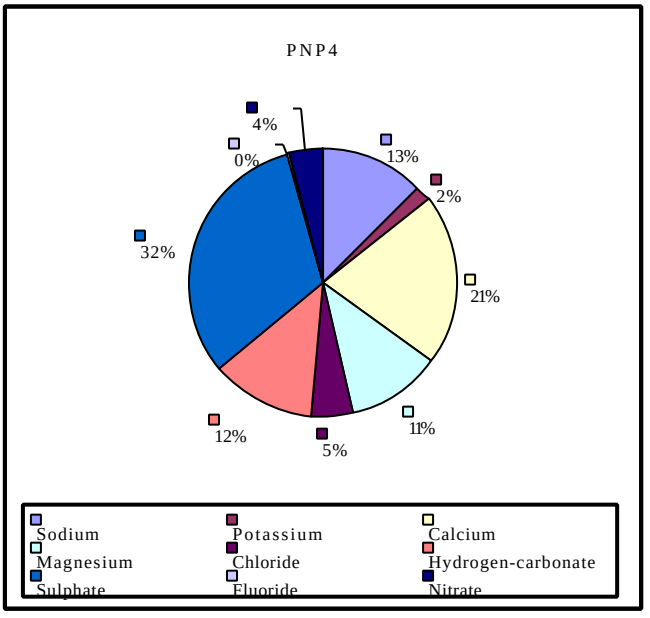
Element\Conc.	Minimum	Maximum	Average	Std.deviation
Aluminium	0,22	0,37	0,3	0,08
Arsenic	0,008	0,012	0,009	0,002
Barium	n.d.	n.d.	-	-
Cadmium	n.d.	n.d.	-	-
Cobalt	n.d.	n.d.	-	-
Chromium	n.d.	n.d.	-	-
Copper	n.d.	n.d.	-	-
Manganese	0,03	0,03	0,03	0
Nickel	n.d.	n.d.	-	-
Lead	n.d.	n.d.	-	-
Uranium	<0,02	0,03	0,02	-
Zinc	0,06	0,15	0,12	0,05

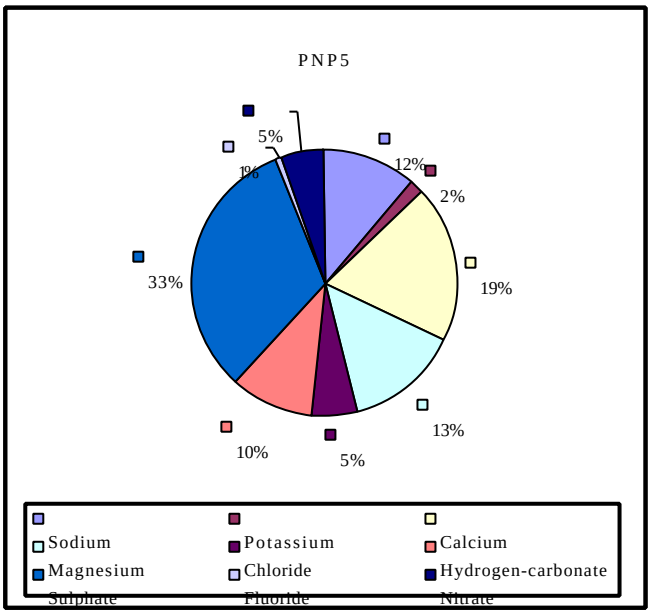
Appendix: 7.7.9. The Representation of the Amount of the Main Components in Different Samples (1996).

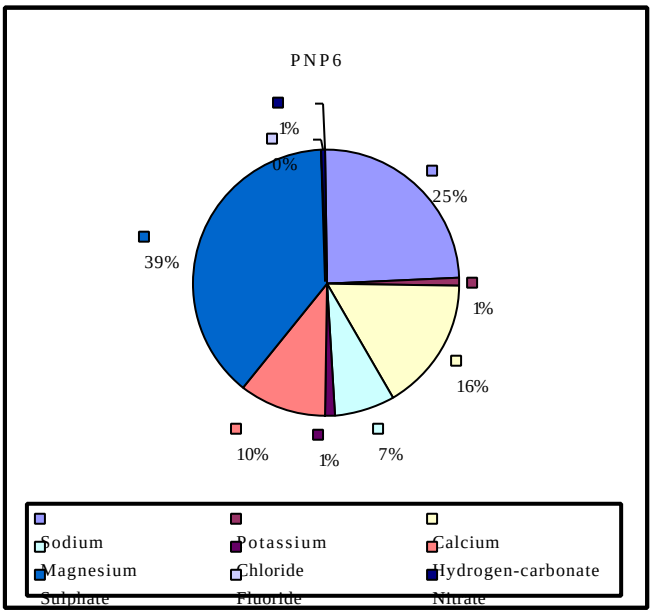




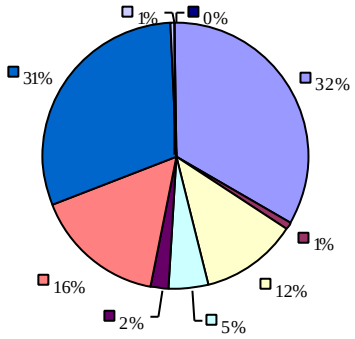






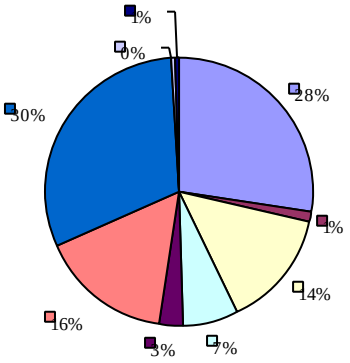


PNP7



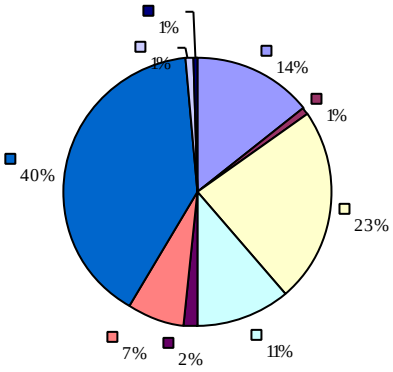
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP8



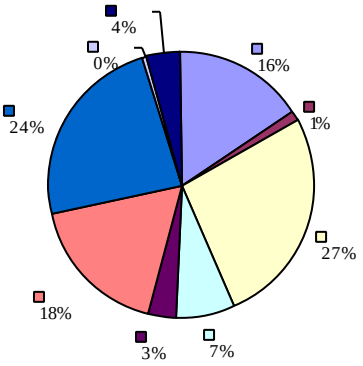
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Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP9



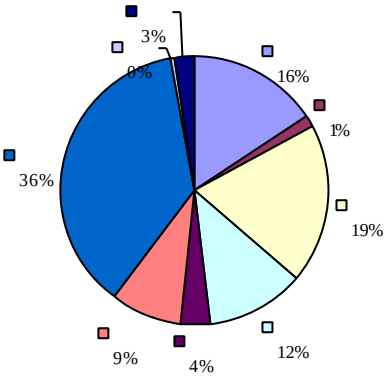
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP10



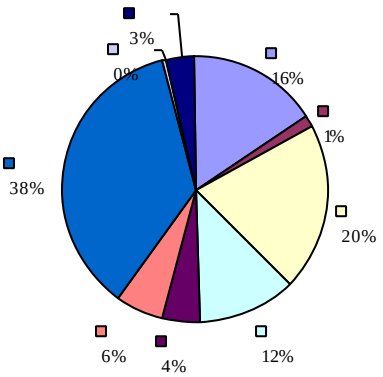
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP11



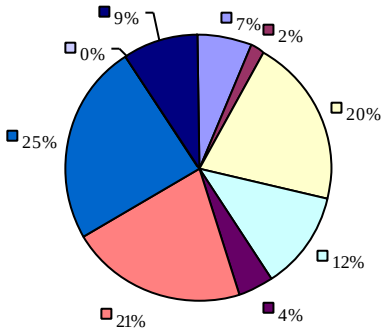
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP12



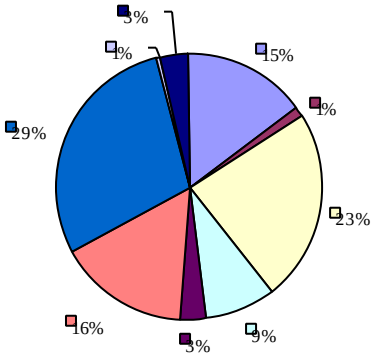
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP13



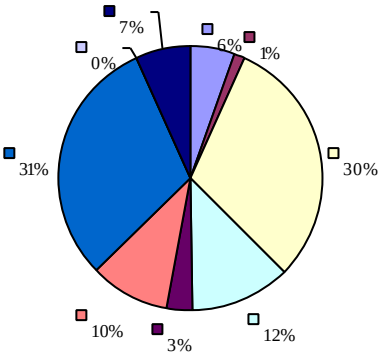
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Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP14



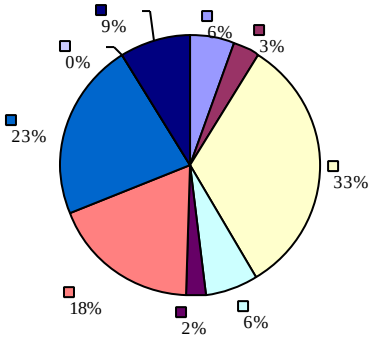
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Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP15



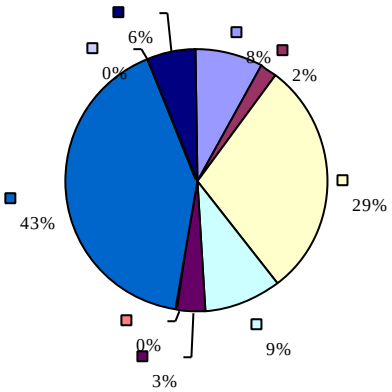
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP16



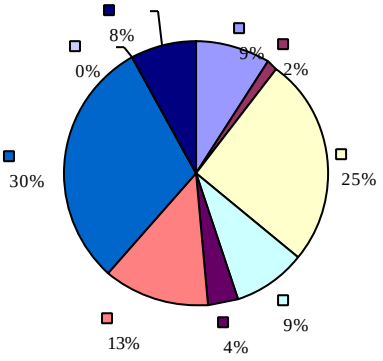
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Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP17



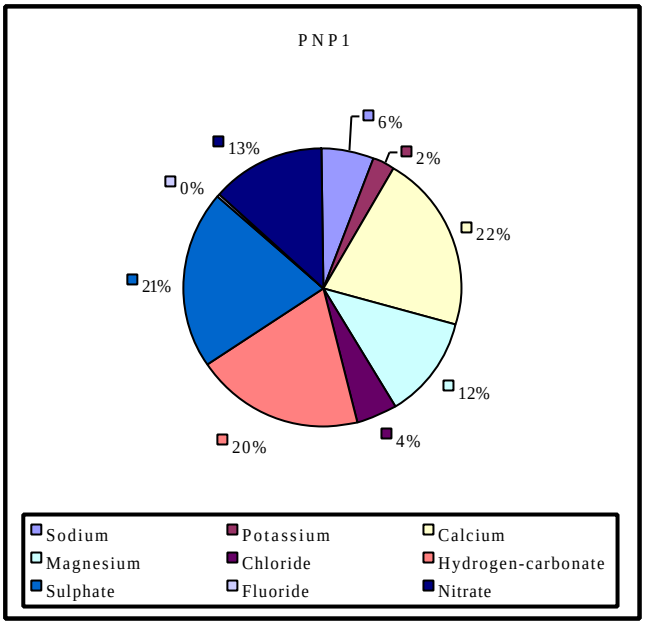
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

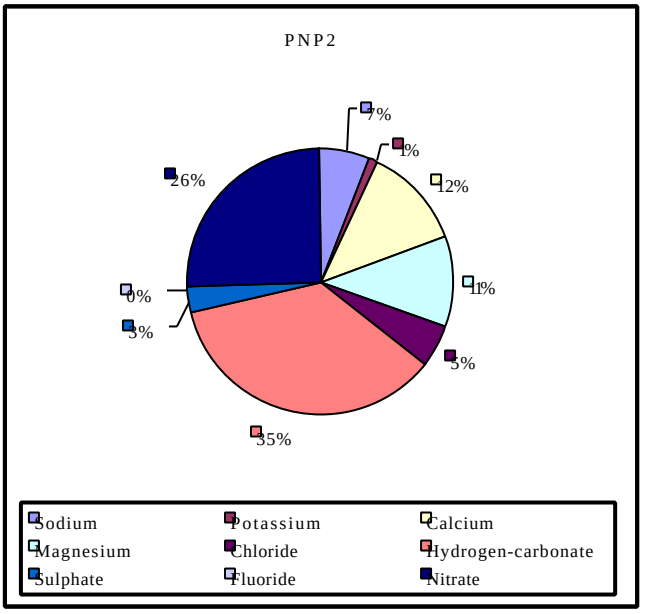
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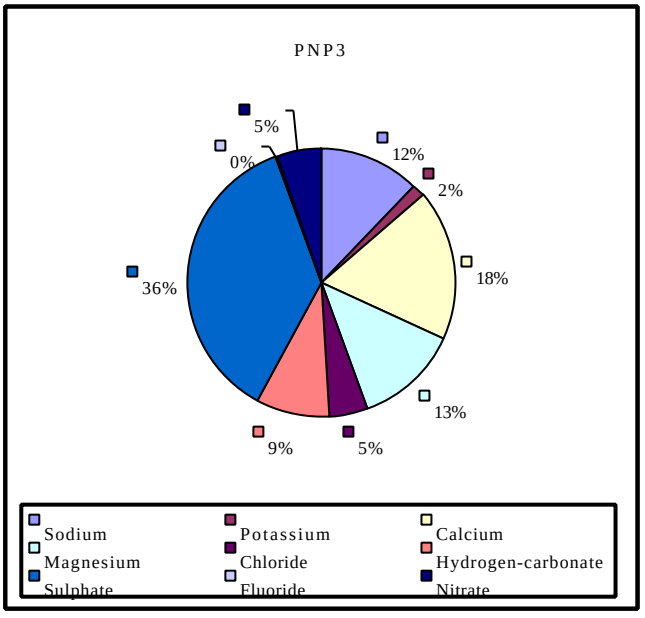


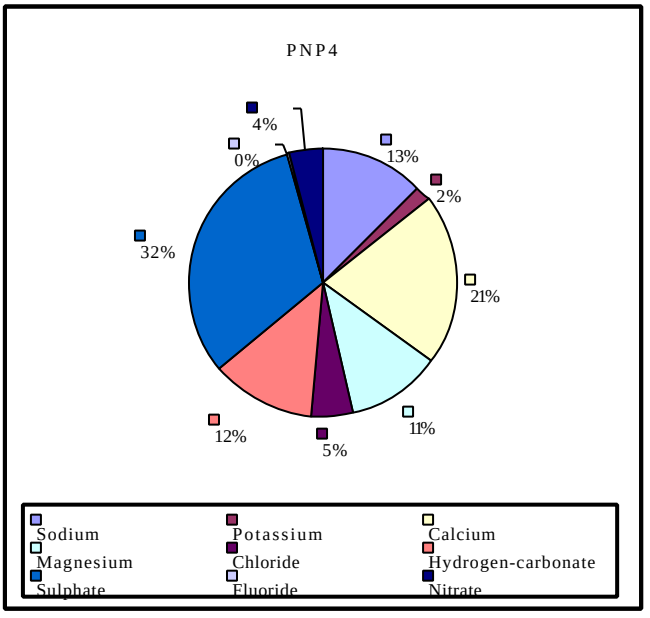
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

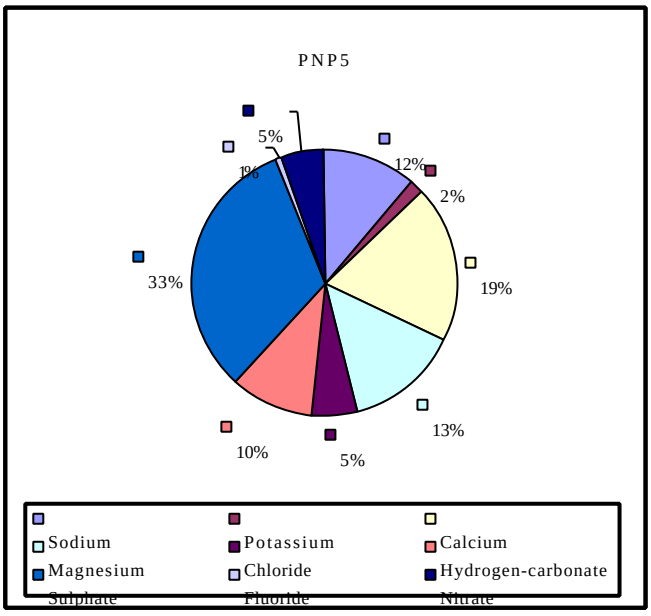
Appendix: 7.7.9. The Representation of the Amount of the Main Components in Different Samples (1996).

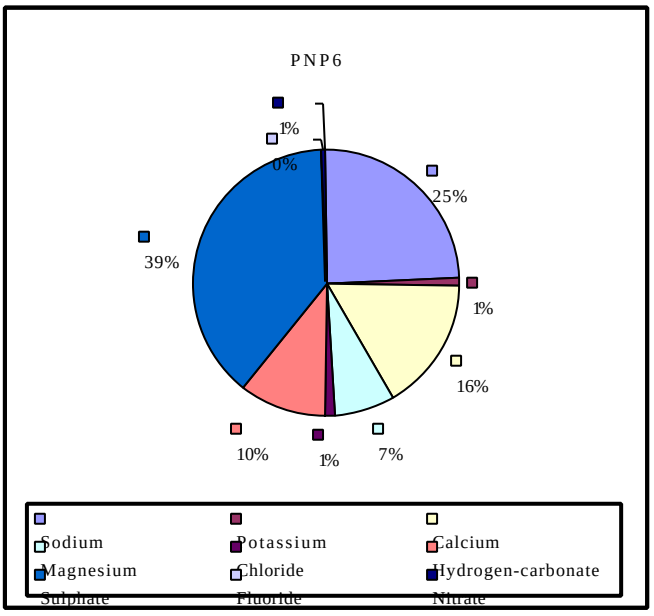




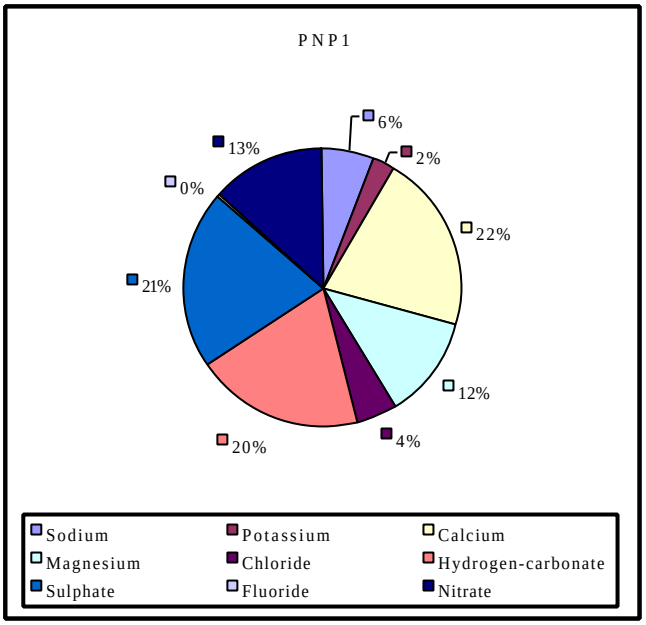


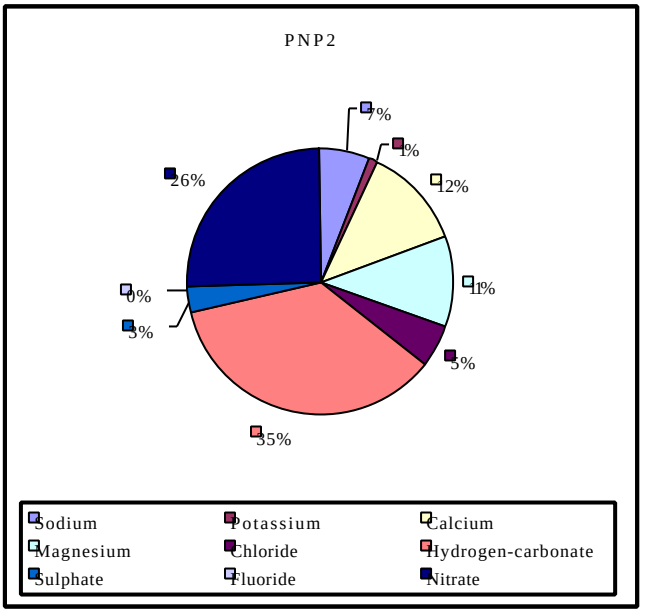


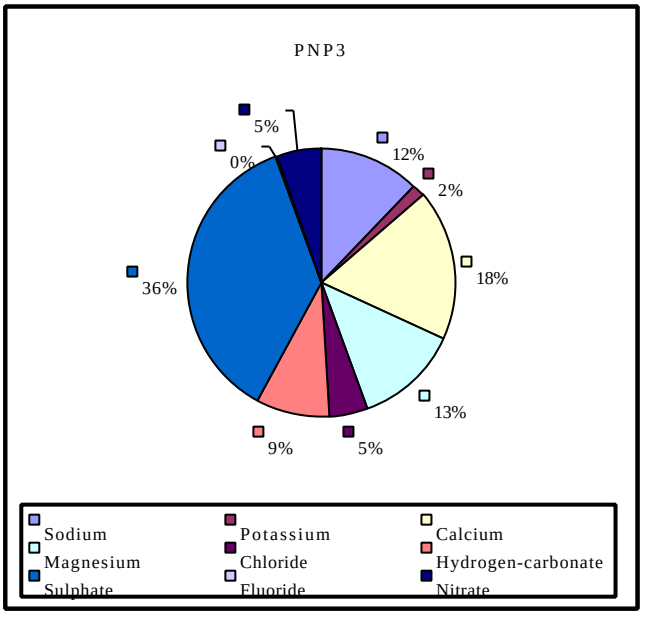


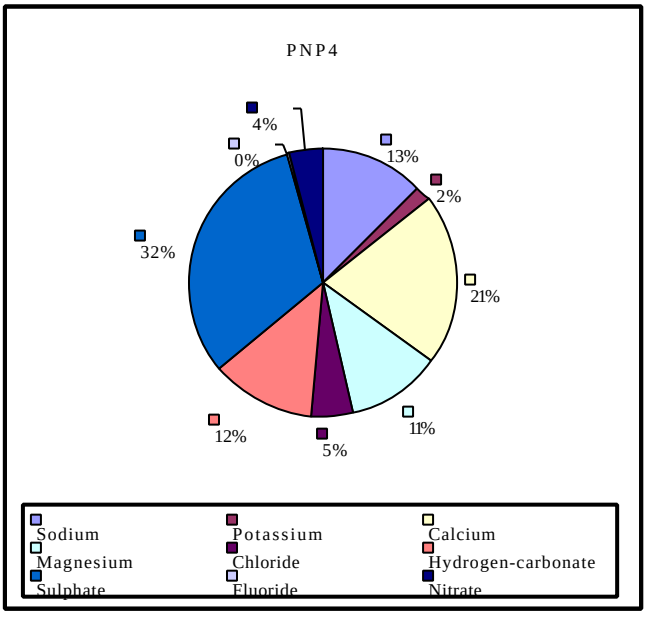


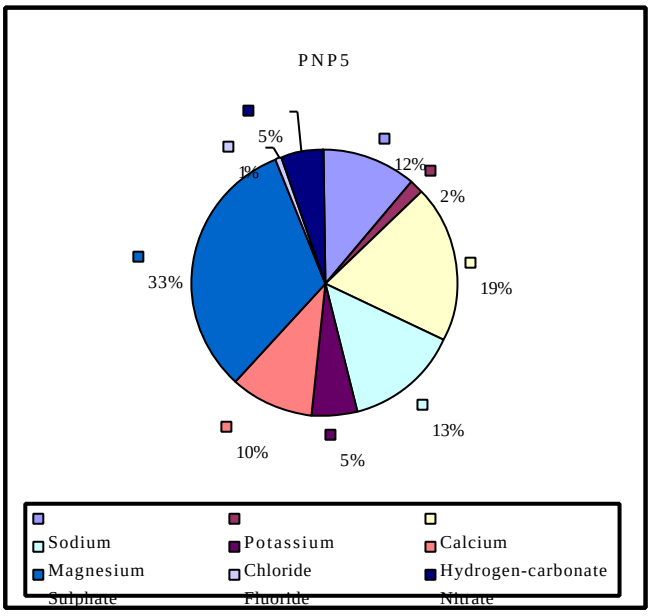
Appendix: 7.7.9. The Representation of the Amount of the Main Components in Different Samples (1996).

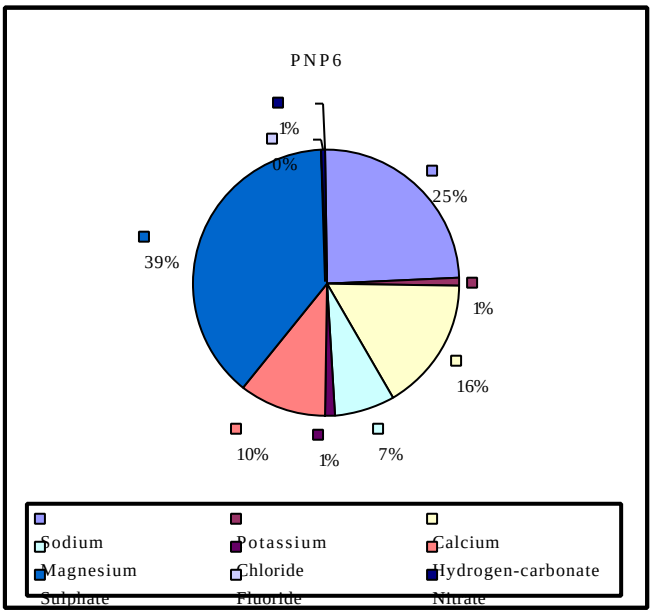




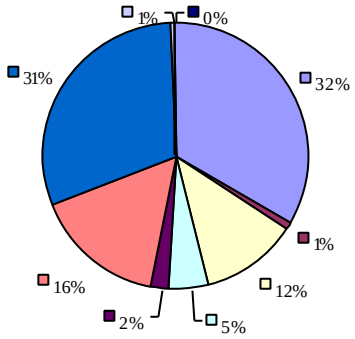






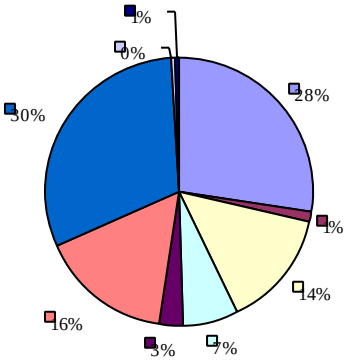


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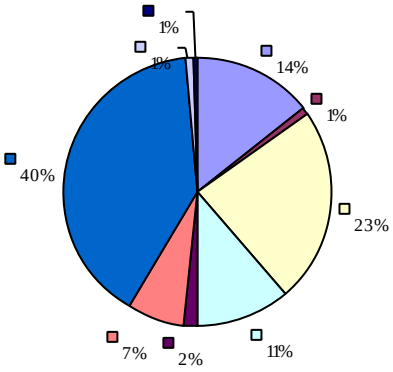
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP8



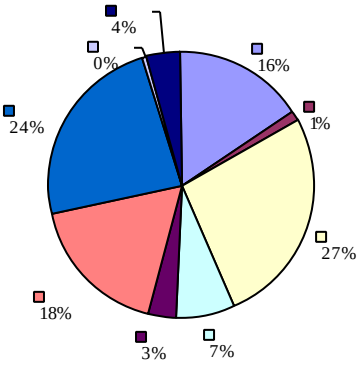
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP9



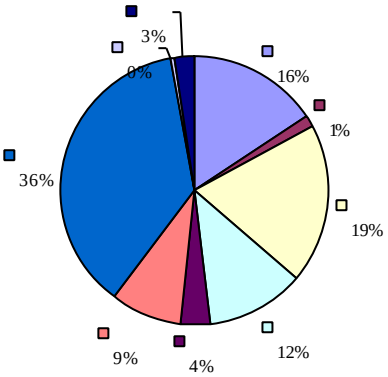
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP10



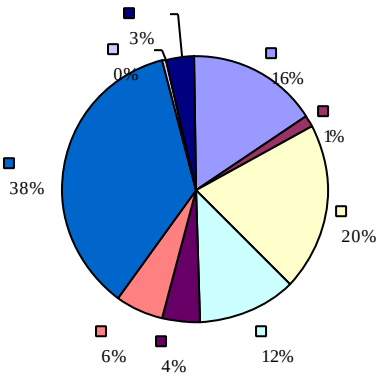
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP11



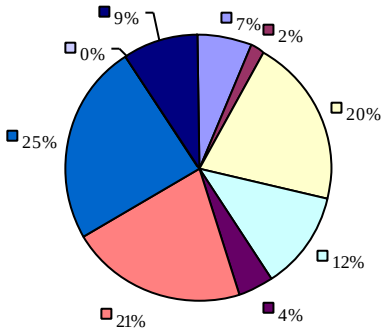
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Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP12



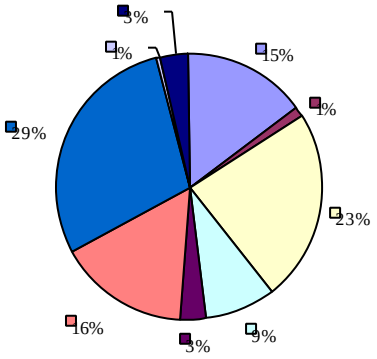
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Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP13



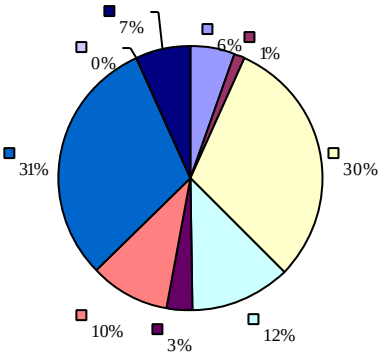
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP14



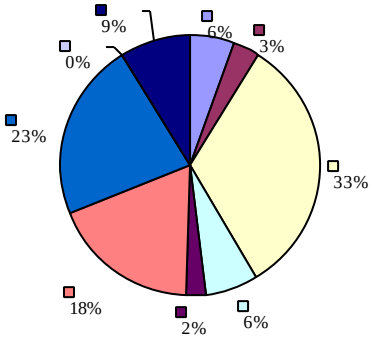
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP15



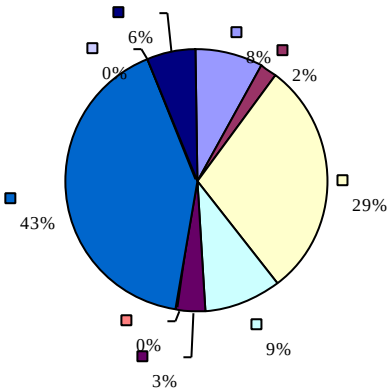
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP16



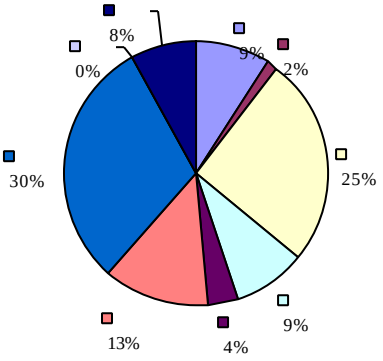
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP17



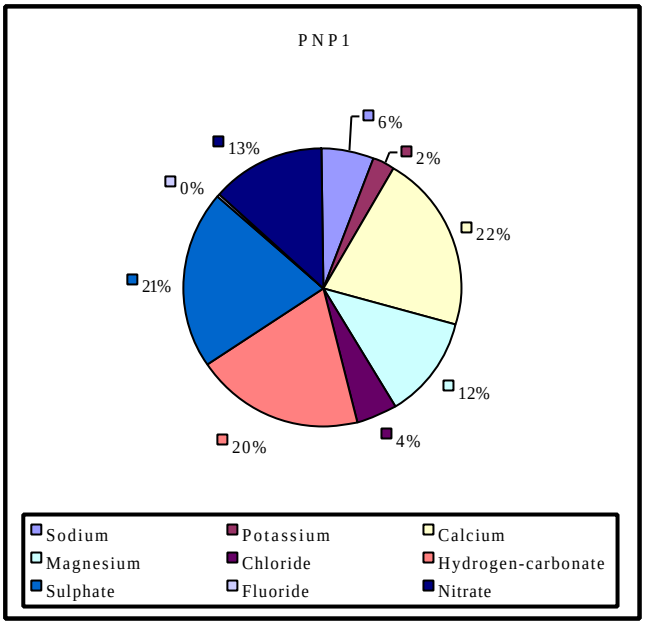
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

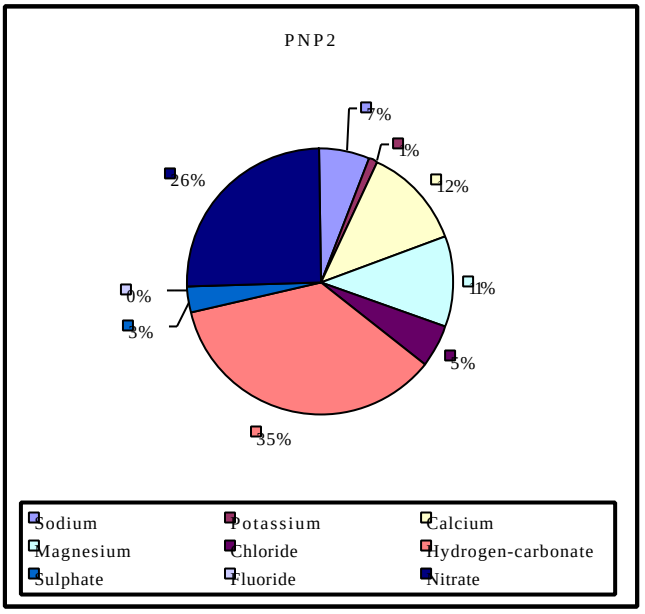
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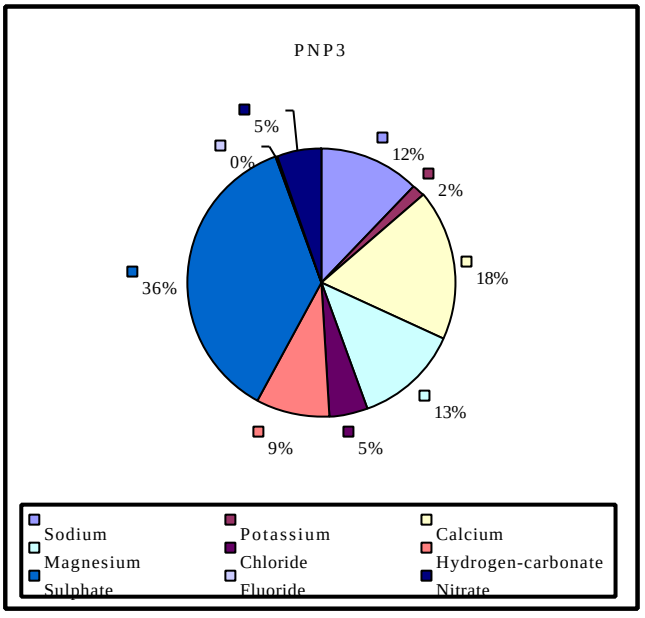


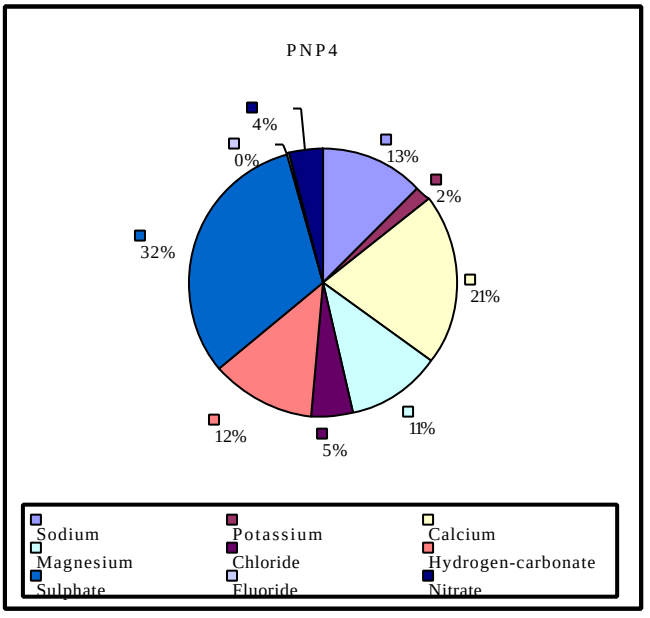
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

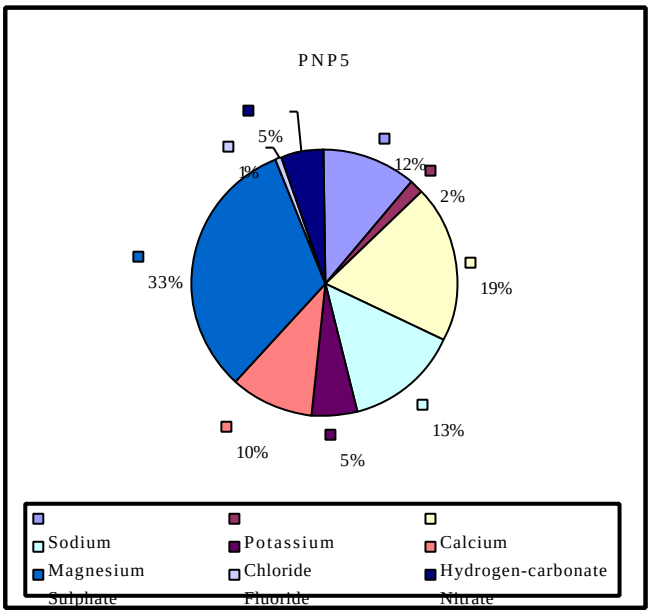
Appendix: 7.7.9. The Representation of the Amount of the Main Components in Different Samples. (1996)

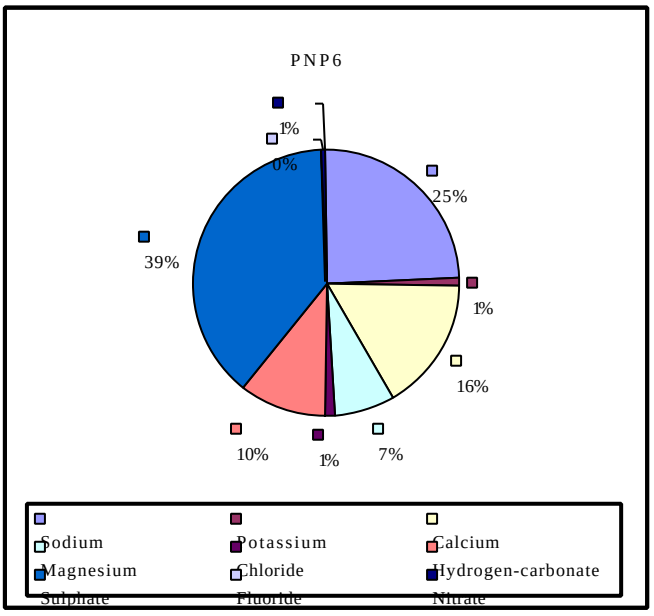




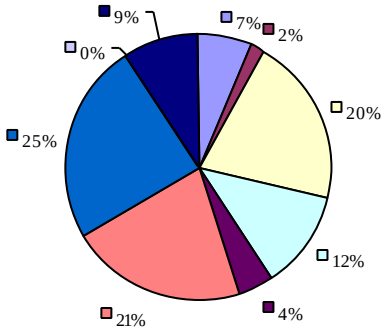






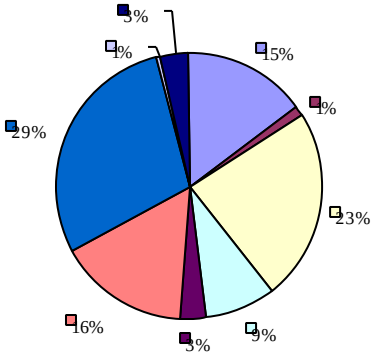


PNP13



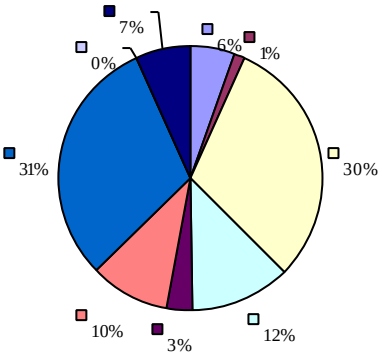
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP14



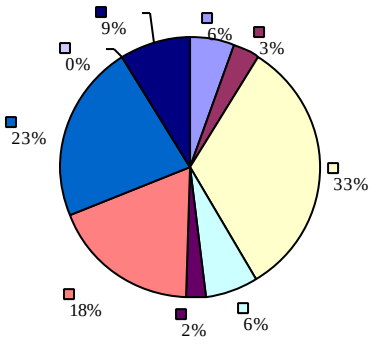
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP15



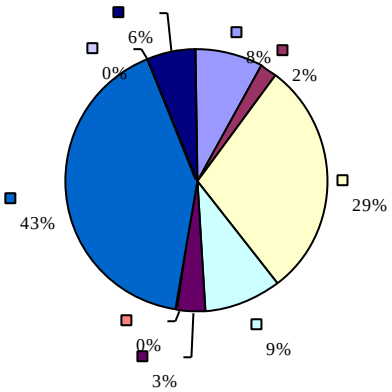
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP16



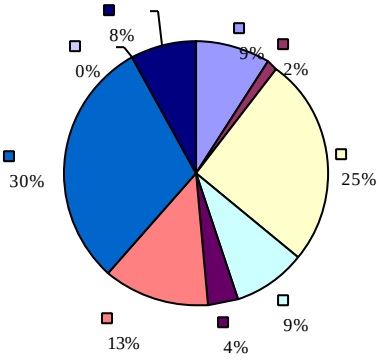
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP17



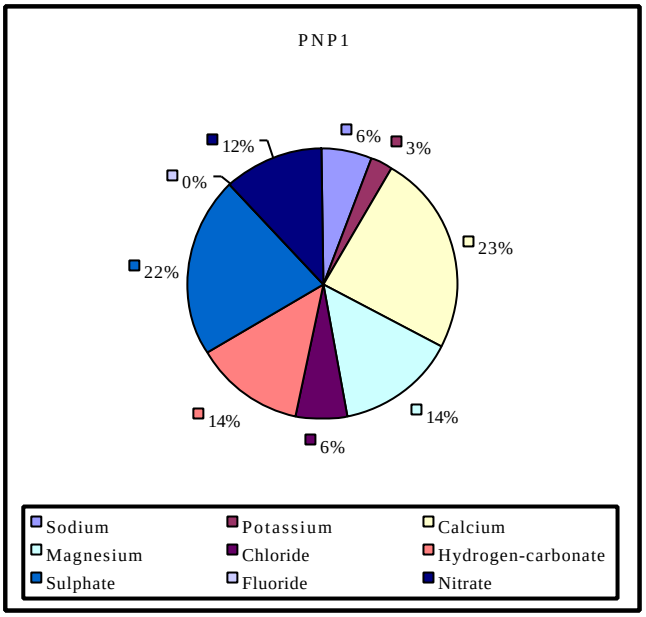
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

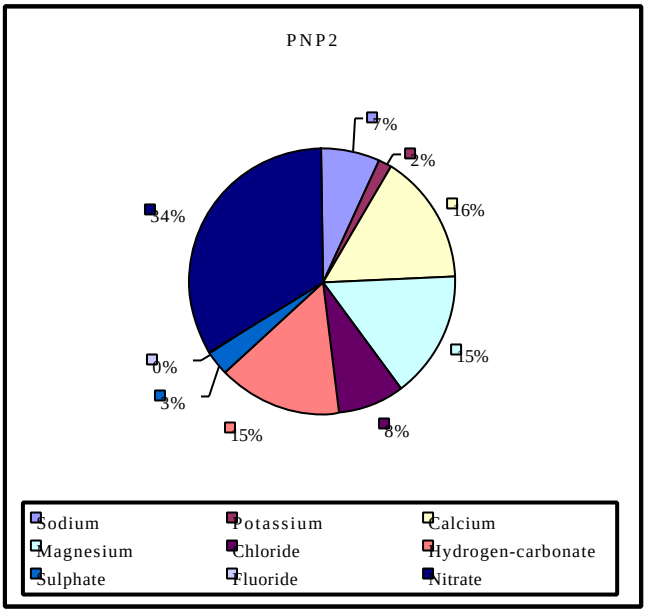
PNP18

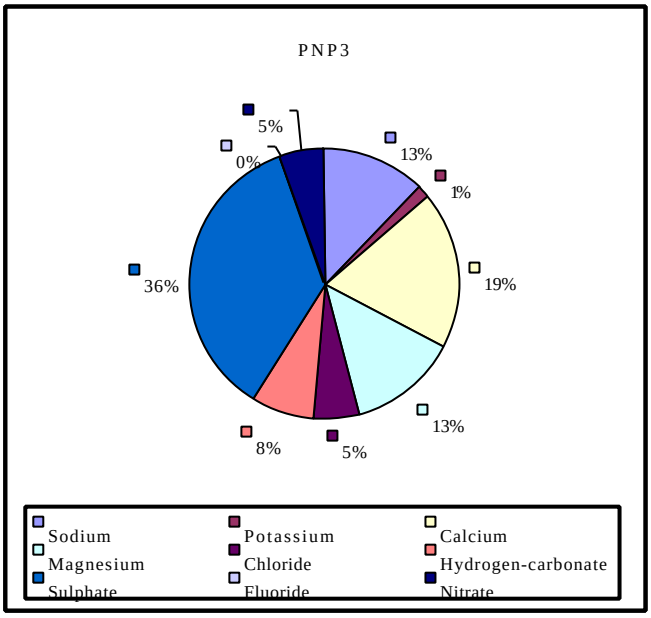


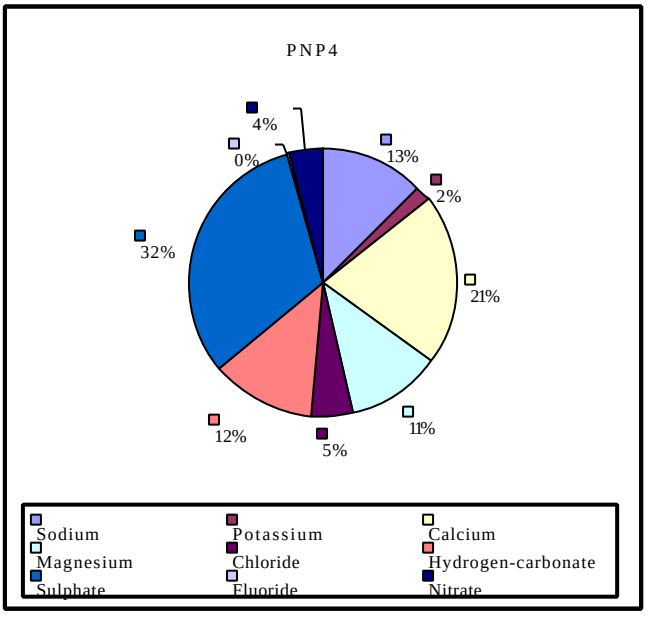
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

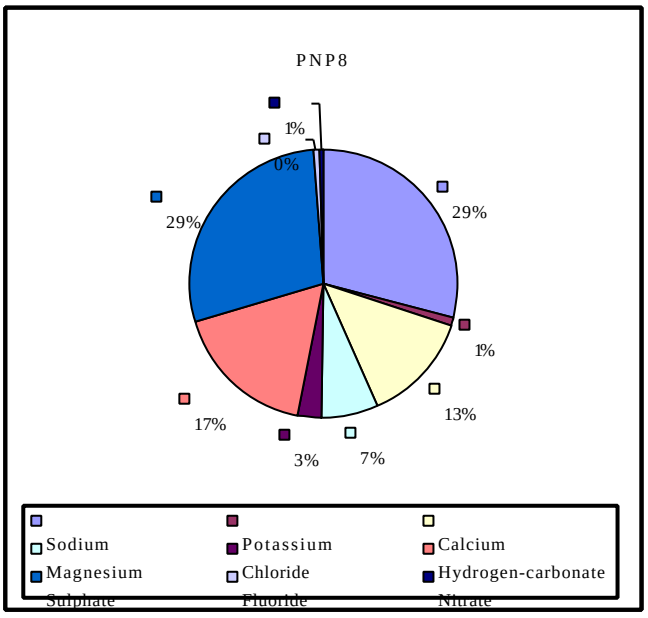
Appendix: 7.7.9. The Representation of the Amount of the Main Components in Different Samples (1997).

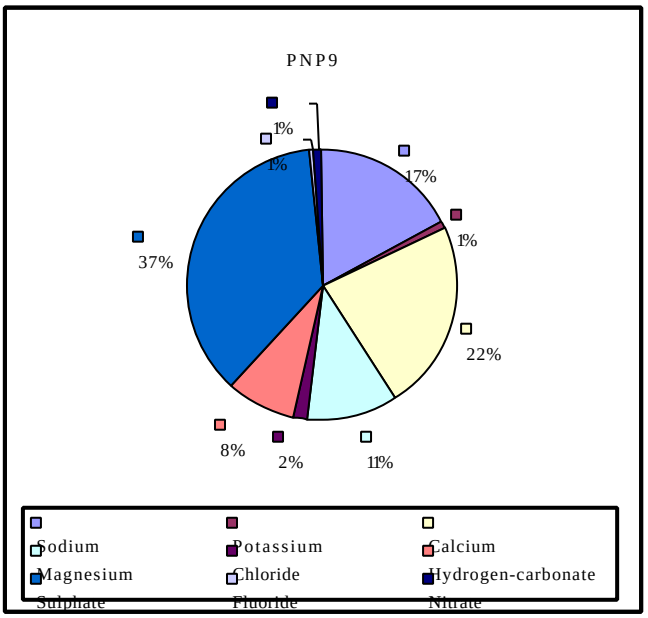




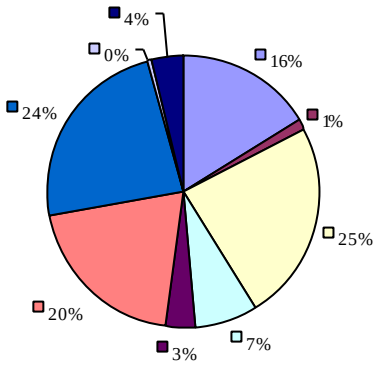






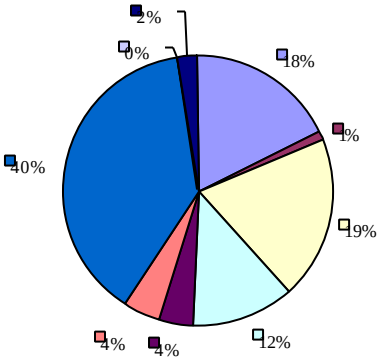


PNP10



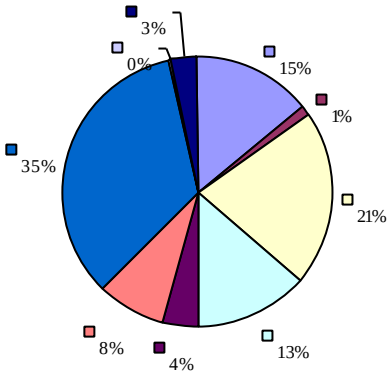
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP11



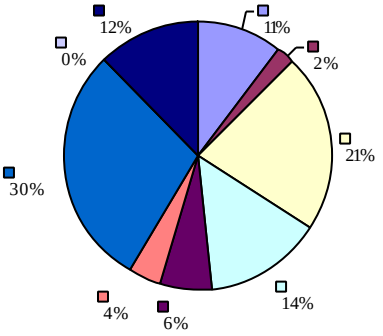
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP12



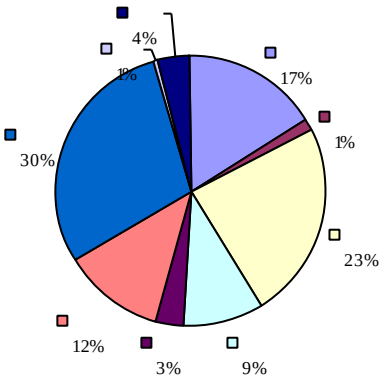
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP13



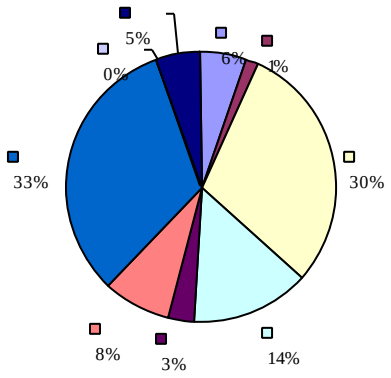
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP14



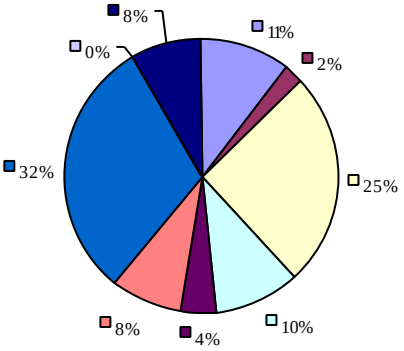
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP15



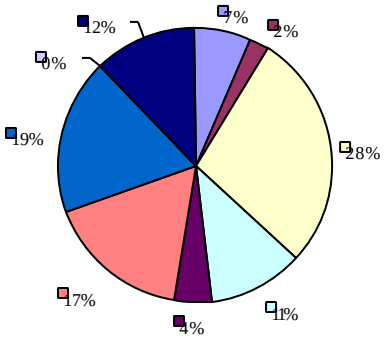
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP18



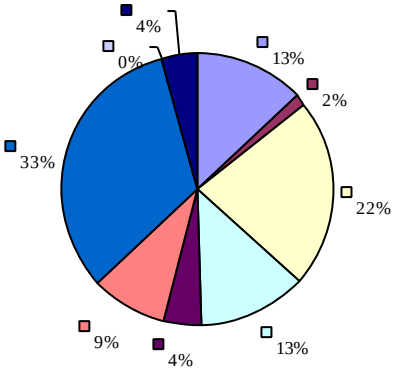
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP19



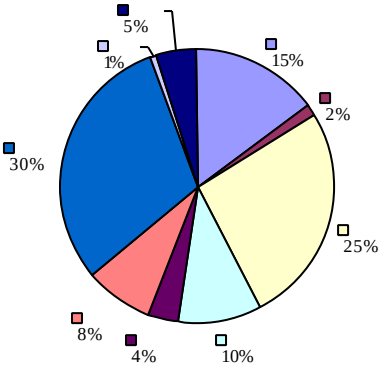
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP20



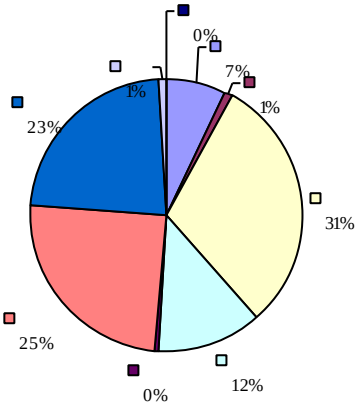
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP21



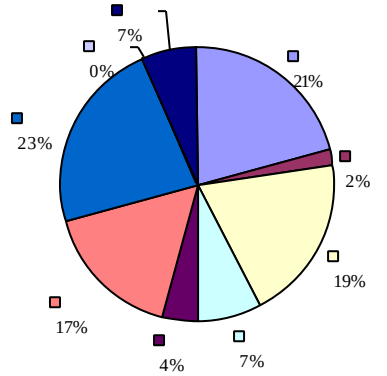
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP23



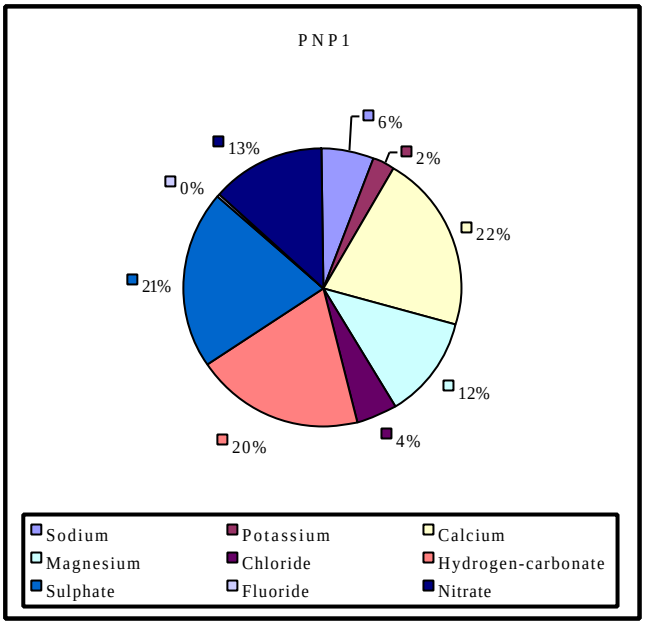
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

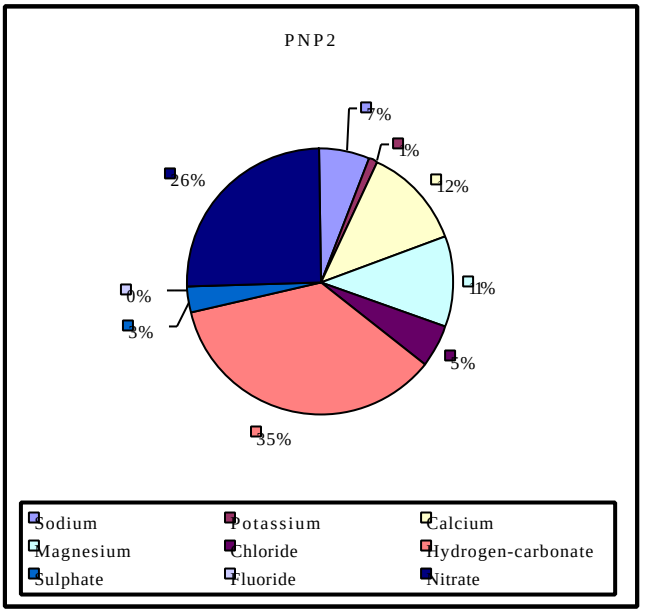
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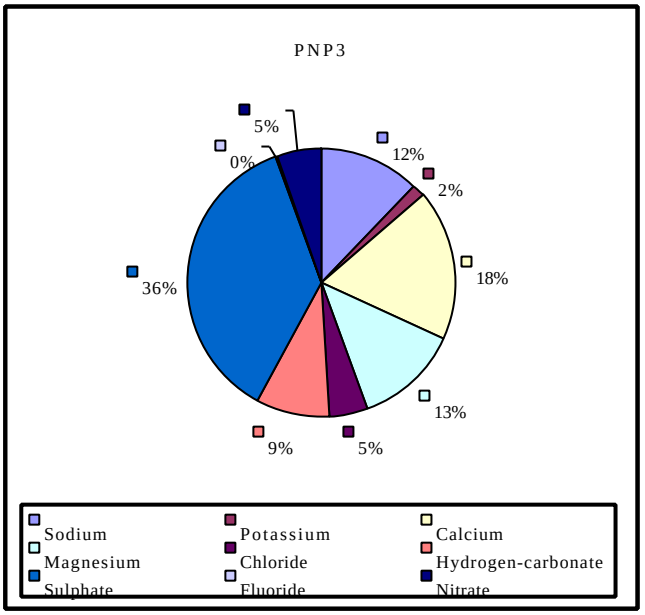


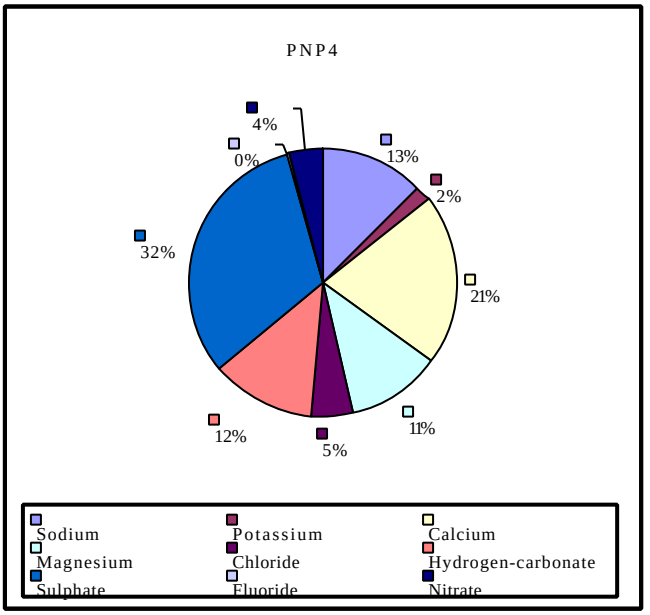
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

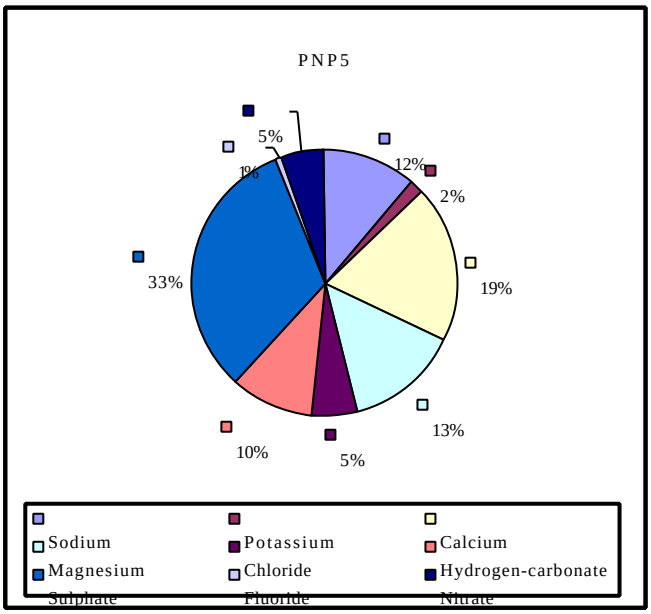
Appendix: 7.7.9. The Representation of the Amount of the Main Components in Different Samples (1997).

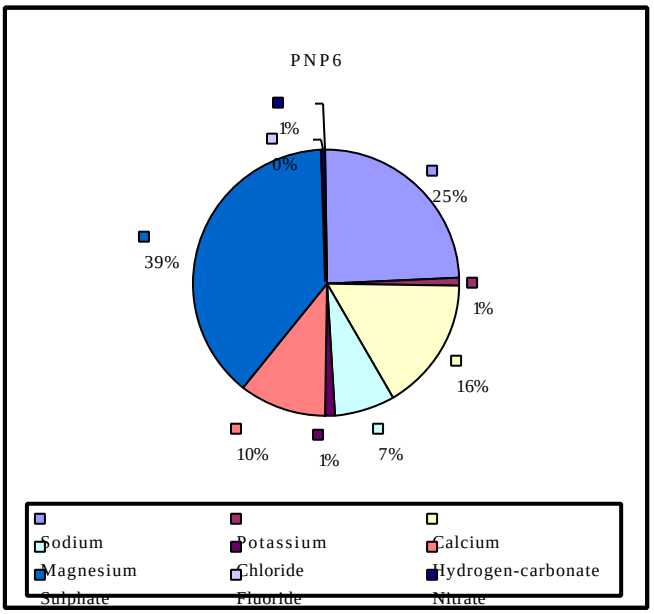




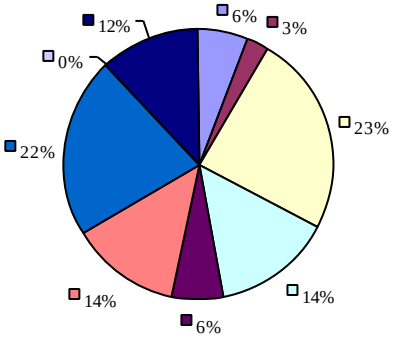






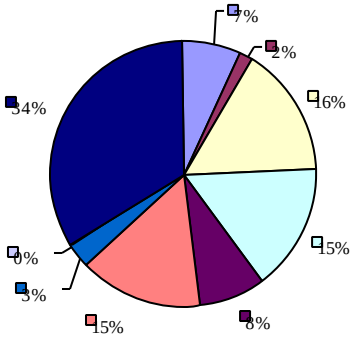


PNP1



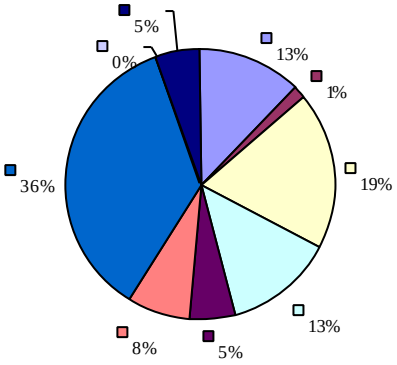
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP2



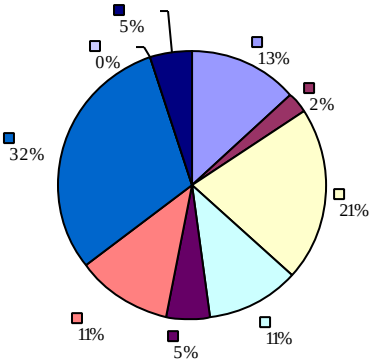
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Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP3



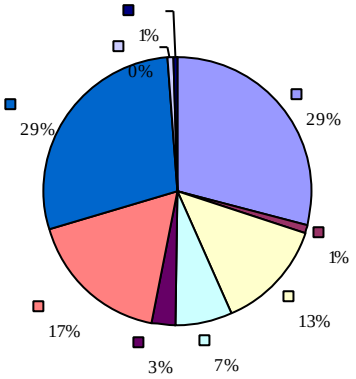
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP4



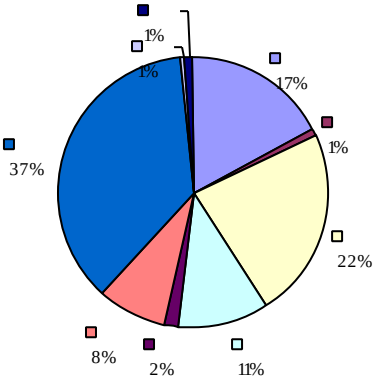
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP8



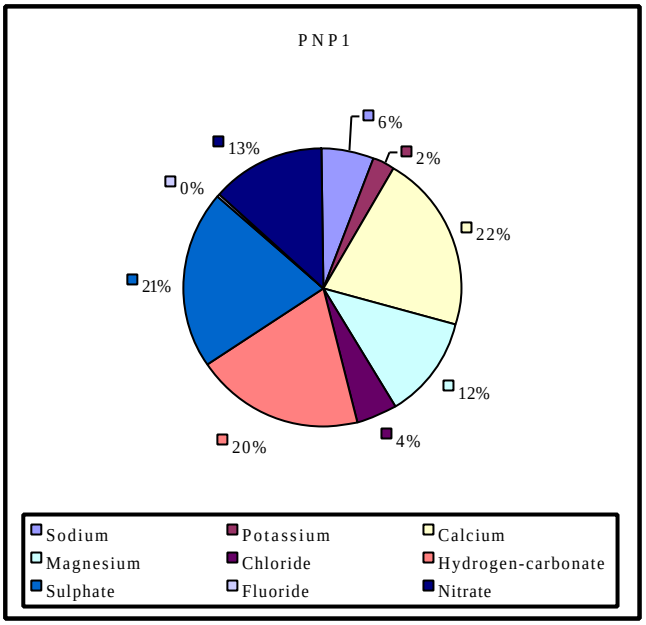
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

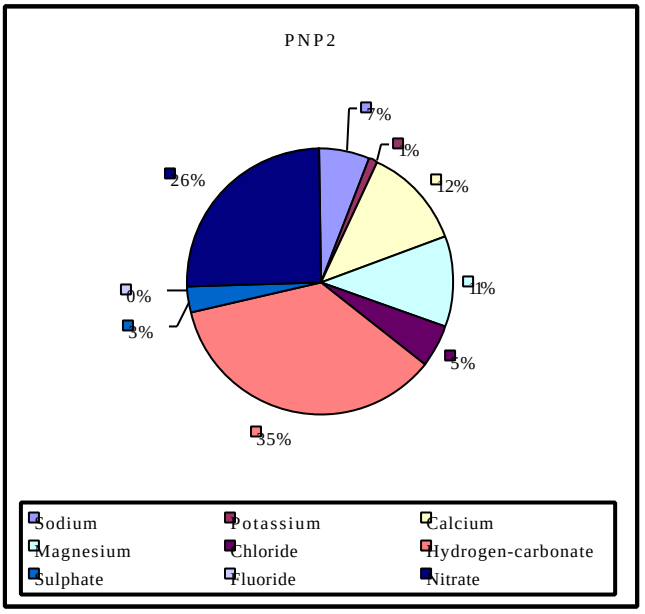
PNP9

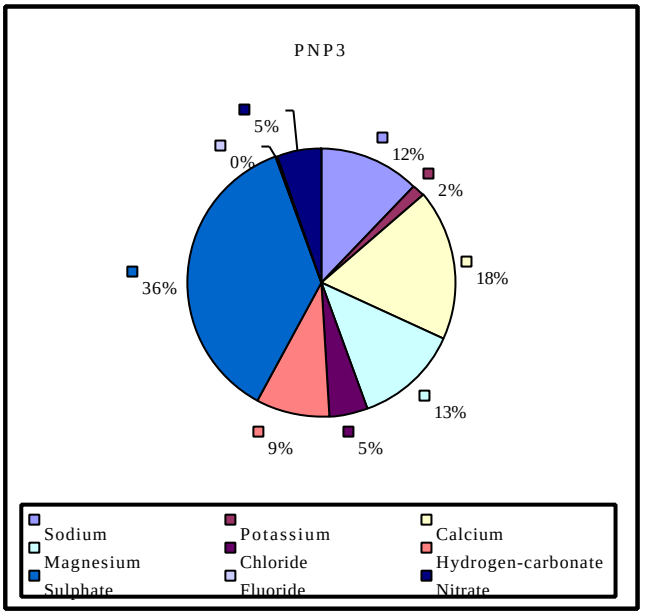


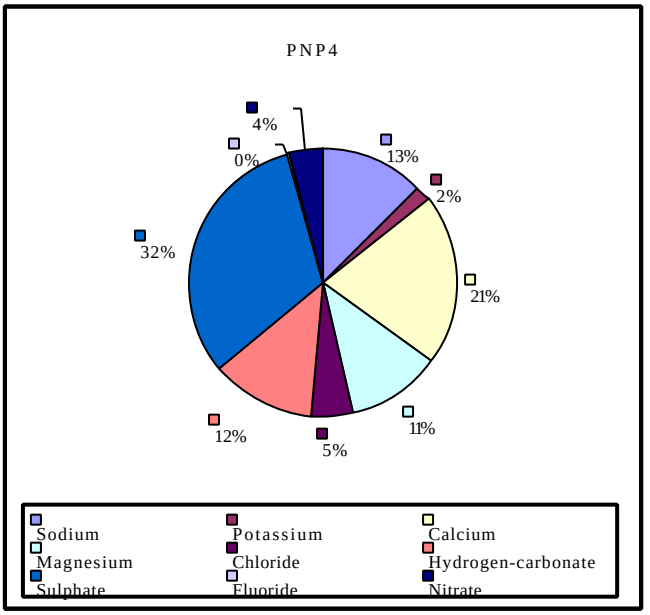
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

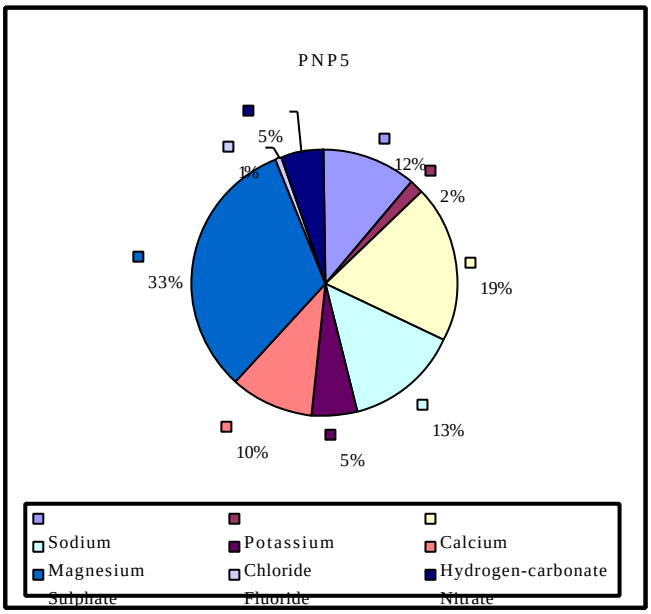
Appendix: 7.7.9. The Representation of the Amount of the Main Components in Different Samples (1997).

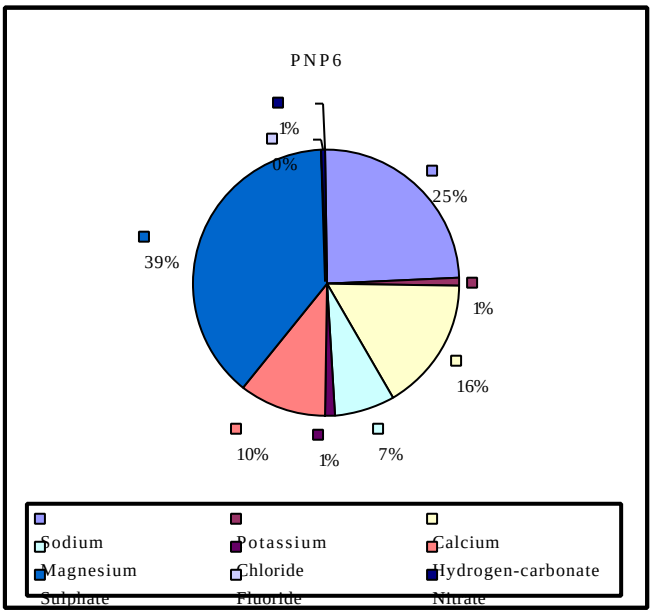




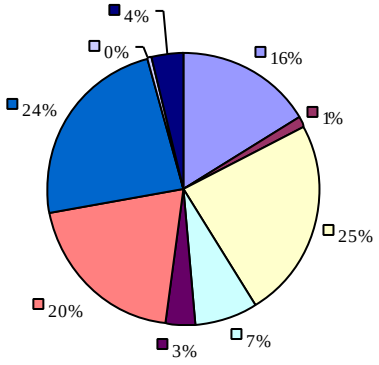






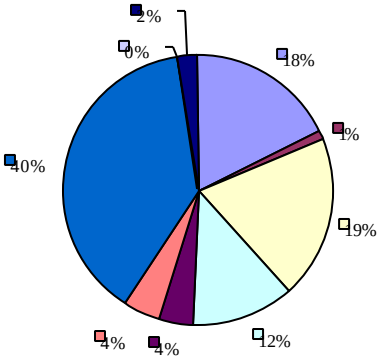


PNP10



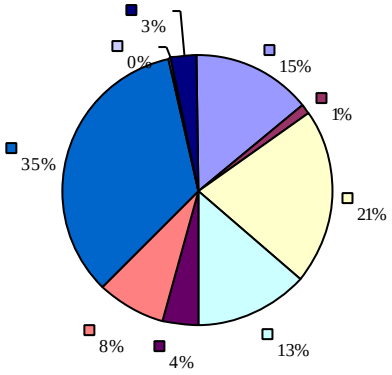
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP11



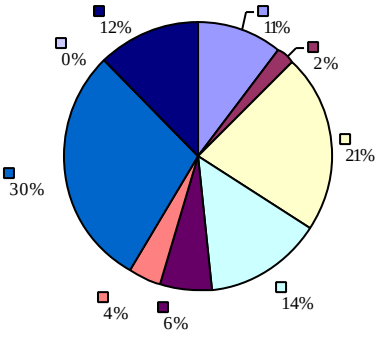
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP12



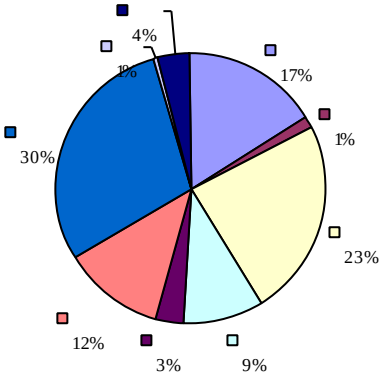
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP13



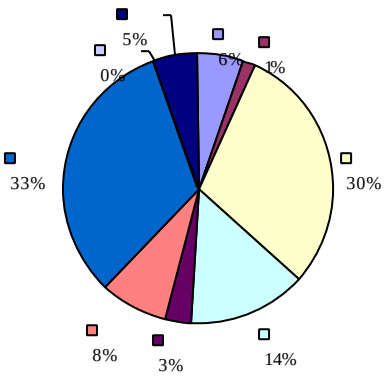
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP14



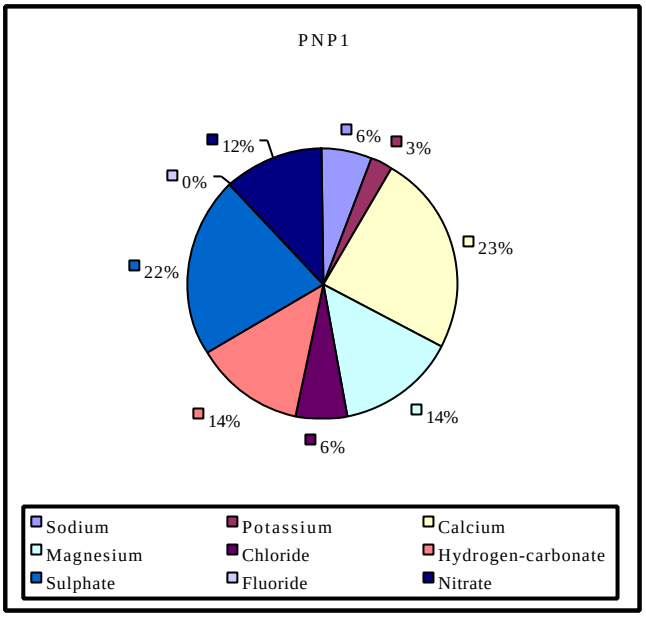
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

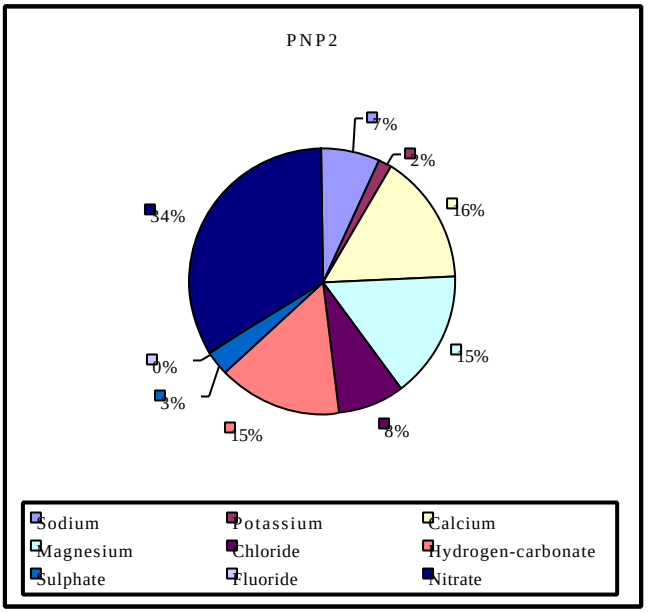
PNP15

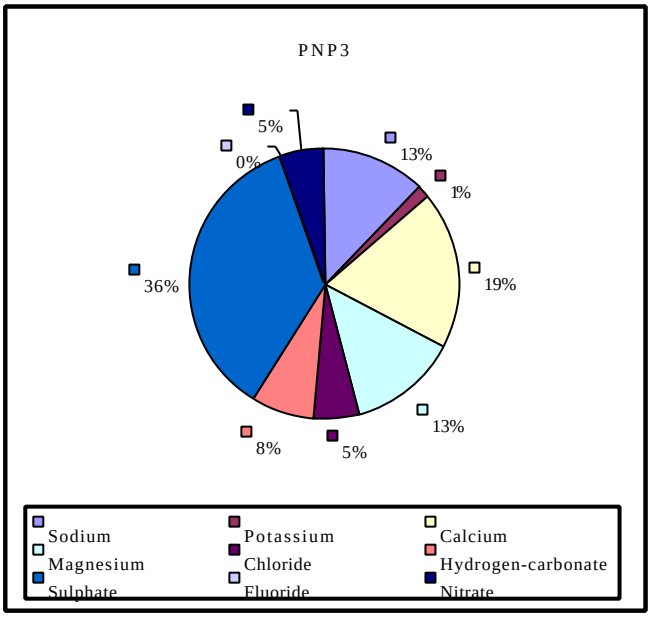


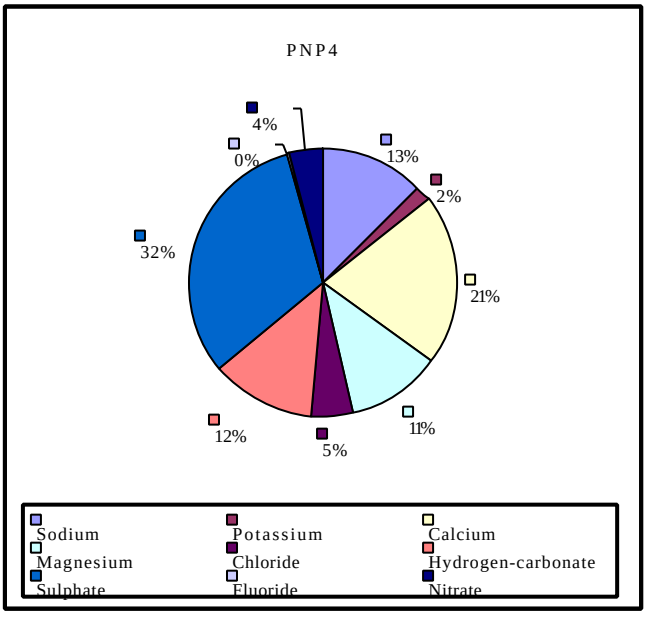
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

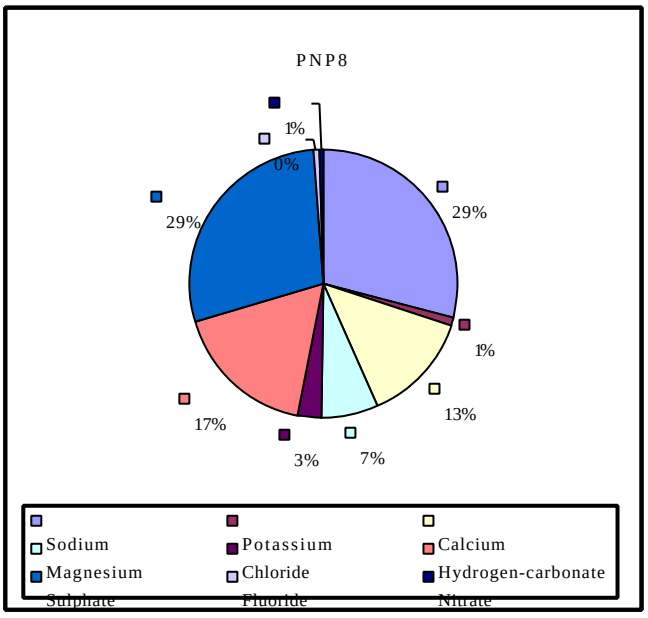
Appendix: 7.7.9. The Representation of the Amount of the Main Components in Different Samples (1997).

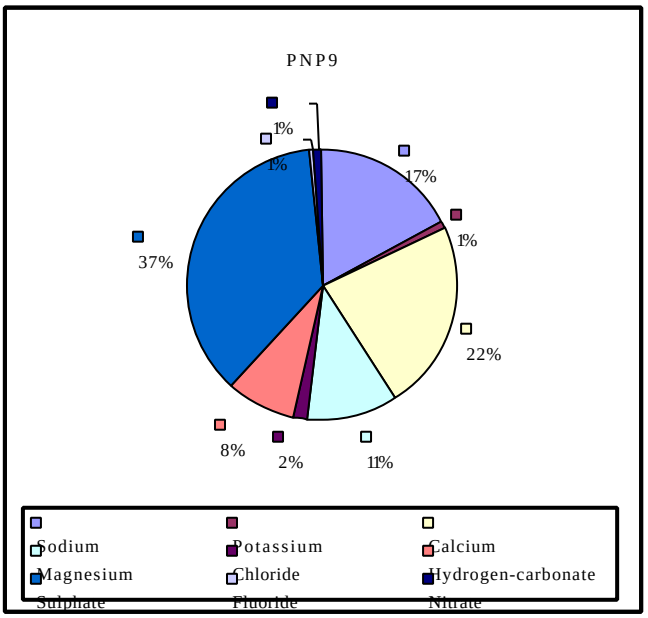




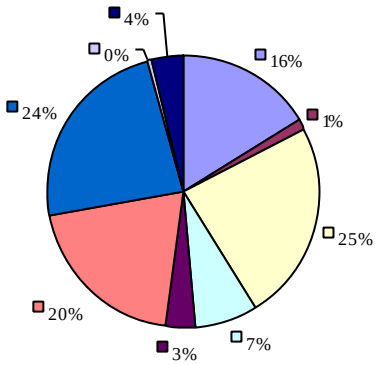






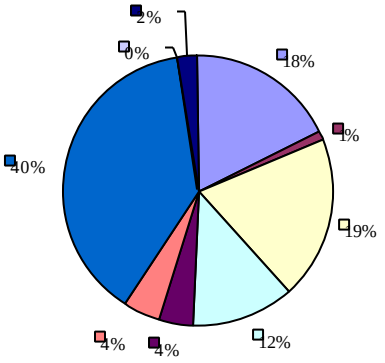


PNP10



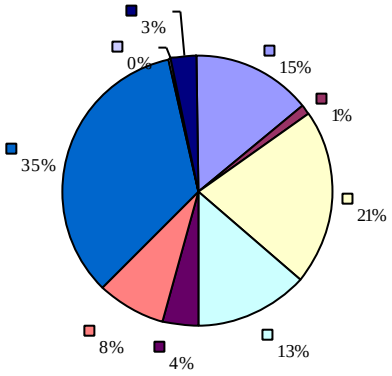
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP11



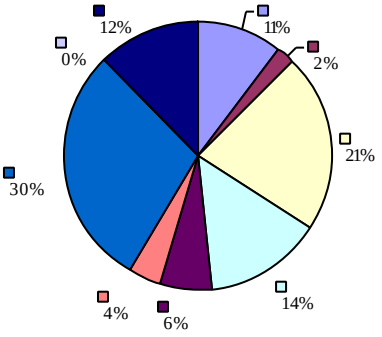
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP12



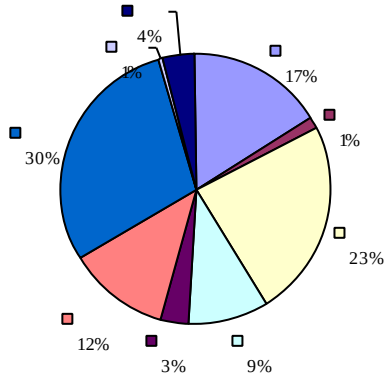
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP13



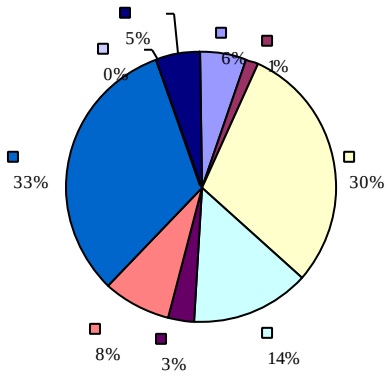
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP14



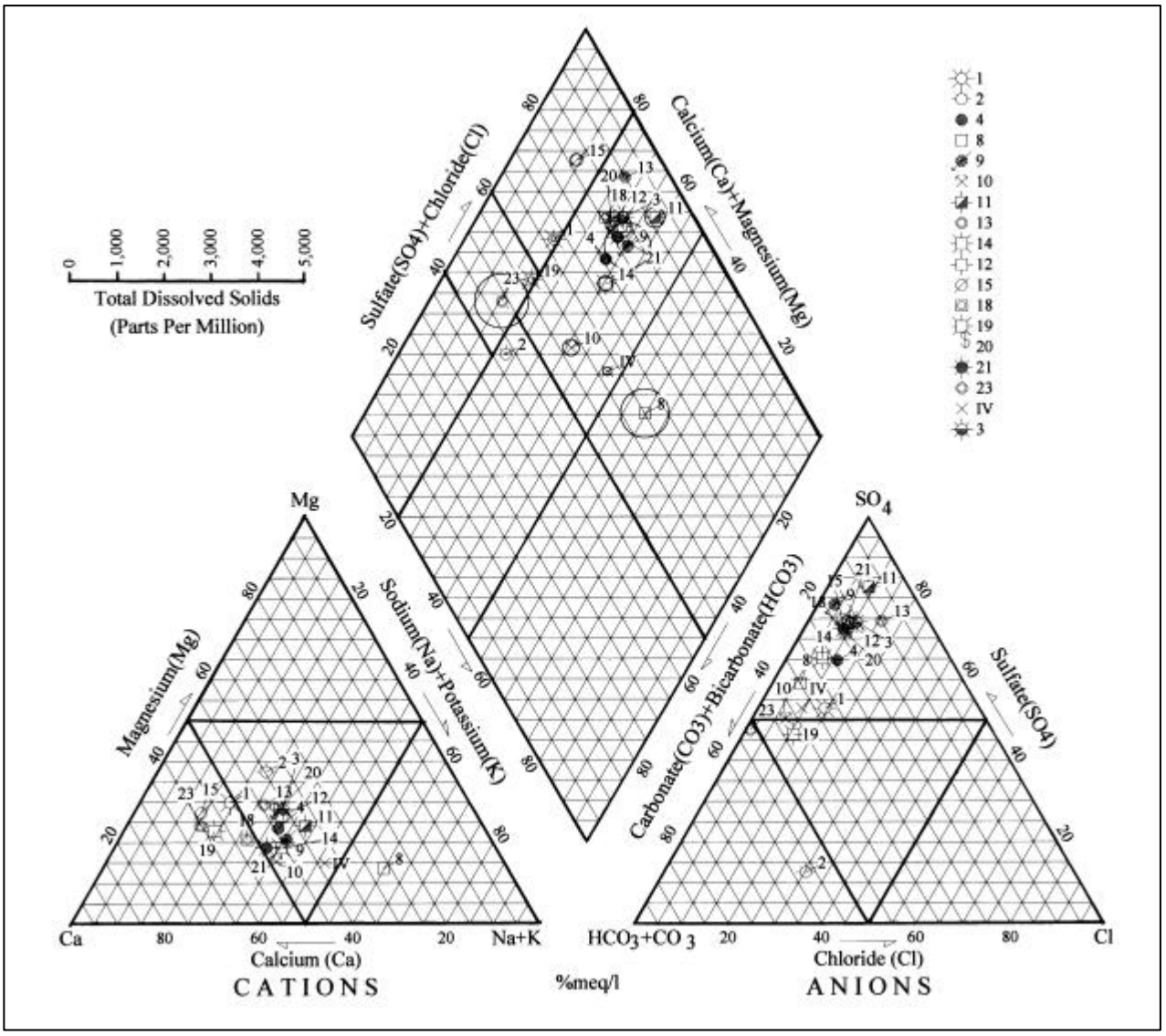
Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

PNP15

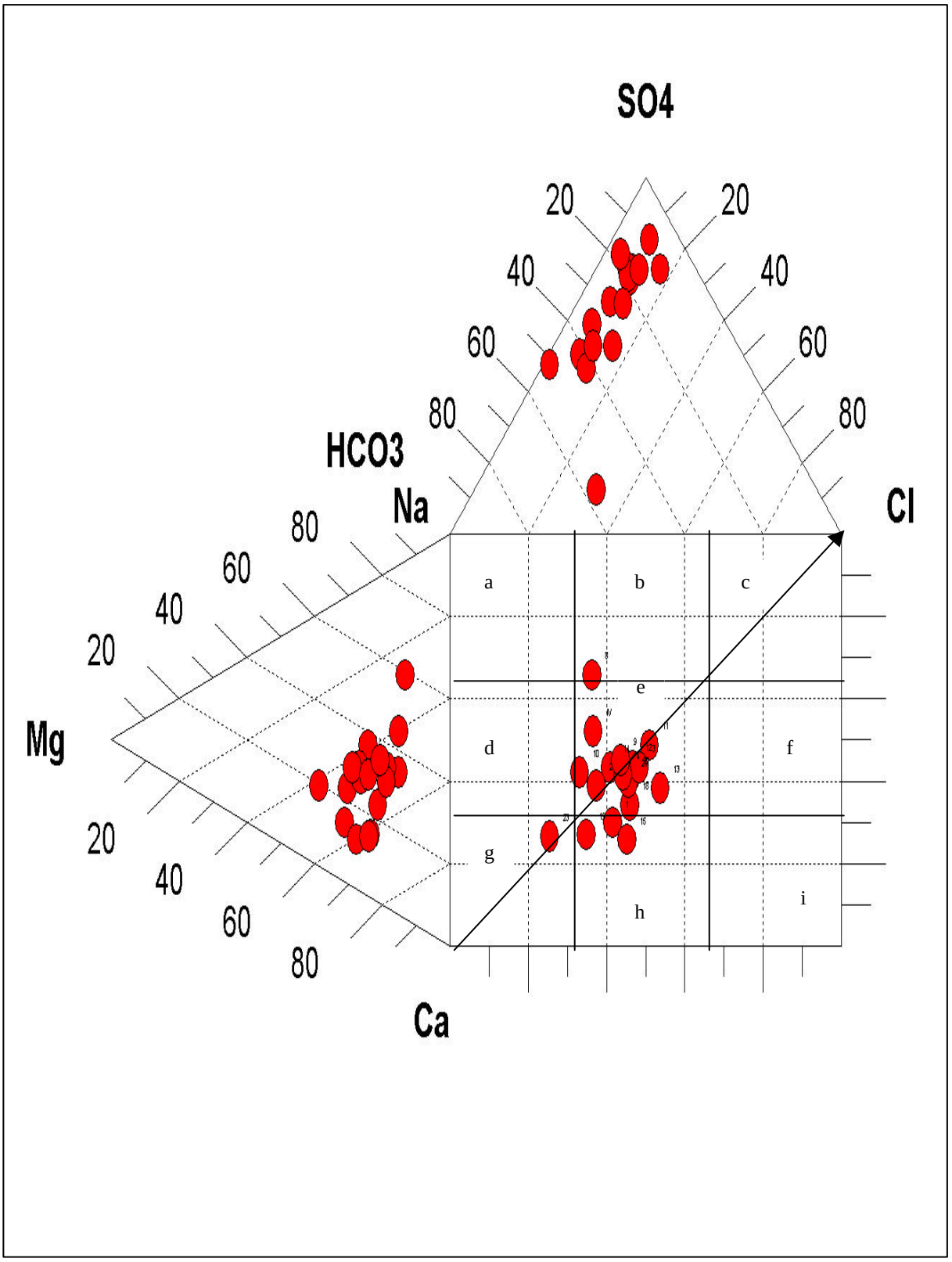


Sodium | Potassium | Calcium
Magnesium | Chloride | Hydrogen-carbonate
Sulphate | Fluoride | Nitrate

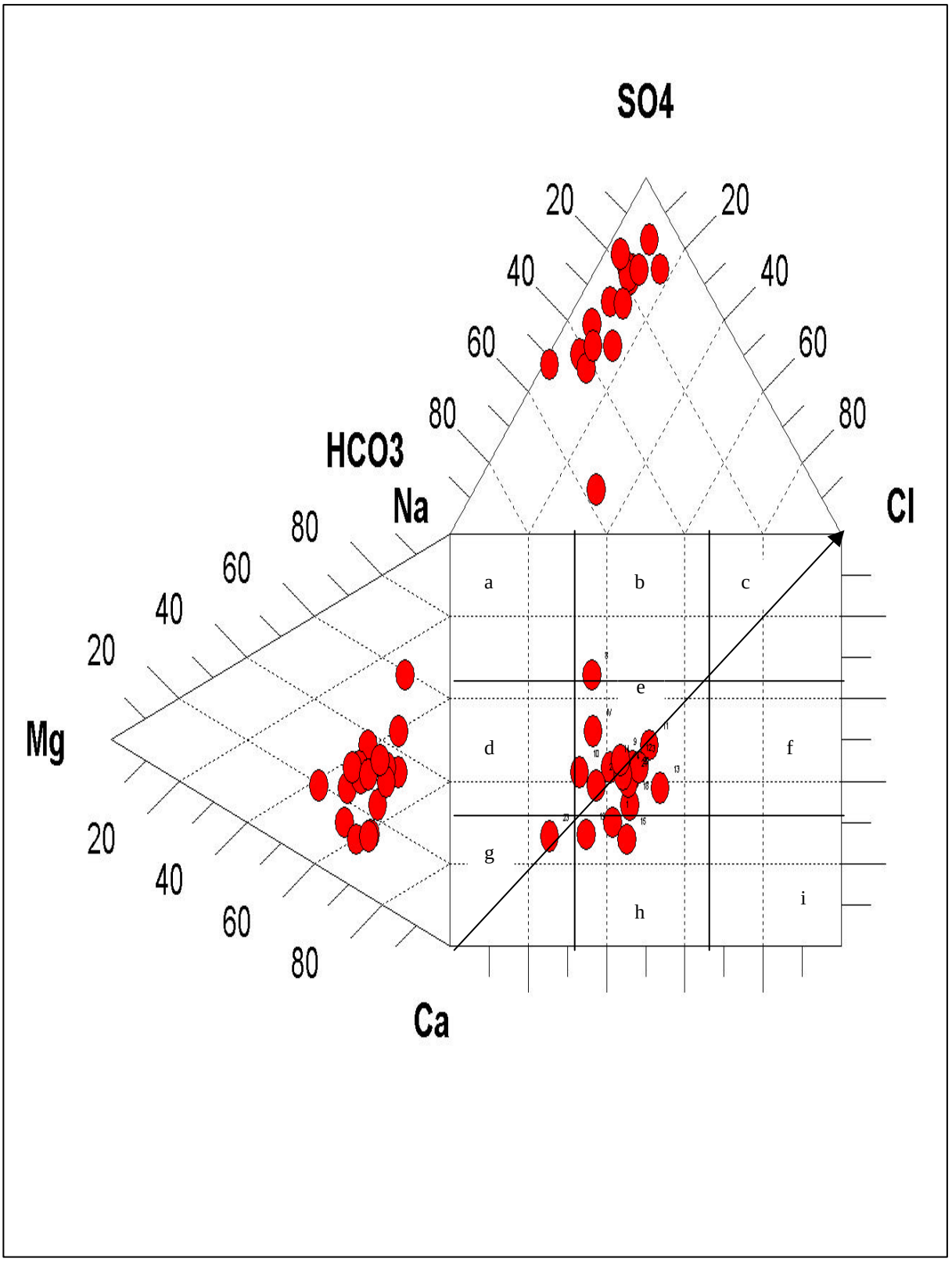
Appendix: 7.7.10. Classification of water quality using Piper diagram according to the data of KUTSCHKE, (1998).



Appendix: 7.7.11. Classification of water quality using Durov diagram according to the data of KUTSCHKE, (1998).



Appendix: 7.7.11. Classification of water quality using Durov diagram according to the data of KUTSCHKE, (1998).



Appendix: 7.7.13. The Main Components of the three Extracted Samples.

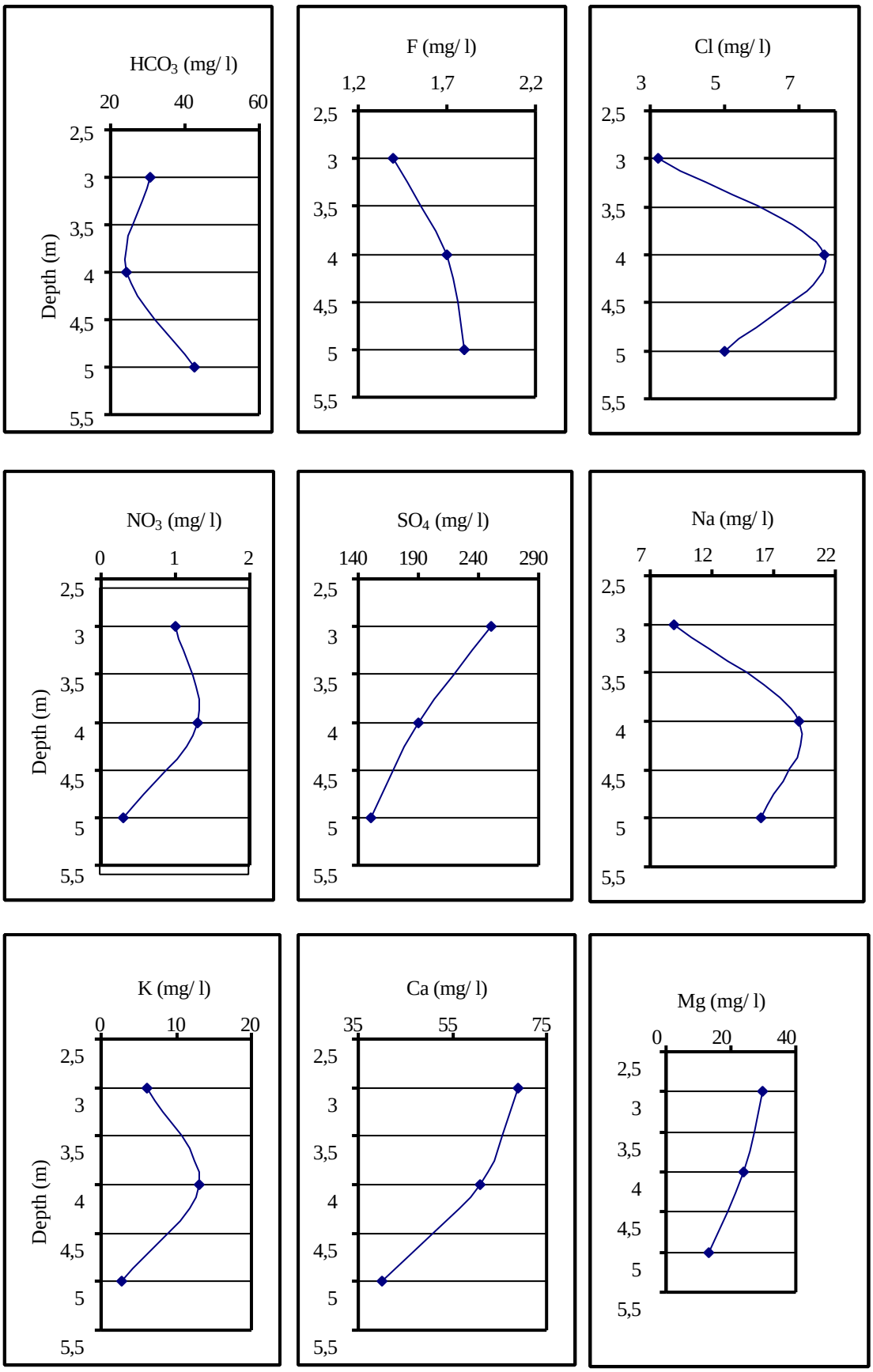
Borehole N°2

Interval of depth	HCO_3^- mg/l	CO_2 mg/l	CO_3^{2-} mg/l	F^- mg/l	Cl^- mg/l	NO_3^- mg/l	SO_4^{2-} mg/l	Na^+ mg/l	K^+ mg/l	Ca^{2+} mg/l	Mg^{2+} mg/l	F^- meq/l	Cl^- meq/l	NO_3^- meq/l	SO_4^{2-} meq/l	HCO_3^- meq/l	CO_3^{2-} meq/l	Na^+ meq/l	K^+ meq/l	Ca^{2+} meq/l	Mg^{2+} meq/l	TDA meq/l	TDC meq/l	TDI meq/l	Balance (%)
2.5-3.5 m	30.5	4.4		1.4	3.2	1	250	8.9	6.2	69	30	0.07	0.09	0.02	5.21	0.50		0.39	0.16	3.45	2.47	5.89	6.46	12.35	4.7
3.5-4.5 m	24.4	4.4		1.7	7.7	1.3	190	19	13	61	24	0.09	0.22	0.02	3.96	0.40		0.83	0.33	3.05	1.98	4.69	6.18	10.87	13.8
4.5-5.5 m	42.7		24	1.8	5	<1	150	16	2.7	40	13	0.09	0.14	0.00	3.13	0.7	0.8	0.70	0.07	2.00	1.07	4.86	3.83	8.70	11.8

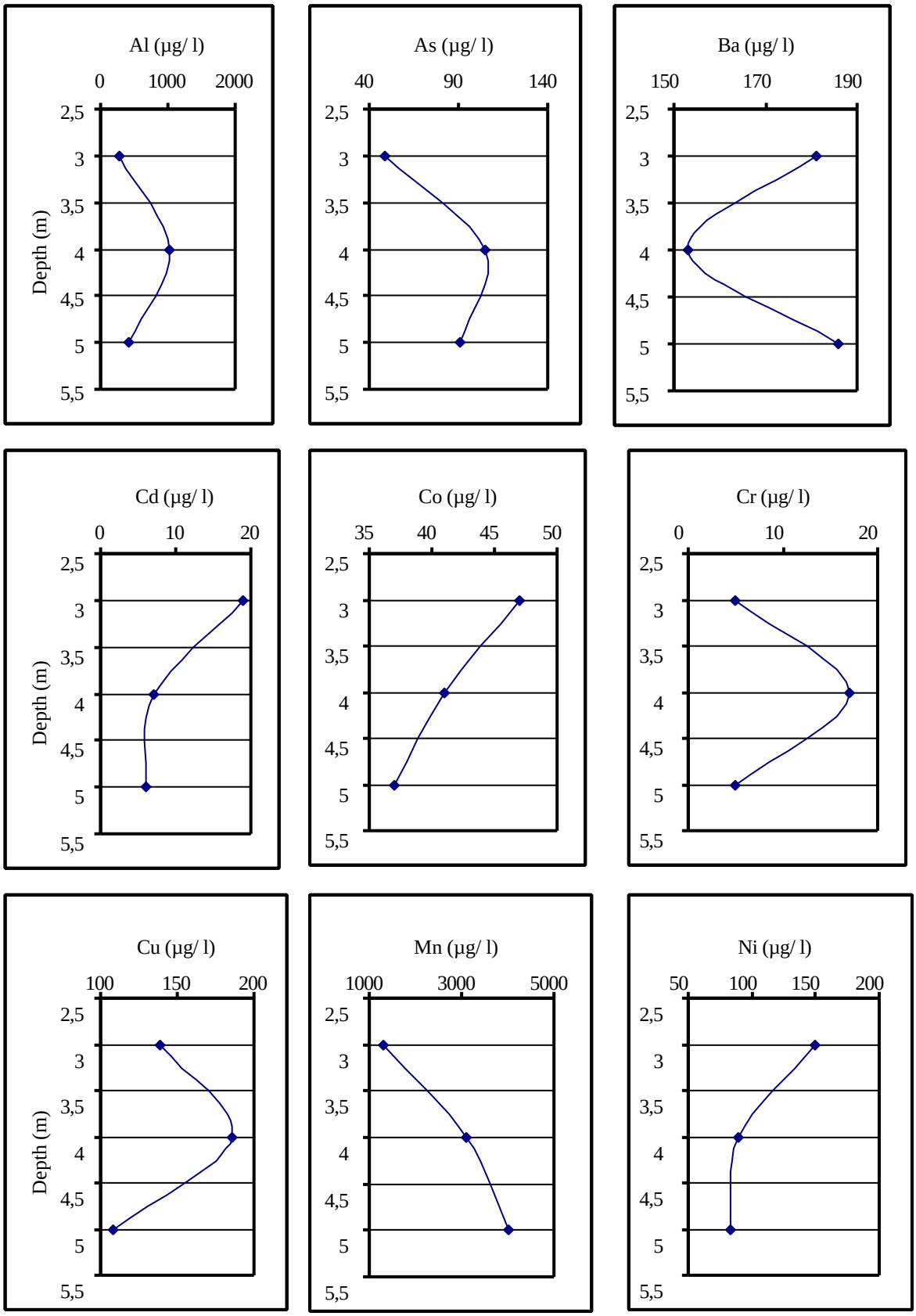
Appendix: 7.7.14. The Heavy and Trace Metals of the three Extracted Samples.

Borehole	Al	As	Ba	Cd	Co	Cr	Cu	Fe	Fe^{2+}	Fe^{3+}	Mn	Ni	Pb	U	Zn
N°2	µg / l	µg / l	µg/ l	µg/ l	µg/ l	µg/ l	µg/ l	µg / l	µg / l	µg / l	µg / l	µg/ l	µg/ l	µg / l	µg / l
Interval															
of depth															
2.5-3.5	275	49	181	19	47	5	139	150	30	120	1319	149	6	55	1220
3.5-4.5	1030	105	153	7	41	17	186	60	10	50	3100	89	21	265	1370
4.5-5.5	409	91	186	6	37	5	108	60	10	50	4000	83	7	949	199

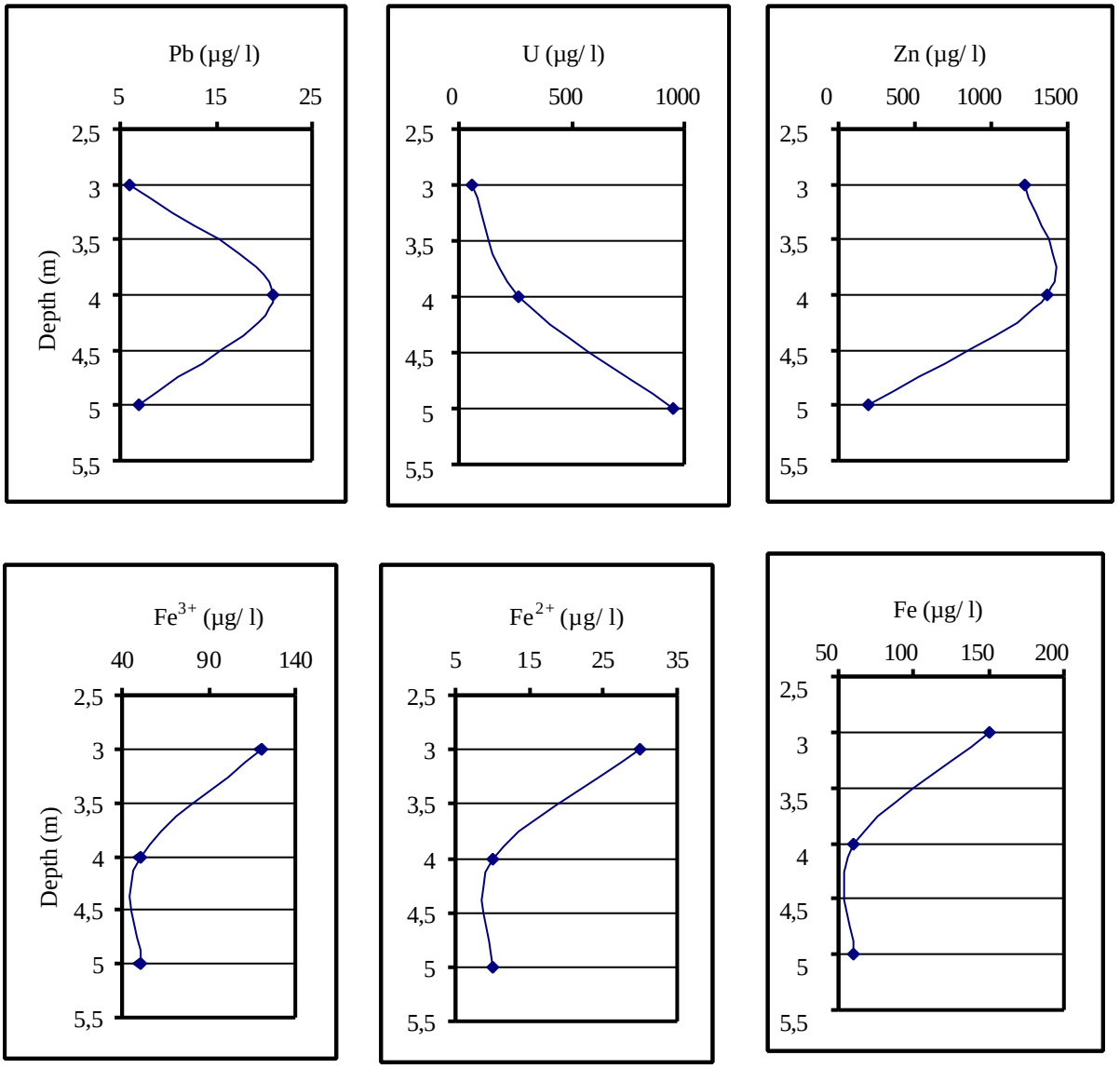
Appendix: 7.7.15. The Change with Depth of the Main Components of the three Extracted Samples.



Appendix: 7.7.16. The Change with Depth of the Heavy and Trace Elements of the three Extracted Samples.

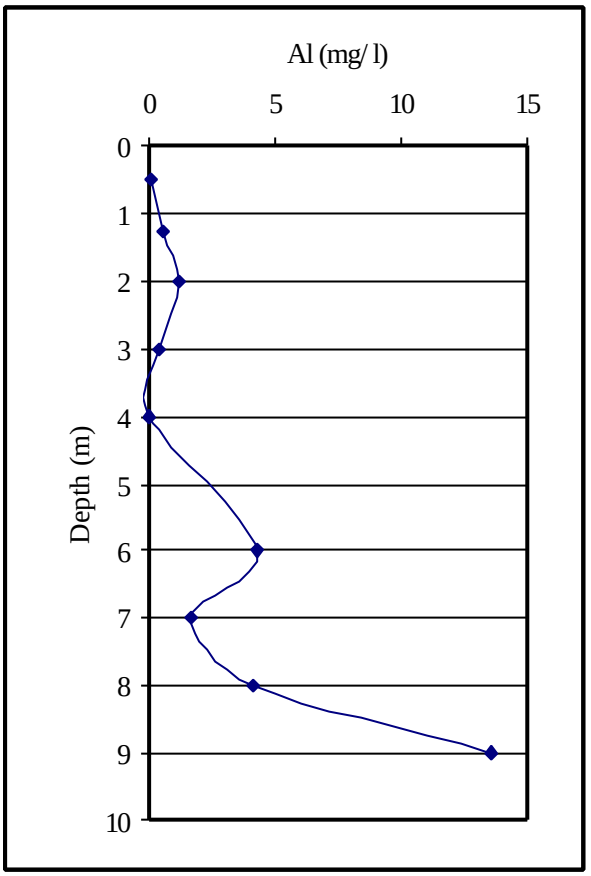


Appendix: 7.7.16. The Change with Depth of the Heavy and Trace Elements of the three Extracted Samples.

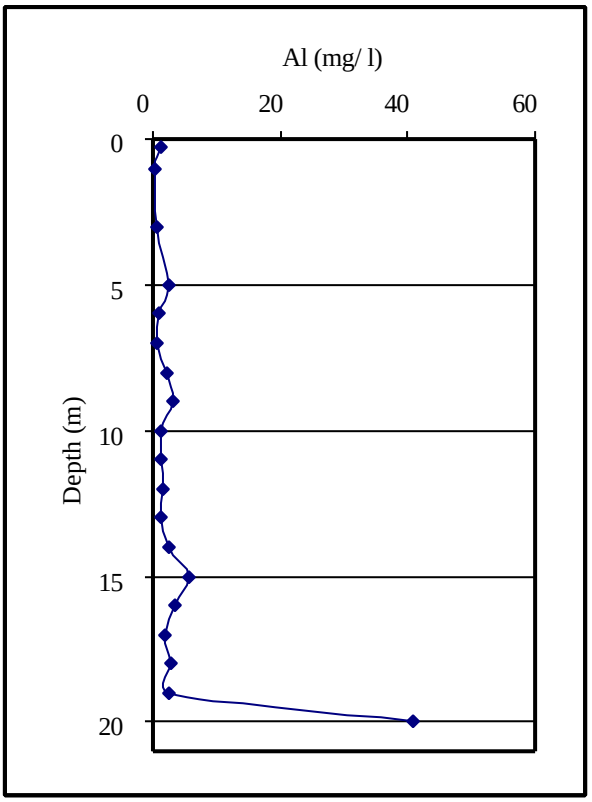


Appendix: 7.7.17. The Change with Depth of the Aluminium Concentration in each Borehole.

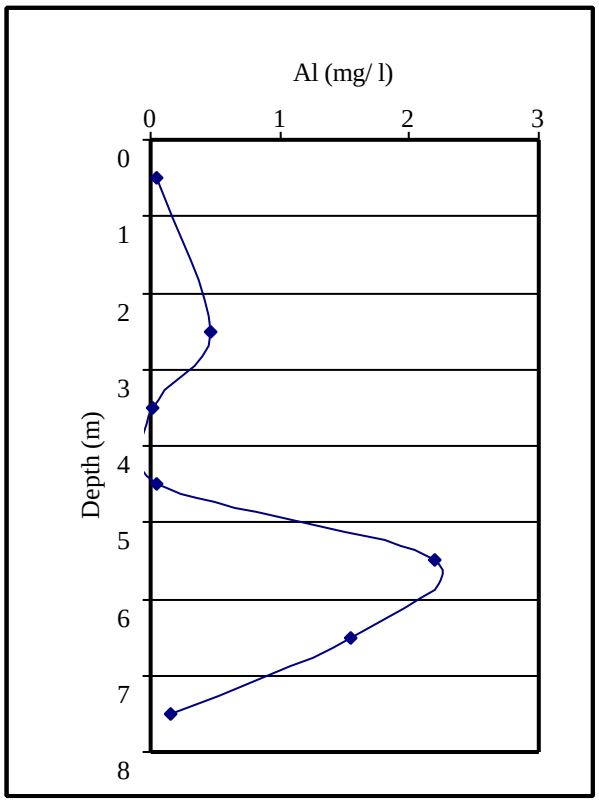
Borehole N°1



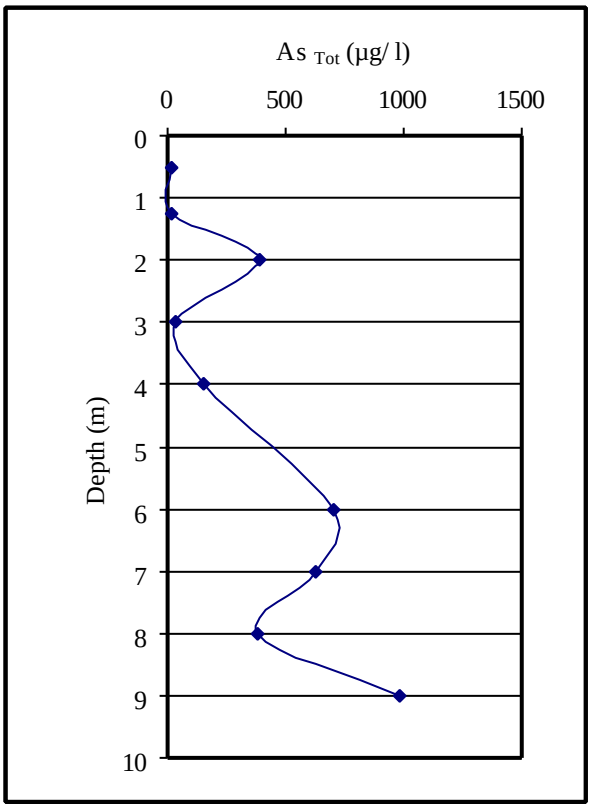
Borehole N°2

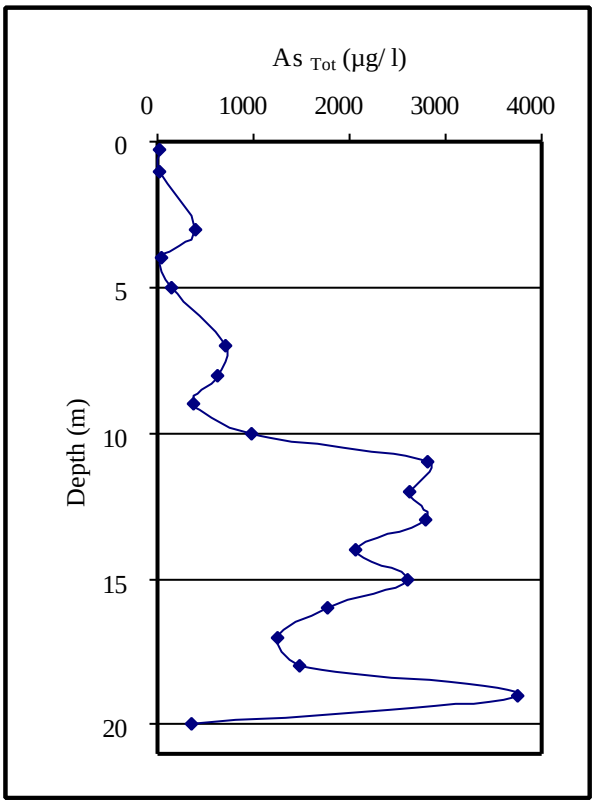


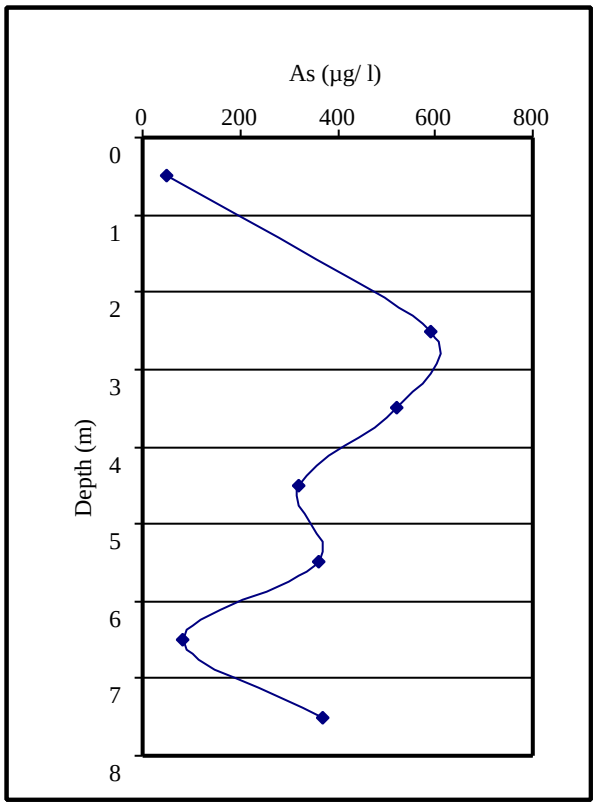
Borehole N°3

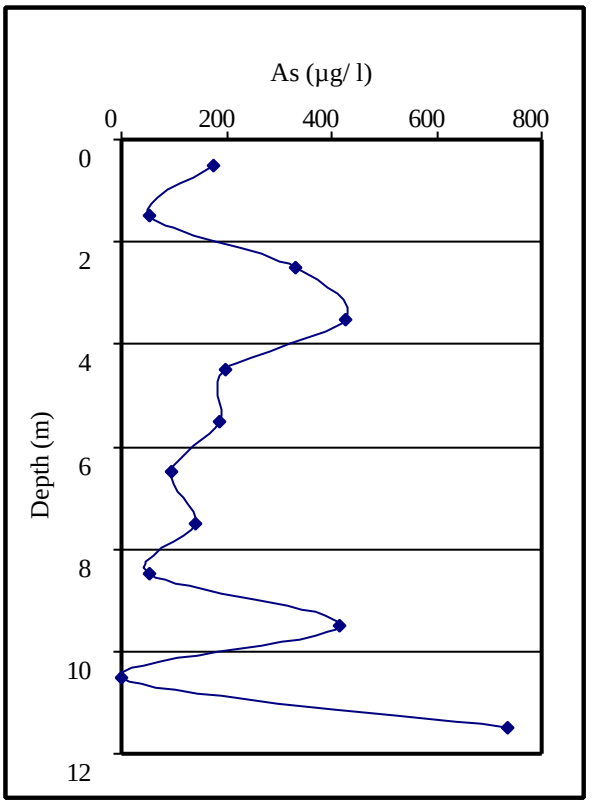


Appendix: 7.7.17. The Change with Depth of the Arsenic Concentration in each Borehole.

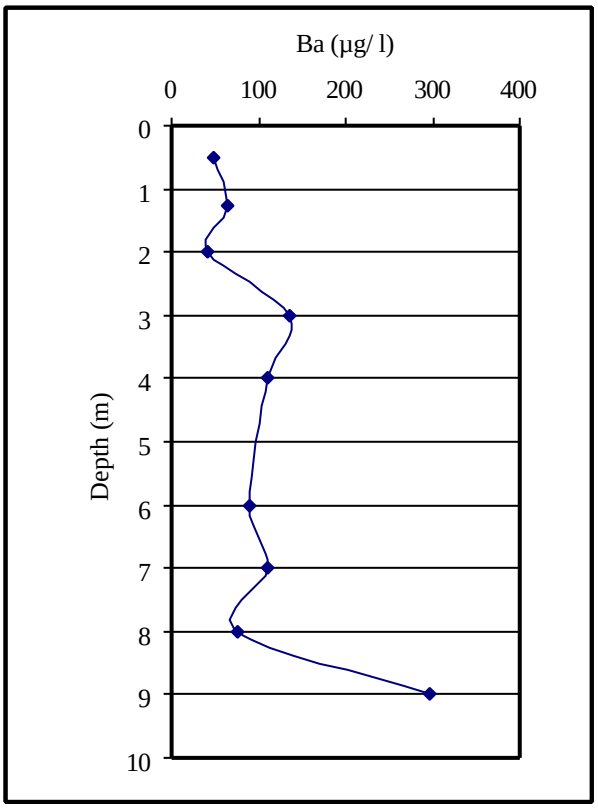


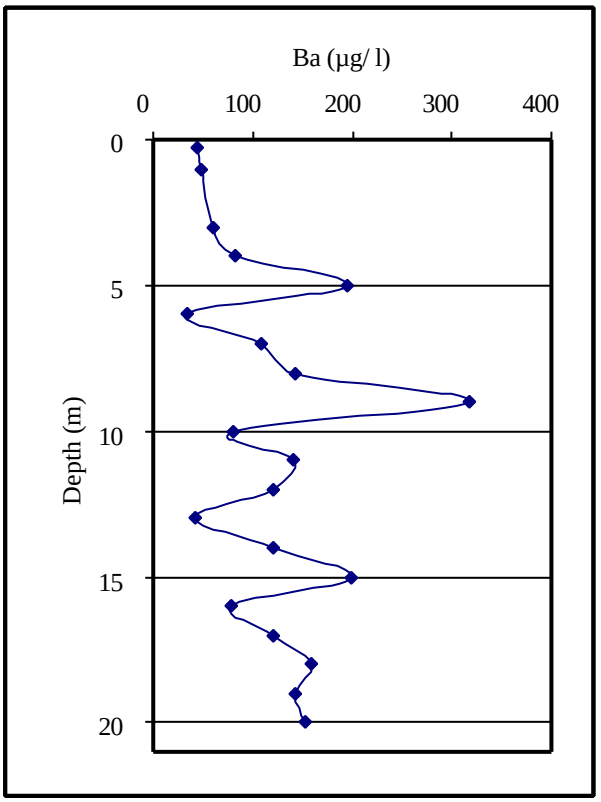


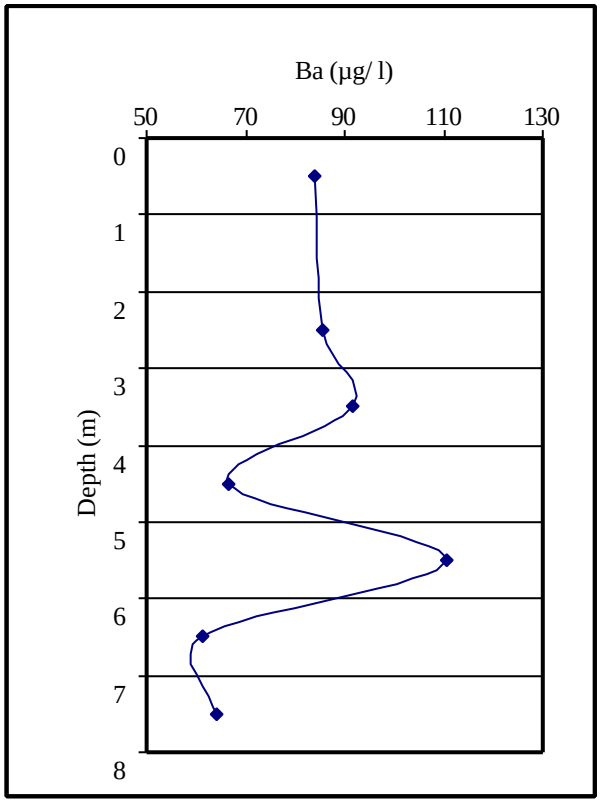


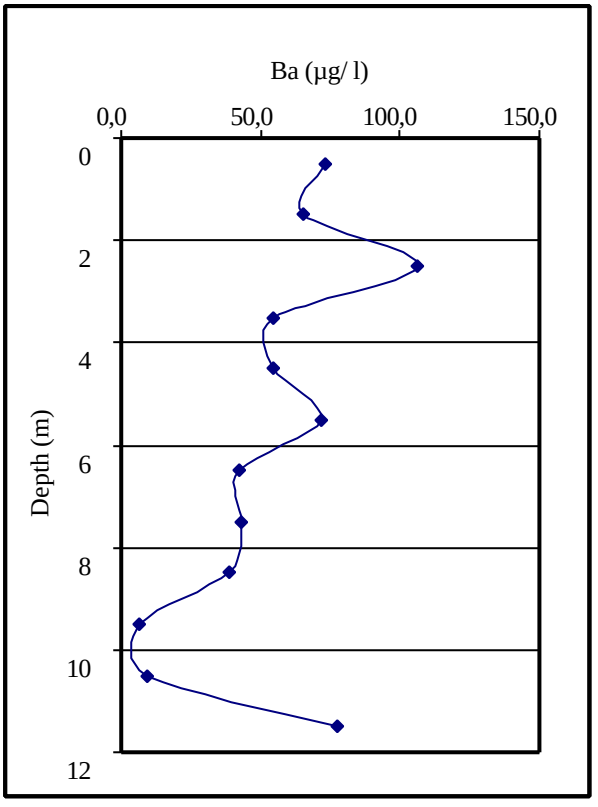


Appendix: 7.7.17. The Change with Depth of the Barium Concentration in each Borehole.

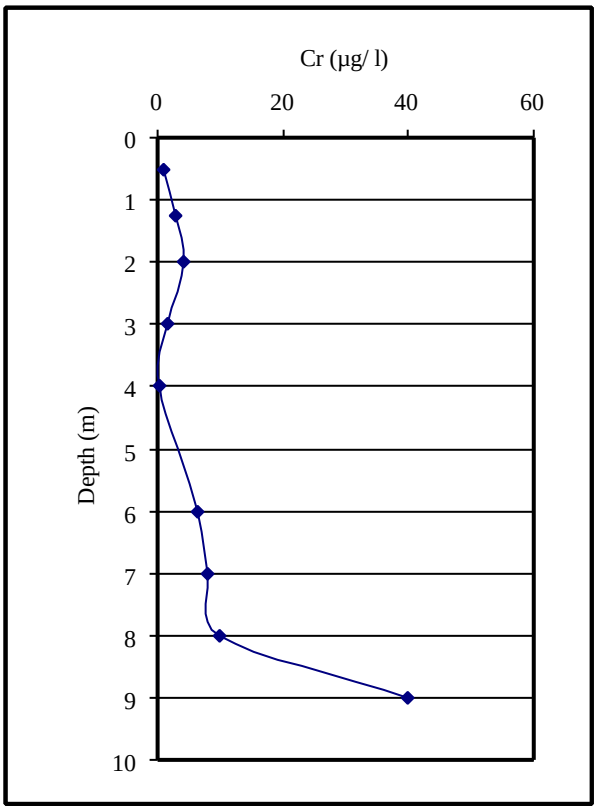


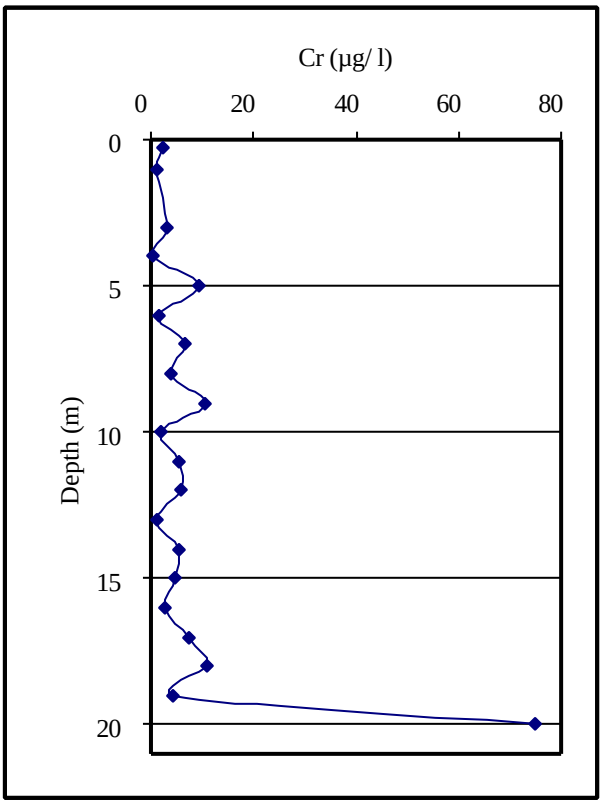


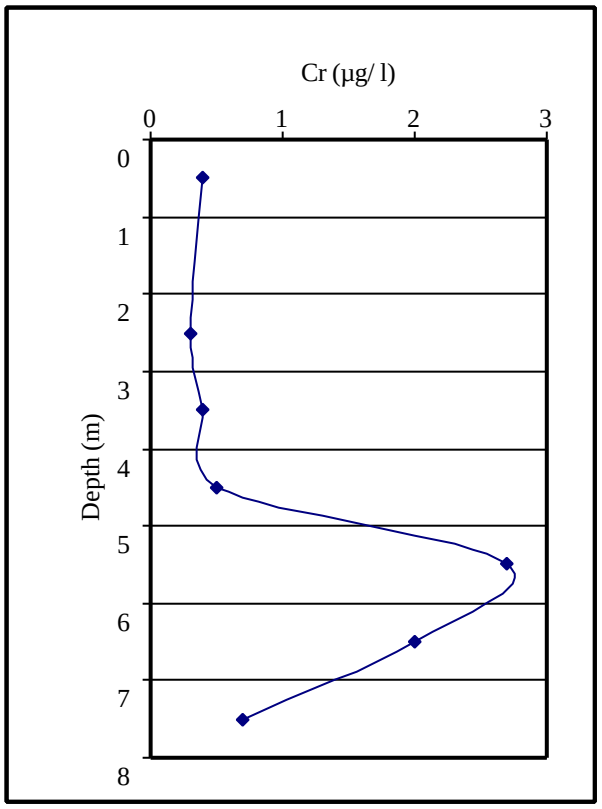




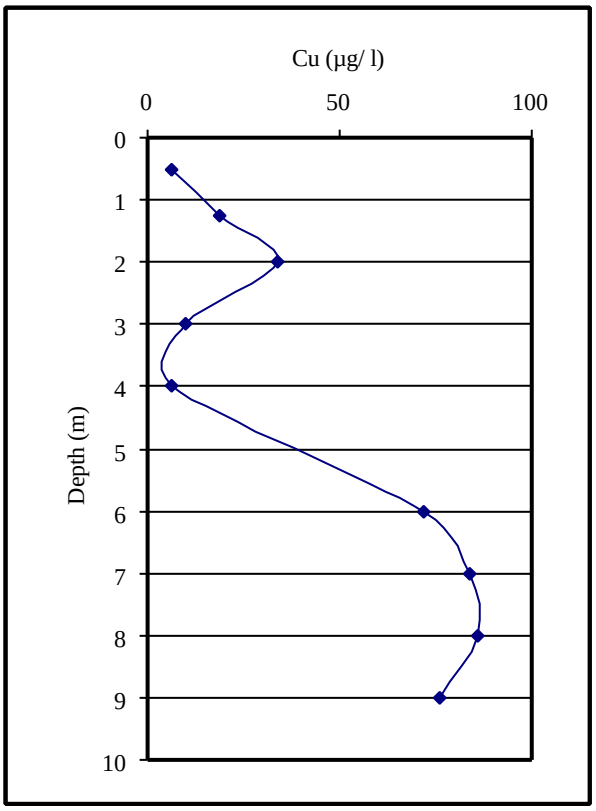
Appendix: 7.7.17. The Change with Depth of the Chromium Concentration in each Borehole.

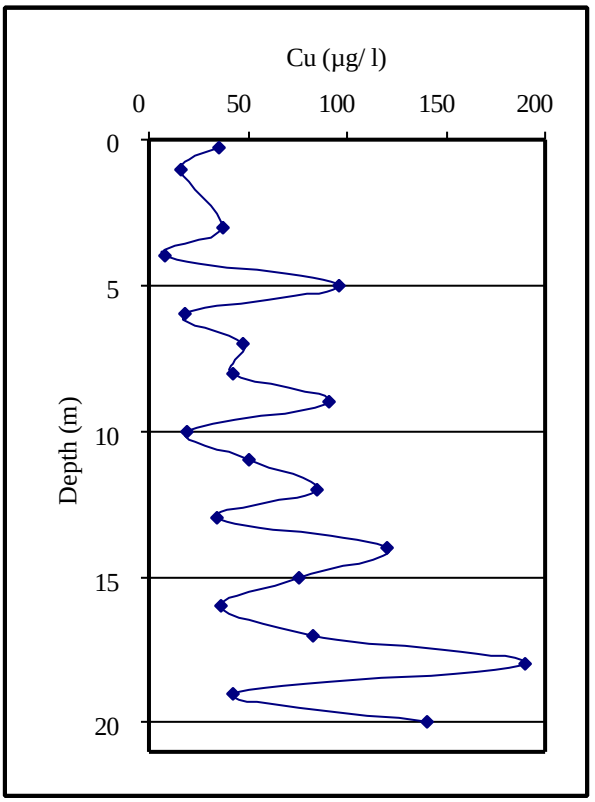


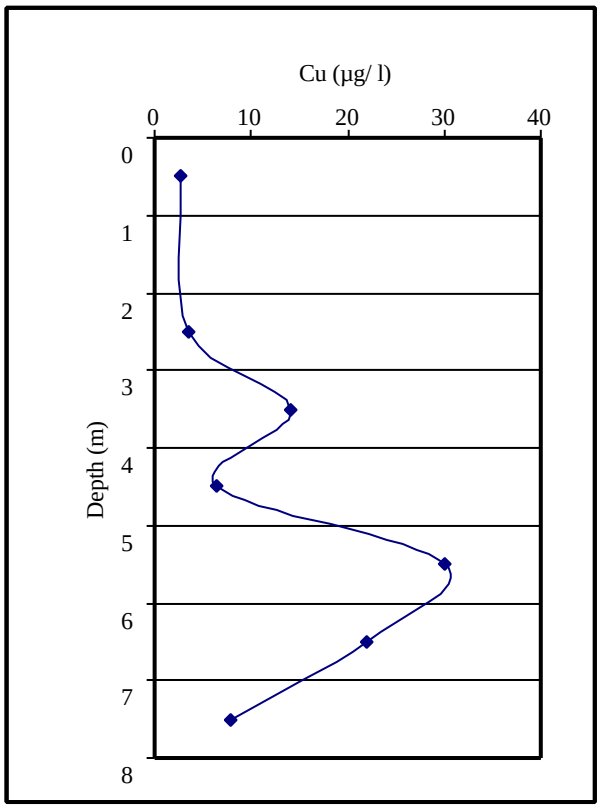


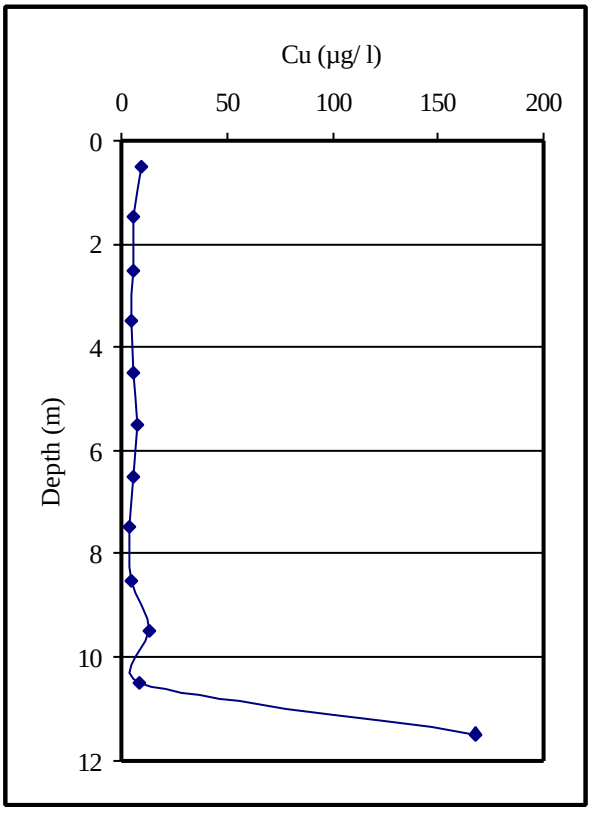


Appendix: 7.7.17. The Change with Depth of the Copper Concentration in each Borehole.

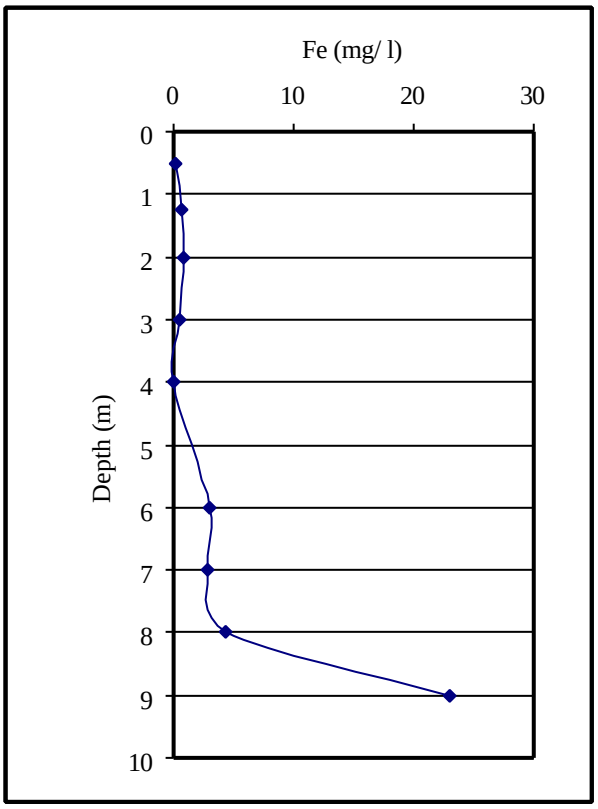


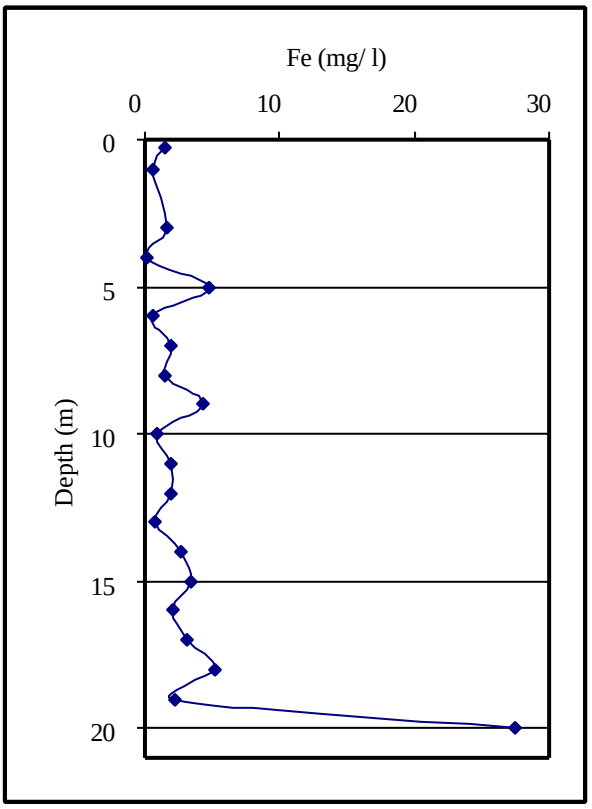


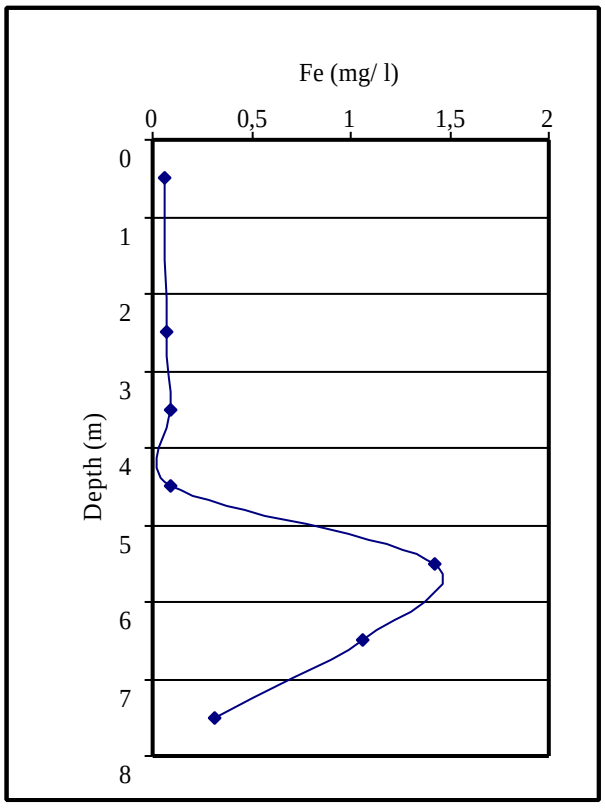


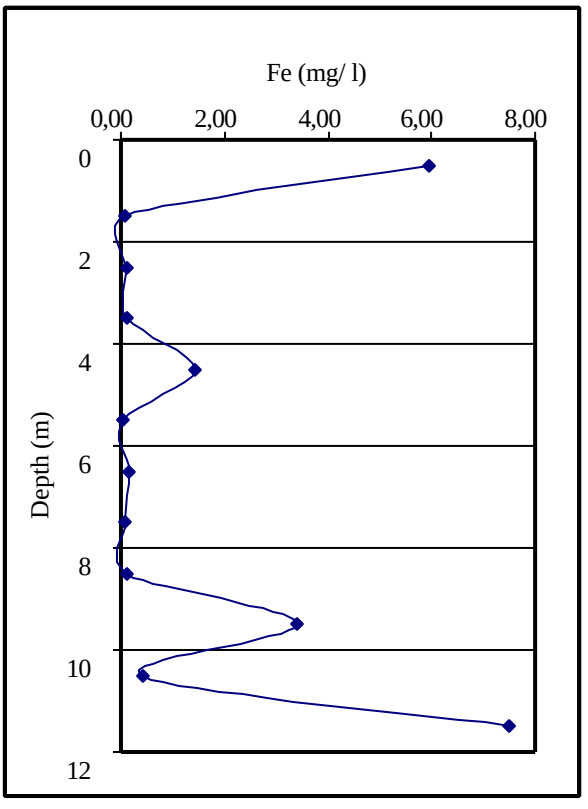


Appendix: 7.7.17. The Change with Depth of the Iron Concentration in each Borehole.

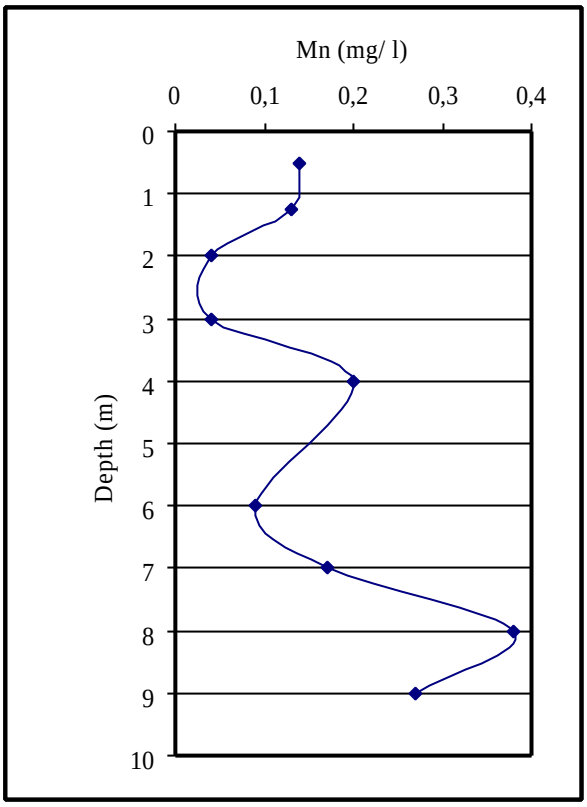


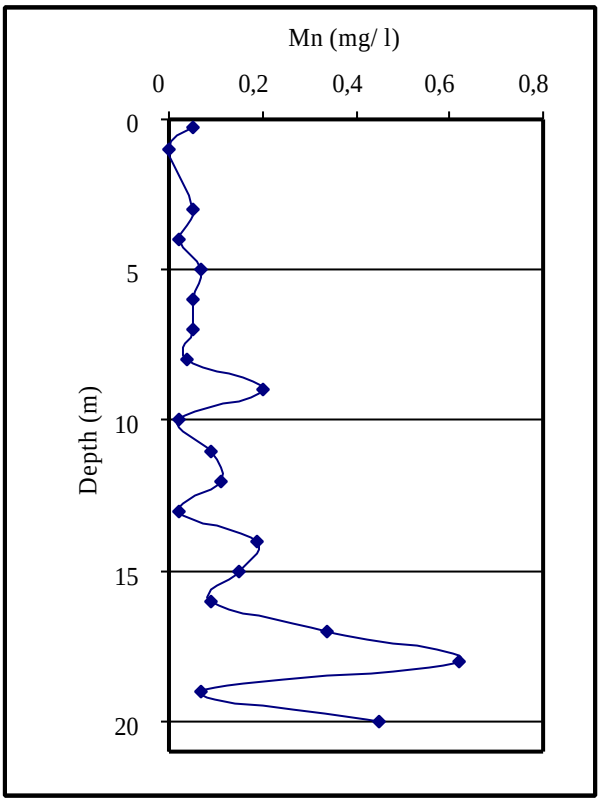


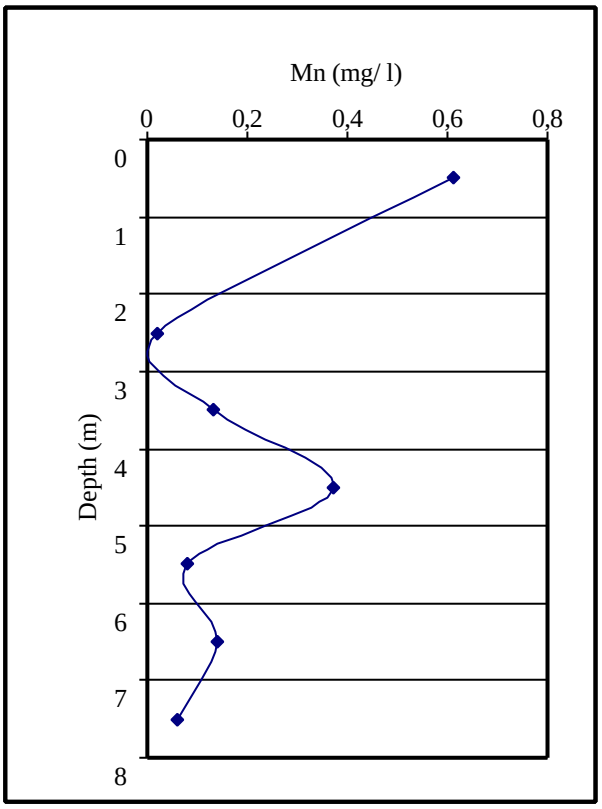


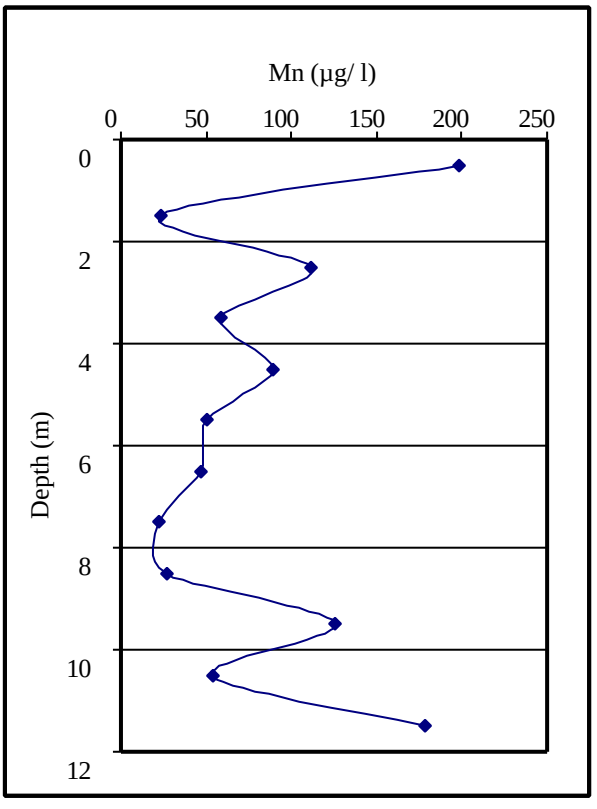


Appendix: 7.7.17. The Change with Depth of the Manganese Concentration in each Borehole.

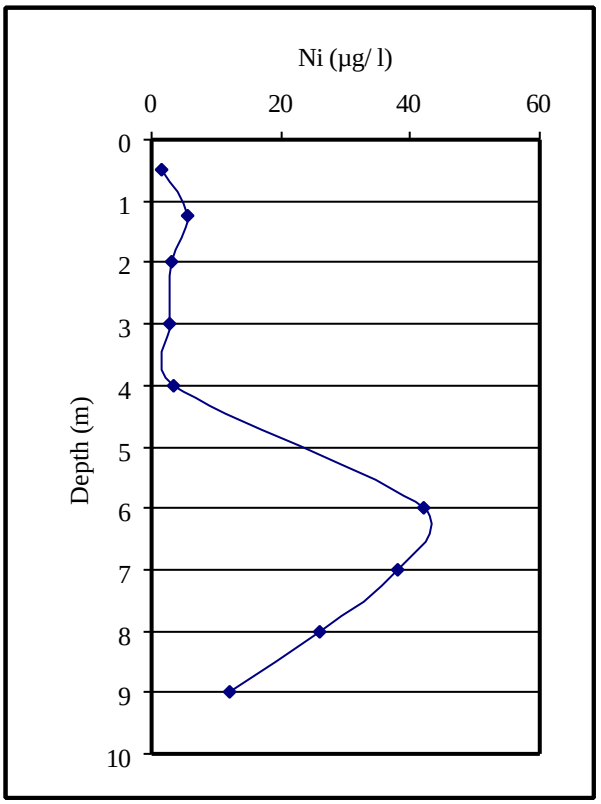


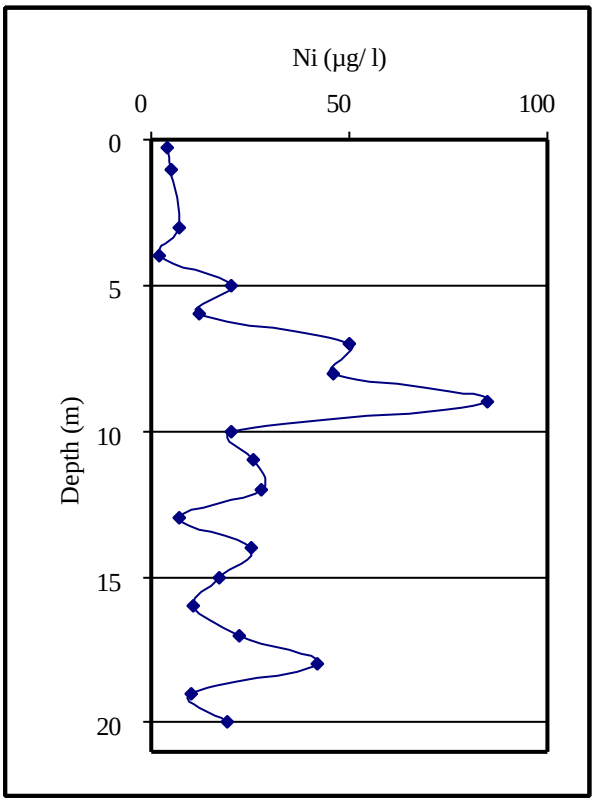


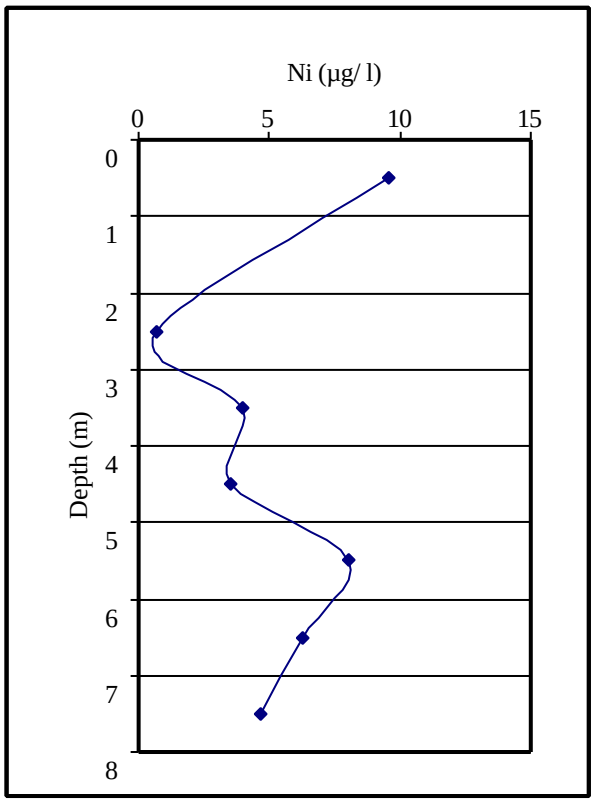


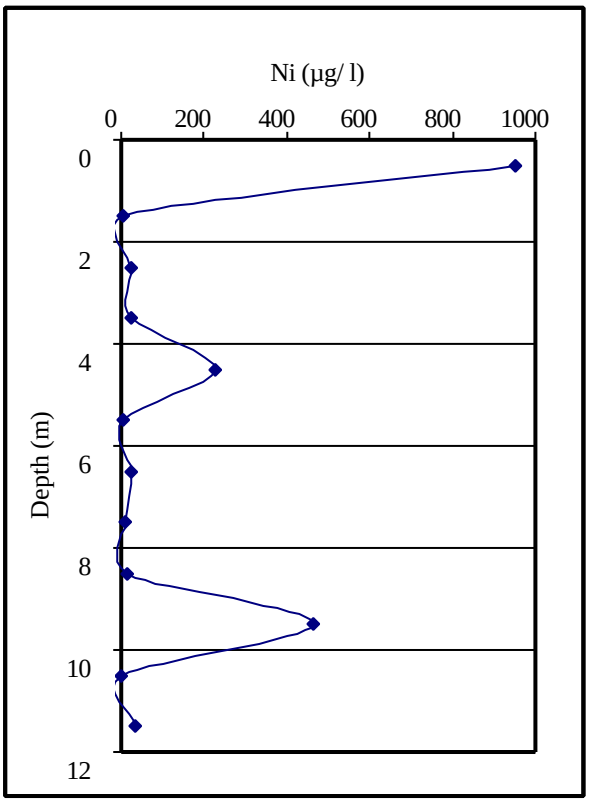


Appendix: 7.7.17. The Change with Depth of the Nickel Concentration in each Borehole.

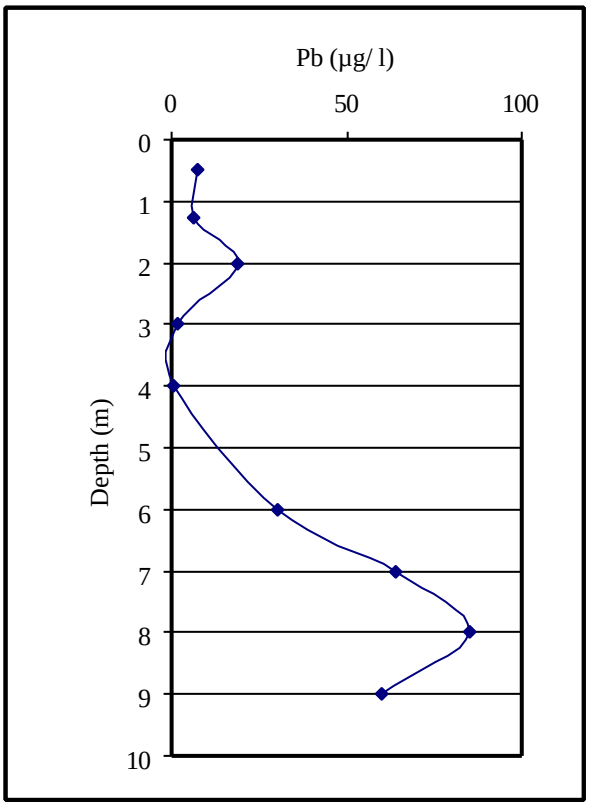


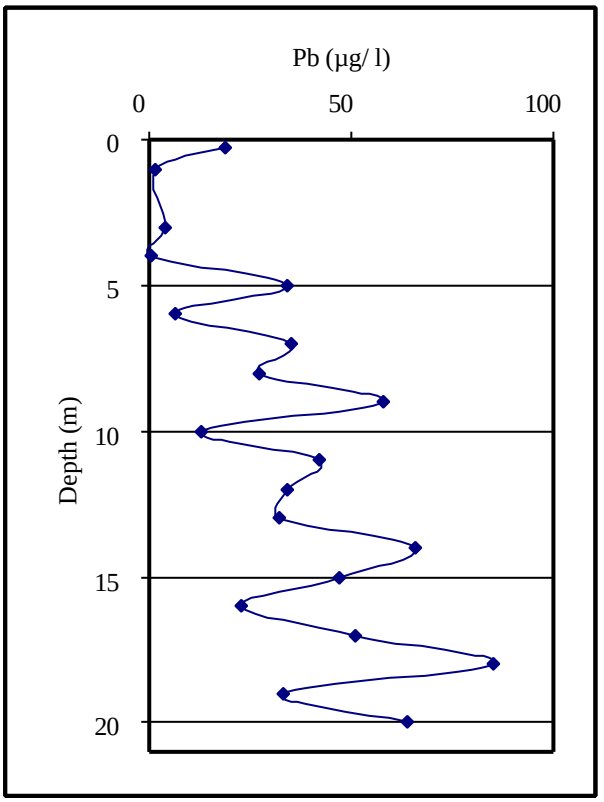


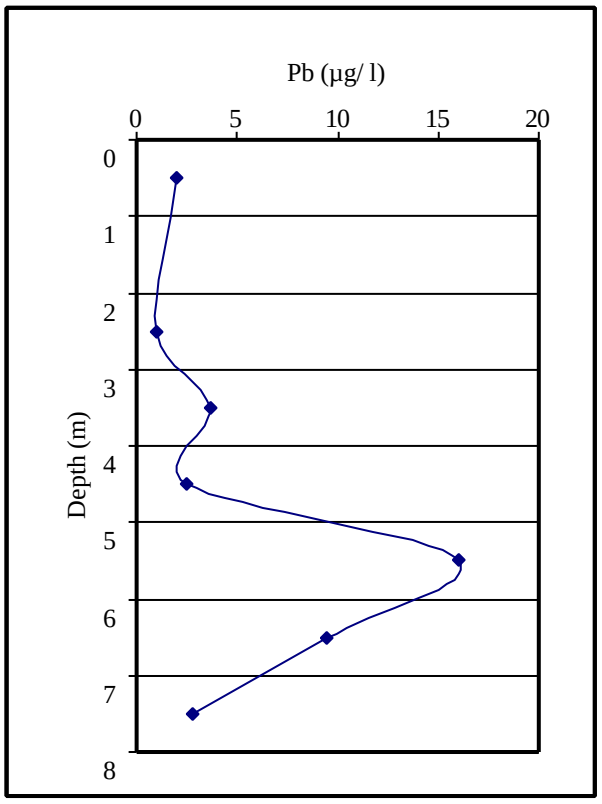


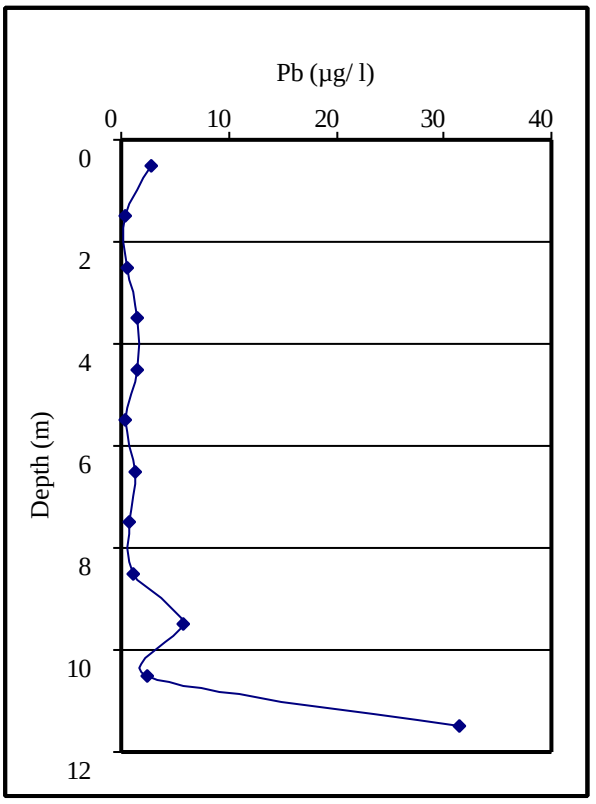


Appendix: 7.7.17. The Change with Depth of the Lead Concentration in each Borehole.

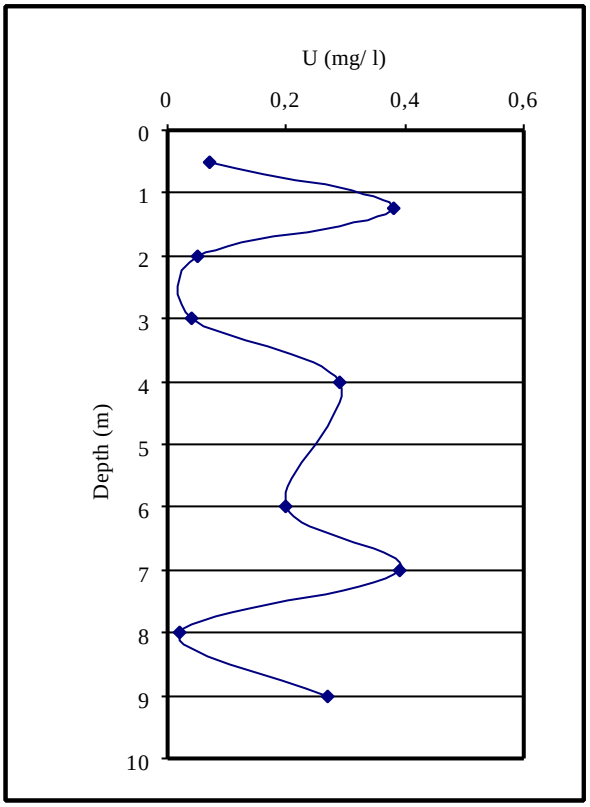


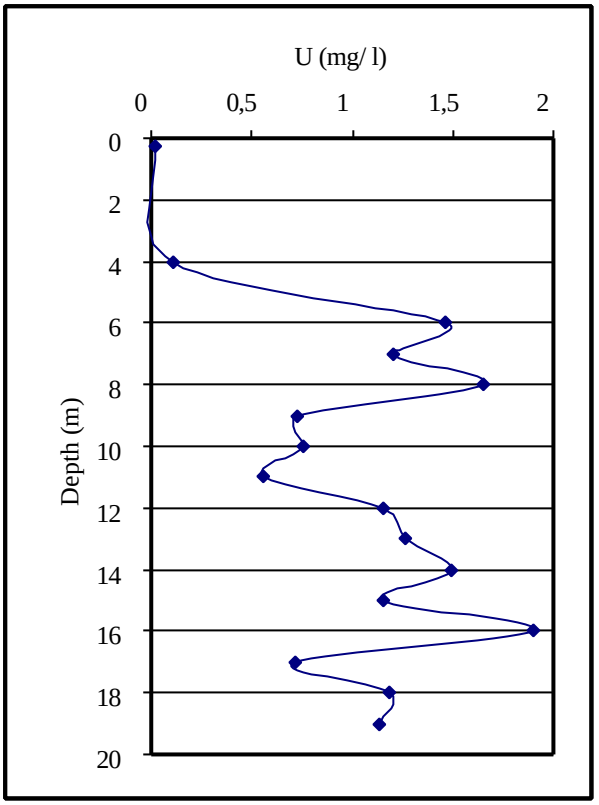


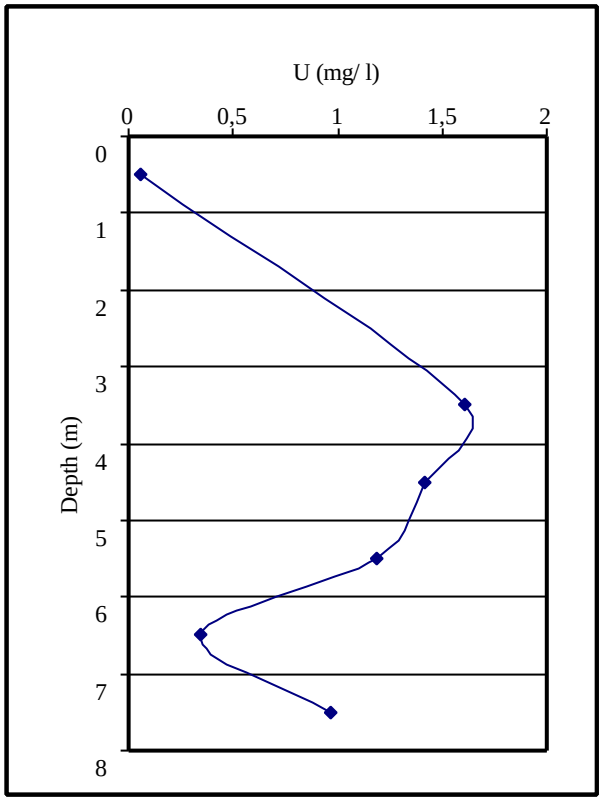


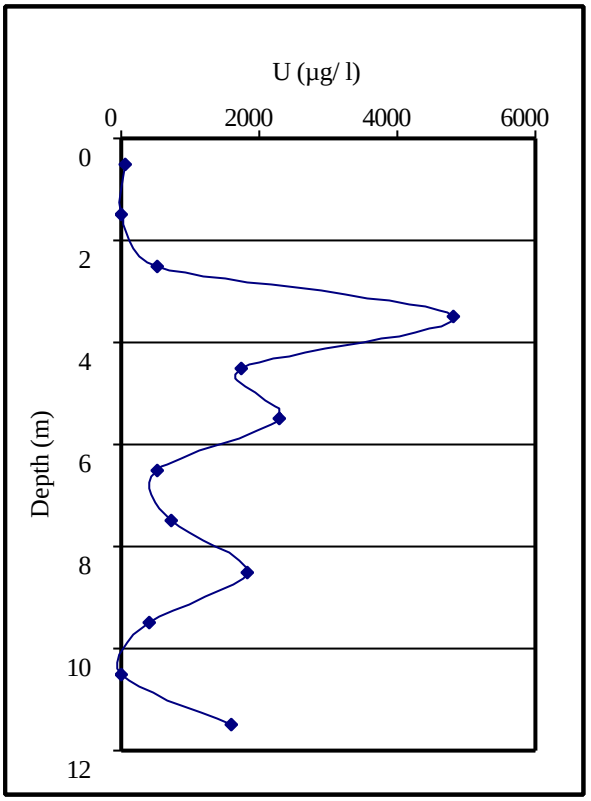


Appendix: 7.7.17. The Change with Depth of the Uranium Concentration in each Borehole.

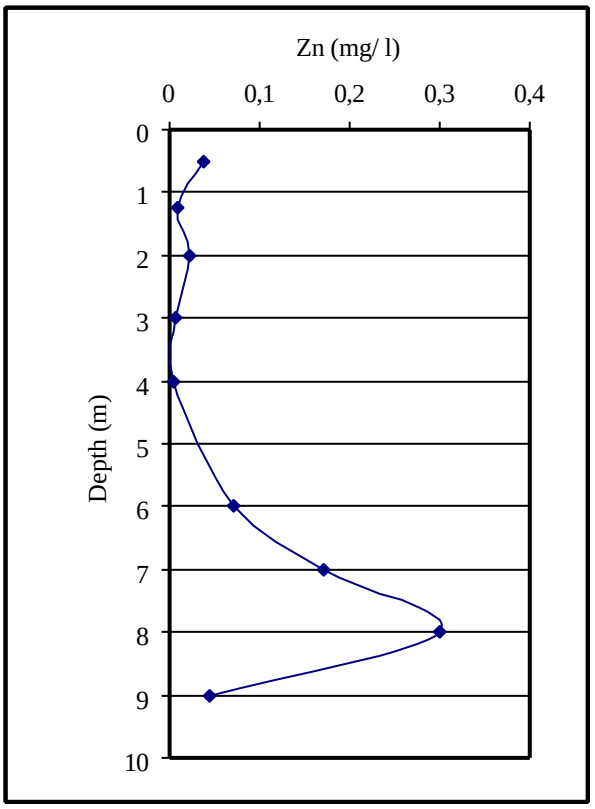


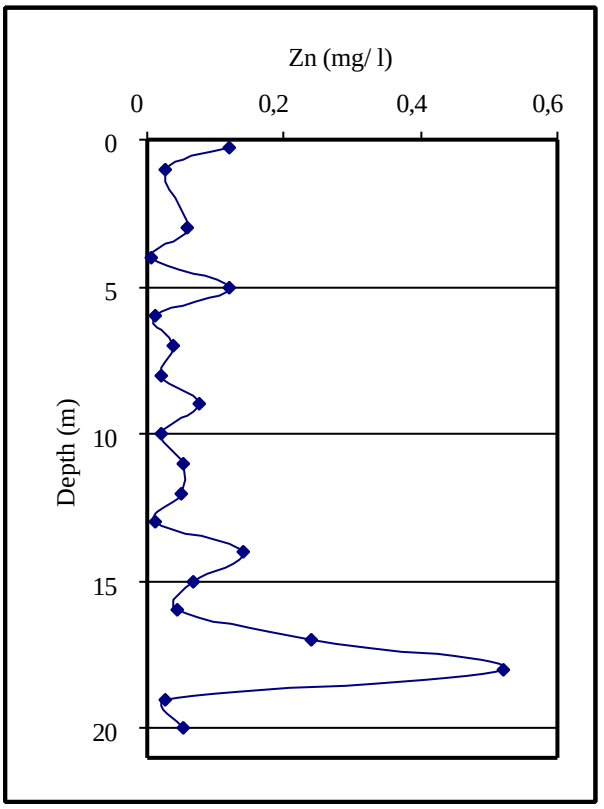


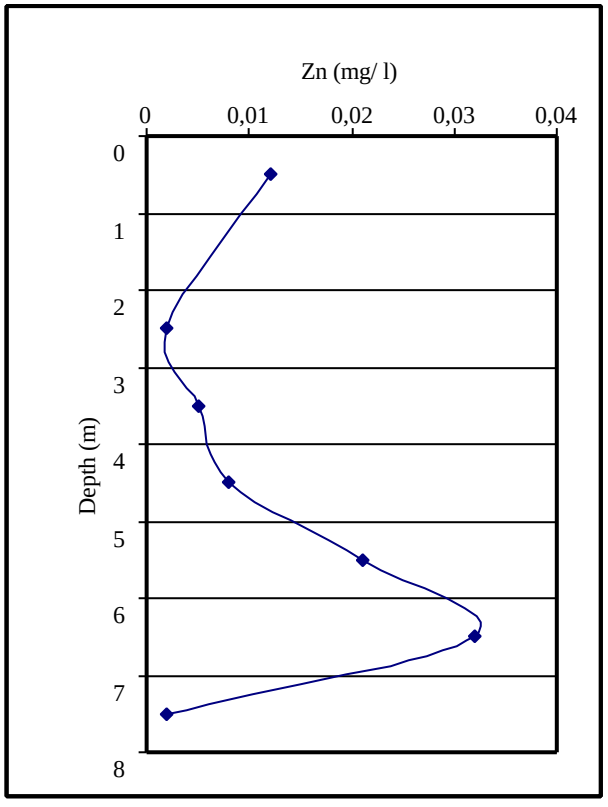


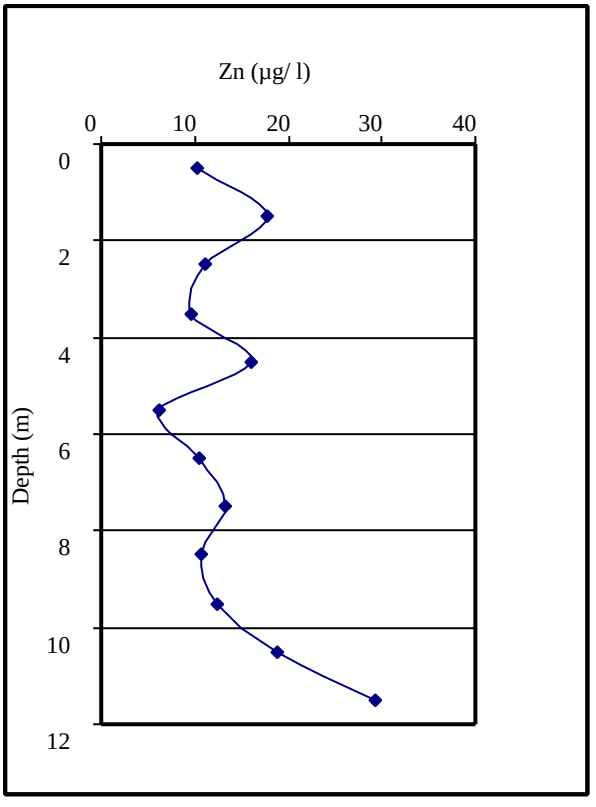


Appendix: 7.7.17. The Change with Depth of the Zinc Concentration in each Borehole.









Appendix: 7.7.18 The Recorded Physical and Chemical Characteristics in each Borehole as well as the DOC Contents in the water extracts.

Borehole N°1

Interval of depth	Temperatur (°C)	pH	EC µs/cm	TDS mg / l	DOC mg / l	m mmol/ l	p mmol/ l
0-1m	19,9	6,93	38	28,2	1,7	0,5	-0,3
1-1,5m	20,4	8,04	177	92,3	3,8	1,12	-0,08
1,5-2,5	19,9	7,14	97	48,5	3,6	0,6	-0,16
2,5-3,5	19,7	7,72	97	50,9	1,9	1,12	-0,08
3,5-4,5	20	7,75	180	123,4	1,2	1,92	-0,2
5,5-6,5	19,9	8,95	240	122,8	3,6	2,3	0,08
6,5-7,5	20,6	9,23	220	110,9	2,1	2,3	0,2
7,5-8,5	19,8	9,63	280	132,9	26	2,56	0,48
8,5-9,5	19,6	7,85	360	212,2	74,8	1,5	-0,2

Borehole N°2

Interval of depth	T (°C)	pH	EC (µs/ cm)	TDS (mg/ l)	DOC (mg/ l)	m (mmol/l)	p (mmol/l)
0-0,5	20,1	6,93	24	15,2	0,8	0,2	-0,1
0,5-1,5	23,4	7,43	34	25	1,9	0,5	-0,2
2,5-3,5	19,7	7,72	48	33,5	1,4	0,2	-0,1
3,5-4,5	21	7,15	73	36,5	1	0,4	-0,1
4,5-5,5	20	7,13	69	43,7	1,5	0,7	-0,1
5,5-6,5	20,1	9,29	800	464,6	1,8	3,8	0,6
6,5-7,5	22,9	9,84	640	401,2	5	6	1,5
7,5-8,5	20,6	9,23	660	347,4	2	6,6	1,2
8,5-9,5	23	9,93	490	204,6	2,7	4,4	2
9,5-10,5	19,8	9,8	470	202,4	2	5,2	1,5
10,5-11,5	23,4	9,94	490	201,2	1,1	5,8	1,7
11,5-12,5	22,5	9,89	500	204,1	4,1	5,6	1,6
12,5-13,5	21,8	9,96	490	197	1,9	5,7	1,8
13,5-14,5	22,7	9,74	490	196,8	3	5,25	1,4
14,5-15,5	20	9,67	520	209,3	2,4	6,1	1,8
15,5-16,5	21,2	9,72	440	193,1	2,9	5,3	1,5
16,5-17,5	23	10,07	390	169,5	2,4	5,7	1,3
17,5-18,5	22,7	9,53	506	204,3	2,8	6,3	1,3
18,5-19,5	20,3	9,64	580	251,8	1,5	6,6	1,5
19,5-20,2	20,5	8,73	311	118,1	128		

Appendix: 7.7.18 The Recorded Physical and Chemical Characteristics in each Borehole as well as the DOC Contents in the water extracts.

Borehole N°3

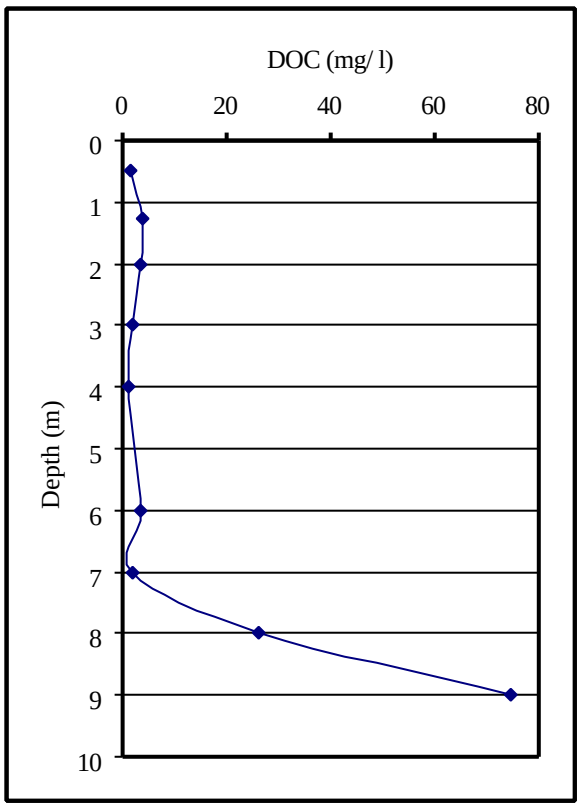
Interval of depth	T (°C)	pH	EC (µs/ cm)	TDS (mg/l)	DOC (mg/l)	m (mmol/l)	p (mmol/l)
0-1m	20,5	6,85	56	40,6	1,3	0,4	-0,05
1-2m	21,1	7,52	143	78,8	1	0,9	-0,05
2-3m	20,3	7,79	73	37	1,9	0,8	-0,05
3-4m	20,3	7,77	177	94,1	1,6	1,6	-0,05
4-5m	20,4	7,73	283	174,1	1	1,45	-0,15
5-6m	20,6	7,75	150	87,3	1,8	1,25	-0,1
6-7m	19,6	7,94	160	91,3	1,4	1,25	-0,1
7-8m	20,3	7,86	170	102,7	1,2	1,1	-0,05

Borehole N°4

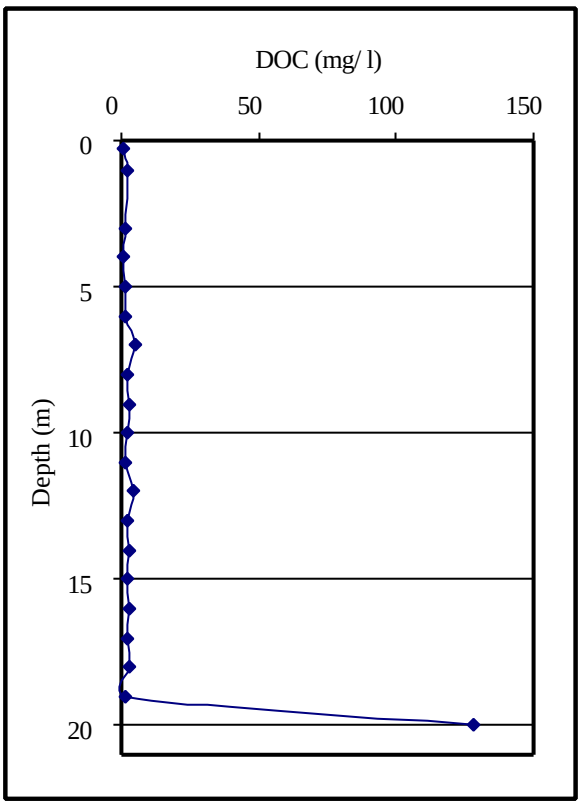
Interval of depth	T (°C)	pH	EC (µs/ cm)	TDS (mg/l)	DOC (mg/l)	m (mmol/l)	p (mmol/l)
0-1m	22,8	6,83	122	75,6	0,79	0,4	-0,05
1-2m	21,9	6,18	183	130,6	1,29	0,2	-0,05
2-3m	22,6	7,14	244	176,4	1,13	1,2	-0,1
3-4m	22,3	7,54	206	132,6	1,36	1	-0,1
4-5m	22,1	7,67	238	159,6	1,13	1,2	-0,1
5-6m	22,1	7,52	222	141,8	1,69	1	-0,1
6-7m	22	7,68	212	127,3	1,85	1	-0,1
7-8m	22	7,62	222	140,1	1,2	1	-0,1
8-9m	22,3	7,49	299	177,4	1,19	1	-0,1
9-10m	22,3	7,45	296	180,9	1,65	0,7	-0,05
10-11m	22,3	6,46	62	37,5	6,74	0,46	-0,05
11-12m	22	7,17	125	70	142	1,06	-0,1

Appendix: 7.7.19. The Change with Depth of the DOC content in each Borehole.

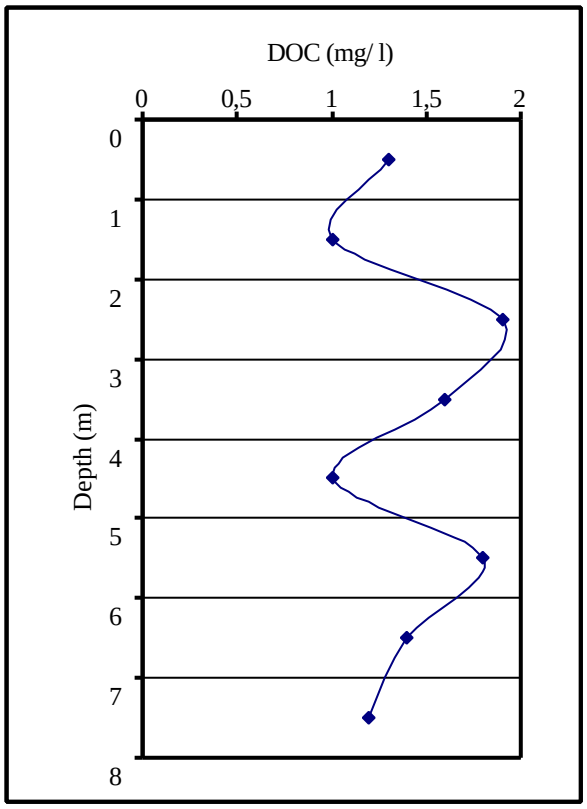
Borehole N°1



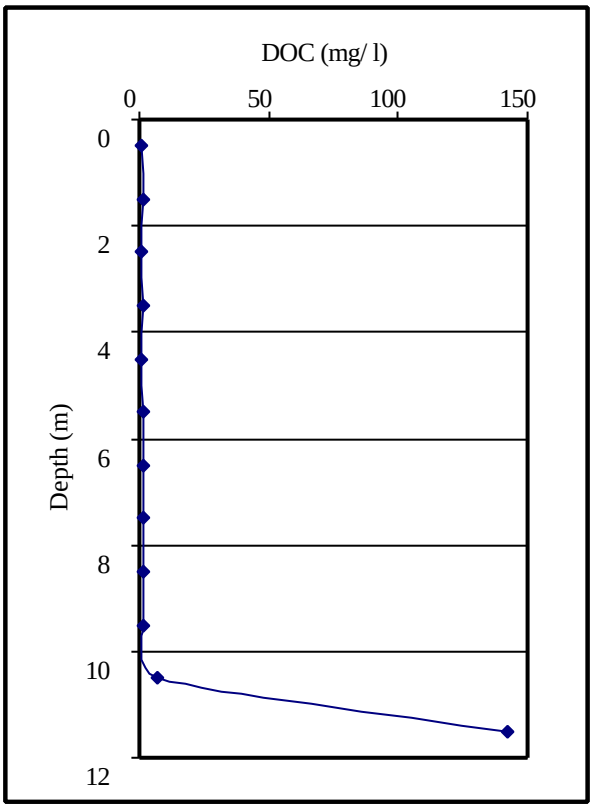
Borehole N°2



Borehole N°3

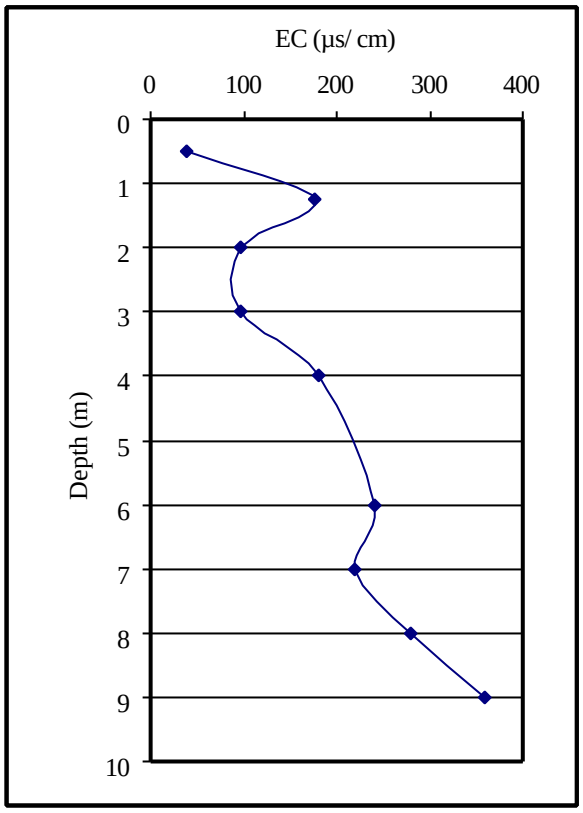


Borehole N°4

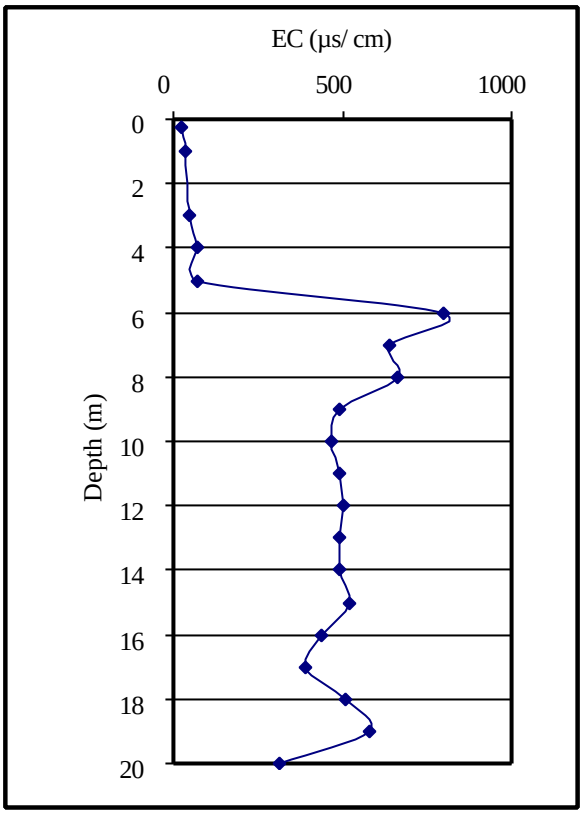


Appendix: 7.7.19. The Change with Depth of the EC value in each Borehole.

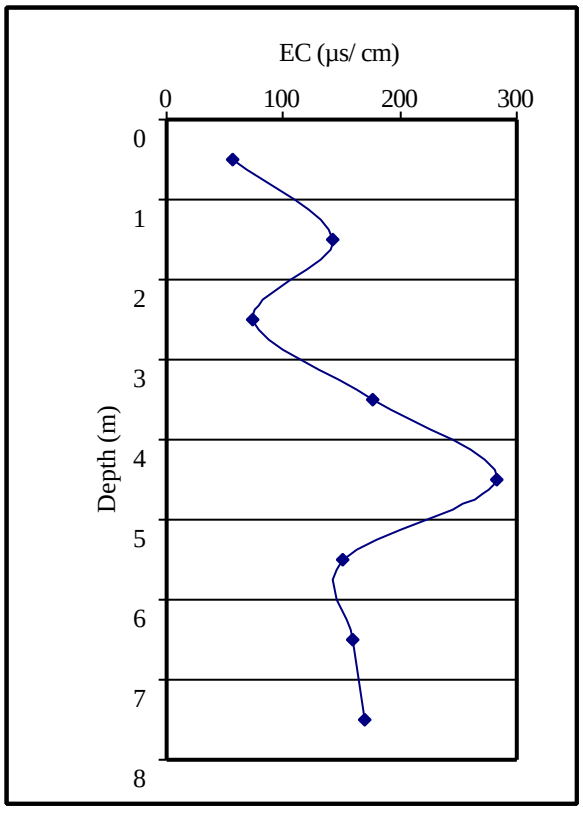
Borehole N°1



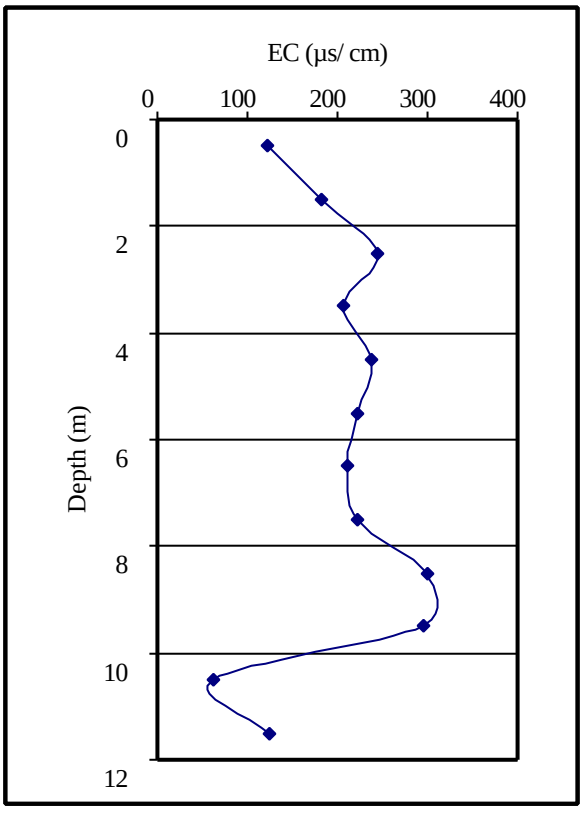
Borehole N°2



Borehole N°3

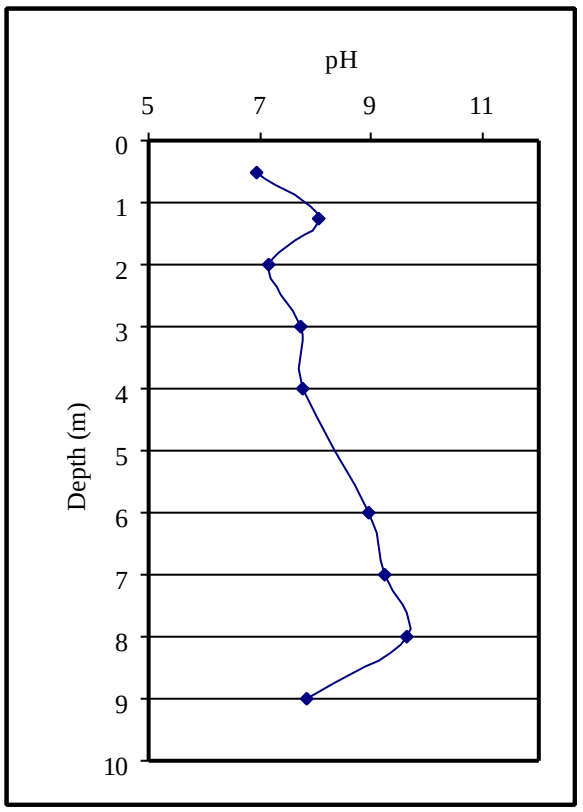


Borehole N°4

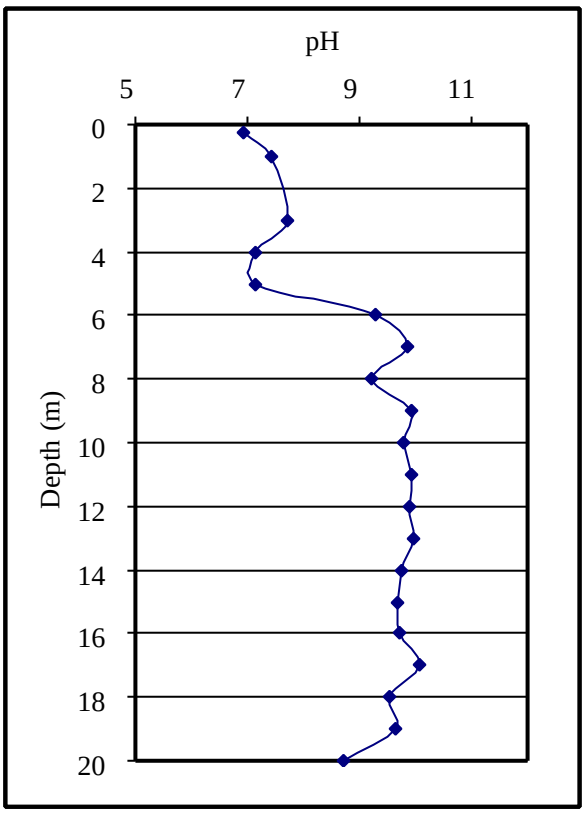


Appendix: 7.7.19. The Change with Depth of the pH value in each Borehole.

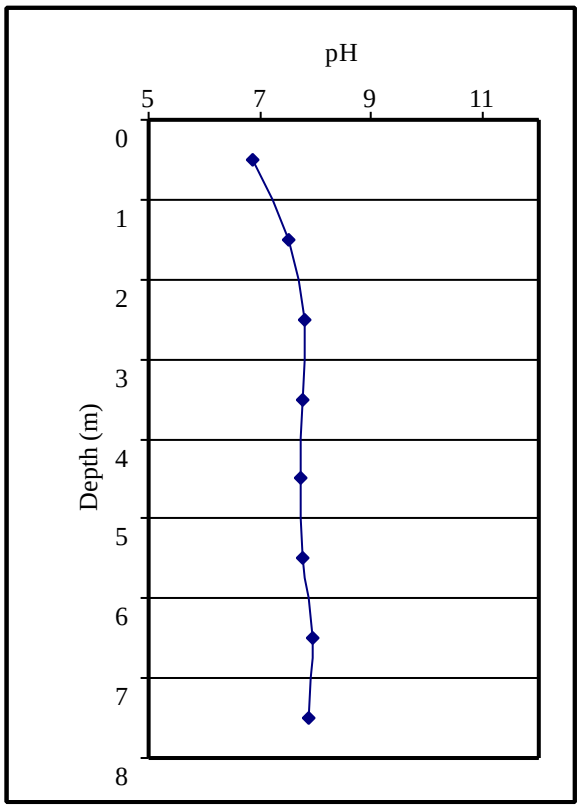
Borehole N°1



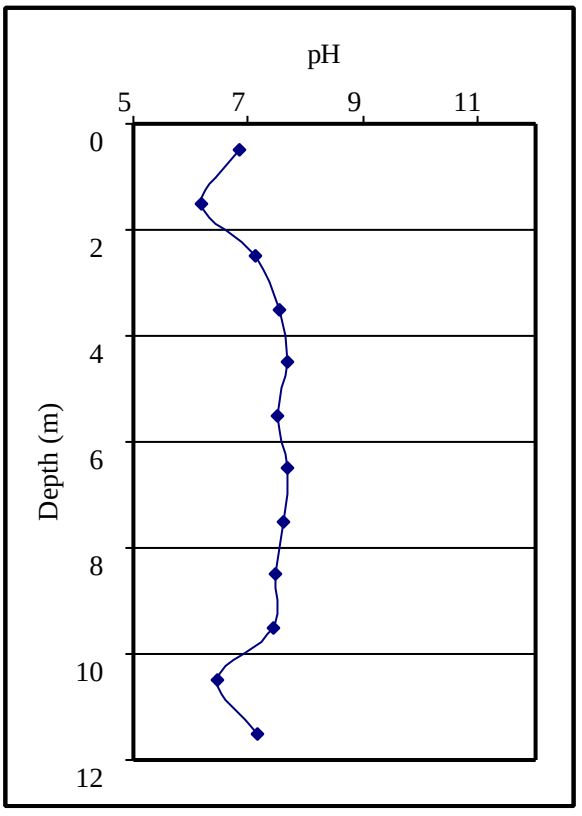
Borehole N°2



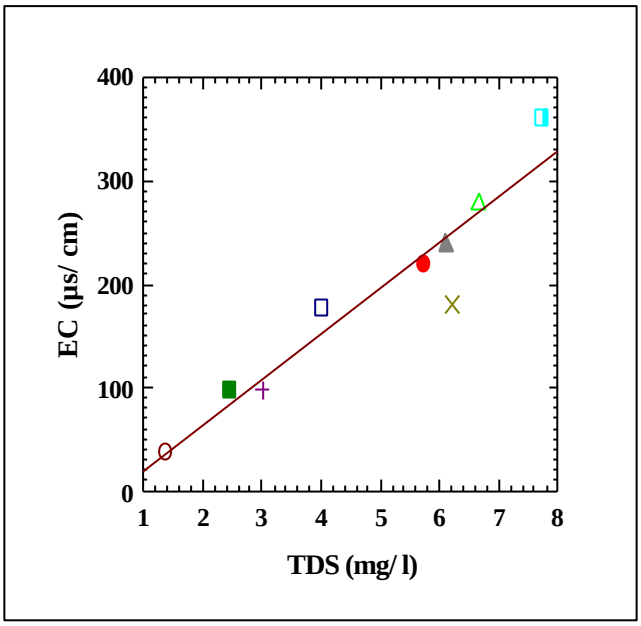
Borehole N°3

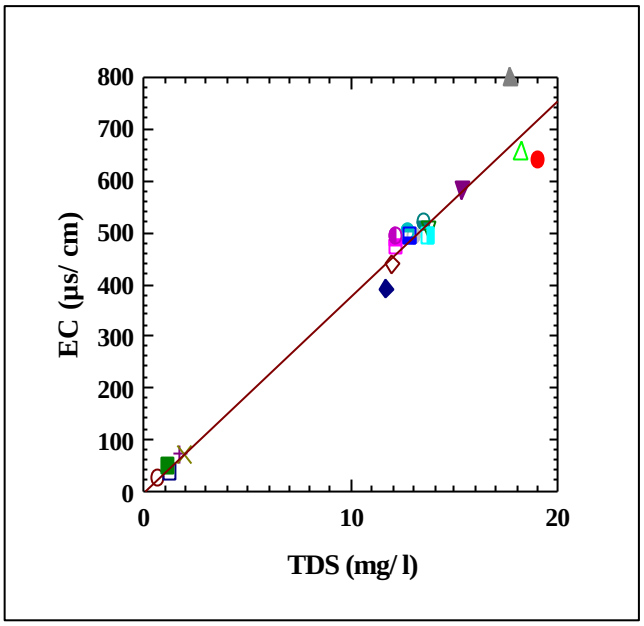


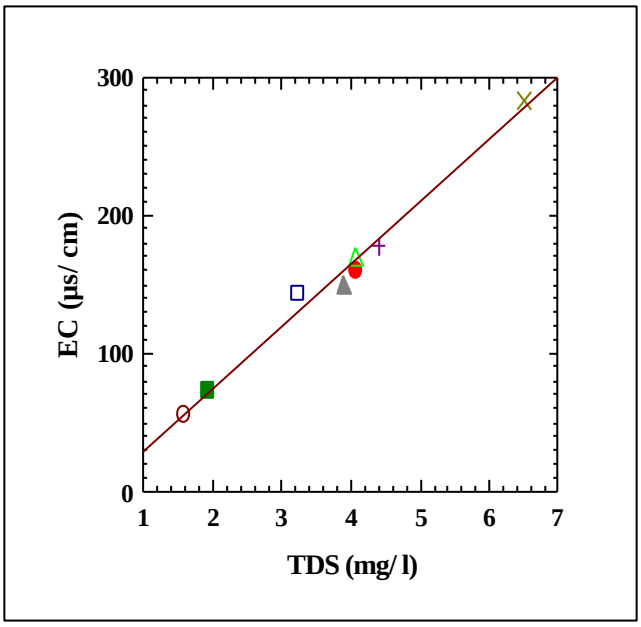
Borehole N°4

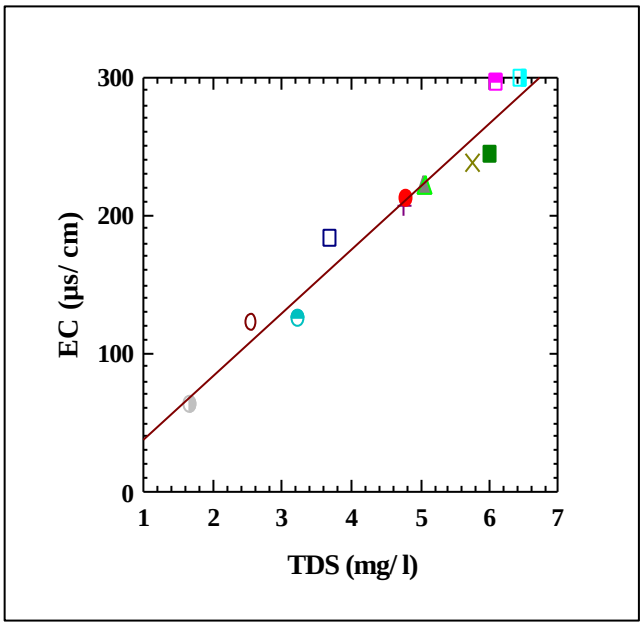


Appendix: 7.7.19. The Relationship between the TDS and the EC values in each Borehole.



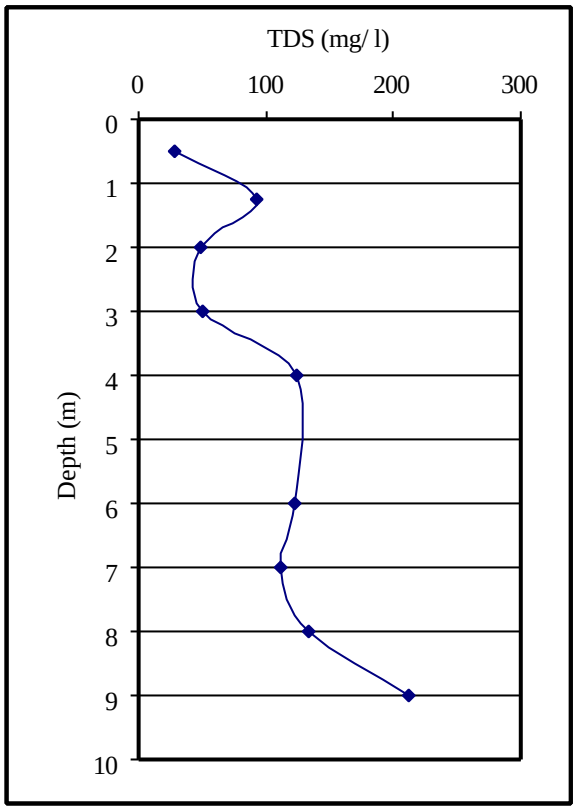




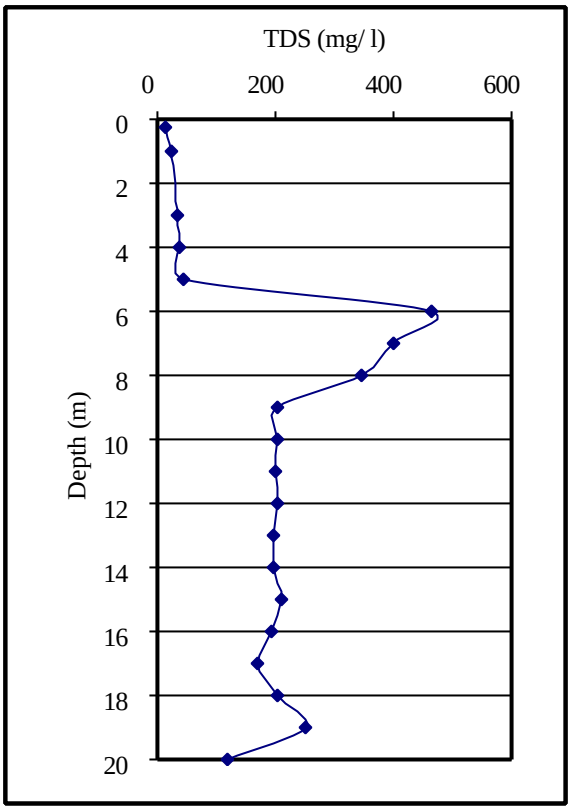


Appendix: 7.7.19. The Change with Depth of the TDS value in each Borehole.

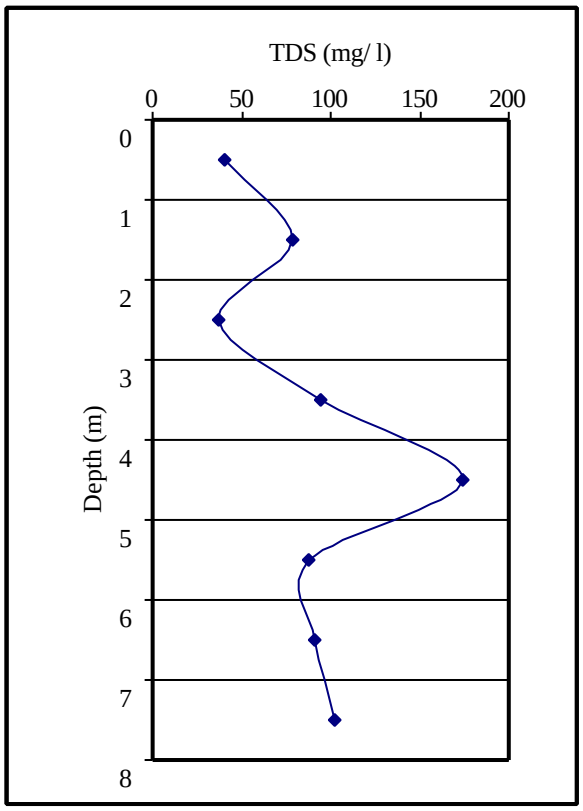
Borehole N°1



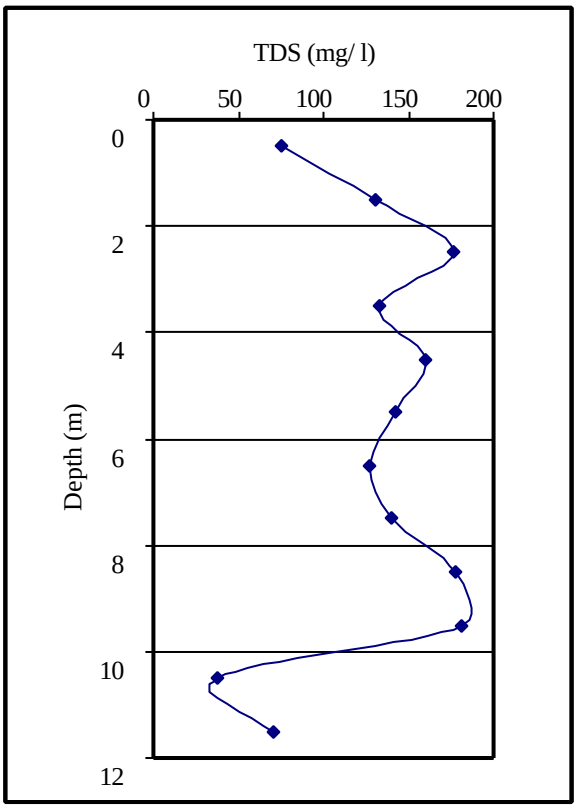
Borehole N°2



Borehole N°3



Borehole N°4



Borehole
N°1

Interval	HCO_3^-	CO_2	CO_3^{2-}	F^-	Cl^-	SO_4^{2-}	Na^+	K^+	Ca^{2+}	Mg^{2+}	F^-	Cl^-	SO_4^{2-}	HCO_3^-	CO_3^{2-}	Na^+	K^+	Ca^{2+}	Mg^{2+}	TDA	TDC	TDI	Balance
of depth	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	(%)
0-1m	30,5	13,2		0,7	0,4	6,1	1,8	3,1	7,7	2,1	0,04	0,01	0,13	0,5		0,08	0,08	0,39	0,17	0,68	0,72	1,39	2,9
1-1,5m	68,32	3,52		0,9	0,8	35	25	3,6	13,8	2,9	0,05	0,02	0,73	1,12		1,09	0,09	0,69	0,24	1,92	2,11	4,03	4,7
1,5-2,5	36,6	7,04		4,5	0,4	21	19	2,6	3,7	1,2	0,24	0,01	0,44	0,6		0,83	0,07	0,19	0,10	1,29	1,18	2,46	4,4
2,5-3,5	68,32	3,52		0,37	7,7	8,1	26	1,8	4,9	0,71	0,02	0,22	0,17	1,12		1,13	0,05	0,25	0,06	1,53	1,48	3,01	1,5
3,5-4,5	117,1	8,8		0,22	0,4	46	32	5,4	26,4	5,5	0,01	0,01	0,96	1,92		1,39	0,14	1,32	0,45	2,90	3,30	6,20	6,5
4,5-5,5																							
5,5-6,5	130,5		4,8	0,31	7,8	39	39	21	8,8	1,1	0,02	0,22	0,81	2,14	0,16	1,70	0,54	0,44	0,09	3,35	2,76	6,11	9,6
6,5-7,5	115,9		12	0,24	1,7	37	36	21	8	1,3	0,01	0,05	0,77	1,9	0,4	1,57	0,54	0,40	0,11	3,13	2,61	5,74	9,1
7,5-8,5	97,6		26,22	0,21	4,3	44	49	24	6,1	1	0,01	0,12	0,92	1,6	0,87	2,13	0,61	0,31	0,08	3,52	3,13	6,65	5,9
8,5-9,5	91,5	8,8		0,5	5,6	121	74	8,9	1,4	0,22	0,03	0,16	2,52	1,5		3,22	0,23	0,07	0,02	4,20	3,53	7,74	8,7

Borehole
N°2

Interval	HCO_3^-	CO_2	CO_3^{2-}	F^-	Cl^-	NO_3^-	SO_4^{2-}	Na^+	K^+	Ca^{2+}	Mg^{2+}	F^-	Cl^-	NO_3^-	SO_4^{2-}	HCO_3^-	CO_3^{2-}	Na^+	K^+	Ca^{2+}	Mg^{2+}	TDA	TDC	TDI	Balance
of depth	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	(%)
0-0,5	12,2	4,4		1,2	<0,4	<0,5	3,3	0,96	3	3,9	0,84	0,06	<0,01	<0,01	0,07	0,20		0,04	0,08	0,20	0,07	0,33	0,38	0,71	7,1
0,5-1,5	30,5	8,8		0,7	1,4	<0,5	5,4	1,18	2,8	7	1,5	0,03	0,04	<0,01	0,11	0,50		0,05	0,07	0,35	0,12	0,69	0,60	1,28	7,0
2,5-3,5	12,2	4,4		0,6	<0,4	<0,5	15	0,78	1,9	6,7	2,3	0,03	<0,01	<0,01	0,31	0,20		0,03	0,05	0,34	0,19	0,55	0,61	1,15	5,4
3,5-4,5	24,4	4,4		0,4	<0,4	<0,5	18	0,9	2,4	10,1	3,7	0,02	<0,01	<0,01	0,38	0,40		0,04	0,06	0,51	0,30	0,79	0,91	1,70	6,8
4,5-5,5	42,7	4,4		0,7	<0,4	<0,5	16	1,78	2,3	10,4	3,2	0,03	<0,01	<0,01	0,33	0,70		0,08	0,06	0,52	0,26	1,07	0,92	1,99	7,4
5,5-6,5	159		36	1	4	<0,5	270	170	3,9	9,9	0,75	0,05	0,11	<0,01	5,63	2,60	1,20	7,39	0,10	0,50	0,06	9,59	8,05	17,64	8,7
6,5-7,5	183		85,9	2,2	27	12	170	180	3	11,8	1,4	0,12	0,76	0,19	3,54	3,00	2,86	7,83	0,08	0,59	0,12	10,47	8,61	19,08	9,8
7,5-8,5	256		72	2,4	17	0,5	130	160	1,6	20,7	3,1	0,13	0,48	0,01	2,71	4,20	2,40	6,96	0,04	1,04	0,26	9,92	8,29	18,21	9,0
8,5-9,5	146		113	1,5	13	<0,5	44	127	2,7	10,5	0,86	0,08	0,37	<0,01	0,92	2,40	3,77	5,52	0,07	0,53	0,07	7,53	6,19	13,71	9,8
9,5-10,5	134		86,2	1,2	19	<0,5	52	111	1,8	10,1	1,6	0,06	0,52	<0,01	1,08	2,20	2,87	4,83	0,05	0,51	0,13	6,74	5,51	12,25	10,1
10,5-11,5	146		96,8	1	24	<0,5	42	117	2,3	10,6	2,1	0,05	0,68	<0,01	0,88	2,40	3,23	5,09	0,06	0,53	0,17	7,23	5,85	13,08	10,6
11,5-12,5	146		91,3	0,6	23	<0,5	39	115	2,3	14	1,5	0,03	0,65	<0,01	0,81	2,40	3,04	5,00	0,06	0,70	0,12	6,94	5,88	12,82	8,2
12,5-13,5	131		103	0,8	22	<0,5	39	115	4,5	11	1,6	0,04	0,62	<0,01	0,81	2,15	3,42	5,00	0,12	0,55	0,13	7,04	5,80	12,84	9,7
13,5-14,5	149		80,7	0,7	19	<0,5	41	105	18	9,2	1,3	0,04	0,54	<0,01	0,85	2,45	2,69	4,57	0,46	0,46	0,11	6,57	5,59	12,16	8,0
14,5-15,5	153		105	1	24	<0,5	28	116	23	10,2	1,2	0,05	0,68	<0,01	0,58	2,50	3,51	5,04	0,59	0,51	0,10	7,32	6,24	13,56	7,9
15,5-16,5	140		86,9	0,8	18	<0,5	39	102	19	8,2	1,1	0,04	0,51	<0,01	0,81	2,30	2,90	4,43	0,49	0,41	0,09	6,56	5,42	11,98	9,5
16,5-17,5	189		71	0,6	12	<0,5	29	100	6,7	10,7	2,3	0,03	0,34	<0,01	0,60	3,10	2,37	4,35	0,17	0,54	0,19	6,44	5,24	11,68	10,2
17,5-18,5	226		76	0,7	6,9	<0,5	48	130	2	9,3	1,4	0,04	0,19	<0,01	1,00	3,70	2,53	5,65	0,05	0,47	0,12	7,46	6,28	13,75	8,6
18,5-19,5	220		87,4	1,6	13	<0,5	73	140	8,4	9,6	1,4	0,08	0,35	<0,01	1,52	3,61	2,91	6,09	0,21	0,48	0,12	8,48	6,90	15,37	10,3
19,5-20,2				0,4	1,6	<0,5	5,6	101	1,8	4,7	0,4		0,05	<0,01	0,12	0,00									

Borehole
N°3

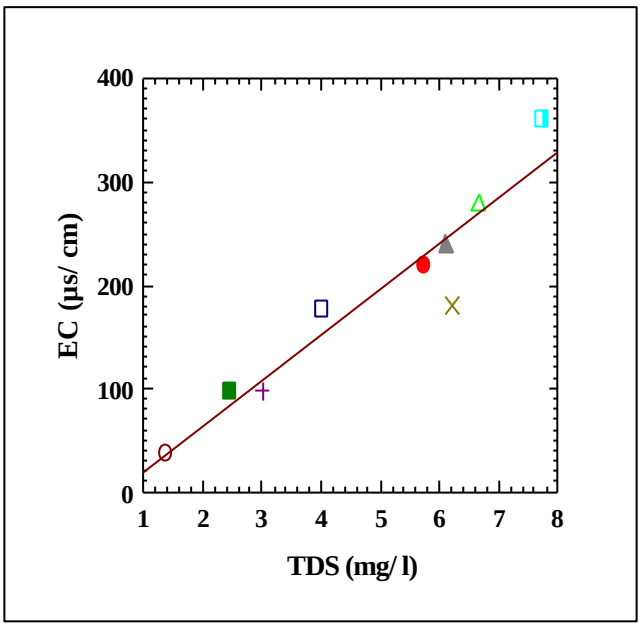
Interval	HCO_3^-	CO_2	F^-	Cl^-	SO_4^{2-}	Li^+	Na^+	K^+	Ca^{2+}	Mg^{2+}	F^-	Cl^-	SO_4^{2-}	HCO_3^-	Na^+	K^+	Ca^{2+}	Mg^{2+}	TDA	TDC	TDI	Balance
of depth	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l	(%)
0-1m	24,4	2,2	0,63	0,79	14	0,03	1,48	4,9	8,3	2,8	0,03	0,02	0,29	0,4	0,06	0,13	0,42	0,22	0,75	0,83	1,58	8,2
1-2m	54,9	2,2	2,3	<0,4	30	0,01	0,89	2,9	27	1,8	0,12	<0,01	0,63	0,9	0,04	0,07	1,35	0,14	1,65	1,61	3,25	3,9
2-3m	48,8	2,2	0,37	<0,4	8,1	<0,008	0,55	1,3	15,7	1,4	0,02	<0,01	0,17	0,8	0,02	0,03	0,79	0,11	0,99	0,95	1,94	3,4
3-4m	97,6	2,2	0,42	1	29	<0,008	7,2	4,6	25	5,9	0,02	0,03	0,60	1,6	0,31	0,12	1,25	0,47	2,25	2,15	4,41	10,2
4-5m	88,5	6,6	2,4	1,2	81	<0,008	22,5	5,9	28	8,6	0,13	0,03	1,69	1,5	0,98	0,15	1,40	0,69	3,30	3,22	6,51	8,0
5-6m	76,3	4,4	0,86	0,65	32	<0,008	18,7	10	12,3	3	0,05	0,02	0,67	1,3	0,81	0,26	0,62	0,24	1,98	1,92	3,90	5,6
6-7m	76,3	4,4	0,72	0,7	36	0,01	23,4	3,6	13,9	2,7	0,04	0,02	0,75	1,3	1,02	0,09	0,70	0,22	2,06	2,02	4,08	3,7
7-8m	67,1	2,2	0,47	1,4	44	0,01	23	3,9	15,4	2,9	0,02	0,01	0,92	1,1	0,00	0,59	0,20	1,23	2,05	2,02	4,07	3,9

Borehole
N°4

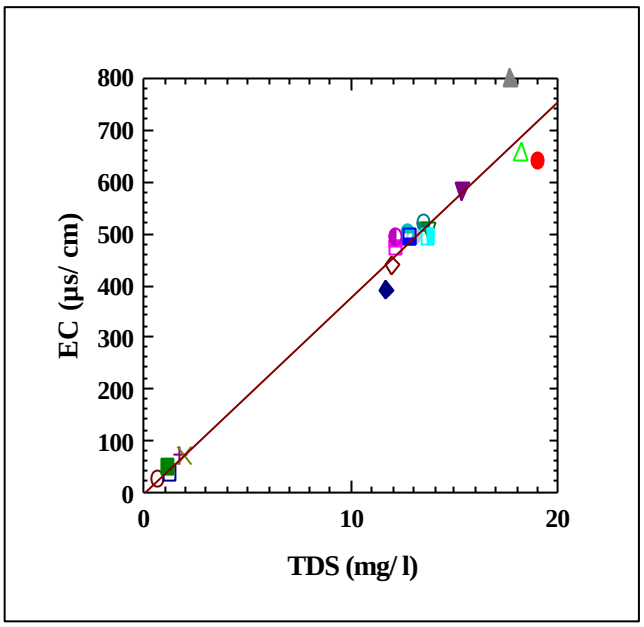
Interval of depth	HCO_3^- mg/l	CO_2 mg/l	F^- mg/l	Cl^- mg/l	NO_3^- mg/l	SO_4^{2-} mg/l	Na^+ mg/l	K^+ mg/l	Ca^{2+} mg/l	Mg^{2+} mg/l	HCO_3^- meq/l	F^- meq/l	Cl^- meq/l	NO_3^- meq/l	SO_4^{2-} meq/l	Na^+ meq/l	K^+ meq/l	Ca^{2+} meq/l	Mg^{2+} meq/l	TDA meq/l	TDC meq/l	TDI meq/l	Balance (%)
0-1m	24,4	2,2	1,7	<0,5	<0,5	35	0,2	1,1	21	3,1	0,40	0,09	<0,01	<0,01	0,73	0,01	0,03	1,05	0,26	1,22	1,34	2,56	4,8
1-2m	12,2	2,2	1,1	<0,5	<0,5	72	0,25	0,9	29	5,6	0,20	0,06	<0,01	<0,01	1,50	0,01	0,02	1,45	0,46	1,76	1,94	3,70	5,0
2-3m	73,2	4,4	<0,3	<0,5	<0,5	83	1,3	2,4	44	9,5	1,20	0,00	<0,01	<0,01	1,73	0,06	0,06	2,20	0,78	2,93	3,10	6,03	2,8
3-4m	61	4,4	<0,3	<0,5	<0,5	57	8,5	2,9	31	7,1	1,00	0,00	<0,01	<0,01	1,19	0,37	0,07	1,55	0,58	2,19	2,58	4,77	8,2
4-5m	73,2	4,4	1,2	<0,5	<0,5	73	11,4	3	36	7,3	1,20	0,06	<0,01	<0,01	1,52	0,50	0,08	1,80	0,60	2,78	2,97	5,76	3,3
5-6m	61	4,4	0,3	<0,5	<0,5	63	17	8,8	27	5	1,00	0,02	<0,01	<0,01	1,31	0,74	0,23	1,35	0,41	2,33	2,73	5,05	7,9
6-7m	61	4,4	0,3	0,7	<0,5	56	25	2,9	22	3,9	1,00	0,02	0,02	<0,01	1,17	1,09	0,07	1,10	0,32	2,20	2,58	4,78	7,9
7-8m	61	4,4	<0,3	2,2	<0,5	60	18,7	2,7	28	5,8	1,00	0,00	0,06	<0,01	1,25	0,81	0,07	1,40	0,48	2,31	2,76	5,07	8,8
8-9m	61	4,4	1,2	9,5	7,4	75	37	2,7	29	3,9	1,00	0,06	0,27	0,12	1,56	1,61	0,07	1,45	0,32	3,01	3,45	6,46	6,7
9-10m	42,7	2,2	<0,3	29	<0,5	61	29	2,6	34	3,3	0,70	0,00	0,82	<0,01	1,27	1,26	0,07	1,70	0,27	2,79	3,30	6,09	8,4
10-11m	28,46	2,2	<0,3	8,4	<0,5	4,5	8,5	1,1	10	<0,3	0,47	0,00	0,24	<0,01	0,09	0,37	0,03	0,50	0,00	0,80	0,90	1,69	5,9
11-12m	65,06	4,4	0,6	0,7	1	16,4	1,8	2,1	29	2,2	1,07	0,03	0,02	0,02	0,34	0,08	0,05	1,45	0,18	1,48	1,76	3,24	8,9

Appendix: 7.7.21. The Relationship between the TDS and the EC values in each Borehole.

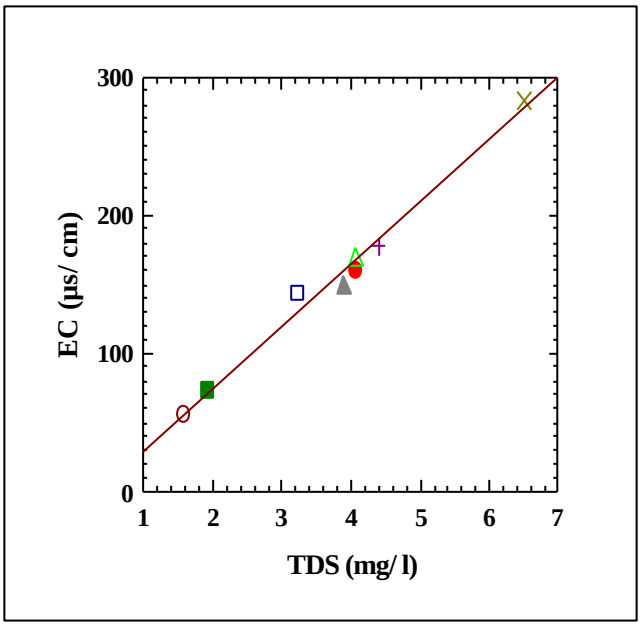
Borehole N°1



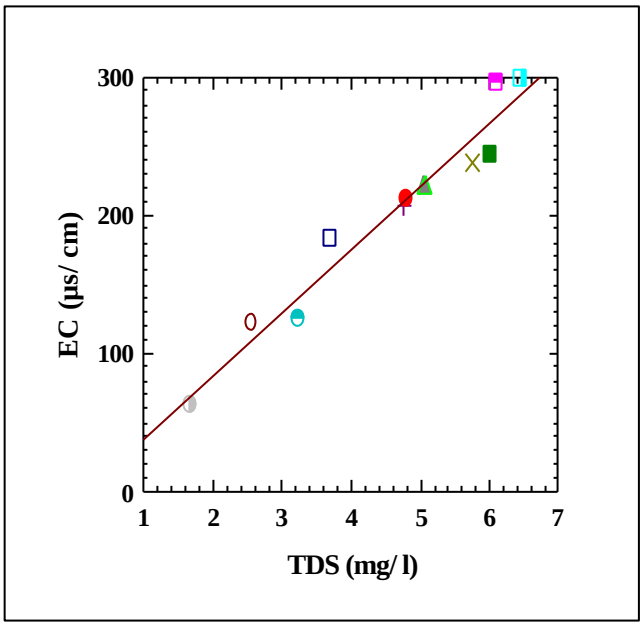
Borehole N°2



Borehole N°3



Borehole N°4



Appendix: 7.7.22. The Change with Depth of Heavy and Trace metals with Depth in the First Borehole.

Borehole	Al	As (tot)	As(III)	As(V)	Ba	Cr	Cu	Fe	Mg	Mn	Ni	Pb	Ti	U	Zn
N°1	mg / l	µg / l	µg / l	µg / l	µg/ l	µg / l	µg/ l	mg / l	mg / l	mg / l	µg/ l	µg/ l	mg / l	mg / l	mg / l
Interval of depth															
0-1 m	0,05	14	<5	14	47,51	1,1	6	0,19	0,89	0,14	1,7	7,5	<0,017	0,07	0,037
1-1,5 m	0,54	13	3	10	63,91	3	19	0,67	2,24	0,13	5,5	6	<0,017	0,38	0,009
1,5-2,5 m	1,16	390	200	190	42,21	4,3	34	0,9	0,76	0,04	3,2	19	<0,017	0,05	0,023
2,5-3,5 m	0,4	37	21	16	134,71	1,7	10	0,43	1,85	0,04	2,7	1,6	<0,017	0,04	0,006
3,5-4,5 m	0,03	152	49	103	110,81	0,3	6	0,08	4,65	0,2	3,4	<1	<0,017	0,29	0,005
5,5-6,5 m	4,29	700	135	565	88,81	6,5	72	2,95	1,02	0,09	42	30	<0,017	0,2	0,07
6,5-7,5 m	1,7	630	210	420	111,01	8	84	2,86	0,71	0,17	38	64	<0,017	0,39	0,17
7,5-8,5 m	4,12	380	110	270	76,11	10	86	4,39	0,73	0,38	26	85	<0,017	0,02	0,3
8,5-9,5 m	13,59	980	115	865	297,41	40	76	23	0,86	0,27	12	60	0,02	0,27	0,045

Appendix: 7.7.22. The Change with Depth of Heavy and Trace metals with Depth in the Second Borehole.

Borehole	Al	As (tot)	As(III)	As(V)	Ba	Cr	Cu	Fe	Mg	Mn	Mo	Ni	Pb	Ti	U	Zn
N°2	mg / l	µg / l	µg / l	µg / l	µg/ l	µg/ l	µg/ l	mg / l	mg / l	mg / l	mg / l	µg/ l	µg/ l	mg / l	mg / l	mg / l
Interval																
of depth																
0-0,5 m	1,22	14	<5	14	44,41	2,5	35	1,51	0,62	0,05	<0,014	4	19	<0,017	0,02	0,12
0,5-1,5 m	0,16	13	3	10	47,91	1,2	16	0,54	0,86	0	<0,014	4,8	1,5	<0,017	<0,08	0,025
2,5-3,5 m	0,71	390	200	190	59,81	3	37	1,59	1,94	0,05	<0,014	7	3,9	<0,017	<0,08	0,058
3,5-4,5 m		37	21	16	82,91	0,4	8,3	0,14	3,19	0,02	<0,014	2,2	<1	<0,017	0,11	0,005
4,5-5,5 m	2,43	152	49	103	194,71	9,5	96	4,78	3,12	0,07	<0,014	20	34	<0,017	<0,08	0,12
5,5-6,5 m	0,93				34,61	1,5	18	0,57	0,2	0,05	0,01	12	6,5	<0,017	1,46	0,013
6,5-7,5 m	0,75	700	135	565	109,41	6,5	47	1,88	0,39	0,05	0,02	50	35	<0,017	1,2	0,037
7,5-8,5 m	2,2	630	210	420	143,31	4	42	1,53	0,66	0,04	0,16	46	27	<0,017	1,65	0,02
8,5-9,5 m	3,02	380	110	270	317,11	10,5	91	4,29	0,97	0,2	0,02	85	58	<0,017	0,73	0,075
9,5-10,5 m	1,21	980	115	865	79,41	1,9	19	0,82	0,28	0,02	0,04	20	13	<0,017	0,76	0,021
10,5-11,5 m	1,34	2810			141,01	5,5	50	1,88	0,41	0,09	<0,014	26	42	<0,017	0,56	0,052
11,5-12,5 m	1,51	2620			120,31	5,7	85	1,86	0,41	0,11	<0,014	28	34	<0,017	1,15	0,051
12,5-13,5 m	1,29	2800			42,81	1,3	34	0,7	0,12	0,02	<0,014	7,1	32	<0,017	1,26	0,011
13,5-14,5 m	2,4	2060			120,81	5,5	120	2,7	0,49	0,19	<0,014	25	66	<0,017	1,49	0,14
14,5-15,5 m	5,51	2600			198,01	4,5	76	3,46	0,48	0,15	<0,014	17	47	<0,017	1,15	0,066
15,5-16,5 m	3,61	1780			78,7	2,7	36	2,08	0,36	0,09	<0,014	10,5	23	<0,017	1,9	0,043
16,5-17,5 m	1,81	1240			120,71	7,5	83	3,06	0,67	0,34	<0,014	22	51	<0,017	0,72	0,24
17,5-18,5 m	2,7	1470			158,21	11	190	5,18	0,99	0,62	<0,014	42	85	<0,017	1,18	0,52
18,5-19,5 m	2,65	3760			142,41	4,2	42	2,19	0,37	0,07	<0,014	10	33	<0,017	1,13	0,026
19,5-20,2 m	40,79	360			151,91	75	140	27,51	0,35	0,45	<0,014	19	64	0,05	<0,08	0,054

Appendix: 7.7.22. The Change with Depth of Heavy and Trace metals with Depth in the Third Borehole.

Borehole N°3	Al mg/ l	As µg/ l	Ba µg/ l	Cr µg/l	Cu µg/ l	Fe mg/ l	Mg mg/ l	Mn mg/ l	Ni µg/l	Pb µg/l	U mg/ l	Zn mg/ l
Interval of depth												
0-1m	0,044	<30	84,11	0,4	2,7	0,06	1,51	0,61	9,6	2	0,06	0,012
2-3m	0,47	590	85,71	0,3	3,6	0,07	1,14	0,02	0,7	1	<0,08	<0,005
3-4m	0,01	520	91,71	0,4	14	0,09	5,11	0,13	4	3,7	1,61	0,005
4-5m	0,04	320	66,41	0,5	6,5	0,09	7,94	0,37	3,5	2,5	1,42	0,008
5-6m	2,2	360	110,71	2,7	30	1,42	1,87	0,08	8	16	1,19	0,021
6-7m	1,54	80	61,31	2	22	1,06	1,82	0,14	6,3	9,5	0,34	0,032
7-8m	0,16	370	64,21	0,7	7,9	0,31	2,05	0,06	4,7	2,8	0,97	<0,005

Appendix: 7.7.22. The Change with Depth of Heavy and Trace metals with Depth in the Fourth Borehole.

Borehole N°4	As µg/ l	Ba µg/ l	Cd µg/l	Cu µg/ l	Mn µg/ l	Pb µg/ l	U µg/ l	Zn µg/ l
Interval of depth								
0-1m	175	73,2	0,22	9,19	198	2,71	58,5	10,3
1-2m	54,3	65,3	0,14	6,12	23,2	0,38	5,73	17,7
2-3m	333	106	0,31	5,50	111	0,55	519	11,1
3-4m	427	54,5	0,51	5,19	58,3	1,44	4805	9,52
4-5m	197	54,3	0,24	5,48	88,8	1,52	1741	16,0
5-6m	188	71,8	0,11	7,19	50,1	0,43	2286	6,25
6-7m	96,9	42,2	0,15	5,64	47,4	1,36	514	10,4
7-8m	140	43,1	0,31	3,84	22,4	0,79	737	13,2
8-9m	54,6	38,6	0,14	4,65	27,3	1,04	1814	10,8
9-10m	414	6,56	0,81	13,2	125	5,85	414	12,3
10-11m	0,21	9,24	0,14	8,21	53,7	2,35	0,49	18,8
11-12m	735	77,3	0,57	168	178	31,5	1597	29,2

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Reading data base.
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           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 0-1m
           SOLUTION        1
           units           mg/l
           temp            19.9
           pH              6.93
           F               0.7
           Cl              0.4
           S(6)            6.1       as SO4
           Na              1.8
           K               3.1
           Mg              2.1
           Ca              7.7
           Alkalinity     30.5       as HCO3
           Al              0.05
           As(+3)          0.00
           As(+5)          0.014
           Ba              0.047
           Cu              0.006
           Fe              0.19
           Mn              0.14
           Ni              0.0017
           Pb              0.0075
           U               0.07
           Zn              0.037
           END
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TITLE
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   Schneckentein 0-1m

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Beginning of initial solution calculations.
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Initial solution 1.

----------------------------Solution composition------------
-----------------

           Elements           Molality       Moles

           Al                1.853e-06   1.853e-06
           Alkalinity        4.999e-04   4.999e-04
           As(5)             1.869e-07   1.869e-07
           Ba                3.422e-07   3.422e-07
           Ca                1.921e-04   1.921e-04
           Cl                1.128e-05   1.128e-05
           Cu                9.442e-08   9.442e-08
           F                 3.685e-05   3.685e-05
           Fe                3.402e-06   3.402e-06
           K                 7.928e-05   7.928e-05
           Mg                8.638e-05   8.638e-05
           Mn                2.548e-06   2.548e-06
           Na                7.830e-05   7.830e-05
           Ni                2.896e-08   2.896e-08
           Pb                3.620e-08   3.620e-08
           S(6)              6.350e-05   6.350e-05
           U                 2.941e-07   2.941e-07
           Zn                5.660e-07   5.660e-07
```

```
----------------------------Description of solution----------------------
-----

                                    pH  =   6.930
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   1.034e-03
                     Mass of water (kg)  =   1.000e+00
                 Total carbon (mol/kg)  =   6.271e-04
                    Total CO2 (mol/kg)  =   6.271e-04
                   Temperature (deg C)  =  19.900
                Electrical balance (eq)  =   5.926e-05
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =   4.28
                               Iterations  =  12
                                  Total H  = 1.110129e+02
                                  Total O  = 5.550823e+01
```

----------Distribution of species----------

	Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
	H+	1.216e-07	1.175e-07	-6.915	-6.930	-0.015
	OH-	5.942e-08	5.732e-08	-7.226	-7.242	-0.016
	H2O	5.551e+01	1.000e+00	-0.000	-0.000	0.000
Al	1.853e-06					
	Al(OH)4-	1.322e-06	1.275e-06	-5.879	-5.894	-0.016
	AlF2+	2.290e-07	2.209e-07	-6.640	-6.656	-0.016
	Al(OH)2+	1.031e-07	9.944e-08	-6.987	-7.002	-0.016
	AlF3	9.572e-08	9.574e-08	-7.019	-7.019	0.000
	Al(OH)3	8.454e-08	8.456e-08	-7.073	-7.073	0.000
	AlF+2	1.511e-08	1.309e-08	-7.821	-7.883	-0.062
	AlOH+2	2.723e-09	2.359e-09	-8.565	-8.627	-0.062
	AlF4-	1.365e-09	1.317e-09	-8.865	-8.880	-0.016
	Al+3	5.388e-11	3.902e-11	-10.269	-10.409	-0.140
	AlSO4+	6.322e-12	6.099e-12	-11.199	-11.215	-0.016
	Al(SO4)2-	1.032e-14	9.955e-15	-13.986	-14.002	-0.016
	AlHSO4+2	7.035e-20	6.095e-20	-19.153	-19.215	-0.062
As(5)	1.869e-07					
	HAsO4-2	1.155e-07	1.000e-07	-6.937	-7.000	-0.062
	H2AsO4-	7.139e-08	6.887e-08	-7.146	-7.162	-0.016
	AsO4-3	2.624e-12	1.900e-12	-11.581	-11.721	-0.140
	H3AsO4	1.347e-12	1.347e-12	-11.871	-11.871	0.000
Ba	3.422e-07					
	Ba+2	3.334e-07	2.888e-07	-6.477	-6.539	-0.062
	BaSO4	7.652e-09	7.654e-09	-8.116	-8.116	0.000
	BaHCO3+	1.157e-09	1.116e-09	-8.937	-8.952	-0.016
	BaCO3	2.280e-11	2.280e-11	-10.642	-10.642	0.000
	BaOH+	8.634e-14	8.330e-14	-13.064	-13.079	-0.016
C(4)	6.271e-04					
	HCO3-	4.904e-04	4.734e-04	-3.309	-3.325	-0.015
	CO2	1.342e-04	1.342e-04	-3.872	-3.872	0.000
	CaHCO3+	9.434e-07	9.102e-07	-6.025	-6.041	-0.016
	MgHCO3+	4.155e-07	4.008e-07	-6.381	-6.397	-0.016
	UO2(CO3)2-2	2.286e-07	1.981e-07	-6.641	-6.703	-0.062
	CO3-2	1.950e-07	1.693e-07	-6.710	-6.771	-0.061
	FeHCO3+	1.239e-07	1.195e-07	-6.907	-6.922	-0.016
	MnHCO3+	9.132e-08	8.810e-08	-7.039	-7.055	-0.016
	UO2CO3	5.485e-08	5.486e-08	-7.261	-7.261	0.000
	CaCO3	4.250e-08	4.251e-08	-7.372	-7.372	0.000
	MnCO3	2.807e-08	2.808e-08	-7.552	-7.552	0.000
	ZnHCO3+	2.754e-08	2.657e-08	-7.560	-7.576	-0.016
	PbCO3	2.270e-08	2.271e-08	-7.644	-7.644	0.000
	CuCO3	2.160e-08	2.160e-08	-7.666	-7.665	0.000
	NaHCO3	2.010e-08	2.010e-08	-7.697	-7.697	0.000
	ZnCO3	1.505e-08	1.506e-08	-7.822	-7.822	0.000
	NiCO3	1.460e-08	1.460e-08	-7.836	-7.836	0.000
	MgCO3	1.103e-08	1.103e-08	-7.958	-7.958	0.000
	FeCO3	1.025e-08	1.026e-08	-7.989	-7.989	0.000
	CuHCO3+	5.844e-09	5.638e-09	-8.233	-8.249	-0.016
	UO2(CO3)3-4	3.780e-09	2.130e-09	-8.422	-8.672	-0.249
	PbHCO3+	3.008e-09	2.902e-09	-8.522	-8.537	-0.016
	BaHCO3+	1.157e-09	1.116e-09	-8.937	-8.952	-0.016
	NiHCO3+	7.881e-10	7.604e-10	-9.103	-9.119	-0.016
	NaCO3-	1.899e-10	1.832e-10	-9.721	-9.737	-0.016
	Zn(CO3)2-2	6.291e-11	5.450e-11	-10.201	-10.264	-0.062
	BaCO3	2.280e-11	2.280e-11	-10.642	-10.642	0.000
	Pb(CO3)2-2	1.115e-11	9.657e-12	-10.953	-11.015	-0.062
	Cu(CO3)2-2	5.315e-12	4.604e-12	-11.275	-11.337	-0.062
	Ni(CO3)2-2	4.959e-12	4.296e-12	-11.305	-11.367	-0.062
	(UO2)3(CO3)6-6	4.173e-17	1.147e-17	-16.380	-16.940	-0.561
	UO2(CO3)3-5	7.778e-26	3.173e-26	-25.109	-25.499	-0.389
	U(CO3)4-4	5.235e-31	2.949e-31	-30.281	-30.530	-0.249
	U(CO3)5-6	1.271e-36	3.493e-37	-35.896	-36.457	-0.561
Ca	1.921e-04					
	Ca+2	1.894e-04	1.644e-04	-3.723	-3.784	-0.062
	CaSO4	1.652e-06	1.652e-06	-5.782	-5.782	0.000
	CaHCO3+	9.434e-07	9.102e-07	-6.025	-6.041	-0.016
	CaF+	4.551e-08	4.390e-08	-7.342	-7.357	-0.016
	CaCO3	4.250e-08	4.251e-08	-7.372	-7.372	0.000
	CaOH+	2.407e-10	2.322e-10	-9.618	-9.634	-0.016
	CaHSO4+	1.110e-12	1.071e-12	-11.955	-11.970	-0.016
Cl	1.128e-05					
	Cl-	1.128e-05	1.088e-05	-4.948	-4.963	-0.016
	MnCl+	9.597e-11	9.259e-11	-10.018	-10.033	-0.016
	FeCl+	3.932e-11	3.794e-11	-10.405	-10.421	-0.016
	ZnCl+	1.077e-11	1.039e-11	-10.968	-10.983	-0.016
	PbCl+	3.048e-12	2.941e-12	-11.516	-11.532	-0.016
	ZnOHCl	1.367e-12	1.367e-12	-11.864	-11.864	0.000
	CuCl+	5.596e-13	5.399e-13	-12.252	-12.268	-0.016
	NiCl+	3.297e-13	3.181e-13	-12.482	-12.497	-0.016
	CuCl2-	4.670e-14	4.506e-14	-13.331	-13.346	-0.016
	UO2Cl+	1.242e-15	1.198e-15	-14.906	-14.922	-0.016
	MnCl2	4.398e-16	4.399e-16	-15.357	-15.357	0.000
	ZnCl2	1.159e-16	1.159e-16	-15.936	-15.936	0.000
	PbCl2	5.587e-17	5.589e-17	-16.253	-16.253	0.000
	NiCl2	1.257e-17	1.257e-17	-16.901	-16.901	0.000
	CuCl2	2.983e-18	2.984e-18	-17.525	-17.525	0.000
	CuCl3-2	8.794e-19	7.618e-19	-18.056	-18.118	-0.062
	FeCl+2	5.841e-19	5.060e-19	-18.234	-18.296	-0.062
	ZnCl3-	1.423e-21	1.372e-21	-20.847	-20.863	-0.016
	MnCl3-	1.367e-21	1.319e-21	-20.864	-20.880	-0.016
	UO2Cl2	6.660e-22	6.661e-22	-21.177	-21.176	0.000
	PbCl3-	4.850e-22	4.679e-22	-21.314	-21.330	-0.016
	FeCl2+	3.006e-23	2.900e-23	-22.522	-22.538	-0.016
	CuCl3-	1.089e-25	1.051e-25	-24.963	-24.978	-0.016
	ZnCl4-2	8.293e-27	7.185e-27	-26.081	-26.144	-0.062
	PbCl4-2	2.703e-27	2.342e-27	-26.568	-26.630	-0.062
	FeCl3	3.155e-29	3.156e-29	-28.501	-28.501	0.000
	CuCl4-2	5.868e-33	5.084e-33	-32.231	-32.294	-0.062
	UCl+3	4.074e-40	2.950e-40	-39.390	-39.530	-0.140
Cu(1)	1.232e-09					
	Cu+	1.231e-09	1.188e-09	-8.910	-8.925	-0.016
	CuCl2-	4.670e-14	4.506e-14	-13.331	-13.346	-0.016
	CuCl3-2	8.794e-19	7.618e-19	-18.056	-18.118	-0.062
Cu(2)	9.319e-08					
	Cu(OH)2	3.596e-08	3.596e-08	-7.444	-7.444	0.000
	Cu+2	2.743e-08	2.376e-08	-7.562	-7.624	-0.062
	CuCO3	2.160e-08	2.160e-08	-7.666	-7.665	0.000
	CuHCO3+	5.844e-09	5.638e-09	-8.233	-8.249	-0.016
	CuOH+	2.096e-09	2.022e-09	-8.679	-8.694	-0.016
	CuSO4	2.474e-10	2.475e-10	-9.607	-9.606	0.000
	CuF+	1.479e-11	1.427e-11	-10.830	-10.846	-0.016
	Cu(CO3)2-2	5.315e-12	4.604e-12	-11.275	-11.337	-0.062
	Cu2(OH)2+2	1.234e-12	1.069e-12	-11.909	-11.971	-0.062
	CuCl+	5.596e-13	5.399e-13	-12.252	-12.268	-0.016
	Cu(OH)3-	1.912e-14	1.844e-14	-13.719	-13.734	-0.016
	CuCl2	2.983e-18	2.984e-18	-17.525	-17.525	0.000
	Cu(OH)4-2	3.615e-20	3.132e-20	-19.442	-19.504	-0.062
	CuCl3-	1.089e-25	1.051e-25	-24.963	-24.978	-0.016
	CuCl4-2	5.868e-33	5.084e-33	-32.231	-32.294	-0.062
F	3.685e-05					
	F-	3.587e-05	3.460e-05	-4.445	-4.461	-0.016
	AlF2+	2.290e-07	2.209e-07	-6.640	-6.656	-0.016
	MgF+	1.592e-07	1.536e-07	-6.798	-6.813	-0.016
	AlF3	9.572e-08	9.574e-08	-7.019	-7.019	0.000
	CaF+	4.551e-08	4.390e-08	-7.342	-7.357	-0.016
	AlF+2	1.511e-08	1.309e-08	-7.821	-7.883	-0.062
	HF	5.567e-09	5.568e-09	-8.254	-8.254	0.000
	NaF	1.503e-09	1.504e-09	-8.823	-8.823	0.000
	AlF4-	1.365e-09	1.317e-09	-8.865	-8.880	-0.016
	FeF+	9.057e-10	8.738e-10	-9.043	-9.059	-0.016
	MnF+	5.182e-10	4.999e-10	-9.286	-9.301	-0.016
	UO2F+	3.431e-10	3.310e-10	-9.465	-9.480	-0.016
	ZnF+	2.116e-10	2.041e-10	-9.675	-9.690	-0.016
	UO2F2	3.870e-11	3.871e-11	-10.412	-10.412	0.000
	CuF+	1.479e-11	1.427e-11	-10.830	-10.846	-0.016
	NiF+	8.327e-12	8.034e-12	-11.079	-11.095	-0.016
	PbF+	4.923e-12	4.750e-12	-11.308	-11.323	-0.016
	HF2-	7.342e-13	7.083e-13	-12.134	-12.150	-0.016
	UO2F3-	2.641e-13	2.548e-13	-12.578	-12.594	-0.016
	FeF2+	1.234e-13	1.191e-13	-12.909	-12.924	-0.016
	FeF+2	1.061e-13	9.194e-14	-12.974	-13.036	-0.062
	FeF3	6.415e-15	6.417e-15	-14.193	-14.193	0.000
	PbF2	3.355e-15	3.356e-15	-14.474	-14.474	0.000
	H2F2	9.686e-17	9.688e-17	-16.014	-16.014	0.000
	UO2F4-2	6.514e-17	5.643e-17	-16.186	-16.248	-0.062
	PbF3-	8.719e-19	8.412e-19	-18.060	-18.075	-0.016
	PbF4-2	1.608e-23	1.393e-23	-22.794	-22.856	-0.062
	UF3+	7.706e-29	7.435e-29	-28.113	-28.129	-0.016
	UF4	2.102e-29	2.103e-29	-28.677	-28.677	0.000
	UF2+2	1.061e-29	9.196e-30	-28.974	-29.036	-0.062
	UF+3	4.478e-32	3.242e-32	-31.349	-31.489	-0.140
	UF5-	2.063e-32	1.990e-32	-31.686	-31.701	-0.016
	UF6-2	1.024e-34	8.868e-35	-33.990	-34.052	-0.062
Fe(2)	3.076e-06					
	Fe+2	2.915e-06	2.525e-06	-5.535	-5.598	-0.062
	FeHCO3+	1.239e-07	1.195e-07	-6.907	-6.922	-0.016
	FeSO4	2.159e-08	2.159e-08	-7.666	-7.666	0.000
	FeCO3	1.025e-08	1.026e-08	-7.989	-7.989	0.000
	FeOH+	4.781e-09	4.612e-09	-8.321	-8.336	-0.016
	FeF+	9.057e-10	8.738e-10	-9.043	-9.059	-0.016
	FeCl+	3.932e-11	3.794e-11	-10.405	-10.421	-0.016
	Fe(OH)2	2.127e-13	2.128e-13	-12.672	-12.672	0.000
	FeHSO4+	1.704e-14	1.644e-14	-13.768	-13.784	-0.016
	Fe(OH)3-	6.627e-17	6.394e-17	-16.179	-16.194	-0.016

Fe(3)	3.261e-07					
	Fe(OH)2+	1.763e-07	1.701e-07	-6.754	-6.769	-0.016
	Fe(OH)3	1.487e-07	1.487e-07	-6.828	-6.828	0.000
	Fe(OH)4-	9.715e-10	9.373e-10	-9.013	-9.028	-0.016
	FeOH+2	8.481e-11	7.348e-11	-10.072	-10.134	-0.062
	FeF2+	1.234e-13	1.191e-13	-12.909	-12.924	-0.016
	FeF+2	1.061e-13	9.194e-14	-12.974	-13.036	-0.062
	FeF3	6.415e-15	6.417e-15	-14.193	-14.193	0.000
	Fe+3	2.506e-15	1.815e-15	-14.601	-14.741	-0.140
	FeSO4+	9.722e-16	9.379e-16	-15.012	-15.028	-0.016
	Fe(SO4)2-	1.102e-18	1.063e-18	-17.958	-17.973	-0.016
	FeCl+2	5.841e-19	5.060e-19	-18.234	-18.296	-0.062
	Fe2(OH)2+4	3.196e-19	1.801e-19	-18.495	-18.745	-0.249
	FeHSO4+2	3.426e-22	2.968e-22	-21.465	-21.527	-0.062
	FeCl2+	3.006e-23	2.900e-23	-22.522	-22.538	-0.016
	Fe3(OH)4+5	2.532e-23	1.033e-23	-22.597	-22.986	-0.389
	FeCl3	3.155e-29	3.156e-29	-28.501	-28.501	0.000
H(0)	1.978e-25					
	H2	9.891e-26	9.894e-26	-25.005	-25.005	0.000
K	7.928e-05					
	K+	7.926e-05	7.645e-05	-4.101	-4.117	-0.016
	KSO4-	2.776e-08	2.679e-08	-7.557	-7.572	-0.016
Mg	8.638e-05					
	Mg+2	8.499e-05	7.382e-05	-4.071	-4.132	-0.061
	MgSO4	8.003e-07	8.005e-07	-6.097	-6.097	0.000
	MgHCO3+	4.155e-07	4.008e-07	-6.381	-6.397	-0.016
	MgF+	1.592e-07	1.536e-07	-6.798	-6.813	-0.016
	MgCO3	1.103e-08	1.103e-08	-7.958	-7.958	0.000
	MgOH+	1.480e-09	1.428e-09	-8.830	-8.845	-0.016
Mn(2)	2.548e-06					
	Mn+2	2.410e-06	2.088e-06	-5.618	-5.680	-0.062
	MnHCO3+	9.132e-08	8.810e-08	-7.039	-7.055	-0.016
	MnCO3	2.807e-08	2.808e-08	-7.552	-7.552	0.000
	MnSO4	1.778e-08	1.778e-08	-7.750	-7.750	0.000
	MnF+	5.182e-10	4.999e-10	-9.286	-9.301	-0.016
	MnOH+	3.102e-10	2.993e-10	-9.508	-9.524	-0.016
	MnCl+	9.597e-11	9.259e-11	-10.018	-10.033	-0.016
	MnCl2	4.398e-16	4.399e-16	-15.357	-15.357	0.000
	Mn(OH)3-	2.115e-20	2.041e-20	-19.675	-19.690	-0.016
	MnCl3-	1.367e-21	1.319e-21	-20.864	-20.880	-0.016
Mn(3)	4.177e-28					
	Mn+3	4.177e-28	3.025e-28	-27.379	-27.519	-0.140
Mn(6)	0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-54.532	-54.594	-0.062
Mn(7)	0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-60.302	-60.317	-0.016
Na	7.830e-05					
	Na+	7.826e-05	7.551e-05	-4.106	-4.122	-0.016
	NaHCO3	2.010e-08	2.010e-08	-7.697	-7.697	0.000
	NaSO4-	2.007e-08	1.936e-08	-7.697	-7.713	-0.016
	NaF	1.503e-09	1.504e-09	-8.823	-8.823	0.000
	NaCO3-	1.899e-10	1.832e-10	-9.721	-9.737	-0.016
Ni	2.896e-08					
	NiCO3	1.460e-08	1.460e-08	-7.836	-7.836	0.000
	Ni+2	1.343e-08	1.164e-08	-7.872	-7.934	-0.062
	NiHCO3+	7.881e-10	7.604e-10	-9.103	-9.119	-0.016
	NiSO4	1.147e-10	1.147e-10	-9.940	-9.940	0.000
	NiOH+	9.839e-12	9.492e-12	-11.007	-11.023	-0.016
	NiF+	8.327e-12	8.034e-12	-11.079	-11.095	-0.016
	Ni(CO3)2-2	4.959e-12	4.296e-12	-11.305	-11.367	-0.062
	NiCl+	3.297e-13	3.181e-13	-12.482	-12.497	-0.016
	Ni(OH)2	8.427e-14	8.429e-14	-13.074	-13.074	0.000
	Ni(SO4)2-2	3.931e-16	3.406e-16	-15.405	-15.468	-0.062
	NiCl2	1.257e-17	1.257e-17	-16.901	-16.901	0.000
	Ni(OH)3-	7.436e-18	7.174e-18	-17.129	-17.144	-0.016
O(0)	0.000e+00					
	O2	0.000e+00	0.000e+00	-44.080	-44.079	0.000
Pb	3.620e-08					
	PbCO3	2.270e-08	2.271e-08	-7.644	-7.644	0.000
	Pb+2	8.909e-09	7.719e-09	-8.050	-8.112	-0.062
	PbHCO3+	3.008e-09	2.902e-09	-8.522	-8.537	-0.016
	PbOH+	1.328e-09	1.281e-09	-8.877	-8.892	-0.016
	PbSO4	2.294e-10	2.295e-10	-9.639	-9.639	0.000
	Pb(CO3)2-2	1.115e-11	9.657e-12	-10.953	-11.015	-0.062
	PbF+	4.923e-12	4.750e-12	-11.308	-11.323	-0.016
	Pb(OH)2	4.240e-12	4.241e-12	-11.373	-11.372	0.000
	PbCl+	3.048e-12	2.941e-12	-11.516	-11.532	-0.016
	Pb(SO4)2-2	7.350e-14	6.368e-14	-13.134	-13.196	-0.062
	PbF2	3.355e-15	3.356e-15	-14.474	-14.474	0.000
	Pb(OH)3-	4.296e-16	4.145e-16	-15.367	-15.382	-0.016
	Pb2OH+3	3.057e-16	2.213e-16	-15.515	-15.655	-0.140
	PbCl2	5.587e-17	5.589e-17	-16.253	-16.253	0.000
	PbF3-	8.719e-19	8.412e-19	-18.060	-18.075	-0.016
	Pb(OH)4-2	9.328e-21	8.082e-21	-20.030	-20.092	-0.062
	Pb3(OH)4+2	1.686e-21	1.461e-21	-20.773	-20.835	-0.062
	PbCl3-	4.850e-22	4.679e-22	-21.314	-21.330	-0.016
	PbF4-2	1.608e-23	1.393e-23	-22.794	-22.856	-0.062
	PbCl4-2	2.703e-27	2.342e-27	-26.568	-26.630	-0.062
S(6)	6.350e-05					
	SO4-2	6.095e-05	5.287e-05	-4.215	-4.277	-0.062
	CaSO4	1.652e-06	1.652e-06	-5.782	-5.782	0.000
	MgSO4	8.003e-07	8.005e-07	-6.097	-6.097	0.000
	KSO4-	2.776e-08	2.679e-08	-7.557	-7.572	-0.016
	FeSO4	2.159e-08	2.159e-08	-7.666	-7.666	0.000
	NaSO4-	2.007e-08	1.936e-08	-7.697	-7.713	-0.016
	MnSO4	1.778e-08	1.778e-08	-7.750	-7.750	0.000
	BaSO4	7.652e-09	7.654e-09	-8.116	-8.116	0.000
	ZnSO4	5.307e-09	5.309e-09	-8.275	-8.275	0.000
	HSO4-	5.614e-10	5.416e-10	-9.251	-9.266	-0.016
	CuSO4	2.474e-10	2.475e-10	-9.607	-9.606	0.000
	PbSO4	2.294e-10	2.295e-10	-9.639	-9.639	0.000
	NiSO4	1.147e-10	1.147e-10	-9.940	-9.940	0.000
	AlSO4+	6.322e-12	6.099e-12	-11.199	-11.215	-0.016
	UO2SO4	5.118e-12	5.119e-12	-11.291	-11.291	0.000
	Zn(SO4)2-2	2.741e-12	2.374e-12	-11.562	-11.624	-0.062
	CaHSO4+	1.110e-12	1.071e-12	-11.955	-11.970	-0.016
	Pb(SO4)2-2	7.350e-14	6.368e-14	-13.134	-13.196	-0.062
	FeHSO4+	1.704e-14	1.644e-14	-13.768	-13.784	-0.016
	Al(SO4)2-	1.032e-14	9.955e-15	-13.986	-14.002	-0.016
	UO2(SO4)2-2	2.739e-15	2.373e-15	-14.562	-14.625	-0.062
	FeSO4+	9.722e-16	9.379e-16	-15.012	-15.028	-0.016
	Ni(SO4)2-2	3.931e-16	3.406e-16	-15.405	-15.468	-0.062
	Fe(SO4)2-	1.102e-18	1.063e-18	-17.958	-17.973	-0.016
	AlHSO4+2	7.035e-20	6.095e-20	-19.153	-19.215	-0.062
	FeHSO4+2	3.426e-22	2.968e-22	-21.465	-21.527	-0.062
	USO4+2	9.918e-35	8.593e-35	-34.004	-34.066	-0.062
	U(SO4)2	3.177e-35	3.178e-35	-34.498	-34.498	0.000
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-49.312	-49.452	-0.140
U(4)	3.642e-18					
	U(OH)4	3.641e-18	3.641e-18	-17.439	-17.439	0.000
	U(OH)3+	1.725e-21	1.664e-21	-20.763	-20.779	-0.016
	U(OH)2+2	1.206e-25	1.045e-25	-24.919	-24.981	-0.062
	UF3+	7.706e-29	7.435e-29	-28.113	-28.129	-0.016
	UF4	2.102e-29	2.103e-29	-28.677	-28.677	0.000
	UF2+2	1.061e-29	9.196e-30	-28.974	-29.036	-0.062
	UOH+3	1.102e-30	7.983e-31	-29.958	-30.098	-0.140
	U(CO3)4-4	5.235e-31	2.949e-31	-30.281	-30.530	-0.249
	UF+3	4.478e-32	3.242e-32	-31.349	-31.489	-0.140
	UF5-	2.063e-32	1.990e-32	-31.686	-31.701	-0.016
	UF6-2	1.024e-34	8.868e-35	-33.990	-34.052	-0.062
	USO4+2	9.918e-35	8.593e-35	-34.004	-34.066	-0.062
	U(SO4)2	3.177e-35	3.178e-35	-34.498	-34.498	0.000
	U(CO3)5-6	1.271e-36	3.493e-37	-35.896	-36.457	-0.561
	U+4	8.024e-37	4.520e-37	-36.096	-36.345	-0.249
	UCl+3	4.074e-40	2.950e-40	-39.390	-39.530	-0.140
	U6(OH)15+9	0.000e+00	0.000e+00	-130.058	-131.319	-1.262
U(5)	2.777e-13					
	UO2+	2.777e-13	2.679e-13	-12.556	-12.572	-0.016
	UO2(CO3)3-5	7.778e-26	3.173e-26	-25.109	-25.499	-0.389
U(6)	2.941e-07					
	UO2(CO3)2-2	2.286e-07	1.981e-07	-6.641	-6.703	-0.062
	UO2CO3	5.485e-08	5.486e-08	-7.261	-7.261	0.000
	UO2(CO3)3-4	3.780e-09	2.130e-09	-8.422	-8.672	-0.249
	UO2(OH)3-	3.173e-09	3.061e-09	-8.499	-8.514	-0.016
	UO2OH+	3.170e-09	3.058e-09	-8.499	-8.515	-0.016
	UO2F+	3.431e-10	3.310e-10	-9.465	-9.480	-0.016
	UO2+2	9.083e-11	7.869e-11	-10.042	-10.104	-0.062
	UO2F2	3.870e-11	3.871e-11	-10.412	-10.412	0.000
	UO2SO4	5.118e-12	5.119e-12	-11.291	-11.291	0.000
	(UO2)3(OH)5+	3.044e-12	2.937e-12	-11.517	-11.532	-0.016
	(UO2)2(OH)2+2	9.197e-13	7.968e-13	-12.036	-12.099	-0.062
	UO2F3-	2.641e-13	2.548e-13	-12.578	-12.594	-0.016
	(UO2)3(OH)7-	1.634e-13	1.577e-13	-12.787	-12.802	-0.016
	(UO2)4(OH)7+	1.619e-14	1.562e-14	-13.791	-13.806	-0.016
	(UO2)3(OH)4+2	3.716e-15	3.219e-15	-14.430	-14.492	-0.062
	UO2(SO4)2-2	2.739e-15	2.373e-15	-14.562	-14.625	-0.062
	UO2Cl+	1.242e-15	1.198e-15	-14.906	-14.922	-0.016
	UO2(OH)4-2	4.767e-16	4.130e-16	-15.322	-15.384	-0.062
	(UO2)2OH+3	1.452e-16	1.052e-16	-15.838	-15.978	-0.140
	UO2F4-2	6.514e-17	5.643e-17	-16.186	-16.248	-0.062
	(UO2)3(CO3)6-6	4.173e-17	1.147e-17	-16.380	-16.940	-0.561
	UO2Cl2	6.660e-22	6.661e-22	-21.177	-21.176	0.000
Zn	5.660e-07					
	Zn+2	5.145e-07	4.458e-07	-6.289	-6.351	-0.062
	ZnHCO3+	2.754e-08	2.657e-08	-7.560	-7.576	-0.016
	ZnCO3	1.505e-08	1.506e-08	-7.822	-7.822	0.000
	ZnSO4	5.307e-09	5.309e-09	-8.275	-8.275	0.000
	ZnOH+	2.909e-09	2.807e-09	-8.536	-8.552	-0.016
	Zn(OH)2	4.064e-10	4.065e-10	-9.391	-9.391	0.000
	ZnF+	2.116e-10	2.041e-10	-9.675	-9.690	-0.016
	Zn(CO3)2-2	6.291e-11	5.450e-11	-10.201	-10.264	-0.062
	ZnCl+	1.077e-11	1.039e-11	-10.968	-10.983	-0.016
	Zn(SO4)2-2	2.741e-12	2.374e-12	-11.562	-11.624	-0.062
	ZnOHCl	1.367e-12	1.367e-12	-11.864	-11.864	0.000
	Zn(OH)3-	1.134e-14	1.094e-14	-13.945	-13.961	-0.016
	ZnCl2	1.159e-16	1.159e-16	-15.936	-15.936	0.000
	Zn(OH)4-2	1.704e-20	1.476e-20	-19.769	-19.831	-0.062
	ZnCl3-	1.423e-21	1.372e-21	-20.847	-20.863	-0.016
	ZnCl4-2	8.293e-27	7.185e-27	-26.081	-26.144	-0.062

-------------------Saturation indices-------------------------------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-0.76	10.38	11.14	Al(OH)3
AlAsO4:2H2O	-6.29	-1.49	4.80	AlAsO4:2H2O
AlumK	-17.82	-23.08	-5.26	KAl(SO4)2:12H2O
Alunite	-1.56	-2.32	-0.76	KAl3(SO4)2(OH)6
Anglesite	-4.57	-12.39	-7.82	PbSO4
Anhydrite	-3.72	-8.06	-4.34	CaSO4
Antlerite	-7.72	0.57	8.29	Cu3(OH)4SO4
Aragonite	-2.25	-10.56	-8.31	CaCO3
Artinite	-11.14	-1.18	9.97	MgCO3:Mg(OH)2:3H2O
As2O5	-30.51	-23.74	6.77	As2O5
Atacamite	-7.00	0.58	7.58	Cu2(OH)3Cl
Azurite	-5.95	-22.56	-16.61	Cu3(OH)2(CO3)2
B-UO2(OH)2	-1.96	3.76	5.72	UO2(OH)2
Ba3(AsO4)2	7.17	-1.78	-8.95	Ba3(AsO4)2
BaF2	-9.69	-15.46	-5.77	BaF2
Barite	-0.76	-10.82	-10.05	BaSO4
Basaluminite	0.69	23.39	22.70	Al4(OH)10SO4
Bianchite	-8.86	-10.63	-1.76	ZnSO4:6H2O
Birnessite	-13.56	30.04	43.60	MnO2
Bixbyite	-13.04	38.22	51.26	Mn2O3
Boehmite	1.44	10.38	8.94	AlOOH
Brochantite	-8.53	6.81	15.34	Cu4(OH)6SO4
Brucite	-7.46	9.73	17.19	Mg(OH)2
Bunsenite	-6.83	5.93	12.76	NiO
Ca3(AsO4)2:4w	-15.89	6.49	22.38	Ca3(AsO4)2:4H2O
Calcite	-2.10	-10.56	-8.45	CaCO3
Cerrusite	-1.69	-14.88	-13.19	PbCO3
Chalcanthite	-9.24	-11.90	-2.66	CuSO4:5H2O
CO2(g)	-2.47	-20.63	-18.16	CO2
Cotunnite	-13.20	-18.04	-4.84	PbCl2
Cu(OH)2	-2.60	6.24	8.83	Cu(OH)2
Cu2SO4	-20.24	-27.52	-7.29	Cu2SO4
Cu3(AsO4)2:6w	-11.19	-5.03	6.16	Cu3(AsO4)2:6H2O
CuCO3	-4.77	-14.40	-9.63	CuCO3
CuF	-20.62	-16.08	4.54	CuF
CuF2	-16.10	-16.55	-0.45	CuF2
CuF2:2H2O	-12.04	-16.55	-4.50	CuF2:2H2O
CuMetal	-3.95	-15.62	-11.68	Cu
CuOCuSO4	-17.65	-5.67	11.98	CuO:CuSO4
CupricFerrite	11.96	44.62	32.66	CuFe2O4
Cuprite	-2.36	-9.39	-7.03	Cu2O
CuprousFerrite	12.93	14.50	1.57	CuFeO2
CuSO4	-15.14	-11.90	3.24	CuSO4
Diaspore	3.19	10.38	7.19	AlOOH
Dolomite	-4.49	-21.46	-16.97	CaMg(CO3)2
Dolomite(d)	-5.06	-21.46	-16.40	CaMg(CO3)2
Epsomite	-6.23	-8.41	-2.18	MgSO4:7H2O
Fe(OH)2.7Cl.3	5.52	15.62	10.10	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	1.16	19.19	18.03	Fe(OH)3
Fe3(OH)8	0.14	46.65	46.51	Fe3(OH)8
Fluorite	-2.04	-12.71	-10.66	CaF2
Gibbsite	1.98	10.38	8.40	Al(OH)3
Goethite	7.05	19.19	12.14	FeOOH
Goslarite	-8.63	-10.63	-2.00	ZnSO4:7H2O
Gummite	-6.94	3.76	10.70	UO3
Gypsum	-3.48	-8.06	-4.58	CaSO4:2H2O
H2(g)	-21.81	-21.86	-0.05	H2
Halite	-10.66	-9.09	1.57	NaCl
Hausmannite	-15.91	46.40	62.31	Mn3O4
Hematite	15.71	38.38	22.67	Fe2O3
Huntite	-13.63	-43.26	-29.64	CaMg3(CO3)4
Hydrocerrusite	-6.56	-24.02	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-25.79	-33.88	-8.10	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-7.88	23.55	31.43	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-6.50	24.12	30.62	KFe3(SO4)2(OH)6
Jarosite-Na	-10.50	24.11	34.61	NaFe3(SO4)2(OH)6
JarositeH	-13.44	21.30	34.74	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-4.53	-7.76	-3.23	AlOHSO4
Langite	-10.49	6.81	17.30	Cu4(OH)6SO4:H2O
Larnakite	-6.44	-6.64	-0.20	PbO:PbSO4
Laurionite	-6.77	-6.15	0.62	PbOHCl
Litharge	-7.18	5.75	12.93	PbO
Maghemite	5.71	38.38	32.67	Fe2O3
Magnesite	-2.95	-10.90	-7.95	MgCO3
Magnetite	15.98	46.65	30.67	Fe3O4
Malachite	-3.19	-8.16	-4.97	Cu2(OH)2CO3
Manganite	-6.23	19.11	25.34	MnOOH
Massicot	-7.38	5.75	13.12	PbO
Matlockite	-8.01	-17.54	-9.53	PbClF
Melanothallite	-21.44	-17.55	3.89	CuCl2
Melanterite	-7.60	-9.87	-2.27	FeSO4:7H2O
Minium	-35.90	39.10	75.00	Pb3O4
Mirabilite	-11.16	-12.52	-1.36	Na2SO4:10H2O
Mn2(SO4)3	-62.66	-16.19	46.47	Mn2(SO4)3
Mn3(AsO4):8H2O	-11.78	0.80	12.57	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-18.09	-15.61	2.49	MnCl2:4H2O
MnSO4	-12.82	-9.96	2.87	MnSO4
Morenosite	-9.81	-12.21	-2.40	NiSO4:7H2O
Na4UO2(CO3)3	-30.62	-46.91	-16.29	Na4UO2(CO3)3
Nahcolite	-6.85	-17.82	-10.97	NaHCO3
Nantokite	-7.00	-16.59	-9.59	CuCl
Natron	-13.50	-15.02	-1.51	Na2CO3:10H2O
Nesquehonite	-5.36	-10.90	-5.55	MgCO3:3H2O
Ni(OH)2	-4.49	5.93	10.41	Ni(OH)2
Ni3(AsO4)2:8H2O	-21.73	-5.96	15.77	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-26.43	5.57	32.00	Ni4(OH)6SO4
NiCO3	-7.99	-14.71	-6.71	NiCO3
Nsutite	-12.52	30.04	42.56	MnO2
O2(g)	-41.23	43.72	84.95	O2
Pb(OH)2	-2.58	5.75	8.33	Pb(OH)2
Pb2(OH)3Cl	-9.19	-0.40	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.70	11.50	26.20	PbO:Pb(OH)2
Pb2O3	-27.68	33.36	61.04	Pb2O3
Pb2OCO3	-8.78	-9.14	-0.35	PbO:PbCO3
Pb3(AsO4)2	-12.38	-6.50	5.88	Pb3(AsO4)2
Pb3O2CO3	-14.75	-3.39	11.36	PbCO3:2PbO
Pb3O2SO4	-11.56	-0.89	10.66	PbSO4:2PbO
Pb4(OH)6SO4	-16.25	4.85	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.69	4.85	22.55	PbSO4:3PbO
PbF2	-9.60	-17.03	-7.43	PbF2
PbMetal	-20.38	-16.11	4.26	Pb
PbO:0.3H2O	-7.23	5.75	12.98	PbO:0.33H2O
Phosgenite	-13.11	-32.92	-19.81	PbCl2:PbCO3
Plattnerite	-22.59	27.61	50.20	PbO2
Portlandite	-13.12	10.08	23.20	Ca(OH)2
Pyrochroite	-7.02	8.18	15.20	Mn(OH)2
Pyrolusite	-12.17	30.04	42.21	MnO2
Retgersite	-10.16	-12.21	-2.05	NiSO4:6H2O
Rhodochrosite	-1.34	-12.45	-11.11	MnCO3
Rhodochrosite(d)	-2.06	-12.45	-10.39	MnCO3
Rutherfordine	-2.44	-16.88	-14.43	UO2CO3
Schoepite	-1.80	3.76	5.56	UO2(OH)2:H2O
Scorodite	-6.21	7.32	13.54	FeAsO4:2H2O
Siderite	-1.51	-12.37	-10.86	FeCO3
Siderite(d)(3)	-1.92	-12.37	-10.45	FeCO3
Smithsonite	-3.18	-13.12	-9.94	ZnCO3
Tenorite	-1.58	6.24	7.81	CuO
Thenardite	-12.35	-12.52	-0.17	Na2SO4
Thermonatrite	-15.18	-15.02	0.16	Na2CO3:H2O
Trona	-21.90	-32.84	-10.94	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-23.56	-36.24	-12.68	U(OH)2SO4
U3O8(c)	-4.16	-10.59	-6.43	U3O8
U4O9(c)	-10.55	-50.56	-40.01	U4O9
UF4(c)	-35.82	-63.67	-27.84	UF4
UF4:2.5H2O	-26.63	-63.67	-37.04	UF4:2.5H2O
UO2(a)	-8.72	-18.10	-9.38	UO2
UO3(gamma)	-4.21	3.76	7.97	UO3
Uraninite(c)	-4.06	-18.10	-14.04	UO2
Witherite	-4.74	-13.31	-8.58	BaCO3
Zincite(c)	-3.91	7.51	11.42	ZnO
Zincosite	-13.88	-10.63	3.25	ZnSO4
Zn(OH)2-a	-4.94	7.51	12.45	Zn(OH)2
Zn(OH)2-b	-4.24	7.51	11.75	Zn(OH)2
Zn(OH)2-c	-4.69	7.51	12.20	Zn(OH)2
Zn(OH)2-e	-3.99	7.51	11.50	Zn(OH)2
Zn(OH)2-g	-4.20	7.51	11.71	Zn(OH)2
Zn2(OH)2SO4	-10.62	-3.12	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-12.08	3.12	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-14.95	-1.21	13.74	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-33.56	-13.75	19.81	ZnO:2ZnSO4
Zn4(OH)6SO4	-16.50	11.90	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-24.74	13.76	38.50	Zn5(OH)8Cl2
ZnCl2	-23.53	-16.28	7.25	ZnCl2
ZnCO3:H2O	-2.86	-13.12	-10.26	ZnCO3:H2O
ZnF2	-13.92	-15.27	-1.35	ZnF2
ZnMetal	-40.58	-14.35	26.23	Zn
ZnO(a)	-3.80	7.51	11.31	ZnO
ZnSO4:H2O	-10.19	-10.63	-0.43	ZnSO4:H2O

End of simulation.

```
------------------
Reading data base.
------------------

          SOLUTION_MASTER_SPECIES
          SOLUTION_SPECIES
          PHASES
          EXCHANGE_MASTER_SPECIES
          EXCHANGE_SPECIES
          SURFACE_MASTER_SPECIES
          SURFACE_SPECIES
          END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

          TITLE   Schneckentein 1-1.5m
          SOLUTION        2
          units           mg/l
          temp            20.4
          pH              8.04
          F               0.9
          Cl              0.8
          S(6)            35        as SO4
          Na              25
          K               3.6
          Mg              2.9
          Ca              13.8
          Alkalinity      68.32      as HCO3
          Al              0.54
          As(+3)          0.003
          As(+5)          0.01
          Ba              0.06391
          Cu              0.019
          Fe              0.67
          Mn              0.13
          Ni              0.0055
          Pb              0.006
          U               0.38
          Zn              0.009
          END
```

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-----
TITLE
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   Schneckentein 1-1.5m

-----------------------------------------
Beginning of initial solution calculations.
-----------------------------------------

Initial solution 2.

----------------------------Solution composition------------
-----------------

            Elements           Molality       Moles

            Al                2.002e-05   2.002e-05
            Alkalinity        1.120e-03   1.120e-03
            As(3)             4.005e-08   4.005e-08
            As(5)             1.335e-07   1.335e-07
            Ba                4.654e-07   4.654e-07
            Ca                3.444e-04   3.444e-04
            Cl                2.257e-05   2.257e-05
            Cu                2.990e-07   2.990e-07
            F                 4.738e-05   4.738e-05
            Fe                1.200e-05   1.200e-05
            K                 9.208e-05   9.208e-05
            Mg                1.193e-04   1.193e-04
            Mn                2.367e-06   2.367e-06
            Na                1.088e-03   1.088e-03
            Ni                9.370e-08   9.370e-08
            Pb                2.896e-08   2.896e-08
            S(6)              3.644e-04   3.644e-04
            U                 1.597e-06   1.597e-06
            Zn                1.377e-07   1.377e-07
```

```
----------------------------Description of solution----------------------------
-

                                    pH  =   8.040
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   2.723e-03
                     Mass of water (kg)  =   1.000e+00
                  Total carbon (mol/kg)  =   1.035e-03
                     Total CO2 (mol/kg)  =   1.035e-03
                    Temperature (deg C)  =  20.400
                 Electrical balance (eq)  =   2.705e-04
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =   7.01
                                Iterations  =  10
                                   Total H  = 1.110136e+02
                                   Total O  = 5.551088e+01

---------------------------------Redox couples---------------------------------
-

          Redox couple             pe  Eh (volts)

          As(3)/As(5)         -1.7493     -0.1019
```

----------Distribution of species----------

	Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
	OH-	8.133e-07	7.685e-07	-6.090	-6.114	-0.025
	H+	9.613e-09	9.120e-09	-8.017	-8.040	-0.023
	H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	2.002e-05					
	Al(OH)4-	1.991e-05	1.881e-05	-4.701	-4.726	-0.025
	Al(OH)3	9.627e-08	9.633e-08	-7.017	-7.016	0.000
	Al(OH)2+	8.948e-09	8.454e-09	-8.048	-8.073	-0.025
	AlF2+	1.833e-10	1.732e-10	-9.737	-9.762	-0.025
	AlF3	9.628e-11	9.634e-11	-10.016	-10.016	0.000
	AlOH+2	1.865e-11	1.486e-11	-10.729	-10.828	-0.099
	AlF+2	1.000e-11	7.972e-12	-11.000	-11.098	-0.099
	AlF4-	1.801e-12	1.701e-12	-11.745	-11.769	-0.025
	Al+3	3.078e-14	1.846e-14	-13.512	-13.734	-0.222
	AlSO4+	1.599e-14	1.510e-14	-13.796	-13.821	-0.025
	Al(SO4)2-	1.359e-16	1.284e-16	-15.867	-15.891	-0.025
	AlHSO4+2	1.476e-23	1.176e-23	-22.831	-22.930	-0.099
As(3)	4.005e-08					
	H3AsO3	3.786e-08	3.788e-08	-7.422	-7.422	0.000
	H2AsO3-	2.187e-09	2.066e-09	-8.660	-8.685	-0.025
	HAsO3-2	1.836e-13	1.463e-13	-12.736	-12.835	-0.099
	H4AsO3+	1.812e-16	1.712e-16	-15.742	-15.767	-0.025
	AsO3-3	8.785e-19	5.271e-19	-18.056	-18.278	-0.222
As(5)	1.335e-07					
	HAsO4-2	1.277e-07	1.018e-07	-6.894	-6.992	-0.099
	H2AsO4-	5.743e-09	5.426e-09	-8.241	-8.266	-0.025
	AsO4-3	4.203e-11	2.521e-11	-10.376	-10.598	-0.222
	H3AsO4	8.275e-15	8.280e-15	-14.082	-14.082	0.000
Ba	4.654e-07					
	Ba+2	4.163e-07	3.317e-07	-6.381	-6.479	-0.099
	BaSO4	4.566e-08	4.569e-08	-7.340	-7.340	0.000
	BaHCO3+	2.748e-09	2.596e-09	-8.561	-8.586	-0.025
	BaCO3	6.867e-10	6.871e-10	-9.163	-9.163	0.000
	BaOH+	1.304e-12	1.232e-12	-11.885	-11.909	-0.025
C(4)	1.035e-03					
	HCO3-	9.976e-04	9.436e-04	-3.001	-3.025	-0.024
	CO2	2.060e-05	2.061e-05	-4.686	-4.686	0.000
	CO3-2	5.493e-06	4.397e-06	-5.260	-5.357	-0.097
	CaHCO3+	3.073e-06	2.904e-06	-5.512	-5.537	-0.025
	CaCO3	1.764e-06	1.765e-06	-5.754	-5.753	0.000
	MgHCO3+	1.035e-06	9.779e-07	-5.985	-6.010	-0.025
	UO2(CO3)2-2	1.011e-06	8.053e-07	-5.995	-6.094	-0.099
	NaHCO3	5.441e-07	5.444e-07	-6.264	-6.264	0.000
	UO2(CO3)3-4	5.361e-07	2.162e-07	-6.271	-6.665	-0.394
	MnCO3	4.748e-07	4.751e-07	-6.324	-6.323	0.000
	MgCO3	3.524e-07	3.527e-07	-6.453	-6.453	0.000
	MnHCO3+	1.211e-07	1.144e-07	-6.917	-6.942	-0.025
	NiCO3	8.887e-08	8.892e-08	-7.051	-7.051	0.000
	NaCO3-	7.025e-08	6.637e-08	-7.153	-7.178	-0.025
	ZnCO3	4.531e-08	4.534e-08	-7.344	-7.344	0.000
	PbCO3	2.698e-08	2.700e-08	-7.569	-7.569	0.000
	CuCO3	2.541e-08	2.542e-08	-7.595	-7.595	0.000
	UO2CO3	8.501e-09	8.507e-09	-8.071	-8.070	0.000
	FeCO3	7.632e-09	7.637e-09	-8.117	-8.117	0.000
	FeHCO3+	7.231e-09	6.832e-09	-8.141	-8.165	-0.025
	ZnHCO3+	6.498e-09	6.139e-09	-8.187	-8.212	-0.025
	Zn(CO3)2-2	5.349e-09	4.263e-09	-8.272	-8.370	-0.099
	BaHCO3+	2.748e-09	2.596e-09	-8.561	-8.586	-0.025
	Ni(CO3)2-2	8.527e-10	6.795e-10	-9.069	-9.168	-0.099
	BaCO3	6.867e-10	6.871e-10	-9.163	-9.163	0.000
	CuHCO3+	5.388e-10	5.091e-10	-9.269	-9.293	-0.025
	NiHCO3+	3.761e-10	3.553e-10	-9.425	-9.449	-0.025
	Pb(CO3)2-2	3.742e-10	2.982e-10	-9.427	-9.526	-0.099
	PbHCO3+	2.803e-10	2.648e-10	-9.552	-9.577	-0.025
	Cu(CO3)2-2	1.766e-10	1.407e-10	-9.753	-9.852	-0.099
	(UO2)3(CO3)6-6	5.725e-15	7.417e-16	-14.242	-15.130	-0.888
	UO2(CO3)3-5	1.367e-23	3.308e-24	-22.864	-23.480	-0.616
	U(CO3)4-4	6.503e-32	2.622e-32	-31.187	-31.581	-0.394
	U(CO3)5-6	6.601e-36	8.553e-37	-35.180	-36.068	-0.888
Ca	3.444e-04					
	Ca+2	3.257e-04	2.607e-04	-3.487	-3.584	-0.097
	CaSO4	1.368e-05	1.368e-05	-4.864	-4.864	0.000
	CaHCO3+	3.073e-06	2.904e-06	-5.512	-5.537	-0.025
	CaCO3	1.764e-06	1.765e-06	-5.754	-5.753	0.000
	CaF+	9.570e-08	9.042e-08	-7.019	-7.044	-0.025
	CaOH+	5.021e-09	4.744e-09	-8.299	-8.324	-0.025
	CaHSO4+	7.326e-13	6.922e-13	-12.135	-12.160	-0.025
Cl	2.257e-05					
	Cl-	2.257e-05	2.131e-05	-4.646	-4.671	-0.025
	MnCl+	1.250e-10	1.181e-10	-9.903	-9.928	-0.025
	ZnOHCl	3.996e-12	3.999e-12	-11.398	-11.398	0.000
	ZnCl+	2.553e-12	2.413e-12	-11.593	-11.618	-0.025
	FeCl+	2.254e-12	2.130e-12	-11.647	-11.672	-0.025
	PbCl+	2.826e-13	2.670e-13	-12.549	-12.574	-0.025
	NiCl+	1.546e-13	1.460e-13	-12.811	-12.836	-0.025
	CuCl+	5.199e-14	4.913e-14	-13.284	-13.309	-0.025
	CuCl2-	8.315e-15	7.856e-15	-14.080	-14.105	-0.025
	MnCl2	1.098e-15	1.099e-15	-14.959	-14.959	0.000
	ZnCl2	5.281e-17	5.284e-17	-16.277	-16.277	0.000
	UO2Cl+	1.485e-17	1.403e-17	-16.828	-16.853	-0.025
	NiCl2	1.129e-17	1.130e-17	-16.947	-16.947	0.000
	PbCl2	9.834e-18	9.840e-18	-17.007	-17.007	0.000
	CuCl2	5.343e-19	5.346e-19	-18.272	-18.272	0.000
	CuCl3-2	3.271e-19	2.606e-19	-18.485	-18.584	-0.099
	FeCl+2	3.728e-20	2.971e-20	-19.429	-19.527	-0.099
	MnCl3-	6.826e-21	6.449e-21	-20.166	-20.190	-0.025
	ZnCl3-	1.300e-21	1.229e-21	-20.886	-20.911	-0.025
	PbCl3-	1.713e-22	1.619e-22	-21.766	-21.791	-0.025
	UO2Cl2	1.535e-23	1.536e-23	-22.814	-22.814	0.000
	FeCl2+	3.471e-24	3.280e-24	-23.459	-23.484	-0.025
	CuCl3-	3.939e-26	3.722e-26	-25.405	-25.429	-0.025
	ZnCl4-2	1.587e-26	1.265e-26	-25.799	-25.898	-0.099
	PbCl4-2	1.999e-27	1.593e-27	-26.699	-26.798	-0.099
	FeCl3	6.986e-30	6.990e-30	-29.156	-29.155	0.000
	CuCl4-2	4.477e-33	3.568e-33	-32.349	-32.448	-0.099
	UCl+3	0.000e+00	0.000e+00	-45.731	-45.953	-0.222
Cu(1)	5.725e-11					
	Cu+	5.724e-11	5.408e-11	-10.242	-10.267	-0.025
	CuCl2-	8.315e-15	7.856e-15	-14.080	-14.105	-0.025
	CuCl3-2	3.271e-19	2.606e-19	-18.485	-18.584	-0.099
Cu(2)	2.990e-07					
	Cu(OH)2	2.702e-07	2.704e-07	-6.568	-6.568	0.000
	CuCO3	2.541e-08	2.542e-08	-7.595	-7.595	0.000
	Cu+2	1.351e-09	1.076e-09	-8.869	-8.968	-0.099
	CuOH+	1.249e-09	1.180e-09	-8.903	-8.928	-0.025
	CuHCO3+	5.388e-10	5.091e-10	-9.269	-9.293	-0.025
	Cu(CO3)2-2	1.766e-10	1.407e-10	-9.753	-9.852	-0.099
	CuSO4	5.845e-11	5.849e-11	-10.233	-10.233	0.000
	Cu(OH)3-	1.891e-12	1.786e-12	-11.723	-11.748	-0.025
	CuF+	8.820e-13	8.334e-13	-12.055	-12.079	-0.025
	Cu2(OH)2+2	4.810e-13	3.833e-13	-12.318	-12.416	-0.099
	CuCl+	5.199e-14	4.913e-14	-13.284	-13.309	-0.025
	Cu(OH)4-2	4.904e-17	3.908e-17	-16.309	-16.408	-0.099
	CuCl2	5.343e-19	5.346e-19	-18.272	-18.272	0.000
	CuCl3-	3.939e-26	3.722e-26	-25.405	-25.429	-0.025
	CuCl4-2	4.477e-33	3.568e-33	-32.349	-32.448	-0.099
F	4.738e-05					
	F-	4.700e-05	4.440e-05	-4.328	-4.353	-0.025
	MgF+	2.574e-07	2.431e-07	-6.589	-6.614	-0.025
	CaF+	9.570e-08	9.042e-08	-7.019	-7.044	-0.025
	NaF	2.620e-08	2.622e-08	-7.582	-7.581	0.000
	HF	5.592e-10	5.595e-10	-9.252	-9.252	0.000
	MnF+	4.422e-10	4.178e-10	-9.354	-9.379	-0.025
	AlF2+	1.833e-10	1.732e-10	-9.737	-9.762	-0.025
	AlF3	9.628e-11	9.634e-11	-10.016	-10.016	0.000
	FeF+	3.403e-11	3.215e-11	-10.468	-10.493	-0.025
	ZnF+	3.235e-11	3.057e-11	-10.490	-10.515	-0.025
	AlF+2	1.000e-11	7.972e-12	-11.000	-11.098	-0.099
	UO2F+	2.678e-12	2.530e-12	-11.572	-11.597	-0.025
	NiF+	2.558e-12	2.417e-12	-11.592	-11.617	-0.025
	AlF4-	1.801e-12	1.701e-12	-11.745	-11.769	-0.025
	CuF+	8.820e-13	8.334e-13	-12.055	-12.079	-0.025
	UO2F2	3.795e-13	3.797e-13	-12.421	-12.421	0.000
	PbF+	2.952e-13	2.790e-13	-12.530	-12.554	-0.025
	HF2-	9.711e-14	9.175e-14	-13.013	-13.037	-0.025
	FeF2+	6.208e-15	5.865e-15	-14.207	-14.232	-0.025
	FeF+2	4.401e-15	3.507e-15	-14.356	-14.455	-0.099
	UO2F3-	3.395e-15	3.208e-15	-14.469	-14.494	-0.025
	FeF3	4.060e-16	4.063e-16	-15.391	-15.391	0.000
	PbF2	2.528e-16	2.529e-16	-15.597	-15.597	0.000
	UO2F4-2	1.143e-18	9.105e-19	-17.942	-18.041	-0.099
	H2F2	9.607e-19	9.613e-19	-18.017	-18.017	0.000
	PbF3-	8.611e-20	8.136e-20	-19.065	-19.090	-0.025
	PbF4-2	2.170e-24	1.729e-24	-23.664	-23.762	-0.099
	UF3+	3.248e-35	3.069e-35	-34.488	-34.513	-0.025
	UF4	1.110e-35	1.111e-35	-34.955	-34.954	0.000
	UF2+2	3.703e-36	2.951e-36	-35.431	-35.530	-0.099
	UF5-	1.452e-38	1.372e-38	-37.838	-37.863	-0.025
	UF+3	1.349e-38	8.095e-39	-37.870	-38.092	-0.222
	UF6-2	0.000e+00	0.000e+00	-40.009	-40.107	-0.099
Fe(2)	1.109e-07					
	Fe+2	9.085e-08	7.240e-08	-7.042	-7.140	-0.099
	FeCO3	7.632e-09	7.637e-09	-8.117	-8.117	0.000
	FeHCO3+	7.231e-09	6.832e-09	-8.141	-8.165	-0.025
	FeSO4	3.246e-09	3.248e-09	-8.489	-8.488	0.000
	FeOH+	1.874e-09	1.770e-09	-8.727	-8.752	-0.025
	FeF+	3.403e-11	3.215e-11	-10.468	-10.493	-0.025
	FeCl+	2.254e-12	2.130e-12	-11.647	-11.672	-0.025
	Fe(OH)2	1.100e-12	1.100e-12	-11.959	-11.958	0.000
	Fe(OH)3-	4.532e-15	4.282e-15	-14.344	-14.368	-0.025
	FeHSO4+	2.034e-16	1.922e-16	-15.692	-15.716	-0.025

Fe(3)	1.189e-05					
	Fe(OH)3	1.008e-05	1.008e-05	-4.997	-4.996	0.000
	Fe(OH)2+	9.263e-07	8.751e-07	-6.033	-6.058	-0.025
	Fe(OH)4-	8.845e-07	8.357e-07	-6.053	-6.078	-0.025
	FeOH+2	3.611e-11	2.878e-11	-10.442	-10.541	-0.099
	FeF2+	6.208e-15	5.865e-15	-14.207	-14.232	-0.025
	FeF+2	4.401e-15	3.507e-15	-14.356	-14.455	-0.099
	FeF3	4.060e-16	4.063e-16	-15.391	-15.391	0.000
	FeSO4+	1.539e-16	1.454e-16	-15.813	-15.837	-0.025
	Fe+3	8.921e-17	5.352e-17	-16.050	-16.271	-0.222
	Fe(SO4)2-	9.088e-19	8.586e-19	-18.042	-18.066	-0.025
	Fe2(OH)2+4	6.705e-20	2.704e-20	-19.174	-19.568	-0.394
	FeCl+2	3.728e-20	2.971e-20	-19.429	-19.527	-0.099
	Fe3(OH)4+5	3.145e-23	7.608e-24	-22.502	-23.119	-0.616
	FeHSO4+2	4.479e-24	3.569e-24	-23.349	-23.447	-0.099
	FeCl2+	3.471e-24	3.280e-24	-23.459	-23.484	-0.025
	FeCl3	6.986e-30	6.990e-30	-29.156	-29.155	0.000
H(0)	1.190e-27					
	H2	5.951e-28	5.954e-28	-27.225	-27.225	0.000
K	9.208e-05					
	K+	9.191e-05	8.680e-05	-4.037	-4.061	-0.025
	KSO4-	1.684e-07	1.591e-07	-6.774	-6.798	-0.025
Mg	1.193e-04					
	Mg+2	1.125e-04	9.020e-05	-3.949	-4.045	-0.096
	MgSO4	5.149e-06	5.152e-06	-5.288	-5.288	0.000
	MgHCO3+	1.035e-06	9.779e-07	-5.985	-6.010	-0.025
	MgCO3	3.524e-07	3.527e-07	-6.453	-6.453	0.000
	MgF+	2.574e-07	2.431e-07	-6.589	-6.614	-0.025
	MgOH+	2.492e-08	2.355e-08	-7.603	-7.628	-0.025
Mn(2)	2.367e-06					
	Mn+2	1.707e-06	1.360e-06	-5.768	-5.866	-0.099
	MnCO3	4.748e-07	4.751e-07	-6.324	-6.323	0.000
	MnHCO3+	1.211e-07	1.144e-07	-6.917	-6.942	-0.025
	MnSO4	6.076e-08	6.080e-08	-7.216	-7.216	0.000
	MnOH+	2.772e-09	2.619e-09	-8.557	-8.582	-0.025
	MnF+	4.422e-10	4.178e-10	-9.354	-9.379	-0.025
	MnCl+	1.250e-10	1.181e-10	-9.903	-9.928	-0.025
	MnCl2	1.098e-15	1.099e-15	-14.959	-14.959	0.000
	Mn(OH)3-	3.007e-17	2.841e-17	-16.522	-16.547	-0.025
	MnCl3-	6.826e-21	6.449e-21	-20.166	-20.190	-0.025
Mn(3)	3.541e-28					
	Mn+3	3.541e-28	2.124e-28	-27.451	-27.673	-0.222
Mn(6)	0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-45.611	-45.710	-0.099
Mn(7)	0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-51.375	-51.399	-0.025
Na	1.088e-03					
	Na+	1.086e-03	1.026e-03	-2.964	-2.989	-0.024
	NaSO4-	1.452e-06	1.372e-06	-5.838	-5.863	-0.025
	NaHCO3	5.441e-07	5.444e-07	-6.264	-6.264	0.000
	NaCO3-	7.025e-08	6.637e-08	-7.153	-7.178	-0.025
	NaF	2.620e-08	2.622e-08	-7.582	-7.581	0.000
Ni	9.370e-08					
	NiCO3	8.887e-08	8.892e-08	-7.051	-7.051	0.000
	Ni+2	3.423e-09	2.728e-09	-8.466	-8.564	-0.099
	Ni(CO3)2-2	8.527e-10	6.795e-10	-9.069	-9.168	-0.099
	NiHCO3+	3.761e-10	3.553e-10	-9.425	-9.449	-0.025
	NiSO4	1.403e-10	1.404e-10	-9.853	-9.853	0.000
	NiOH+	3.146e-11	2.973e-11	-10.502	-10.527	-0.025
	Ni(OH)2	3.277e-12	3.279e-12	-11.485	-11.484	0.000
	NiF+	2.558e-12	2.417e-12	-11.592	-11.617	-0.025
	NiCl+	1.546e-13	1.460e-13	-12.811	-12.836	-0.025
	Ni(OH)3-	3.805e-15	3.595e-15	-14.420	-14.444	-0.025
	Ni(SO4)2-2	2.707e-15	2.157e-15	-14.567	-14.666	-0.099
	NiCl2	1.129e-17	1.130e-17	-16.947	-16.947	0.000
O(0)	6.800e-40					
	O2	3.400e-40	3.402e-40	-39.469	-39.468	0.000
Pb	2.896e-08					
	PbCO3	2.698e-08	2.700e-08	-7.569	-7.569	0.000
	PbOH+	7.993e-10	7.552e-10	-9.097	-9.122	-0.025
	Pb+2	4.433e-10	3.533e-10	-9.353	-9.452	-0.099
	Pb(CO3)2-2	3.742e-10	2.982e-10	-9.427	-9.526	-0.099
	PbHCO3+	2.803e-10	2.648e-10	-9.552	-9.577	-0.025
	PbSO4	5.456e-11	5.460e-11	-10.263	-10.263	0.000
	Pb(OH)2	3.219e-11	3.221e-11	-10.492	-10.492	0.000
	PbF+	2.952e-13	2.790e-13	-12.530	-12.554	-0.025
	PbCl+	2.826e-13	2.670e-13	-12.549	-12.574	-0.025
	Pb(SO4)2-2	9.881e-14	7.874e-14	-13.005	-13.104	-0.099
	Pb(OH)3-	4.292e-14	4.055e-14	-13.367	-13.392	-0.025
	PbF2	2.528e-16	2.529e-16	-15.597	-15.597	0.000
	Pb(OH)4-2	1.278e-17	1.019e-17	-16.893	-16.992	-0.099
	Pb2OH+3	9.956e-18	5.973e-18	-17.002	-17.224	-0.222
	PbCl2	9.834e-18	9.840e-18	-17.007	-17.007	0.000
	PbF3-	8.611e-20	8.136e-20	-19.065	-19.090	-0.025
	Pb3(OH)4+2	5.229e-21	4.167e-21	-20.282	-20.380	-0.099
	PbCl3-	1.713e-22	1.619e-22	-21.766	-21.791	-0.025
	PbF4-2	2.170e-24	1.729e-24	-23.664	-23.762	-0.099
	PbCl4-2	1.999e-27	1.593e-27	-26.699	-26.798	-0.099
S(6)	3.644e-04					
	SO4-2	3.438e-04	2.748e-04	-3.464	-3.561	-0.097
	CaSO4	1.368e-05	1.368e-05	-4.864	-4.864	0.000
	MgSO4	5.149e-06	5.152e-06	-5.288	-5.288	0.000
	NaSO4-	1.452e-06	1.372e-06	-5.838	-5.863	-0.025
	KSO4-	1.684e-07	1.591e-07	-6.774	-6.798	-0.025
	MnSO4	6.076e-08	6.080e-08	-7.216	-7.216	0.000
	BaSO4	4.566e-08	4.569e-08	-7.340	-7.340	0.000
	FeSO4	3.246e-09	3.248e-09	-8.489	-8.488	0.000
	ZnSO4	3.210e-09	3.212e-09	-8.494	-8.493	0.000
	HSO4-	2.337e-10	2.208e-10	-9.631	-9.656	-0.025
	NiSO4	1.403e-10	1.404e-10	-9.853	-9.853	0.000
	CuSO4	5.845e-11	5.849e-11	-10.233	-10.233	0.000
	PbSO4	5.456e-11	5.460e-11	-10.263	-10.263	0.000
	Zn(SO4)2-2	9.333e-12	7.437e-12	-11.030	-11.129	-0.099
	CaHSO4+	7.326e-13	6.922e-13	-12.135	-12.160	-0.025
	UO2SO4	1.604e-13	1.605e-13	-12.795	-12.795	0.000
	Pb(SO4)2-2	9.881e-14	7.874e-14	-13.005	-13.104	-0.099
	AlSO4+	1.599e-14	1.510e-14	-13.796	-13.821	-0.025
	Ni(SO4)2-2	2.707e-15	2.157e-15	-14.567	-14.666	-0.099
	UO2(SO4)2-2	4.904e-16	3.908e-16	-15.309	-15.408	-0.099
	FeHSO4+	2.034e-16	1.922e-16	-15.692	-15.716	-0.025
	FeSO4+	1.539e-16	1.454e-16	-15.813	-15.837	-0.025
	Al(SO4)2-	1.359e-16	1.284e-16	-15.867	-15.891	-0.025
	Fe(SO4)2-	9.088e-19	8.586e-19	-18.042	-18.066	-0.025
	AlHSO4+2	1.476e-23	1.176e-23	-22.831	-22.930	-0.099
	FeHSO4+2	4.479e-24	3.569e-24	-23.349	-23.447	-0.099
	U(SO4)2	1.714e-40	1.715e-40	-39.766	-39.766	0.000
	USO4+2	1.101e-40	0.000e+00	-39.958	-40.057	-0.099
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-55.909	-56.130	-0.222
U(4)	2.104e-20					
	U(OH)4	2.104e-20	2.106e-20	-19.677	-19.677	0.000
	U(OH)3+	7.859e-25	7.425e-25	-24.105	-24.129	-0.025
	U(OH)2+2	4.475e-30	3.566e-30	-29.349	-29.448	-0.099
	U(CO3)4-4	6.503e-32	2.622e-32	-31.187	-31.581	-0.394
	UF3+	3.248e-35	3.069e-35	-34.488	-34.513	-0.025
	UF4	1.110e-35	1.111e-35	-34.955	-34.954	0.000
	U(CO3)5-6	6.601e-36	8.553e-37	-35.180	-36.068	-0.888
	UF2+2	3.703e-36	2.951e-36	-35.431	-35.530	-0.099
	UOH+3	3.459e-36	2.075e-36	-35.461	-35.683	-0.222
	UF5-	1.452e-38	1.372e-38	-37.838	-37.863	-0.025
	UF+3	1.349e-38	8.095e-39	-37.870	-38.092	-0.222
	U(SO4)2	1.714e-40	1.715e-40	-39.766	-39.766	0.000
	USO4+2	1.101e-40	0.000e+00	-39.958	-40.057	-0.099
	UF6-2	0.000e+00	0.000e+00	-40.009	-40.107	-0.099
	U+4	0.000e+00	0.000e+00	-42.660	-43.054	-0.394
	UCl+3	0.000e+00	0.000e+00	-45.731	-45.953	-0.222
	U6(OH)15+9	0.000e+00	0.000e+00	-152.928	-154.925	-1.997
U(5)	1.671e-15					
	UO2+	1.671e-15	1.579e-15	-14.777	-14.802	-0.025
	UO2(CO3)3-5	1.367e-23	3.308e-24	-22.864	-23.480	-0.616
U(6)	1.597e-06					
	UO2(CO3)2-2	1.011e-06	8.053e-07	-5.995	-6.094	-0.099
	UO2(CO3)3-4	5.361e-07	2.162e-07	-6.271	-6.665	-0.394
	UO2(OH)3-	4.120e-08	3.893e-08	-7.385	-7.410	-0.025
	UO2CO3	8.501e-09	8.507e-09	-8.071	-8.070	0.000
	UO2OH+	2.561e-10	2.420e-10	-9.592	-9.616	-0.025
	UO2F+	2.678e-12	2.530e-12	-11.572	-11.597	-0.025
	(UO2)3(OH)7-	2.068e-12	1.954e-12	-11.684	-11.709	-0.025
	UO2+2	5.874e-13	4.681e-13	-12.231	-12.330	-0.099
	UO2F2	3.795e-13	3.797e-13	-12.421	-12.421	0.000
	(UO2)3(OH)5+	2.498e-13	2.360e-13	-12.602	-12.627	-0.025
	UO2SO4	1.604e-13	1.605e-13	-12.795	-12.795	0.000
	UO2(OH)4-2	8.489e-14	6.765e-14	-13.071	-13.170	-0.099
	(UO2)2(OH)2+2	6.050e-15	4.821e-15	-14.218	-14.317	-0.099
	(UO2)3(CO3)6-6	5.725e-15	7.417e-16	-14.242	-15.130	-0.888
	UO2F3-	3.395e-15	3.208e-15	-14.469	-14.494	-0.025
	(UO2)4(OH)7+	1.219e-15	1.151e-15	-14.914	-14.939	-0.025
	UO2(SO4)2-2	4.904e-16	3.908e-16	-15.309	-15.408	-0.099
	(UO2)3(OH)4+2	2.342e-17	1.866e-17	-16.630	-16.729	-0.099
	UO2Cl+	1.485e-17	1.403e-17	-16.828	-16.853	-0.025
	UO2F4-2	1.143e-18	9.105e-19	-17.942	-18.041	-0.099
	(UO2)2OH+3	7.990e-20	4.794e-20	-19.097	-19.319	-0.222
	UO2Cl2	1.535e-23	1.536e-23	-22.814	-22.814	0.000
Zn	1.377e-07					
	Zn+2	6.485e-08	5.168e-08	-7.188	-7.287	-0.099
	ZnCO3	4.531e-08	4.534e-08	-7.344	-7.344	0.000
	Zn(OH)2	7.816e-09	7.821e-09	-8.107	-8.107	0.000
	ZnHCO3+	6.498e-09	6.139e-09	-8.187	-8.212	-0.025
	Zn(CO3)2-2	5.349e-09	4.263e-09	-8.272	-8.370	-0.099
	ZnOH+	4.613e-09	4.359e-09	-8.336	-8.361	-0.025
	ZnSO4	3.210e-09	3.212e-09	-8.494	-8.493	0.000
	ZnF+	3.235e-11	3.057e-11	-10.490	-10.515	-0.025
	Zn(SO4)2-2	9.333e-12	7.437e-12	-11.030	-11.129	-0.099
	ZnOHCl	3.996e-12	3.999e-12	-11.398	-11.398	0.000
	Zn(OH)3-	2.870e-12	2.712e-12	-11.542	-11.567	-0.025
	ZnCl+	2.553e-12	2.413e-12	-11.593	-11.618	-0.025
	Zn(OH)4-2	5.913e-17	4.712e-17	-16.228	-16.327	-0.099
	ZnCl2	5.281e-17	5.284e-17	-16.277	-16.277	0.000
	ZnCl3-	1.300e-21	1.229e-21	-20.886	-20.911	-0.025
	ZnCl4-2	1.587e-26	1.265e-26	-25.799	-25.898	-0.099

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-0.72	10.39	11.10	Al(OH)3
AlAsO4:2H2O	-8.50	-3.70	4.80	AlAsO4:2H2O
AlumK	-19.66	-24.92	-5.25	KAl(SO4)2:12H2O
Alunite	-3.32	-4.14	-0.82	KAl3(SO4)2(OH)6
Anglesite	-5.20	-13.01	-7.81	PbSO4
Anhydrite	-2.80	-7.14	-4.34	CaSO4
Antlerite	-6.60	1.69	8.29	Cu3(OH)4SO4
Aragonite	-0.63	-8.94	-8.31	CaCO3
Arsenolite	-26.72	-29.69	-2.97	As4O6
Artinite	-7.30	2.63	9.93	MgCO3:Mg(OH)2:3H2O
As2O5	-34.92	-28.16	6.76	As2O5
Atacamite	-6.04	1.51	7.55	Cu2(OH)3Cl
Azurite	-4.90	-21.54	-16.64	Cu3(OH)2(CO3)2
B-UO2(OH)2	-1.95	3.75	5.70	UO2(OH)2
Ba3(AsO4)2	9.58	0.64	-8.95	Ba3(AsO4)2
BaF2	-9.41	-15.18	-5.77	BaF2
Barite	0.01	-10.04	-10.05	BaSO4
Basaluminite	-0.80	21.90	22.70	Al4(OH)10SO4
Bianchite	-9.08	-10.85	-1.76	ZnSO4:6H2O
Birnessite	-9.31	34.29	43.60	MnO2
Bixbyite	-6.67	44.51	51.18	Mn2O3
Boehmite	1.48	10.39	8.91	AlOOH
Brochantite	-6.53	8.81	15.34	Cu4(OH)6SO4
Brucite	-5.12	12.04	17.15	Mg(OH)2
Bunsenite	-5.21	7.52	12.72	NiO
Ca3(AsO4)2:4w	-13.04	9.32	22.37	Ca3(AsO4)2:4H2O
Calcite	-0.49	-8.94	-8.46	CaCO3
Cerrusite	-1.62	-14.81	-13.19	PbCO3
Chalcanthite	-9.87	-12.53	-2.66	CuSO4:5H2O
Claudetite	-26.47	-29.69	-3.22	As4O6
CO2(g)	-3.27	-21.44	-18.16	CO2
Cotunnite	-13.96	-18.79	-4.83	PbCl2
Cu(OH)2	-1.70	7.11	8.82	Cu(OH)2
Cu2SO4	-22.20	-29.50	-7.30	Cu2SO4
Cu3(AsO4)2:6w	-12.98	-6.83	6.15	Cu3(AsO4)2:6H2O
CuCO3	-4.69	-14.32	-9.63	CuCO3
CuF	-21.84	-17.32	4.52	CuF
CuF2	-17.21	-17.67	-0.47	CuF2
CuF2:2H2O	-13.17	-17.67	-4.51	CuF2:2H2O
CuMetal	-5.31	-16.97	-11.66	Cu
CuOCuSO4	-17.36	-5.42	11.94	CuO:CuSO4
CupricFerrite	16.48	49.07	32.59	CuFe2O4
Cuprite	-2.83	-9.86	-7.02	Cu2O
CuprousFerrite	14.50	16.05	1.55	CuFeO2
CuSO4	-15.75	-12.53	3.22	CuSO4
Diaspore	3.22	10.39	7.16	AlOOH
Dolomite	-1.36	-18.34	-16.98	CaMg(CO3)2
Dolomite(d)	-1.93	-18.34	-16.41	CaMg(CO3)2
Epsomite	-5.43	-7.61	-2.17	MgSO4:7H2O
Fe(OH)2.7Cl.3	7.08	17.17	10.09	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.96	20.98	18.02	Fe(OH)3
Fe3(OH)8	4.41	50.90	46.48	Fe3(OH)8
Fluorite	-1.63	-12.29	-10.65	CaF2
Gibbsite	2.01	10.39	8.37	Al(OH)3
Goethite	8.85	20.98	12.13	FeOOH
Goslarite	-8.85	-10.85	-2.00	ZnSO4:7H2O
Gummite	-6.92	3.75	10.67	UO3
Gypsum	-2.56	-7.14	-4.58	CaSO4:2H2O
H2(g)	-24.03	-24.08	-0.05	H2
Halite	-9.23	-7.66	1.57	NaCl
Hausmannite	-7.47	54.72	62.19	Mn3O4
Hematite	19.35	41.96	22.61	Fe2O3
Huntite	-7.47	-37.15	-29.67	CaMg3(CO3)4
Hydrocerrusite	-5.53	-22.99	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-17.41	-25.57	-8.16	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-4.52	26.87	31.39	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-2.91	27.64	30.54	KFe3(SO4)2(OH)6
Jarosite-Na	-5.82	28.71	34.53	NaFe3(SO4)2(OH)6
JarositeH	-10.98	23.66	34.64	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-6.02	-9.25	-3.23	AlOHSO4
Langite	-8.44	8.81	17.24	Cu4(OH)6SO4:H2O
Larnakite	-6.18	-6.38	-0.21	PbO:PbSO4
Laurionite	-6.71	-6.08	0.62	PbOHCl
Litharge	-6.28	6.63	12.91	PbO
Maghemite	9.31	41.96	32.65	Fe2O3
Magnesite	-1.44	-9.40	-7.96	MgCO3
Magnetite	20.32	50.90	30.58	Fe3O4
Malachite	-2.22	-7.21	-4.99	Cu2(OH)2CO3
Manganite	-3.09	22.25	25.34	MnOOH
Massicot	-6.47	6.63	13.10	PbO
Matlockite	-8.95	-18.48	-9.52	PbClF
Melanothallite	-22.18	-18.31	3.87	CuCl2
Melanterite	-8.43	-10.70	-2.27	FeSO4:7H2O
Minium	-30.91	43.96	74.87	Pb3O4
Mirabilite	-8.21	-9.54	-1.33	Na2SO4:10H2O
Mn2(SO4)3	-60.77	-14.42	46.35	Mn2(SO4)3
Mn3(AsO4):8H2O	-10.09	2.48	12.57	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-17.72	-15.21	2.51	MnCl2:4H2O
MnSO4	-12.27	-9.43	2.85	MnSO4
Morenosite	-9.73	-12.13	-2.39	NiSO4:7H2O
Na4UO2(CO3)3	-24.07	-40.36	-16.29	Na4UO2(CO3)3
Nahcolite	-5.42	-16.39	-10.96	NaHCO3
Nantokite	-8.06	-17.64	-9.58	CuCl
Natron	-9.84	-11.33	-1.49	Na2CO3:10H2O
Nesquehonite	-3.85	-9.40	-5.55	MgCO3:3H2O
Ni(OH)2	-2.93	7.52	10.45	Ni(OH)2
Ni3(AsO4)2:8H2O	-21.38	-5.62	15.76	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-21.58	10.42	32.00	Ni4(OH)6SO4
NiCO3	-7.20	-13.92	-6.73	NiCO3
Nsutite	-8.27	34.29	42.56	MnO2
O2(g)	-36.61	48.16	84.77	O2
Pb(OH)2	-1.68	6.63	8.31	Pb(OH)2
Pb2(OH)3Cl	-8.25	0.54	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-12.94	13.26	26.20	PbO:Pb(OH)2
Pb2O3	-23.70	37.34	61.04	Pb2O3
Pb2OCO3	-7.81	-8.18	-0.37	PbO:PbCO3
Pb3(AsO4)2	-14.15	-8.28	5.87	Pb3(AsO4)2
Pb3O2CO3	-12.88	-1.55	11.32	PbCO3:2PbO
Pb3O2SO4	-10.40	0.24	10.64	PbSO4:2PbO
Pb4(OH)6SO4	-14.23	6.87	21.10	Pb4(OH)6SO4
Pb4O3SO4	-15.63	6.87	22.50	PbSO4:3PbO
PbF2	-10.73	-18.16	-7.43	PbF2
PbMetal	-21.72	-17.45	4.27	Pb
PbO:0.3H2O	-6.35	6.63	12.98	PbO:0.33H2O
Phosgenite	-13.79	-33.60	-19.81	PbCl2:PbCO3
Plattnerite	-19.40	30.71	50.11	PbO2
Portlandite	-10.66	12.50	23.16	Ca(OH)2
Pyrochroite	-4.99	10.21	15.20	Mn(OH)2
Pyrolusite	-7.83	34.29	42.13	MnO2
Retgersite	-10.07	-12.13	-2.05	NiSO4:6H2O
Rhodochrosite	-0.11	-11.22	-11.11	MnCO3
Rhodochrosite(d)	-0.83	-11.22	-10.39	MnCO3
Rutherfordine	-3.25	-17.69	-14.43	UO2CO3
Schoepite	-1.79	3.75	5.54	UO2(OH)2:H2O
Scorodite	-6.62	6.90	13.52	FeAsO4:2H2O
Siderite	-1.64	-12.50	-10.86	FeCO3
Siderite(d)(3)	-2.05	-12.50	-10.45	FeCO3
Smithsonite	-2.69	-12.64	-9.95	ZnCO3
Tenorite	-0.68	7.11	7.80	CuO
Thenardite	-9.37	-9.54	-0.17	Na2SO4
Thermonatrite	-11.49	-11.33	0.16	Na2CO3:H2O
Trona	-16.76	-27.72	-10.96	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-27.34	-39.97	-12.64	U(OH)2SO4
U3O8(c)	-6.38	-12.83	-6.44	U3O8
U4O9(c)	-17.28	-57.24	-39.96	U4O9
UF4(c)	-42.08	-69.90	-27.82	UF4
UF4:2.5H2O	-32.90	-69.90	-37.00	UF4:2.5H2O
UO2(a)	-10.99	-20.33	-9.34	UO2
UO3(gamma)	-4.19	3.75	7.94	UO3
Uraninite(c)	-6.31	-20.33	-14.02	UO2
Witherite	-3.26	-11.84	-8.57	BaCO3
Zincite(c)	-2.60	8.79	11.39	ZnO
Zincosite	-14.08	-10.85	3.23	ZnSO4
Zn(OH)2-a	-3.66	8.79	12.45	Zn(OH)2
Zn(OH)2-b	-2.96	8.79	11.75	Zn(OH)2
Zn(OH)2-c	-3.41	8.79	12.20	Zn(OH)2
Zn(OH)2-e	-2.71	8.79	11.50	Zn(OH)2
Zn(OH)2-g	-2.92	8.79	11.71	Zn(OH)2
Zn2(OH)2SO4	-9.55	-2.05	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-10.32	4.88	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-15.51	-1.78	13.73	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-32.63	-12.90	19.73	ZnO:2ZnSO4
Zn4(OH)6SO4	-12.87	15.53	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-19.96	18.54	38.50	Zn5(OH)8Cl2
ZnCl2	-23.86	-16.63	7.23	ZnCl2
ZnCO3:H2O	-2.38	-12.64	-10.26	ZnCO3:H2O
ZnF2	-14.62	-15.99	-1.37	ZnF2
ZnMetal	-41.47	-15.29	26.18	Zn
ZnO(a)	-2.52	8.79	11.31	ZnO
ZnSO4:H2O	-10.40	-10.85	-0.45	ZnSO4:H2O

End of simulation.

```
------------------
Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 1.5-2.5m
           SOLUTION        3
           units           mg/l
           temp            19.9
           pH              7.14
           F               4.5
           Cl              0.4
           S(6)            21          as SO4
           Na              19
           K               2.6
           Mg              1.2
           Ca              3.7
           Alkalinity      36.6        as HCO3
           Al              1.16
           As(+3)          0.2
           As(+5)          0.19
           Ba              0.042
           Cu              0.034
           Fe              0.9
           Mn              0.04
           Ni              0.0032
           Pb              0.0019
           U               0.05
           Zn              0.023
           END
```

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TITLE
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   Schneckentein 1.5-2.5m

-----------------------------------------
Beginning of initial solution calculations.
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Initial solution 3.

----------------------------Solution composition--------------------
----------

           Elements           Molality       Moles

           Al                 4.300e-05   4.300e-05
           Alkalinity         5.999e-04   5.999e-04
           As(3)              2.670e-06   2.670e-06
           As(5)              2.536e-06   2.536e-06
           Ba                 3.058e-07   3.058e-07
           Ca                 9.232e-05   9.232e-05
           Cl                 1.128e-05   1.128e-05
           Cu                 5.351e-07   5.351e-07
           F                  2.369e-04   2.369e-04
           Fe                 1.612e-05   1.612e-05
           K                  6.650e-05   6.650e-05
           Mg                 4.936e-05   4.936e-05
           Mn                 7.282e-07   7.282e-07
           Na                 8.265e-04   8.265e-04
           Ni                 5.451e-08   5.451e-08
           Pb                 9.171e-09   9.171e-09
           S(6)               2.186e-04   2.186e-04
           U                  2.101e-07   2.101e-07
           Zn                 3.519e-07   3.519e-07
```

```
----------------------------Description of solution----------------------------

                                    pH  =   7.140
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   1.542e-03
                     Mass of water (kg)  =   1.000e+00
                 Total carbon (mol/kg)  =   6.149e-04
                    Total CO2 (mol/kg)  =   6.149e-04
                   Temperature (deg C)  =  19.900
                Electrical balance (eq)  =   5.008e-05
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =   2.13
                              Iterations  =  15
                                 Total H  = 1.110130e+02
                                 Total O  = 5.550894e+01

---------------------------------Redox couples---------------------------------

           Redox couple             pe  Eh (volts)

           As(3)/As(5)         -0.2616     -0.0152
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	9.709e-08	9.297e-08	-7.013	-7.032	-0.019
H+	7.547e-08	7.244e-08	-7.122	-7.140	-0.018
H2O	5.551e+01	1.000e+00	-0.000	-0.000	0.000
Al 4.300e-05					
AlF3	1.620e-05	1.621e-05	-4.790	-4.790	0.000
Al(OH)4-	1.600e-05	1.532e-05	-4.796	-4.815	-0.019
AlF2+	8.488e-06	8.127e-06	-5.071	-5.090	-0.019
AlF4-	1.072e-06	1.026e-06	-5.970	-5.989	-0.019
Al(OH)3	6.264e-07	6.266e-07	-6.203	-6.203	0.000
Al(OH)2+	4.745e-07	4.544e-07	-6.324	-6.343	-0.019
AlF+2	1.245e-07	1.046e-07	-6.905	-6.980	-0.075
AlOH+2	7.906e-09	6.646e-09	-8.102	-8.177	-0.075
Al+3	1.002e-10	6.778e-11	-9.999	-10.169	-0.170
AlSO4+	3.763e-11	3.603e-11	-10.425	-10.443	-0.019
Al(SO4)2-	2.088e-13	1.999e-13	-12.680	-12.699	-0.019
AlHSO4+2	2.641e-19	2.220e-19	-18.578	-18.654	-0.075
As(3) 2.670e-06					
H3AsO3	2.651e-06	2.652e-06	-5.577	-5.576	0.000
H2AsO3-	1.865e-08	1.786e-08	-7.729	-7.748	-0.019
HAsO3-2	1.853e-13	1.558e-13	-12.732	-12.808	-0.075
H4AsO3+	9.941e-14	9.519e-14	-13.003	-13.021	-0.019
AsO3-3	1.025e-19	6.938e-20	-18.989	-19.159	-0.170
As(5) 2.536e-06					
HAsO4-2	1.848e-06	1.553e-06	-5.733	-5.809	-0.075
H2AsO4-	6.885e-07	6.592e-07	-6.162	-6.181	-0.019
AsO4-3	7.069e-11	4.783e-11	-10.151	-10.320	-0.170
H3AsO4	7.949e-12	7.952e-12	-11.100	-11.100	0.000
Ba 3.058e-07					
Ba+2	2.833e-07	2.382e-07	-6.548	-6.623	-0.075
BaSO4	2.145e-08	2.146e-08	-7.669	-7.668	0.000
BaHCO3+	1.021e-09	9.773e-10	-8.991	-9.010	-0.019
BaCO3	3.237e-11	3.238e-11	-10.490	-10.490	0.000
BaOH+	1.163e-13	1.114e-13	-12.934	-12.953	-0.019
C(4) 6.149e-04					
HCO3-	5.245e-04	5.026e-04	-3.280	-3.299	-0.019
CO2	8.783e-05	8.786e-05	-4.056	-4.056	0.000
FeHCO3+	4.913e-07	4.705e-07	-6.309	-6.327	-0.019
CaHCO3+	4.613e-07	4.417e-07	-6.336	-6.355	-0.019
CO3-2	3.458e-07	2.915e-07	-6.461	-6.535	-0.074
MgHCO3+	2.400e-07	2.298e-07	-6.620	-6.639	-0.019
NaHCO3	2.234e-07	2.235e-07	-6.651	-6.651	0.000
UO2(CO3)2-2	1.755e-07	1.475e-07	-6.756	-6.831	-0.075
CuCO3	1.158e-07	1.158e-07	-6.936	-6.936	0.000
FeCO3	6.543e-08	6.546e-08	-7.184	-7.184	0.000
NiCO3	3.402e-08	3.403e-08	-7.468	-7.468	0.000
CaCO3	3.344e-08	3.345e-08	-7.476	-7.476	0.000
MnHCO3+	2.641e-08	2.529e-08	-7.578	-7.597	-0.019
UO2CO3	2.372e-08	2.373e-08	-7.625	-7.625	0.000
CuHCO3+	1.946e-08	1.864e-08	-7.711	-7.730	-0.019
ZnHCO3+	1.697e-08	1.625e-08	-7.770	-7.789	-0.019
ZnCO3	1.493e-08	1.494e-08	-7.826	-7.826	0.000
MnCO3	1.307e-08	1.307e-08	-7.884	-7.884	0.000
MgCO3	1.025e-08	1.025e-08	-7.989	-7.989	0.000
PbCO3	6.577e-09	6.579e-09	-8.182	-8.182	0.000
UO2(CO3)3-4	5.471e-09	2.732e-09	-8.262	-8.564	-0.302
NaCO3-	3.450e-09	3.304e-09	-8.462	-8.481	-0.019
NiHCO3+	1.141e-09	1.092e-09	-8.943	-8.962	-0.019
BaHCO3+	1.021e-09	9.773e-10	-8.991	-9.010	-0.019
PbHCO3+	5.415e-10	5.185e-10	-9.266	-9.285	-0.019
Zn(CO3)2-2	1.108e-10	9.311e-11	-9.956	-10.031	-0.075
Cu(CO3)2-2	5.056e-11	4.251e-11	-10.296	-10.372	-0.075
BaCO3	3.237e-11	3.238e-11	-10.490	-10.490	0.000
Ni(CO3)2-2	2.051e-11	1.724e-11	-10.688	-10.763	-0.075
Pb(CO3)2-2	5.731e-12	4.818e-12	-11.242	-11.317	-0.075
(UO2)3(CO3)6-6	2.262e-17	4.741e-18	-16.645	-17.324	-0.679
UO2(CO3)3-5	1.205e-25	4.070e-26	-24.919	-25.390	-0.471
U(CO3)4-4	1.886e-31	9.416e-32	-30.725	-31.026	-0.302
U(CO3)5-6	9.164e-37	1.921e-37	-36.038	-36.717	-0.679
Ca 9.232e-05					
Ca+2	8.917e-05	7.515e-05	-4.050	-4.124	-0.074
CaSO4	2.567e-06	2.568e-06	-5.591	-5.590	0.000
CaHCO3+	4.613e-07	4.417e-07	-6.336	-6.355	-0.019
CaF+	9.643e-08	9.234e-08	-7.016	-7.035	-0.019
CaCO3	3.344e-08	3.345e-08	-7.476	-7.476	0.000
CaOH+	1.798e-10	1.721e-10	-9.745	-9.764	-0.019
CaHSO4+	1.071e-12	1.026e-12	-11.970	-11.989	-0.019
Cl 1.128e-05					
Cl-	1.128e-05	1.080e-05	-4.948	-4.967	-0.019
FeCl+	1.458e-10	1.396e-10	-9.836	-9.855	-0.019
MnCl+	2.594e-11	2.484e-11	-10.586	-10.605	-0.019
ZnCl+	6.203e-12	5.939e-12	-11.207	-11.226	-0.019
CuCl+	1.742e-12	1.668e-12	-11.759	-11.778	-0.019
ZnOHCl	1.267e-12	1.268e-12	-11.897	-11.897	0.000
PbCl+	5.128e-13	4.910e-13	-12.290	-12.309	-0.019
NiCl+	4.462e-13	4.272e-13	-12.351	-12.369	-0.019
CuCl2-	1.443e-13	1.382e-13	-12.841	-12.860	-0.019
UO2Cl+	3.119e-16	2.987e-16	-15.506	-15.525	-0.019
MnCl2	1.171e-16	1.171e-16	-15.932	-15.931	0.000
ZnCl2	6.577e-17	6.579e-17	-16.182	-16.182	0.000
NiCl2	1.675e-17	1.675e-17	-16.776	-16.776	0.000
PbCl2	9.258e-18	9.261e-18	-17.033	-17.033	0.000
CuCl2	9.145e-18	9.149e-18	-17.039	-17.039	0.000
CuCl3-2	2.758e-18	2.318e-18	-17.559	-17.635	-0.075
FeCl+2	2.214e-18	1.861e-18	-17.655	-17.730	-0.075
ZnCl3-	8.072e-22	7.729e-22	-21.093	-21.112	-0.019
MnCl3-	3.639e-22	3.484e-22	-21.439	-21.458	-0.019
UO2Cl2	1.648e-22	1.648e-22	-21.783	-21.783	0.000
FeCl2+	1.106e-22	1.059e-22	-21.956	-21.975	-0.019
PbCl3-	8.037e-23	7.696e-23	-22.095	-22.114	-0.019
CuCl3-	3.340e-25	3.198e-25	-24.476	-24.495	-0.019
ZnCl4-2	4.777e-27	4.016e-27	-26.321	-26.396	-0.075
PbCl4-2	4.548e-28	3.823e-28	-27.342	-27.418	-0.075
FeCl3	1.143e-28	1.144e-28	-27.942	-27.942	0.000
CuCl4-2	1.827e-32	1.535e-32	-31.738	-31.814	-0.075
UCl+3	0.000e+00	0.000e+00	-40.804	-40.973	-0.170
Cu(1) 3.863e-09					
Cu+	3.863e-09	3.699e-09	-8.413	-8.432	-0.019
CuCl2-	1.443e-13	1.382e-13	-12.841	-12.860	-0.019
CuCl3-2	2.758e-18	2.318e-18	-17.559	-17.635	-0.075
Cu(2) 5.312e-07					
Cu(OH)2	2.944e-07	2.945e-07	-6.531	-6.531	0.000
CuCO3	1.158e-07	1.158e-07	-6.936	-6.936	0.000
Cu+2	8.800e-08	7.398e-08	-7.056	-7.131	-0.075
CuHCO3+	1.946e-08	1.864e-08	-7.711	-7.730	-0.019
CuOH+	1.066e-08	1.021e-08	-7.972	-7.991	-0.019
CuSO4	2.619e-09	2.620e-09	-8.582	-8.582	0.000
CuF+	2.135e-10	2.044e-10	-9.671	-9.690	-0.019
Cu(CO3)2-2	5.056e-11	4.251e-11	-10.296	-10.372	-0.075
Cu2(OH)2+2	3.242e-11	2.726e-11	-10.489	-10.565	-0.075
CuCl+	1.742e-12	1.668e-12	-11.759	-11.778	-0.019
Cu(OH)3-	2.558e-13	2.449e-13	-12.592	-12.611	-0.019
CuCl2	9.145e-18	9.149e-18	-17.039	-17.039	0.000
Cu(OH)4-2	8.025e-19	6.746e-19	-18.096	-18.171	-0.075
CuCl3-	3.340e-25	3.198e-25	-24.476	-24.495	-0.019
CuCl4-2	1.827e-32	1.535e-32	-31.738	-31.814	-0.075
F 2.369e-04					
F-	1.663e-04	1.592e-04	-3.779	-3.798	-0.019
AlF3	1.620e-05	1.621e-05	-4.790	-4.790	0.000
AlF2+	8.488e-06	8.127e-06	-5.071	-5.090	-0.019
AlF4-	1.072e-06	1.026e-06	-5.970	-5.989	-0.019
MgF+	3.987e-07	3.817e-07	-6.399	-6.418	-0.019
AlF+2	1.245e-07	1.046e-07	-6.905	-6.980	-0.075
CaF+	9.643e-08	9.234e-08	-7.016	-7.035	-0.019
NaF	7.242e-08	7.244e-08	-7.140	-7.140	0.000
HF	1.579e-08	1.580e-08	-7.802	-7.801	0.000
FeF+	1.557e-08	1.490e-08	-7.808	-7.827	-0.019
MnF+	6.494e-10	6.219e-10	-9.187	-9.206	-0.019
ZnF+	5.652e-10	5.412e-10	-9.248	-9.267	-0.019
UO2F+	3.996e-10	3.826e-10	-9.398	-9.417	-0.019
CuF+	2.135e-10	2.044e-10	-9.671	-9.690	-0.019
UO2F2	2.058e-10	2.059e-10	-9.687	-9.686	0.000
NiF+	5.224e-11	5.002e-11	-10.282	-10.301	-0.019
FeF2+	9.761e-12	9.346e-12	-11.011	-11.029	-0.019
HF2-	9.658e-12	9.247e-12	-11.015	-11.034	-0.019
UO2F3-	6.512e-12	6.236e-12	-11.186	-11.205	-0.019
PbF+	3.840e-12	3.677e-12	-11.416	-11.434	-0.019
FeF3	2.317e-12	2.317e-12	-11.635	-11.635	0.000
FeF+2	1.866e-12	1.568e-12	-11.729	-11.805	-0.075
PbF2	1.195e-14	1.195e-14	-13.923	-13.922	0.000
UO2F4-2	7.561e-15	6.356e-15	-14.121	-14.197	-0.075
H2F2	7.797e-16	7.799e-16	-15.108	-15.108	0.000
PbF3-	1.440e-17	1.379e-17	-16.842	-16.860	-0.019
PbF4-2	1.250e-21	1.051e-21	-20.903	-20.978	-0.075
UF4	3.422e-28	3.423e-28	-27.466	-27.466	0.000
UF3+	2.747e-28	2.630e-28	-27.561	-27.580	-0.019
UF2+2	8.411e-30	7.070e-30	-29.075	-29.151	-0.075
UF5-	1.557e-30	1.491e-30	-29.808	-29.827	-0.019
UF6-2	3.636e-32	3.057e-32	-31.439	-31.515	-0.075
UF+3	8.007e-33	5.417e-33	-32.097	-32.266	-0.170
Fe(2) 1.201e-05					
Fe+2	1.114e-05	9.360e-06	-4.953	-5.029	-0.075
FeHCO3+	4.913e-07	4.705e-07	-6.309	-6.327	-0.019
FeSO4	2.721e-07	2.721e-07	-6.565	-6.565	0.000
FeCO3	6.543e-08	6.546e-08	-7.184	-7.184	0.000
FeOH+	2.896e-08	2.773e-08	-7.538	-7.557	-0.019
FeF+	1.557e-08	1.490e-08	-7.808	-7.827	-0.019
FeCl+	1.458e-10	1.396e-10	-9.836	-9.855	-0.019
Fe(OH)2	2.074e-12	2.074e-12	-11.683	-11.683	0.000
FeHSO4+	1.335e-13	1.278e-13	-12.875	-12.894	-0.019
Fe(OH)3-	1.056e-15	1.011e-15	-14.976	-14.995	-0.019

Fe(3)	4.108e-06					
	Fe(OH)3	2.351e-06	2.352e-06	-5.629	-5.629	0.000
	Fe(OH)2+	1.732e-06	1.658e-06	-5.762	-5.780	-0.019
	Fe(OH)4-	2.510e-08	2.403e-08	-7.600	-7.619	-0.019
	FeOH+2	5.254e-10	4.417e-10	-9.279	-9.355	-0.075
	FeF2+	9.761e-12	9.346e-12	-11.011	-11.029	-0.019
	FeF3	2.317e-12	2.317e-12	-11.635	-11.635	0.000
	FeF+2	1.866e-12	1.568e-12	-11.729	-11.805	-0.075
	FeSO4+	1.235e-14	1.182e-14	-13.908	-13.927	-0.019
	Fe+3	9.942e-15	6.727e-15	-14.003	-14.172	-0.170
	Fe(SO4)2-	4.758e-17	4.556e-17	-16.323	-16.341	-0.019
	Fe2(OH)2+4	1.303e-17	6.507e-18	-16.885	-17.187	-0.302
	FeCl+2	2.214e-18	1.861e-18	-17.655	-17.730	-0.075
	Fe3(OH)4+5	1.077e-20	3.639e-21	-19.968	-20.439	-0.471
	FeHSO4+2	2.744e-21	2.307e-21	-20.562	-20.637	-0.075
	FeCl2+	1.106e-22	1.059e-22	-21.956	-21.975	-0.019
	FeCl3	1.143e-28	1.144e-28	-27.942	-27.942	0.000
H(0)	7.520e-26					
	H2	3.760e-26	3.762e-26	-25.425	-25.425	0.000
K	6.650e-05					
	K+	6.642e-05	6.358e-05	-4.178	-4.197	-0.019
	KSO4-	7.911e-08	7.575e-08	-7.102	-7.121	-0.019
Mg	4.936e-05					
	Mg+2	4.724e-05	3.986e-05	-4.326	-4.399	-0.074
	MgSO4	1.469e-06	1.470e-06	-5.833	-5.833	0.000
	MgF+	3.987e-07	3.817e-07	-6.399	-6.418	-0.019
	MgHCO3+	2.400e-07	2.298e-07	-6.620	-6.639	-0.019
	MgCO3	1.025e-08	1.025e-08	-7.989	-7.989	0.000
	MgOH+	1.306e-09	1.250e-09	-8.884	-8.903	-0.019
Mn(2)	7.282e-07					
	Mn+2	6.715e-07	5.645e-07	-6.173	-6.248	-0.075
	MnHCO3+	2.641e-08	2.529e-08	-7.578	-7.597	-0.019
	MnSO4	1.634e-08	1.635e-08	-7.787	-7.787	0.000
	MnCO3	1.307e-08	1.307e-08	-7.884	-7.884	0.000
	MnF+	6.494e-10	6.219e-10	-9.187	-9.206	-0.019
	MnOH+	1.370e-10	1.312e-10	-9.863	-9.882	-0.019
	MnCl+	2.594e-11	2.484e-11	-10.586	-10.605	-0.019
	MnCl2	1.171e-16	1.171e-16	-15.932	-15.931	0.000
	Mn(OH)3-	2.457e-20	2.353e-20	-19.610	-19.628	-0.019
	MnCl3-	3.639e-22	3.484e-22	-21.439	-21.458	-0.019
Mn(3)	1.208e-28					
	Mn+3	1.208e-28	8.176e-29	-27.918	-28.087	-0.170
Mn(6)	0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-53.407	-53.482	-0.075
Mn(7)	0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-59.187	-59.205	-0.019
Na	8.265e-04					
	Na+	8.255e-04	7.906e-04	-3.083	-3.102	-0.019
	NaSO4-	7.199e-07	6.893e-07	-6.143	-6.162	-0.019
	NaHCO3	2.234e-07	2.235e-07	-6.651	-6.651	0.000
	NaF	7.242e-08	7.244e-08	-7.140	-7.140	0.000
	NaCO3-	3.450e-09	3.304e-09	-8.462	-8.481	-0.019
Ni	5.451e-08					
	NiCO3	3.402e-08	3.403e-08	-7.468	-7.468	0.000
	Ni+2	1.873e-08	1.575e-08	-7.727	-7.803	-0.075
	NiHCO3+	1.141e-09	1.092e-09	-8.943	-8.962	-0.019
	NiSO4	5.276e-10	5.278e-10	-9.278	-9.278	0.000
	NiF+	5.224e-11	5.002e-11	-10.282	-10.301	-0.019
	NiOH+	2.175e-11	2.083e-11	-10.662	-10.681	-0.019
	Ni(CO3)2-2	2.051e-11	1.724e-11	-10.688	-10.763	-0.075
	NiCl+	4.462e-13	4.272e-13	-12.351	-12.369	-0.019
	Ni(OH)2	2.999e-13	3.000e-13	-12.523	-12.523	0.000
	Ni(SO4)2-2	6.339e-15	5.328e-15	-14.198	-14.273	-0.075
	Ni(OH)3-	4.325e-17	4.141e-17	-16.364	-16.383	-0.019
	NiCl2	1.675e-17	1.675e-17	-16.776	-16.776	0.000
O(0)	0.000e+00					
	O2	0.000e+00	0.000e+00	-43.240	-43.239	0.000
Pb	9.171e-09					
	PbCO3	6.577e-09	6.579e-09	-8.182	-8.182	0.000
	Pb+2	1.545e-09	1.299e-09	-8.811	-8.887	-0.075
	PbHCO3+	5.415e-10	5.185e-10	-9.266	-9.285	-0.019
	PbOH+	3.650e-10	3.495e-10	-9.438	-9.457	-0.019
	PbSO4	1.312e-10	1.313e-10	-9.882	-9.882	0.000
	Pb(CO3)2-2	5.731e-12	4.818e-12	-11.242	-11.317	-0.075
	PbF+	3.840e-12	3.677e-12	-11.416	-11.434	-0.019
	Pb(OH)2	1.876e-12	1.877e-12	-11.727	-11.727	0.000
	PbCl+	5.128e-13	4.910e-13	-12.290	-12.309	-0.019
	Pb(SO4)2-2	1.473e-13	1.239e-13	-12.832	-12.907	-0.075
	PbF2	1.195e-14	1.195e-14	-13.923	-13.922	0.000
	Pb(OH)3-	3.107e-16	2.975e-16	-15.508	-15.527	-0.019
	Pb2OH+3	1.502e-17	1.016e-17	-16.823	-16.993	-0.170
	PbF3-	1.440e-17	1.379e-17	-16.842	-16.860	-0.019
	PbCl2	9.258e-18	9.261e-18	-17.033	-17.033	0.000
	Pb(OH)4-2	1.119e-20	9.406e-21	-19.951	-20.027	-0.075
	PbF4-2	1.250e-21	1.051e-21	-20.903	-20.978	-0.075
	PbCl3-	8.037e-23	7.696e-23	-22.095	-22.114	-0.019
	Pb3(OH)4+2	5.724e-23	4.812e-23	-22.242	-22.318	-0.075
	PbCl4-2	4.548e-28	3.823e-28	-27.342	-27.418	-0.075
S(6)	2.186e-04					
	SO4-2	2.135e-04	1.798e-04	-3.671	-3.745	-0.075
	CaSO4	2.567e-06	2.568e-06	-5.591	-5.590	0.000
	MgSO4	1.469e-06	1.470e-06	-5.833	-5.833	0.000
	NaSO4-	7.199e-07	6.893e-07	-6.143	-6.162	-0.019
	FeSO4	2.721e-07	2.721e-07	-6.565	-6.565	0.000
	KSO4-	7.911e-08	7.575e-08	-7.102	-7.121	-0.019
	BaSO4	2.145e-08	2.146e-08	-7.669	-7.668	0.000
	MnSO4	1.634e-08	1.635e-08	-7.787	-7.787	0.000
	ZnSO4	1.040e-08	1.040e-08	-7.983	-7.983	0.000
	CuSO4	2.619e-09	2.620e-09	-8.582	-8.582	0.000
	HSO4-	1.186e-09	1.136e-09	-8.926	-8.945	-0.019
	NiSO4	5.276e-10	5.278e-10	-9.278	-9.278	0.000
	PbSO4	1.312e-10	1.313e-10	-9.882	-9.882	0.000
	AlSO4+	3.763e-11	3.603e-11	-10.425	-10.443	-0.019
	Zn(SO4)2-2	1.881e-11	1.582e-11	-10.726	-10.801	-0.075
	UO2SO4	4.371e-12	4.372e-12	-11.359	-11.359	0.000
	CaHSO4+	1.071e-12	1.026e-12	-11.970	-11.989	-0.019
	Al(SO4)2-	2.088e-13	1.999e-13	-12.680	-12.699	-0.019
	Pb(SO4)2-2	1.473e-13	1.239e-13	-12.832	-12.907	-0.075
	FeHSO4+	1.335e-13	1.278e-13	-12.875	-12.894	-0.019
	FeSO4+	1.235e-14	1.182e-14	-13.908	-13.927	-0.019
	UO2(SO4)2-2	8.197e-15	6.890e-15	-14.086	-14.162	-0.075
	Ni(SO4)2-2	6.339e-15	5.328e-15	-14.198	-14.273	-0.075
	Fe(SO4)2-	4.758e-17	4.556e-17	-16.323	-16.341	-0.019
	AlHSO4+2	2.641e-19	2.220e-19	-18.578	-18.654	-0.075
	FeHSO4+2	2.744e-21	2.307e-21	-20.562	-20.637	-0.075
	U(SO4)2	1.333e-35	1.334e-35	-34.875	-34.875	0.000
	USO4+2	1.262e-35	1.061e-35	-34.899	-34.974	-0.075
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-50.722	-50.892	-0.170
U(4)	9.146e-19					
	U(OH)4	9.143e-19	9.147e-19	-18.039	-18.039	0.000
	U(OH)3+	2.692e-22	2.578e-22	-21.570	-21.589	-0.019
	U(OH)2+2	1.187e-26	9.976e-27	-25.926	-26.001	-0.075
	UF4	3.422e-28	3.423e-28	-27.466	-27.466	0.000
	UF3+	2.747e-28	2.630e-28	-27.561	-27.580	-0.019
	UF2+2	8.411e-30	7.070e-30	-29.075	-29.151	-0.075
	UF5-	1.557e-30	1.491e-30	-29.808	-29.827	-0.019
	U(CO3)4-4	1.886e-31	9.416e-32	-30.725	-31.026	-0.302
	UOH+3	6.947e-32	4.701e-32	-31.158	-31.328	-0.170
	UF6-2	3.636e-32	3.057e-32	-31.439	-31.515	-0.075
	UF+3	8.007e-33	5.417e-33	-32.097	-32.266	-0.170
	U(SO4)2	1.333e-35	1.334e-35	-34.875	-34.875	0.000
	USO4+2	1.262e-35	1.061e-35	-34.899	-34.974	-0.075
	U(CO3)5-6	9.164e-37	1.921e-37	-36.038	-36.717	-0.679
	U+4	3.287e-38	1.641e-38	-37.483	-37.785	-0.302
	UCl+3	0.000e+00	0.000e+00	-40.804	-40.973	-0.170
	U6(OH)15+9	0.000e+00	0.000e+00	-135.282	-136.809	-1.527
U(5)	7.029e-14					
	UO2+	7.029e-14	6.730e-14	-13.153	-13.172	-0.019
	UO2(CO3)3-5	1.205e-25	4.070e-26	-24.919	-25.390	-0.471
U(6)	2.101e-07					
	UO2(CO3)2-2	1.755e-07	1.475e-07	-6.756	-6.831	-0.075
	UO2CO3	2.372e-08	2.373e-08	-7.625	-7.625	0.000
	UO2(CO3)3-4	5.471e-09	2.732e-09	-8.262	-8.564	-0.302
	UO2(OH)3-	3.426e-09	3.280e-09	-8.465	-8.484	-0.019
	UO2OH+	1.301e-09	1.246e-09	-8.886	-8.905	-0.019
	UO2F+	3.996e-10	3.826e-10	-9.398	-9.417	-0.019
	UO2F2	2.058e-10	2.059e-10	-9.687	-9.686	0.000
	UO2+2	2.352e-11	1.977e-11	-10.629	-10.704	-0.075
	UO2F3-	6.512e-12	6.236e-12	-11.186	-11.205	-0.019
	UO2SO4	4.371e-12	4.372e-12	-11.359	-11.359	0.000
	(UO2)3(OH)5+	5.454e-13	5.223e-13	-12.263	-12.282	-0.019
	(UO2)2(OH)2+2	1.573e-13	1.322e-13	-12.803	-12.879	-0.075
	(UO2)3(OH)7-	7.701e-14	7.374e-14	-13.113	-13.132	-0.019
	UO2(SO4)2-2	8.197e-15	6.890e-15	-14.086	-14.162	-0.075
	UO2F4-2	7.561e-15	6.356e-15	-14.121	-14.197	-0.075
	(UO2)4(OH)7+	1.917e-15	1.835e-15	-14.717	-14.736	-0.019
	UO2(OH)4-2	8.537e-16	7.176e-16	-15.069	-15.144	-0.075
	(UO2)3(OH)4+2	4.199e-16	3.530e-16	-15.377	-15.452	-0.075
	UO2Cl+	3.119e-16	2.987e-16	-15.506	-15.525	-0.019
	(UO2)3(CO3)6-6	2.262e-17	4.741e-18	-16.645	-17.324	-0.679
	(UO2)2OH+3	1.590e-17	1.076e-17	-16.798	-16.968	-0.170
	UO2Cl2	1.648e-22	1.648e-22	-21.783	-21.783	0.000
Zn	3.519e-07					
	Zn+2	3.055e-07	2.568e-07	-6.515	-6.590	-0.075
	ZnHCO3+	1.697e-08	1.625e-08	-7.770	-7.789	-0.019
	ZnCO3	1.493e-08	1.494e-08	-7.826	-7.826	0.000
	ZnSO4	1.040e-08	1.040e-08	-7.983	-7.983	0.000
	ZnOH+	2.739e-09	2.622e-09	-8.562	-8.581	-0.019
	Zn(OH)2	6.158e-10	6.160e-10	-9.211	-9.210	0.000
	ZnF+	5.652e-10	5.412e-10	-9.248	-9.267	-0.019
	Zn(CO3)2-2	1.108e-10	9.311e-11	-9.956	-10.031	-0.075
	Zn(SO4)2-2	1.881e-11	1.582e-11	-10.726	-10.801	-0.075
	ZnCl+	6.203e-12	5.939e-12	-11.207	-11.226	-0.019
	ZnOHCl	1.267e-12	1.268e-12	-11.897	-11.897	0.000
	Zn(OH)3-	2.808e-14	2.689e-14	-13.552	-13.570	-0.019
	ZnCl2	6.577e-17	6.579e-17	-16.182	-16.182	0.000
	Zn(OH)4-2	6.998e-20	5.883e-20	-19.155	-19.230	-0.075
	ZnCl3-	8.072e-22	7.729e-22	-21.093	-21.112	-0.019
	ZnCl4-2	4.777e-27	4.016e-27	-26.321	-26.396	-0.075

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	0.11	11.25	11.14	Al(OH)3
AlAsO4:2H2O	-4.65	0.15	4.80	AlAsO4:2H2O
AlumK	-16.59	-21.86	-5.26	KAl(SO4)2:12H2O
Alunite	1.41	0.65	-0.76	KAl3(SO4)2(OH)6
Anglesite	-4.81	-12.63	-7.82	PbSO4
Anhydrite	-3.53	-7.87	-4.34	CaSO4
Antlerite	-4.87	3.42	8.29	Cu3(OH)4SO4
Aragonite	-2.35	-10.66	-8.31	CaCO3
Arsenolite	-19.32	-22.31	-2.98	As4O6
Artinite	-11.02	-1.05	9.97	MgCO3:Mg(OH)2:3H2O
As2O5	-28.97	-22.20	6.77	As2O5
Atacamite	-5.39	2.19	7.58	Cu2(OH)3Cl
Azurite	-3.57	-20.18	-16.61	Cu3(OH)2(CO3)2
B-UO2(OH)2	-2.14	3.58	5.72	UO2(OH)2
Ba3(AsO4)2	9.72	0.77	-8.95	Ba3(AsO4)2
BaF2	-8.45	-14.22	-5.77	BaF2
Barite	-0.31	-10.37	-10.05	BaSO4
Basaluminite	4.28	26.98	22.70	Al4(OH)10SO4
Bianchite	-8.57	-10.34	-1.76	ZnSO4:6H2O
Birnessite	-13.29	30.31	43.60	MnO2
Bixbyite	-12.92	38.34	51.26	Mn2O3
Boehmite	2.31	11.25	8.94	AlOOH
Brochantite	-4.77	10.57	15.34	Cu4(OH)6SO4
Brucite	-7.31	9.88	17.19	Mg(OH)2
Bunsenite	-6.28	6.48	12.76	NiO
Ca3(AsO4)2:4w	-14.11	8.27	22.38	Ca3(AsO4)2:4H2O
Calcite	-2.21	-10.66	-8.45	CaCO3
Cerrusite	-2.23	-15.42	-13.19	PbCO3
Chalcanthite	-8.22	-10.88	-2.66	CuSO4:5H2O
Claudetite	-19.07	-22.31	-3.23	As4O6
CO2(g)	-2.65	-20.82	-18.16	CO2
Cotunnite	-13.98	-18.82	-4.84	PbCl2
Cu(OH)2	-1.69	7.15	8.83	Cu(OH)2
Cu2SO4	-18.72	-26.01	-7.29	Cu2SO4
Cu3(AsO4)2:6w	-6.91	-0.75	6.16	Cu3(AsO4)2:6H2O
CuCO3	-4.04	-13.67	-9.63	CuCO3
CuF	-19.47	-14.93	4.54	CuF
CuF2	-14.28	-14.73	-0.45	CuF2
CuF2:2H2O	-10.22	-14.73	-4.50	CuF2:2H2O
CuMetal	-3.45	-15.13	-11.68	Cu
CuOCuSO4	-15.71	-3.73	11.98	CuO:CuSO4
CupricFerrite	15.27	47.93	32.66	CuFe2O4
Cuprite	-0.95	-7.98	-7.03	Cu2O
CuprousFerrite	14.83	16.40	1.57	CuFeO2
CuSO4	-14.12	-10.88	3.24	CuSO4
Diaspore	4.06	11.25	7.19	AlOOH
Dolomite	-4.62	-21.59	-16.97	CaMg(CO3)2
Dolomite(d)	-5.20	-21.59	-16.40	CaMg(CO3)2
Epsomite	-5.97	-8.14	-2.18	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.66	16.76	10.10	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.36	20.39	18.03	Fe(OH)3
Fe3(OH)8	3.52	50.03	46.51	Fe3(OH)8
Fluorite	-1.06	-11.72	-10.66	CaF2
Gibbsite	2.85	11.25	8.40	Al(OH)3
Goethite	8.25	20.39	12.14	FeOOH
Goslarite	-8.33	-10.34	-2.00	ZnSO4:7H2O
Gummite	-7.12	3.58	10.70	UO3
Gypsum	-3.29	-7.87	-4.58	CaSO4:2H2O
H2(g)	-22.23	-22.28	-0.05	H2
Halite	-9.64	-8.07	1.57	NaCl
Hausmannite	-15.94	46.37	62.31	Mn3O4
Hematite	18.11	40.78	22.67	Fe2O3
Huntite	-13.82	-43.46	-29.64	CaMg3(CO3)4
Hydrocerrusite	-7.99	-25.45	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-25.76	-33.86	-8.10	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-3.92	27.51	31.43	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-2.55	28.07	30.62	KFe3(SO4)2(OH)6
Jarosite-Na	-5.45	29.16	34.61	NaFe3(SO4)2(OH)6
JarositeH	-9.62	25.12	34.74	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-3.54	-6.77	-3.23	AlOHSO4
Langite	-6.72	10.57	17.30	Cu4(OH)6SO4:H2O
Larnakite	-7.04	-7.24	-0.20	PbO:PbSO4
Laurionite	-7.34	-6.71	0.62	PbOHCl
Litharge	-7.54	5.39	12.93	PbO
Maghemite	8.11	40.78	32.67	Fe2O3
Magnesite	-2.98	-10.93	-7.95	MgCO3
Magnetite	19.37	50.03	30.67	Fe3O4
Malachite	-1.54	-6.52	-4.97	Cu2(OH)2CO3
Manganite	-6.17	19.17	25.34	MnOOH
Massicot	-7.73	5.39	13.12	PbO
Matlockite	-8.12	-17.65	-9.53	PbClF
Melanothallite	-20.95	-17.06	3.89	CuCl2
Melanterite	-6.50	-8.77	-2.27	FeSO4:7H2O
Minium	-36.54	38.46	75.00	Pb3O4
Mirabilite	-8.59	-9.95	-1.36	Na2SO4:10H2O
Mn2(SO4)3	-62.20	-15.73	46.47	Mn2(SO4)3
Mn3(AsO4):8H2O	-10.68	1.90	12.57	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-18.67	-16.18	2.49	MnCl2:4H2O
MnSO4	-12.86	-9.99	2.87	MnSO4
Morenosite	-9.15	-11.55	-2.40	NiSO4:7H2O
Na4UO2(CO3)3	-26.43	-42.72	-16.29	Na4UO2(CO3)3
Nahcolite	-5.81	-16.78	-10.97	NaHCO3
Nantokite	-6.51	-16.10	-9.59	CuCl
Natron	-11.23	-12.74	-1.51	Na2CO3:10H2O
Nesquehonite	-5.39	-10.93	-5.55	MgCO3:3H2O
Ni(OH)2	-3.93	6.48	10.41	Ni(OH)2
Ni3(AsO4)2:8H2O	-18.54	-2.77	15.77	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-24.12	7.88	32.00	Ni4(OH)6SO4
NiCO3	-7.62	-14.34	-6.71	NiCO3
Nsutite	-12.25	30.31	42.56	MnO2
O2(g)	-40.39	44.56	84.95	O2
Pb(OH)2	-2.94	5.39	8.33	Pb(OH)2
Pb2(OH)3Cl	-10.11	-1.32	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.41	10.79	26.20	PbO:Pb(OH)2
Pb2O3	-27.97	33.07	61.04	Pb2O3
Pb2OCO3	-9.67	-10.03	-0.35	PbO:PbCO3
Pb3(AsO4)2	-11.90	-6.02	5.88	Pb3(AsO4)2
Pb3O2CO3	-15.99	-4.63	11.36	PbCO3:2PbO
Pb3O2SO4	-12.51	-1.84	10.66	PbSO4:2PbO
Pb4(OH)6SO4	-17.55	3.55	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.00	3.55	22.55	PbSO4:3PbO
PbF2	-9.05	-16.48	-7.43	PbF2
PbMetal	-21.15	-16.89	4.26	Pb
PbO:0.3H2O	-7.59	5.39	12.98	PbO:0.33H2O
Phosgenite	-14.43	-34.24	-19.81	PbCl2:PbCO3
Plattnerite	-22.53	27.67	50.20	PbO2
Portlandite	-13.04	10.16	23.20	Ca(OH)2
Pyrochroite	-7.17	8.03	15.20	Mn(OH)2
Pyrolusite	-11.90	30.31	42.21	MnO2
Retgersite	-9.49	-11.55	-2.05	NiSO4:6H2O
Rhodochrosite	-1.67	-12.78	-11.11	MnCO3
Rhodochrosite(d)	-2.39	-12.78	-10.39	MnCO3
Rutherfordine	-2.81	-17.24	-14.43	UO2CO3
Schoepite	-1.98	3.58	5.56	UO2(OH)2:H2O
Scorodite	-4.24	9.29	13.54	FeAsO4:2H2O
Siderite	-0.71	-11.56	-10.86	FeCO3
Siderite(d)(3)	-1.11	-11.56	-10.45	FeCO3
Smithsonite	-3.18	-13.13	-9.94	ZnCO3
Tenorite	-0.67	7.15	7.81	CuO
Thenardite	-9.78	-9.95	-0.17	Na2SO4
Thermonatrite	-12.90	-12.74	0.16	Na2CO3:H2O
Trona	-18.57	-29.52	-10.94	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-24.05	-36.73	-12.68	U(OH)2SO4
U3O8(c)	-5.12	-11.55	-6.43	U3O8
U4O9(c)	-12.53	-52.54	-40.01	U4O9
UF4(c)	-34.61	-62.46	-27.84	UF4
UF4:2.5H2O	-25.41	-62.46	-37.04	UF4:2.5H2O
UO2(a)	-9.32	-18.70	-9.38	UO2
UO3(gamma)	-4.39	3.58	7.97	UO3
Uraninite(c)	-4.66	-18.70	-14.04	UO2
Witherite	-4.58	-13.16	-8.58	BaCO3
Zincite(c)	-3.73	7.69	11.42	ZnO
Zincosite	-13.59	-10.34	3.25	ZnSO4
Zn(OH)2-a	-4.76	7.69	12.45	Zn(OH)2
Zn(OH)2-b	-4.06	7.69	11.75	Zn(OH)2
Zn(OH)2-c	-4.51	7.69	12.20	Zn(OH)2
Zn(OH)2-e	-3.81	7.69	11.50	Zn(OH)2
Zn(OH)2-g	-4.02	7.69	11.71	Zn(OH)2
Zn2(OH)2SO4	-10.15	-2.65	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-11.93	3.27	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-12.87	0.87	13.74	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-32.79	-12.98	19.81	ZnO:2ZnSO4
Zn4(OH)6SO4	-15.67	12.73	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-24.26	14.24	38.50	Zn5(OH)8Cl2
ZnCl2	-23.78	-16.52	7.25	ZnCl2
ZnCO3:H2O	-2.87	-13.13	-10.26	ZnCO3:H2O
ZnF2	-12.83	-14.19	-1.35	ZnF2
ZnMetal	-40.82	-14.59	26.23	Zn
ZnO(a)	-3.62	7.69	11.31	ZnO
ZnSO4:H2O	-9.90	-10.34	-0.43	ZnSO4:H2O

End of simulation.

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Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 2.5-3.5m
           SOLUTION        4
           units           mg/l
           temp            19.7
           pH              7.72
           F               0.37
           Cl              7.7
           S(6)            8.1         as SO4
           Na              26
           K               1.8
           Mg              0.71
           Ca              4.9
           Alkalinity      36.6        as HCO3
           Al              0.4
           As(+3)          0.021
           As(+5)          0.016
           Ba              0.135
           Cu              0.010
           Fe              0.43
           Mn              0.04
           Ni              0.0027
           Pb              0.0016
           U               0.04
           Zn              0.006
           END
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TITLE
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   Schneckentein 2.5-3.5m

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Beginning of initial solution calculations.
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Initial solution 4.

-----------------------------Solution composition------------
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           Elements           Molality       Moles

           Al                1.483e-05   1.483e-05
           Alkalinity        5.999e-04   5.999e-04
           As(3)             2.803e-07   2.803e-07
           As(5)             2.136e-07   2.136e-07
           Ba                9.830e-07   9.830e-07
           Ca                1.223e-04   1.223e-04
           Cl                2.172e-04   2.172e-04
           Cu                1.574e-07   1.574e-07
           F                 1.948e-05   1.948e-05
           Fe                7.700e-06   7.700e-06
           K                 4.604e-05   4.604e-05
           Mg                2.921e-05   2.921e-05
           Mn                7.282e-07   7.282e-07
           Na                1.131e-03   1.131e-03
           Ni                4.599e-08   4.599e-08
           Pb                7.723e-09   7.723e-09
           S(6)              8.433e-05   8.433e-05
           U                 1.681e-07   1.681e-07
           Zn                9.179e-08   9.179e-08
```

```
----------------------------Description of solution----------------------
-----

                                    pH  =   7.720
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   1.449e-03
                     Mass of water (kg)  =   1.000e+00
                  Total carbon (mol/kg)  =   5.551e-04
                     Total CO2 (mol/kg)  =   5.551e-04
                    Temperature (deg C)  =  19.700
                  Electrical balance (eq)  =   5.317e-04
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  21.89
                                Iterations  =   9
                                   Total H  = 1.110130e+02
                                   Total O  = 5.550828e+01

---------------------------------Redox couples---------------------------
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           Redox couple             pe  Eh (volts)

           As(3)/As(5)         -1.4085     -0.0818
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	3.628e-07	3.479e-07	-6.440	-6.459	-0.018
H+	1.983e-08	1.905e-08	-7.703	-7.720	-0.017
H2O	5.551e+01	1.000e+00	-0.000	-0.000	0.000
Al	**1.483e-05**				
Al(OH)4-	1.464e-05	1.404e-05	-4.834	-4.853	-0.018
Al(OH)3	1.513e-07	1.513e-07	-6.820	-6.820	0.000
Al(OH)2+	3.058e-08	2.932e-08	-7.515	-7.533	-0.018
AlF2+	5.329e-10	5.109e-10	-9.273	-9.292	-0.018
AlOH+2	1.360e-10	1.149e-10	-9.866	-9.940	-0.073
AlF3	1.191e-10	1.191e-10	-9.924	-9.924	0.000
AlF+2	6.665e-11	5.631e-11	-10.176	-10.249	-0.073
AlF4-	9.197e-13	8.818e-13	-12.036	-12.055	-0.018
Al+3	4.565e-13	3.124e-13	-12.341	-12.505	-0.165
AlSO4+	6.685e-14	6.409e-14	-13.175	-13.193	-0.018
Al(SO4)2-	1.434e-16	1.375e-16	-15.843	-15.862	-0.018
AlHSO4+2	1.227e-22	1.037e-22	-21.911	-21.984	-0.073
As(3)	**2.803e-07**				
H3AsO3	2.731e-07	2.732e-07	-6.564	-6.564	0.000
H2AsO3-	7.239e-09	6.941e-09	-8.140	-8.159	-0.018
HAsO3-2	2.699e-13	2.281e-13	-12.569	-12.642	-0.073
H4AsO3+	2.690e-15	2.579e-15	-14.570	-14.589	-0.018
AsO3-3	5.604e-19	3.835e-19	-18.252	-18.416	-0.165
As(5)	**2.136e-07**				
HAsO4-2	1.944e-07	1.643e-07	-6.711	-6.784	-0.073
H2AsO4-	1.914e-08	1.835e-08	-7.718	-7.736	-0.018
AsO4-3	2.796e-11	1.913e-11	-10.554	-10.718	-0.165
H3AsO4	5.810e-14	5.812e-14	-13.236	-13.236	0.000
Ba	**9.830e-07**				
Ba+2	9.512e-07	8.037e-07	-6.022	-6.095	-0.073
BaSO4	2.801e-08	2.802e-08	-7.553	-7.552	0.000
BaHCO3+	3.448e-09	3.306e-09	-8.462	-8.481	-0.018
BaCO3	4.153e-10	4.155e-10	-9.382	-9.381	0.000
BaOH+	1.491e-12	1.429e-12	-11.827	-11.845	-0.018
C(4)	**5.551e-04**				
HCO3-	5.285e-04	5.071e-04	-3.277	-3.295	-0.018
CO2	2.338e-05	2.339e-05	-4.631	-4.631	0.000
CO3-2	1.314e-06	1.113e-06	-5.881	-5.953	-0.072
CaHCO3+	6.268e-07	6.009e-07	-6.203	-6.221	-0.018
NaHCO3	3.090e-07	3.091e-07	-6.510	-6.510	0.000
CaCO3	1.723e-07	1.724e-07	-6.764	-6.764	0.000
MgHCO3+	1.473e-07	1.412e-07	-6.832	-6.850	-0.018
UO2(CO3)2-2	1.365e-07	1.154e-07	-6.865	-6.938	-0.073
MnCO3	4.831e-08	4.833e-08	-7.316	-7.316	0.000
NiCO3	3.975e-08	3.977e-08	-7.401	-7.400	0.000
MnHCO3+	2.577e-08	2.470e-08	-7.589	-7.607	-0.018
MgCO3	2.378e-08	2.379e-08	-7.624	-7.624	0.000
FeHCO3+	2.306e-08	2.211e-08	-7.637	-7.656	-0.018
NaCO3-	1.785e-08	1.711e-08	-7.748	-7.767	-0.018
UO2(CO3)3-4	1.626e-08	8.285e-09	-7.789	-8.082	-0.293
CuCO3	1.434e-08	1.435e-08	-7.843	-7.843	0.000
ZnCO3	1.298e-08	1.299e-08	-7.887	-7.886	0.000
FeCO3	1.164e-08	1.164e-08	-7.934	-7.934	0.000
PbCO3	6.745e-09	6.748e-09	-8.171	-8.171	0.000
UO2CO3	4.876e-09	4.878e-09	-8.312	-8.312	0.000
ZnHCO3+	3.894e-09	3.733e-09	-8.410	-8.428	-0.018
BaHCO3+	3.448e-09	3.306e-09	-8.462	-8.481	-0.018
CuHCO3+	6.362e-10	6.100e-10	-9.196	-9.215	-0.018
BaCO3	4.153e-10	4.155e-10	-9.382	-9.381	0.000
Zn(CO3)2-2	3.658e-10	3.091e-10	-9.437	-9.510	-0.073
NiHCO3+	3.519e-10	3.373e-10	-9.454	-9.472	-0.018
PbHCO3+	1.466e-10	1.405e-10	-9.834	-9.852	-0.018
Ni(CO3)2-2	9.103e-11	7.692e-11	-10.041	-10.114	-0.073
Cu(CO3)2-2	2.379e-11	2.010e-11	-10.624	-10.697	-0.073
Pb(CO3)2-2	2.233e-11	1.886e-11	-10.651	-10.724	-0.073
(UO2)3(CO3)6-6	1.049e-17	2.301e-18	-16.979	-17.638	-0.659
UO2(CO3)3-5	3.501e-25	1.221e-25	-24.456	-24.913	-0.457
U(CO3)4-4	1.055e-32	5.376e-33	-31.977	-32.270	-0.293
U(CO3)5-6	1.863e-37	4.089e-38	-36.730	-37.388	-0.659
Ca	**1.223e-04**				
Ca+2	1.201e-04	1.017e-04	-3.920	-3.993	-0.072
CaSO4	1.342e-06	1.343e-06	-5.872	-5.872	0.000
CaHCO3+	6.268e-07	6.009e-07	-6.203	-6.221	-0.018
CaCO3	1.723e-07	1.724e-07	-6.764	-6.764	0.000
CaF+	1.517e-08	1.455e-08	-7.819	-7.837	-0.018
CaOH+	9.241e-10	8.860e-10	-9.034	-9.053	-0.018
CaHSO4+	1.468e-13	1.408e-13	-12.833	-12.851	-0.018
Cl	**2.172e-04**				
Cl-	2.172e-04	2.082e-04	-3.663	-3.682	-0.018
MnCl+	4.836e-10	4.636e-10	-9.316	-9.334	-0.018
FeCl+	1.307e-10	1.253e-10	-9.884	-9.902	-0.018
ZnCl+	2.694e-11	2.583e-11	-10.570	-10.588	-0.018
ZnOHCl	2.115e-11	2.116e-11	-10.675	-10.675	0.000
PbCl+	2.638e-12	2.529e-12	-11.579	-11.597	-0.018
NiCl+	2.629e-12	2.520e-12	-11.580	-11.599	-0.018
CuCl2-	1.735e-12	1.663e-12	-11.761	-11.779	-0.018
CuCl+	1.077e-12	1.033e-12	-11.968	-11.986	-0.018
MnCl2	4.212e-14	4.213e-14	-13.376	-13.375	0.000
ZnCl2	5.509e-15	5.511e-15	-14.259	-14.259	0.000
NiCl2	1.905e-15	1.905e-15	-14.720	-14.720	0.000
PbCl2	9.228e-16	9.231e-16	-15.035	-15.035	0.000
CuCl3-2	6.361e-16	5.375e-16	-15.196	-15.270	-0.073
UO2Cl+	3.230e-16	3.097e-16	-15.491	-15.509	-0.018
CuCl2	1.089e-16	1.089e-16	-15.963	-15.963	0.000
MnCl3-	2.520e-18	2.416e-18	-17.599	-17.617	-0.018
FeCl+2	1.943e-18	1.641e-18	-17.712	-17.785	-0.073
ZnCl3-	1.300e-18	1.246e-18	-17.886	-17.904	-0.018
PbCl3-	1.540e-19	1.477e-19	-18.812	-18.831	-0.018
UO2Cl2	3.286e-21	3.287e-21	-20.483	-20.483	0.000
FeCl2+	1.889e-21	1.811e-21	-20.724	-20.742	-0.018
ZnCl4-2	1.475e-22	1.246e-22	-21.831	-21.904	-0.073
CuCl3-	7.627e-23	7.313e-23	-22.118	-22.136	-0.018
PbCl4-2	1.671e-23	1.412e-23	-22.777	-22.850	-0.073
FeCl3	3.770e-26	3.771e-26	-25.424	-25.424	0.000
CuCl4-2	7.971e-29	6.734e-29	-28.099	-28.172	-0.073
UCl+3	0.000e+00	0.000e+00	-43.092	-43.257	-0.165
Cu(1)	**1.267e-10**				
Cu+	1.249e-10	1.198e-10	-9.903	-9.922	-0.018
CuCl2-	1.735e-12	1.663e-12	-11.761	-11.779	-0.018
CuCl3-2	6.361e-16	5.375e-16	-15.196	-15.270	-0.073
Cu(2)	**1.573e-07**				
Cu(OH)2	1.381e-07	1.381e-07	-6.860	-6.860	0.000
CuCO3	1.434e-08	1.435e-08	-7.843	-7.843	0.000
Cu+2	2.841e-09	2.400e-09	-8.547	-8.620	-0.073
CuOH+	1.314e-09	1.260e-09	-8.881	-8.900	-0.018
CuHCO3+	6.362e-10	6.100e-10	-9.196	-9.215	-0.018
CuSO4	3.284e-11	3.285e-11	-10.484	-10.484	0.000
Cu(CO3)2-2	2.379e-11	2.010e-11	-10.624	-10.697	-0.073
CuCl+	1.077e-12	1.033e-12	-11.968	-11.986	-0.018
CuF+	8.072e-13	7.739e-13	-12.093	-12.111	-0.018
Cu2(OH)2+2	4.809e-13	4.063e-13	-12.318	-12.391	-0.073
Cu(OH)3-	4.555e-13	4.367e-13	-12.342	-12.360	-0.018
CuCl2	1.089e-16	1.089e-16	-15.963	-15.963	0.000
Cu(OH)4-2	5.412e-18	4.573e-18	-17.267	-17.340	-0.073
CuCl3-	7.627e-23	7.313e-23	-22.118	-22.136	-0.018
CuCl4-2	7.971e-29	6.734e-29	-28.099	-28.172	-0.073
F	**1.948e-05**				
F-	1.942e-05	1.862e-05	-4.712	-4.730	-0.018
MgF+	2.827e-08	2.711e-08	-7.549	-7.567	-0.018
CaF+	1.517e-08	1.455e-08	-7.819	-7.837	-0.018
NaF	1.161e-08	1.161e-08	-7.935	-7.935	0.000
AlF2+	5.329e-10	5.109e-10	-9.273	-9.292	-0.018
HF	4.840e-10	4.842e-10	-9.315	-9.315	0.000
AlF3	1.191e-10	1.191e-10	-9.924	-9.924	0.000
FeF+	8.466e-11	8.117e-11	-10.072	-10.091	-0.018
MnF+	7.344e-11	7.041e-11	-10.134	-10.152	-0.018
AlF+2	6.665e-11	5.631e-11	-10.176	-10.249	-0.073
ZnF+	1.499e-11	1.437e-11	-10.824	-10.842	-0.018
UO2F+	2.514e-12	2.411e-12	-11.600	-11.618	-0.018
NiF+	1.867e-12	1.790e-12	-11.729	-11.747	-0.018
AlF4-	9.197e-13	8.818e-13	-12.036	-12.055	-0.018
CuF+	8.072e-13	7.739e-13	-12.093	-12.111	-0.018
UO2F2	1.516e-13	1.517e-13	-12.819	-12.819	0.000
PbF+	1.205e-13	1.155e-13	-12.919	-12.937	-0.018
HF2-	3.450e-14	3.308e-14	-13.462	-13.480	-0.018
FeF+2	9.962e-15	8.417e-15	-14.002	-14.075	-0.073
FeF2+	6.103e-15	5.851e-15	-14.214	-14.233	-0.018
UO2F3-	5.602e-16	5.371e-16	-15.252	-15.270	-0.018
FeF3	1.695e-16	1.695e-16	-15.771	-15.771	0.000
PbF2	4.389e-17	4.391e-17	-16.358	-16.357	0.000
H2F2	7.375e-19	7.377e-19	-18.132	-18.132	0.000
UO2F4-2	7.580e-20	6.405e-20	-19.120	-19.193	-0.073
PbF3-	6.177e-21	5.922e-21	-20.209	-20.228	-0.018
PbF4-2	6.246e-26	5.278e-26	-25.204	-25.278	-0.073
UF3+	1.178e-34	1.130e-34	-33.929	-33.947	-0.018
UF2+2	3.077e-35	2.600e-35	-34.512	-34.585	-0.073
UF4	1.720e-35	1.721e-35	-34.764	-34.764	0.000
UF+3	2.490e-37	1.705e-37	-36.604	-36.768	-0.165
UF5-	9.080e-39	8.706e-39	-38.042	-38.060	-0.018
UF6-2	0.000e+00	0.000e+00	-40.606	-40.680	-0.073
Fe(2)	**5.608e-07**				
Fe+2	5.160e-07	4.359e-07	-6.287	-6.361	-0.073
FeHCO3+	2.306e-08	2.211e-08	-7.637	-7.656	-0.018
FeCO3	1.164e-08	1.164e-08	-7.934	-7.934	0.000
FeOH+	5.042e-09	4.834e-09	-8.297	-8.316	-0.018
FeSO4	4.885e-09	4.887e-09	-8.311	-8.311	0.000
FeCl+	1.307e-10	1.253e-10	-9.884	-9.902	-0.018
FeF+	8.466e-11	8.117e-11	-10.072	-10.091	-0.018
Fe(OH)2	1.350e-12	1.350e-12	-11.870	-11.870	0.000
Fe(OH)3-	2.605e-15	2.497e-15	-14.584	-14.603	-0.018
FeHSO4+	6.292e-16	6.033e-16	-15.201	-15.219	-0.018

Fe(3)	7.139e-06					
	Fe(OH)3	5.779e-06	5.781e-06	-5.238	-5.238	0.000
	Fe(OH)2+	1.128e-06	1.082e-06	-5.948	-5.966	-0.018
	Fe(OH)4-	2.323e-07	2.227e-07	-6.634	-6.652	-0.018
	FeOH+2	9.041e-11	7.639e-11	-10.044	-10.117	-0.073
	FeF+2	9.962e-15	8.417e-15	-14.002	-14.075	-0.073
	FeF2+	6.103e-15	5.851e-15	-14.214	-14.233	-0.018
	Fe+3	4.526e-16	3.098e-16	-15.344	-15.509	-0.165
	FeSO4+	2.187e-16	2.097e-16	-15.660	-15.678	-0.018
	FeF3	1.695e-16	1.695e-16	-15.771	-15.771	0.000
	FeCl+2	1.943e-18	1.641e-18	-17.712	-17.785	-0.073
	Fe2(OH)2+4	3.852e-19	1.963e-19	-18.414	-18.707	-0.293
	Fe(SO4)2-	3.259e-19	3.125e-19	-18.487	-18.505	-0.018
	FeCl2+	1.889e-21	1.811e-21	-20.724	-20.742	-0.018
	Fe3(OH)4+5	2.093e-22	7.299e-23	-21.679	-22.137	-0.457
	FeHSO4+2	1.274e-23	1.077e-23	-22.895	-22.968	-0.073
	FeCl3	3.770e-26	3.771e-26	-25.424	-25.424	0.000
H(0)	5.205e-27					
	H2	2.603e-27	2.604e-27	-26.585	-26.584	0.000
K	4.604e-05					
	K+	4.602e-05	4.411e-05	-4.337	-4.355	-0.018
	KSO4-	2.115e-08	2.028e-08	-7.675	-7.693	-0.018
Mg	2.921e-05					
	Mg+2	2.866e-05	2.430e-05	-4.543	-4.614	-0.072
	MgSO4	3.448e-07	3.449e-07	-6.462	-6.462	0.000
	MgHCO3+	1.473e-07	1.412e-07	-6.832	-6.850	-0.018
	MgF+	2.827e-08	2.711e-08	-7.549	-7.567	-0.018
	MgCO3	2.378e-08	2.379e-08	-7.624	-7.624	0.000
	MgOH+	2.967e-09	2.844e-09	-8.528	-8.546	-0.018
Mn(2)	7.282e-07					
	Mn+2	6.469e-07	5.466e-07	-6.189	-6.262	-0.073
	MnCO3	4.831e-08	4.833e-08	-7.316	-7.316	0.000
	MnHCO3+	2.577e-08	2.470e-08	-7.589	-7.607	-0.018
	MnSO4	6.099e-09	6.101e-09	-8.215	-8.215	0.000
	MnOH+	4.954e-10	4.749e-10	-9.305	-9.323	-0.018
	MnCl+	4.836e-10	4.636e-10	-9.316	-9.334	-0.018
	MnF+	7.344e-11	7.041e-11	-10.134	-10.152	-0.018
	MnCl2	4.212e-14	4.213e-14	-13.376	-13.375	0.000
	MnCl3-	2.520e-18	2.416e-18	-17.599	-17.617	-0.018
	Mn(OH)3-	1.306e-18	1.252e-18	-17.884	-17.902	-0.018
Mn(3)	1.122e-28					
	Mn+3	1.122e-28	7.681e-29	-27.950	-28.115	-0.165
Mn(6)	0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-48.859	-48.932	-0.073
Mn(7)	0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-54.651	-54.669	-0.018
Na	1.131e-03					
	Na+	1.130e-03	1.084e-03	-2.947	-2.965	-0.018
	NaSO4-	3.809e-07	3.652e-07	-6.419	-6.437	-0.018
	NaHCO3	3.090e-07	3.091e-07	-6.510	-6.510	0.000
	NaCO3-	1.785e-08	1.711e-08	-7.748	-7.767	-0.018
	NaF	1.161e-08	1.161e-08	-7.935	-7.935	0.000
Ni	4.599e-08					
	NiCO3	3.975e-08	3.977e-08	-7.401	-7.400	0.000
	Ni+2	5.704e-09	4.819e-09	-8.244	-8.317	-0.073
	NiHCO3+	3.519e-10	3.373e-10	-9.454	-9.472	-0.018
	Ni(CO3)2-2	9.103e-11	7.692e-11	-10.041	-10.114	-0.073
	NiSO4	6.239e-11	6.241e-11	-10.205	-10.205	0.000
	NiOH+	2.492e-11	2.389e-11	-10.603	-10.622	-0.018
	NiCl+	2.629e-12	2.520e-12	-11.580	-11.599	-0.018
	NiF+	1.867e-12	1.790e-12	-11.729	-11.747	-0.018
	Ni(OH)2	1.327e-12	1.327e-12	-11.877	-11.877	0.000
	NiCl2	1.905e-15	1.905e-15	-14.720	-14.720	0.000
	Ni(OH)3-	7.265e-16	6.965e-16	-15.139	-15.157	-0.018
	Ni(SO4)2-2	2.891e-16	2.443e-16	-15.539	-15.612	-0.073
O(0)	0.000e+00					
	O2	0.000e+00	0.000e+00	-40.988	-40.988	0.000
Pb	7.723e-09					
	PbCO3	6.745e-09	6.748e-09	-8.171	-8.171	0.000
	Pb+2	4.129e-10	3.488e-10	-9.384	-9.457	-0.073
	PbOH+	3.723e-10	3.570e-10	-9.429	-9.447	-0.018
	PbHCO3+	1.466e-10	1.405e-10	-9.834	-9.852	-0.018
	Pb(CO3)2-2	2.233e-11	1.886e-11	-10.651	-10.724	-0.073
	PbSO4	1.364e-11	1.365e-11	-10.865	-10.865	0.000
	Pb(OH)2	7.285e-12	7.288e-12	-11.138	-11.137	0.000
	PbCl+	2.638e-12	2.529e-12	-11.579	-11.597	-0.018
	PbF+	1.205e-13	1.155e-13	-12.919	-12.937	-0.018
	Pb(SO4)2-2	5.898e-15	4.983e-15	-14.229	-14.303	-0.073
	Pb(OH)3-	4.580e-15	4.391e-15	-14.339	-14.357	-0.018
	PbCl2	9.228e-16	9.231e-16	-15.035	-15.035	0.000
	PbF2	4.389e-17	4.391e-17	-16.358	-16.357	0.000
	Pb2OH+3	4.073e-18	2.788e-18	-17.390	-17.555	-0.165
	Pb(OH)4-2	6.248e-19	5.279e-19	-18.204	-18.277	-0.073
	PbCl3-	1.540e-19	1.477e-19	-18.812	-18.831	-0.018
	PbF3-	6.177e-21	5.922e-21	-20.209	-20.228	-0.018
	Pb3(OH)4+2	2.236e-22	1.889e-22	-21.651	-21.724	-0.073
	PbCl4-2	1.671e-23	1.412e-23	-22.777	-22.850	-0.073
	PbF4-2	6.246e-26	5.278e-26	-25.204	-25.278	-0.073
S(6)	8.433e-05					
	SO4-2	8.220e-05	6.957e-05	-4.085	-4.158	-0.072
	CaSO4	1.342e-06	1.343e-06	-5.872	-5.872	0.000
	NaSO4-	3.809e-07	3.652e-07	-6.419	-6.437	-0.018
	MgSO4	3.448e-07	3.449e-07	-6.462	-6.462	0.000
	BaSO4	2.801e-08	2.802e-08	-7.553	-7.552	0.000
	KSO4-	2.115e-08	2.028e-08	-7.675	-7.693	-0.018
	MnSO4	6.099e-09	6.101e-09	-8.215	-8.215	0.000
	FeSO4	4.885e-09	4.887e-09	-8.311	-8.311	0.000
	ZnSO4	9.146e-10	9.149e-10	-9.039	-9.039	0.000
	HSO4-	1.201e-10	1.151e-10	-9.921	-9.939	-0.018
	NiSO4	6.239e-11	6.241e-11	-10.205	-10.205	0.000
	CuSO4	3.284e-11	3.285e-11	-10.484	-10.484	0.000
	PbSO4	1.364e-11	1.365e-11	-10.865	-10.865	0.000
	Zn(SO4)2-2	6.383e-13	5.393e-13	-12.195	-12.268	-0.073
	CaHSO4+	1.468e-13	1.408e-13	-12.833	-12.851	-0.018
	UO2SO4	9.069e-14	9.072e-14	-13.042	-13.042	0.000
	AlSO4+	6.685e-14	6.409e-14	-13.175	-13.193	-0.018
	Pb(SO4)2-2	5.898e-15	4.983e-15	-14.229	-14.303	-0.073
	FeHSO4+	6.292e-16	6.033e-16	-15.201	-15.219	-0.018
	Ni(SO4)2-2	2.891e-16	2.443e-16	-15.539	-15.612	-0.073
	FeSO4+	2.187e-16	2.097e-16	-15.660	-15.678	-0.018
	Al(SO4)2-	1.434e-16	1.375e-16	-15.843	-15.862	-0.018
	UO2(SO4)2-2	6.520e-17	5.509e-17	-16.186	-16.259	-0.073
	Fe(SO4)2-	3.259e-19	3.125e-19	-18.487	-18.505	-0.018
	AlHSO4+2	1.227e-22	1.037e-22	-21.911	-21.984	-0.073
	FeHSO4+2	1.274e-23	1.077e-23	-22.895	-22.968	-0.073
	USO4+2	1.303e-39	1.101e-39	-38.885	-38.958	-0.073
	U(SO4)2	5.317e-40	5.318e-40	-39.274	-39.274	0.000
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-54.311	-54.475	-0.165
U(4)	4.986e-20					
	U(OH)4	4.986e-20	4.988e-20	-19.302	-19.302	0.000
	U(OH)3+	3.866e-24	3.706e-24	-23.413	-23.431	-0.018
	U(OH)2+2	4.491e-29	3.795e-29	-28.348	-28.421	-0.073
	U(CO3)4-4	1.055e-32	5.376e-33	-31.977	-32.270	-0.293
	UF3+	1.178e-34	1.130e-34	-33.929	-33.947	-0.018
	UOH+3	6.924e-35	4.739e-35	-34.160	-34.324	-0.165
	UF2+2	3.077e-35	2.600e-35	-34.512	-34.585	-0.073
	UF4	1.720e-35	1.721e-35	-34.764	-34.764	0.000
	UF+3	2.490e-37	1.705e-37	-36.604	-36.768	-0.165
	U(CO3)5-6	1.863e-37	4.089e-38	-36.730	-37.388	-0.659
	UF5-	9.080e-39	8.706e-39	-38.042	-38.060	-0.018
	USO4+2	1.303e-39	1.101e-39	-38.885	-38.958	-0.073
	U(SO4)2	5.317e-40	5.318e-40	-39.274	-39.274	0.000
	UF6-2	0.000e+00	0.000e+00	-40.606	-40.680	-0.073
	U+4	0.000e+00	0.000e+00	-41.063	-41.356	-0.293
	UCl+3	0.000e+00	0.000e+00	-43.092	-43.257	-0.165
	U6(OH)15+9	0.000e+00	0.000e+00	-148.052	-149.534	-1.482
U(5)	3.799e-15					
	UO2+	3.799e-15	3.643e-15	-14.420	-14.439	-0.018
	UO2(CO3)3-5	3.501e-25	1.221e-25	-24.456	-24.913	-0.457
U(6)	1.681e-07					
	UO2(CO3)2-2	1.365e-07	1.154e-07	-6.865	-6.938	-0.073
	UO2(CO3)3-4	1.626e-08	8.285e-09	-7.789	-8.082	-0.293
	UO2(OH)3-	1.014e-08	9.718e-09	-7.994	-8.012	-0.018
	UO2CO3	4.876e-09	4.878e-09	-8.312	-8.312	0.000
	UO2OH+	2.629e-10	2.521e-10	-9.580	-9.598	-0.018
	UO2F+	2.514e-12	2.411e-12	-11.600	-11.618	-0.018
	UO2+2	1.261e-12	1.066e-12	-11.899	-11.972	-0.073
	UO2F2	1.516e-13	1.517e-13	-12.819	-12.819	0.000
	(UO2)3(OH)7-	1.384e-13	1.327e-13	-12.859	-12.877	-0.018
	UO2SO4	9.069e-14	9.072e-14	-13.042	-13.042	0.000
	(UO2)3(OH)5+	6.584e-14	6.312e-14	-13.182	-13.200	-0.018
	UO2(OH)4-2	9.567e-15	8.083e-15	-14.019	-14.092	-0.073
	(UO2)2(OH)2+2	6.497e-15	5.490e-15	-14.187	-14.260	-0.073
	UO2F3-	5.602e-16	5.371e-16	-15.252	-15.270	-0.018
	UO2Cl+	3.230e-16	3.097e-16	-15.491	-15.509	-0.018
	(UO2)4(OH)7+	1.857e-16	1.780e-16	-15.731	-15.750	-0.018
	UO2(SO4)2-2	6.520e-17	5.509e-17	-16.186	-16.259	-0.073
	(UO2)3(OH)4+2	1.368e-17	1.156e-17	-16.864	-16.937	-0.073
	(UO2)3(CO3)6-6	1.049e-17	2.301e-18	-16.979	-17.638	-0.659
	(UO2)2OH+3	1.737e-19	1.189e-19	-18.760	-18.925	-0.165
	UO2F4-2	7.580e-20	6.405e-20	-19.120	-19.193	-0.073
	UO2Cl2	3.286e-21	3.287e-21	-20.483	-20.483	0.000
Zn	9.179e-08					
	Zn+2	6.921e-08	5.848e-08	-7.160	-7.233	-0.073
	ZnCO3	1.298e-08	1.299e-08	-7.887	-7.886	0.000
	ZnHCO3+	3.894e-09	3.733e-09	-8.410	-8.428	-0.018
	ZnOH+	2.331e-09	2.235e-09	-8.632	-8.651	-0.018
	Zn(OH)2	2.027e-09	2.028e-09	-8.693	-8.693	0.000
	ZnSO4	9.146e-10	9.149e-10	-9.039	-9.039	0.000
	Zn(CO3)2-2	3.658e-10	3.091e-10	-9.437	-9.510	-0.073
	ZnCl+	2.694e-11	2.583e-11	-10.570	-10.588	-0.018
	ZnOHCl	2.115e-11	2.116e-11	-10.675	-10.675	0.000
	ZnF+	1.499e-11	1.437e-11	-10.824	-10.842	-0.018
	Zn(SO4)2-2	6.383e-13	5.393e-13	-12.195	-12.268	-0.073
	Zn(OH)3-	3.510e-13	3.365e-13	-12.455	-12.473	-0.018
	ZnCl2	5.509e-15	5.511e-15	-14.259	-14.259	0.000
	Zn(OH)4-2	3.312e-18	2.799e-18	-17.480	-17.553	-0.073
	ZnCl3-	1.300e-18	1.246e-18	-17.886	-17.904	-0.018
	ZnCl4-2	1.475e-22	1.246e-22	-21.831	-21.904	-0.073

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-0.50	10.65	11.15	Al(OH)3
AlAsO4:2H2O	-7.39	-2.58	4.81	AlAsO4:2H2O
AlumK	-19.91	-25.18	-5.27	KAl(SO4)2:12H2O
Alunite	-3.13	-3.87	-0.73	KAl3(SO4)2(OH)6
Anglesite	-5.80	-13.61	-7.82	PbSO4
Anhydrite	-3.81	-8.15	-4.34	CaSO4
Antlerite	-7.43	0.86	8.29	Cu3(OH)4SO4
Aragonite	-1.64	-9.95	-8.30	CaCO3
Arsenolite	-23.26	-26.25	-2.99	As4O6
Artinite	-9.72	0.26	9.98	MgCO3:Mg(OH)2:3H2O
As2O5	-33.24	-26.47	6.77	As2O5
Atacamite	-5.35	2.24	7.59	Cu2(OH)3Cl
Azurite	-5.73	-22.33	-16.60	Cu3(OH)2(CO3)2
B-UO2(OH)2	-2.26	3.47	5.73	UO2(OH)2
Ba3(AsO4)2	10.51	1.56	-8.95	Ba3(AsO4)2
BaF2	-9.78	-15.56	-5.77	BaF2
Barite	-0.19	-10.25	-10.06	BaSO4
Basaluminite	0.32	23.02	22.70	Al4(OH)10SO4
Bianchite	-9.63	-11.39	-1.76	ZnSO4:6H2O
Birnessite	-10.98	32.62	43.60	MnO2
Bixbyite	-9.50	41.80	51.30	Mn2O3
Boehmite	1.70	10.65	8.96	AlOOH
Brochantite	-7.66	7.68	15.34	Cu4(OH)6SO4
Brucite	-6.37	10.83	17.20	Mg(OH)2
Bunsenite	-5.64	7.12	12.77	NiO
Ca3(AsO4)2:4w	-14.51	7.87	22.38	Ca3(AsO4)2:4H2O
Calcite	-1.49	-9.95	-8.45	CaCO3
Cerrusite	-2.22	-15.41	-13.19	PbCO3
Chalcanthite	-10.12	-12.78	-2.66	CuSO4:5H2O
Claudetite	-23.01	-26.25	-3.24	As4O6
CO2(g)	-3.23	-21.39	-18.17	CO2
Cotunnite	-11.98	-16.82	-4.84	PbCl2
Cu(OH)2	-2.02	6.82	8.84	Cu(OH)2
Cu2SO4	-22.11	-29.40	-7.29	Cu2SO4
Cu3(AsO4)2:6w	-12.17	-6.01	6.16	Cu3(AsO4)2:6H2O
CuCO3	-4.94	-14.57	-9.63	CuCO3
CuF	-21.90	-17.35	4.55	CuF
CuF2	-17.64	-18.08	-0.44	CuF2
CuF2:2H2O	-13.58	-18.08	-4.50	CuF2:2H2O
CuMetal	-4.93	-16.62	-11.69	Cu
CuOCuSO4	-17.96	-5.96	12.00	CuO:CuSO4
CupricFerrite	15.73	48.42	32.69	CuFe2O4
Cuprite	-2.77	-9.80	-7.03	Cu2O
CuprousFerrite	14.32	15.90	1.58	CuFeO2
CuSO4	-16.03	-12.78	3.25	CuSO4
Diaspore	3.45	10.65	7.21	AlOOH
Dolomite	-3.55	-20.51	-16.96	CaMg(CO3)2
Dolomite(d)	-4.12	-20.51	-16.39	CaMg(CO3)2
Epsomite	-6.59	-8.77	-2.18	MgSO4:7H2O
Fe(OH)2.7Cl.3	7.27	17.38	10.11	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.76	20.80	18.04	Fe(OH)3
Fe3(OH)8	4.16	50.68	46.52	Fe3(OH)8
Fluorite	-2.79	-13.45	-10.66	CaF2
Gibbsite	2.24	10.65	8.41	Al(OH)3
Goethite	8.65	20.80	12.15	FeOOH
Goslarite	-9.39	-11.39	-2.00	ZnSO4:7H2O
Gummite	-7.24	3.47	10.71	UO3
Gypsum	-3.57	-8.15	-4.58	CaSO4:2H2O
H2(g)	-23.39	-23.44	-0.05	H2
Halite	-8.22	-6.65	1.57	NaCl
Hausmannite	-11.39	50.97	62.37	Mn3O4
Hematite	18.90	41.60	22.70	Fe2O3
Huntite	-12.02	-41.65	-29.63	CaMg3(CO3)4
Hydrocerrusite	-7.38	-24.84	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-23.38	-31.45	-8.07	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-5.51	25.94	31.45	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-4.08	26.57	30.65	KFe3(SO4)2(OH)6
Jarosite-Na	-6.69	27.96	34.65	NaFe3(SO4)2(OH)6
JarositeH	-11.58	23.20	34.79	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-5.71	-8.94	-3.23	AlOHSO4
Langite	-9.63	7.68	17.32	Cu4(OH)6SO4:H2O
Larnakite	-7.44	-7.63	-0.19	PbO:PbSO4
Laurionite	-6.04	-5.42	0.62	PbOHCl
Litharge	-6.95	5.98	12.94	PbO
Maghemite	8.92	41.60	32.68	Fe2O3
Magnesite	-2.62	-10.57	-7.95	MgCO3
Magnetite	19.98	50.68	30.70	Fe3O4
Malachite	-2.79	-7.75	-4.97	Cu2(OH)2CO3
Manganite	-4.44	20.90	25.34	MnOOH
Massicot	-7.15	5.98	13.13	PbO
Matlockite	-8.33	-17.87	-9.54	PbClF
Melanothallite	-19.88	-15.98	3.89	CuCl2
Melanterite	-8.24	-10.52	-2.28	FeSO4:7H2O
Minium	-33.67	41.39	75.05	Pb3O4
Mirabilite	-8.72	-10.09	-1.37	Na2SO4:10H2O
Mn2(SO4)3	-63.51	-17.00	46.51	Mn2(SO4)3
Mn3(AsO4):8H2O	-11.52	1.06	12.58	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-16.10	-13.63	2.48	MnCl2:4H2O
MnSO4	-13.29	-10.42	2.87	MnSO4
Morenosite	-10.08	-12.47	-2.40	NiSO4:7H2O
Na4UO2(CO3)3	-25.40	-41.69	-16.29	Na4UO2(CO3)3
Nahcolite	-5.66	-16.64	-10.98	NaHCO3
Nantokite	-6.71	-16.30	-9.59	CuCl
Natron	-10.36	-11.88	-1.52	Na2CO3:10H2O
Nesquehonite	-5.02	-10.57	-5.54	MgCO3:3H2O
Ni(OH)2	-3.27	7.12	10.40	Ni(OH)2
Ni3(AsO4)2:8H2O	-20.88	-5.10	15.77	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-23.11	8.89	32.00	Ni4(OH)6SO4
NiCO3	-7.56	-14.27	-6.71	NiCO3
Nsutite	-9.95	32.62	42.56	MnO2
O2(g)	-38.14	46.88	85.02	O2
Pb(OH)2	-2.35	5.98	8.34	Pb(OH)2
Pb2(OH)3Cl	-8.23	0.56	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.23	11.97	26.20	PbO:Pb(OH)2
Pb2O3	-25.63	35.41	61.04	Pb2O3
Pb2OCO3	-9.08	-9.43	-0.35	PbO:PbCO3
Pb3(AsO4)2	-14.41	-8.52	5.88	Pb3(AsO4)2
Pb3O2CO3	-14.82	-3.45	11.37	PbCO3:2PbO
Pb3O2SO4	-12.32	-1.65	10.68	PbSO4:2PbO
Pb4(OH)6SO4	-16.77	4.33	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.23	4.33	22.57	PbSO4:3PbO
PbF2	-11.49	-18.92	-7.43	PbF2
PbMetal	-21.72	-17.46	4.26	Pb
PbO:0.3H2O	-7.00	5.98	12.98	PbO:0.33H2O
Phosgenite	-12.42	-32.23	-19.81	PbCl2:PbCO3
Plattnerite	-20.82	29.42	50.24	PbO2
Portlandite	-11.76	11.45	23.21	Ca(OH)2
Pyrochroite	-6.02	9.18	15.20	Mn(OH)2
Pyrolusite	-9.63	32.62	42.24	MnO2
Retgersite	-10.42	-12.47	-2.05	NiSO4:6H2O
Rhodochrosite	-1.10	-12.22	-11.11	MnCO3
Rhodochrosite(d)	-1.83	-12.22	-10.39	MnCO3
Rutherfordine	-3.49	-17.93	-14.43	UO2CO3
Schoepite	-2.10	3.47	5.56	UO2(OH)2:H2O
Scorodite	-5.98	7.56	13.54	FeAsO4:2H2O
Siderite	-1.46	-12.31	-10.86	FeCO3
Siderite(d)(3)	-1.86	-12.31	-10.45	FeCO3
Smithsonite	-3.24	-13.19	-9.94	ZnCO3
Tenorite	-1.00	6.82	7.82	CuO
Thenardite	-9.92	-10.09	-0.17	Na2SO4
Thermonatrite	-12.05	-11.88	0.16	Na2CO3:H2O
Trona	-17.59	-28.52	-10.93	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-26.87	-39.57	-12.70	U(OH)2SO4
U3O8(c)	-6.62	-13.04	-6.42	U3O8
U4O9(c)	-16.42	-56.45	-40.03	U4O9
UF4(c)	-41.92	-69.77	-27.85	UF4
UF4:2.5H2O	-32.71	-69.77	-37.06	UF4:2.5H2O
UO2(a)	-10.58	-19.97	-9.40	UO2
UO3(gamma)	-4.51	3.47	7.98	UO3
Uraninite(c)	-5.92	-19.97	-14.05	UO2
Witherite	-3.47	-12.05	-8.58	BaCO3
Zincite(c)	-3.22	8.21	11.43	ZnO
Zincosite	-14.66	-11.39	3.26	ZnSO4
Zn(OH)2-a	-4.24	8.21	12.45	Zn(OH)2
Zn(OH)2-b	-3.54	8.21	11.75	Zn(OH)2
Zn(OH)2-c	-3.99	8.21	12.20	Zn(OH)2
Zn(OH)2-e	-3.29	8.21	11.50	Zn(OH)2
Zn(OH)2-g	-3.50	8.21	11.71	Zn(OH)2
Zn2(OH)2SO4	-10.68	-3.18	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-10.19	5.01	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-15.59	-1.85	13.74	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-34.42	-14.57	19.84	ZnO:2ZnSO4
Zn4(OH)6SO4	-15.17	13.23	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-20.27	18.23	38.50	Zn5(OH)8Cl2
ZnCl2	-21.86	-14.60	7.26	ZnCl2
ZnCO3:H2O	-2.93	-13.19	-10.26	ZnCO3:H2O
ZnF2	-15.35	-16.69	-1.35	ZnF2
ZnMetal	-41.48	-15.23	26.24	Zn
ZnO(a)	-3.10	8.21	11.31	ZnO
ZnSO4:H2O	-10.96	-11.39	-0.43	ZnSO4:H2O

End of simulation.

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Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 3.5-4.5m
           SOLUTION        5
           units           mg/l
           temp            20.0
           pH              7.75
           F               0.22
           Cl              0.4
           S(6)            46          as SO4
           Na              32
           K               5.4
           Mg              5.5
           Ca              26.4
           Alkalinity      117.12      as HCO3
           Al              0.03
           As(+3)          0.049
           As(+5)          0.103
           Ba              0.111
           Cu              0.006
           Fe              0.08
           Mn              0.02
           Ni              0.0034
           U               0.29
           Zn              0.005
           END
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TITLE
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   Schneckentein 3.5-4.5m

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Beginning of initial solution calculations.
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Initial solution 5.

----------------------------Solution composition------------
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            Elements           Molality       Moles

            Al                1.112e-06   1.112e-06
            Alkalinity        1.920e-03   1.920e-03
            As(3)             6.542e-07   6.542e-07
            As(5)             1.375e-06   1.375e-06
            Ba                8.084e-07   8.084e-07
            Ca                6.588e-04   6.588e-04
            Cl                1.129e-05   1.129e-05
            Cu                9.444e-08   9.444e-08
            F                 1.158e-05   1.158e-05
            Fe                1.433e-06   1.433e-06
            K                 1.381e-04   1.381e-04
            Mg                2.263e-04   2.263e-04
            Mn                3.641e-07   3.641e-07
            Na                1.392e-03   1.392e-03
            Ni                5.793e-08   5.793e-08
            S(6)              4.790e-04   4.790e-04
            U                 1.219e-06   1.219e-06
            Zn                7.651e-08   7.651e-08
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```
----------------------------Description of solution----------------------
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                                    pH  =   7.750
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   4.267e-03
                     Mass of water (kg)  =   1.000e+00
                 Total carbon (mol/kg)  =   1.975e-03
                    Total CO2 (mol/kg)  =   1.975e-03
                   Temperature (deg C)  =  20.000
                Electrical balance (eq)  =   4.087e-04
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =   6.83
                              Iterations  =  16
                                 Total H  = 1.110143e+02
                                 Total O  = 5.551400e+01

--------------------------------Redox couples-------------------------------
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           Redox couple             pe  Eh (volts)

           As(3)/As(5)         -1.2800     -0.0744
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----------Distribution of species----------

	Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
	OH-	4.094e-07	3.818e-07	-6.388	-6.418	-0.030
	H+	1.895e-08	1.778e-08	-7.722	-7.750	-0.028
	H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	1.112e-06					
	Al(OH)4-	1.100e-06	1.026e-06	-5.959	-5.989	-0.030
	Al(OH)3	1.028e-08	1.029e-08	-7.988	-7.988	0.000
	Al(OH)2+	1.948e-09	1.816e-09	-8.710	-8.741	-0.030
	AlF2+	9.257e-12	8.633e-12	-11.034	-11.064	-0.030
	AlOH+2	8.544e-12	6.462e-12	-11.068	-11.190	-0.121
	AlF+2	2.195e-12	1.660e-12	-11.658	-11.780	-0.121
	AlF3	1.151e-12	1.152e-12	-11.939	-11.939	0.000
	Al+3	3.013e-14	1.607e-14	-13.521	-13.794	-0.273
	AlSO4+	1.689e-14	1.575e-14	-13.772	-13.803	-0.030
	AlF4-	5.231e-15	4.878e-15	-14.281	-14.312	-0.030
	Al(SO4)2-	1.727e-16	1.611e-16	-15.763	-15.793	-0.030
	AlHSO4+2	3.153e-23	2.384e-23	-22.501	-22.623	-0.121
As(3)	6.542e-07					
	H3AsO3	6.354e-07	6.360e-07	-6.197	-6.197	0.000
	H2AsO3-	1.878e-08	1.752e-08	-7.726	-7.757	-0.030
	HAsO3-2	8.265e-13	6.251e-13	-12.083	-12.204	-0.121
	H4AsO3+	6.009e-15	5.604e-15	-14.221	-14.252	-0.030
	AsO3-3	2.134e-18	1.138e-18	-17.671	-17.944	-0.273
As(5)	1.375e-06					
	HAsO4-2	1.268e-06	9.588e-07	-5.897	-6.018	-0.121
	H2AsO4-	1.071e-07	9.986e-08	-6.970	-7.001	-0.030
	AsO4-3	2.261e-10	1.206e-10	-9.646	-9.919	-0.273
	H3AsO4	2.957e-13	2.960e-13	-12.529	-12.529	0.000
Ba	8.084e-07					
	Ba+2	7.101e-07	5.370e-07	-6.149	-6.270	-0.121
	BaSO4	8.903e-08	8.911e-08	-7.050	-7.050	0.000
	BaHCO3+	8.252e-09	7.695e-09	-8.083	-8.114	-0.030
	BaCO3	1.039e-09	1.040e-09	-8.983	-8.983	0.000
	BaOH+	1.097e-12	1.023e-12	-11.960	-11.990	-0.030
C(4)	1.975e-03					
	HCO3-	1.873e-03	1.750e-03	-2.727	-2.757	-0.030
	CO2	7.489e-05	7.497e-05	-4.126	-4.125	0.000
	CaHCO3+	1.031e-05	9.612e-06	-4.987	-5.017	-0.030
	CO3-2	5.441e-06	4.144e-06	-5.264	-5.383	-0.118
	MgHCO3+	3.470e-06	3.236e-06	-5.460	-5.490	-0.030
	CaCO3	2.969e-06	2.972e-06	-5.527	-5.527	0.000
	NaHCO3	1.274e-06	1.275e-06	-5.895	-5.895	0.000
	UO2(CO3)2-2	7.531e-07	5.696e-07	-6.123	-6.244	-0.121
	MgCO3	5.896e-07	5.902e-07	-6.229	-6.229	0.000
	UO2(CO3)3-4	4.545e-07	1.487e-07	-6.342	-6.828	-0.485
	NaCO3-	8.296e-08	7.736e-08	-7.081	-7.111	-0.030
	MnCO3	6.393e-08	6.400e-08	-7.194	-7.194	0.000
	NiCO3	5.448e-08	5.453e-08	-7.264	-7.263	0.000
	MnHCO3+	3.251e-08	3.032e-08	-7.488	-7.518	-0.030
	ZnCO3	2.393e-08	2.395e-08	-7.621	-7.621	0.000
	CuCO3	2.298e-08	2.300e-08	-7.639	-7.638	0.000
	FeHCO3+	1.170e-08	1.091e-08	-7.932	-7.962	-0.030
	BaHCO3+	8.252e-09	7.695e-09	-8.083	-8.114	-0.030
	ZnHCO3+	6.842e-09	6.381e-09	-8.165	-8.195	-0.030
	UO2CO3	6.426e-09	6.433e-09	-8.192	-8.192	0.000
	FeCO3	6.194e-09	6.201e-09	-8.208	-8.208	0.000
	Zn(CO3)2-2	2.805e-09	2.122e-09	-8.552	-8.673	-0.121
	BaCO3	1.039e-09	1.040e-09	-8.983	-8.983	0.000
	CuHCO3+	9.720e-10	9.065e-10	-9.012	-9.043	-0.030
	Ni(CO3)2-2	5.192e-10	3.927e-10	-9.285	-9.406	-0.121
	NiHCO3+	4.598e-10	4.288e-10	-9.337	-9.368	-0.030
	Cu(CO3)2-2	1.587e-10	1.200e-10	-9.800	-9.921	-0.121
	(UO2)3(CO3)6-6	3.343e-15	2.706e-16	-14.476	-15.568	-1.092
	UO2(CO3)3-5	1.276e-23	2.227e-24	-22.894	-23.652	-0.758
	U(CO3)4-4	7.967e-31	2.607e-31	-30.099	-30.584	-0.485
	U(CO3)5-6	9.444e-35	7.646e-36	-34.025	-35.117	-1.092
Ca	6.588e-04					
	Ca+2	6.160e-04	4.689e-04	-3.210	-3.329	-0.119
	CaSO4	2.951e-05	2.954e-05	-4.530	-4.530	0.000
	CaHCO3+	1.031e-05	9.612e-06	-4.987	-5.017	-0.030
	CaCO3	2.969e-06	2.972e-06	-5.527	-5.527	0.000
	CaF+	4.143e-08	3.863e-08	-7.383	-7.413	-0.030
	CaOH+	4.692e-09	4.376e-09	-8.329	-8.359	-0.030
	CaHSO4+	3.110e-12	2.900e-12	-11.507	-11.538	-0.030
Cl	1.129e-05					
	Cl-	1.129e-05	1.052e-05	-4.947	-4.978	-0.031
	MnCl+	8.932e-12	8.330e-12	-11.049	-11.079	-0.030
	FeCl+	9.711e-13	9.056e-13	-12.013	-12.043	-0.030
	ZnCl+	7.026e-13	6.553e-13	-12.153	-12.184	-0.030
	ZnOHCl	5.667e-13	5.672e-13	-12.247	-12.246	0.000
	NiCl+	5.029e-14	4.690e-14	-13.299	-13.329	-0.030
	CuCl+	2.446e-14	2.281e-14	-13.612	-13.642	-0.030
	CuCl2-	1.964e-15	1.831e-15	-14.707	-14.737	-0.030
	MnCl2	3.820e-17	3.824e-17	-16.418	-16.417	0.000
	ZnCl2	7.063e-18	7.070e-18	-17.151	-17.151	0.000
	UO2Cl+	5.949e-18	5.548e-18	-17.226	-17.256	-0.030
	NiCl2	1.789e-18	1.791e-18	-17.747	-17.747	0.000
	CuCl2	1.218e-19	1.219e-19	-18.914	-18.914	0.000
	CuCl3-2	3.958e-20	2.993e-20	-19.403	-19.524	-0.121
	FeCl+2	1.611e-20	1.219e-20	-19.793	-19.914	-0.121
	MnCl3-	1.188e-22	1.108e-22	-21.925	-21.956	-0.030
	ZnCl3-	8.677e-23	8.092e-23	-22.062	-22.092	-0.030
	UO2Cl2	2.981e-24	2.984e-24	-23.526	-23.525	0.000
	FeCl2+	7.213e-25	6.726e-25	-24.142	-24.172	-0.030
	CuCl3-	4.459e-27	4.158e-27	-26.351	-26.381	-0.030
	ZnCl4-2	5.416e-28	4.096e-28	-27.266	-27.388	-0.121
	FeCl3	7.067e-31	7.074e-31	-30.151	-30.150	0.000
	CuCl4-2	2.576e-34	1.948e-34	-33.589	-33.710	-0.121
	UCl+3	0.000e+00	0.000e+00	-44.882	-45.155	-0.273
Cu(1)	5.548e-11					
	Cu+	5.547e-11	5.173e-11	-10.256	-10.286	-0.030
	CuCl2-	1.964e-15	1.831e-15	-14.707	-14.737	-0.030
	CuCl3-2	3.958e-20	2.993e-20	-19.403	-19.524	-0.121
Cu(2)	9.439e-08					
	Cu(OH)2	6.822e-08	6.828e-08	-7.166	-7.166	0.000
	CuCO3	2.298e-08	2.300e-08	-7.639	-7.638	0.000
	Cu+2	1.367e-09	1.034e-09	-8.864	-8.986	-0.121
	CuHCO3+	9.720e-10	9.065e-10	-9.012	-9.043	-0.030
	CuOH+	6.233e-10	5.812e-10	-9.205	-9.236	-0.030
	Cu(CO3)2-2	1.587e-10	1.200e-10	-9.800	-9.921	-0.121
	CuSO4	6.740e-11	6.746e-11	-10.171	-10.171	0.000
	Cu(OH)3-	2.481e-13	2.314e-13	-12.605	-12.636	-0.030
	CuF+	2.051e-13	1.912e-13	-12.688	-12.718	-0.030
	Cu2(OH)2+2	1.180e-13	8.923e-14	-12.928	-13.050	-0.121
	CuCl+	2.446e-14	2.281e-14	-13.612	-13.642	-0.030
	Cu(OH)4-2	3.432e-18	2.596e-18	-17.464	-17.586	-0.121
	CuCl2	1.218e-19	1.219e-19	-18.914	-18.914	0.000
	CuCl3-	4.459e-27	4.158e-27	-26.351	-26.381	-0.030
	CuCl4-2	2.576e-34	1.948e-34	-33.589	-33.710	-0.121
F	1.158e-05					
	F-	1.142e-05	1.065e-05	-4.942	-4.973	-0.030
	MgF+	1.109e-07	1.034e-07	-6.955	-6.985	-0.030
	CaF+	4.143e-08	3.863e-08	-7.383	-7.413	-0.030
	NaF	7.934e-09	7.942e-09	-8.100	-8.100	0.000
	HF	2.596e-10	2.599e-10	-9.586	-9.585	0.000
	MnF+	1.536e-11	1.433e-11	-10.813	-10.844	-0.030
	AlF2+	9.257e-12	8.633e-12	-11.034	-11.064	-0.030
	FeF+	7.125e-12	6.644e-12	-11.147	-11.178	-0.030
	ZnF+	4.384e-12	4.089e-12	-11.358	-11.388	-0.030
	AlF+2	2.195e-12	1.660e-12	-11.658	-11.780	-0.121
	AlF3	1.151e-12	1.152e-12	-11.939	-11.939	0.000
	UO2F+	5.232e-13	4.879e-13	-12.281	-12.312	-0.030
	NiF+	4.046e-13	3.773e-13	-12.393	-12.423	-0.030
	CuF+	2.051e-13	1.912e-13	-12.688	-12.718	-0.030
	UO2F2	1.755e-14	1.756e-14	-13.756	-13.755	0.000
	HF2-	1.092e-14	1.018e-14	-13.962	-13.992	-0.030
	AlF4-	5.231e-15	4.878e-15	-14.281	-14.312	-0.030
	FeF+2	9.311e-16	7.042e-16	-15.031	-15.152	-0.121
	FeF2+	3.014e-16	2.811e-16	-15.521	-15.551	-0.030
	UO2F3-	3.816e-17	3.558e-17	-16.418	-16.449	-0.030
	FeF3	4.660e-18	4.664e-18	-17.332	-17.331	0.000
	H2F2	2.101e-19	2.103e-19	-18.678	-18.677	0.000
	UO2F4-2	3.207e-21	2.426e-21	-20.494	-20.615	-0.121
	UF3+	5.726e-36	5.340e-36	-35.242	-35.272	-0.030
	UF2+2	2.836e-36	2.145e-36	-35.547	-35.669	-0.121
	UF4	4.641e-37	4.646e-37	-36.333	-36.333	0.000
	UF+3	4.604e-38	2.456e-38	-37.337	-37.610	-0.273
	UF5-	1.456e-40	1.358e-40	-39.837	-39.867	-0.030
	UF6-2	0.000e+00	0.000e+00	-42.609	-42.730	-0.121
Fe(2)	1.045e-07					
	Fe+2	8.248e-08	6.238e-08	-7.084	-7.205	-0.121
	FeHCO3+	1.170e-08	1.091e-08	-7.932	-7.962	-0.030
	FeCO3	6.194e-09	6.201e-09	-8.208	-8.208	0.000
	FeSO4	3.343e-09	3.347e-09	-8.476	-8.475	0.000
	FeOH+	8.134e-10	7.585e-10	-9.090	-9.120	-0.030
	FeF+	7.125e-12	6.644e-12	-11.147	-11.178	-0.030
	FeCl+	9.711e-13	9.056e-13	-12.013	-12.043	-0.030
	Fe(OH)2	2.330e-13	2.333e-13	-12.633	-12.632	0.000
	Fe(OH)3-	4.971e-16	4.636e-16	-15.304	-15.334	-0.030
	FeHSO4+	4.137e-16	3.858e-16	-15.383	-15.414	-0.030

Fe(3)	1.328e-06					
	Fe(OH)3	1.080e-06	1.081e-06	-5.967	-5.966	0.000
	Fe(OH)2+	1.998e-07	1.863e-07	-6.700	-6.730	-0.030
	Fe(OH)4-	4.846e-08	4.519e-08	-7.315	-7.345	-0.030
	FeOH+2	1.604e-11	1.213e-11	-10.795	-10.916	-0.121
	FeF+2	9.311e-16	7.042e-16	-15.031	-15.152	-0.121
	FeF2+	3.014e-16	2.811e-16	-15.521	-15.551	-0.030
	FeSO4+	1.568e-16	1.462e-16	-15.805	-15.835	-0.030
	Fe+3	8.452e-17	4.508e-17	-16.073	-16.346	-0.273
	FeF3	4.660e-18	4.664e-18	-17.332	-17.331	0.000
	Fe(SO4)2-	1.114e-18	1.038e-18	-17.953	-17.984	-0.030
	FeCl+2	1.611e-20	1.219e-20	-19.793	-19.914	-0.121
	Fe2(OH)2+4	1.494e-20	4.889e-21	-19.826	-20.311	-0.485
	FeHSO4+2	9.261e-24	7.004e-24	-23.033	-23.155	-0.121
	Fe3(OH)4+5	1.743e-24	3.042e-25	-23.759	-24.517	-0.758
	FeCl2+	7.213e-25	6.726e-25	-24.142	-24.172	-0.030
	FeCl3	7.067e-31	7.074e-31	-30.151	-30.150	0.000
H(0)	4.528e-27					
	H2	2.264e-27	2.266e-27	-26.645	-26.645	0.000
K	1.381e-04					
	K+	1.378e-04	1.284e-04	-3.861	-3.891	-0.031
	KSO4-	3.026e-07	2.822e-07	-6.519	-6.549	-0.030
Mg	2.263e-04					
	Mg+2	2.111e-04	1.612e-04	-3.675	-3.793	-0.117
	MgSO4	1.096e-05	1.097e-05	-4.960	-4.960	0.000
	MgHCO3+	3.470e-06	3.236e-06	-5.460	-5.490	-0.030
	MgCO3	5.896e-07	5.902e-07	-6.229	-6.229	0.000
	MgF+	1.109e-07	1.034e-07	-6.955	-6.985	-0.030
	MgOH+	2.229e-08	2.079e-08	-7.652	-7.682	-0.030
Mn(2)	3.641e-07					
	Mn+2	2.571e-07	1.944e-07	-6.590	-6.711	-0.121
	MnCO3	6.393e-08	6.400e-08	-7.194	-7.194	0.000
	MnHCO3+	3.251e-08	3.032e-08	-7.488	-7.518	-0.030
	MnSO4	1.038e-08	1.039e-08	-7.984	-7.983	0.000
	MnOH+	1.991e-10	1.857e-10	-9.701	-9.731	-0.030
	MnF+	1.536e-11	1.433e-11	-10.813	-10.844	-0.030
	MnCl+	8.932e-12	8.330e-12	-11.049	-11.079	-0.030
	MnCl2	3.820e-17	3.824e-17	-16.418	-16.417	0.000
	Mn(OH)3-	5.875e-19	5.479e-19	-18.231	-18.261	-0.030
	MnCl3-	1.188e-22	1.108e-22	-21.925	-21.956	-0.030
Mn(3)	5.360e-29					
	Mn+3	5.360e-29	2.859e-29	-28.271	-28.544	-0.273
Mn(6)	0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-48.906	-49.027	-0.121
Mn(7)	0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-54.713	-54.743	-0.030
Na	1.392e-03					
	Na+	1.389e-03	1.296e-03	-2.857	-2.887	-0.030
	NaSO4-	2.232e-06	2.082e-06	-5.651	-5.682	-0.030
	NaHCO3	1.274e-06	1.275e-06	-5.895	-5.895	0.000
	NaCO3-	8.296e-08	7.736e-08	-7.081	-7.111	-0.030
	NaF	7.934e-09	7.942e-09	-8.100	-8.100	0.000
Ni	5.793e-08					
	NiCO3	5.448e-08	5.453e-08	-7.264	-7.263	0.000
	Ni+2	2.347e-09	1.775e-09	-8.629	-8.751	-0.121
	Ni(CO3)2-2	5.192e-10	3.927e-10	-9.285	-9.406	-0.121
	NiHCO3+	4.598e-10	4.288e-10	-9.337	-9.368	-0.030
	NiSO4	1.096e-10	1.097e-10	-9.960	-9.960	0.000
	NiOH+	1.033e-11	9.637e-12	-10.986	-11.016	-0.030
	Ni(OH)2	5.607e-13	5.613e-13	-12.251	-12.251	0.000
	NiF+	4.046e-13	3.773e-13	-12.393	-12.423	-0.030
	NiCl+	5.029e-14	4.690e-14	-13.299	-13.329	-0.030
	Ni(SO4)2-2	2.694e-15	2.038e-15	-14.570	-14.691	-0.121
	Ni(OH)3-	3.384e-16	3.156e-16	-15.471	-15.501	-0.030
	NiCl2	1.789e-18	1.791e-18	-17.747	-17.747	0.000
O(0)	0.000e+00					
	O2	0.000e+00	0.000e+00	-40.766	-40.765	0.000
S(6)	4.790e-04					
	SO4-2	4.358e-04	3.311e-04	-3.361	-3.480	-0.119
	CaSO4	2.951e-05	2.954e-05	-4.530	-4.530	0.000
	MgSO4	1.096e-05	1.097e-05	-4.960	-4.960	0.000
	NaSO4-	2.232e-06	2.082e-06	-5.651	-5.682	-0.030
	KSO4-	3.026e-07	2.822e-07	-6.519	-6.549	-0.030
	BaSO4	8.903e-08	8.911e-08	-7.050	-7.050	0.000
	MnSO4	1.038e-08	1.039e-08	-7.984	-7.983	0.000
	FeSO4	3.343e-09	3.347e-09	-8.476	-8.475	0.000
	ZnSO4	2.160e-09	2.162e-09	-8.666	-8.665	0.000
	HSO4-	5.516e-10	5.144e-10	-9.258	-9.289	-0.030
	NiSO4	1.096e-10	1.097e-10	-9.960	-9.960	0.000
	CuSO4	6.740e-11	6.746e-11	-10.171	-10.171	0.000
	Zn(SO4)2-2	8.000e-12	6.051e-12	-11.097	-11.218	-0.121
	CaHSO4+	3.110e-12	2.900e-12	-11.507	-11.538	-0.030
	UO2SO4	1.537e-13	1.539e-13	-12.813	-12.813	0.000
	AlSO4+	1.689e-14	1.575e-14	-13.772	-13.803	-0.030
	Ni(SO4)2-2	2.694e-15	2.038e-15	-14.570	-14.691	-0.121
	UO2(SO4)2-2	5.918e-16	4.476e-16	-15.228	-15.349	-0.121
	FeHSO4+	4.137e-16	3.858e-16	-15.383	-15.414	-0.030
	Al(SO4)2-	1.727e-16	1.611e-16	-15.763	-15.793	-0.030
	FeSO4+	1.568e-16	1.462e-16	-15.805	-15.835	-0.030
	Fe(SO4)2-	1.114e-18	1.038e-18	-17.953	-17.984	-0.030
	AlHSO4+2	3.153e-23	2.384e-23	-22.501	-22.623	-0.121
	FeHSO4+2	9.261e-24	7.004e-24	-23.033	-23.155	-0.121
	U(SO4)2	3.079e-39	3.082e-39	-38.512	-38.511	0.000
	USO4+2	1.754e-39	1.327e-39	-38.756	-38.877	-0.121
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-54.782	-55.055	-0.273
U(4)	1.732e-20					
	U(OH)4	1.731e-20	1.733e-20	-19.762	-19.761	0.000
	U(OH)3+	1.284e-24	1.198e-24	-23.891	-23.922	-0.030
	U(OH)2+2	1.500e-29	1.134e-29	-28.824	-28.945	-0.121
	U(CO3)4-4	7.967e-31	2.607e-31	-30.099	-30.584	-0.485
	U(CO3)5-6	9.444e-35	7.646e-36	-34.025	-35.117	-1.092
	UOH+3	2.451e-35	1.307e-35	-34.611	-34.884	-0.273
	UF3+	5.726e-36	5.340e-36	-35.242	-35.272	-0.030
	UF2+2	2.836e-36	2.145e-36	-35.547	-35.669	-0.121
	UF4	4.641e-37	4.646e-37	-36.333	-36.333	0.000
	UF+3	4.604e-38	2.456e-38	-37.337	-37.610	-0.273
	U(SO4)2	3.079e-39	3.082e-39	-38.512	-38.511	0.000
	USO4+2	1.754e-39	1.327e-39	-38.756	-38.877	-0.121
	UF5-	1.456e-40	1.358e-40	-39.837	-39.867	-0.030
	U+4	0.000e+00	0.000e+00	-41.468	-41.953	-0.485
	UF6-2	0.000e+00	0.000e+00	-42.609	-42.730	-0.121
	UCl+3	0.000e+00	0.000e+00	-44.882	-45.155	-0.273
	U6(OH)15+9	0.000e+00	0.000e+00	-150.215	-152.671	-2.456
U(5)	1.373e-15					
	UO2+	1.373e-15	1.280e-15	-14.862	-14.893	-0.030
	UO2(CO3)3-5	1.276e-23	2.227e-24	-22.894	-23.652	-0.758
U(6)	1.219e-06					
	UO2(CO3)2-2	7.531e-07	5.696e-07	-6.123	-6.244	-0.121
	UO2(CO3)3-4	4.545e-07	1.487e-07	-6.342	-6.828	-0.485
	UO2CO3	6.426e-09	6.433e-09	-8.192	-8.192	0.000
	UO2(OH)3-	4.531e-09	4.226e-09	-8.344	-8.374	-0.030
	UO2OH+	1.044e-10	9.733e-11	-9.981	-10.012	-0.030
	UO2F+	5.232e-13	4.879e-13	-12.281	-12.312	-0.030
	UO2+2	4.981e-13	3.767e-13	-12.303	-12.424	-0.121
	UO2SO4	1.537e-13	1.539e-13	-12.813	-12.813	0.000
	UO2F2	1.755e-14	1.756e-14	-13.756	-13.755	0.000
	(UO2)3(OH)7-	1.019e-14	9.501e-15	-13.992	-14.022	-0.030
	UO2(OH)4-2	4.979e-15	3.766e-15	-14.303	-14.424	-0.121
	(UO2)3(OH)5+	4.413e-15	4.115e-15	-14.355	-14.386	-0.030
	(UO2)3(CO3)6-6	3.343e-15	2.706e-16	-14.476	-15.568	-1.092
	(UO2)2(OH)2+2	1.060e-15	8.018e-16	-14.975	-15.096	-0.121
	UO2(SO4)2-2	5.918e-16	4.476e-16	-15.228	-15.349	-0.121
	UO2F3-	3.816e-17	3.558e-17	-16.418	-16.449	-0.030
	UO2Cl+	5.949e-18	5.548e-18	-17.226	-17.256	-0.030
	(UO2)4(OH)7+	4.832e-18	4.506e-18	-17.316	-17.346	-0.030
	(UO2)3(OH)4+2	8.896e-19	6.728e-19	-18.051	-18.172	-0.121
	(UO2)2OH+3	2.985e-20	1.592e-20	-19.525	-19.798	-0.273
	UO2F4-2	3.207e-21	2.426e-21	-20.494	-20.615	-0.121
	UO2Cl2	2.981e-24	2.984e-24	-23.526	-23.525	0.000
Zn	7.651e-08					
	Zn+2	3.830e-08	2.897e-08	-7.417	-7.538	-0.121
	ZnCO3	2.393e-08	2.395e-08	-7.621	-7.621	0.000
	ZnHCO3+	6.842e-09	6.381e-09	-8.165	-8.195	-0.030
	Zn(CO3)2-2	2.805e-09	2.122e-09	-8.552	-8.673	-0.121
	ZnSO4	2.160e-09	2.162e-09	-8.666	-8.665	0.000
	ZnOH+	1.302e-09	1.214e-09	-8.885	-8.916	-0.030
	Zn(OH)2	1.152e-09	1.153e-09	-8.939	-8.938	0.000
	Zn(SO4)2-2	8.000e-12	6.051e-12	-11.097	-11.218	-0.121
	ZnF+	4.384e-12	4.089e-12	-11.358	-11.388	-0.030
	ZnCl+	7.026e-13	6.553e-13	-12.153	-12.184	-0.030
	ZnOHCl	5.667e-13	5.672e-13	-12.247	-12.246	0.000
	Zn(OH)3-	2.199e-13	2.050e-13	-12.658	-12.688	-0.030
	ZnCl2	7.063e-18	7.070e-18	-17.151	-17.151	0.000
	Zn(OH)4-2	2.416e-18	1.827e-18	-17.617	-17.738	-0.121
	ZnCl3-	8.677e-23	8.092e-23	-22.062	-22.092	-0.030
	ZnCl4-2	5.416e-28	4.096e-28	-27.266	-27.388	-0.121

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Reading data base.
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           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
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Reading input data for simulation 1.
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           TITLE   Schneckentein 5.5-6.5m
           SOLUTION        6
           units           mg/l
           temp            19.9
           pH              8.95
           F               0.31
           Cl              7.8
           S(6)            39          as SO4
           Na              39
           K               21
           Mg              1.1
           Ca              8.8
           Alkalinity      130.54      as HCO3
           Al              4.29
           As(+3)          0.135
           As(+5)          0.565
           Ba              0.089
           Cu              0.072
           Fe              2.95
           Mn              0.09
           Ni              0.042
           Pb              0.030
           U               0.2
           Zn              0.07
           END
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TITLE
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   Schneckentein 5.5-6.5m

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Beginning of initial solution calculations.
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Initial solution 6.

-----------------------------Solution composition--------------
---------------

            Elements           Molality       Moles

            Al                1.590e-04   1.590e-04
            Alkalinity        2.140e-03   2.140e-03
            As(3)             1.802e-06   1.802e-06
            As(5)             7.543e-06   7.543e-06
            Ba                6.482e-07   6.482e-07
            Ca                2.196e-04   2.196e-04
            Cl                2.201e-04   2.201e-04
            Cu                1.133e-06   1.133e-06
            F                 1.632e-05   1.632e-05
            Fe                5.284e-05   5.284e-05
            K                 5.372e-04   5.372e-04
            Mg                4.526e-05   4.526e-05
            Mn                1.639e-06   1.639e-06
            Na                1.697e-03   1.697e-03
            Ni                7.156e-07   7.156e-07
            Pb                1.448e-07   1.448e-07
            S(6)              4.061e-04   4.061e-04
            U                 8.404e-07   8.404e-07
            Zn                1.071e-06   1.071e-06
```

```
----------------------------Description of solution-------------------------
---

                                    pH  =   8.950
                                    pe  =   4.000
                        Activity of water  =   1.000
                           Ionic strength  =   3.358e-03
                       Mass of water (kg)  =   1.000e+00
                    Total carbon (mol/kg)  =   1.340e-03
                       Total CO2 (mol/kg)  =   1.340e-03
                      Temperature (deg C)  =  19.900
                  Electrical balance (eq)  =   1.101e-04
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =   2.07
                                Iterations  =  12
                                   Total H  = 1.110145e+02
                                   Total O  = 5.551272e+01

---------------------------------Redox couples-----------------------------
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           Redox couple             pe  Eh (volts)

           As(3)/As(5)         -3.4281     -0.1993
```

----------Distribution of species----------

	Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
	OH-	6.390e-06	6.002e-06	-5.195	-5.222	-0.027
	H+	1.188e-09	1.122e-09	-8.925	-8.950	-0.025
	H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	1.590e-04					
	Al(OH)4-	1.589e-04	1.493e-04	-3.799	-3.826	-0.027
	Al(OH)3	9.450e-08	9.457e-08	-7.025	-7.024	0.000
	Al(OH)2+	1.131e-09	1.062e-09	-8.947	-8.974	-0.027
	AlOH+2	3.090e-13	2.406e-13	-12.510	-12.619	-0.109
	AlF2+	4.462e-14	4.192e-14	-13.350	-13.378	-0.027
	AlF3	8.010e-15	8.016e-15	-14.096	-14.096	0.000
	AlF+2	7.226e-15	5.627e-15	-14.141	-14.250	-0.109
	Al+3	6.673e-17	3.801e-17	-16.176	-16.420	-0.244
	AlF4-	5.182e-17	4.868e-17	-16.286	-16.313	-0.027
	AlSO4+	3.659e-17	3.438e-17	-16.437	-16.464	-0.027
	Al(SO4)2-	3.455e-19	3.246e-19	-18.462	-18.489	-0.027
	AlHSO4+2	4.213e-27	3.280e-27	-26.375	-26.484	-0.109
As(3)	1.802e-06					
	H3AsO3	1.231e-06	1.232e-06	-5.910	-5.909	0.000
	H2AsO3-	5.705e-07	5.359e-07	-6.244	-6.271	-0.027
	HAsO3-2	3.875e-10	3.017e-10	-9.412	-9.520	-0.109
	AsO3-3	1.523e-14	8.679e-15	-13.817	-14.062	-0.244
	H4AsO3+	7.293e-16	6.851e-16	-15.137	-15.164	-0.027
As(5)	7.543e-06					
	HAsO4-2	7.482e-06	5.827e-06	-5.126	-5.235	-0.109
	H2AsO4-	4.077e-08	3.830e-08	-7.390	-7.417	-0.027
	AsO4-3	2.034e-08	1.159e-08	-7.692	-7.936	-0.244
	H3AsO4	7.151e-15	7.156e-15	-14.146	-14.145	0.000
Ba	6.482e-07					
	Ba+2	5.669e-07	4.415e-07	-6.246	-6.355	-0.109
	BaSO4	6.762e-08	6.768e-08	-7.170	-7.170	0.000
	BaCO3	9.120e-09	9.127e-09	-8.040	-8.040	0.000
	BaHCO3+	4.542e-09	4.267e-09	-8.343	-8.370	-0.027
	BaOH+	1.419e-11	1.333e-11	-10.848	-10.875	-0.027
C(4)	1.340e-03					
	HCO3-	1.258e-03	1.184e-03	-2.900	-2.927	-0.027
	CO3-2	5.661e-05	4.433e-05	-4.247	-4.353	-0.106
	CaCO3	1.048e-05	1.048e-05	-4.980	-4.979	0.000
	CO2	3.203e-06	3.205e-06	-5.494	-5.494	0.000
	CaHCO3+	2.282e-06	2.144e-06	-5.642	-5.669	-0.027
	MgCO3	1.269e-06	1.270e-06	-5.896	-5.896	0.000
	MnCO3	1.157e-06	1.158e-06	-5.936	-5.936	0.000
	NaCO3-	1.076e-06	1.011e-06	-5.968	-5.995	-0.027
	NaHCO3	1.058e-06	1.059e-06	-5.976	-5.975	0.000
	UO2(CO3)3-4	6.981e-07	2.568e-07	-6.156	-6.590	-0.434
	NiCO3	6.481e-07	6.486e-07	-6.188	-6.188	0.000
	MgHCO3+	4.693e-07	4.409e-07	-6.329	-6.356	-0.027
	Zn(CO3)2-2	3.621e-07	2.820e-07	-6.441	-6.550	-0.109
	ZnCO3	2.973e-07	2.975e-07	-6.527	-6.526	0.000
	PbCO3	1.229e-07	1.230e-07	-6.910	-6.910	0.000
	UO2(CO3)2-2	1.171e-07	9.119e-08	-6.931	-7.040	-0.109
	Ni(CO3)2-2	6.416e-08	4.997e-08	-7.193	-7.301	-0.109
	MnHCO3+	3.695e-08	3.471e-08	-7.432	-7.460	-0.027
	Pb(CO3)2-2	1.759e-08	1.370e-08	-7.755	-7.863	-0.109
	CuCO3	1.600e-08	1.602e-08	-7.796	-7.795	0.000
	BaCO3	9.120e-09	9.127e-09	-8.040	-8.040	0.000
	ZnHCO3+	5.336e-09	5.013e-09	-8.273	-8.300	-0.027
	BaHCO3+	4.542e-09	4.267e-09	-8.343	-8.370	-0.027
	Cu(CO3)2-2	1.148e-09	8.938e-10	-8.940	-9.049	-0.109
	FeCO3	4.847e-10	4.850e-10	-9.315	-9.314	0.000
	NiHCO3+	3.433e-10	3.225e-10	-9.464	-9.491	-0.027
	PbHCO3+	1.598e-10	1.502e-10	-9.796	-9.823	-0.027
	UO2CO3	9.637e-11	9.645e-11	-10.016	-10.016	0.000
	FeHCO3+	5.748e-11	5.399e-11	-10.241	-10.268	-0.027
	CuHCO3+	4.249e-11	3.991e-11	-10.372	-10.399	-0.027
	(UO2)3(CO3)6-6	1.063e-17	1.119e-18	-16.974	-17.951	-0.977
	UO2(CO3)3-5	1.826e-23	3.825e-24	-22.739	-23.417	-0.679
	U(CO3)4-4	2.106e-34	7.745e-35	-33.677	-34.111	-0.434
	U(CO3)5-6	2.281e-37	2.402e-38	-36.642	-37.619	-0.977
Ca	2.196e-04					
	Ca+2	1.978e-04	1.549e-04	-3.704	-3.810	-0.106
	CaCO3	1.048e-05	1.048e-05	-4.980	-4.979	0.000
	CaSO4	8.996e-06	9.003e-06	-5.046	-5.046	0.000
	CaHCO3+	2.282e-06	2.144e-06	-5.642	-5.669	-0.027
	CaOH+	2.438e-08	2.290e-08	-7.613	-7.640	-0.027
	CaF+	1.943e-08	1.825e-08	-7.712	-7.739	-0.027
	CaHSO4+	5.930e-14	5.571e-14	-13.227	-13.254	-0.027
Cl	2.201e-04					
	Cl-	2.201e-04	2.066e-04	-3.657	-3.685	-0.027
	MnCl+	2.947e-10	2.769e-10	-9.531	-9.558	-0.027
	ZnOHCl	2.049e-10	2.051e-10	-9.688	-9.688	0.000
	ZnCl+	1.584e-11	1.488e-11	-10.800	-10.827	-0.027
	PbCl+	1.229e-12	1.155e-12	-11.910	-11.937	-0.027
	NiCl+	1.090e-12	1.024e-12	-11.962	-11.990	-0.027
	FeCl+	1.385e-13	1.301e-13	-12.859	-12.886	-0.027
	CuCl2-	4.893e-14	4.597e-14	-13.310	-13.338	-0.027
	CuCl+	3.089e-14	2.902e-14	-13.510	-13.537	-0.027
	MnCl2	2.495e-14	2.497e-14	-13.603	-13.603	0.000
	ZnCl2	3.150e-15	3.153e-15	-14.502	-14.501	0.000
	NiCl2	7.678e-16	7.683e-16	-15.115	-15.114	0.000
	PbCl2	4.163e-16	4.167e-16	-15.381	-15.380	0.000
	CuCl3-2	1.895e-17	1.475e-17	-16.722	-16.831	-0.109
	CuCl2	3.042e-18	3.044e-18	-17.517	-17.517	0.000
	MnCl3-	1.513e-18	1.421e-18	-17.820	-17.847	-0.027
	ZnCl3-	7.542e-19	7.085e-19	-18.123	-18.150	-0.027
	UO2Cl+	1.625e-19	1.527e-19	-18.789	-18.816	-0.027
	PbCl3-	7.050e-20	6.623e-20	-19.152	-19.179	-0.027
	FeCl+2	2.228e-21	1.735e-21	-20.652	-20.761	-0.109
	ZnCl4-2	9.041e-23	7.041e-23	-22.044	-22.152	-0.109
	PbCl4-2	8.081e-24	6.293e-24	-23.093	-23.201	-0.109
	CuCl3-	2.167e-24	2.035e-24	-23.664	-23.691	-0.027
	FeCl2+	2.009e-24	1.888e-24	-23.697	-23.724	-0.027
	UO2Cl2	1.610e-24	1.612e-24	-23.793	-23.793	0.000
	FeCl3	3.897e-29	3.900e-29	-28.409	-28.409	0.000
	CuCl4-2	2.400e-30	1.869e-30	-29.620	-29.728	-0.109
	UCl+3	0.000e+00	0.000e+00	-51.260	-51.505	-0.244
Cu(1)	3.629e-12					
	Cu+	3.580e-12	3.363e-12	-11.446	-11.473	-0.027
	CuCl2-	4.893e-14	4.597e-14	-13.310	-13.338	-0.027
	CuCl3-2	1.895e-17	1.475e-17	-16.722	-16.831	-0.109
Cu(2)	1.133e-06					
	Cu(OH)2	1.115e-06	1.116e-06	-5.953	-5.952	0.000
	CuCO3	1.600e-08	1.602e-08	-7.796	-7.795	0.000
	Cu(CO3)2-2	1.148e-09	8.938e-10	-8.940	-9.049	-0.109
	CuOH+	6.382e-10	5.995e-10	-9.195	-9.222	-0.027
	Cu+2	8.638e-11	6.727e-11	-10.064	-10.172	-0.109
	Cu(OH)3-	6.381e-11	5.994e-11	-10.195	-10.222	-0.027
	CuHCO3+	4.249e-11	3.991e-11	-10.372	-10.399	-0.027
	CuSO4	4.050e-12	4.053e-12	-11.393	-11.392	0.000
	Cu2(OH)2+2	1.206e-13	9.395e-14	-12.919	-13.027	-0.109
	CuCl+	3.089e-14	2.902e-14	-13.510	-13.537	-0.027
	CuF+	1.897e-14	1.782e-14	-13.722	-13.749	-0.027
	Cu(OH)4-2	1.369e-14	1.066e-14	-13.864	-13.972	-0.109
	CuCl2	3.042e-18	3.044e-18	-17.517	-17.517	0.000
	CuCl3-	2.167e-24	2.035e-24	-23.664	-23.691	-0.027
	CuCl4-2	2.400e-30	1.869e-30	-29.620	-29.728	-0.109
F	1.632e-05					
	F-	1.626e-05	1.527e-05	-4.789	-4.816	-0.027
	MgF+	3.175e-08	2.982e-08	-7.498	-7.525	-0.027
	CaF+	1.943e-08	1.825e-08	-7.712	-7.739	-0.027
	NaF	1.396e-08	1.398e-08	-7.855	-7.855	0.000
	MnF+	3.700e-11	3.475e-11	-10.432	-10.459	-0.027
	HF	2.345e-11	2.347e-11	-10.630	-10.630	0.000
	ZnF+	7.236e-12	6.797e-12	-11.141	-11.168	-0.027
	NiF+	6.401e-13	6.013e-13	-12.194	-12.221	-0.027
	FeF+	7.414e-14	6.965e-14	-13.130	-13.157	-0.027
	PbF+	4.616e-14	4.336e-14	-13.336	-13.363	-0.027
	AlF2+	4.462e-14	4.192e-14	-13.350	-13.378	-0.027
	CuF+	1.897e-14	1.782e-14	-13.722	-13.749	-0.027
	AlF3	8.010e-15	8.016e-15	-14.096	-14.096	0.000
	AlF+2	7.226e-15	5.627e-15	-14.141	-14.250	-0.109
	HF2-	1.402e-15	1.317e-15	-14.853	-14.880	-0.027
	UO2F+	1.044e-15	9.807e-16	-14.981	-15.008	-0.027
	AlF4-	5.182e-17	4.868e-17	-16.286	-16.313	-0.027
	UO2F2	5.057e-17	5.061e-17	-16.296	-16.296	0.000
	PbF2	1.351e-17	1.352e-17	-16.869	-16.869	0.000
	FeF+2	9.410e-18	7.328e-18	-17.026	-17.135	-0.109
	FeF2+	4.459e-18	4.189e-18	-17.351	-17.378	-0.027
	UO2F3-	1.565e-19	1.470e-19	-18.806	-18.833	-0.027
	FeF3	9.953e-20	9.961e-20	-19.002	-19.002	0.000
	H2F2	1.719e-21	1.721e-21	-20.765	-20.764	0.000
	PbF3-	1.592e-21	1.496e-21	-20.798	-20.825	-0.027
	UO2F4-2	1.845e-23	1.437e-23	-22.734	-22.843	-0.109
	PbF4-2	1.404e-26	1.093e-26	-25.853	-25.961	-0.109
	UF3+	0.000e+00	0.000e+00	-42.420	-42.448	-0.027
	UF2+2	0.000e+00	0.000e+00	-42.891	-43.000	-0.109
	UF4	0.000e+00	0.000e+00	-43.352	-43.351	0.000
	UF+3	0.000e+00	0.000e+00	-44.853	-45.097	-0.244
	UF5-	0.000e+00	0.000e+00	-46.703	-46.730	-0.027
	UF6-2	0.000e+00	0.000e+00	-49.328	-49.437	-0.109
Fe(2)	1.244e-09					
	Fe+2	5.857e-10	4.561e-10	-9.232	-9.341	-0.109
	FeCO3	4.847e-10	4.850e-10	-9.315	-9.314	0.000
	FeOH+	9.285e-11	8.722e-11	-10.032	-10.059	-0.027
	FeHCO3+	5.748e-11	5.399e-11	-10.241	-10.268	-0.027
	FeSO4	2.255e-11	2.256e-11	-10.647	-10.647	0.000
	Fe(OH)2	4.210e-13	4.213e-13	-12.376	-12.375	0.000
	FeCl+	1.385e-13	1.301e-13	-12.859	-12.886	-0.027
	FeF+	7.414e-14	6.965e-14	-13.130	-13.157	-0.027
	Fe(OH)3-	1.411e-14	1.326e-14	-13.850	-13.878	-0.027
	FeHSO4+	1.747e-19	1.641e-19	-18.758	-18.785	-0.027

Fe(3)	5.284e-05					
	Fe(OH)3	3.082e-05	3.084e-05	-4.511	-4.511	0.000
	Fe(OH)4-	2.166e-05	2.035e-05	-4.664	-4.691	-0.027
	Fe(OH)2+	3.585e-07	3.368e-07	-6.445	-6.473	-0.027
	FeOH+2	1.784e-12	1.390e-12	-11.749	-11.857	-0.109
	FeF+2	9.410e-18	7.328e-18	-17.026	-17.135	-0.109
	FeF2+	4.459e-18	4.189e-18	-17.351	-17.378	-0.027
	FeSO4+	1.043e-18	9.800e-19	-17.982	-18.009	-0.027
	Fe+3	5.754e-19	3.278e-19	-18.240	-18.484	-0.244
	FeF3	9.953e-20	9.961e-20	-19.002	-19.002	0.000
	Fe(SO4)2-	6.841e-21	6.427e-21	-20.165	-20.192	-0.027
	FeCl+2	2.228e-21	1.735e-21	-20.652	-20.761	-0.109
	Fe2(OH)2+4	1.751e-22	6.440e-23	-21.757	-22.191	-0.434
	FeCl2+	2.009e-24	1.888e-24	-23.697	-23.724	-0.027
	Fe3(OH)4+5	3.491e-26	7.314e-27	-25.457	-26.136	-0.679
	FeHSO4+2	3.804e-27	2.962e-27	-26.420	-26.528	-0.109
	FeCl3	3.897e-29	3.900e-29	-28.409	-28.409	0.000
H(0)	1.803e-29					
	H2	9.016e-30	9.023e-30	-29.045	-29.045	0.000
K	5.372e-04					
	K+	5.361e-04	5.033e-04	-3.271	-3.298	-0.027
	KSO4-	1.086e-06	1.020e-06	-5.964	-5.991	-0.027
Mg	4.526e-05					
	Mg+2	4.138e-05	3.247e-05	-4.383	-4.489	-0.105
	MgSO4	2.035e-06	2.037e-06	-5.691	-5.691	0.000
	MgCO3	1.269e-06	1.270e-06	-5.896	-5.896	0.000
	MgHCO3+	4.693e-07	4.409e-07	-6.329	-6.356	-0.027
	MgOH+	7.000e-08	6.576e-08	-7.155	-7.182	-0.027
	MgF+	3.175e-08	2.982e-08	-7.498	-7.525	-0.027
Mn(2)	1.639e-06					
	MnCO3	1.157e-06	1.158e-06	-5.936	-5.936	0.000
	Mn+2	4.224e-07	3.289e-07	-6.374	-6.483	-0.109
	MnHCO3+	3.695e-08	3.471e-08	-7.432	-7.460	-0.027
	MnSO4	1.619e-08	1.621e-08	-7.791	-7.790	0.000
	MnOH+	5.255e-09	4.936e-09	-8.279	-8.307	-0.027
	MnCl+	2.947e-10	2.769e-10	-9.531	-9.558	-0.027
	MnF+	3.700e-11	3.475e-11	-10.432	-10.459	-0.027
	MnCl2	2.495e-14	2.497e-14	-13.603	-13.603	0.000
	Mn(OH)3-	3.928e-15	3.690e-15	-14.406	-14.433	-0.027
	MnCl3-	1.513e-18	1.421e-18	-17.820	-17.847	-0.027
Mn(3)	8.363e-29					
	Mn+3	8.363e-29	4.765e-29	-28.078	-28.322	-0.244
Mn(6)	7.446e-40					
	MnO4-2	7.446e-40	5.798e-40	-39.128	-39.237	-0.109
Mn(7)	0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-44.933	-44.960	-0.027
Na	1.697e-03					
	Na+	1.692e-03	1.590e-03	-2.772	-2.799	-0.027
	NaSO4-	2.511e-06	2.359e-06	-5.600	-5.627	-0.027
	NaCO3-	1.076e-06	1.011e-06	-5.968	-5.995	-0.027
	NaHCO3	1.058e-06	1.059e-06	-5.976	-5.975	0.000
	NaF	1.396e-08	1.398e-08	-7.855	-7.855	0.000
Ni	7.156e-07					
	NiCO3	6.481e-07	6.486e-07	-6.188	-6.188	0.000
	Ni(CO3)2-2	6.416e-08	4.997e-08	-7.193	-7.301	-0.109
	Ni+2	2.534e-09	1.973e-09	-8.596	-8.705	-0.109
	NiHCO3+	3.433e-10	3.225e-10	-9.464	-9.491	-0.027
	NiOH+	1.794e-10	1.686e-10	-9.746	-9.773	-0.027
	Ni(OH)2	1.566e-10	1.567e-10	-9.805	-9.805	0.000
	NiSO4	1.125e-10	1.126e-10	-9.949	-9.949	0.000
	Ni(OH)3-	1.487e-12	1.397e-12	-11.828	-11.855	-0.027
	NiCl+	1.090e-12	1.024e-12	-11.962	-11.990	-0.027
	NiF+	6.401e-13	6.013e-13	-12.194	-12.221	-0.027
	Ni(SO4)2-2	2.483e-15	1.933e-15	-14.605	-14.714	-0.109
	NiCl2	7.678e-16	7.683e-16	-15.115	-15.114	0.000
O(0)	2.001e-36					
	O2	1.000e-36	1.001e-36	-36.000	-35.999	0.000
Pb	1.448e-07					
	PbCO3	1.229e-07	1.230e-07	-6.910	-6.910	0.000
	Pb(CO3)2-2	1.759e-08	1.370e-08	-7.755	-7.863	-0.109
	PbOH+	2.954e-09	2.775e-09	-8.530	-8.557	-0.027
	Pb(OH)2	9.612e-10	9.620e-10	-9.017	-9.017	0.000
	Pb+2	2.050e-10	1.597e-10	-9.688	-9.797	-0.109
	PbHCO3+	1.598e-10	1.502e-10	-9.796	-9.823	-0.027
	PbSO4	2.744e-11	2.747e-11	-10.562	-10.561	0.000
	Pb(OH)3-	1.048e-11	9.843e-12	-10.980	-11.007	-0.027
	PbCl+	1.229e-12	1.155e-12	-11.910	-11.937	-0.027
	Pb(SO4)2-2	5.661e-14	4.409e-14	-13.247	-13.356	-0.109
	PbF+	4.616e-14	4.336e-14	-13.336	-13.363	-0.027
	Pb(OH)4-2	2.581e-14	2.010e-14	-13.588	-13.697	-0.109
	PbCl2	4.163e-16	4.167e-16	-15.381	-15.380	0.000
	Pb2OH+3	1.741e-17	9.918e-18	-16.759	-17.004	-0.244
	PbF2	1.351e-17	1.352e-17	-16.869	-16.869	0.000
	Pb3(OH)4+2	1.996e-18	1.554e-18	-17.700	-17.808	-0.109
	PbCl3-	7.050e-20	6.623e-20	-19.152	-19.179	-0.027
	PbF3-	1.592e-21	1.496e-21	-20.798	-20.825	-0.027
	PbCl4-2	8.081e-24	6.293e-24	-23.093	-23.201	-0.109
	PbF4-2	1.404e-26	1.093e-26	-25.853	-25.961	-0.109
S(6)	4.061e-04					
	SO4-2	3.914e-04	3.059e-04	-3.407	-3.514	-0.107
	CaSO4	8.996e-06	9.003e-06	-5.046	-5.046	0.000
	NaSO4-	2.511e-06	2.359e-06	-5.600	-5.627	-0.027
	MgSO4	2.035e-06	2.037e-06	-5.691	-5.691	0.000
	KSO4-	1.086e-06	1.020e-06	-5.964	-5.991	-0.027
	BaSO4	6.762e-08	6.768e-08	-7.170	-7.170	0.000
	MnSO4	1.619e-08	1.621e-08	-7.791	-7.790	0.000
	ZnSO4	2.315e-09	2.317e-09	-8.635	-8.635	0.000
	NiSO4	1.125e-10	1.126e-10	-9.949	-9.949	0.000
	HSO4-	3.185e-11	2.992e-11	-10.497	-10.524	-0.027
	PbSO4	2.744e-11	2.747e-11	-10.562	-10.561	0.000
	FeSO4	2.255e-11	2.256e-11	-10.647	-10.647	0.000
	Zn(SO4)2-2	7.700e-12	5.996e-12	-11.114	-11.222	-0.109
	CuSO4	4.050e-12	4.053e-12	-11.393	-11.392	0.000
	CaHSO4+	5.930e-14	5.571e-14	-13.227	-13.254	-0.027
	Pb(SO4)2-2	5.661e-14	4.409e-14	-13.247	-13.356	-0.109
	Ni(SO4)2-2	2.483e-15	1.933e-15	-14.605	-14.714	-0.109
	UO2SO4	1.987e-16	1.988e-16	-15.702	-15.702	0.000
	AlSO4+	3.659e-17	3.438e-17	-16.437	-16.464	-0.027
	FeSO4+	1.043e-18	9.800e-19	-17.982	-18.009	-0.027
	UO2(SO4)2-2	6.846e-19	5.331e-19	-18.165	-18.273	-0.109
	Al(SO4)2-	3.455e-19	3.246e-19	-18.462	-18.489	-0.027
	FeHSO4+	1.747e-19	1.641e-19	-18.758	-18.785	-0.027
	Fe(SO4)2-	6.841e-21	6.427e-21	-20.165	-20.192	-0.027
	AlHSO4+2	4.213e-27	3.280e-27	-26.375	-26.484	-0.109
	FeHSO4+2	3.804e-27	2.962e-27	-26.420	-26.528	-0.109
	U(SO4)2	0.000e+00	0.000e+00	-46.227	-46.226	0.000
	USO4+2	0.000e+00	0.000e+00	-46.448	-46.557	-0.109
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-62.461	-62.705	-0.244
U(4)	2.442e-23					
	U(OH)4	2.442e-23	2.444e-23	-22.612	-22.612	0.000
	U(OH)3+	1.136e-28	1.067e-28	-27.945	-27.972	-0.027
	U(CO3)4-4	2.106e-34	7.745e-35	-33.677	-34.111	-0.434
	U(OH)2+2	8.213e-35	6.396e-35	-34.085	-34.194	-0.109
	U(CO3)5-6	2.281e-37	2.402e-38	-36.642	-37.619	-0.977
	UOH+3	0.000e+00	0.000e+00	-41.087	-41.331	-0.244
	UF3+	0.000e+00	0.000e+00	-42.420	-42.448	-0.027
	UF2+2	0.000e+00	0.000e+00	-42.891	-43.000	-0.109
	UF4	0.000e+00	0.000e+00	-43.352	-43.351	0.000
	UF+3	0.000e+00	0.000e+00	-44.853	-45.097	-0.244
	U(SO4)2	0.000e+00	0.000e+00	-46.227	-46.226	0.000
	USO4+2	0.000e+00	0.000e+00	-46.448	-46.557	-0.109
	UF5-	0.000e+00	0.000e+00	-46.703	-46.730	-0.027
	U+4	0.000e+00	0.000e+00	-49.163	-49.598	-0.434
	UF6-2	0.000e+00	0.000e+00	-49.328	-49.437	-0.109
	UCl+3	0.000e+00	0.000e+00	-51.260	-51.505	-0.244
	U6(OH)15+9	0.000e+00	0.000e+00	-178.338	-180.538	-2.199
U(5)	1.915e-18					
	UO2+	1.915e-18	1.799e-18	-17.718	-17.745	-0.027
	UO2(CO3)3-5	1.826e-23	3.825e-24	-22.739	-23.417	-0.679
U(6)	8.404e-07					
	UO2(CO3)3-4	6.981e-07	2.568e-07	-6.156	-6.590	-0.434
	UO2(CO3)2-2	1.171e-07	9.119e-08	-6.931	-7.040	-0.109
	UO2(OH)3-	2.511e-08	2.359e-08	-7.600	-7.627	-0.027
	UO2CO3	9.637e-11	9.645e-11	-10.016	-10.016	0.000
	UO2OH+	2.288e-12	2.149e-12	-11.641	-11.668	-0.027
	UO2(OH)4-2	4.279e-13	3.332e-13	-12.369	-12.477	-0.109
	(UO2)3(OH)7-	7.007e-15	6.583e-15	-14.154	-14.182	-0.027
	UO2F+	1.044e-15	9.807e-16	-14.981	-15.008	-0.027
	UO2+2	6.784e-16	5.283e-16	-15.169	-15.277	-0.109
	UO2SO4	1.987e-16	1.988e-16	-15.702	-15.702	0.000
	UO2F2	5.057e-17	5.061e-17	-16.296	-16.296	0.000
	(UO2)3(OH)5+	1.191e-17	1.118e-17	-16.924	-16.951	-0.027
	(UO2)3(CO3)6-6	1.063e-17	1.119e-18	-16.974	-17.951	-0.977
	UO2(SO4)2-2	6.846e-19	5.331e-19	-18.165	-18.273	-0.109
	(UO2)2(OH)2+2	5.056e-19	3.937e-19	-18.296	-18.405	-0.109
	UO2Cl+	1.625e-19	1.527e-19	-18.789	-18.816	-0.027
	UO2F3-	1.565e-19	1.470e-19	-18.806	-18.833	-0.027
	(UO2)4(OH)7+	4.660e-21	4.378e-21	-20.332	-20.359	-0.027
	(UO2)3(OH)4+2	1.504e-22	1.171e-22	-21.823	-21.932	-0.109
	UO2F4-2	1.845e-23	1.437e-23	-22.734	-22.843	-0.109
	UO2Cl2	1.610e-24	1.612e-24	-23.793	-23.793	0.000
	(UO2)2OH+3	8.711e-25	4.963e-25	-24.060	-24.304	-0.244
Zn	1.071e-06					
	Zn(CO3)2-2	3.621e-07	2.820e-07	-6.441	-6.550	-0.109
	Zn(OH)2	3.360e-07	3.363e-07	-6.474	-6.473	0.000
	ZnCO3	2.973e-07	2.975e-07	-6.527	-6.526	0.000
	Zn+2	4.319e-08	3.363e-08	-7.365	-7.473	-0.109
	ZnOH+	2.360e-08	2.217e-08	-7.627	-7.654	-0.027
	ZnHCO3+	5.336e-09	5.013e-09	-8.273	-8.300	-0.027
	ZnSO4	2.315e-09	2.317e-09	-8.635	-8.635	0.000
	Zn(OH)3-	1.009e-09	9.477e-10	-8.996	-9.023	-0.027
	ZnOHCl	2.049e-10	2.051e-10	-9.688	-9.688	0.000
	ZnCl+	1.584e-11	1.488e-11	-10.800	-10.827	-0.027
	Zn(SO4)2-2	7.700e-12	5.996e-12	-11.114	-11.222	-0.109
	ZnF+	7.236e-12	6.797e-12	-11.141	-11.168	-0.027
	Zn(OH)4-2	1.719e-13	1.339e-13	-12.765	-12.873	-0.109
	ZnCl2	3.150e-15	3.153e-15	-14.502	-14.501	0.000
	ZnCl3-	7.542e-19	7.085e-19	-18.123	-18.150	-0.027
	ZnCl4-2	9.041e-23	7.041e-23	-22.044	-22.152	-0.109

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-0.71	10.43	11.14	Al(OH)3
AlAsO4:2H2O	-8.52	-3.72	4.80	AlAsO4:2H2O
AlumK	-21.49	-26.75	-5.26	KAl(SO4)2:12H2O
Alunite	-5.13	-5.89	-0.76	KAl3(SO4)2(OH)6
Anglesite	-5.49	-13.31	-7.82	PbSO4
Anhydrite	-2.98	-7.32	-4.34	CaSO4
Antlerite	-6.52	1.77	8.29	Cu3(OH)4SO4
Aragonite	0.14	-8.16	-8.31	CaCO3
Arsenolite	-20.65	-23.64	-2.98	As4O6
Artinite	-5.40	4.57	9.97	MgCO3:Mg(OH)2:3H2O
As2O5	-35.06	-28.29	6.77	As2O5
Atacamite	-4.76	2.82	7.58	Cu2(OH)3Cl
Azurite	-4.71	-21.32	-16.61	Cu3(OH)2(CO3)2
B-UO2(OH)2	-3.10	2.62	5.72	UO2(OH)2
Ba3(AsO4)2	15.29	6.34	-8.95	Ba3(AsO4)2
BaF2	-10.21	-15.99	-5.77	BaF2
Barite	0.19	-9.87	-10.05	BaSO4
Basaluminite	-2.40	20.30	22.70	Al4(OH)10SO4
Bianchite	-9.22	-10.99	-1.76	ZnSO4:6H2O
Birnessite	-6.28	37.32	43.60	MnO2
Bixbyite	-2.53	48.73	51.26	Mn2O3
Boehmite	1.49	10.43	8.94	AlOOH
Brochantite	-5.84	9.50	15.34	Cu4(OH)6SO4
Brucite	-3.77	13.41	17.19	Mg(OH)2
Bunsenite	-3.56	9.20	12.76	NiO
Ca3(AsO4)2:4w	-8.40	13.98	22.38	Ca3(AsO4)2:4H2O
Calcite	0.29	-8.16	-8.45	CaCO3
Cerrusite	-0.96	-14.15	-13.19	PbCO3
Chalcanthite	-11.03	-13.69	-2.66	CuSO4:5H2O
Claudetite	-20.40	-23.64	-3.23	As4O6
CO2(g)	-4.09	-22.25	-18.16	CO2
Cotunnite	-12.33	-17.17	-4.84	PbCl2
Cu(OH)2	-1.11	7.73	8.83	Cu(OH)2
Cu2SO4	-24.57	-31.86	-7.29	Cu2SO4
Cu3(AsO4)2:6w	-11.27	-5.11	6.16	Cu3(AsO4)2:6H2O
CuCO3	-4.90	-14.53	-9.63	CuCO3
CuF	-23.53	-18.99	4.54	CuF
CuF2	-19.35	-19.80	-0.45	CuF2
CuF2:2H2O	-15.30	-19.80	-4.50	CuF2:2H2O
CuMetal	-6.49	-18.17	-11.68	Cu
CuOCuSO4	-17.94	-5.96	11.98	CuO:CuSO4
CupricFerrite	18.09	50.75	32.66	CuFe2O4
Cuprite	-3.42	-10.44	-7.03	Cu2O
CuprousFerrite	14.71	16.29	1.57	CuFeO2
CuSO4	-16.93	-13.69	3.24	CuSO4
Diaspore	3.24	10.43	7.19	AlOOH
Dolomite	-0.04	-17.01	-16.97	CaMg(CO3)2
Dolomite(d)	-0.61	-17.01	-16.40	CaMg(CO3)2
Epsomite	-5.83	-8.00	-2.18	MgSO4:7H2O
Fe(OH)2.7Cl.3	7.62	17.72	10.10	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	3.47	21.51	18.03	Fe(OH)3
Fe3(OH)8	5.07	51.58	46.51	Fe3(OH)8
Fluorite	-2.78	-13.44	-10.66	CaF2
Gibbsite	2.03	10.43	8.40	Al(OH)3
Goethite	9.37	21.51	12.14	FeOOH
Goslarite	-8.99	-10.99	-2.00	ZnSO4:7H2O
Gummite	-8.07	2.62	10.70	UO3
Gypsum	-2.74	-7.32	-4.58	CaSO4:2H2O
H2(g)	-25.85	-25.90	-0.05	H2
Halite	-8.05	-6.48	1.57	NaCl
Hausmannite	-2.16	60.15	62.31	Mn3O4
Hematite	20.35	43.02	22.67	Fe2O3
Huntite	-5.05	-34.69	-29.64	CaMg3(CO3)4
Hydrocerrusite	-2.74	-20.20	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-13.86	-21.96	-8.10	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-5.20	26.23	31.43	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-3.27	27.35	30.62	KFe3(SO4)2(OH)6
Jarosite-Na	-6.76	27.85	34.61	NaFe3(SO4)2(OH)6
JarositeH	-13.05	21.70	34.74	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-7.75	-10.98	-3.23	AlOHSO4
Langite	-7.80	9.50	17.30	Cu4(OH)6SO4:H2O
Larnakite	-5.01	-5.21	-0.20	PbO:PbSO4
Laurionite	-5.15	-4.53	0.62	PbOHCl
Litharge	-4.83	8.10	12.93	PbO
Maghemite	10.35	43.02	32.67	Fe2O3
Magnesite	-0.89	-8.84	-7.95	MgCO3
Magnetite	20.91	51.58	30.67	Fe3O4
Malachite	-1.82	-6.80	-4.97	Cu2(OH)2CO3
Manganite	-0.97	24.37	25.34	MnOOH
Massicot	-5.02	8.10	13.12	PbO
Matlockite	-8.77	-18.30	-9.53	PbClF
Melanothallite	-21.43	-17.54	3.89	CuCl2
Melanterite	-10.58	-12.86	-2.27	FeSO4:7H2O
Minium	-24.79	50.21	75.00	Pb3O4
Mirabilite	-7.76	-9.11	-1.36	Na2SO4:10H2O
Mn2(SO4)3	-61.97	-15.51	46.47	Mn2(SO4)3
Mn3(AsO4):8H2O	-6.61	5.96	12.57	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-16.34	-13.85	2.49	MnCl2:4H2O
MnSO4	-12.86	-10.00	2.87	MnSO4
Morenosite	-9.82	-12.22	-2.40	NiSO4:7H2O
Na4UO2(CO3)3	-23.24	-39.53	-16.29	Na4UO2(CO3)3
Nahcolite	-5.13	-16.10	-10.97	NaHCO3
Nantokite	-8.27	-17.86	-9.59	CuCl
Natron	-8.44	-9.95	-1.51	Na2CO3:10H2O
Nesquehonite	-3.29	-8.84	-5.55	MgCO3:3H2O
Ni(OH)2	-1.22	9.20	10.41	Ni(OH)2
Ni3(AsO4)2:8H2O	-16.48	-0.71	15.77	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-16.63	15.37	32.00	Ni4(OH)6SO4
NiCO3	-6.34	-13.06	-6.71	NiCO3
Nsutite	-5.25	37.32	42.56	MnO2
O2(g)	-33.15	51.80	84.95	O2
Pb(OH)2	-0.23	8.10	8.33	Pb(OH)2
Pb2(OH)3Cl	-5.22	3.57	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-9.99	16.21	26.20	PbO:Pb(OH)2
Pb2O3	-18.93	42.11	61.04	Pb2O3
Pb2OCO3	-5.69	-6.05	-0.35	PbO:PbCO3
Pb3(AsO4)2	-9.86	-3.98	5.88	Pb3(AsO4)2
Pb3O2CO3	-9.30	2.06	11.36	PbCO3:2PbO
Pb3O2SO4	-7.77	2.90	10.66	PbSO4:2PbO
Pb4(OH)6SO4	-10.10	11.00	21.10	Pb4(OH)6SO4
Pb4O3SO4	-11.55	11.00	22.55	PbSO4:3PbO
PbF2	-12.00	-19.43	-7.43	PbF2
PbMetal	-22.06	-17.80	4.26	Pb
PbO:0.3H2O	-4.88	8.10	12.98	PbO:0.33H2O
Phosgenite	-11.51	-31.32	-19.81	PbCl2:PbCO3
Plattnerite	-16.20	34.00	50.20	PbO2
Portlandite	-9.11	14.09	23.20	Ca(OH)2
Pyrochroite	-3.78	11.42	15.20	Mn(OH)2
Pyrolusite	-4.89	37.32	42.21	MnO2
Retgersite	-10.17	-12.22	-2.05	NiSO4:6H2O
Rhodochrosite	0.28	-10.84	-11.11	MnCO3
Rhodochrosite(d)	-0.45	-10.84	-10.39	MnCO3
Rutherfordine	-5.20	-19.63	-14.43	UO2CO3
Schoepite	-2.93	2.62	5.56	UO2(OH)2:H2O
Scorodite	-6.17	7.36	13.54	FeAsO4:2H2O
Siderite	-2.84	-13.69	-10.86	FeCO3
Siderite(d)(3)	-3.24	-13.69	-10.45	FeCO3
Smithsonite	-1.88	-11.83	-9.94	ZnCO3
Tenorite	-0.09	7.73	7.81	CuO
Thenardite	-8.94	-9.11	-0.17	Na2SO4
Thermonatrite	-10.11	-9.95	0.16	Na2CO3:H2O
Trona	-15.11	-26.05	-10.94	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-32.01	-44.69	-12.68	U(OH)2SO4
U3O8(c)	-11.60	-18.03	-6.43	U3O8
U4O9(c)	-27.20	-67.21	-40.01	U4O9
UF4(c)	-50.50	-78.34	-27.84	UF4
UF4:2.5H2O	-41.30	-78.34	-37.04	UF4:2.5H2O
UO2(a)	-13.90	-23.28	-9.38	UO2
UO3(gamma)	-5.34	2.62	7.97	UO3
Uraninite(c)	-9.24	-23.28	-14.04	UO2
Witherite	-2.13	-10.71	-8.58	BaCO3
Zincite(c)	-0.99	10.43	11.42	ZnO
Zincosite	-14.24	-10.99	3.25	ZnSO4
Zn(OH)2-a	-2.02	10.43	12.45	Zn(OH)2
Zn(OH)2-b	-1.32	10.43	11.75	Zn(OH)2
Zn(OH)2-c	-1.77	10.43	12.20	Zn(OH)2
Zn(OH)2-e	-1.07	10.43	11.50	Zn(OH)2
Zn(OH)2-g	-1.28	10.43	11.71	Zn(OH)2
Zn2(OH)2SO4	-8.06	-0.56	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.98	8.22	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-10.75	2.99	13.74	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-31.36	-11.55	19.81	ZnO:2ZnSO4
Zn4(OH)6SO4	-8.11	20.29	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-11.64	26.86	38.50	Zn5(OH)8Cl2
ZnCl2	-22.10	-14.84	7.25	ZnCl2
ZnCO3:H2O	-1.57	-11.83	-10.26	ZnCO3:H2O
ZnF2	-15.75	-17.11	-1.35	ZnF2
ZnMetal	-41.70	-15.47	26.23	Zn
ZnO(a)	-0.88	10.43	11.31	ZnO
ZnSO4:H2O	-10.55	-10.99	-0.43	ZnSO4:H2O

End of simulation.

```
------------------
Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 6.5-7.5m
           SOLUTION        7
           units           mg/l
           temp            20.6
           pH              9.23
           F               0.24
           Cl              1.7
           S(6)            37          as SO4
           Na              36
           K               21
           Mg              1.3
           Ca              8.0
           Alkalinity      115.9       as HCO3
           Al              1.7
           As(+3)          0.21
           As(+5)          0.42
           Ba              0.111
           Cu              0.084
           Fe              2.86
           Mn              0.17
           Ni              0.038
           Pb              0.064
           U               0.39
           Zn              0.17
           END
```

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TITLE
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   Schneckentein 6.5-7.5m

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Beginning of initial solution calculations.
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Initial solution 7.

-----------------------------Solution composition------------
-----------------

            Elements           Molality       Moles

            Al               6.302e-05   6.302e-05
            Alkalinity       1.900e-03   1.900e-03
            As(3)            2.804e-06   2.804e-06
            As(5)            5.607e-06   5.607e-06
            Ba               8.084e-07   8.084e-07
            Ca               1.996e-04   1.996e-04
            Cl               4.796e-05   4.796e-05
            Cu               1.322e-06   1.322e-06
            F                1.264e-05   1.264e-05
            Fe               5.122e-05   5.122e-05
            K                5.372e-04   5.372e-04
            Mg               5.348e-05   5.348e-05
            Mn               3.095e-06   3.095e-06
            Na               1.566e-03   1.566e-03
            Ni               6.474e-07   6.474e-07
            Pb               3.090e-07   3.090e-07
            S(6)             3.852e-04   3.852e-04
            U                1.639e-06   1.639e-06
            Zn               2.601e-06   2.601e-06
```

```
----------------------------Description of solution----------------------------
---

                                    pH  =   9.230
                                    pe  =   4.000
                       Activity of water  =   1.000
                          Ionic strength  =   3.192e-03
                      Mass of water (kg)  =   1.000e+00
                 Total carbon (mol/kg)  =   1.401e-03
                    Total CO2 (mol/kg)  =   1.401e-03
                   Temperature (deg C)  =  20.600
                Electrical balance (eq)  =   1.343e-04
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =   2.71
                               Iterations  =  23
                                  Total H  = 1.110142e+02
                                  Total O  = 5.551245e+01

---------------------------------Redox couples--------------------------------
---

           Redox couple             pe  Eh (volts)

           As(3)/As(5)         -4.1156     -0.2399
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	1.285e-05	1.209e-05	-4.891	-4.918	-0.027
H+	6.230e-10	5.888e-10	-9.206	-9.230	-0.024
H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	**6.302e-05**				
Al(OH)4-	6.300e-05	5.926e-05	-4.201	-4.227	-0.027
Al(OH)3	1.954e-08	1.955e-08	-7.709	-7.709	0.000
Al(OH)2+	1.159e-10	1.091e-10	-9.936	-9.962	-0.027
AlOH+2	1.552e-14	1.216e-14	-13.809	-13.915	-0.106
AlF2+	6.831e-16	6.426e-16	-15.166	-15.192	-0.027
AlF+2	1.416e-16	1.109e-16	-15.849	-15.955	-0.106
AlF3	9.525e-17	9.532e-17	-16.021	-16.021	0.000
Al+3	1.668e-18	9.620e-19	-17.778	-18.017	-0.239
AlSO4+	8.922e-19	8.393e-19	-18.050	-18.076	-0.027
AlF4-	4.770e-19	4.488e-19	-18.321	-18.348	-0.027
Al(SO4)2-	8.078e-21	7.599e-21	-20.093	-20.119	-0.027
AlHSO4+2	5.396e-29	4.226e-29	-28.268	-28.374	-0.106
As(3)	**2.804e-06**				
H3AsO3	1.470e-06	1.472e-06	-5.833	-5.832	0.000
H2AsO3-	1.331e-06	1.252e-06	-5.876	-5.902	-0.027
HAsO3-2	1.770e-09	1.386e-09	-8.752	-8.858	-0.106
AsO3-3	1.350e-13	7.788e-14	-12.870	-13.109	-0.239
H4AsO3+	4.564e-16	4.293e-16	-15.341	-15.367	-0.027
As(5)	**5.607e-06**				
HAsO4-2	5.562e-06	4.355e-06	-5.255	-5.361	-0.106
AsO4-3	2.912e-08	1.680e-08	-7.536	-7.775	-0.239
H2AsO4-	1.592e-08	1.498e-08	-7.798	-7.825	-0.027
H3AsO4	1.478e-15	1.479e-15	-14.830	-14.830	0.000
Ba	**8.084e-07**				
Ba+2	7.002e-07	5.483e-07	-6.155	-6.261	-0.106
BaSO4	8.026e-08	8.032e-08	-7.095	-7.095	0.000
BaCO3	2.219e-08	2.220e-08	-7.654	-7.654	0.000
BaHCO3+	5.745e-09	5.404e-09	-8.241	-8.267	-0.027
BaOH+	3.354e-11	3.155e-11	-10.474	-10.501	-0.027
C(4)	**1.401e-03**				
HCO3-	1.254e-03	1.181e-03	-2.902	-2.928	-0.026
CO3-2	1.088e-04	8.563e-05	-3.964	-4.067	-0.104
CaCO3	1.790e-05	1.791e-05	-4.747	-4.747	0.000
MgCO3	2.865e-06	2.867e-06	-5.543	-5.543	0.000
MnCO3	2.545e-06	2.547e-06	-5.594	-5.594	0.000
CaHCO3+	2.015e-06	1.895e-06	-5.696	-5.722	-0.027
NaCO3-	1.988e-06	1.870e-06	-5.702	-5.728	-0.027
CO2	1.659e-06	1.660e-06	-5.780	-5.780	0.000
UO2(CO3)3-4	1.450e-06	5.452e-07	-5.839	-6.263	-0.425
Zn(CO3)2-2	1.078e-06	8.438e-07	-5.968	-6.074	-0.106
NaHCO3	9.750e-07	9.757e-07	-6.011	-6.011	0.000
NiCO3	5.425e-07	5.429e-07	-6.266	-6.265	0.000
MgHCO3+	5.418e-07	5.097e-07	-6.266	-6.293	-0.027
ZnCO3	4.606e-07	4.609e-07	-6.337	-6.336	0.000
PbCO3	2.349e-07	2.351e-07	-6.629	-6.629	0.000
UO2(CO3)2-2	1.353e-07	1.060e-07	-6.869	-6.975	-0.106
Ni(CO3)2-2	1.032e-07	8.079e-08	-6.986	-7.093	-0.106
Pb(CO3)2-2	6.457e-08	5.056e-08	-7.190	-7.296	-0.106
MnHCO3+	4.190e-08	3.941e-08	-7.378	-7.404	-0.027
BaCO3	2.219e-08	2.220e-08	-7.654	-7.654	0.000
CuCO3	1.000e-08	1.001e-08	-8.000	-8.000	0.000
BaHCO3+	5.745e-09	5.404e-09	-8.241	-8.267	-0.027
ZnHCO3+	4.264e-09	4.011e-09	-8.370	-8.397	-0.027
Cu(CO3)2-2	1.378e-09	1.079e-09	-8.861	-8.967	-0.106
PbHCO3+	1.576e-10	1.482e-10	-9.803	-9.829	-0.027
NiHCO3+	1.482e-10	1.394e-10	-9.829	-9.856	-0.027
FeCO3	8.197e-11	8.203e-11	-10.086	-10.086	0.000
UO2CO3	5.723e-11	5.728e-11	-10.242	-10.242	0.000
CuHCO3+	1.369e-11	1.288e-11	-10.863	-10.890	-0.027
FeHCO3+	5.014e-12	4.716e-12	-11.300	-11.326	-0.027
(UO2)3(CO3)6-6	1.504e-17	1.664e-18	-16.823	-17.779	-0.956
UO2(CO3)3-5	3.889e-23	8.434e-24	-22.410	-23.074	-0.664
U(CO3)4-4	5.780e-35	2.173e-35	-34.238	-34.663	-0.425
U(CO3)5-6	1.276e-37	1.413e-38	-36.894	-37.850	-0.956
Ca	**1.996e-04**				
Ca+2	1.721e-04	1.354e-04	-3.764	-3.868	-0.104
CaCO3	1.790e-05	1.791e-05	-4.747	-4.747	0.000
CaSO4	7.571e-06	7.576e-06	-5.121	-5.121	0.000
CaHCO3+	2.015e-06	1.895e-06	-5.696	-5.722	-0.027
CaOH+	4.057e-08	3.817e-08	-7.392	-7.418	-0.027
CaF+	1.338e-08	1.258e-08	-7.874	-7.900	-0.027
CaHSO4+	2.636e-14	2.480e-14	-13.579	-13.606	-0.027
Cl	**4.796e-05**				
Cl-	4.796e-05	4.509e-05	-4.319	-4.346	-0.027
MnCl+	7.312e-11	6.879e-11	-10.136	-10.162	-0.027
ZnOHCl	6.836e-11	6.841e-11	-10.165	-10.165	0.000
ZnCl+	2.859e-12	2.689e-12	-11.544	-11.570	-0.027
PbCl+	2.699e-13	2.539e-13	-12.569	-12.595	-0.027
NiCl+	1.030e-13	9.688e-14	-12.987	-13.014	-0.027
FeCl+	2.643e-15	2.486e-15	-14.578	-14.605	-0.027
CuCl+	2.256e-15	2.123e-15	-14.647	-14.673	-0.027
MnCl2	1.353e-15	1.354e-15	-14.869	-14.868	0.000
CuCl2-	7.568e-16	7.119e-16	-15.121	-15.148	-0.027
ZnCl2	1.246e-16	1.247e-16	-15.904	-15.904	0.000
PbCl2	1.971e-17	1.972e-17	-16.705	-16.705	0.000
NiCl2	1.585e-17	1.586e-17	-16.800	-16.800	0.000
CuCl3-2	6.387e-20	5.001e-20	-19.195	-19.301	-0.106
CuCl2	4.894e-20	4.898e-20	-19.310	-19.310	0.000
MnCl3-	1.788e-20	1.682e-20	-19.748	-19.774	-0.027
UO2Cl+	1.092e-20	1.028e-20	-19.962	-19.988	-0.027
ZnCl3-	6.531e-21	6.144e-21	-20.185	-20.212	-0.027
PbCl3-	7.306e-22	6.873e-22	-21.136	-21.163	-0.027
FeCl+2	4.507e-23	3.529e-23	-22.346	-22.452	-0.106
ZnCl4-2	1.712e-25	1.340e-25	-24.767	-24.873	-0.106
UO2Cl2	2.382e-26	2.384e-26	-25.623	-25.623	0.000
PbCl4-2	1.830e-26	1.433e-26	-25.737	-25.844	-0.106
FeCl2+	8.707e-27	8.190e-27	-26.060	-26.087	-0.027
CuCl3-	7.697e-27	7.240e-27	-26.114	-26.140	-0.027
FeCl3	3.691e-32	3.693e-32	-31.433	-31.433	0.000
CuCl4-2	1.884e-33	1.476e-33	-32.725	-32.831	-0.106
UCl+3	0.000e+00	0.000e+00	-53.630	-53.869	-0.239
Cu(1)	**1.165e-12**				
Cu+	1.165e-12	1.095e-12	-11.934	-11.960	-0.027
CuCl2-	7.568e-16	7.119e-16	-15.121	-15.148	-0.027
CuCl3-2	6.387e-20	5.001e-20	-19.195	-19.301	-0.106
Cu(2)	**1.322e-06**				
Cu(OH)2	1.310e-06	1.311e-06	-5.883	-5.882	0.000
CuCO3	1.000e-08	1.001e-08	-8.000	-8.000	0.000
Cu(CO3)2-2	1.378e-09	1.079e-09	-8.861	-8.967	-0.106
CuOH+	3.929e-10	3.696e-10	-9.406	-9.432	-0.027
Cu(OH)3-	1.426e-10	1.342e-10	-9.846	-9.872	-0.027
Cu+2	2.779e-11	2.176e-11	-10.556	-10.662	-0.106
CuHCO3+	1.369e-11	1.288e-11	-10.863	-10.890	-0.027
CuSO4	1.259e-12	1.259e-12	-11.900	-11.900	0.000
Cu(OH)4-2	5.805e-14	4.546e-14	-13.236	-13.342	-0.106
Cu2(OH)2+2	4.899e-14	3.836e-14	-13.310	-13.416	-0.106
CuF+	4.783e-15	4.500e-15	-14.320	-14.347	-0.027
CuCl+	2.256e-15	2.123e-15	-14.647	-14.673	-0.027
CuCl2	4.894e-20	4.898e-20	-19.310	-19.310	0.000
CuCl3-	7.697e-27	7.240e-27	-26.114	-26.140	-0.027
CuCl4-2	1.884e-33	1.476e-33	-32.725	-32.831	-0.106
F	**1.264e-05**				
F-	1.258e-05	1.184e-05	-4.900	-4.927	-0.027
MgF+	2.878e-08	2.708e-08	-7.541	-7.567	-0.027
CaF+	1.338e-08	1.258e-08	-7.874	-7.900	-0.027
NaF	1.000e-08	1.001e-08	-8.000	-8.000	0.000
MnF+	3.260e-11	3.066e-11	-10.487	-10.513	-0.027
HF	9.657e-12	9.664e-12	-11.015	-11.015	0.000
ZnF+	4.534e-12	4.265e-12	-11.344	-11.370	-0.027
NiF+	2.148e-13	2.020e-13	-12.668	-12.695	-0.027
PbF+	3.535e-14	3.326e-14	-13.452	-13.478	-0.027
FeF+	5.025e-15	4.727e-15	-14.299	-14.325	-0.027
CuF+	4.783e-15	4.500e-15	-14.320	-14.347	-0.027
AlF2+	6.831e-16	6.426e-16	-15.166	-15.192	-0.027
HF2-	4.499e-16	4.232e-16	-15.347	-15.373	-0.027
UO2F+	2.477e-16	2.330e-16	-15.606	-15.633	-0.027
AlF+2	1.416e-16	1.109e-16	-15.849	-15.955	-0.106
AlF3	9.525e-17	9.532e-17	-16.021	-16.021	0.000
UO2F2	9.316e-18	9.323e-18	-17.031	-17.030	0.000
PbF2	8.032e-18	8.037e-18	-17.095	-17.095	0.000
FeF+2	6.682e-19	5.232e-19	-18.175	-18.281	-0.106
AlF4-	4.770e-19	4.488e-19	-18.321	-18.348	-0.027
FeF2+	2.486e-19	2.338e-19	-18.605	-18.631	-0.027
UO2F3-	2.232e-20	2.100e-20	-19.651	-19.678	-0.027
FeF3	4.317e-21	4.320e-21	-20.365	-20.364	0.000
PbF3-	7.327e-22	6.892e-22	-21.135	-21.162	-0.027
H2F2	2.846e-22	2.848e-22	-21.546	-21.546	0.000
UO2F4-2	2.028e-24	1.588e-24	-23.693	-23.799	-0.106
PbF4-2	4.987e-27	3.905e-27	-26.302	-26.408	-0.106
UF3+	0.000e+00	0.000e+00	-44.448	-44.475	-0.027
UF2+2	0.000e+00	0.000e+00	-44.812	-44.918	-0.106
UF4	0.000e+00	0.000e+00	-45.491	-45.491	0.000
UF+3	0.000e+00	0.000e+00	-46.667	-46.906	-0.239
UF5-	0.000e+00	0.000e+00	-48.944	-48.970	-0.027
UF6-2	0.000e+00	0.000e+00	-51.684	-51.790	-0.106
Fe(2)	**1.564e-10**				
FeCO3	8.197e-11	8.203e-11	-10.086	-10.086	0.000
Fe+2	5.100e-11	3.994e-11	-10.292	-10.399	-0.106
FeOH+	1.633e-11	1.536e-11	-10.787	-10.814	-0.027
FeHCO3+	5.014e-12	4.716e-12	-11.300	-11.326	-0.027
FeSO4	1.912e-12	1.913e-12	-11.719	-11.718	0.000
Fe(OH)2	1.504e-13	1.505e-13	-12.823	-12.822	0.000
Fe(OH)3-	9.664e-15	9.091e-15	-14.015	-14.041	-0.027
FeF+	5.025e-15	4.727e-15	-14.299	-14.325	-0.027
FeCl+	2.643e-15	2.486e-15	-14.578	-14.605	-0.027
FeHSO4+	7.773e-21	7.312e-21	-20.109	-20.136	-0.027

Fe(3)	5.122e-05					
	Fe(OH)4-	2.960e-05	2.784e-05	-4.529	-4.555	-0.027
	Fe(OH)3	2.150e-05	2.151e-05	-4.668	-4.667	0.000
	Fe(OH)2+	1.270e-07	1.195e-07	-6.896	-6.923	-0.027
	FeOH+2	3.214e-13	2.517e-13	-12.493	-12.599	-0.106
	FeF+2	6.682e-19	5.232e-19	-18.175	-18.281	-0.106
	FeF2+	2.486e-19	2.338e-19	-18.605	-18.631	-0.027
	FeSO4+	9.216e-20	8.670e-20	-19.035	-19.062	-0.027
	Fe+3	5.177e-20	2.986e-20	-19.286	-19.525	-0.239
	FeF3	4.317e-21	4.320e-21	-20.365	-20.364	0.000
	Fe(SO4)2-	5.792e-22	5.448e-22	-21.237	-21.264	-0.027
	FeCl+2	4.507e-23	3.529e-23	-22.346	-22.452	-0.106
	Fe2(OH)2+4	5.454e-24	2.051e-24	-23.263	-23.688	-0.425
	FeCl2+	8.707e-27	8.190e-27	-26.060	-26.087	-0.027
	Fe3(OH)4+5	3.564e-28	7.729e-29	-27.448	-28.112	-0.664
	FeHSO4+2	1.754e-28	1.373e-28	-27.756	-27.862	-0.106
	FeCl3	3.691e-32	3.693e-32	-31.433	-31.433	0.000
H(0)	4.958e-30					
	H2	2.479e-30	2.481e-30	-29.606	-29.605	0.000
K	5.372e-04					
	K+	5.361e-04	5.041e-04	-3.271	-3.298	-0.027
	KSO4-	1.048e-06	9.854e-07	-5.980	-6.006	-0.027
Mg	5.348e-05					
	Mg+2	4.759e-05	3.754e-05	-4.322	-4.426	-0.103
	MgCO3	2.865e-06	2.867e-06	-5.543	-5.543	0.000
	MgSO4	2.291e-06	2.293e-06	-5.640	-5.640	0.000
	MgHCO3+	5.418e-07	5.097e-07	-6.266	-6.293	-0.027
	MgOH+	1.644e-07	1.546e-07	-6.784	-6.811	-0.027
	MgF+	2.878e-08	2.708e-08	-7.541	-7.567	-0.027
Mn(2)	3.095e-06					
	MnCO3	2.545e-06	2.547e-06	-5.594	-5.594	0.000
	Mn+2	4.782e-07	3.745e-07	-6.320	-6.427	-0.106
	MnHCO3+	4.190e-08	3.941e-08	-7.378	-7.404	-0.027
	MnSO4	1.786e-08	1.787e-08	-7.748	-7.748	0.000
	MnOH+	1.207e-08	1.136e-08	-7.918	-7.945	-0.027
	MnCl+	7.312e-11	6.879e-11	-10.136	-10.162	-0.027
	MnF+	3.260e-11	3.066e-11	-10.487	-10.513	-0.027
	Mn(OH)3-	3.089e-14	2.906e-14	-13.510	-13.537	-0.027
	MnCl2	1.353e-15	1.354e-15	-14.869	-14.868	0.000
	MnCl3-	1.788e-20	1.682e-20	-19.748	-19.774	-0.027
Mn(3)	1.045e-28					
	Mn+3	1.045e-28	6.027e-29	-27.981	-28.220	-0.239
Mn(6)	2.706e-37					
	MnO4-2	2.706e-37	2.119e-37	-36.568	-36.674	-0.106
Mn(7)	0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-42.323	-42.350	-0.027
Na	1.566e-03					
	Na+	1.561e-03	1.469e-03	-2.807	-2.833	-0.026
	NaSO4-	2.224e-06	2.092e-06	-5.653	-5.679	-0.027
	NaCO3-	1.988e-06	1.870e-06	-5.702	-5.728	-0.027
	NaHCO3	9.750e-07	9.757e-07	-6.011	-6.011	0.000
	NaF	1.000e-08	1.001e-08	-8.000	-8.000	0.000
Ni	6.474e-07					
	NiCO3	5.425e-07	5.429e-07	-6.266	-6.265	0.000
	Ni(CO3)2-2	1.032e-07	8.079e-08	-6.986	-7.093	-0.106
	Ni+2	1.092e-09	8.553e-10	-8.962	-9.068	-0.106
	Ni(OH)2	2.465e-10	2.466e-10	-9.608	-9.608	0.000
	NiOH+	1.557e-10	1.465e-10	-9.808	-9.834	-0.027
	NiHCO3+	1.482e-10	1.394e-10	-9.829	-9.856	-0.027
	NiSO4	4.688e-11	4.691e-11	-10.329	-10.329	0.000
	Ni(OH)3-	4.452e-12	4.188e-12	-11.351	-11.378	-0.027
	NiF+	2.148e-13	2.020e-13	-12.668	-12.695	-0.027
	NiCl+	1.030e-13	9.688e-14	-12.987	-13.014	-0.027
	Ni(SO4)2-2	9.774e-16	7.653e-16	-15.010	-15.116	-0.106
	NiCl2	1.585e-17	1.586e-17	-16.800	-16.800	0.000
O(0)	4.579e-35					
	O2	2.289e-35	2.291e-35	-34.640	-34.640	0.000
Pb	3.090e-07					
	PbCO3	2.349e-07	2.351e-07	-6.629	-6.629	0.000
	Pb(CO3)2-2	6.457e-08	5.056e-08	-7.190	-7.296	-0.106
	PbOH+	5.561e-09	5.231e-09	-8.255	-8.281	-0.027
	Pb(OH)2	3.453e-09	3.456e-09	-8.462	-8.461	0.000
	Pb+2	2.018e-10	1.580e-10	-9.695	-9.801	-0.106
	PbHCO3+	1.576e-10	1.482e-10	-9.803	-9.829	-0.027
	Pb(OH)3-	7.163e-11	6.738e-11	-10.145	-10.171	-0.027
	PbSO4	2.595e-11	2.597e-11	-10.586	-10.586	0.000
	Pb(OH)4-2	3.348e-13	2.621e-13	-12.475	-12.581	-0.106
	PbCl+	2.699e-13	2.539e-13	-12.569	-12.595	-0.027
	Pb(SO4)2-2	5.088e-14	3.984e-14	-13.293	-13.400	-0.106
	PbF+	3.535e-14	3.326e-14	-13.452	-13.478	-0.027
	Pb2OH+3	3.208e-17	1.850e-17	-16.494	-16.733	-0.239
	Pb3(OH)4+2	2.825e-17	2.212e-17	-16.549	-16.655	-0.106
	PbCl2	1.971e-17	1.972e-17	-16.705	-16.705	0.000
	PbF2	8.032e-18	8.037e-18	-17.095	-17.095	0.000
	PbF3-	7.327e-22	6.892e-22	-21.135	-21.162	-0.027
	PbCl3-	7.306e-22	6.873e-22	-21.136	-21.163	-0.027
	PbCl4-2	1.830e-26	1.433e-26	-25.737	-25.844	-0.106
	PbF4-2	4.987e-27	3.905e-27	-26.302	-26.408	-0.106
S(6)	3.852e-04					
	SO4-2	3.720e-04	2.923e-04	-3.429	-3.534	-0.105
	CaSO4	7.571e-06	7.576e-06	-5.121	-5.121	0.000
	MgSO4	2.291e-06	2.293e-06	-5.640	-5.640	0.000
	NaSO4-	2.224e-06	2.092e-06	-5.653	-5.679	-0.027
	KSO4-	1.048e-06	9.854e-07	-5.980	-6.006	-0.027
	BaSO4	8.026e-08	8.032e-08	-7.095	-7.095	0.000
	MnSO4	1.786e-08	1.787e-08	-7.748	-7.748	0.000
	ZnSO4	1.785e-09	1.786e-09	-8.748	-8.748	0.000
	NiSO4	4.688e-11	4.691e-11	-10.329	-10.329	0.000
	PbSO4	2.595e-11	2.597e-11	-10.586	-10.586	0.000
	HSO4-	1.619e-11	1.523e-11	-10.791	-10.817	-0.027
	Zn(SO4)2-2	5.610e-12	4.393e-12	-11.251	-11.357	-0.106
	FeSO4	1.912e-12	1.913e-12	-11.719	-11.718	0.000
	CuSO4	1.259e-12	1.259e-12	-11.900	-11.900	0.000
	Pb(SO4)2-2	5.088e-14	3.984e-14	-13.293	-13.400	-0.106
	CaHSO4+	2.636e-14	2.480e-14	-13.579	-13.606	-0.027
	Ni(SO4)2-2	9.774e-16	7.653e-16	-15.010	-15.116	-0.106
	UO2SO4	5.922e-17	5.926e-17	-16.228	-16.227	0.000
	AlSO4+	8.922e-19	8.393e-19	-18.050	-18.076	-0.027
	UO2(SO4)2-2	1.969e-19	1.542e-19	-18.706	-18.812	-0.106
	FeSO4+	9.216e-20	8.670e-20	-19.035	-19.062	-0.027
	Al(SO4)2-	8.078e-21	7.599e-21	-20.093	-20.119	-0.027
	FeHSO4+	7.773e-21	7.312e-21	-20.109	-20.136	-0.027
	Fe(SO4)2-	5.792e-22	5.448e-22	-21.237	-21.264	-0.027
	FeHSO4+2	1.754e-28	1.373e-28	-27.756	-27.862	-0.106
	AlHSO4+2	5.396e-29	4.226e-29	-28.268	-28.374	-0.106
	U(SO4)2	0.000e+00	0.000e+00	-47.948	-47.947	0.000
	USO4+2	0.000e+00	0.000e+00	-48.162	-48.268	-0.106
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-64.118	-64.357	-0.239
U(4)	7.184e-24					
	U(OH)4	7.184e-24	7.189e-24	-23.144	-23.143	0.000
	U(OH)3+	1.736e-29	1.633e-29	-28.761	-28.787	-0.027
	U(CO3)4-4	5.780e-35	2.173e-35	-34.238	-34.663	-0.425
	U(OH)2+2	6.429e-36	5.034e-36	-35.192	-35.298	-0.106
	U(CO3)5-6	1.276e-37	1.413e-38	-36.894	-37.850	-0.956
	UOH+3	0.000e+00	0.000e+00	-42.487	-42.726	-0.239
	UF3+	0.000e+00	0.000e+00	-44.448	-44.475	-0.027
	UF2+2	0.000e+00	0.000e+00	-44.812	-44.918	-0.106
	UF4	0.000e+00	0.000e+00	-45.491	-45.491	0.000
	UF+3	0.000e+00	0.000e+00	-46.667	-46.906	-0.239
	U(SO4)2	0.000e+00	0.000e+00	-47.948	-47.947	0.000
	USO4+2	0.000e+00	0.000e+00	-48.162	-48.268	-0.106
	UF5-	0.000e+00	0.000e+00	-48.944	-48.970	-0.027
	U+4	0.000e+00	0.000e+00	-50.868	-51.293	-0.425
	UF6-2	0.000e+00	0.000e+00	-51.684	-51.790	-0.106
	UCl+3	0.000e+00	0.000e+00	-53.630	-53.869	-0.239
	U6(OH)15+9	0.000e+00	0.000e+00	-184.360	-186.511	-2.151
U(5)	5.773e-19					
	UO2+	5.772e-19	5.430e-19	-18.239	-18.265	-0.027
	UO2(CO3)3-5	3.889e-23	8.434e-24	-22.410	-23.074	-0.664
U(6)	1.639e-06					
	UO2(CO3)3-4	1.450e-06	5.452e-07	-5.839	-6.263	-0.425
	UO2(CO3)2-2	1.353e-07	1.060e-07	-6.869	-6.975	-0.106
	UO2(OH)3-	5.309e-08	4.994e-08	-7.275	-7.302	-0.027
	UO2CO3	5.723e-11	5.728e-11	-10.242	-10.242	0.000
	UO2(OH)4-2	1.716e-12	1.344e-12	-11.765	-11.872	-0.106
	UO2OH+	1.394e-12	1.311e-12	-11.856	-11.882	-0.027
	(UO2)3(OH)7-	1.828e-14	1.720e-14	-13.738	-13.765	-0.027
	UO2F+	2.477e-16	2.330e-16	-15.606	-15.633	-0.027
	UO2+2	2.064e-16	1.616e-16	-15.685	-15.791	-0.106
	UO2SO4	5.922e-17	5.926e-17	-16.228	-16.227	0.000
	(UO2)3(CO3)6-6	1.504e-17	1.664e-18	-16.823	-17.779	-0.956
	(UO2)3(OH)5+	9.479e-18	8.917e-18	-17.023	-17.050	-0.027
	UO2F2	9.316e-18	9.323e-18	-17.031	-17.030	0.000
	UO2(SO4)2-2	1.969e-19	1.542e-19	-18.706	-18.812	-0.106
	(UO2)2(OH)2+2	1.782e-19	1.395e-19	-18.749	-18.855	-0.106
	UO2F3-	2.232e-20	2.100e-20	-19.651	-19.678	-0.027
	UO2Cl+	1.092e-20	1.028e-20	-19.962	-19.988	-0.027
	(UO2)4(OH)7+	3.720e-21	3.499e-21	-20.429	-20.456	-0.027
	(UO2)3(OH)4+2	5.646e-23	4.421e-23	-22.248	-22.354	-0.106
	UO2F4-2	2.028e-24	1.588e-24	-23.693	-23.799	-0.106
	(UO2)2OH+3	1.535e-25	8.853e-26	-24.814	-25.053	-0.239
	UO2Cl2	2.382e-26	2.384e-26	-25.623	-25.623	0.000
Zn	2.601e-06					
	Zn(CO3)2-2	1.078e-06	8.438e-07	-5.968	-6.074	-0.106
	Zn(OH)2	9.787e-07	9.794e-07	-6.009	-6.009	0.000
	ZnCO3	4.606e-07	4.609e-07	-6.337	-6.336	0.000
	ZnOH+	3.806e-08	3.580e-08	-7.420	-7.446	-0.027
	Zn+2	3.446e-08	2.698e-08	-7.463	-7.569	-0.106
	Zn(OH)3-	5.591e-09	5.260e-09	-8.252	-8.279	-0.027
	ZnHCO3+	4.264e-09	4.011e-09	-8.370	-8.397	-0.027
	ZnSO4	1.785e-09	1.786e-09	-8.748	-8.748	0.000
	ZnOHCl	6.836e-11	6.841e-11	-10.165	-10.165	0.000
	Zn(SO4)2-2	5.610e-12	4.393e-12	-11.251	-11.357	-0.106
	ZnF+	4.534e-12	4.265e-12	-11.344	-11.370	-0.027
	ZnCl+	2.859e-12	2.689e-12	-11.544	-11.570	-0.027
	Zn(OH)4-2	1.808e-12	1.416e-12	-11.743	-11.849	-0.106
	ZnCl2	1.246e-16	1.247e-16	-15.904	-15.904	0.000
	ZnCl3-	6.531e-21	6.144e-21	-20.185	-20.212	-0.027
	ZnCl4-2	1.712e-25	1.340e-25	-24.767	-24.873	-0.106

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-1.42	9.67	11.09	Al(OH)3
AlAsO4:2H2O	-9.95	-5.16	4.80	AlAsO4:2H2O
AlumK	-23.13	-28.38	-5.25	KAl(SO4)2:12H2O
Alunite	-8.19	-9.04	-0.85	KAl3(SO4)2(OH)6
Anglesite	-5.52	-13.34	-7.81	PbSO4
Anhydrite	-3.06	-7.40	-4.35	CaSO4
Antlerite	-6.89	1.40	8.29	Cu3(OH)4SO4
Aragonite	0.37	-7.94	-8.31	CaCO3
Arsenolite	-20.37	-23.33	-2.96	As4O6
Artinite	-4.37	5.54	9.92	MgCO3:Mg(OH)2:3H2O
As2O5	-36.42	-29.66	6.76	As2O5
Atacamite	-5.53	2.02	7.55	Cu2(OH)3Cl
Azurite	-5.01	-21.66	-16.65	Cu3(OH)2(CO3)2
B-UO2(OH)2	-3.03	2.67	5.69	UO2(OH)2
Ba3(AsO4)2	15.88	6.94	-8.94	Ba3(AsO4)2
BaF2	-10.34	-16.11	-5.77	BaF2
Barite	0.25	-9.80	-10.04	BaSO4
Basaluminite	-6.00	16.70	22.70	Al4(OH)10SO4
Bianchite	-9.34	-11.10	-1.76	ZnSO4:6H2O
Birnessite	-5.11	38.49	43.60	MnO2
Bixbyite	-0.62	50.53	51.14	Mn2O3
Boehmite	0.78	9.67	8.89	AlOOH
Brochantite	-6.14	9.20	15.34	Cu4(OH)6SO4
Brucite	-3.10	14.03	17.14	Mg(OH)2
Bunsenite	-3.32	9.39	12.71	NiO
Ca3(AsO4)2:4w	-8.25	14.11	22.36	Ca3(AsO4)2:4H2O
Calcite	0.52	-7.94	-8.46	CaCO3
Cerrusite	-0.69	-13.87	-13.18	PbCO3
Chalcanthite	-11.54	-14.20	-2.66	CuSO4:5H2O
Claudetite	-20.12	-23.33	-3.21	As4O6
CO2(g)	-4.37	-22.53	-18.16	CO2
Cotunnite	-13.66	-18.49	-4.83	PbCl2
Cu(OH)2	-1.01	7.80	8.81	Cu(OH)2
Cu2SO4	-25.55	-32.86	-7.30	Cu2SO4
Cu3(AsO4)2:6w	-12.41	-6.27	6.15	Cu3(AsO4)2:6H2O
CuCO3	-5.10	-14.73	-9.63	CuCO3
CuF	-24.10	-19.59	4.51	CuF
CuF2	-20.04	-20.52	-0.47	CuF2
CuF2:2H2O	-16.01	-20.52	-4.51	CuF2:2H2O
CuMetal	-7.01	-18.66	-11.65	Cu
CuOCuSO4	-18.32	-6.40	11.92	CuO:CuSO4
CupricFerrite	17.82	50.38	32.56	CuFe2O4
Cuprite	-3.84	-10.86	-7.02	Cu2O
CuprousFerrite	14.31	15.86	1.55	CuFeO2
CuSO4	-17.41	-14.20	3.21	CuSO4
Diaspore	2.52	9.67	7.15	AlOOH
Dolomite	0.56	-16.43	-16.99	CaMg(CO3)2
Dolomite(d)	-0.01	-16.43	-16.42	CaMg(CO3)2
Epsomite	-5.79	-7.96	-2.17	MgSO4:7H2O
Fe(OH)2.7Cl.3	7.13	17.22	10.09	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	3.27	21.29	18.02	Fe(OH)3
Fe3(OH)8	4.17	50.64	46.47	Fe3(OH)8
Fluorite	-3.07	-13.72	-10.65	CaF2
Gibbsite	1.31	9.67	8.36	Al(OH)3
Goethite	9.17	21.29	12.13	FeOOH
Goslarite	-9.11	-11.10	-2.00	ZnSO4:7H2O
Gummite	-7.99	2.67	10.66	UO3
Gypsum	-2.82	-7.40	-4.58	CaSO4:2H2O
H2(g)	-26.41	-26.46	-0.05	H2
Halite	-8.75	-7.18	1.57	NaCl
Hausmannite	0.43	62.56	62.13	Mn3O4
Hematite	20.00	42.58	22.58	Fe2O3
Huntite	-3.73	-33.41	-29.69	CaMg3(CO3)4
Hydrocerrusite	-1.62	-19.08	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-11.75	-19.94	-8.19	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-6.73	24.65	31.38	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-4.69	25.82	30.51	KFe3(SO4)2(OH)6
Jarosite-Na	-8.21	26.28	34.50	NaFe3(SO4)2(OH)6
JarositeH	-14.71	19.89	34.59	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-9.09	-12.32	-3.23	AlOHSO4
Langite	-8.03	9.20	17.22	Cu4(OH)6SO4:H2O
Larnakite	-4.47	-4.68	-0.21	PbO:PbSO4
Laurionite	-5.54	-4.92	0.62	PbOHCl
Litharge	-4.24	8.66	12.90	PbO
Maghemite	9.94	42.58	32.64	Fe2O3
Magnesite	-0.53	-8.49	-7.96	MgCO3
Magnetite	20.10	50.64	30.54	Fe3O4
Malachite	-1.93	-6.93	-5.00	Cu2(OH)2CO3
Manganite	-0.08	25.26	25.34	MnOOH
Massicot	-4.44	8.66	13.09	PbO
Matlockite	-9.56	-19.07	-9.52	PbClF
Melanothallite	-23.22	-19.35	3.87	CuCl2
Melanterite	-11.67	-13.93	-2.26	FeSO4:7H2O
Minium	-22.38	52.44	74.82	Pb3O4
Mirabilite	-7.88	-9.20	-1.32	Na2SO4:10H2O
Mn2(SO4)3	-61.76	-15.46	46.30	Mn2(SO4)3
Mn3(AsO4):8H2O	-6.12	6.44	12.56	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-17.64	-15.12	2.52	MnCl2:4H2O
MnSO4	-12.80	-9.96	2.84	MnSO4
Morenosite	-10.21	-12.60	-2.39	NiSO4:7H2O
Na4UO2(CO3)3	-23.04	-39.33	-16.29	Na4UO2(CO3)3
Nahcolite	-5.17	-16.13	-10.96	NaHCO3
Nantokite	-9.44	-19.01	-9.57	CuCl
Natron	-8.25	-9.73	-1.48	Na2CO3:10H2O
Nesquehonite	-2.94	-8.49	-5.56	MgCO3:3H2O
Ni(OH)2	-1.07	9.39	10.47	Ni(OH)2
Ni3(AsO4)2:8H2O	-17.24	-1.48	15.76	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-16.43	15.57	32.00	Ni4(OH)6SO4
NiCO3	-6.40	-13.14	-6.73	NiCO3
Nsutite	-4.07	38.49	42.56	MnO2
O2(g)	-31.78	52.92	84.70	O2
Pb(OH)2	0.35	8.66	8.30	Pb(OH)2
Pb2(OH)3Cl	-5.05	3.74	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-8.88	17.32	26.20	PbO:Pb(OH)2
Pb2O3	-17.26	43.78	61.04	Pb2O3
Pb2OCO3	-4.84	-5.21	-0.37	PbO:PbCO3
Pb3(AsO4)2	-9.55	-3.68	5.87	Pb3(AsO4)2
Pb3O2CO3	-7.86	3.45	11.31	PbCO3:2PbO
Pb3O2SO4	-6.65	3.98	10.63	PbSO4:2PbO
Pb4(OH)6SO4	-8.46	12.64	21.10	Pb4(OH)6SO4
Pb4O3SO4	-9.84	12.64	22.49	PbSO4:3PbO
PbF2	-12.22	-19.65	-7.43	PbF2
PbMetal	-22.07	-17.80	4.27	Pb
PbO:0.3H2O	-4.32	8.66	12.98	PbO:0.33H2O
Phosgenite	-12.55	-32.36	-19.81	PbCl2:PbCO3
Plattnerite	-14.96	35.12	50.08	PbO2
Portlandite	-8.55	14.59	23.14	Ca(OH)2
Pyrochroite	-3.17	12.03	15.20	Mn(OH)2
Pyrolusite	-3.60	38.49	42.09	MnO2
Retgersite	-10.55	-12.60	-2.05	NiSO4:6H2O
Rhodochrosite	0.62	-10.49	-11.11	MnCO3
Rhodochrosite(d)	-0.10	-10.49	-10.39	MnCO3
Rutherfordine	-5.42	-19.86	-14.43	UO2CO3
Schoepite	-2.87	2.67	5.54	UO2(OH)2:H2O
Scorodite	-7.05	6.46	13.51	FeAsO4:2H2O
Siderite	-3.60	-14.47	-10.86	FeCO3
Siderite(d)(3)	-4.02	-14.47	-10.45	FeCO3
Smithsonite	-1.68	-11.64	-9.95	ZnCO3
Tenorite	0.01	7.80	7.79	CuO
Thenardite	-9.03	-9.20	-0.17	Na2SO4
Thermonatrite	-9.89	-9.73	0.16	Na2CO3:H2O
Trona	-14.90	-25.86	-10.97	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-33.17	-45.79	-12.62	U(OH)2SO4
U3O8(c)	-12.00	-18.45	-6.45	U3O8
U4O9(c)	-28.76	-68.71	-39.94	U4O9
UF4(c)	-52.60	-80.42	-27.82	UF4
UF4:2.5H2O	-43.44	-80.42	-36.98	UF4:2.5H2O
UO2(a)	-14.47	-23.79	-9.32	UO2
UO3(gamma)	-5.26	2.67	7.93	UO3
Uraninite(c)	-9.78	-23.79	-14.01	UO2
Witherite	-1.76	-10.33	-8.57	BaCO3
Zincite(c)	-0.49	10.89	11.38	ZnO
Zincosite	-14.32	-11.10	3.22	ZnSO4
Zn(OH)2-a	-1.56	10.89	12.45	Zn(OH)2
Zn(OH)2-b	-0.86	10.89	11.75	Zn(OH)2
Zn(OH)2-c	-1.31	10.89	12.20	Zn(OH)2
Zn(OH)2-e	-0.61	10.89	11.50	Zn(OH)2
Zn(OH)2-g	-0.82	10.89	11.71	Zn(OH)2
Zn2(OH)2SO4	-7.71	-0.21	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.99	8.21	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-10.71	3.01	13.72	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-31.02	-11.32	19.70	ZnO:2ZnSO4
Zn4(OH)6SO4	-6.83	21.57	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-11.20	27.30	38.50	Zn5(OH)8Cl2
ZnCl2	-23.48	-16.26	7.22	ZnCl2
ZnCO3:H2O	-1.38	-11.64	-10.26	ZnCO3:H2O
ZnF2	-16.05	-17.42	-1.38	ZnF2
ZnMetal	-41.73	-15.57	26.16	Zn
ZnO(a)	-0.42	10.89	11.31	ZnO
ZnSO4:H2O	-10.65	-11.10	-0.45	ZnSO4:H2O

End of simulation.

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Reading data base.
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           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
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           TITLE   Schneckentein 7.5-8.5m
           SOLUTION        8
           units           mg/l
           temp            19.8
           pH              9.63
           F               0.21
           Cl              4.3
           S(6)            44          as SO4
           Na              49
           K               24
           Mg              1.0
           Ca              6.1
           Alkalinity      97.6        as HCO3
           Al              4.12
           As(+3)          0.11
           As(+5)          0.27
           Ba              0.076
           Cu              0.086
           Fe              4.39
           Mn              0.38
           Ni              0.026
           Pb              0.085
           U               0.02
           Zn              0.3
           END
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TITLE
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   Schneckentein 7.5-8.5m

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Beginning of initial solution calculations.
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Initial solution 8.

----------------------------Solution composition------------
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           Elements           Molality       Moles

           Al                1.527e-04   1.527e-04
           Alkalinity        1.600e-03   1.600e-03
           As(3)             1.469e-06   1.469e-06
           As(5)             3.605e-06   3.605e-06
           Ba                5.535e-07   5.535e-07
           Ca                1.522e-04   1.522e-04
           Cl                1.213e-04   1.213e-04
           Cu                1.354e-06   1.354e-06
           F                 1.106e-05   1.106e-05
           Fe                7.863e-05   7.863e-05
           K                 6.139e-04   6.139e-04
           Mg                4.114e-05   4.114e-05
           Mn                6.919e-06   6.919e-06
           Na                2.132e-03   2.132e-03
           Ni                4.430e-07   4.430e-07
           Pb                4.103e-07   4.103e-07
           S(6)              4.581e-04   4.581e-04
           U                 8.404e-08   8.404e-08
           Zn                4.590e-06   4.590e-06
```

```
----------------------------Description of solution----------------------------

                                    pH  =   9.630
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   3.284e-03
                     Mass of water (kg)  =   1.000e+00
                    Total carbon (mol/kg)  =   6.651e-04
                       Total CO2 (mol/kg)  =   6.651e-04
                     Temperature (deg C)  =  19.800
                   Electrical balance (eq)  =   1.046e-03
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  20.48
                                Iterations  =  19
                                   Total H  = 1.110139e+02
                                   Total O  = 5.551101e+01

---------------------------------Redox couples---------------------------------

           Redox couple             pe  Eh (volts)

           As(3)/As(5)         -4.7301     -0.2749
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	3.032e-05	2.850e-05	-4.518	-4.545	-0.027
H+	2.482e-10	2.344e-10	-9.605	-9.630	-0.025
H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	**1.527e-04**				
Al(OH)4-	1.527e-04	1.436e-04	-3.816	-3.843	-0.027
Al(OH)3	1.900e-08	1.902e-08	-7.721	-7.721	0.000
Al(OH)2+	4.784e-11	4.497e-11	-10.320	-10.347	-0.027
AlOH+2	2.752e-15	2.149e-15	-14.560	-14.668	-0.107
AlF2+	3.847e-17	3.616e-17	-16.415	-16.442	-0.027
AlF+2	9.173e-18	7.162e-18	-17.037	-17.145	-0.107
AlF3	4.685e-18	4.689e-18	-17.329	-17.329	0.000
Al+3	1.246e-19	7.139e-20	-18.905	-19.146	-0.242
AlSO4+	7.805e-20	7.336e-20	-19.108	-19.135	-0.027
AlF4-	2.054e-20	1.931e-20	-19.687	-19.714	-0.027
Al(SO4)2-	8.382e-22	7.879e-22	-21.077	-21.104	-0.027
AlHSO4+2	1.872e-30	1.462e-30	-29.728	-29.835	-0.107
As(3)	**1.469e-06**				
H2AsO3-	1.008e-06	9.479e-07	-5.996	-6.023	-0.027
H3AsO3	4.569e-07	4.572e-07	-6.340	-6.340	0.000
HAsO3-2	3.257e-09	2.543e-09	-8.487	-8.595	-0.107
AsO3-3	6.088e-13	3.489e-13	-12.216	-12.457	-0.242
H4AsO3+	5.649e-17	5.310e-17	-16.248	-16.275	-0.027
As(5)	**3.605e-06**				
HAsO4-2	3.555e-06	2.775e-06	-5.449	-5.557	-0.107
AsO4-3	4.598e-08	2.635e-08	-7.337	-7.579	-0.242
H2AsO4-	4.057e-09	3.814e-09	-8.392	-8.419	-0.027
H3AsO4	1.486e-16	1.487e-16	-15.828	-15.828	0.000
Ba	**5.535e-07**				
Ba+2	4.724e-07	3.689e-07	-6.326	-6.433	-0.107
BaSO4	6.430e-08	6.434e-08	-7.192	-7.191	0.000
BaCO3	1.513e-08	1.514e-08	-7.820	-7.820	0.000
BaHCO3+	1.575e-09	1.480e-09	-8.803	-8.830	-0.027
BaOH+	5.672e-11	5.331e-11	-10.246	-10.273	-0.027
C(4)	**6.651e-04**				
HCO3-	5.239e-04	4.932e-04	-3.281	-3.307	-0.026
CO3-2	1.123e-04	8.819e-05	-3.949	-4.055	-0.105
CaCO3	1.381e-05	1.382e-05	-4.860	-4.860	0.000
MnCO3	5.725e-06	5.729e-06	-5.242	-5.242	0.000
NaCO3-	2.674e-06	2.513e-06	-5.573	-5.600	-0.027
MgCO3	2.223e-06	2.225e-06	-5.653	-5.653	0.000
Zn(CO3)2-2	6.568e-07	5.128e-07	-6.183	-6.290	-0.107
CaHCO3+	6.292e-07	5.914e-07	-6.201	-6.228	-0.027
NaHCO3	5.538e-07	5.542e-07	-6.257	-6.256	0.000
NiCO3	3.685e-07	3.687e-07	-6.434	-6.433	0.000
PbCO3	2.854e-07	2.856e-07	-6.545	-6.544	0.000
CO2	2.792e-07	2.794e-07	-6.554	-6.554	0.000
ZnCO3	2.717e-07	2.720e-07	-6.566	-6.566	0.000
MgHCO3+	1.722e-07	1.619e-07	-6.764	-6.791	-0.027
Pb(CO3)2-2	8.104e-08	6.327e-08	-7.091	-7.199	-0.107
Ni(CO3)2-2	7.238e-08	5.651e-08	-7.140	-7.248	-0.107
UO2(CO3)3-4	5.294e-08	1.967e-08	-7.276	-7.706	-0.430
MnHCO3+	3.824e-08	3.595e-08	-7.417	-7.444	-0.027
BaCO3	1.513e-08	1.514e-08	-7.820	-7.820	0.000
UO2(CO3)2-2	4.463e-09	3.484e-09	-8.350	-8.458	-0.107
CuCO3	1.684e-09	1.685e-09	-8.774	-8.773	0.000
BaHCO3+	1.575e-09	1.480e-09	-8.803	-8.830	-0.027
ZnHCO3+	1.021e-09	9.595e-10	-8.991	-9.018	-0.027
Cu(CO3)2-2	2.396e-10	1.871e-10	-9.621	-9.728	-0.107
PbHCO3+	7.766e-11	7.300e-11	-10.110	-10.137	-0.027
NiHCO3+	4.085e-11	3.840e-11	-10.389	-10.416	-0.027
FeCO3	5.262e-12	5.266e-12	-11.279	-11.278	0.000
UO2CO3	1.855e-12	1.856e-12	-11.732	-11.731	0.000
CuHCO3+	9.354e-13	8.793e-13	-12.029	-12.056	-0.027
FeHCO3+	1.306e-13	1.228e-13	-12.884	-12.911	-0.027
(UO2)3(CO3)6-6	5.837e-22	6.293e-23	-21.234	-22.201	-0.967
UO2(CO3)3-5	1.369e-24	2.915e-25	-23.864	-24.535	-0.672
U(CO3)4-4	6.144e-38	2.283e-38	-37.212	-37.641	-0.430
U(CO3)5-6	1.291e-40	0.000e+00	-39.889	-40.856	-0.967
Ca	**1.522e-04**				
Ca+2	1.309e-04	1.027e-04	-3.883	-3.988	-0.105
CaCO3	1.381e-05	1.382e-05	-4.860	-4.860	0.000
CaSO4	6.786e-06	6.791e-06	-5.168	-5.168	0.000
CaHCO3+	6.292e-07	5.914e-07	-6.201	-6.228	-0.027
CaOH+	7.737e-08	7.273e-08	-7.111	-7.138	-0.027
CaF+	8.713e-09	8.191e-09	-8.060	-8.087	-0.027
CaHSO4+	9.329e-15	8.769e-15	-14.030	-14.057	-0.027
Cl	**1.213e-04**				
Cl-	1.213e-04	1.140e-04	-3.916	-3.943	-0.027
MnCl+	4.039e-10	3.797e-10	-9.394	-9.421	-0.027
ZnOHCl	2.486e-10	2.488e-10	-9.604	-9.604	0.000
ZnCl+	3.994e-12	3.754e-12	-11.399	-11.425	-0.027
PbCl+	7.889e-13	7.416e-13	-12.103	-12.130	-0.027
NiCl+	1.718e-13	1.615e-13	-12.765	-12.792	-0.027
MnCl2	1.888e-14	1.889e-14	-13.724	-13.724	0.000
CuCl+	8.959e-16	8.421e-16	-15.048	-15.075	-0.027
CuCl2-	7.863e-16	7.392e-16	-15.104	-15.131	-0.027
ZnCl2	4.383e-16	4.386e-16	-15.358	-15.358	0.000
FeCl+	4.166e-16	3.916e-16	-15.380	-15.407	-0.027
PbCl2	1.478e-16	1.479e-16	-15.830	-15.830	0.000
NiCl2	6.677e-17	6.682e-17	-16.175	-16.175	0.000
MnCl3-	6.309e-19	5.930e-19	-18.200	-18.227	-0.027
CuCl3-2	1.676e-19	1.308e-19	-18.776	-18.883	-0.107
ZnCl3-	5.781e-20	5.434e-20	-19.238	-19.265	-0.027
CuCl2	4.864e-20	4.868e-20	-19.313	-19.313	0.000
PbCl3-	1.379e-20	1.296e-20	-19.861	-19.887	-0.027
UO2Cl+	8.664e-22	8.144e-22	-21.062	-21.089	-0.027
FeCl+2	6.631e-24	5.177e-24	-23.178	-23.286	-0.107
ZnCl4-2	3.812e-24	2.977e-24	-23.419	-23.526	-0.107
PbCl4-2	8.693e-25	6.787e-25	-24.061	-24.168	-0.107
CuCl3-	1.907e-26	1.792e-26	-25.720	-25.747	-0.027
UO2Cl2	4.734e-27	4.737e-27	-26.325	-26.324	0.000
FeCl2+	3.316e-27	3.117e-27	-26.479	-26.506	-0.027
FeCl3	3.550e-32	3.553e-32	-31.450	-31.449	0.000
CuCl4-2	1.160e-32	9.058e-33	-31.935	-32.043	-0.107
UCl+3	0.000e+00	0.000e+00	-56.246	-56.487	-0.242
Cu(1)	**1.898e-13**				
Cu+	1.890e-13	1.777e-13	-12.723	-12.750	-0.027
CuCl2-	7.863e-16	7.392e-16	-15.104	-15.131	-0.027
CuCl3-2	1.676e-19	1.308e-19	-18.776	-18.883	-0.107
Cu(2)	**1.354e-06**				
Cu(OH)2	1.351e-06	1.352e-06	-5.869	-5.869	0.000
CuCO3	1.684e-09	1.685e-09	-8.774	-8.773	0.000
Cu(OH)3-	3.697e-10	3.476e-10	-9.432	-9.459	-0.027
Cu(CO3)2-2	2.396e-10	1.871e-10	-9.621	-9.728	-0.107
CuOH+	1.614e-10	1.517e-10	-9.792	-9.819	-0.027
Cu+2	4.556e-12	3.557e-12	-11.341	-11.449	-0.107
CuHCO3+	9.354e-13	8.793e-13	-12.029	-12.056	-0.027
Cu(OH)4-2	3.788e-13	2.958e-13	-12.422	-12.529	-0.107
CuSO4	2.435e-13	2.437e-13	-12.613	-12.613	0.000
Cu2(OH)2+2	7.630e-15	5.957e-15	-14.117	-14.225	-0.107
CuCl+	8.959e-16	8.421e-16	-15.048	-15.075	-0.027
CuF+	6.793e-16	6.386e-16	-15.168	-15.195	-0.027
CuCl2	4.864e-20	4.868e-20	-19.313	-19.313	0.000
CuCl3-	1.907e-26	1.792e-26	-25.720	-25.747	-0.027
CuCl4-2	1.160e-32	9.058e-33	-31.935	-32.043	-0.107
F	**1.106e-05**				
F-	1.102e-05	1.036e-05	-4.958	-4.985	-0.027
MgF+	1.893e-08	1.780e-08	-7.723	-7.750	-0.027
NaF	1.190e-08	1.191e-08	-7.924	-7.924	0.000
CaF+	8.713e-09	8.191e-09	-8.060	-8.087	-0.027
MnF+	6.233e-11	5.859e-11	-10.205	-10.232	-0.027
HF	3.316e-12	3.319e-12	-11.479	-11.479	0.000
ZnF+	2.250e-12	2.115e-12	-11.648	-11.675	-0.027
NiF+	1.240e-13	1.165e-13	-12.907	-12.934	-0.027
PbF+	3.651e-14	3.432e-14	-13.438	-13.464	-0.027
CuF+	6.793e-16	6.386e-16	-15.168	-15.195	-0.027
FeF+	2.742e-16	2.578e-16	-15.562	-15.589	-0.027
HF2-	1.343e-16	1.262e-16	-15.872	-15.899	-0.027
AlF2+	3.847e-17	3.616e-17	-16.415	-16.442	-0.027
AlF+2	9.173e-18	7.162e-18	-17.037	-17.145	-0.107
PbF2	7.251e-18	7.256e-18	-17.140	-17.139	0.000
UO2F+	6.846e-18	6.435e-18	-17.165	-17.191	-0.027
AlF3	4.685e-18	4.689e-18	-17.329	-17.329	0.000
UO2F2	2.250e-19	2.252e-19	-18.648	-18.647	0.000
FeF+2	3.449e-20	2.693e-20	-19.462	-19.570	-0.107
AlF4-	2.054e-20	1.931e-20	-19.687	-19.714	-0.027
FeF2+	1.109e-20	1.042e-20	-19.955	-19.982	-0.027
PbF3-	5.791e-22	5.443e-22	-21.237	-21.264	-0.027
UO2F3-	4.719e-22	4.436e-22	-21.326	-21.353	-0.027
FeF3	1.679e-22	1.680e-22	-21.775	-21.775	0.000
H2F2	3.452e-23	3.454e-23	-22.462	-22.462	0.000
UO2F4-2	3.767e-26	2.941e-26	-25.424	-25.531	-0.107
PbF4-2	3.456e-27	2.698e-27	-26.461	-26.569	-0.107
UF3+	0.000e+00	0.000e+00	-47.652	-47.679	-0.027
UF2+2	0.000e+00	0.000e+00	-47.955	-48.062	-0.107
UF4	0.000e+00	0.000e+00	-48.752	-48.751	0.000
UF+3	0.000e+00	0.000e+00	-49.749	-49.991	-0.242
UF5-	0.000e+00	0.000e+00	-52.274	-52.300	-0.027
UF6-2	0.000e+00	0.000e+00	-55.068	-55.175	-0.107
Fe(2)	**1.119e-11**				
FeCO3	5.262e-12	5.266e-12	-11.279	-11.278	0.000
Fe+2	3.188e-12	2.489e-12	-11.496	-11.604	-0.107
FeOH+	2.405e-12	2.261e-12	-11.619	-11.646	-0.027
FeSO4	1.398e-13	1.399e-13	-12.855	-12.854	0.000
FeHCO3+	1.306e-13	1.228e-13	-12.884	-12.911	-0.027
Fe(OH)2	5.176e-14	5.180e-14	-13.286	-13.286	0.000
Fe(OH)3-	8.291e-15	7.794e-15	-14.081	-14.108	-0.027
FeCl+	4.166e-16	3.916e-16	-15.380	-15.407	-0.027
FeF+	2.742e-16	2.578e-16	-15.562	-15.589	-0.027
FeHSO4+	2.260e-22	2.125e-22	-21.646	-21.673	-0.027

Fe(3)	7.863e-05					
	Fe(OH)4-	6.051e-05	5.688e-05	-4.218	-4.245	-0.027
	Fe(OH)3	1.807e-05	1.809e-05	-4.743	-4.743	0.000
	Fe(OH)2+	4.410e-08	4.145e-08	-7.356	-7.382	-0.027
	FeOH+2	4.595e-14	3.587e-14	-13.338	-13.445	-0.107
	FeF+2	3.449e-20	2.693e-20	-19.462	-19.570	-0.107
	FeF2+	1.109e-20	1.042e-20	-19.955	-19.982	-0.027
	FeSO4+	6.423e-21	6.038e-21	-20.192	-20.219	-0.027
	Fe+3	3.104e-21	1.779e-21	-20.508	-20.750	-0.242
	FeF3	1.679e-22	1.680e-22	-21.775	-21.775	0.000
	Fe(SO4)2-	4.791e-23	4.504e-23	-22.320	-22.346	-0.027
	FeCl+2	6.631e-24	5.177e-24	-23.178	-23.286	-0.107
	Fe2(OH)2+4	1.160e-25	4.311e-26	-24.936	-25.365	-0.430
	FeCl2+	3.316e-27	3.117e-27	-26.479	-26.506	-0.027
	FeHSO4+2	4.884e-30	3.814e-30	-29.311	-29.419	-0.107
	Fe3(OH)4+5	2.857e-30	6.084e-31	-29.544	-30.216	-0.672
	FeCl3	3.550e-32	3.553e-32	-31.450	-31.449	0.000
H(0)	7.874e-31					
	H2	3.937e-31	3.940e-31	-30.405	-30.405	0.000
K	6.139e-04					
	K+	6.125e-04	5.755e-04	-3.213	-3.240	-0.027
	KSO4-	1.410e-06	1.325e-06	-5.851	-5.878	-0.027
Mg	4.114e-05					
	Mg+2	3.640e-05	2.863e-05	-4.439	-4.543	-0.104
	MgCO3	2.223e-06	2.225e-06	-5.653	-5.653	0.000
	MgSO4	2.037e-06	2.038e-06	-5.691	-5.691	0.000
	MgOH+	2.925e-07	2.749e-07	-6.534	-6.561	-0.027
	MgHCO3+	1.722e-07	1.619e-07	-6.764	-6.791	-0.027
	MgF+	1.893e-08	1.780e-08	-7.723	-7.750	-0.027
Mn(2)	6.919e-06					
	MnCO3	5.725e-06	5.729e-06	-5.242	-5.242	0.000
	Mn+2	1.047e-06	8.178e-07	-5.980	-6.087	-0.107
	MnOH+	6.196e-08	5.824e-08	-7.208	-7.235	-0.027
	MnSO4	4.572e-08	4.575e-08	-7.340	-7.340	0.000
	MnHCO3+	3.824e-08	3.595e-08	-7.417	-7.444	-0.027
	MnCl+	4.039e-10	3.797e-10	-9.394	-9.421	-0.027
	MnF+	6.233e-11	5.859e-11	-10.205	-10.232	-0.027
	Mn(OH)3-	1.070e-12	1.006e-12	-11.971	-11.997	-0.027
	MnCl2	1.888e-14	1.889e-14	-13.724	-13.724	0.000
	MnCl3-	6.309e-19	5.930e-19	-18.200	-18.227	-0.027
Mn(3)	2.036e-28					
	Mn+3	2.036e-28	1.167e-28	-27.691	-27.933	-0.242
Mn(6)	4.657e-34					
	MnO4-2	4.657e-34	3.636e-34	-33.332	-33.439	-0.107
Mn(7)	7.201e-40					
	MnO4-	7.201e-40	6.769e-40	-39.143	-39.169	-0.027
Na	2.132e-03					
	Na+	2.125e-03	1.998e-03	-2.673	-2.699	-0.027
	NaSO4-	3.586e-06	3.371e-06	-5.445	-5.472	-0.027
	NaCO3-	2.674e-06	2.513e-06	-5.573	-5.600	-0.027
	NaHCO3	5.538e-07	5.542e-07	-6.257	-6.256	0.000
	NaF	1.190e-08	1.191e-08	-7.924	-7.924	0.000
Ni	4.430e-07					
	NiCO3	3.685e-07	3.687e-07	-6.434	-6.433	0.000
	Ni(CO3)2-2	7.238e-08	5.651e-08	-7.140	-7.248	-0.107
	Ni(OH)2	1.025e-09	1.026e-09	-8.989	-8.989	0.000
	Ni+2	7.224e-10	5.640e-10	-9.141	-9.249	-0.107
	NiOH+	2.435e-10	2.289e-10	-9.613	-9.640	-0.027
	Ni(OH)3-	4.656e-11	4.377e-11	-10.332	-10.359	-0.027
	NiHCO3+	4.085e-11	3.840e-11	-10.389	-10.416	-0.027
	NiSO4	3.654e-11	3.657e-11	-10.437	-10.437	0.000
	NiCl+	1.718e-13	1.615e-13	-12.765	-12.792	-0.027
	NiF+	1.240e-13	1.165e-13	-12.907	-12.934	-0.027
	Ni(SO4)2-2	9.163e-16	7.154e-16	-15.038	-15.145	-0.107
	NiCl2	6.677e-17	6.682e-17	-16.175	-16.175	0.000
O(0)	9.703e-34					
	O2	4.852e-34	4.855e-34	-33.314	-33.314	0.000
Pb	4.103e-07					
	PbCO3	2.854e-07	2.856e-07	-6.545	-6.544	0.000
	Pb(CO3)2-2	8.104e-08	6.327e-08	-7.091	-7.199	-0.107
	Pb(OH)2	2.570e-08	2.572e-08	-7.590	-7.590	0.000
	PbOH+	1.649e-08	1.550e-08	-7.783	-7.810	-0.027
	Pb(OH)3-	1.340e-09	1.260e-09	-8.873	-8.900	-0.027
	Pb+2	2.387e-10	1.864e-10	-9.622	-9.730	-0.107
	PbHCO3+	7.766e-11	7.300e-11	-10.110	-10.137	-0.027
	PbSO4	3.645e-11	3.647e-11	-10.438	-10.438	0.000
	Pb(OH)4-2	1.577e-11	1.231e-11	-10.802	-10.910	-0.107
	PbCl+	7.889e-13	7.416e-13	-12.103	-12.130	-0.027
	Pb(SO4)2-2	8.533e-14	6.662e-14	-13.069	-13.176	-0.107
	PbF+	3.651e-14	3.432e-14	-13.438	-13.464	-0.027
	Pb3(OH)4+2	1.635e-15	1.277e-15	-14.786	-14.894	-0.107
	PbCl2	1.478e-16	1.479e-16	-15.830	-15.830	0.000
	Pb2OH+3	1.129e-16	6.467e-17	-15.947	-16.189	-0.242
	PbF2	7.251e-18	7.256e-18	-17.140	-17.139	0.000
	PbCl3-	1.379e-20	1.296e-20	-19.861	-19.887	-0.027
	PbF3-	5.791e-22	5.443e-22	-21.237	-21.264	-0.027
	PbCl4-2	8.693e-25	6.787e-25	-24.061	-24.168	-0.107
	PbF4-2	3.456e-27	2.698e-27	-26.461	-26.569	-0.107
S(6)	4.581e-04					
	SO4-2	4.442e-04	3.480e-04	-3.352	-3.458	-0.106
	CaSO4	6.786e-06	6.791e-06	-5.168	-5.168	0.000
	NaSO4-	3.586e-06	3.371e-06	-5.445	-5.472	-0.027
	MgSO4	2.037e-06	2.038e-06	-5.691	-5.691	0.000
	KSO4-	1.410e-06	1.325e-06	-5.851	-5.878	-0.027
	BaSO4	6.430e-08	6.434e-08	-7.192	-7.191	0.000
	MnSO4	4.572e-08	4.575e-08	-7.340	-7.340	0.000
	ZnSO4	1.210e-09	1.211e-09	-8.917	-8.917	0.000
	NiSO4	3.654e-11	3.657e-11	-10.437	-10.437	0.000
	PbSO4	3.645e-11	3.647e-11	-10.438	-10.438	0.000
	HSO4-	7.552e-12	7.099e-12	-11.122	-11.149	-0.027
	Zn(SO4)2-2	4.569e-12	3.567e-12	-11.340	-11.448	-0.107
	CuSO4	2.435e-13	2.437e-13	-12.613	-12.613	0.000
	FeSO4	1.398e-13	1.399e-13	-12.855	-12.854	0.000
	Pb(SO4)2-2	8.533e-14	6.662e-14	-13.069	-13.176	-0.107
	CaHSO4+	9.329e-15	8.769e-15	-14.030	-14.057	-0.027
	Ni(SO4)2-2	9.163e-16	7.154e-16	-15.038	-15.145	-0.107
	UO2SO4	2.182e-18	2.184e-18	-17.661	-17.661	0.000
	AlSO4+	7.805e-20	7.336e-20	-19.108	-19.135	-0.027
	UO2(SO4)2-2	8.515e-21	6.648e-21	-20.070	-20.177	-0.107
	FeSO4+	6.423e-21	6.038e-21	-20.192	-20.219	-0.027
	Al(SO4)2-	8.382e-22	7.879e-22	-21.077	-21.104	-0.027
	FeHSO4+	2.260e-22	2.125e-22	-21.646	-21.673	-0.027
	Fe(SO4)2-	4.791e-23	4.504e-23	-22.320	-22.346	-0.027
	FeHSO4+2	4.884e-30	3.814e-30	-29.311	-29.419	-0.107
	AlHSO4+2	1.872e-30	1.462e-30	-29.728	-29.835	-0.107
	U(SO4)2	0.000e+00	0.000e+00	-50.842	-50.841	0.000
	USO4+2	0.000e+00	0.000e+00	-51.119	-51.226	-0.107
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-67.195	-67.437	-0.242
U(4)	2.378e-25					
	U(OH)4	2.378e-25	2.379e-25	-24.624	-24.624	0.000
	U(OH)3+	2.312e-31	2.173e-31	-30.636	-30.663	-0.027
	U(CO3)4-4	6.144e-38	2.283e-38	-37.212	-37.641	-0.430
	U(OH)2+2	3.495e-38	2.729e-38	-37.457	-37.564	-0.107
	U(CO3)5-6	1.291e-40	0.000e+00	-39.889	-40.856	-0.967
	UOH+3	0.000e+00	0.000e+00	-45.137	-45.379	-0.242
	UF3+	0.000e+00	0.000e+00	-47.652	-47.679	-0.027
	UF2+2	0.000e+00	0.000e+00	-47.955	-48.062	-0.107
	UF4	0.000e+00	0.000e+00	-48.752	-48.751	0.000
	UF+3	0.000e+00	0.000e+00	-49.749	-49.991	-0.242
	U(SO4)2	0.000e+00	0.000e+00	-50.842	-50.841	0.000
	USO4+2	0.000e+00	0.000e+00	-51.119	-51.226	-0.107
	UF5-	0.000e+00	0.000e+00	-52.274	-52.300	-0.027
	U+4	0.000e+00	0.000e+00	-53.893	-54.323	-0.430
	UF6-2	0.000e+00	0.000e+00	-55.068	-55.175	-0.107
	UCl+3	0.000e+00	0.000e+00	-56.246	-56.487	-0.242
	U6(OH)15+9	0.000e+00	0.000e+00	-196.513	-198.690	-2.176
U(5)	1.856e-20					
	UO2+	1.856e-20	1.744e-20	-19.731	-19.758	-0.027
	UO2(CO3)3-5	1.369e-24	2.915e-25	-23.864	-24.535	-0.672
U(6)	8.404e-08					
	UO2(CO3)3-4	5.294e-08	1.967e-08	-7.276	-7.706	-0.430
	UO2(OH)3-	2.664e-08	2.504e-08	-7.574	-7.601	-0.027
	UO2(CO3)2-2	4.463e-09	3.484e-09	-8.350	-8.458	-0.107
	UO2(OH)4-2	2.168e-12	1.693e-12	-11.664	-11.771	-0.107
	UO2CO3	1.855e-12	1.856e-12	-11.732	-11.731	0.000
	UO2OH+	1.053e-13	9.894e-14	-12.978	-13.005	-0.027
	(UO2)3(OH)7-	3.655e-16	3.435e-16	-15.437	-15.464	-0.027
	UO2F+	6.846e-18	6.435e-18	-17.165	-17.191	-0.027
	UO2+2	6.550e-18	5.114e-18	-17.184	-17.291	-0.107
	UO2SO4	2.182e-18	2.184e-18	-17.661	-17.661	0.000
	UO2F2	2.250e-19	2.252e-19	-18.648	-18.647	0.000
	(UO2)3(OH)5+	2.671e-20	2.511e-20	-19.573	-19.600	-0.027
	UO2(SO4)2-2	8.515e-21	6.648e-21	-20.070	-20.177	-0.107
	(UO2)2(OH)2+2	1.076e-21	8.400e-22	-20.968	-21.076	-0.107
	UO2Cl+	8.664e-22	8.144e-22	-21.062	-21.089	-0.027
	(UO2)3(CO3)6-6	5.837e-22	6.293e-23	-21.234	-22.201	-0.967
	UO2F3-	4.719e-22	4.436e-22	-21.326	-21.353	-0.027
	(UO2)4(OH)7+	2.353e-24	2.212e-24	-23.628	-23.655	-0.027
	(UO2)3(OH)4+2	7.138e-26	5.573e-26	-25.146	-25.254	-0.107
	UO2F4-2	3.767e-26	2.941e-26	-25.424	-25.531	-0.107
	UO2Cl2	4.734e-27	4.737e-27	-26.325	-26.324	0.000
	(UO2)2OH+3	3.884e-28	2.226e-28	-27.411	-27.653	-0.242
Zn	4.590e-06					
	Zn(OH)2	3.537e-06	3.540e-06	-5.451	-5.451	0.000
	Zn(CO3)2-2	6.568e-07	5.128e-07	-6.183	-6.290	-0.107
	ZnCO3	2.717e-07	2.720e-07	-6.566	-6.566	0.000
	ZnOH+	5.147e-08	4.838e-08	-7.288	-7.315	-0.027
	Zn(OH)3-	5.080e-08	4.775e-08	-7.294	-7.321	-0.027
	Zn+2	1.979e-08	1.545e-08	-7.703	-7.811	-0.107
	ZnSO4	1.210e-09	1.211e-09	-8.917	-8.917	0.000
	ZnHCO3+	1.021e-09	9.595e-10	-8.991	-9.018	-0.027
	ZnOHCl	2.486e-10	2.488e-10	-9.604	-9.604	0.000
	Zn(OH)4-2	4.134e-11	3.228e-11	-10.384	-10.491	-0.107
	Zn(SO4)2-2	4.569e-12	3.567e-12	-11.340	-11.448	-0.107
	ZnCl+	3.994e-12	3.754e-12	-11.399	-11.425	-0.027
	ZnF+	2.250e-12	2.115e-12	-11.648	-11.675	-0.027
	ZnCl2	4.383e-16	4.386e-16	-15.358	-15.358	0.000
	ZnCl3-	5.781e-20	5.434e-20	-19.238	-19.265	-0.027
	ZnCl4-2	3.812e-24	2.977e-24	-23.419	-23.526	-0.107

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-1.40	9.74	11.14	Al(OH)3
AlAsO4:2H2O	-10.89	-6.08	4.80	AlAsO4:2H2O
AlumK	-24.04	-29.30	-5.26	KAl(SO4)2:12H2O
Alunite	-9.07	-9.82	-0.75	KAl3(SO4)2(OH)6
Anglesite	-5.37	-13.19	-7.82	PbSO4
Anhydrite	-3.10	-7.45	-4.34	CaSO4
Antlerite	-7.58	0.71	8.29	Cu3(OH)4SO4
Aragonite	0.26	-8.04	-8.30	CaCO3
Arsenolite	-22.37	-25.36	-2.99	As4O6
Artinite	-3.86	6.12	9.97	MgCO3:Mg(OH)2:3H2O
As2O5	-38.42	-31.66	6.77	As2O5
Atacamite	-5.53	2.05	7.58	Cu2(OH)3Cl
Azurite	-6.59	-23.20	-16.60	Cu3(OH)2(CO3)2
B-UO2(OH)2	-3.75	1.97	5.72	UO2(OH)2
Ba3(AsO4)2	15.78	6.83	-8.95	Ba3(AsO4)2
BaF2	-10.63	-16.40	-5.77	BaF2
Barite	0.16	-9.89	-10.06	BaSO4
Basaluminite	-6.44	16.26	22.70	Al4(OH)10SO4
Bianchite	-9.51	-11.27	-1.76	ZnSO4:6H2O
Birnessite	-3.17	40.43	43.60	MnO2
Bixbyite	2.33	53.61	51.28	Mn2O3
Boehmite	0.79	9.74	8.95	AlOOH
Brochantite	-6.81	8.53	15.34	Cu4(OH)6SO4
Brucite	-2.48	14.72	17.19	Mg(OH)2
Bunsenite	-2.75	10.01	12.76	NiO
Ca3(AsO4)2:4w	-8.22	14.16	22.38	Ca3(AsO4)2:4H2O
Calcite	0.41	-8.04	-8.45	CaCO3
Cerrusite	-0.59	-13.78	-13.19	PbCO3
Chalcanthite	-12.25	-14.91	-2.66	CuSO4:5H2O
Claudetite	-22.12	-25.36	-3.24	As4O6
CO2(g)	-5.15	-23.31	-18.17	CO2
Cotunnite	-12.77	-17.62	-4.84	PbCl2
Cu(OH)2	-1.03	7.81	8.84	Cu(OH)2
Cu2SO4	-27.07	-34.36	-7.29	Cu2SO4
Cu3(AsO4)2:6w	-14.38	-8.22	6.16	Cu3(AsO4)2:6H2O
CuCO3	-5.87	-15.50	-9.63	CuCO3
CuF	-24.98	-20.43	4.54	CuF
CuF2	-20.97	-21.42	-0.45	CuF2
CuF2:2H2O	-16.92	-21.42	-4.50	CuF2:2H2O
CuMetal	-7.77	-19.45	-11.68	Cu
CuOCuSO4	-19.09	-7.10	11.99	CuO:CuSO4
CupricFerrite	17.71	50.38	32.68	CuFe2O4
Cuprite	-4.61	-11.64	-7.03	Cu2O
CuprousFerrite	13.89	15.47	1.58	CuFeO2
CuSO4	-18.15	-14.91	3.25	CuSO4
Diaspore	2.54	9.74	7.20	AlOOH
Dolomite	0.33	-16.64	-16.97	CaMg(CO3)2
Dolomite(d)	-0.24	-16.64	-16.40	CaMg(CO3)2
Epsomite	-5.83	-8.00	-2.18	MgSO4:7H2O
Fe(OH)2.7Cl.3	7.11	17.21	10.11	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	3.25	21.29	18.04	Fe(OH)3
Fe3(OH)8	3.71	50.23	46.51	Fe3(OH)8
Fluorite	-3.30	-13.96	-10.66	CaF2
Gibbsite	1.34	9.74	8.41	Al(OH)3
Goethite	9.14	21.29	12.15	FeOOH
Goslarite	-9.27	-11.27	-2.00	ZnSO4:7H2O
Gummite	-8.73	1.97	10.70	UO3
Gypsum	-2.87	-7.45	-4.58	CaSO4:2H2O
H2(g)	-27.21	-27.26	-0.05	H2
Halite	-8.21	-6.64	1.57	NaCl
Hausmannite	4.44	66.78	62.34	Mn3O4
Hematite	19.89	42.57	22.69	Fe2O3
Huntite	-4.20	-33.84	-29.63	CaMg3(CO3)4
Hydrocerrusite	-0.58	-18.04	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-11.59	-19.67	-8.08	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-7.89	23.55	31.44	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-5.82	24.81	30.63	KFe3(SO4)2(OH)6
Jarosite-Na	-9.28	25.35	34.63	NaFe3(SO4)2(OH)6
JarositeH	-16.34	18.42	34.77	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-9.74	-12.97	-3.23	AlOHSO4
Langite	-8.78	8.53	17.31	Cu4(OH)6SO4:H2O
Larnakite	-3.46	-3.66	-0.20	PbO:PbSO4
Laurionite	-4.67	-4.04	0.62	PbOHCl
Litharge	-3.40	9.53	12.93	PbO
Maghemite	9.89	42.57	32.68	Fe2O3
Magnesite	-0.65	-8.60	-7.95	MgCO3
Magnetite	19.54	50.23	30.69	Fe3O4
Malachite	-2.72	-7.69	-4.97	Cu2(OH)2CO3
Manganite	1.46	26.80	25.34	MnOOH
Massicot	-3.60	9.53	13.13	PbO
Matlockite	-9.12	-18.66	-9.53	PbClF
Melanothallite	-23.23	-19.34	3.89	CuCl2
Melanterite	-12.79	-15.06	-2.27	FeSO4:7H2O
Minium	-19.18	55.85	75.03	Pb3O4
Mirabilite	-7.50	-8.86	-1.36	Na2SO4:10H2O
Mn2(SO4)3	-61.04	-14.55	46.49	Mn2(SO4)3
Mn3(AsO4):8H2O	-4.71	7.86	12.58	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-16.46	-13.97	2.48	MnCl2:4H2O
MnSO4	-12.42	-9.55	2.87	MnSO4
Morenosite	-10.31	-12.71	-2.40	NiSO4:7H2O
Na4UO2(CO3)3	-23.96	-40.25	-16.29	Na4UO2(CO3)3
Nahcolite	-5.41	-16.38	-10.97	NaHCO3
Nantokite	-9.80	-19.39	-9.59	CuCl
Natron	-7.94	-9.45	-1.52	Na2CO3:10H2O
Nesquehonite	-3.05	-8.60	-5.55	MgCO3:3H2O
Ni(OH)2	-0.39	10.01	10.40	Ni(OH)2
Ni3(AsO4)2:8H2O	-17.39	-1.62	15.77	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-14.67	17.33	32.00	Ni4(OH)6SO4
NiCO3	-6.59	-13.30	-6.71	NiCO3
Nsutite	-2.13	40.43	42.56	MnO2
O2(g)	-30.46	54.52	84.98	O2
Pb(OH)2	1.20	9.53	8.33	Pb(OH)2
Pb2(OH)3Cl	-3.31	5.49	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-7.14	19.06	26.20	PbO:Pb(OH)2
Pb2O3	-14.72	46.32	61.04	Pb2O3
Pb2OCO3	-3.90	-4.25	-0.35	PbO:PbCO3
Pb3(AsO4)2	-8.94	-3.06	5.88	Pb3(AsO4)2
Pb3O2CO3	-6.09	5.28	11.36	PbCO3:2PbO
Pb3O2SO4	-4.80	5.87	10.67	PbSO4:2PbO
Pb4(OH)6SO4	-5.70	15.40	21.10	Pb4(OH)6SO4
Pb4O3SO4	-7.15	15.40	22.56	PbSO4:3PbO
PbF2	-12.27	-19.70	-7.43	PbF2
PbMetal	-21.99	-17.73	4.26	Pb
PbO:0.3H2O	-3.45	9.53	12.98	PbO:0.33H2O
Phosgenite	-11.59	-31.40	-19.81	PbCl2:PbCO3
Plattnerite	-13.43	36.79	50.22	PbO2
Portlandite	-7.93	15.27	23.20	Ca(OH)2
Pyrochroite	-2.03	13.17	15.20	Mn(OH)2
Pyrolusite	-1.79	40.43	42.23	MnO2
Retgersite	-10.65	-12.71	-2.05	NiSO4:6H2O
Rhodochrosite	0.97	-10.14	-11.11	MnCO3
Rhodochrosite(d)	0.25	-10.14	-10.39	MnCO3
Rutherfordine	-6.91	-21.35	-14.43	UO2CO3
Schoepite	-3.59	1.97	5.56	UO2(OH)2:H2O
Scorodite	-8.08	5.46	13.54	FeAsO4:2H2O
Siderite	-4.80	-15.66	-10.86	FeCO3
Siderite(d)(3)	-5.21	-15.66	-10.45	FeCO3
Smithsonite	-1.92	-11.87	-9.94	ZnCO3
Tenorite	-0.01	7.81	7.82	CuO
Thenardite	-8.69	-8.86	-0.17	Na2SO4
Thermonatrite	-9.61	-9.45	0.16	Na2CO3:H2O
Trona	-14.90	-25.84	-10.94	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-35.32	-48.01	-12.69	U(OH)2SO4
U3O8(c)	-14.93	-21.35	-6.42	U3O8
U4O9(c)	-33.89	-73.91	-40.02	U4O9
UF4(c)	-55.90	-83.75	-27.85	UF4
UF4:2.5H2O	-46.70	-83.75	-37.05	UF4:2.5H2O
UO2(a)	-15.90	-25.29	-9.39	UO2
UO3(gamma)	-6.00	1.97	7.97	UO3
Uraninite(c)	-11.25	-25.29	-14.05	UO2
Witherite	-1.91	-10.49	-8.58	BaCO3
Zincite(c)	0.02	11.45	11.42	ZnO
Zincosite	-14.53	-11.27	3.26	ZnSO4
Zn(OH)2-a	-1.00	11.45	12.45	Zn(OH)2
Zn(OH)2-b	-0.30	11.45	11.75	Zn(OH)2
Zn(OH)2-c	-0.75	11.45	12.20	Zn(OH)2
Zn(OH)2-e	-0.05	11.45	11.50	Zn(OH)2
Zn(OH)2-g	-0.26	11.45	11.71	Zn(OH)2
Zn2(OH)2SO4	-7.32	0.18	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.88	9.32	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-11.05	2.69	13.74	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-30.92	-11.09	19.83	ZnO:2ZnSO4
Zn4(OH)6SO4	-5.32	23.08	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-8.40	30.10	38.50	Zn5(OH)8Cl2
ZnCl2	-22.95	-15.70	7.26	ZnCl2
ZnCO3:H2O	-1.61	-11.87	-10.26	ZnCO3:H2O
ZnF2	-16.43	-17.78	-1.35	ZnF2
ZnMetal	-42.05	-15.81	26.24	Zn
ZnO(a)	0.14	11.45	11.31	ZnO
ZnSO4:H2O	-10.84	-11.27	-0.43	ZnSO4:H2O

End of simulation.

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Reading data base.
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           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
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Reading input data for simulation 1.
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           TITLE   Schneckentein 8.5-9.5m
           SOLUTION        9
           units           mg/l
           temp            19.6
           pH              7.85
           F               0.5
           Cl              5.6
           S(6)            121         as SO4
           Na              74
           K               8.9
           Mg              0.22
           Ca              1.4
           Alkalinity      91.5        as HCO3
           Al              13.59
           As(+3)          0.115
           As(+5)          0.865
           Ba              0.297
           Cu              0.076
           Fe              23
           Mn              0.27
           Ni              0.012
           Pb              0.060
           U               0.27
           Zn              0.045
           END
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TITLE
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   Schneckentein 8.5-9.5m

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Beginning of initial solution calculations.
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Initial solution 9.


----------------------------Solution composition--------------
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            Elements           Molality       Moles

            Al                 4.837e-04   4.837e-04
            Alkalinity         2.052e-03   2.052e-03
            As(3)              1.590e-06   1.590e-06
            As(5)              9.875e-06   9.875e-06
            Ba                 4.462e-07   4.462e-07
            Ca                 4.738e-06   4.738e-06
            Cl                 1.683e-04   1.683e-04
            Cu                 1.470e-08   1.470e-08
            F                  2.445e-07   2.445e-07
            Fe                 1.260e-04   1.260e-04
            K                  2.431e-04   2.431e-04
            Mg                 1.356e-06   1.356e-06
            Mn                 8.219e-08   8.219e-08
            Na                 3.432e-03   3.432e-03
            Ni                 1.930e-09   1.930e-09
            Pb                 3.065e-09   3.065e-09
            S(6)               4.925e-04   4.925e-04
            U                  1.050e-08   1.050e-08
            Zn                 6.366e-09   6.366e-09
```

```
----------------------------Description of solution----------------------------

                                    pH  =   7.850
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   3.444e-03
                     Mass of water (kg)  =   1.000e+00
                Total carbon (mol/kg)    =   0.000e+00
                   Total CO2 (mol/kg)    =   0.000e+00
                  Temperature (deg C)    =  19.600
               Electrical balance (eq)   =   2.055e-03
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  38.37
                              Iterations  = 101
                                 Total H  = 1.110147e+02
                                 Total O  = 5.551052e+01

---------------------------------Redox couples---------------------------------

           Redox couple             pe  Eh (volts)

           As(3)/As(5)         -1.2195     -0.0708
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	4.959e-07	4.655e-07	-6.305	-6.332	-0.027
H+	1.497e-08	1.413e-08	-7.825	-7.850	-0.025
H2O	5.551e+01	1.000e+00	-0.000	-0.000	0.000
Al	**4.837e-04**				
Al(OH)4-	4.796e-04	4.502e-04	-3.319	-3.347	-0.027
Al(OH)3	3.598e-06	3.601e-06	-5.444	-5.444	0.000
Al(OH)2+	5.553e-07	5.213e-07	-6.255	-6.283	-0.027
AlOH+2	1.969e-09	1.529e-09	-8.706	-8.816	-0.110
AlF+2	8.853e-12	6.875e-12	-11.053	-11.163	-0.110
Al+3	5.479e-12	3.101e-12	-11.261	-11.508	-0.247
AlSO4+	3.678e-12	3.452e-12	-11.434	-11.462	-0.027
AlF2+	8.172e-13	7.671e-13	-12.088	-12.115	-0.027
Al(SO4)2-	4.286e-14	4.023e-14	-13.368	-13.395	-0.027
AlF3	2.198e-15	2.200e-15	-14.658	-14.658	0.000
AlF4-	2.135e-19	2.004e-19	-18.671	-18.698	-0.027
AlHSO4+2	5.329e-21	4.138e-21	-20.273	-20.383	-0.110
As(3)	**1.590e-06**				
H3AsO3	1.534e-06	1.535e-06	-5.814	-5.814	0.000
H2AsO3-	5.583e-08	5.241e-08	-7.253	-7.281	-0.027
HAsO3-2	2.978e-12	2.313e-12	-11.526	-11.636	-0.110
H4AsO3+	1.144e-14	1.074e-14	-13.941	-13.969	-0.027
AsO3-3	9.236e-18	5.228e-18	-17.035	-17.282	-0.247
As(5)	**9.875e-06**				
HAsO4-2	9.240e-06	7.175e-06	-5.034	-5.144	-0.110
H2AsO4-	6.334e-07	5.946e-07	-6.198	-6.226	-0.027
AsO4-3	1.987e-09	1.125e-09	-8.702	-8.949	-0.247
H3AsO4	1.393e-12	1.394e-12	-11.856	-11.856	0.000
Ba	**4.462e-07**				
Ba+2	3.890e-07	3.020e-07	-6.410	-6.520	-0.110
BaSO4	5.718e-08	5.723e-08	-7.243	-7.242	0.000
BaOH+	7.719e-13	7.246e-13	-12.112	-12.140	-0.027
BaHCO3+	0.000e+00	0.000e+00	-270.579	-270.606	-0.027
BaCO3	0.000e+00	0.000e+00	-271.378	-271.378	0.000
C(4)	**0.000e+00**				
HCO3-	0.000e+00	0.000e+00	-264.967	-264.994	-0.027
CO2	0.000e+00	0.000e+00	-266.460	-266.460	0.000
CO3-2	0.000e+00	0.000e+00	-267.416	-267.524	-0.107
NaHCO3	0.000e+00	0.000e+00	-267.737	-267.737	0.000
FeHCO3+	0.000e+00	0.000e+00	-268.466	-268.493	-0.027
FeCO3	0.000e+00	0.000e+00	-268.643	-268.643	0.000
NaCO3-	0.000e+00	0.000e+00	-268.839	-268.867	-0.027
PbCO3	0.000e+00	0.000e+00	-269.277	-269.277	0.000
CaHCO3+	0.000e+00	0.000e+00	-269.357	-269.384	-0.027
NiCO3	0.000e+00	0.000e+00	-269.504	-269.504	0.000
CaCO3	0.000e+00	0.000e+00	-269.798	-269.798	0.000
MnCO3	0.000e+00	0.000e+00	-269.840	-269.839	0.000
MgHCO3+	0.000e+00	0.000e+00	-269.907	-269.935	-0.027
MnHCO3+	0.000e+00	0.000e+00	-270.232	-270.260	-0.027
UO2CO3	0.000e+00	0.000e+00	-270.273	-270.273	0.000
BaHCO3+	0.000e+00	0.000e+00	-270.579	-270.606	-0.027
MgCO3	0.000e+00	0.000e+00	-270.580	-270.580	0.000
ZnCO3	0.000e+00	0.000e+00	-270.594	-270.594	0.000
CuCO3	0.000e+00	0.000e+00	-270.655	-270.655	0.000
PbHCO3+	0.000e+00	0.000e+00	-271.060	-271.087	-0.027
ZnHCO3+	0.000e+00	0.000e+00	-271.237	-271.264	-0.027
BaCO3	0.000e+00	0.000e+00	-271.378	-271.378	0.000
NiHCO3+	0.000e+00	0.000e+00	-271.677	-271.704	-0.027
CuHCO3+	0.000e+00	0.000e+00	-272.128	-272.155	-0.027
UO2(CO3)2-2	0.000e+00	0.000e+00	-530.360	-530.470	-0.110
Pb(CO3)2-2	0.000e+00	0.000e+00	-533.291	-533.401	-0.110
Zn(CO3)2-2	0.000e+00	0.000e+00	-533.678	-533.787	-0.110
Ni(CO3)2-2	0.000e+00	0.000e+00	-533.678	-533.788	-0.110
Cu(CO3)2-2	0.000e+00	0.000e+00	-534.969	-535.079	-0.110
UO2(CO3)3-4	0.000e+00	0.000e+00	-792.741	-793.181	-0.439
UO2(CO3)3-5	0.000e+00	0.000e+00	-809.328	-810.015	-0.687
U(CO3)4-4	0.000e+00	0.000e+00	-1079.013	-1079.452	-0.439
U(CO3)5-6	0.000e+00	0.000e+00	-1345.158	-1346.147	-0.989
(UO2)3(CO3)6-6	0.000e+00	0.000e+00	-1587.242	-1588.231	-0.989
Ca	**4.738e-06**				
Ca+2	4.487e-06	3.503e-06	-5.348	-5.456	-0.108
CaSO4	2.508e-07	2.510e-07	-6.601	-6.600	0.000
CaOH+	4.384e-11	4.116e-11	-10.358	-10.386	-0.027
CaF+	6.550e-12	6.148e-12	-11.184	-11.211	-0.027
CaHSO4+	2.076e-14	1.949e-14	-13.683	-13.710	-0.027
CaHCO3+	0.000e+00	0.000e+00	-269.357	-269.384	-0.027
CaCO3	0.000e+00	0.000e+00	-269.798	-269.798	0.000
Cl	**1.683e-04**				
Cl-	1.683e-04	1.579e-04	-3.774	-3.802	-0.028
FeCl+	7.363e-10	6.912e-10	-9.133	-9.160	-0.027
MnCl+	4.171e-11	3.916e-11	-10.380	-10.407	-0.027
PbCl+	5.939e-12	5.575e-12	-11.226	-11.254	-0.027
ZnOHCl	1.579e-12	1.580e-12	-11.802	-11.801	0.000
ZnCl+	1.516e-12	1.424e-12	-11.819	-11.847	-0.027
NiCl+	5.970e-13	5.604e-13	-12.224	-12.251	-0.027
CuCl2-	5.840e-14	5.482e-14	-13.234	-13.261	-0.027
CuCl+	4.761e-14	4.469e-14	-13.322	-13.350	-0.027
MnCl2	2.697e-15	2.699e-15	-14.569	-14.569	0.000
PbCl2	1.545e-15	1.546e-15	-14.811	-14.811	0.000
NiCl2	3.211e-16	3.213e-16	-15.493	-15.493	0.000
ZnCl2	2.301e-16	2.302e-16	-15.638	-15.638	0.000
UO2Cl+	1.018e-16	9.552e-17	-15.992	-16.020	-0.027
CuCl3-2	1.730e-17	1.343e-17	-16.762	-16.872	-0.110
FeCl+2	1.156e-17	8.975e-18	-16.937	-17.047	-0.110
CuCl2	3.568e-18	3.571e-18	-17.448	-17.447	0.000
PbCl3-	1.997e-19	1.875e-19	-18.700	-18.727	-0.027
MnCl3-	1.250e-19	1.174e-19	-18.903	-18.930	-0.027
ZnCl3-	4.204e-20	3.947e-20	-19.376	-19.404	-0.027
FeCl2+	8.028e-21	7.536e-21	-20.095	-20.123	-0.027
UO2Cl2	7.677e-22	7.683e-22	-21.115	-21.114	0.000
PbCl4-2	1.749e-23	1.358e-23	-22.757	-22.867	-0.110
ZnCl4-2	3.851e-24	2.990e-24	-23.414	-23.524	-0.110
CuCl3-	1.934e-24	1.815e-24	-23.714	-23.741	-0.027
FeCl3	1.189e-25	1.190e-25	-24.925	-24.924	0.000
CuCl4-2	1.629e-30	1.265e-30	-29.788	-29.898	-0.110
UCl+3	0.000e+00	0.000e+00	-44.030	-44.277	-0.247
Cu(1)	**7.369e-12**				
Cu+	7.310e-12	6.863e-12	-11.136	-11.164	-0.027
CuCl2-	5.840e-14	5.482e-14	-13.234	-13.261	-0.027
CuCl3-2	1.730e-17	1.343e-17	-16.762	-16.872	-0.110
Cu(2)	**1.469e-08**				
Cu(OH)2	1.440e-08	1.441e-08	-7.842	-7.841	0.000
Cu+2	1.773e-10	1.377e-10	-9.751	-9.861	-0.110
CuOH+	1.038e-10	9.745e-11	-9.984	-10.011	-0.027
CuSO4	1.022e-11	1.023e-11	-10.991	-10.990	0.000
Cu(OH)3-	6.550e-14	6.149e-14	-13.184	-13.211	-0.027
CuCl+	4.761e-14	4.469e-14	-13.322	-13.350	-0.027
Cu2(OH)2+2	3.100e-15	2.407e-15	-14.509	-14.618	-0.110
CuF+	5.813e-16	5.457e-16	-15.236	-15.263	-0.027
CuCl2	3.568e-18	3.571e-18	-17.448	-17.447	0.000
Cu(OH)4-2	1.118e-18	8.685e-19	-17.951	-18.061	-0.110
CuCl3-	1.934e-24	1.815e-24	-23.714	-23.741	-0.027
CuCl4-2	1.629e-30	1.265e-30	-29.788	-29.898	-0.110
CuCO3	0.000e+00	0.000e+00	-270.655	-270.655	0.000
CuHCO3+	0.000e+00	0.000e+00	-272.128	-272.155	-0.027
Cu(CO3)2-2	0.000e+00	0.000e+00	-534.969	-535.079	-0.110
F	**2.445e-07**				
F-	2.441e-07	2.291e-07	-6.613	-6.640	-0.027
NaF	4.239e-10	4.242e-10	-9.373	-9.372	0.000
MgF+	1.460e-11	1.371e-11	-10.836	-10.863	-0.027
AlF+2	8.853e-12	6.875e-12	-11.053	-11.163	-0.110
FeF+	7.739e-12	7.265e-12	-11.111	-11.139	-0.027
CaF+	6.550e-12	6.148e-12	-11.184	-11.211	-0.027
HF	4.405e-12	4.409e-12	-11.356	-11.356	0.000
AlF2+	8.172e-13	7.671e-13	-12.088	-12.115	-0.027
MnF+	1.028e-13	9.648e-14	-12.988	-13.016	-0.027
ZnF+	1.373e-14	1.289e-14	-13.862	-13.890	-0.027
UO2F+	1.286e-14	1.208e-14	-13.891	-13.918	-0.027
NiF+	6.881e-15	6.459e-15	-14.162	-14.190	-0.027
PbF+	4.411e-15	4.141e-15	-14.355	-14.383	-0.027
AlF3	2.198e-15	2.200e-15	-14.658	-14.658	0.000
FeF+2	9.632e-16	7.479e-16	-15.016	-15.126	-0.110
CuF+	5.813e-16	5.457e-16	-15.236	-15.263	-0.027
UO2F2	9.340e-18	9.348e-18	-17.030	-17.029	0.000
FeF2+	6.807e-18	6.390e-18	-17.167	-17.194	-0.027
HF2-	3.945e-18	3.703e-18	-17.404	-17.431	-0.027
AlF4-	2.135e-19	2.004e-19	-18.671	-18.698	-0.027
PbF2	1.936e-20	1.937e-20	-19.713	-19.713	0.000
FeF3	2.275e-21	2.277e-21	-20.643	-20.643	0.000
UO2F3-	4.339e-22	4.073e-22	-21.363	-21.390	-0.027
H2F2	6.134e-23	6.138e-23	-22.212	-22.212	0.000
PbF3-	3.425e-26	3.215e-26	-25.465	-25.493	-0.027
UO2F4-2	7.699e-28	5.978e-28	-27.114	-27.223	-0.110
PbF4-2	4.540e-33	3.525e-33	-32.343	-32.453	-0.110
UF2+2	6.363e-40	4.941e-40	-39.196	-39.306	-0.110
UF+3	4.652e-40	2.633e-40	-39.332	-39.579	-0.247
UF3+	0.000e+00	0.000e+00	-40.551	-40.578	-0.027
UF4	0.000e+00	0.000e+00	-43.306	-43.305	0.000
UF5-	0.000e+00	0.000e+00	-48.485	-48.513	-0.027
UF6-2	0.000e+00	0.000e+00	-52.932	-53.042	-0.110
Fe(2)	**4.327e-06**				
Fe+2	4.084e-06	3.171e-06	-5.389	-5.499	-0.110
FeSO4	1.926e-07	1.928e-07	-6.715	-6.715	0.000
FeOH+	5.014e-08	4.707e-08	-7.300	-7.327	-0.027
FeCl+	7.363e-10	6.912e-10	-9.133	-9.160	-0.027
Fe(OH)2	1.757e-11	1.758e-11	-10.755	-10.755	0.000
FeF+	7.739e-12	7.265e-12	-11.111	-11.139	-0.027
Fe(OH)3-	4.667e-14	4.381e-14	-13.331	-13.358	-0.027
FeHSO4+	1.879e-14	1.764e-14	-13.726	-13.753	-0.027
FeHCO3+	0.000e+00	0.000e+00	-268.466	-268.493	-0.027
FeCO3	0.000e+00	0.000e+00	-268.643	-268.643	0.000

Fe(3)	1.217e-04					
	Fe(OH)3	1.011e-04	1.012e-04	-3.995	-3.995	0.000
	Fe(OH)2+	1.502e-05	1.410e-05	-4.823	-4.851	-0.027
	Fe(OH)4-	5.578e-06	5.236e-06	-5.254	-5.281	-0.027
	FeOH+2	9.540e-10	7.408e-10	-9.020	-9.130	-0.110
	FeSO4+	8.759e-15	8.223e-15	-14.058	-14.085	-0.027
	Fe+3	3.958e-15	2.240e-15	-14.403	-14.650	-0.247
	FeF+2	9.632e-16	7.479e-16	-15.016	-15.126	-0.110
	Fe(SO4)2-	7.090e-17	6.656e-17	-16.149	-16.177	-0.027
	Fe2(OH)2+4	5.099e-17	1.854e-17	-16.292	-16.732	-0.439
	FeCl+2	1.156e-17	8.975e-18	-16.937	-17.047	-0.110
	FeF2+	6.807e-18	6.390e-18	-17.167	-17.194	-0.027
	Fe3(OH)4+5	4.408e-19	9.071e-20	-18.356	-19.042	-0.687
	FeCl2+	8.028e-21	7.536e-21	-20.095	-20.123	-0.027
	FeF3	2.275e-21	2.277e-21	-20.643	-20.643	0.000
	FeHSO4+2	4.032e-22	3.131e-22	-21.395	-21.504	-0.110
	FeCl3	1.189e-25	1.190e-25	-24.925	-24.924	0.000
H(0)	2.860e-27					
	H2	1.430e-27	1.431e-27	-26.845	-26.844	0.000
K	2.431e-04					
	K+	2.425e-04	2.275e-04	-3.615	-3.643	-0.028
	KSO4-	6.048e-07	5.677e-07	-6.218	-6.246	-0.027
Mg	1.356e-06					
	Mg+2	1.279e-06	1.001e-06	-5.893	-6.000	-0.106
	MgSO4	7.690e-08	7.696e-08	-7.114	-7.114	0.000
	MgOH+	1.667e-10	1.565e-10	-9.778	-9.805	-0.027
	MgF+	1.460e-11	1.371e-11	-10.836	-10.863	-0.027
	MgHCO3+	0.000e+00	0.000e+00	-269.907	-269.935	-0.027
	MgCO3	0.000e+00	0.000e+00	-270.580	-270.580	0.000
Mn(2)	8.219e-08					
	Mn+2	7.839e-08	6.087e-08	-7.106	-7.216	-0.110
	MnSO4	3.682e-09	3.685e-09	-8.434	-8.434	0.000
	MnOH+	7.537e-11	7.075e-11	-10.123	-10.150	-0.027
	MnCl+	4.171e-11	3.916e-11	-10.380	-10.407	-0.027
	MnF+	1.028e-13	9.648e-14	-12.988	-13.016	-0.027
	MnCl2	2.697e-15	2.699e-15	-14.569	-14.569	0.000
	Mn(OH)3-	3.646e-19	3.423e-19	-18.438	-18.466	-0.027
	MnCl3-	1.250e-19	1.174e-19	-18.903	-18.930	-0.027
	MnCO3	0.000e+00	0.000e+00	-269.840	-269.839	0.000
	MnHCO3+	0.000e+00	0.000e+00	-270.232	-270.260	-0.027
Mn(3)	1.488e-29					
	Mn+3	1.488e-29	8.425e-30	-28.827	-29.074	-0.247
Mn(6)	0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-48.774	-48.884	-0.110
Mn(7)	0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-54.600	-54.628	-0.027
Na	3.432e-03					
	Na+	3.426e-03	3.218e-03	-2.465	-2.492	-0.027
	NaSO4-	6.272e-06	5.888e-06	-5.203	-5.230	-0.027
	NaF	4.239e-10	4.242e-10	-9.373	-9.372	0.000
	NaHCO3	0.000e+00	0.000e+00	-267.737	-267.737	0.000
	NaCO3-	0.000e+00	0.000e+00	-268.839	-268.867	-0.027
Ni	1.930e-09					
	Ni+2	1.820e-09	1.413e-09	-8.740	-8.850	-0.110
	NiSO4	9.926e-11	9.934e-11	-10.003	-10.003	0.000
	NiOH+	9.992e-12	9.380e-12	-11.000	-11.028	-0.027
	Ni(OH)2	7.076e-13	7.082e-13	-12.150	-12.150	0.000
	NiCl+	5.970e-13	5.604e-13	-12.224	-12.251	-0.027
	NiF+	6.881e-15	6.459e-15	-14.162	-14.190	-0.027
	Ni(SO4)2-2	2.723e-15	2.114e-15	-14.565	-14.675	-0.110
	Ni(OH)3-	5.341e-16	5.013e-16	-15.272	-15.300	-0.027
	NiCl2	3.211e-16	3.213e-16	-15.493	-15.493	0.000
	NiCO3	0.000e+00	0.000e+00	-269.504	-269.504	0.000
	NiHCO3+	0.000e+00	0.000e+00	-271.677	-271.704	-0.027
	Ni(CO3)2-2	0.000e+00	0.000e+00	-533.678	-533.788	-0.110
O(0)	0.000e+00					
	O2	0.000e+00	0.000e+00	-40.503	-40.502	0.000
Pb	3.065e-09					
	PbOH+	1.495e-09	1.403e-09	-8.825	-8.853	-0.027
	Pb+2	1.309e-09	1.016e-09	-8.883	-8.993	-0.110
	PbSO4	2.159e-10	2.161e-10	-9.666	-9.665	0.000
	Pb(OH)2	3.861e-11	3.864e-11	-10.413	-10.413	0.000
	PbCl+	5.939e-12	5.575e-12	-11.226	-11.254	-0.027
	Pb(SO4)2-2	5.521e-13	4.287e-13	-12.258	-12.368	-0.110
	Pb(OH)3-	3.346e-14	3.141e-14	-13.475	-13.503	-0.027
	PbF+	4.411e-15	4.141e-15	-14.355	-14.383	-0.027
	PbCl2	1.545e-15	1.546e-15	-14.811	-14.811	0.000
	Pb2OH+3	5.641e-17	3.193e-17	-16.249	-16.496	-0.247
	Pb(OH)4-2	6.560e-18	5.094e-18	-17.183	-17.293	-0.110
	PbCl3-	1.997e-19	1.875e-19	-18.700	-18.727	-0.027
	Pb3(OH)4+2	1.963e-20	1.524e-20	-19.707	-19.817	-0.110
	PbF2	1.936e-20	1.937e-20	-19.713	-19.713	0.000
	PbCl4-2	1.749e-23	1.358e-23	-22.757	-22.867	-0.110
	PbF3-	3.425e-26	3.215e-26	-25.465	-25.493	-0.027
	PbF4-2	4.540e-33	3.525e-33	-32.343	-32.453	-0.110
	PbCO3	0.000e+00	0.000e+00	-269.277	-269.277	0.000
	PbHCO3+	0.000e+00	0.000e+00	-271.060	-271.087	-0.027
	Pb(CO3)2-2	0.000e+00	0.000e+00	-533.291	-533.401	-0.110
S(6)	4.925e-04					
	SO4-2	4.850e-04	3.780e-04	-3.314	-3.422	-0.108
	NaSO4-	6.272e-06	5.888e-06	-5.203	-5.230	-0.027
	KSO4-	6.048e-07	5.677e-07	-6.218	-6.246	-0.027
	CaSO4	2.508e-07	2.510e-07	-6.601	-6.600	0.000
	FeSO4	1.926e-07	1.928e-07	-6.715	-6.715	0.000
	MgSO4	7.690e-08	7.696e-08	-7.114	-7.114	0.000
	BaSO4	5.718e-08	5.723e-08	-7.243	-7.242	0.000
	MnSO4	3.682e-09	3.685e-09	-8.434	-8.434	0.000
	HSO4-	4.929e-10	4.627e-10	-9.307	-9.335	-0.027
	ZnSO4	3.623e-10	3.626e-10	-9.441	-9.441	0.000
	PbSO4	2.159e-10	2.161e-10	-9.666	-9.665	0.000
	NiSO4	9.926e-11	9.934e-11	-10.003	-10.003	0.000
	CuSO4	1.022e-11	1.023e-11	-10.991	-10.990	0.000
	AlSO4+	3.678e-12	3.452e-12	-11.434	-11.462	-0.027
	Zn(SO4)2-2	1.497e-12	1.162e-12	-11.825	-11.935	-0.110
	Pb(SO4)2-2	5.521e-13	4.287e-13	-12.258	-12.368	-0.110
	UO2SO4	2.000e-13	2.002e-13	-12.699	-12.699	0.000
	Al(SO4)2-	4.286e-14	4.023e-14	-13.368	-13.395	-0.027
	CaHSO4+	2.076e-14	1.949e-14	-13.683	-13.710	-0.027
	FeHSO4+	1.879e-14	1.764e-14	-13.726	-13.753	-0.027
	FeSO4+	8.759e-15	8.223e-15	-14.058	-14.085	-0.027
	Ni(SO4)2-2	2.723e-15	2.114e-15	-14.565	-14.675	-0.110
	UO2(SO4)2-2	8.487e-16	6.590e-16	-15.071	-15.181	-0.110
	Fe(SO4)2-	7.090e-17	6.656e-17	-16.149	-16.177	-0.027
	AlHSO4+2	5.329e-21	4.138e-21	-20.273	-20.383	-0.110
	FeHSO4+2	4.032e-22	3.131e-22	-21.395	-21.504	-0.110
	U(SO4)2	1.960e-39	1.961e-39	-38.708	-38.707	0.000
	USO4+2	9.652e-40	7.495e-40	-39.015	-39.125	-0.110
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-55.136	-55.383	-0.247
U(4)	2.041e-20					
	U(OH)4	2.041e-20	2.042e-20	-19.690	-19.690	0.000
	U(OH)3+	1.200e-24	1.127e-24	-23.921	-23.948	-0.027
	U(OH)2+2	1.104e-29	8.574e-30	-28.957	-29.067	-0.110
	UOH+3	1.408e-35	7.968e-36	-34.852	-35.099	-0.247
	U(SO4)2	1.960e-39	1.961e-39	-38.708	-38.707	0.000
	USO4+2	9.652e-40	7.495e-40	-39.015	-39.125	-0.110
	UF2+2	6.363e-40	4.941e-40	-39.196	-39.306	-0.110
	UF+3	4.652e-40	2.633e-40	-39.332	-39.579	-0.247
	UF3+	0.000e+00	0.000e+00	-40.551	-40.578	-0.027
	U+4	0.000e+00	0.000e+00	-41.818	-42.257	-0.439
	UF4	0.000e+00	0.000e+00	-43.306	-43.305	0.000
	UCl+3	0.000e+00	0.000e+00	-44.030	-44.277	-0.247
	UF5-	0.000e+00	0.000e+00	-48.485	-48.513	-0.027
	UF6-2	0.000e+00	0.000e+00	-52.932	-53.042	-0.110
	U6(OH)15+9	0.000e+00	0.000e+00	-150.768	-152.993	-2.224
	U(CO3)4-4	0.000e+00	0.000e+00	-1079.013	-1079.452	-0.439
	U(CO3)5-6	0.000e+00	0.000e+00	-1345.158	-1346.147	-0.989
U(5)	1.583e-15					
	UO2+	1.583e-15	1.486e-15	-14.801	-14.828	-0.027
	UO2(CO3)3-5	0.000e+00	0.000e+00	-809.328	-810.015	-0.687
U(6)	1.050e-08					
	UO2(OH)3-	1.035e-08	9.714e-09	-7.985	-8.013	-0.027
	UO2OH+	1.465e-10	1.376e-10	-9.834	-9.862	-0.027
	UO2+2	5.588e-13	4.339e-13	-12.253	-12.363	-0.110
	UO2SO4	2.000e-13	2.002e-13	-12.699	-12.699	0.000
	(UO2)3(OH)7-	7.756e-14	7.281e-14	-13.110	-13.138	-0.027
	(UO2)3(OH)5+	1.998e-14	1.876e-14	-13.699	-13.727	-0.027
	UO2(OH)4-2	1.404e-14	1.090e-14	-13.853	-13.963	-0.110
	UO2F+	1.286e-14	1.208e-14	-13.891	-13.918	-0.027
	(UO2)2(OH)2+2	2.120e-15	1.646e-15	-14.674	-14.784	-0.110
	UO2(SO4)2-2	8.487e-16	6.590e-16	-15.071	-15.181	-0.110
	UO2Cl+	1.018e-16	9.552e-17	-15.992	-16.020	-0.027
	(UO2)4(OH)7+	4.237e-17	3.977e-17	-16.373	-16.400	-0.027
	UO2F2	9.340e-18	9.348e-18	-17.030	-17.029	0.000
	(UO2)3(OH)4+2	3.327e-18	2.583e-18	-17.478	-17.588	-0.110
	(UO2)2OH+3	4.698e-20	2.660e-20	-19.328	-19.575	-0.247
	UO2Cl2	7.677e-22	7.683e-22	-21.115	-21.114	0.000
	UO2F3-	4.339e-22	4.073e-22	-21.363	-21.390	-0.027
	UO2F4-2	7.699e-28	5.978e-28	-27.114	-27.223	-0.110
	UO2CO3	0.000e+00	0.000e+00	-270.273	-270.273	0.000
	UO2(CO3)2-2	0.000e+00	0.000e+00	-530.360	-530.470	-0.110
	UO2(CO3)3-4	0.000e+00	0.000e+00	-792.741	-793.181	-0.439
	(UO2)3(CO3)6-6	0.000e+00	0.000e+00	-1587.242	-1588.231	-0.989
Zn	6.366e-09					
	Zn+2	5.497e-09	4.269e-09	-8.260	-8.370	-0.110
	ZnSO4	3.623e-10	3.626e-10	-9.441	-9.441	0.000
	Zn(OH)2	2.691e-10	2.693e-10	-9.570	-9.570	0.000
	ZnOH+	2.326e-10	2.183e-10	-9.633	-9.661	-0.027
	ZnOHCl	1.579e-12	1.580e-12	-11.802	-11.801	0.000
	ZnCl+	1.516e-12	1.424e-12	-11.819	-11.847	-0.027
	Zn(SO4)2-2	1.497e-12	1.162e-12	-11.825	-11.935	-0.110
	Zn(OH)3-	6.423e-14	6.030e-14	-13.192	-13.220	-0.027
	ZnF+	1.373e-14	1.289e-14	-13.862	-13.890	-0.027
	ZnCl2	2.301e-16	2.302e-16	-15.638	-15.638	0.000
	Zn(OH)4-2	8.712e-19	6.765e-19	-18.060	-18.170	-0.110
	ZnCl3-	4.204e-20	3.947e-20	-19.376	-19.404	-0.027
	ZnCl4-2	3.851e-24	2.990e-24	-23.414	-23.524	-0.110
	ZnCO3	0.000e+00	0.000e+00	-270.594	-270.594	0.000
	ZnHCO3+	0.000e+00	0.000e+00	-271.237	-271.264	-0.027
	Zn(CO3)2-2	0.000e+00	0.000e+00	-533.678	-533.787	-0.110

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	0.88	12.04	11.16	Al(OH)3
AlAsO4:2H2O	-4.62	0.19	4.81	AlAsO4:2H2O
AlumK	-16.73	-22.00	-5.27	KAl(SO4)2:12H2O
Alunite	2.81	2.09	-0.72	KAl3(SO4)2(OH)6
Anglesite	-4.60	-12.42	-7.82	PbSO4
Anhydrite	-4.54	-8.88	-4.34	CaSO4
Antlerite	-9.90	-1.61	8.29	Cu3(OH)4SO4
Aragonite	-264.68	-272.98	-8.30	CaCO3
Arsenolite	-20.26	-23.26	-2.99	As4O6
Artinite	-273.81	-263.82	9.99	MgCO3:Mg(OH)2:3H2O
As2O5	-30.48	-23.71	6.77	As2O5
Atacamite	-7.57	0.03	7.59	Cu2(OH)3Cl
Azurite	-532.34	-548.93	-16.59	Cu3(OH)2(CO3)2
B-UO2(OH)2	-2.39	3.34	5.73	UO2(OH)2
Ba3(AsO4)2	12.78	3.83	-8.95	Ba3(AsO4)2
BaF2	-14.03	-19.80	-5.77	BaF2
Barite	0.12	-9.94	-10.06	BaSO4
Basaluminite	6.34	29.04	22.70	Al4(OH)10SO4
Bianchite	-10.03	-11.79	-1.76	ZnSO4:6H2O
Birnessite	-11.42	32.18	43.60	MnO2
Bixbyite	-10.64	40.67	51.31	Mn2O3
Boehmite	3.08	12.04	8.97	AlOOH
Brochantite	-11.11	4.23	15.34	Cu4(OH)6SO4
Brucite	-7.51	9.70	17.21	Mg(OH)2
Bunsenite	-5.92	6.85	12.77	NiO
Ca3(AsO4)2:4w	-15.36	7.02	22.38	Ca3(AsO4)2:4H2O
Calcite	-264.53	-272.98	-8.45	CaCO3
Cerrusite	-263.32	-276.52	-13.20	PbCO3
Chalcanthite	-10.62	-13.28	-2.66	CuSO4:5H2O
Claudetite	-20.01	-23.26	-3.24	As4O6
CO2(g)	-265.06	-283.22	-18.17	CO2
Cotunnite	-11.75	-16.60	-4.85	PbCl2
Cu(OH)2	-3.01	5.84	8.85	Cu(OH)2
Cu2SO4	-23.86	-31.14	-7.28	Cu2SO4
Cu3(AsO4)2:6w	-12.36	-6.19	6.16	Cu3(AsO4)2:6H2O
CuCO3	-267.76	-277.39	-9.63	CuCO3
CuF	-25.05	-20.50	4.55	CuF
CuF2	-22.70	-23.14	-0.44	CuF2
CuF2:2H2O	-18.64	-23.14	-4.50	CuF2:2H2O
CuMetal	-6.17	-17.86	-11.69	Cu
CuOCuSO4	-19.46	-7.44	12.01	CuO:CuSO4
CupricFerrite	17.24	49.94	32.70	CuFe2O4
Cuprite	-4.99	-12.02	-7.03	Cu2O
CuprousFerrite	14.46	16.04	1.58	CuFeO2
CuSO4	-16.54	-13.28	3.26	CuSO4
Diaspore	4.83	12.04	7.21	AlOOH
Dolomite	-529.54	-546.50	-16.96	CaMg(CO3)2
Dolomite(d)	-530.11	-546.50	-16.39	CaMg(CO3)2
Epsomite	-7.24	-9.42	-2.18	MgSO4:7H2O
Fe(OH)2.7Cl.3	8.44	18.56	10.11	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	4.01	22.05	18.04	Fe(OH)3
Fe3(OH)8	7.78	54.30	46.52	Fe3(OH)8
Fluorite	-8.07	-18.74	-10.66	CaF2
Gibbsite	3.62	12.04	8.42	Al(OH)3
Goethite	9.90	22.05	12.15	FeOOH
Goslarite	-9.79	-11.79	-2.00	ZnSO4:7H2O
Gummite	-7.38	3.34	10.71	UO3
Gypsum	-4.30	-8.88	-4.58	CaSO4:2H2O
H2(g)	-23.65	-23.70	-0.05	H2
Halite	-7.86	-6.29	1.57	NaCl
Hausmannite	-13.24	49.15	62.39	Mn3O4
Hematite	21.39	44.10	22.71	Fe2O3
Huntite	-1063.93	-1093.55	-29.62	CaMg3(CO3)4
Hydrocerrusite	-528.87	-546.33	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-1076.34	-1084.39	-8.06	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-0.14	31.31	31.45	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	1.45	32.12	30.67	KFe3(SO4)2(OH)6
Jarosite-Na	-1.40	33.27	34.66	NaFe3(SO4)2(OH)6
JarositeH	-6.90	27.91	34.81	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-3.85	-7.08	-3.23	AlOHSO4
Langite	-13.09	4.23	17.33	Cu4(OH)6SO4:H2O
Larnakite	-5.52	-5.71	-0.19	PbO:PbSO4
Laurionite	-5.57	-4.94	0.62	PbOHCl
Litharge	-6.23	6.71	12.94	PbO
Maghemite	11.41	44.10	32.69	Fe2O3
Magnesite	-265.58	-273.52	-7.95	MgCO3
Magnetite	23.58	54.30	30.72	Fe3O4
Malachite	-266.58	-271.55	-4.96	Cu2(OH)2CO3
Manganite	-5.01	20.33	25.34	MnOOH
Massicot	-6.43	6.71	13.14	PbO
Matlockite	-9.90	-19.43	-9.54	PbClF
Melanothallite	-21.36	-17.46	3.90	CuCl2
Melanterite	-6.64	-8.92	-2.28	FeSO4:7H2O
Minium	-31.26	43.82	75.08	Pb3O4
Mirabilite	-7.04	-8.41	-1.37	Na2SO4:10H2O
Mn2(SO4)3	-63.23	-16.70	46.53	Mn2(SO4)3
Mn3(AsO4):8H2O	-10.84	1.74	12.58	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-17.29	-14.82	2.48	MnCl2:4H2O
MnSO4	-13.52	-10.64	2.88	MnSO4
Morenosite	-9.87	-12.27	-2.40	NiSO4:7H2O
Na4UO2(CO3)3	-808.61	-824.90	-16.29	Na4UO2(CO3)3
Nahcolite	-266.89	-277.87	-10.98	NaHCO3
Nantokite	-8.07	-17.66	-9.59	CuCl
Natron	-270.98	-272.51	-1.52	Na2CO3:10H2O
Nesquehonite	-267.98	-273.52	-5.54	MgCO3:3H2O
Ni(OH)2	-3.54	6.85	10.39	Ni(OH)2
Ni3(AsO4)2:8H2O	-18.94	-3.16	15.78	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-23.72	8.28	32.00	Ni4(OH)6SO4
NiCO3	-269.67	-276.37	-6.71	NiCO3
Nsutite	-10.38	32.18	42.56	MnO2
O2(g)	-37.65	47.40	85.05	O2
Pb(OH)2	-1.63	6.71	8.34	Pb(OH)2
Pb2(OH)3Cl	-7.03	1.76	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-12.79	13.41	26.20	PbO:Pb(OH)2
Pb2O3	-23.93	37.11	61.04	Pb2O3
Pb2OCO3	-269.46	-269.81	-0.35	PbO:PbCO3
Pb3(AsO4)2	-9.47	-3.59	5.88	Pb3(AsO4)2
Pb3O2CO3	-274.48	-263.10	11.38	PbCO3:2PbO
Pb3O2SO4	-9.68	1.00	10.68	PbSO4:2PbO
Pb4(OH)6SO4	-13.39	7.71	21.10	Pb4(OH)6SO4
Pb4O3SO4	-14.87	7.71	22.57	PbSO4:3PbO
PbF2	-14.84	-22.27	-7.43	PbF2
PbMetal	-21.26	-16.99	4.26	Pb
PbO:0.3H2O	-6.27	6.71	12.98	PbO:0.33H2O
Phosgenite	-273.30	-293.11	-19.81	PbCl2:PbCO3
Plattnerite	-19.85	30.41	50.26	PbO2
Portlandite	-12.97	10.24	23.22	Ca(OH)2
Pyrochroite	-6.72	8.48	15.20	Mn(OH)2
Pyrolusite	-10.08	32.18	42.26	MnO2
Retgersite	-10.22	-12.27	-2.05	NiSO4:6H2O
Rhodochrosite	-263.63	-274.74	-11.11	MnCO3
Rhodochrosite(d)	-264.35	-274.74	-10.39	MnCO3
Rutherfordine	-265.46	-279.89	-14.43	UO2CO3
Schoepite	-2.23	3.34	5.57	UO2(OH)2:H2O
Scorodite	-3.35	10.20	13.55	FeAsO4:2H2O
Siderite	-262.17	-273.02	-10.86	FeCO3
Siderite(d)(3)	-262.57	-273.02	-10.45	FeCO3
Smithsonite	-265.95	-275.89	-9.94	ZnCO3
Tenorite	-1.99	5.84	7.83	CuO
Thenardite	-8.24	-8.41	-0.17	Na2SO4
Thermonatrite	-272.67	-272.51	0.16	Na2CO3:H2O
Trona	-539.44	-550.38	-10.93	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-26.78	-39.49	-12.71	U(OH)2SO4
U3O8(c)	-7.27	-13.69	-6.42	U3O8
U4O9(c)	-17.71	-57.75	-40.04	U4O9
UF4(c)	-50.47	-78.32	-27.86	UF4
UF4:2.5H2O	-41.25	-78.32	-37.07	UF4:2.5H2O
UO2(a)	-10.96	-20.36	-9.41	UO2
UO3(gamma)	-4.64	3.34	7.98	UO3
Uraninite(c)	-6.31	-20.36	-14.05	UO2
Witherite	-265.47	-274.04	-8.58	BaCO3
Zincite(c)	-4.11	7.33	11.44	ZnO
Zincosite	-15.06	-11.79	3.27	ZnSO4
Zn(OH)2-a	-5.12	7.33	12.45	Zn(OH)2
Zn(OH)2-b	-4.42	7.33	11.75	Zn(OH)2
Zn(OH)2-c	-4.87	7.33	12.20	Zn(OH)2
Zn(OH)2-e	-4.17	7.33	11.50	Zn(OH)2
Zn(OH)2-g	-4.38	7.33	11.71	Zn(OH)2
Zn2(OH)2SO4	-11.96	-4.46	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-12.19	3.01	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-15.46	-1.72	13.74	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-36.11	-16.25	19.86	ZnO:2ZnSO4
Zn4(OH)6SO4	-18.20	10.20	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-25.15	13.35	38.50	Zn5(OH)8Cl2
ZnCl2	-23.24	-15.97	7.27	ZnCl2
ZnCO3:H2O	-265.63	-275.89	-10.26	ZnCO3:H2O
ZnF2	-20.31	-21.65	-1.34	ZnF2
ZnMetal	-42.62	-16.37	26.25	Zn
ZnO(a)	-3.98	7.33	11.31	ZnO
ZnSO4:H2O	-11.37	-11.79	-0.43	ZnSO4:H2O

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Reading data base.
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           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
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Reading input data for simulation 1.
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           TITLE   Schneckentein 0-0.5m
           SOLUTION        1
           units           mg/l
           temp            20.1
           pH              6.93
           F               1.2
           Cl              0.2
           S(6)            3.3       as SO4
           Na              0.96
           K               3.0
           Mg              0.84
           Ca              3.9
           Alkalinity     12.2       as HCO3
           Al              1.22
           As(+3)          0.00
           As(+5)          0.014
           Ba              0.044
           Cu              0.035
           Fe              1.51
           Mn              0.05
           Ni              0.004
           Pb              0.019
           U               0.02
           Zn              0.12
           END
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TITLE
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   Schneckentein 0-0.5m

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Beginning of initial solution calculations.
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Initial solution 1.

-----------------------------Solution composition--------------
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           Elements           Molality       Moles

           Al                4.522e-05   4.522e-05
           Alkalinity        1.999e-04   1.999e-04
           As(5)             1.869e-07   1.869e-07
           Ba                3.204e-07   3.204e-07
           Ca                9.731e-05   9.731e-05
           Cl                5.641e-06   5.641e-06
           Cu                5.508e-07   5.508e-07
           F                 6.317e-05   6.317e-05
           Fe                2.704e-05   2.704e-05
           K                 7.672e-05   7.672e-05
           Mg                3.455e-05   3.455e-05
           Mn                9.101e-07   9.101e-07
           Na                4.176e-05   4.176e-05
           Ni                6.813e-08   6.813e-08
           Pb                9.171e-08   9.171e-08
           S(6)              3.435e-05   3.435e-05
           U                 8.403e-08   8.403e-08
           Zn                1.836e-06   1.836e-06
```

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----------------------------Description of solution----------------------------

                                    pH  =   6.930
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   5.194e-04
                     Mass of water (kg)  =   1.000e+00
                 Total carbon (mol/kg)  =   8.127e-05
                    Total CO2 (mol/kg)  =   8.127e-05
                   Temperature (deg C)  =  20.100
                Electrical balance (eq)  =   2.391e-04
Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  36.56
                               Iterations  =  10
                                  Total H  = 1.110126e+02
                                  Total O  = 5.550672e+01
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
H+	1.204e-07	1.175e-07	-6.919	-6.930	-0.011
OH-	5.977e-08	5.825e-08	-7.224	-7.235	-0.011
H2O	5.551e+01	1.000e+00	-0.000	-0.000	0.000
Al 4.522e-05					
Al(OH)4-	3.079e-05	3.000e-05	-4.512	-4.523	-0.011
AlF2+	6.504e-06	6.339e-06	-5.187	-5.198	-0.011
AlF3	3.106e-06	3.107e-06	-5.508	-5.508	0.000
Al(OH)2+	2.358e-06	2.298e-06	-5.627	-5.639	-0.011
Al(OH)3	1.985e-06	1.986e-06	-5.702	-5.702	0.000
AlF+2	3.677e-07	3.317e-07	-6.434	-6.479	-0.045
AlOH+2	5.932e-08	5.352e-08	-7.227	-7.272	-0.045
AlF4-	4.960e-08	4.834e-08	-7.304	-7.316	-0.011
Al+3	1.101e-09	8.736e-10	-8.958	-9.059	-0.101
AlSO4+	8.038e-11	7.834e-11	-10.095	-10.106	-0.011
Al(SO4)2-	7.513e-14	7.322e-14	-13.124	-13.135	-0.011
AlHSO4+2	8.690e-19	7.840e-19	-18.061	-18.106	-0.045
As(5) 1.869e-07					
HAsO4-2	1.142e-07	1.030e-07	-6.942	-6.987	-0.045
H2AsO4-	7.269e-08	7.084e-08	-7.139	-7.150	-0.011
AsO4-3	2.478e-12	1.966e-12	-11.606	-11.706	-0.101
H3AsO4	1.388e-12	1.389e-12	-11.857	-11.857	0.000
Ba 3.204e-07					
Ba+2	3.159e-07	2.850e-07	-6.500	-6.545	-0.045
BaSO4	4.320e-09	4.321e-09	-8.364	-8.364	0.000
BaHCO3+	1.484e-10	1.447e-10	-9.828	-9.840	-0.011
BaCO3	2.962e-12	2.962e-12	-11.528	-11.528	0.000
BaOH+	8.434e-14	8.220e-14	-13.074	-13.085	-0.011
C(4) 8.127e-05					
HCO3-	6.338e-05	6.179e-05	-4.198	-4.209	-0.011
CO2	1.746e-05	1.746e-05	-4.758	-4.758	0.000
FeHCO3+	1.365e-07	1.331e-07	-6.865	-6.876	-0.011
CaHCO3+	6.499e-08	6.334e-08	-7.187	-7.198	-0.011
UO2CO3	3.348e-08	3.349e-08	-7.475	-7.475	0.000
CO3-2	2.458e-08	2.220e-08	-7.609	-7.654	-0.044
MgHCO3+	2.252e-08	2.195e-08	-7.647	-7.659	-0.011
CuCO3	2.249e-08	2.250e-08	-7.648	-7.648	0.000
PbCO3	2.041e-08	2.041e-08	-7.690	-7.690	0.000
UO2(CO3)2-2	1.764e-08	1.591e-08	-7.753	-7.798	-0.045
ZnHCO3+	1.290e-08	1.257e-08	-7.889	-7.901	-0.011
FeCO3	1.147e-08	1.147e-08	-7.941	-7.941	0.000
NiCO3	8.697e-09	8.698e-09	-8.061	-8.061	0.000
ZnCO3	7.159e-09	7.160e-09	-8.145	-8.145	0.000
CuHCO3+	5.996e-09	5.844e-09	-8.222	-8.233	-0.011
MnHCO3+	4.587e-09	4.470e-09	-8.338	-8.350	-0.011
CaCO3	2.970e-09	2.970e-09	-8.527	-8.527	0.000
PbHCO3+	2.664e-09	2.597e-09	-8.574	-8.586	-0.011
MnCO3	1.431e-09	1.431e-09	-8.844	-8.844	0.000
NaHCO3	1.414e-09	1.414e-09	-8.850	-8.850	0.000
MgCO3	6.080e-10	6.081e-10	-9.216	-9.216	0.000
NiHCO3+	4.626e-10	4.508e-10	-9.335	-9.346	-0.011
BaHCO3+	1.484e-10	1.447e-10	-9.828	-9.840	-0.011
UO2(CO3)3-4	3.334e-11	2.208e-11	-10.477	-10.656	-0.179
NaCO3-	1.342e-11	1.308e-11	-10.872	-10.883	-0.011
Zn(CO3)2-2	3.767e-12	3.398e-12	-11.424	-11.469	-0.045
BaCO3	2.962e-12	2.962e-12	-11.528	-11.528	0.000
Pb(CO3)2-2	1.262e-12	1.138e-12	-11.899	-11.944	-0.045
Cu(CO3)2-2	6.969e-13	6.287e-13	-12.157	-12.202	-0.045
Ni(CO3)2-2	3.719e-13	3.356e-13	-12.430	-12.474	-0.045
(UO2)3(CO3)6-6	1.480e-20	5.858e-21	-19.830	-20.232	-0.402
UO2(CO3)3-5	6.329e-28	3.326e-28	-27.199	-27.478	-0.279
U(CO3)4-4	5.877e-34	3.893e-34	-33.231	-33.410	-0.179
U(CO3)5-6	1.563e-40	0.000e+00	-39.806	-40.208	-0.402
Ca 9.731e-05					
Ca+2	9.671e-05	8.733e-05	-4.015	-4.059	-0.044
CaSO4	5.031e-07	5.031e-07	-6.298	-6.298	0.000
CaHCO3+	6.499e-08	6.334e-08	-7.187	-7.198	-0.011
CaF+	2.719e-08	2.650e-08	-7.566	-7.577	-0.011
CaCO3	2.970e-09	2.970e-09	-8.527	-8.527	0.000
CaOH+	1.266e-10	1.234e-10	-9.898	-9.909	-0.011
CaHSO4+	3.352e-13	3.267e-13	-12.475	-12.486	-0.011
Cl 5.641e-06					
Cl-	5.641e-06	5.497e-06	-5.249	-5.260	-0.011
FeCl+	1.677e-10	1.634e-10	-9.776	-9.787	-0.011
ZnCl+	1.970e-11	1.920e-11	-10.706	-10.717	-0.011
MnCl+	1.865e-11	1.818e-11	-10.729	-10.740	-0.011
PbCl+	1.050e-11	1.023e-11	-10.979	-10.990	-0.011
ZnOHCl	2.504e-12	2.504e-12	-11.601	-11.601	0.000
CuCl+	2.245e-12	2.188e-12	-11.649	-11.660	-0.011
NiCl+	7.489e-13	7.299e-13	-12.126	-12.137	-0.011
CuCl2-	9.380e-14	9.141e-14	-13.028	-13.039	-0.011
UO2Cl+	2.893e-15	2.819e-15	-14.539	-14.550	-0.011
ZnCl2	1.083e-16	1.083e-16	-15.965	-15.965	0.000
PbCl2	9.785e-17	9.786e-17	-16.009	-16.009	0.000
MnCl2	4.362e-17	4.363e-17	-16.360	-16.360	0.000
NiCl2	1.457e-17	1.457e-17	-16.837	-16.837	0.000
CuCl2	6.119e-18	6.120e-18	-17.213	-17.213	0.000
FeCl+2	2.460e-18	2.219e-18	-17.609	-17.654	-0.045
CuCl3-2	8.661e-19	7.814e-19	-18.062	-18.107	-0.045
UO2Cl2	7.933e-22	7.934e-22	-21.101	-21.101	0.000
ZnCl3-	6.655e-22	6.486e-22	-21.177	-21.188	-0.011
PbCl3-	4.252e-22	4.144e-22	-21.371	-21.383	-0.011
MnCl3-	6.778e-23	6.606e-23	-22.169	-22.180	-0.011
FeCl2+	6.548e-23	6.381e-23	-22.184	-22.195	-0.011
CuCl3-	1.121e-25	1.093e-25	-24.950	-24.961	-0.011
ZnCl4-2	1.904e-27	1.718e-27	-26.720	-26.765	-0.045
PbCl4-2	1.163e-27	1.049e-27	-26.934	-26.979	-0.045
FeCl3	3.508e-29	3.508e-29	-28.455	-28.455	0.000
CuCl4-2	2.974e-33	2.683e-33	-32.527	-32.571	-0.045
UCl+3	8.343e-40	6.618e-40	-39.079	-39.179	-0.101
Cu(1) 9.699e-09					
Cu+	9.699e-09	9.453e-09	-8.013	-8.024	-0.011
CuCl2-	9.380e-14	9.141e-14	-13.028	-13.039	-0.011
CuCl3-2	8.661e-19	7.814e-19	-18.062	-18.107	-0.045
Cu(2) 5.411e-07					
Cu(OH)2	2.856e-07	2.856e-07	-6.544	-6.544	0.000
Cu+2	2.092e-07	1.887e-07	-6.680	-6.724	-0.045
CuCO3	2.249e-08	2.250e-08	-7.648	-7.648	0.000
CuOH+	1.648e-08	1.606e-08	-7.783	-7.794	-0.011
CuHCO3+	5.996e-09	5.844e-09	-8.222	-8.233	-0.011
CuSO4	1.126e-09	1.126e-09	-8.949	-8.948	0.000
CuF+	1.317e-10	1.284e-10	-9.880	-9.892	-0.011
Cu2(OH)2+2	7.629e-11	6.883e-11	-10.118	-10.162	-0.045
CuCl+	2.245e-12	2.188e-12	-11.649	-11.660	-0.011
Cu(CO3)2-2	6.969e-13	6.287e-13	-12.157	-12.202	-0.045
Cu(OH)3-	1.503e-13	1.465e-13	-12.823	-12.834	-0.011
CuCl2	6.119e-18	6.120e-18	-17.213	-17.213	0.000
Cu(OH)4-2	2.757e-19	2.487e-19	-18.560	-18.604	-0.045
CuCl3-	1.121e-25	1.093e-25	-24.950	-24.961	-0.011
CuCl4-2	2.974e-33	2.683e-33	-32.527	-32.571	-0.045
F 6.317e-05					
F-	4.015e-05	3.913e-05	-4.396	-4.408	-0.011
AlF2+	6.504e-06	6.339e-06	-5.187	-5.198	-0.011
AlF3	3.106e-06	3.107e-06	-5.508	-5.508	0.000
AlF+2	3.677e-07	3.317e-07	-6.434	-6.479	-0.045
MgF+	7.501e-08	7.311e-08	-7.125	-7.136	-0.011
AlF4-	4.960e-08	4.834e-08	-7.304	-7.316	-0.011
CaF+	2.719e-08	2.650e-08	-7.566	-7.577	-0.011
FeF+	8.646e-09	8.426e-09	-8.063	-8.074	-0.011
HF	6.317e-09	6.318e-09	-8.199	-8.199	0.000
UO2F+	1.786e-09	1.741e-09	-8.748	-8.759	-0.011
NaF	9.161e-10	9.163e-10	-9.038	-9.038	0.000
ZnF+	8.611e-10	8.392e-10	-9.065	-9.076	-0.011
UO2F2	2.302e-10	2.302e-10	-9.638	-9.638	0.000
MnF+	2.255e-10	2.197e-10	-9.647	-9.658	-0.011
CuF+	1.317e-10	1.284e-10	-9.880	-9.892	-0.011
NiF+	4.234e-11	4.127e-11	-10.373	-10.384	-0.011
PbF+	3.777e-11	3.681e-11	-10.423	-10.434	-0.011
UO2F3-	1.758e-12	1.713e-12	-11.755	-11.766	-0.011
FeF2+	1.355e-12	1.321e-12	-11.868	-11.879	-0.011
FeF+2	9.971e-13	8.995e-13	-12.001	-12.046	-0.045
HF2-	9.342e-13	9.105e-13	-12.030	-12.041	-0.011
FeF3	8.052e-14	8.053e-14	-13.094	-13.094	0.000
PbF2	2.941e-14	2.941e-14	-13.532	-13.531	0.000
UO2F4-2	4.754e-16	4.289e-16	-15.323	-15.368	-0.045
H2F2	1.239e-16	1.239e-16	-15.907	-15.907	0.000
PbF3-	8.554e-18	8.337e-18	-17.068	-17.079	-0.011
PbF4-2	1.731e-22	1.561e-22	-21.762	-21.806	-0.045
UF3+	4.925e-28	4.800e-28	-27.308	-27.319	-0.011
UF4	1.533e-28	1.533e-28	-27.814	-27.814	0.000
UF2+2	5.814e-29	5.245e-29	-28.236	-28.280	-0.045
UF+3	2.060e-31	1.634e-31	-30.686	-30.787	-0.101
UF5-	1.695e-31	1.652e-31	-30.771	-30.782	-0.011
UF6-2	9.209e-34	8.308e-34	-33.036	-33.081	-0.045
Fe(2) 2.417e-05					
Fe+2	2.387e-05	2.153e-05	-4.622	-4.667	-0.045
FeHCO3+	1.365e-07	1.331e-07	-6.865	-6.876	-0.011
FeSO4	1.057e-07	1.058e-07	-6.976	-6.976	0.000
FeOH+	4.099e-08	3.995e-08	-7.387	-7.399	-0.011
FeCO3	1.147e-08	1.147e-08	-7.941	-7.941	0.000
FeF+	8.646e-09	8.426e-09	-8.063	-8.074	-0.011
FeCl+	1.677e-10	1.634e-10	-9.776	-9.787	-0.011
Fe(OH)2	1.876e-12	1.876e-12	-11.727	-11.727	0.000
FeHSO4+	8.267e-14	8.057e-14	-13.083	-13.094	-0.011
Fe(OH)3-	5.797e-16	5.650e-16	-15.237	-15.248	-0.011

Fe(3)	2.866e-06					
	Fe(OH)2+	1.536e-06	1.497e-06	-5.814	-5.825	-0.011
	Fe(OH)3	1.321e-06	1.321e-06	-5.879	-5.879	0.000
	Fe(OH)4-	8.611e-09	8.392e-09	-8.065	-8.076	-0.011
	FeOH+2	7.111e-10	6.415e-10	-9.148	-9.193	-0.045
	FeF2+	1.355e-12	1.321e-12	-11.868	-11.879	-0.011
	FeF+2	9.971e-13	8.995e-13	-12.001	-12.046	-0.045
	FeF3	8.052e-14	8.053e-14	-13.094	-13.094	0.000
	Fe+3	1.973e-14	1.565e-14	-13.705	-13.805	-0.101
	FeSO4+	4.771e-15	4.650e-15	-14.321	-14.333	-0.011
	Fe2(OH)2+4	2.054e-17	1.361e-17	-16.687	-16.866	-0.179
	Fe(SO4)2-	3.097e-18	3.018e-18	-17.509	-17.520	-0.011
	FeCl+2	2.460e-18	2.219e-18	-17.609	-17.654	-0.045
	Fe3(OH)4+5	1.282e-20	6.739e-21	-19.892	-20.171	-0.279
	FeHSO4+2	1.630e-21	1.471e-21	-20.788	-20.832	-0.045
	FeCl2+	6.548e-23	6.381e-23	-22.184	-22.195	-0.011
	FeCl3	3.508e-29	3.508e-29	-28.455	-28.455	0.000
H(0)	1.978e-25					
	H2	9.888e-26	9.889e-26	-25.005	-25.005	0.000
K	7.672e-05					
	K+	7.671e-05	7.475e-05	-4.115	-4.126	-0.011
	KSO4-	1.542e-08	1.502e-08	-7.812	-7.823	-0.011
Mg	3.455e-05					
	Mg+2	3.426e-05	3.095e-05	-4.465	-4.509	-0.044
	MgSO4	1.930e-07	1.930e-07	-6.714	-6.714	0.000
	MgF+	7.501e-08	7.311e-08	-7.125	-7.136	-0.011
	MgHCO3+	2.252e-08	2.195e-08	-7.647	-7.659	-0.011
	MgOH+	6.258e-10	6.099e-10	-9.204	-9.215	-0.011
	MgCO3	6.080e-10	6.081e-10	-9.216	-9.216	0.000
Mn(2)	9.101e-07					
	Mn+2	8.998e-07	8.118e-07	-6.046	-6.091	-0.045
	MnHCO3+	4.587e-09	4.470e-09	-8.338	-8.350	-0.011
	MnSO4	3.970e-09	3.971e-09	-8.401	-8.401	0.000
	MnCO3	1.431e-09	1.431e-09	-8.844	-8.844	0.000
	MnF+	2.255e-10	2.197e-10	-9.647	-9.658	-0.011
	MnOH+	1.214e-10	1.183e-10	-9.916	-9.927	-0.011
	MnCl+	1.865e-11	1.818e-11	-10.729	-10.740	-0.011
	MnCl2	4.362e-17	4.363e-17	-16.360	-16.360	0.000
	Mn(OH)3-	8.139e-21	7.933e-21	-20.089	-20.101	-0.011
	MnCl3-	6.778e-23	6.606e-23	-22.169	-22.180	-0.011
Mn(3)	1.528e-28					
	Mn+3	1.528e-28	1.212e-28	-27.816	-27.917	-0.101
Mn(6)	0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-54.883	-54.928	-0.045
Mn(7)	0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-60.627	-60.638	-0.011
Na	4.176e-05					
	Na+	4.175e-05	4.069e-05	-4.379	-4.390	-0.011
	NaSO4-	6.134e-09	5.978e-09	-8.212	-8.223	-0.011
	NaHCO3	1.414e-09	1.414e-09	-8.850	-8.850	0.000
	NaF	9.161e-10	9.163e-10	-9.038	-9.038	0.000
	NaCO3-	1.342e-11	1.308e-11	-10.872	-10.883	-0.011
Ni	6.813e-08					
	Ni+2	5.859e-08	5.286e-08	-7.232	-7.277	-0.045
	NiCO3	8.697e-09	8.698e-09	-8.061	-8.061	0.000
	NiHCO3+	4.626e-10	4.508e-10	-9.335	-9.346	-0.011
	NiSO4	2.986e-10	2.987e-10	-9.525	-9.525	0.000
	NiOH+	4.489e-11	4.375e-11	-10.348	-10.359	-0.011
	NiF+	4.234e-11	4.127e-11	-10.373	-10.384	-0.011
	NiCl+	7.489e-13	7.299e-13	-12.126	-12.137	-0.011
	Ni(OH)2	3.828e-13	3.829e-13	-12.417	-12.417	0.000
	Ni(CO3)2-2	3.719e-13	3.356e-13	-12.430	-12.474	-0.045
	Ni(SO4)2-2	5.614e-16	5.065e-16	-15.251	-15.295	-0.045
	Ni(OH)3-	3.344e-17	3.259e-17	-16.476	-16.487	-0.011
	NiCl2	1.457e-17	1.457e-17	-16.837	-16.837	0.000
O(0)	0.000e+00					
	O2	0.000e+00	0.000e+00	-44.011	-44.011	0.000
Pb	9.171e-08					
	Pb+2	5.864e-08	5.291e-08	-7.232	-7.276	-0.045
	PbCO3	2.041e-08	2.041e-08	-7.690	-7.690	0.000
	PbOH+	9.009e-09	8.780e-09	-8.045	-8.056	-0.011
	PbHCO3+	2.664e-09	2.597e-09	-8.574	-8.586	-0.011
	PbSO4	8.999e-10	9.000e-10	-9.046	-9.046	0.000
	PbF+	3.777e-11	3.681e-11	-10.423	-10.434	-0.011
	Pb(OH)2	2.907e-11	2.907e-11	-10.537	-10.536	0.000
	PbCl+	1.050e-11	1.023e-11	-10.979	-10.990	-0.011
	Pb(CO3)2-2	1.262e-12	1.138e-12	-11.899	-11.944	-0.045
	Pb(SO4)2-2	1.584e-13	1.429e-13	-12.800	-12.845	-0.045
	PbF2	2.941e-14	2.941e-14	-13.532	-13.531	0.000
	Pb2OH+3	1.311e-14	1.040e-14	-13.882	-13.983	-0.101
	Pb(OH)3-	2.915e-15	2.841e-15	-14.535	-14.546	-0.011
	PbCl2	9.785e-17	9.786e-17	-16.009	-16.009	0.000
	PbF3-	8.554e-18	8.337e-18	-17.068	-17.079	-0.011
	Pb3(OH)4+2	5.379e-19	4.853e-19	-18.269	-18.314	-0.045
	Pb(OH)4-2	6.141e-20	5.540e-20	-19.212	-19.256	-0.045
	PbCl3-	4.252e-22	4.144e-22	-21.371	-21.383	-0.011
	PbF4-2	1.731e-22	1.561e-22	-21.762	-21.806	-0.045
	PbCl4-2	1.163e-27	1.049e-27	-26.934	-26.979	-0.045
S(6)	3.435e-05					
	SO4-2	3.351e-05	3.025e-05	-4.475	-4.519	-0.044
	CaSO4	5.031e-07	5.031e-07	-6.298	-6.298	0.000
	MgSO4	1.930e-07	1.930e-07	-6.714	-6.714	0.000
	FeSO4	1.057e-07	1.058e-07	-6.976	-6.976	0.000
	KSO4-	1.542e-08	1.502e-08	-7.812	-7.823	-0.011
	ZnSO4	1.103e-08	1.103e-08	-7.957	-7.957	0.000
	NaSO4-	6.134e-09	5.978e-09	-8.212	-8.223	-0.011
	BaSO4	4.320e-09	4.321e-09	-8.364	-8.364	0.000
	MnSO4	3.970e-09	3.971e-09	-8.401	-8.401	0.000
	CuSO4	1.126e-09	1.126e-09	-8.949	-8.948	0.000
	PbSO4	8.999e-10	9.000e-10	-9.046	-9.046	0.000
	HSO4-	3.193e-10	3.112e-10	-9.496	-9.507	-0.011
	NiSO4	2.986e-10	2.987e-10	-9.525	-9.525	0.000
	AlSO4+	8.038e-11	7.834e-11	-10.095	-10.106	-0.011
	UO2SO4	1.369e-11	1.369e-11	-10.864	-10.864	0.000
	Zn(SO4)2-2	3.124e-12	2.818e-12	-11.505	-11.550	-0.045
	CaHSO4+	3.352e-13	3.267e-13	-12.475	-12.486	-0.011
	Pb(SO4)2-2	1.584e-13	1.429e-13	-12.800	-12.845	-0.045
	FeHSO4+	8.267e-14	8.057e-14	-13.083	-13.094	-0.011
	Al(SO4)2-	7.513e-14	7.322e-14	-13.124	-13.135	-0.011
	FeSO4+	4.771e-15	4.650e-15	-14.321	-14.333	-0.011
	UO2(SO4)2-2	4.041e-15	3.646e-15	-14.393	-14.438	-0.045
	Ni(SO4)2-2	5.614e-16	5.065e-16	-15.251	-15.295	-0.045
	Fe(SO4)2-	3.097e-18	3.018e-18	-17.509	-17.520	-0.011
	AlHSO4+2	8.690e-19	7.840e-19	-18.061	-18.106	-0.045
	FeHSO4+2	1.630e-21	1.471e-21	-20.788	-20.832	-0.045
	USO4+2	2.438e-34	2.200e-34	-33.613	-33.658	-0.045
	U(SO4)2	4.686e-35	4.687e-35	-34.329	-34.329	0.000
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-48.689	-48.790	-0.101
U(4)	1.674e-17					
	U(OH)4	1.673e-17	1.674e-17	-16.776	-16.776	0.000
	U(OH)3+	7.830e-21	7.631e-21	-20.106	-20.117	-0.011
	U(OH)2+2	5.278e-25	4.762e-25	-24.278	-24.322	-0.045
	UF3+	4.925e-28	4.800e-28	-27.308	-27.319	-0.011
	UF4	1.533e-28	1.533e-28	-27.814	-27.814	0.000
	UF2+2	5.814e-29	5.245e-29	-28.236	-28.280	-0.045
	UOH+3	4.552e-30	3.611e-30	-29.342	-29.442	-0.101
	UF+3	2.060e-31	1.634e-31	-30.686	-30.787	-0.101
	UF5-	1.695e-31	1.652e-31	-30.771	-30.782	-0.011
	UF6-2	9.209e-34	8.308e-34	-33.036	-33.081	-0.045
	U(CO3)4-4	5.877e-34	3.893e-34	-33.231	-33.410	-0.179
	USO4+2	2.438e-34	2.200e-34	-33.613	-33.658	-0.045
	U(SO4)2	4.686e-35	4.687e-35	-34.329	-34.329	0.000
	U+4	3.046e-36	2.018e-36	-35.516	-35.695	-0.179
	UCl+3	8.343e-40	6.618e-40	-39.079	-39.179	-0.101
	U(CO3)5-6	1.563e-40	0.000e+00	-39.806	-40.208	-0.402
	U6(OH)15+9	0.000e+00	0.000e+00	-126.515	-127.420	-0.905
U(5)	1.273e-12					
	UO2+	1.273e-12	1.241e-12	-11.895	-11.906	-0.011
	UO2(CO3)3-5	6.329e-28	3.326e-28	-27.199	-27.478	-0.279
U(6)	8.402e-08					
	UO2CO3	3.348e-08	3.349e-08	-7.475	-7.475	0.000
	UO2(CO3)2-2	1.764e-08	1.591e-08	-7.753	-7.798	-0.045
	UO2OH+	1.477e-08	1.440e-08	-7.830	-7.842	-0.011
	UO2(OH)3-	1.460e-08	1.423e-08	-7.836	-7.847	-0.011
	UO2F+	1.786e-09	1.741e-09	-8.748	-8.759	-0.011
	UO2+2	4.055e-10	3.658e-10	-9.392	-9.437	-0.045
	(UO2)3(OH)5+	3.117e-10	3.038e-10	-9.506	-9.517	-0.011
	UO2F2	2.302e-10	2.302e-10	-9.638	-9.638	0.000
	UO2(CO3)3-4	3.334e-11	2.208e-11	-10.477	-10.656	-0.179
	(UO2)2(OH)2+2	1.932e-11	1.743e-11	-10.714	-10.759	-0.045
	(UO2)3(OH)7-	1.625e-11	1.584e-11	-10.789	-10.800	-0.011
	UO2SO4	1.369e-11	1.369e-11	-10.864	-10.864	0.000
	(UO2)4(OH)7+	7.484e-12	7.294e-12	-11.126	-11.137	-0.011
	UO2F3-	1.758e-12	1.713e-12	-11.755	-11.766	-0.011
	(UO2)3(OH)4+2	3.585e-13	3.234e-13	-12.446	-12.490	-0.045
	UO2(SO4)2-2	4.041e-15	3.646e-15	-14.393	-14.438	-0.045
	UO2Cl+	2.893e-15	2.819e-15	-14.539	-14.550	-0.011
	(UO2)2OH+3	2.865e-15	2.272e-15	-14.543	-14.644	-0.101
	UO2(OH)4-2	2.128e-15	1.920e-15	-14.672	-14.717	-0.045
	UO2F4-2	4.754e-16	4.289e-16	-15.323	-15.368	-0.045
	(UO2)3(CO3)6-6	1.480e-20	5.858e-21	-19.830	-20.232	-0.402
	UO2Cl2	7.933e-22	7.934e-22	-21.101	-21.101	0.000
Zn	1.836e-06					
	Zn+2	1.792e-06	1.616e-06	-5.747	-5.791	-0.045
	ZnHCO3+	1.290e-08	1.257e-08	-7.889	-7.901	-0.011
	ZnSO4	1.103e-08	1.103e-08	-7.957	-7.957	0.000
	ZnOH+	1.061e-08	1.034e-08	-7.974	-7.986	-0.011
	ZnCO3	7.159e-09	7.160e-09	-8.145	-8.145	0.000
	Zn(OH)2	1.474e-09	1.474e-09	-8.832	-8.831	0.000
	ZnF+	8.611e-10	8.392e-10	-9.065	-9.076	-0.011
	ZnCl+	1.970e-11	1.920e-11	-10.706	-10.717	-0.011
	Zn(CO3)2-2	3.767e-12	3.398e-12	-11.424	-11.469	-0.045
	Zn(SO4)2-2	3.124e-12	2.818e-12	-11.505	-11.550	-0.045
	ZnOHCl	2.504e-12	2.504e-12	-11.601	-11.601	0.000
	Zn(OH)3-	4.071e-14	3.968e-14	-13.390	-13.401	-0.011
	ZnCl2	1.083e-16	1.083e-16	-15.965	-15.965	0.000
	Zn(OH)4-2	5.933e-20	5.352e-20	-19.227	-19.271	-0.045
	ZnCl3-	6.655e-22	6.486e-22	-21.177	-21.188	-0.011
	ZnCl4-2	1.904e-27	1.718e-27	-26.720	-26.765	-0.045

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	0.61	11.73	11.12	Al(OH)3
AlAsO4:2H2O	-4.93	-0.13	4.80	AlAsO4:2H2O
AlumK	-16.97	-22.22	-5.26	KAl(SO4)2:12H2O
Alunite	2.02	1.24	-0.78	KAl3(SO4)2(OH)6
Anglesite	-3.98	-11.80	-7.82	PbSO4
Anhydrite	-4.23	-8.58	-4.34	CaSO4
Antlerite	-5.26	3.03	8.29	Cu3(OH)4SO4
Aragonite	-3.41	-11.71	-8.31	CaCO3
Artinite	-12.76	-2.81	9.95	MgCO3:Mg(OH)2:3H2O
As2O5	-30.48	-23.71	6.77	As2O5
Atacamite	-5.49	2.08	7.57	Cu2(OH)3Cl
Azurite	-5.00	-21.62	-16.62	Cu3(OH)2(CO3)2
B-UO2(OH)2	-1.29	4.42	5.71	UO2(OH)2
Ba3(AsO4)2	7.18	-1.77	-8.95	Ba3(AsO4)2
BaF2	-9.59	-15.36	-5.77	BaF2
Barite	-1.01	-11.06	-10.05	BaSO4
Basaluminite	5.85	28.55	22.70	Al4(OH)10SO4
Bianchite	-8.55	-10.31	-1.76	ZnSO4:6H2O
Birnessite	-13.97	29.63	43.60	MnO2
Bixbyite	-13.83	37.40	51.23	Mn2O3
Boehmite	2.80	11.73	8.93	AlOOH
Brochantite	-5.18	10.16	15.34	Cu4(OH)6SO4
Brucite	-7.82	9.35	17.17	Mg(OH)2
Bunsenite	-6.16	6.58	12.74	NiO
Ca3(AsO4)2:4w	-16.68	5.69	22.37	Ca3(AsO4)2:4H2O
Calcite	-3.26	-11.71	-8.45	CaCO3
Cerrusite	-1.74	-14.93	-13.19	PbCO3
Chalcanthite	-8.59	-11.24	-2.66	CuSO4:5H2O
CO2(g)	-3.35	-21.51	-18.16	CO2
Cotunnite	-12.96	-17.80	-4.84	PbCl2
Cu(OH)2	-1.69	7.14	8.83	Cu(OH)2
Cu2SO4	-18.67	-25.97	-7.29	Cu2SO4
Cu3(AsO4)2:6w	-8.46	-2.31	6.16	Cu3(AsO4)2:6H2O
CuCO3	-4.75	-14.38	-9.63	CuCO3
CuF	-19.66	-15.13	4.53	CuF
CuF2	-15.08	-15.54	-0.46	CuF2
CuF2:2H2O	-11.03	-15.54	-4.51	CuF2:2H2O
CuMetal	-3.05	-14.72	-11.67	Cu
CuOCuSO4	-16.07	-4.11	11.97	CuO:CuSO4
CupricFerrite	14.75	47.38	32.63	CuFe2O4
Cuprite	-0.56	-7.59	-7.03	Cu2O
CuprousFerrite	14.76	16.33	1.57	CuFeO2
CuSO4	-14.48	-11.24	3.23	CuSO4
Diaspore	4.55	11.73	7.18	AlOOH
Dolomite	-6.90	-23.88	-16.97	CaMg(CO3)2
Dolomite(d)	-7.47	-23.88	-16.40	CaMg(CO3)2
Epsomite	-6.85	-9.03	-2.17	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.37	16.47	10.10	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.09	20.12	18.03	Fe(OH)3
Fe3(OH)8	2.94	49.44	46.50	Fe3(OH)8
Fluorite	-2.22	-12.87	-10.66	CaF2
Gibbsite	3.34	11.73	8.39	Al(OH)3
Goethite	7.98	20.12	12.14	FeOOH
Goslarite	-8.31	-10.31	-2.00	ZnSO4:7H2O
Gummite	-6.26	4.42	10.68	UO3
Gypsum	-4.00	-8.58	-4.58	CaSO4:2H2O
H2(g)	-21.81	-21.86	-0.05	H2
Halite	-11.22	-9.65	1.57	NaCl
Hausmannite	-17.09	45.17	62.26	Mn3O4
Hematite	17.60	40.25	22.65	Fe2O3
Huntite	-18.55	-48.20	-29.65	CaMg3(CO3)4
Hydrocerrusite	-5.82	-23.28	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-31.18	-39.30	-8.12	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-5.57	25.85	31.42	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-4.17	26.41	30.59	KFe3(SO4)2(OH)6
Jarosite-Na	-8.43	26.15	34.58	NaFe3(SO4)2(OH)6
JarositeH	-11.09	23.61	34.70	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-3.42	-6.65	-3.23	AlOHSO4
Langite	-7.11	10.16	17.28	Cu4(OH)6SO4:H2O
Larnakite	-5.01	-5.21	-0.20	PbO:PbSO4
Laurionite	-6.23	-5.61	0.62	PbOHCl
Litharge	-6.34	6.58	12.92	PbO
Maghemite	7.58	40.25	32.66	Fe2O3
Magnesite	-4.21	-12.16	-7.95	MgCO3
Magnetite	18.81	49.44	30.63	Fe3O4
Malachite	-2.26	-7.24	-4.98	Cu2(OH)2CO3
Manganite	-6.64	18.70	25.34	MnOOH
Massicot	-6.53	6.58	13.12	PbO
Matlockite	-7.42	-16.94	-9.53	PbClF
Melanothallite	-21.12	-17.24	3.88	CuCl2
Melanterite	-6.92	-9.19	-2.27	FeSO4:7H2O
Minium	-33.34	41.61	74.95	Pb3O4
Mirabilite	-11.95	-13.30	-1.35	Na2SO4:10H2O
Mn2(SO4)3	-64.16	-17.74	46.42	Mn2(SO4)3
Mn3(AsO4):8H2O	-12.98	-0.41	12.57	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-19.11	-16.61	2.50	MnCl2:4H2O
MnSO4	-13.47	-10.61	2.86	MnSO4
Morenosite	-9.40	-11.80	-2.40	NiSO4:7H2O
Na4UO2(CO3)3	-33.67	-49.96	-16.29	Na4UO2(CO3)3
Nahcolite	-8.01	-18.97	-10.97	NaHCO3
Nantokite	-6.40	-15.98	-9.58	CuCl
Natron	-14.93	-16.43	-1.50	Na2CO3:10H2O
Nesquehonite	-6.61	-12.16	-5.55	MgCO3:3H2O
Ni(OH)2	-3.84	6.58	10.43	Ni(OH)2
Ni3(AsO4)2:8H2O	-19.73	-3.97	15.77	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-24.05	7.95	32.00	Ni4(OH)6SO4
NiCO3	-8.21	-14.93	-6.72	NiCO3
Nsutite	-12.93	29.63	42.56	MnO2
O2(g)	-41.16	43.72	84.88	O2
Pb(OH)2	-1.74	6.58	8.32	Pb(OH)2
Pb2(OH)3Cl	-7.82	0.98	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.03	13.17	26.20	PbO:Pb(OH)2
Pb2O3	-26.01	35.03	61.04	Pb2O3
Pb2OCO3	-7.99	-8.35	-0.36	PbO:PbCO3
Pb3(AsO4)2	-9.84	-3.96	5.88	Pb3(AsO4)2
Pb3O2CO3	-13.11	-1.76	11.34	PbCO3:2PbO
Pb3O2SO4	-9.28	1.37	10.65	PbSO4:2PbO
Pb4(OH)6SO4	-13.15	7.95	21.10	Pb4(OH)6SO4
Pb4O3SO4	-14.57	7.95	22.53	PbSO4:3PbO
PbF2	-8.66	-16.09	-7.43	PbF2
PbMetal	-19.54	-15.28	4.27	Pb
PbO:0.3H2O	-6.40	6.58	12.98	PbO:0.33H2O
Phosgenite	-12.92	-32.73	-19.81	PbCl2:PbCO3
Plattnerite	-21.72	28.44	50.17	PbO2
Portlandite	-13.38	9.80	23.18	Ca(OH)2
Pyrochroite	-7.43	7.77	15.20	Mn(OH)2
Pyrolusite	-12.55	29.63	42.18	MnO2
Retgersite	-9.74	-11.80	-2.05	NiSO4:6H2O
Rhodochrosite	-2.63	-13.74	-11.11	MnCO3
Rhodochrosite(d)	-3.35	-13.74	-10.39	MnCO3
Rutherfordine	-2.66	-17.09	-14.43	UO2CO3
Schoepite	-1.13	4.42	5.55	UO2(OH)2:H2O
Scorodite	-5.26	8.27	13.53	FeAsO4:2H2O
Siderite	-1.46	-12.32	-10.86	FeCO3
Siderite(d)(3)	-1.87	-12.32	-10.45	FeCO3
Smithsonite	-3.50	-13.45	-9.95	ZnCO3
Tenorite	-0.67	7.14	7.81	CuO
Thenardite	-13.13	-13.30	-0.17	Na2SO4
Thermonatrite	-16.59	-16.43	0.16	Na2CO3:H2O
Trona	-24.46	-35.41	-10.95	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-23.15	-35.82	-12.66	U(OH)2SO4
U3O8(c)	-2.16	-8.59	-6.43	U3O8
U4O9(c)	-7.90	-47.89	-39.99	U4O9
UF4(c)	-34.95	-62.79	-27.84	UF4
UF4:2.5H2O	-25.76	-62.79	-37.02	UF4:2.5H2O
UO2(a)	-8.08	-17.44	-9.36	UO2
UO3(gamma)	-3.53	4.42	7.96	UO3
Uraninite(c)	-3.40	-17.44	-14.03	UO2
Witherite	-5.62	-14.20	-8.57	BaCO3
Zincite(c)	-3.34	8.07	11.41	ZnO
Zincosite	-13.56	-10.31	3.25	ZnSO4
Zn(OH)2-a	-4.38	8.07	12.45	Zn(OH)2
Zn(OH)2-b	-3.68	8.07	11.75	Zn(OH)2
Zn(OH)2-c	-4.13	8.07	12.20	Zn(OH)2
Zn(OH)2-e	-3.43	8.07	11.50	Zn(OH)2
Zn(OH)2-g	-3.64	8.07	11.71	Zn(OH)2
Zn2(OH)2SO4	-9.74	-2.24	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-11.25	3.95	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-13.24	0.49	13.73	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-32.33	-12.55	19.78	ZnO:2ZnSO4
Zn4(OH)6SO4	-14.51	13.89	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-22.54	15.96	38.50	Zn5(OH)8Cl2
ZnCl2	-23.56	-16.31	7.24	ZnCl2
ZnCO3:H2O	-3.19	-13.45	-10.26	ZnCO3:H2O
ZnF2	-13.25	-14.61	-1.36	ZnF2
ZnMetal	-40.00	-13.79	26.21	Zn
ZnO(a)	-3.24	8.07	11.31	ZnO
ZnSO4:H2O	-9.87	-10.31	-0.44	ZnSO4:H2O

End of simulation.

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------------------
Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 0.5-1.5m
           SOLUTION        2
           units           mg/l
           temp            23.4
           pH              7.43
           F               0.66
           Cl              1.4
           S(6)            5.4       as SO4
           Na              1.18
           K               2.8
           Mg              1.5
           Ca              7.0
           Alkalinity     30.5       as HCO3
           Al              0.16
           As(+3)          0.003
           As(+5)          0.010
           Ba              0.048
           Cu              0.016
           Fe              0.54
           Ni              0.0048
           Pb              0.0015
           Zn              0.025
           END
```

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-----
TITLE
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   Schneckentein 0.5-1.5m

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Beginning of initial solution calculations.
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Initial solution 2.

----------------------------Solution composition-----
------------------------

           Elements           Molality       Moles

           Al                5.930e-06   5.930e-06
           Alkalinity        4.999e-04   4.999e-04
           As(3)             4.004e-08   4.004e-08
           As(5)             1.335e-07   1.335e-07
           Ba                3.495e-07   3.495e-07
           Ca                1.747e-04   1.747e-04
           Cl                3.949e-05   3.949e-05
           Cu                2.518e-07   2.518e-07
           F                 3.474e-05   3.474e-05
           Fe                9.670e-06   9.670e-06
           K                 7.161e-05   7.161e-05
           Mg                6.170e-05   6.170e-05
           Na                5.133e-05   5.133e-05
           Ni                8.176e-08   8.176e-08
           Pb                7.240e-09   7.240e-09
           S(6)              5.622e-05   5.622e-05
           Zn                3.825e-07   3.825e-07
```

```
----------------------------Description of solution----------------------------

                                    pH  =   7.430
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   9.171e-04
                     Mass of water (kg)  =   1.000e+00
                  Total carbon (mol/kg)  =   5.070e-04
                     Total CO2 (mol/kg)  =   5.070e-04
                    Temperature (deg C)  =  23.400
                 Electrical balance (eq)  =  -5.951e-05
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  -4.75
                               Iterations  =   9
                                  Total H  = 1.110129e+02
                                  Total O  = 5.550797e+01

--------------------------------Redox couples--------------------------------

           Redox couple             pe  Eh (volts)

           As(3)/As(5)         -0.6567     -0.0386
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	2.467e-07	2.385e-07	-6.608	-6.623	-0.015
H+	3.838e-08	3.715e-08	-7.416	-7.430	-0.014
H2O	5.551e+01	1.000e+00	-0.000	-0.000	0.000
Al	**5.930e-06**				
Al(OH)4-	5.779e-06	5.585e-06	-5.238	-5.253	-0.015
Al(OH)3	1.124e-07	1.124e-07	-6.949	-6.949	0.000
Al(OH)2+	3.304e-08	3.194e-08	-7.481	-7.496	-0.015
AlF2+	4.113e-09	3.976e-09	-8.386	-8.401	-0.015
AlF3	1.669e-09	1.669e-09	-8.778	-8.777	0.000
AlF+2	2.744e-10	2.394e-10	-9.562	-9.621	-0.059
AlOH+2	1.997e-10	1.743e-10	-9.700	-9.759	-0.059
AlF4-	2.296e-11	2.219e-11	-10.639	-10.654	-0.015
Al+3	9.833e-13	7.237e-13	-12.007	-12.140	-0.133
AlSO4+	1.098e-13	1.061e-13	-12.959	-12.974	-0.015
Al(SO4)2-	1.632e-16	1.577e-16	-15.787	-15.802	-0.015
AlHSO4+2	3.951e-22	3.448e-22	-21.403	-21.462	-0.059
As(3)	**4.004e-08**				
H3AsO3	3.943e-08	3.944e-08	-7.404	-7.404	0.000
H2AsO3-	6.120e-10	5.916e-10	-9.213	-9.228	-0.015
HAsO3-2	1.346e-14	1.174e-14	-13.871	-13.930	-0.059
H4AsO3+	7.512e-16	7.260e-16	-15.124	-15.139	-0.015
AsO3-3	1.567e-20	1.153e-20	-19.805	-19.938	-0.133
As(5)	**1.335e-07**				
HAsO4-2	1.118e-07	9.759e-08	-6.951	-7.011	-0.059
H2AsO4-	2.164e-08	2.091e-08	-7.665	-7.680	-0.015
AsO4-3	8.696e-12	6.400e-12	-11.061	-11.194	-0.133
H3AsO4	1.339e-13	1.339e-13	-12.873	-12.873	0.000
Ba	**3.495e-07**				
Ba+2	3.411e-07	2.977e-07	-6.467	-6.526	-0.059
BaSO4	7.062e-09	7.063e-09	-8.151	-8.151	0.000
BaHCO3+	1.266e-09	1.224e-09	-8.898	-8.912	-0.015
BaCO3	8.200e-11	8.202e-11	-10.086	-10.086	0.000
BaOH+	2.809e-13	2.715e-13	-12.551	-12.566	-0.015
C(4)	**5.070e-04**				
HCO3-	4.664e-04	4.510e-04	-3.331	-3.346	-0.015
CO2	3.844e-05	3.845e-05	-4.415	-4.415	0.000
CaHCO3+	8.734e-07	8.442e-07	-6.059	-6.074	-0.015
CO3-2	6.301e-07	5.508e-07	-6.201	-6.259	-0.058
MgHCO3+	2.879e-07	2.782e-07	-6.541	-6.556	-0.015
CaCO3	1.346e-07	1.346e-07	-6.871	-6.871	0.000
FeHCO3+	7.212e-08	6.970e-08	-7.142	-7.157	-0.015
NiCO3	6.285e-08	6.286e-08	-7.202	-7.202	0.000
CuCO3	3.758e-08	3.759e-08	-7.425	-7.425	0.000
ZnCO3	3.081e-08	3.082e-08	-7.511	-7.511	0.000
MgCO3	2.722e-08	2.723e-08	-7.565	-7.565	0.000
FeCO3	2.042e-08	2.042e-08	-7.690	-7.690	0.000
ZnHCO3+	1.647e-08	1.592e-08	-7.783	-7.798	-0.015
NaHCO3	1.257e-08	1.258e-08	-7.901	-7.900	0.000
PbCO3	5.933e-09	5.934e-09	-8.227	-8.227	0.000
CuHCO3+	2.972e-09	2.872e-09	-8.527	-8.542	-0.015
BaHCO3+	1.266e-09	1.224e-09	-8.898	-8.912	-0.015
NiHCO3+	9.916e-10	9.584e-10	-9.004	-9.018	-0.015
NaCO3-	4.852e-10	4.690e-10	-9.314	-9.329	-0.015
Zn(CO3)2-2	4.159e-10	3.629e-10	-9.381	-9.440	-0.059
PbHCO3+	2.298e-10	2.221e-10	-9.639	-9.654	-0.015
BaCO3	8.200e-11	8.202e-11	-10.086	-10.086	0.000
Ni(CO3)2-2	6.895e-11	6.017e-11	-10.161	-10.221	-0.059
Cu(CO3)2-2	2.987e-11	2.606e-11	-10.525	-10.584	-0.059
Pb(CO3)2-2	9.408e-12	8.210e-12	-11.027	-11.086	-0.059
Ca	**1.747e-04**				
Ca+2	1.722e-04	1.505e-04	-3.764	-3.822	-0.058
CaSO4	1.400e-06	1.401e-06	-5.854	-5.854	0.000
CaHCO3+	8.734e-07	8.442e-07	-6.059	-6.074	-0.015
CaCO3	1.346e-07	1.346e-07	-6.871	-6.871	0.000
CaF+	4.364e-08	4.218e-08	-7.360	-7.375	-0.015
CaOH+	6.956e-10	6.723e-10	-9.158	-9.172	-0.015
CaHSO4+	3.093e-13	2.989e-13	-12.510	-12.524	-0.015
Cl	**3.949e-05**				
Cl-	3.949e-05	3.816e-05	-4.404	-4.418	-0.015
FeCl+	8.424e-11	8.142e-11	-10.074	-10.089	-0.015
ZnCl+	2.776e-11	2.683e-11	-10.557	-10.571	-0.015
ZnOHCl	9.537e-12	9.539e-12	-11.021	-11.021	0.000
NiCl+	1.527e-12	1.476e-12	-11.816	-11.831	-0.015
CuCl+	1.248e-12	1.206e-12	-11.904	-11.918	-0.015
PbCl+	9.364e-13	9.051e-13	-12.029	-12.043	-0.015
CuCl2-	3.143e-13	3.037e-13	-12.503	-12.518	-0.015
ZnCl2	1.065e-15	1.065e-15	-14.973	-14.972	0.000
NiCl2	2.045e-16	2.045e-16	-15.689	-15.689	0.000
PbCl2	5.640e-17	5.641e-17	-16.249	-16.249	0.000
CuCl2	2.429e-17	2.430e-17	-16.614	-16.614	0.000
CuCl3-2	2.092e-17	1.826e-17	-16.679	-16.739	-0.059
FeCl+2	1.696e-18	1.480e-18	-17.771	-17.830	-0.059
ZnCl3-	4.675e-20	4.518e-20	-19.330	-19.345	-0.015
PbCl3-	1.752e-21	1.693e-21	-20.756	-20.771	-0.015
FeCl2+	2.747e-22	2.655e-22	-21.561	-21.576	-0.015
CuCl3-	3.309e-24	3.198e-24	-23.480	-23.495	-0.015
ZnCl4-2	9.778e-25	8.533e-25	-24.010	-24.069	-0.059
PbCl4-2	3.501e-26	3.055e-26	-25.456	-25.515	-0.059
FeCl3	1.013e-27	1.013e-27	-26.994	-26.994	0.000
CuCl4-2	6.753e-31	5.893e-31	-30.171	-30.230	-0.059
Cu(1)	**6.800e-10**				
Cu+	6.797e-10	6.570e-10	-9.168	-9.182	-0.015
CuCl2-	3.143e-13	3.037e-13	-12.503	-12.518	-0.015
CuCl3-2	2.092e-17	1.826e-17	-16.679	-16.739	-0.059
Cu(2)	**2.511e-07**				
Cu(OH)2	1.923e-07	1.923e-07	-6.716	-6.716	0.000
CuCO3	3.758e-08	3.759e-08	-7.425	-7.425	0.000
Cu+2	1.456e-08	1.271e-08	-7.837	-7.896	-0.059
CuOH+	3.539e-09	3.420e-09	-8.451	-8.466	-0.015
CuHCO3+	2.972e-09	2.872e-09	-8.527	-8.542	-0.015
CuSO4	1.215e-10	1.215e-10	-9.916	-9.915	0.000
Cu(CO3)2-2	2.987e-11	2.606e-11	-10.525	-10.584	-0.059
CuF+	7.876e-12	7.612e-12	-11.104	-11.119	-0.015
Cu2(OH)2+2	5.000e-12	4.363e-12	-11.301	-11.360	-0.059
CuCl+	1.248e-12	1.206e-12	-11.904	-11.918	-0.015
Cu(OH)3-	3.227e-13	3.119e-13	-12.491	-12.506	-0.015
CuCl2	2.429e-17	2.430e-17	-16.614	-16.614	0.000
Cu(OH)4-2	1.920e-18	1.675e-18	-17.717	-17.776	-0.059
CuCl3-	3.309e-24	3.198e-24	-23.480	-23.495	-0.015
CuCl4-2	6.753e-31	5.893e-31	-30.171	-30.230	-0.059
F	**3.474e-05**				
F-	3.456e-05	3.341e-05	-4.461	-4.476	-0.015
MgF+	1.178e-07	1.138e-07	-6.929	-6.944	-0.015
CaF+	4.364e-08	4.218e-08	-7.360	-7.375	-0.015
AlF2+	4.113e-09	3.976e-09	-8.386	-8.401	-0.015
HF	1.808e-09	1.809e-09	-8.743	-8.743	0.000
AlF3	1.669e-09	1.669e-09	-8.778	-8.777	0.000
NaF	9.531e-10	9.533e-10	-9.021	-9.021	0.000
FeF+	5.342e-10	5.163e-10	-9.272	-9.287	-0.015
AlF+2	2.744e-10	2.394e-10	-9.562	-9.621	-0.059
ZnF+	1.342e-10	1.297e-10	-9.872	-9.887	-0.015
AlF4-	2.296e-11	2.219e-11	-10.639	-10.654	-0.015
NiF+	1.062e-11	1.026e-11	-10.974	-10.989	-0.015
CuF+	7.876e-12	7.612e-12	-11.104	-11.119	-0.015
PbF+	3.810e-13	3.683e-13	-12.419	-12.434	-0.015
HF2-	2.368e-13	2.289e-13	-12.626	-12.640	-0.015
FeF2+	9.425e-14	9.109e-14	-13.026	-13.041	-0.015
FeF+2	8.001e-14	6.982e-14	-13.097	-13.156	-0.059
FeF3	4.796e-15	4.797e-15	-14.319	-14.319	0.000
PbF2	2.511e-16	2.512e-16	-15.600	-15.600	0.000
H2F2	9.027e-18	9.029e-18	-17.044	-17.044	0.000
PbF3-	6.290e-20	6.079e-20	-19.201	-19.216	-0.015
PbF4-2	1.114e-24	9.720e-25	-23.953	-24.012	-0.059
Fe(2)	**1.889e-06**				
Fe+2	1.771e-06	1.546e-06	-5.752	-5.811	-0.059
FeHCO3+	7.212e-08	6.970e-08	-7.142	-7.157	-0.015
FeCO3	2.042e-08	2.042e-08	-7.690	-7.690	0.000
FeSO4	1.263e-08	1.264e-08	-7.898	-7.898	0.000
FeOH+	1.207e-08	1.167e-08	-7.918	-7.933	-0.015
FeF+	5.342e-10	5.163e-10	-9.272	-9.287	-0.015
FeCl+	8.424e-11	8.142e-11	-10.074	-10.089	-0.015
Fe(OH)2	2.323e-12	2.323e-12	-11.634	-11.634	0.000
FeHSO4+	3.176e-15	3.070e-15	-14.498	-14.513	-0.015
Fe(OH)3-	2.366e-15	2.287e-15	-14.626	-14.641	-0.015

Fe(3)	7.781e-06					
	Fe(OH)3	5.789e-06	5.791e-06	-5.237	-5.237	0.000
	Fe(OH)2+	1.853e-06	1.791e-06	-5.732	-5.747	-0.015
	Fe(OH)4-	1.379e-07	1.332e-07	-6.861	-6.875	-0.015
	FeOH+2	2.448e-10	2.136e-10	-9.611	-9.670	-0.059
	FeF2+	9.425e-14	9.109e-14	-13.026	-13.041	-0.015
	FeF+2	8.001e-14	6.982e-14	-13.097	-13.156	-0.059
	FeF3	4.796e-15	4.797e-15	-14.319	-14.319	0.000
	Fe+3	1.836e-15	1.351e-15	-14.736	-14.869	-0.133
	FeSO4+	7.005e-16	6.771e-16	-15.155	-15.169	-0.015
	Fe2(OH)2+4	2.264e-18	1.313e-18	-17.645	-17.882	-0.237
	FeCl+2	1.696e-18	1.480e-18	-17.771	-17.830	-0.059
	Fe(SO4)2-	7.210e-19	6.969e-19	-18.142	-18.157	-0.015
	Fe3(OH)4+5	1.335e-21	5.700e-22	-20.874	-21.244	-0.370
	FeCl2+	2.747e-22	2.655e-22	-21.561	-21.576	-0.015
	FeHSO4+2	7.726e-23	6.742e-23	-22.112	-22.171	-0.059
	FeCl3	1.013e-27	1.013e-27	-26.994	-26.994	0.000
H(0)	1.962e-26					
	H2	9.808e-27	9.810e-27	-26.008	-26.008	0.000
K	7.161e-05					
	K+	7.159e-05	6.918e-05	-4.145	-4.160	-0.015
	KSO4-	2.350e-08	2.272e-08	-7.629	-7.644	-0.015
Mg	6.170e-05					
	Mg+2	6.070e-05	5.309e-05	-4.217	-4.275	-0.058
	MgSO4	5.652e-07	5.653e-07	-6.248	-6.248	0.000
	MgHCO3+	2.879e-07	2.782e-07	-6.541	-6.556	-0.015
	MgF+	1.178e-07	1.138e-07	-6.929	-6.944	-0.015
	MgCO3	2.722e-08	2.723e-08	-7.565	-7.565	0.000
	MgOH+	4.642e-09	4.487e-09	-8.333	-8.348	-0.015
Na	5.133e-05					
	Na+	5.130e-05	4.959e-05	-4.290	-4.305	-0.015
	NaHCO3	1.257e-08	1.258e-08	-7.901	-7.900	0.000
	NaSO4-	1.205e-08	1.165e-08	-7.919	-7.934	-0.015
	NaF	9.531e-10	9.533e-10	-9.021	-9.021	0.000
	NaCO3-	4.852e-10	4.690e-10	-9.314	-9.329	-0.015
Ni	8.176e-08					
	NiCO3	6.285e-08	6.286e-08	-7.202	-7.202	0.000
	Ni+2	1.764e-08	1.540e-08	-7.753	-7.813	-0.059
	NiHCO3+	9.916e-10	9.584e-10	-9.004	-9.018	-0.015
	NiSO4	1.402e-10	1.402e-10	-9.853	-9.853	0.000
	Ni(CO3)2-2	6.895e-11	6.017e-11	-10.161	-10.221	-0.059
	NiOH+	5.286e-11	5.109e-11	-10.277	-10.292	-0.015
	NiF+	1.062e-11	1.026e-11	-10.974	-10.989	-0.015
	NiCl+	1.527e-12	1.476e-12	-11.816	-11.831	-0.015
	Ni(OH)2	1.115e-12	1.115e-12	-11.953	-11.953	0.000
	Ni(SO4)2-2	4.141e-16	3.614e-16	-15.383	-15.442	-0.059
	Ni(OH)3-	3.106e-16	3.002e-16	-15.508	-15.523	-0.015
	NiCl2	2.045e-16	2.045e-16	-15.689	-15.689	0.000
O(0)	0.000e+00					
	O2	0.000e+00	0.000e+00	-40.893	-40.893	0.000
Pb	7.240e-09					
	PbCO3	5.933e-09	5.934e-09	-8.227	-8.227	0.000
	Pb+2	7.104e-10	6.200e-10	-9.148	-9.208	-0.059
	PbOH+	3.366e-10	3.254e-10	-9.473	-9.488	-0.015
	PbHCO3+	2.298e-10	2.221e-10	-9.639	-9.654	-0.015
	PbSO4	1.650e-11	1.651e-11	-10.782	-10.782	0.000
	Pb(CO3)2-2	9.408e-12	8.210e-12	-11.027	-11.086	-0.059
	Pb(OH)2	3.406e-12	3.407e-12	-11.468	-11.468	0.000
	PbCl+	9.364e-13	9.051e-13	-12.029	-12.043	-0.015
	PbF+	3.810e-13	3.683e-13	-12.419	-12.434	-0.015
	Pb(SO4)2-2	4.700e-15	4.101e-15	-14.328	-14.387	-0.059
	Pb(OH)3-	1.089e-15	1.053e-15	-14.963	-14.978	-0.015
	PbF2	2.511e-16	2.512e-16	-15.600	-15.600	0.000
	PbCl2	5.640e-17	5.641e-17	-16.249	-16.249	0.000
	Pb2OH+3	6.135e-18	4.516e-18	-17.212	-17.345	-0.133
	Pb(OH)4-2	7.439e-20	6.491e-20	-19.129	-19.188	-0.059
	PbF3-	6.290e-20	6.079e-20	-19.201	-19.216	-0.015
	PbCl3-	1.752e-21	1.693e-21	-20.756	-20.771	-0.015
	Pb3(OH)4+2	1.484e-22	1.295e-22	-21.829	-21.888	-0.059
	PbF4-2	1.114e-24	9.720e-25	-23.953	-24.012	-0.059
	PbCl4-2	3.501e-26	3.055e-26	-25.456	-25.515	-0.059
S(6)	5.622e-05					
	SO4-2	5.419e-05	4.735e-05	-4.266	-4.325	-0.059
	CaSO4	1.400e-06	1.401e-06	-5.854	-5.854	0.000
	MgSO4	5.652e-07	5.653e-07	-6.248	-6.248	0.000
	KSO4-	2.350e-08	2.272e-08	-7.629	-7.644	-0.015
	FeSO4	1.263e-08	1.264e-08	-7.898	-7.898	0.000
	NaSO4-	1.205e-08	1.165e-08	-7.919	-7.934	-0.015
	BaSO4	7.062e-09	7.063e-09	-8.151	-8.151	0.000
	ZnSO4	3.074e-09	3.074e-09	-8.512	-8.512	0.000
	HSO4-	1.709e-10	1.652e-10	-9.767	-9.782	-0.015
	NiSO4	1.402e-10	1.402e-10	-9.853	-9.853	0.000
	CuSO4	1.215e-10	1.215e-10	-9.916	-9.915	0.000
	PbSO4	1.650e-11	1.651e-11	-10.782	-10.782	0.000
	Zn(SO4)2-2	1.373e-12	1.198e-12	-11.862	-11.922	-0.059
	CaHSO4+	3.093e-13	2.989e-13	-12.510	-12.524	-0.015
	AlSO4+	1.098e-13	1.061e-13	-12.959	-12.974	-0.015
	Pb(SO4)2-2	4.700e-15	4.101e-15	-14.328	-14.387	-0.059
	FeHSO4+	3.176e-15	3.070e-15	-14.498	-14.513	-0.015
	FeSO4+	7.005e-16	6.771e-16	-15.155	-15.169	-0.015
	Ni(SO4)2-2	4.141e-16	3.614e-16	-15.383	-15.442	-0.059
	Al(SO4)2-	1.632e-16	1.577e-16	-15.787	-15.802	-0.015
	Fe(SO4)2-	7.210e-19	6.969e-19	-18.142	-18.157	-0.015
	AlHSO4+2	3.951e-22	3.448e-22	-21.403	-21.462	-0.059
	FeHSO4+2	7.726e-23	6.742e-23	-22.112	-22.171	-0.059
Zn	3.825e-07					
	Zn+2	3.214e-07	2.804e-07	-6.493	-6.552	-0.059
	ZnCO3	3.081e-08	3.082e-08	-7.511	-7.511	0.000
	ZnHCO3+	1.647e-08	1.592e-08	-7.783	-7.798	-0.015
	ZnOH+	7.579e-09	7.326e-09	-8.120	-8.135	-0.015
	ZnSO4	3.074e-09	3.074e-09	-8.512	-8.512	0.000
	Zn(OH)2	2.557e-09	2.558e-09	-8.592	-8.592	0.000
	Zn(CO3)2-2	4.159e-10	3.629e-10	-9.381	-9.440	-0.059
	ZnF+	1.342e-10	1.297e-10	-9.872	-9.887	-0.015
	ZnCl+	2.776e-11	2.683e-11	-10.557	-10.571	-0.015
	ZnOHCl	9.537e-12	9.539e-12	-11.021	-11.021	0.000
	Zn(SO4)2-2	1.373e-12	1.198e-12	-11.862	-11.922	-0.059
	Zn(OH)3-	2.252e-13	2.177e-13	-12.647	-12.662	-0.015
	ZnCl2	1.065e-15	1.065e-15	-14.973	-14.972	0.000
	Zn(OH)4-2	1.064e-18	9.286e-19	-17.973	-18.032	-0.059
	ZnCl3-	4.675e-20	4.518e-20	-19.330	-19.345	-0.015
	ZnCl4-2	9.778e-25	8.533e-25	-24.010	-24.069	-0.059

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-0.76	10.15	10.90	Al(OH)3
AlAsO4:2H2O	-7.50	-2.72	4.77	AlAsO4:2H2O
AlumK	-19.75	-24.95	-5.20	KAl(SO4)2:12H2O
Alunite	-3.45	-4.65	-1.20	KAl3(SO4)2(OH)6
Anglesite	-5.73	-13.53	-7.80	PbSO4
Anhydrite	-3.79	-8.15	-4.35	CaSO4
Antlerite	-6.58	1.71	8.29	Cu3(OH)4SO4
Aragonite	-1.76	-10.08	-8.33	CaCO3
Arsenolite	-26.76	-29.62	-2.86	As4O6
Artinite	-9.66	0.05	9.71	MgCO3:Mg(OH)2:3H2O
As2O5	-32.47	-25.75	6.72	As2O5
Atacamite	-5.33	2.08	7.41	Cu2(OH)3Cl
Azurite	-4.53	-21.35	-16.81	Cu3(OH)2(CO3)2
Ba3(AsO4)2	8.18	-0.75	-8.93	Ba3(AsO4)2
BaF2	-9.71	-15.48	-5.76	BaF2
Barite	-0.86	-10.85	-10.00	BaSO4
Basaluminite	-1.29	21.41	22.70	Al4(OH)10SO4
Bianchite	-9.11	-10.88	-1.76	ZnSO4:6H2O
Boehmite	1.45	10.15	8.70	AlOOH
Brochantite	-6.67	8.67	15.34	Cu4(OH)6SO4
Brucite	-6.36	10.59	16.95	Mg(OH)2
Bunsenite	-5.50	7.05	12.54	NiO
Ca3(AsO4)2:4w	-14.95	7.37	22.32	Ca3(AsO4)2:4H2O
Calcite	-1.61	-10.08	-8.47	CaCO3
Cerrusite	-2.32	-15.47	-13.15	PbCO3
Chalcanthite	-9.57	-12.22	-2.65	CuSO4:5H2O
Claudetite	-26.50	-29.62	-3.12	As4O6
CO2(g)	-2.97	-21.12	-18.15	CO2
Cotunnite	-13.25	-18.04	-4.79	PbCl2
Cu(OH)2	-1.74	6.96	8.70	Cu(OH)2
Cu2SO4	-20.76	-28.12	-7.36	Cu2SO4
Cu3(AsO4)2:6w	-10.95	-4.85	6.10	Cu3(AsO4)2:6H2O
CuCO3	-4.52	-14.15	-9.63	CuCO3
CuF	-20.79	-16.37	4.42	CuF
CuF2	-16.28	-16.85	-0.57	CuF2
CuF2:2H2O	-12.31	-16.85	-4.54	CuF2:2H2O
CuMetal	-4.35	-15.90	-11.54	Cu
CuOCuSO4	-16.93	-5.26	11.67	CuO:CuSO4
CupricFerrite	15.77	47.92	32.15	CuFe2O4
Cuprite	-1.93	-8.93	-7.00	Cu2O
CuprousFerrite	14.57	16.01	1.44	CuFeO2
CuSO4	-15.30	-12.22	3.08	CuSO4
Diaspore	3.17	10.15	6.98	AlOOH
Dolomite	-3.56	-20.62	-17.05	CaMg(CO3)2
Dolomite(d)	-4.12	-20.62	-16.50	CaMg(CO3)2
Epsomite	-6.45	-8.60	-2.15	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.91	16.92	10.02	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.53	20.48	17.95	Fe(OH)3
Fe3(OH)8	3.67	50.01	46.34	Fe3(OH)8
Fluorite	-2.16	-12.77	-10.62	CaF2
Gibbsite	1.95	10.15	8.20	Al(OH)3
Goethite	8.42	20.48	12.06	FeOOH
Goslarite	-8.90	-10.88	-1.97	ZnSO4:7H2O
Gypsum	-3.57	-8.15	-4.58	CaSO4:2H2O
H2(g)	-22.82	-22.86	-0.04	H2
Halite	-10.30	-8.72	1.58	NaCl
Hematite	18.73	40.96	22.23	Fe2O3
Huntite	-11.82	-41.68	-29.87	CaMg3(CO3)4
Hydrocerrusite	-7.82	-25.28	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-23.00	-31.55	-8.56	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-5.50	25.68	31.17	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-3.75	26.34	30.09	KFe3(SO4)2(OH)6
Jarosite-Na	-7.84	26.19	34.04	NaFe3(SO4)2(OH)6
JarositeH	-10.94	23.07	34.00	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-5.81	-9.04	-3.23	AlOHSO4
Langite	-8.28	8.67	16.95	Cu4(OH)6SO4:H2O
Larnakite	-7.63	-7.88	-0.25	PbO:PbSO4
Laurionite	-6.82	-6.20	0.62	PbOHCl
Litharge	-7.13	5.65	12.78	PbO
Magnemite	8.46	40.96	32.50	Fe2O3
Magnesite	-2.53	-10.53	-8.00	MgCO3
Magnetite	19.95	50.01	30.05	Fe3O4
Malachite	-2.08	-7.19	-5.12	Cu2(OH)2CO3
Massicot	-7.32	5.65	12.98	PbO
Matlockite	-8.64	-18.10	-9.46	PbClF
Melanothallite	-20.51	-16.73	3.78	CuCl2
Melanterite	-7.91	-10.14	-2.23	FeSO4:7H2O
Minium	-34.28	39.82	74.10	Pb3O4
Mirabilite	-11.74	-12.93	-1.19	Na2SO4:10H2O
Morenosite	-9.77	-12.14	-2.37	NiSO4:7H2O
Nahcolite	-7.09	-17.99	-10.91	NaHCO3
Nantokite	-6.80	-16.31	-9.51	CuCl
Natron	-13.49	-14.87	-1.37	Na2CO3:10H2O
Nesquehonite	-4.94	-10.53	-5.60	MgCO3:3H2O
Ni(OH)2	-3.63	7.05	10.68	Ni(OH)2
Ni3(AsO4)2:8H2O	-20.31	-4.60	15.71	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-23.00	9.00	32.00	Ni4(OH)6SO4
NiCO3	-7.27	-14.07	-6.80	NiCO3
O2(g)	-38.01	45.72	83.73	O2
Pb(OH)2	-2.55	5.65	8.21	Pb(OH)2
Pb2(OH)3Cl	-9.34	-0.54	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.90	11.30	26.20	PbO:Pb(OH)2
Pb2O3	-26.88	34.16	61.04	Pb2O3
Pb2OCO3	-9.36	-9.81	-0.45	PbO:PbCO3
Pb3(AsO4)2	-14.61	-8.79	5.82	Pb3(AsO4)2
Pb3O2CO3	-15.29	-4.16	11.12	PbCO3:2PbO
Pb3O2SO4	-12.71	-2.23	10.48	PbSO4:2PbO
Pb4(OH)6SO4	-17.68	3.42	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.81	3.42	22.24	PbSO4:3PbO
PbF2	-10.72	-18.16	-7.44	PbF2
PbMetal	-21.48	-17.21	4.27	Pb
PbO:0.3H2O	-7.33	5.65	12.98	PbO:0.33H2O
Phosgenite	-13.70	-33.51	-19.81	PbCl2:PbCO3
Plattnerite	-21.07	28.51	49.58	PbO2
Portlandite	-11.89	11.04	22.92	Ca(OH)2
Retgersite	-10.09	-12.14	-2.04	NiSO4:6H2O
Scorodite	-5.81	7.61	13.42	FeAsO4:2H2O
Siderite	-1.19	-12.07	-10.88	FeCO3
Siderite(d)(3)	-1.62	-12.07	-10.45	FeCO3
Smithsonite	-2.83	-12.81	-9.98	ZnCO3
Tenorite	-0.72	6.96	7.68	CuO
Thenardite	-12.76	-12.93	-0.18	Na2SO4
Thermonatrite	-15.00	-14.87	0.14	Na2CO3:H2O
Trona	-21.79	-32.86	-11.07	NaHCO3:Na2CO3:2H2O
Witherite	-4.22	-12.79	-8.56	BaCO3
Zincite(c)	-2.92	8.31	11.23	ZnO
Zincosite	-13.96	-10.88	3.09	ZnSO4
Zn(OH)2-a	-4.14	8.31	12.45	Zn(OH)2
Zn(OH)2-b	-3.44	8.31	11.75	Zn(OH)2
Zn(OH)2-c	-3.89	8.31	12.20	Zn(OH)2
Zn(OH)2-e	-3.19	8.31	11.50	Zn(OH)2
Zn(OH)2-g	-3.40	8.31	11.71	Zn(OH)2
Zn2(OH)2SO4	-10.07	-2.57	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-10.43	4.77	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-14.50	-0.82	13.68	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-32.71	-13.45	19.27	ZnO:2ZnSO4
Zn4(OH)6SO4	-14.35	14.05	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-20.66	17.84	38.50	Zn5(OH)8Cl2
ZnCl2	-22.49	-15.39	7.10	ZnCl2
ZnCO3:H2O	-2.55	-12.81	-10.26	ZnCO3:H2O
ZnF2	-14.04	-15.50	-1.47	ZnF2
ZnMetal	-40.45	-14.55	25.90	Zn
ZnO(a)	-3.00	8.31	11.31	ZnO
ZnSO4:H2O	-10.35	-10.88	-0.53	ZnSO4:H2O

End of simulation.

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------------------
Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 2.5-3.5m
           SOLUTION        3
           units           mg/l
           temp            19.7
           pH              7.72
           F               0.62
           Cl              0.2
           S(6)            15        as SO4
           Na              0.78
           K               1.9
           Mg              2.3
           Ca              6.7
           Alkalinity      12.2      as HCO3
           Al              0.71
           As(+3)          0.2
           As(+5)          0.19
           Ba              0.05981
           Cu              0.037
           Fe              1.59
           Ni              0.007
           Pb              0.0039
           Zn              0.058
           END
```

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TITLE
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   Schneckentein 2.5-3.5m

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Beginning of initial solution calculations.
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Initial solution 3.

-----------------------------Solution composition--------------
--------------

           Elements           Molality       Moles

           Al                2.632e-05   2.632e-05
           Alkalinity        1.999e-04   1.999e-04
           As(3)             2.670e-06   2.670e-06
           As(5)             2.536e-06   2.536e-06
           Ba                4.355e-07   4.355e-07
           Ca                1.672e-04   1.672e-04
           Cl                5.642e-06   5.642e-06
           Cu                5.823e-07   5.823e-07
           F                 3.264e-05   3.264e-05
           Fe                2.847e-05   2.847e-05
           K                 4.859e-05   4.859e-05
           Mg                9.461e-05   9.461e-05
           Na                3.393e-05   3.393e-05
           Ni                1.192e-07   1.192e-07
           Pb                1.882e-08   1.882e-08
           S(6)              1.562e-04   1.562e-04
           Zn                8.873e-07   8.873e-07
```

```
----------------------------Description of solution--------------------
--------

                                    pH  =   7.720
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   9.330e-04
                     Mass of water (kg)  =   1.000e+00
                  Total carbon (mol/kg)  =   7.060e-05
                     Total CO2 (mol/kg)  =   7.060e-05
                    Temperature (deg C)  =  19.700
                  Electrical balance (eq)  =   1.665e-04
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  15.96
                                Iterations  =   9
                                   Total H  = 1.110127e+02
                                   Total O  = 5.550725e+01

---------------------------------Redox couples-------------------------
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           Redox couple             pe  Eh (volts)

           As(3)/As(5)         -1.3541     -0.0787
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	3.599e-07	3.479e-07	-6.444	-6.459	-0.015
H+	1.969e-08	1.905e-08	-7.706	-7.720	-0.014
H2O	5.551e+01	1.000e+00	-0.000	-0.000	0.000
Al	**2.632e-05**				
Al(OH)4-	2.599e-05	2.511e-05	-4.585	-4.600	-0.015
Al(OH)3	2.706e-07	2.707e-07	-6.568	-6.568	0.000
Al(OH)2+	5.427e-08	5.245e-08	-7.265	-7.280	-0.015
AlF2+	2.680e-09	2.590e-09	-8.572	-8.587	-0.015
AlF3	1.016e-09	1.016e-09	-8.993	-8.993	0.000
AlOH+2	2.356e-10	2.055e-10	-9.628	-9.687	-0.059
AlF+2	1.944e-10	1.696e-10	-9.711	-9.771	-0.059
AlF4-	1.311e-11	1.267e-11	-10.882	-10.897	-0.015
Al+3	7.597e-13	5.588e-13	-12.119	-12.253	-0.133
AlSO4+	2.238e-13	2.163e-13	-12.650	-12.665	-0.015
Al(SO4)2-	9.060e-16	8.756e-16	-15.043	-15.058	-0.015
AlHSO4+2	4.012e-22	3.500e-22	-21.397	-21.456	-0.059
As(3)	**2.670e-06**				
H3AsO3	2.601e-06	2.602e-06	-5.585	-5.585	0.000
H2AsO3-	6.840e-08	6.611e-08	-7.165	-7.180	-0.015
HAsO3-2	2.490e-12	2.172e-12	-11.604	-11.663	-0.059
H4AsO3+	2.541e-14	2.456e-14	-13.595	-13.610	-0.015
AsO3-3	4.966e-18	3.653e-18	-17.304	-17.437	-0.133
As(5)	**2.536e-06**				
HAsO4-2	2.303e-06	2.009e-06	-5.638	-5.697	-0.059
H2AsO4-	2.323e-07	2.245e-07	-6.634	-6.649	-0.015
AsO4-3	3.183e-10	2.341e-10	-9.497	-9.631	-0.133
H3AsO4	7.109e-13	7.110e-13	-12.148	-12.148	0.000
Ba	**4.355e-07**				
Ba+2	4.117e-07	3.591e-07	-6.385	-6.445	-0.059
BaSO4	2.362e-08	2.363e-08	-7.627	-7.627	0.000
BaHCO3+	1.956e-10	1.890e-10	-9.709	-9.723	-0.015
BaCO3	2.375e-11	2.376e-11	-10.624	-10.624	0.000
BaOH+	6.608e-13	6.386e-13	-12.180	-12.195	-0.015
C(4)	**7.060e-05**				
HCO3-	6.711e-05	6.489e-05	-4.173	-4.188	-0.015
CO2	2.992e-06	2.993e-06	-5.524	-5.524	0.000
CO3-2	1.630e-07	1.424e-07	-6.788	-6.846	-0.059
CaHCO3+	1.117e-07	1.080e-07	-6.952	-6.967	-0.015
MgHCO3+	6.205e-08	5.997e-08	-7.207	-7.222	-0.015
NiCO3	5.614e-08	5.615e-08	-7.251	-7.251	0.000
CaCO3	3.096e-08	3.096e-08	-7.509	-7.509	0.000
ZnCO3	1.958e-08	1.958e-08	-7.708	-7.708	0.000
FeHCO3+	1.090e-08	1.053e-08	-7.963	-7.978	-0.015
MgCO3	1.010e-08	1.010e-08	-7.996	-7.996	0.000
PbCO3	9.645e-09	9.647e-09	-8.016	-8.016	0.000
CuCO3	7.409e-09	7.411e-09	-8.130	-8.130	0.000
ZnHCO3+	5.825e-09	5.630e-09	-8.235	-8.250	-0.015
FeCO3	5.543e-09	5.544e-09	-8.256	-8.256	0.000
NaHCO3	1.196e-09	1.196e-09	-8.922	-8.922	0.000
NiHCO3+	4.929e-10	4.764e-10	-9.307	-9.322	-0.015
CuHCO3+	3.260e-10	3.151e-10	-9.487	-9.502	-0.015
PbHCO3+	2.079e-10	2.009e-10	-9.682	-9.697	-0.015
BaHCO3+	1.956e-10	1.890e-10	-9.709	-9.723	-0.015
NaCO3-	6.851e-11	6.621e-11	-10.164	-10.179	-0.015
Zn(CO3)2-2	6.836e-11	5.964e-11	-10.165	-10.224	-0.059
BaCO3	2.375e-11	2.376e-11	-10.624	-10.624	0.000
Ni(CO3)2-2	1.593e-11	1.390e-11	-10.798	-10.857	-0.059
Pb(CO3)2-2	3.956e-12	3.451e-12	-11.403	-11.462	-0.059
Cu(CO3)2-2	1.523e-12	1.329e-12	-11.817	-11.877	-0.059
Ca	**1.672e-04**				
Ca+2	1.634e-04	1.428e-04	-3.787	-3.845	-0.059
CaSO4	3.556e-06	3.557e-06	-5.449	-5.449	0.000
CaHCO3+	1.117e-07	1.080e-07	-6.952	-6.967	-0.015
CaF+	3.557e-08	3.438e-08	-7.449	-7.464	-0.015
CaCO3	3.096e-08	3.096e-08	-7.509	-7.509	0.000
CaOH+	1.287e-09	1.244e-09	-8.890	-8.905	-0.015
CaHSO4+	3.858e-13	3.729e-13	-12.414	-12.428	-0.015
Cl	**5.642e-06**				
Cl-	5.641e-06	5.451e-06	-5.249	-5.263	-0.015
FeCl+	1.264e-11	1.221e-11	-10.898	-10.913	-0.015
ZnCl+	8.248e-12	7.971e-12	-11.084	-11.098	-0.015
ZnOHCl	6.527e-12	6.529e-12	-11.185	-11.185	0.000
PbCl+	7.657e-13	7.400e-13	-12.116	-12.131	-0.015
NiCl+	7.536e-13	7.283e-13	-12.123	-12.138	-0.015
CuCl+	1.129e-13	1.092e-13	-12.947	-12.962	-0.015
CuCl2-	4.762e-15	4.602e-15	-14.322	-14.337	-0.015
ZnCl2	4.451e-17	4.452e-17	-16.352	-16.351	0.000
NiCl2	1.441e-17	1.441e-17	-16.841	-16.841	0.000
PbCl2	7.070e-18	7.071e-18	-17.151	-17.150	0.000
CuCl2	3.014e-19	3.014e-19	-18.521	-18.521	0.000
FeCl+2	1.834e-19	1.600e-19	-18.737	-18.796	-0.059
CuCl3-2	4.464e-20	3.895e-20	-19.350	-19.410	-0.059
ZnCl3-	2.728e-22	2.637e-22	-21.564	-21.579	-0.015
PbCl3-	3.065e-23	2.962e-23	-22.514	-22.528	-0.015
FeCl2+	4.783e-24	4.622e-24	-23.320	-23.335	-0.015
CuCl3-	5.483e-27	5.299e-27	-26.261	-26.276	-0.015
ZnCl4-2	7.912e-28	6.902e-28	-27.102	-27.161	-0.059
PbCl4-2	8.498e-29	7.413e-29	-28.071	-28.130	-0.059
FeCl3	2.519e-30	2.520e-30	-29.599	-29.599	0.000
CuCl4-2	1.465e-34	1.278e-34	-33.834	-33.894	-0.059
Cu(1)	**5.003e-10**				
Cu+	5.003e-10	4.835e-10	-9.301	-9.316	-0.015
CuCl2-	4.762e-15	4.602e-15	-14.322	-14.337	-0.015
CuCl3-2	4.464e-20	3.895e-20	-19.350	-19.410	-0.059
Cu(2)	**5.818e-07**				
Cu(OH)2	5.574e-07	5.575e-07	-6.254	-6.254	0.000
Cu+2	1.111e-08	9.689e-09	-7.954	-8.014	-0.059
CuCO3	7.409e-09	7.411e-09	-8.130	-8.130	0.000
CuOH+	5.261e-09	5.085e-09	-8.279	-8.294	-0.015
CuHCO3+	3.260e-10	3.151e-10	-9.487	-9.502	-0.015
CuSO4	2.501e-10	2.502e-10	-9.602	-9.602	0.000
Cu2(OH)2+2	7.590e-12	6.621e-12	-11.120	-11.179	-0.059
CuF+	5.442e-12	5.259e-12	-11.264	-11.279	-0.015
Cu(OH)3-	1.824e-12	1.763e-12	-11.739	-11.754	-0.015
Cu(CO3)2-2	1.523e-12	1.329e-12	-11.817	-11.877	-0.059
CuCl+	1.129e-13	1.092e-13	-12.947	-12.962	-0.015
Cu(OH)4-2	2.116e-17	1.846e-17	-16.674	-16.734	-0.059
CuCl2	3.014e-19	3.014e-19	-18.521	-18.521	0.000
CuCl3-	5.483e-27	5.299e-27	-26.261	-26.276	-0.015
CuCl4-2	1.465e-34	1.278e-34	-33.834	-33.894	-0.059
F	**3.264e-05**				
F-	3.243e-05	3.134e-05	-4.489	-4.504	-0.015
MgF+	1.567e-07	1.514e-07	-6.805	-6.820	-0.015
CaF+	3.557e-08	3.438e-08	-7.449	-7.464	-0.015
AlF2+	2.680e-09	2.590e-09	-8.572	-8.587	-0.015
AlF3	1.016e-09	1.016e-09	-8.993	-8.993	0.000
HF	8.149e-10	8.151e-10	-9.089	-9.089	0.000
NaF	5.910e-10	5.911e-10	-9.228	-9.228	0.000
FeF+	5.263e-10	5.087e-10	-9.279	-9.294	-0.015
ZnF+	2.950e-10	2.851e-10	-9.530	-9.545	-0.015
AlF+2	1.944e-10	1.696e-10	-9.711	-9.771	-0.059
NiF+	3.442e-11	3.326e-11	-10.463	-10.478	-0.015
AlF4-	1.311e-11	1.267e-11	-10.882	-10.897	-0.015
CuF+	5.442e-12	5.259e-12	-11.264	-11.279	-0.015
PbF+	2.248e-12	2.173e-12	-11.648	-11.663	-0.015
HF2-	9.700e-14	9.375e-14	-13.013	-13.028	-0.015
FeF2+	6.387e-14	6.173e-14	-13.195	-13.209	-0.015
FeF+2	6.046e-14	5.275e-14	-13.219	-13.278	-0.059
FeF3	3.010e-15	3.011e-15	-14.521	-14.521	0.000
PbF2	1.390e-15	1.390e-15	-14.857	-14.857	0.000
H2F2	2.090e-18	2.091e-18	-17.680	-17.680	0.000
PbF3-	3.267e-19	3.157e-19	-18.486	-18.501	-0.015
PbF4-2	5.429e-24	4.736e-24	-23.265	-23.325	-0.059
Fe(2)	**1.930e-06**				
Fe+2	1.860e-06	1.623e-06	-5.730	-5.790	-0.059
FeSO4	3.432e-08	3.432e-08	-7.465	-7.464	0.000
FeOH+	1.862e-08	1.800e-08	-7.730	-7.745	-0.015
FeHCO3+	1.090e-08	1.053e-08	-7.963	-7.978	-0.015
FeCO3	5.543e-09	5.544e-09	-8.256	-8.256	0.000
FeF+	5.263e-10	5.087e-10	-9.279	-9.294	-0.015
FeCl+	1.264e-11	1.221e-11	-10.898	-10.913	-0.015
Fe(OH)2	5.026e-12	5.027e-12	-11.299	-11.299	0.000
Fe(OH)3-	9.619e-15	9.296e-15	-14.017	-14.032	-0.015
FeHSO4+	4.384e-15	4.237e-15	-14.358	-14.373	-0.015

Fe(3)	2.654e-05					
	Fe(OH)3	2.152e-05	2.152e-05	-4.667	-4.667	0.000
	Fe(OH)2+	4.167e-06	4.027e-06	-5.380	-5.395	-0.015
	Fe(OH)4-	8.580e-07	8.292e-07	-6.067	-6.081	-0.015
	FeOH+2	3.260e-10	2.844e-10	-9.487	-9.546	-0.059
	FeF2+	6.387e-14	6.173e-14	-13.195	-13.209	-0.015
	FeF+2	6.046e-14	5.275e-14	-13.219	-13.278	-0.059
	FeF3	3.010e-15	3.011e-15	-14.521	-14.521	0.000
	Fe+3	1.568e-15	1.153e-15	-14.805	-14.938	-0.133
	FeSO4+	1.524e-15	1.473e-15	-14.817	-14.832	-0.015
	Fe2(OH)2+4	4.697e-18	2.720e-18	-17.328	-17.565	-0.237
	Fe(SO4)2-	4.285e-18	4.141e-18	-17.368	-17.383	-0.015
	FeCl+2	1.834e-19	1.600e-19	-18.737	-18.796	-0.059
	Fe3(OH)4+5	8.840e-21	3.766e-21	-20.054	-20.424	-0.371
	FeHSO4+2	8.669e-23	7.563e-23	-22.062	-22.121	-0.059
	FeCl2+	4.783e-24	4.622e-24	-23.320	-23.335	-0.015
	FeCl3	2.519e-30	2.520e-30	-29.599	-29.599	0.000
H(0)	5.206e-27					
	H2	2.603e-27	2.604e-27	-26.585	-26.584	0.000
K	4.859e-05					
	K+	4.855e-05	4.691e-05	-4.314	-4.329	-0.015
	KSO4-	4.212e-08	4.070e-08	-7.376	-7.390	-0.015
Mg	9.461e-05					
	Mg+2	9.221e-05	8.063e-05	-4.035	-4.094	-0.058
	MgSO4	2.159e-06	2.159e-06	-5.666	-5.666	0.000
	MgF+	1.567e-07	1.514e-07	-6.805	-6.820	-0.015
	MgHCO3+	6.205e-08	5.997e-08	-7.207	-7.222	-0.015
	MgCO3	1.010e-08	1.010e-08	-7.996	-7.996	0.000
	MgOH+	9.766e-09	9.438e-09	-8.010	-8.025	-0.015
Na	3.393e-05					
	Na+	3.391e-05	3.277e-05	-4.470	-4.484	-0.015
	NaSO4-	2.156e-08	2.084e-08	-7.666	-7.681	-0.015
	NaHCO3	1.196e-09	1.196e-09	-8.922	-8.922	0.000
	NaF	5.910e-10	5.911e-10	-9.228	-9.228	0.000
	NaCO3-	6.851e-11	6.621e-11	-10.164	-10.179	-0.015
Ni	1.192e-07					
	Ni+2	6.096e-08	5.318e-08	-7.215	-7.274	-0.059
	NiCO3	5.614e-08	5.615e-08	-7.251	-7.251	0.000
	NiSO4	1.299e-09	1.300e-09	-8.886	-8.886	0.000
	NiHCO3+	4.929e-10	4.764e-10	-9.307	-9.322	-0.015
	NiOH+	2.728e-10	2.636e-10	-9.564	-9.579	-0.015
	NiF+	3.442e-11	3.326e-11	-10.463	-10.478	-0.015
	Ni(CO3)2-2	1.593e-11	1.390e-11	-10.798	-10.857	-0.059
	Ni(OH)2	1.464e-11	1.465e-11	-10.834	-10.834	0.000
	NiCl+	7.536e-13	7.283e-13	-12.123	-12.138	-0.015
	Ni(SO4)2-2	1.100e-14	9.596e-15	-13.959	-14.018	-0.059
	Ni(OH)3-	7.954e-15	7.687e-15	-14.099	-14.114	-0.015
	NiCl2	1.441e-17	1.441e-17	-16.841	-16.841	0.000
O(0)	0.000e+00					
	O2	0.000e+00	0.000e+00	-40.988	-40.988	0.000
Pb	1.882e-08					
	PbCO3	9.645e-09	9.647e-09	-8.016	-8.016	0.000
	Pb+2	4.468e-09	3.898e-09	-8.350	-8.409	-0.059
	PbOH+	4.127e-09	3.988e-09	-8.384	-8.399	-0.015
	PbSO4	2.877e-10	2.877e-10	-9.541	-9.541	0.000
	PbHCO3+	2.079e-10	2.009e-10	-9.682	-9.697	-0.015
	Pb(OH)2	8.142e-11	8.143e-11	-10.089	-10.089	0.000
	Pb(CO3)2-2	3.956e-12	3.451e-12	-11.403	-11.462	-0.059
	PbF+	2.248e-12	2.173e-12	-11.648	-11.663	-0.015
	PbCl+	7.657e-13	7.400e-13	-12.116	-12.131	-0.015
	Pb(SO4)2-2	2.272e-13	1.982e-13	-12.644	-12.703	-0.059
	Pb(OH)3-	5.077e-14	4.907e-14	-13.294	-13.309	-0.015
	PbF2	1.390e-15	1.390e-15	-14.857	-14.857	0.000
	Pb2OH+3	4.732e-16	3.480e-16	-15.325	-15.458	-0.133
	PbCl2	7.070e-18	7.071e-18	-17.151	-17.150	0.000
	Pb(OH)4-2	6.762e-18	5.899e-18	-17.170	-17.229	-0.059
	PbF3-	3.267e-19	3.157e-19	-18.486	-18.501	-0.015
	Pb3(OH)4+2	3.021e-19	2.636e-19	-18.520	-18.579	-0.059
	PbCl3-	3.065e-23	2.962e-23	-22.514	-22.528	-0.015
	PbF4-2	5.429e-24	4.736e-24	-23.265	-23.325	-0.059
	PbCl4-2	8.498e-29	7.413e-29	-28.071	-28.130	-0.059

S(6)	1.562e-04					
	SO4-2	1.503e-04	1.313e-04	-3.823	-3.882	-0.059
	CaSO4	3.556e-06	3.557e-06	-5.449	-5.449	0.000
	MgSO4	2.159e-06	2.159e-06	-5.666	-5.666	0.000
	KSO4-	4.212e-08	4.070e-08	-7.376	-7.390	-0.015
	FeSO4	3.432e-08	3.432e-08	-7.465	-7.464	0.000
	BaSO4	2.362e-08	2.363e-08	-7.627	-7.627	0.000
	NaSO4-	2.156e-08	2.084e-08	-7.666	-7.681	-0.015
	ZnSO4	2.034e-08	2.034e-08	-7.692	-7.692	0.000
	NiSO4	1.299e-09	1.300e-09	-8.886	-8.886	0.000
	PbSO4	2.877e-10	2.877e-10	-9.541	-9.541	0.000
	CuSO4	2.501e-10	2.502e-10	-9.602	-9.602	0.000
	HSO4-	2.247e-10	2.172e-10	-9.648	-9.663	-0.015
	Zn(SO4)2-2	2.594e-11	2.263e-11	-10.586	-10.645	-0.059
	CaHSO4+	3.858e-13	3.729e-13	-12.414	-12.428	-0.015
	Pb(SO4)2-2	2.272e-13	1.982e-13	-12.644	-12.703	-0.059
	AlSO4+	2.238e-13	2.163e-13	-12.650	-12.665	-0.015
	Ni(SO4)2-2	1.100e-14	9.596e-15	-13.959	-14.018	-0.059
	FeHSO4+	4.384e-15	4.237e-15	-14.358	-14.373	-0.015
	FeSO4+	1.524e-15	1.473e-15	-14.817	-14.832	-0.015
	Al(SO4)2-	9.060e-16	8.756e-16	-15.043	-15.058	-0.015
	Fe(SO4)2-	4.285e-18	4.141e-18	-17.368	-17.383	-0.015
	AlHSO4+2	4.012e-22	3.500e-22	-21.397	-21.456	-0.059
	FeHSO4+2	8.669e-23	7.563e-23	-22.062	-22.121	-0.059
Zn	8.873e-07					
	Zn+2	7.900e-07	6.892e-07	-6.102	-6.162	-0.059
	ZnOH+	2.725e-08	2.634e-08	-7.565	-7.579	-0.015
	Zn(OH)2	2.389e-08	2.390e-08	-7.622	-7.622	0.000
	ZnSO4	2.034e-08	2.034e-08	-7.692	-7.692	0.000
	ZnCO3	1.958e-08	1.958e-08	-7.708	-7.708	0.000
	ZnHCO3+	5.825e-09	5.630e-09	-8.235	-8.250	-0.015
	ZnF+	2.950e-10	2.851e-10	-9.530	-9.545	-0.015
	Zn(CO3)2-2	6.836e-11	5.964e-11	-10.165	-10.224	-0.059
	Zn(SO4)2-2	2.594e-11	2.263e-11	-10.586	-10.645	-0.059
	ZnCl+	8.248e-12	7.971e-12	-11.084	-11.098	-0.015
	ZnOHCl	6.527e-12	6.529e-12	-11.185	-11.185	0.000
	Zn(OH)3-	4.103e-12	3.966e-12	-11.387	-11.402	-0.015
	ZnCl2	4.451e-17	4.452e-17	-16.352	-16.351	0.000
	Zn(OH)4-2	3.781e-17	3.298e-17	-16.422	-16.482	-0.059
	ZnCl3-	2.728e-22	2.637e-22	-21.564	-21.579	-0.015
	ZnCl4-2	7.912e-28	6.902e-28	-27.102	-27.161	-0.059

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-0.24	10.91	11.15	Al(OH)3
AlAsO4:2H2O	-6.05	-1.24	4.81	AlAsO4:2H2O
AlumK	-19.08	-24.35	-5.27	KAl(SO4)2:12H2O
Alunite	-1.80	-2.53	-0.73	KAl3(SO4)2(OH)6
Anglesite	-4.47	-12.29	-7.82	PbSO4
Anhydrite	-3.38	-7.73	-4.34	CaSO4
Antlerite	-5.33	2.96	8.29	Cu3(OH)4SO4
Aragonite	-2.39	-10.69	-8.30	CaCO3
Arsenolite	-19.35	-22.34	-2.99	As4O6
Artinite	-9.57	0.41	9.98	MgCO3:Mg(OH)2:3H2O
As2O5	-31.07	-24.30	6.77	As2O5
Atacamite	-5.72	1.87	7.59	Cu2(OH)3Cl
Azurite	-5.70	-22.29	-16.60	Cu3(OH)2(CO3)2
Ba3(AsO4)2	11.64	2.69	-8.95	Ba3(AsO4)2
BaF2	-9.68	-15.45	-5.77	BaF2
Barite	-0.27	-10.33	-10.06	BaSO4
Basaluminite	1.61	24.31	22.70	Al4(OH)10SO4
Bianchite	-8.28	-10.04	-1.76	ZnSO4:6H2O
Boehmite	1.95	10.91	8.96	AlOOH
Brochantite	-4.96	10.38	15.34	Cu4(OH)6SO4
Brucite	-5.85	11.35	17.20	Mg(OH)2
Bunsenite	-4.60	8.17	12.77	NiO
Ca3(AsO4)2:4w	-11.89	10.49	22.38	Ca3(AsO4)2:4H2O
Calcite	-2.24	-10.69	-8.45	CaCO3
Cerrusite	-2.06	-15.26	-13.19	PbCO3
Chalcanthite	-9.24	-11.90	-2.66	CuSO4:5H2O
Claudetite	-19.10	-22.34	-3.24	As4O6
CO2(g)	-4.12	-22.29	-18.17	CO2
Cotunnite	-14.09	-18.94	-4.84	PbCl2
Cu(OH)2	-1.42	7.43	8.84	Cu(OH)2
Cu2SO4	-20.62	-27.91	-7.29	Cu2SO4
Cu3(AsO4)2:6w	-8.18	-2.02	6.16	Cu3(AsO4)2:6H2O
CuCO3	-5.23	-14.86	-9.63	CuCO3
CuF	-21.06	-16.52	4.55	CuF
CuF2	-16.58	-17.02	-0.44	CuF2
CuF2:2H2O	-12.52	-17.02	-4.50	CuF2:2H2O
CuMetal	-4.33	-16.01	-11.69	Cu
CuOCuSO4	-16.47	-4.47	12.00	CuO:CuSO4
CupricFerrite	17.48	50.17	32.69	CuFe2O4
Cuprite	-1.56	-8.59	-7.03	Cu2O
CuprousFerrite	15.50	17.08	1.58	CuFeO2
CuSO4	-15.15	-11.90	3.25	CuSO4
Diaspore	3.70	10.91	7.21	AlOOH
Dolomite	-4.67	-21.63	-16.96	CaMg(CO3)2
Dolomite(d)	-5.24	-21.63	-16.39	CaMg(CO3)2
Epsomite	-5.80	-7.98	-2.18	MgSO4:7H2O
Fe(OH)2.7Cl.3	7.37	17.48	10.11	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	3.33	21.37	18.04	Fe(OH)3
Fe3(OH)8	5.87	52.39	46.52	Fe3(OH)8
Fluorite	-2.19	-12.85	-10.66	CaF2
Gibbsite	2.49	10.91	8.41	Al(OH)3
Goethite	9.22	21.37	12.15	FeOOH
Goslarite	-8.04	-10.04	-2.00	ZnSO4:7H2O
Gypsum	-3.15	-7.73	-4.58	CaSO4:2H2O
H2(g)	-23.39	-23.44	-0.05	H2
Halite	-11.32	-9.75	1.57	NaCl
Hematite	20.04	42.74	22.70	Fe2O3
Huntite	-13.89	-43.51	-29.63	CaMg3(CO3)4
Hydrocerrusite	-6.02	-23.48	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-24.34	-32.41	-8.07	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-3.27	28.18	31.45	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-1.79	28.86	30.65	KFe3(SO4)2(OH)6
Jarosite-Na	-5.94	28.70	34.65	NaFe3(SO4)2(OH)6
JarositeH	-9.32	25.47	34.79	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-5.18	-8.41	-3.23	AlOHSO4
Langite	-6.93	10.38	17.32	Cu4(OH)6SO4:H2O
Larnakite	-5.07	-5.26	-0.19	PbO:PbSO4
Laurionite	-6.58	-5.95	0.62	PbOHCl
Litharge	-5.91	7.03	12.94	PbO
Maghemite	10.06	42.74	32.68	Fe2O3
Magnesite	-2.99	-10.94	-7.95	MgCO3
Magnetite	21.69	52.39	30.70	Fe3O4
Malachite	-2.47	-7.43	-4.97	Cu2(OH)2CO3
Massicot	-6.10	7.03	13.13	PbO
Matlockite	-8.64	-18.18	-9.54	PbClF
Melanothallite	-22.43	-18.54	3.89	CuCl2
Melanterite	-7.40	-9.67	-2.28	FeSO4:7H2O
Minium	-30.52	44.53	75.05	Pb3O4
Mirabilite	-11.48	-12.85	-1.37	Na2SO4:10H2O
Morenosite	-8.76	-11.16	-2.40	NiSO4:7H2O
Nahcolite	-8.07	-19.05	-10.98	NaHCO3
Nantokite	-7.69	-17.28	-9.59	CuCl
Natron	-14.30	-15.82	-1.52	Na2CO3:10H2O
Nesquehonite	-5.40	-10.94	-5.54	MgCO3:3H2O
Ni(OH)2	-2.23	8.17	10.40	Ni(OH)2
Ni3(AsO4)2:8H2O	-15.57	0.20	15.77	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-18.66	13.34	32.00	Ni4(OH)6SO4
NiCO3	-7.41	-14.12	-6.71	NiCO3
O2(g)	-38.14	46.88	85.02	O2
Pb(OH)2	-1.30	7.03	8.34	Pb(OH)2
Pb2(OH)3Cl	-7.71	1.08	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-12.14	14.06	26.20	PbO:Pb(OH)2
Pb2O3	-23.54	37.50	61.04	Pb2O3
Pb2OCO3	-7.88	-8.22	-0.35	PbO:PbCO3
Pb3(AsO4)2	-9.09	-3.20	5.88	Pb3(AsO4)2
Pb3O2CO3	-12.56	-1.19	11.37	PbCO3:2PbO
Pb3O2SO4	-8.90	1.77	10.68	PbSO4:2PbO
Pb4(OH)6SO4	-12.30	8.80	21.10	Pb4(OH)6SO4
Pb4O3SO4	-13.76	8.80	22.57	PbSO4:3PbO
PbF2	-9.99	-17.42	-7.43	PbF2
PbMetal	-20.67	-16.41	4.26	Pb
PbO:0.3H2O	-5.95	7.03	12.98	PbO:0.33H2O
Phosgenite	-14.38	-34.19	-19.81	PbCl2:PbCO3
Plattnerite	-19.77	30.47	50.24	PbO2
Portlandite	-11.62	11.59	23.21	Ca(OH)2
Retgersite	-9.10	-11.16	-2.05	NiSO4:6H2O
Scorodite	-4.32	9.22	13.54	FeAsO4:2H2O
Siderite	-1.78	-12.64	-10.86	FeCO3
Siderite(d)(3)	-2.19	-12.64	-10.45	FeCO3
Smithsonite	-3.07	-13.01	-9.94	ZnCO3
Tenorite	-0.40	7.43	7.82	CuO
Thenardite	-12.68	-12.85	-0.17	Na2SO4
Thermonatrite	-15.98	-15.82	0.16	Na2CO3:H2O
Trona	-23.93	-34.87	-10.93	NaHCO3:Na2CO3:2H2O
Witherite	-4.72	-13.29	-8.58	BaCO3
Zincite(c)	-2.15	9.28	11.43	ZnO
Zincosite	-13.31	-10.04	3.26	ZnSO4
Zn(OH)2-a	-3.17	9.28	12.45	Zn(OH)2
Zn(OH)2-b	-2.47	9.28	11.75	Zn(OH)2
Zn(OH)2-c	-2.92	9.28	12.20	Zn(OH)2
Zn(OH)2-e	-2.22	9.28	11.50	Zn(OH)2
Zn(OH)2-g	-2.43	9.28	11.71	Zn(OH)2
Zn2(OH)2SO4	-8.27	-0.77	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.63	5.57	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-10.20	3.54	13.74	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-30.65	-10.81	19.84	ZnO:2ZnSO4
Zn4(OH)6SO4	-10.61	17.79	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-18.08	20.42	38.50	Zn5(OH)8Cl2
ZnCl2	-23.95	-16.69	7.26	ZnCl2
ZnCO3:H2O	-2.75	-13.01	-10.26	ZnCO3:H2O
ZnF2	-13.82	-15.17	-1.35	ZnF2
ZnMetal	-40.41	-14.16	26.24	Zn
ZnO(a)	-2.03	9.28	11.31	ZnO
ZnSO4:H2O	-9.61	-10.04	-0.43	ZnSO4:H2O

End of simulation.

```
------------------
Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 3.5-4.5m
           SOLUTION        4
           units           mg/l
           temp            21.0
           pH              7.15
           F               0.37
           Cl              0.2
           S(6)            18        as SO4
           Na              0.9
           K               2.4
           Mg              3.7
           Ca              10.1
           Alkalinity      24.4      as HCO3
           Al              0.0
           As(+3)          0.021
           As(+5)          0.016
           Ba              0.08291
           Cu              0.0083
           Fe              0.14
           Mn              0.02
           Ni              0.0022
           Pb              0.000
           U               0.11
           Zn              0.005
           END
```

```
-----
TITLE
-----

   Schneckentein 3.5-4.5m

-----------------------------------------
Beginning of initial solution calculations.
-----------------------------------------

Initial solution 4.

----------------------------Solution composition------------
-----------------

            Elements           Molality       Moles

            Alkalinity         3.999e-04   3.999e-04
            As(3)              2.803e-07   2.803e-07
            As(5)              2.136e-07   2.136e-07
            Ba                 6.037e-07   6.037e-07
            Ca                 2.520e-04   2.520e-04
            Cl                 5.642e-06   5.642e-06
            Cu                 1.306e-07   1.306e-07
            F                  1.948e-05   1.948e-05
            Fe                 2.507e-06   2.507e-06
            K                  6.138e-05   6.138e-05
            Mg                 1.522e-04   1.522e-04
            Mn                 3.641e-07   3.641e-07
            Na                 3.915e-05   3.915e-05
            Ni                 3.747e-08   3.747e-08
            S(6)               1.874e-04   1.874e-04
            U                  4.622e-07   4.622e-07
            Zn                 7.649e-08   7.649e-08
```

```
----------------------------Description of solution----------------------
-----

                                    pH  =   7.150
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   1.408e-03
                     Mass of water (kg)  =   1.000e+00
                  Total carbon (mol/kg)  =   4.614e-04
                     Total CO2 (mol/kg)  =   4.614e-04
                    Temperature (deg C)  =  21.000
                  Electrical balance (eq)  =   1.165e-04
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =   6.98
                                Iterations  =  11
                                   Total H  = 1.110128e+02
                                   Total O  = 5.550829e+01

---------------------------------Redox couples---------------------------
-----

           Redox couple             pe  Eh (volts)

           As(3)/As(5)         -0.3671     -0.0214
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	1.082e-07	1.038e-07	-6.966	-6.984	-0.018
H+	7.364e-08	7.079e-08	-7.133	-7.150	-0.017
H2O	5.551e+01	1.000e+00	-0.000	-0.000	0.000
As(3) 2.803e-07					
H3AsO3	2.782e-07	2.783e-07	-6.556	-6.555	0.000
H2AsO3-	2.086e-09	2.001e-09	-8.681	-8.699	-0.018
HAsO3-2	2.215e-14	1.875e-14	-13.655	-13.727	-0.072
H4AsO3+	1.018e-14	9.762e-15	-13.992	-14.010	-0.018
AsO3-3	1.292e-20	8.886e-21	-19.889	-20.051	-0.163
As(5) 2.136e-07					
HAsO4-2	1.565e-07	1.325e-07	-6.805	-6.878	-0.072
H2AsO4-	5.702e-08	5.470e-08	-7.244	-7.262	-0.018
AsO4-3	6.247e-12	4.295e-12	-11.204	-11.367	-0.163
H3AsO4	6.516e-13	6.518e-13	-12.186	-12.186	0.000
Ba 6.037e-07					
Ba+2	5.660e-07	4.792e-07	-6.247	-6.320	-0.072
BaSO4	3.608e-08	3.610e-08	-7.443	-7.443	0.000
BaHCO3+	1.600e-09	1.535e-09	-8.796	-8.814	-0.018
BaCO3	5.266e-11	5.268e-11	-10.278	-10.278	0.000
BaOH+	2.391e-13	2.293e-13	-12.621	-12.640	-0.018
C(4) 4.614e-04					
HCO3-	3.949e-04	3.790e-04	-3.404	-3.421	-0.018
CO2	6.366e-05	6.368e-05	-4.196	-4.196	0.000
CaHCO3+	9.801e-07	9.401e-07	-6.009	-6.027	-0.018
MgHCO3+	5.699e-07	5.467e-07	-6.244	-6.262	-0.018
UO2(CO3)2-2	3.736e-07	3.163e-07	-6.428	-6.500	-0.072
CO3-2	2.717e-07	2.306e-07	-6.566	-6.637	-0.071
CaCO3	7.452e-08	7.455e-08	-7.128	-7.128	0.000
UO2CO3	6.297e-08	6.299e-08	-7.201	-7.201	0.000
FeHCO3+	5.430e-08	5.209e-08	-7.265	-7.283	-0.018
MgCO3	2.592e-08	2.593e-08	-7.586	-7.586	0.000
CuCO3	2.305e-08	2.306e-08	-7.637	-7.637	0.000
NiCO3	2.152e-08	2.153e-08	-7.667	-7.667	0.000
MnHCO3+	1.018e-08	9.761e-09	-7.992	-8.011	-0.018
UO2(CO3)3-4	8.267e-09	4.247e-09	-8.083	-8.372	-0.289
NaHCO3	7.995e-09	7.998e-09	-8.097	-8.097	0.000
FeCO3	7.601e-09	7.603e-09	-8.119	-8.119	0.000
MnCO3	5.292e-09	5.294e-09	-8.276	-8.276	0.000
CuHCO3+	3.687e-09	3.537e-09	-8.433	-8.451	-0.018
ZnHCO3+	2.869e-09	2.752e-09	-8.542	-8.560	-0.018
ZnCO3	2.653e-09	2.654e-09	-8.576	-8.576	0.000
BaHCO3+	1.600e-09	1.535e-09	-8.796	-8.814	-0.018
NiHCO3+	6.868e-10	6.588e-10	-9.163	-9.181	-0.018
NaCO3-	1.369e-10	1.313e-10	-9.863	-9.882	-0.018
BaCO3	5.266e-11	5.268e-11	-10.278	-10.278	0.000
Zn(CO3)2-2	1.546e-11	1.309e-11	-10.811	-10.883	-0.072
Ni(CO3)2-2	1.019e-11	8.628e-12	-10.992	-11.064	-0.072
Cu(CO3)2-2	7.908e-12	6.695e-12	-11.102	-11.174	-0.072
(UO2)3(CO3)6-6	1.920e-16	4.290e-17	-15.717	-16.368	-0.651
UO2(CO3)3-5	1.900e-25	6.711e-26	-24.721	-25.173	-0.452
U(CO3)4-4	1.748e-31	8.977e-32	-30.758	-31.047	-0.289
U(CO3)5-6	7.372e-37	1.647e-37	-36.132	-36.783	-0.651
Ca 2.520e-04					
Ca+2	2.449e-04	2.078e-04	-3.611	-3.682	-0.071
CaSO4	6.000e-06	6.002e-06	-5.222	-5.222	0.000
CaHCO3+	9.801e-07	9.401e-07	-6.009	-6.027	-0.018
CaCO3	7.452e-08	7.455e-08	-7.128	-7.128	0.000
CaF+	3.177e-08	3.048e-08	-7.498	-7.516	-0.018
CaOH+	5.079e-10	4.872e-10	-9.294	-9.312	-0.018
CaHSO4+	2.473e-12	2.373e-12	-11.607	-11.625	-0.018
Cl 5.642e-06					
Cl-	5.642e-06	5.410e-06	-5.249	-5.267	-0.018
FeCl+	1.070e-11	1.026e-11	-10.971	-10.989	-0.018
MnCl+	6.640e-12	6.369e-12	-11.178	-11.196	-0.018
ZnCl+	7.323e-13	7.025e-13	-12.135	-12.153	-0.018
CuCl+	2.318e-13	2.223e-13	-12.635	-12.653	-0.018
NiCl+	1.784e-13	1.711e-13	-12.749	-12.767	-0.018
ZnOHCl	1.459e-13	1.460e-13	-12.836	-12.836	0.000
CuCl2-	9.167e-15	8.793e-15	-14.038	-14.056	-0.018
UO2Cl+	5.257e-16	5.043e-16	-15.279	-15.297	-0.018
MnCl2	1.504e-17	1.504e-17	-16.823	-16.823	0.000
ZnCl2	3.914e-18	3.915e-18	-17.407	-17.407	0.000
NiCl2	3.361e-18	3.362e-18	-17.474	-17.473	0.000
CuCl2	6.180e-19	6.182e-19	-18.209	-18.209	0.000
FeCl+2	1.784e-19	1.510e-19	-18.749	-18.821	-0.072
CuCl3-2	8.769e-20	7.423e-20	-19.057	-19.129	-0.072
UO2Cl2	1.409e-22	1.409e-22	-21.851	-21.851	0.000
ZnCl3-	2.418e-23	2.320e-23	-22.616	-22.635	-0.018
MnCl3-	2.337e-23	2.241e-23	-22.631	-22.649	-0.018
FeCl2+	4.327e-24	4.150e-24	-23.364	-23.382	-0.018
CuCl3-	1.152e-26	1.105e-26	-25.939	-25.957	-0.018
ZnCl4-2	7.195e-29	6.091e-29	-28.143	-28.215	-0.072
FeCl3	2.245e-30	2.245e-30	-29.649	-29.649	0.000
CuCl4-2	3.221e-34	2.727e-34	-33.492	-33.564	-0.072
UCl+3	0.000e+00	0.000e+00	-40.737	-40.900	-0.163
Cu(1) 9.809e-10					
Cu+	9.809e-10	9.409e-10	-9.008	-9.026	-0.018
CuCl2-	9.167e-15	8.793e-15	-14.038	-14.056	-0.018
CuCl3-2	8.769e-20	7.423e-20	-19.057	-19.129	-0.072
Cu(2) 1.296e-07					
Cu(OH)2	7.759e-08	7.762e-08	-7.110	-7.110	0.000
CuCO3	2.305e-08	2.306e-08	-7.637	-7.637	0.000
Cu+2	2.199e-08	1.862e-08	-7.658	-7.730	-0.072
CuHCO3+	3.687e-09	3.537e-09	-8.433	-8.451	-0.018
CuOH+	2.742e-09	2.630e-09	-8.562	-8.580	-0.018
CuSO4	5.555e-10	5.556e-10	-9.255	-9.255	0.000
Cu(CO3)2-2	7.908e-12	6.695e-12	-11.102	-11.174	-0.072
CuF+	6.298e-12	6.042e-12	-11.201	-11.219	-0.018
Cu2(OH)2+2	2.390e-12	2.024e-12	-11.622	-11.694	-0.072
CuCl+	2.318e-13	2.223e-13	-12.635	-12.653	-0.018
Cu(OH)3-	6.887e-14	6.606e-14	-13.162	-13.180	-0.018
CuCl2	6.180e-19	6.182e-19	-18.209	-18.209	0.000
Cu(OH)4-2	2.199e-19	1.862e-19	-18.658	-18.730	-0.072
CuCl3-	1.152e-26	1.105e-26	-25.939	-25.957	-0.018
CuCl4-2	3.221e-34	2.727e-34	-33.492	-33.564	-0.072
F 1.948e-05					
F-	1.929e-05	1.851e-05	-4.715	-4.733	-0.018
MgF+	1.484e-07	1.423e-07	-6.829	-6.847	-0.018
CaF+	3.177e-08	3.048e-08	-7.498	-7.516	-0.018
HF	1.829e-09	1.830e-09	-8.738	-8.738	0.000
NaF	3.995e-10	3.996e-10	-9.398	-9.398	0.000
FeF+	2.652e-10	2.543e-10	-9.576	-9.595	-0.018
UO2F+	1.548e-10	1.485e-10	-9.810	-9.828	-0.018
MnF+	3.857e-11	3.700e-11	-10.414	-10.432	-0.018
ZnF+	1.494e-11	1.433e-11	-10.826	-10.844	-0.018
UO2F2	9.288e-12	9.291e-12	-11.032	-11.032	0.000
CuF+	6.298e-12	6.042e-12	-11.201	-11.219	-0.018
NiF+	4.848e-12	4.650e-12	-11.314	-11.333	-0.018
HF2-	1.310e-13	1.257e-13	-12.883	-12.901	-0.018
FeF+2	3.423e-14	2.898e-14	-13.466	-13.538	-0.072
UO2F3-	3.411e-14	3.272e-14	-13.467	-13.485	-0.018
FeF2+	2.121e-14	2.034e-14	-13.673	-13.692	-0.018
FeF3	5.884e-16	5.886e-16	-15.230	-15.230	0.000
H2F2	1.006e-17	1.006e-17	-16.997	-16.997	0.000
UO2F4-2	4.564e-18	3.864e-18	-17.341	-17.413	-0.072
UF3+	1.049e-30	1.006e-30	-29.979	-29.997	-0.018
UF2+2	2.732e-31	2.313e-31	-30.563	-30.636	-0.072
UF4	1.512e-31	1.512e-31	-30.821	-30.820	0.000
UF+3	2.211e-33	1.520e-33	-32.655	-32.818	-0.163
UF5-	8.279e-35	7.941e-35	-34.082	-34.100	-0.018
UF6-2	2.213e-37	1.874e-37	-36.655	-36.727	-0.072
Fe(2) 1.724e-06					
Fe+2	1.623e-06	1.374e-06	-5.790	-5.862	-0.072
FeHCO3+	5.430e-08	5.209e-08	-7.265	-7.283	-0.018
FeSO4	3.410e-08	3.411e-08	-7.467	-7.467	0.000
FeCO3	7.601e-09	7.603e-09	-8.119	-8.119	0.000
FeOH+	4.727e-09	4.534e-09	-8.325	-8.343	-0.018
FeF+	2.652e-10	2.543e-10	-9.576	-9.595	-0.018
FeCl+	1.070e-11	1.026e-11	-10.971	-10.989	-0.018
Fe(OH)2	3.830e-13	3.831e-13	-12.417	-12.417	0.000
FeHSO4+	1.636e-14	1.569e-14	-13.786	-13.804	-0.018
Fe(OH)3-	2.014e-16	1.932e-16	-15.696	-15.714	-0.018

Fe(3)	7.826e-07					
	Fe(OH)3	4.616e-07	4.617e-07	-6.336	-6.336	0.000
	Fe(OH)2+	3.157e-07	3.028e-07	-6.501	-6.519	-0.018
	Fe(OH)4-	5.269e-09	5.054e-09	-8.278	-8.296	-0.018
	FeOH+2	8.918e-11	7.550e-11	-10.050	-10.122	-0.072
	FeF+2	3.423e-14	2.898e-14	-13.466	-13.538	-0.072
	FeF2+	2.121e-14	2.034e-14	-13.673	-13.692	-0.018
	FeSO4+	1.651e-15	1.583e-15	-14.782	-14.800	-0.018
	Fe+3	1.529e-15	1.051e-15	-14.816	-14.978	-0.163
	FeF3	5.884e-16	5.886e-16	-15.230	-15.230	0.000
	Fe(SO4)2-	5.343e-18	5.125e-18	-17.272	-17.290	-0.018
	Fe2(OH)2+4	3.531e-19	1.814e-19	-18.452	-18.741	-0.289
	FeCl+2	1.784e-19	1.510e-19	-18.749	-18.821	-0.072
	FeHSO4+2	3.560e-22	3.014e-22	-21.449	-21.521	-0.072
	Fe3(OH)4+5	4.724e-23	1.668e-23	-22.326	-22.778	-0.452
	FeCl2+	4.327e-24	4.150e-24	-23.364	-23.382	-0.018
	FeCl3	2.245e-30	2.245e-30	-29.649	-29.649	0.000
H(0)	7.163e-26					
	H2	3.581e-26	3.583e-26	-25.446	-25.446	0.000
K	6.138e-05					
	K+	6.132e-05	5.881e-05	-4.212	-4.231	-0.018
	KSO4-	6.195e-08	5.943e-08	-7.208	-7.226	-0.018
Mg	1.522e-04					
	Mg+2	1.475e-04	1.253e-04	-3.831	-3.902	-0.071
	MgSO4	3.975e-06	3.977e-06	-5.401	-5.400	0.000
	MgHCO3+	5.699e-07	5.467e-07	-6.244	-6.262	-0.018
	MgF+	1.484e-07	1.423e-07	-6.829	-6.847	-0.018
	MgCO3	2.592e-08	2.593e-08	-7.586	-7.586	0.000
	MgOH+	4.645e-09	4.455e-09	-8.333	-8.351	-0.018
Mn(2)	3.641e-07					
	Mn+2	3.413e-07	2.890e-07	-6.467	-6.539	-0.072
	MnHCO3+	1.018e-08	9.761e-09	-7.992	-8.011	-0.018
	MnSO4	7.147e-09	7.149e-09	-8.146	-8.146	0.000
	MnCO3	5.292e-09	5.294e-09	-8.276	-8.276	0.000
	MnOH+	7.859e-11	7.539e-11	-10.105	-10.123	-0.018
	MnF+	3.857e-11	3.700e-11	-10.414	-10.432	-0.018
	MnCl+	6.640e-12	6.369e-12	-11.178	-11.196	-0.018
	MnCl2	1.504e-17	1.504e-17	-16.823	-16.823	0.000
	Mn(OH)3-	1.346e-20	1.291e-20	-19.871	-19.889	-0.018
	MnCl3-	2.337e-23	2.241e-23	-22.631	-22.649	-0.018
Mn(3)	7.185e-29					
	Mn+3	7.185e-29	4.940e-29	-28.144	-28.306	-0.163
Mn(6)	0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-53.202	-53.275	-0.072
Mn(7)	0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-58.906	-58.924	-0.018
Na	3.915e-05					
	Na+	3.911e-05	3.753e-05	-4.408	-4.426	-0.018
	NaSO4-	2.872e-08	2.755e-08	-7.542	-7.560	-0.018
	NaHCO3	7.995e-09	7.998e-09	-8.097	-8.097	0.000
	NaF	3.995e-10	3.996e-10	-9.398	-9.398	0.000
	NaCO3-	1.369e-10	1.313e-10	-9.863	-9.882	-0.018
Ni	3.747e-08					
	NiCO3	2.152e-08	2.153e-08	-7.667	-7.667	0.000
	Ni+2	1.487e-08	1.259e-08	-7.828	-7.900	-0.072
	NiHCO3+	6.868e-10	6.588e-10	-9.163	-9.181	-0.018
	NiSO4	3.563e-10	3.564e-10	-9.448	-9.448	0.000
	NiOH+	1.925e-11	1.846e-11	-10.716	-10.734	-0.018
	Ni(CO3)2-2	1.019e-11	8.628e-12	-10.992	-11.064	-0.072
	NiF+	4.848e-12	4.650e-12	-11.314	-11.333	-0.018
	Ni(OH)2	2.512e-13	2.513e-13	-12.600	-12.600	0.000
	NiCl+	1.784e-13	1.711e-13	-12.749	-12.767	-0.018
	Ni(SO4)2-2	3.519e-15	2.979e-15	-14.454	-14.526	-0.072
	Ni(OH)3-	3.700e-17	3.549e-17	-16.432	-16.450	-0.018
	NiCl2	3.361e-18	3.362e-18	-17.474	-17.473	0.000
O(0)	0.000e+00					
	O2	0.000e+00	0.000e+00	-42.824	-42.824	0.000

S(6)	1.874e-04					
	SO4-2	1.772e-04	1.503e-04	-3.751	-3.823	-0.072
	CaSO4	6.000e-06	6.002e-06	-5.222	-5.222	0.000
	MgSO4	3.975e-06	3.977e-06	-5.401	-5.400	0.000
	KSO4-	6.195e-08	5.943e-08	-7.208	-7.226	-0.018
	BaSO4	3.608e-08	3.610e-08	-7.443	-7.443	0.000
	FeSO4	3.410e-08	3.411e-08	-7.467	-7.467	0.000
	NaSO4-	2.872e-08	2.755e-08	-7.542	-7.560	-0.018
	MnSO4	7.147e-09	7.149e-09	-8.146	-8.146	0.000
	ZnSO4	1.969e-09	1.970e-09	-8.706	-8.706	0.000
	HSO4-	9.898e-10	9.495e-10	-9.004	-9.023	-0.018
	CuSO4	5.555e-10	5.556e-10	-9.255	-9.255	0.000
	NiSO4	3.563e-10	3.564e-10	-9.448	-9.448	0.000
	UO2SO4	1.254e-11	1.255e-11	-10.902	-10.902	0.000
	Zn(SO4)2-2	2.933e-12	2.483e-12	-11.533	-11.605	-0.072
	CaHSO4+	2.473e-12	2.373e-12	-11.607	-11.625	-0.018
	UO2(SO4)2-2	1.999e-14	1.693e-14	-13.699	-13.771	-0.072
	FeHSO4+	1.636e-14	1.569e-14	-13.786	-13.804	-0.018
	Ni(SO4)2-2	3.519e-15	2.979e-15	-14.454	-14.526	-0.072
	FeSO4+	1.651e-15	1.583e-15	-14.782	-14.800	-0.018
	Fe(SO4)2-	5.343e-18	5.125e-18	-17.272	-17.290	-0.018
	FeHSO4+2	3.560e-22	3.014e-22	-21.449	-21.521	-0.072
	USO4+2	2.582e-35	2.186e-35	-34.588	-34.660	-0.072
	U(SO4)2	2.386e-35	2.387e-35	-34.622	-34.622	0.000
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-50.275	-50.438	-0.163
U(4)	2.862e-18					
	U(OH)4	2.861e-18	2.862e-18	-17.543	-17.543	0.000
	U(OH)3+	8.108e-22	7.777e-22	-21.091	-21.109	-0.018
	U(OH)2+2	3.366e-26	2.850e-26	-25.473	-25.545	-0.072
	UF3+	1.049e-30	1.006e-30	-29.979	-29.997	-0.018
	UF2+2	2.732e-31	2.313e-31	-30.563	-30.636	-0.072
	UOH+3	1.830e-31	1.258e-31	-30.737	-30.900	-0.163
	U(CO3)4-4	1.748e-31	8.977e-32	-30.758	-31.047	-0.289
	UF4	1.512e-31	1.512e-31	-30.821	-30.820	0.000
	UF+3	2.211e-33	1.520e-33	-32.655	-32.818	-0.163
	UF5-	8.279e-35	7.941e-35	-34.082	-34.100	-0.018
	USO4+2	2.582e-35	2.186e-35	-34.588	-34.660	-0.072
	U(SO4)2	2.386e-35	2.387e-35	-34.622	-34.622	0.000
	U(CO3)5-6	7.372e-37	1.647e-37	-36.132	-36.783	-0.651
	UF6-2	2.213e-37	1.874e-37	-36.655	-36.727	-0.072
	U+4	7.778e-38	3.995e-38	-37.109	-37.398	-0.289
	UCl+3	0.000e+00	0.000e+00	-40.737	-40.900	-0.163
	U6(OH)15+9	0.000e+00	0.000e+00	-132.876	-134.341	-1.465
U(5)	2.287e-13					
	UO2+	2.287e-13	2.194e-13	-12.641	-12.659	-0.018
	UO2(CO3)3-5	1.900e-25	6.711e-26	-24.721	-25.173	-0.452
U(6)	4.622e-07					
	UO2(CO3)2-2	3.736e-07	3.163e-07	-6.428	-6.500	-0.072
	UO2CO3	6.297e-08	6.299e-08	-7.201	-7.201	0.000
	UO2(OH)3-	1.220e-08	1.170e-08	-7.914	-7.932	-0.018
	UO2(CO3)3-4	8.267e-09	4.247e-09	-8.083	-8.372	-0.289
	UO2OH+	4.749e-09	4.556e-09	-8.323	-8.341	-0.018
	UO2F+	1.548e-10	1.485e-10	-9.810	-9.828	-0.018
	UO2+2	7.775e-11	6.582e-11	-10.109	-10.182	-0.072
	(UO2)3(OH)5+	2.650e-11	2.542e-11	-10.577	-10.595	-0.018
	UO2SO4	1.254e-11	1.255e-11	-10.902	-10.902	0.000
	UO2F2	9.288e-12	9.291e-12	-11.032	-11.032	0.000
	(UO2)3(OH)7-	3.335e-12	3.199e-12	-11.477	-11.495	-0.018
	(UO2)2(OH)2+2	1.937e-12	1.640e-12	-11.713	-11.785	-0.072
	(UO2)4(OH)7+	2.764e-13	2.651e-13	-12.559	-12.577	-0.018
	UO2F3-	3.411e-14	3.272e-14	-13.467	-13.485	-0.018
	UO2(SO4)2-2	1.999e-14	1.693e-14	-13.699	-13.771	-0.072
	(UO2)3(OH)4+2	1.688e-14	1.429e-14	-13.773	-13.845	-0.072
	UO2(OH)4-2	3.095e-15	2.620e-15	-14.509	-14.582	-0.072
	UO2Cl+	5.257e-16	5.043e-16	-15.279	-15.297	-0.018
	(UO2)3(CO3)6-6	1.920e-16	4.290e-17	-15.717	-16.368	-0.651
	(UO2)2OH+3	1.776e-16	1.221e-16	-15.751	-15.913	-0.163
	UO2F4-2	4.564e-18	3.864e-18	-17.341	-17.413	-0.072
	UO2Cl2	1.409e-22	1.409e-22	-21.851	-21.851	0.000
Zn	7.649e-08					
	Zn+2	6.814e-08	5.768e-08	-7.167	-7.239	-0.072
	ZnHCO3+	2.869e-09	2.752e-09	-8.542	-8.560	-0.018
	ZnCO3	2.653e-09	2.654e-09	-8.576	-8.576	0.000
	ZnSO4	1.969e-09	1.970e-09	-8.706	-8.706	0.000
	ZnOH+	6.848e-10	6.569e-10	-9.164	-9.183	-0.018
	Zn(OH)2	1.448e-10	1.449e-10	-9.839	-9.839	0.000
	Zn(CO3)2-2	1.546e-11	1.309e-11	-10.811	-10.883	-0.072
	ZnF+	1.494e-11	1.433e-11	-10.826	-10.844	-0.018
	Zn(SO4)2-2	2.933e-12	2.483e-12	-11.533	-11.605	-0.072
	ZnCl+	7.323e-13	7.025e-13	-12.135	-12.153	-0.018
	ZnOHCl	1.459e-13	1.460e-13	-12.836	-12.836	0.000
	Zn(OH)3-	6.747e-15	6.472e-15	-14.171	-14.189	-0.018
	ZnCl2	3.914e-18	3.915e-18	-17.407	-17.407	0.000
	Zn(OH)4-2	1.711e-20	1.449e-20	-19.767	-19.839	-0.072
	ZnCl3-	2.418e-23	2.320e-23	-22.616	-22.635	-0.018
	ZnCl4-2	7.195e-29	6.091e-29	-28.143	-28.215	-0.072

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Anhydrite	-3.16	-7.51	-4.35	CaSO4
Antlerite	-6.70	1.59	8.29	Cu3(OH)4SO4
Aragonite	-2.01	-10.32	-8.31	CaCO3
Arsenolite	-23.28	-26.22	-2.94	As4O6
Artinite	-10.03	-0.14	9.89	MgCO3:Mg(OH)2:3H2O
As2O5	-31.12	-24.37	6.75	As2O5
Atacamite	-6.80	0.72	7.53	Cu2(OH)3Cl
Azurite	-5.49	-22.16	-16.67	Cu3(OH)2(CO3)2
B-UO2(OH)2	-1.56	4.12	5.68	UO2(OH)2
Ba3(AsO4)2	8.51	-0.43	-8.94	Ba3(AsO4)2
BaF2	-10.01	-15.78	-5.77	BaF2
Barite	-0.11	-10.14	-10.04	BaSO4
Bianchite	-9.30	-11.06	-1.76	ZnSO4:6H2O
Birnessite	-13.54	30.06	43.60	MnO2
Bixbyite	-13.25	37.82	51.08	Mn2O3
Brochantite	-7.18	8.16	15.34	Cu4(OH)6SO4
Brucite	-6.71	10.40	17.11	Mg(OH)2
Bunsenite	-6.29	6.40	12.69	NiO
Ca3(AsO4)2:4w	-14.88	7.48	22.36	Ca3(AsO4)2:4H2O
Calcite	-1.86	-10.32	-8.46	CaCO3
Chalcanthite	-8.90	-11.55	-2.65	CuSO4:5H2O
Claudetite	-23.02	-26.22	-3.20	As4O6
CO2(g)	-2.78	-20.94	-18.16	CO2
Cu(OH)2	-2.22	6.57	8.79	Cu(OH)2
Cu2SO4	-19.97	-27.28	-7.31	Cu2SO4
Cu3(AsO4)2:6w	-10.80	-4.66	6.14	Cu3(AsO4)2:6H2O
CuCO3	-4.74	-14.37	-9.63	CuCO3
CuF	-20.96	-16.46	4.50	CuF
CuF2	-16.71	-17.20	-0.49	CuF2
CuF2:2H2O	-12.68	-17.20	-4.51	CuF2:2H2O
CuMetal	-4.10	-15.73	-11.63	Cu
CuOCuSO4	-16.87	-4.98	11.88	CuO:CuSO4
CupricFerrite	13.25	45.75	32.50	CuFe2O4
Cuprite	-2.14	-9.16	-7.02	Cu2O
CuprousFerrite	13.48	15.01	1.53	CuFeO2
CuSO4	-14.74	-11.55	3.19	CuSO4
Dolomite	-3.86	-20.86	-17.00	CaMg(CO3)2
Dolomite(d)	-4.43	-20.86	-16.43	CaMg(CO3)2
Epsomite	-5.56	-7.73	-2.17	MgSO4:7H2O
Fe(OH)2.7Cl.3	5.79	15.86	10.08	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	1.58	19.59	18.01	Fe(OH)3
Fe3(OH)8	1.16	47.61	46.45	Fe3(OH)8
Fluorite	-2.50	-13.15	-10.65	CaF2
Goethite	7.47	19.59	12.12	FeOOH
Goslarite	-9.07	-11.06	-1.99	ZnSO4:7H2O
Gummite	-6.51	4.12	10.63	UO3
Gypsum	-2.92	-7.51	-4.58	CaSO4:2H2O
H2(g)	-22.25	-22.30	-0.05	H2
Halite	-11.27	-9.69	1.57	NaCl
Hausmannite	-16.45	45.58	62.03	Mn3O4
Hematite	16.64	39.18	22.53	Fe2O3
Huntite	-12.23	-41.94	-29.71	CaMg3(CO3)4
Hydromagnesite	-23.52	-31.76	-8.24	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-6.50	24.85	31.35	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-5.01	25.44	30.45	KFe3(SO4)2(OH)6
Jarosite-Na	-9.19	25.24	34.43	NaFe3(SO4)2(OH)6
JarositeH	-11.99	22.52	34.51	(H3O)Fe3(SO4)2(OH)6
Langite	-9.03	8.16	17.18	Cu4(OH)6SO4:H2O
Maghemite	6.56	39.18	32.62	Fe2O3
Magnesite	-2.57	-10.54	-7.97	MgCO3
Magnetite	17.14	47.61	30.47	Fe3O4
Malachite	-2.78	-7.80	-5.02	Cu2(OH)2CO3
Manganite	-6.43	18.91	25.34	MnOOH
Melanothallite	-22.12	-18.26	3.85	CuCl2
Melanterite	-7.43	-9.68	-2.26	FeSO4:7H2O
Mirabilite	-11.37	-12.67	-1.30	Na2SO4:10H2O
Mn2(SO4)3	-62.76	-16.55	46.21	Mn2(SO4)3
Mn3(AsO4):8H2O	-13.64	-1.09	12.56	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-19.61	-17.07	2.54	MnCl2:4H2O
MnSO4	-13.19	-10.36	2.82	MnSO4
Morenosite	-9.33	-11.72	-2.39	NiSO4:7H2O
Na4UO2(CO3)3	-31.51	-47.80	-16.29	Na4UO2(CO3)3
Nahcolite	-7.26	-18.21	-10.95	NaHCO3
Nantokite	-7.43	-17.00	-9.56	CuCl
Natron	-14.02	-15.49	-1.47	Na2CO3:10H2O
Nesquehonite	-4.98	-10.54	-5.56	MgCO3:3H2O
Ni(OH)2	-4.10	6.40	10.50	Ni(OH)2
Ni3(AsO4)2:8H2O	-20.92	-5.17	15.75	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-24.52	7.48	32.00	Ni4(OH)6SO4
NiCO3	-7.80	-14.54	-6.74	NiCO3
Nsutite	-12.50	30.06	42.56	MnO2
O2(g)	-39.96	44.60	84.56	O2
Portlandite	-12.49	10.62	23.11	Ca(OH)2
Pyrochroite	-7.44	7.76	15.20	Mn(OH)2
Pyrolusite	-11.97	30.06	42.03	MnO2
Retgersite	-9.67	-11.72	-2.05	NiSO4:6H2O
Rhodochrosite	-2.06	-13.18	-11.12	MnCO3
Rhodochrosite(d)	-2.79	-13.18	-10.39	MnCO3
Rutherfordine	-2.38	-16.82	-14.44	UO2CO3
Schoepite	-1.41	4.12	5.52	UO2(OH)2:H2O
Scorodite	-6.10	7.40	13.50	FeAsO4:2H2O
Siderite	-1.63	-12.50	-10.87	FeCO3
Siderite(d)(3)	-2.05	-12.50	-10.45	FeCO3
Smithsonite	-3.92	-13.88	-9.96	ZnCO3
Tenorite	-1.20	6.57	7.77	CuO
Thenardite	-12.50	-12.67	-0.17	Na2SO4
Thermonatrite	-15.64	-15.49	0.15	Na2CO3:H2O
Trona	-22.72	-33.70	-10.98	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-23.72	-36.30	-12.58	U(OH)2SO4
U3O8(c)	-3.48	-9.94	-6.46	U3O8
U4O9(c)	-10.52	-50.43	-39.91	U4O9
UF4(c)	-37.91	-65.71	-27.80	UF4
UF4:2.5H2O	-28.76	-65.71	-36.95	UF4:2.5H2O
UO2(a)	-8.90	-18.18	-9.28	UO2
UO3(gamma)	-3.79	4.12	7.91	UO3
Uraninite(c)	-4.18	-18.18	-14.00	UO2
Witherite	-4.39	-12.96	-8.57	BaCO3
Zincite(c)	-4.30	7.06	11.36	ZnO
Zincosite	-14.26	-11.06	3.20	ZnSO4
Zn(OH)2-a	-5.39	7.06	12.45	Zn(OH)2
Zn(OH)2-b	-4.69	7.06	11.75	Zn(OH)2
Zn(OH)2-c	-5.14	7.06	12.20	Zn(OH)2
Zn(OH)2-e	-4.44	7.06	11.50	Zn(OH)2
Zn(OH)2-g	-4.65	7.06	11.71	Zn(OH)2
Zn2(OH)2SO4	-11.50	-4.00	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-13.49	1.71	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-16.90	-3.19	13.72	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-34.70	-15.06	19.64	ZnO:2ZnSO4
Zn4(OH)6SO4	-18.28	10.12	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-28.03	10.47	38.50	Zn5(OH)8Cl2
ZnCl2	-24.98	-17.77	7.20	ZnCl2
ZnCO3:H2O	-3.62	-13.88	-10.26	ZnCO3:H2O
ZnF2	-15.31	-16.70	-1.39	ZnF2
ZnMetal	-41.36	-15.24	26.12	Zn
ZnO(a)	-4.25	7.06	11.31	ZnO
ZnSO4:H2O	-10.60	-11.06	-0.46	ZnSO4:H2O

End of simulation.

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Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 4.5-5.5m
           SOLUTION        5
           units           mg/l
           temp            20.0
           pH              7.13
           F               0.65
           Cl              0.2
           S(6)            16        as SO4
           Na              1.78
           K               2.3
           Mg              3.2
           Ca              10.4
           Alkalinity      42.7      as HCO3
           Al              2.43
           As(+3)          0.049
           As(+5)          0.103
           Ba              0.195
           Cu              0.096
           Fe              4.78
           Mn              0.07
           Ni              0.02
           Pb              0.034
           U               0.00
           Zn              0.12
           END
```

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-----
TITLE
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   Schneckentein 4.5-5.5m

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Beginning of initial solution calculations.
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Initial solution 5.

-----------------------------Solution composition--------------
---------------

           Elements           Molality       Moles

           Al                 9.007e-05   9.007e-05
           Alkalinity         6.998e-04   6.998e-04
           As(3)              6.541e-07   6.541e-07
           As(5)              1.375e-06   1.375e-06
           Ba                 1.420e-06   1.420e-06
           Ca                 2.595e-04   2.595e-04
           Cl                 5.642e-06   5.642e-06
           Cu                 1.511e-06   1.511e-06
           F                  3.422e-05   3.422e-05
           Fe                 8.560e-05   8.560e-05
           K                  5.883e-05   5.883e-05
           Mg                 1.316e-04   1.316e-04
           Mn                 1.274e-06   1.274e-06
           Na                 7.743e-05   7.743e-05
           Ni                 3.407e-07   3.407e-07
           Pb                 1.641e-07   1.641e-07
           S(6)               1.666e-04   1.666e-04
           Zn                 1.836e-06   1.836e-06
```

```
----------------------------Description of solution----------------------------
-

                                    pH  =   7.130
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   1.513e-03
                     Mass of water (kg)  =   1.000e+00
                  Total carbon (mol/kg)  =   3.971e-04
                     Total CO2 (mol/kg)  =   3.971e-04
                    Temperature (deg C)  =  20.000
                 Electrical balance (eq)  =   2.772e-04
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  15.26
                               Iterations  =  10
                                  Total H  = 1.110132e+02
                                  Total O  = 5.550843e+01

---------------------------------Redox couples---------------------------------
-

           Redox couple             pe  Eh (volts)

           As(3)/As(5)         -0.0739     -0.0043
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	9.561e-08	9.158e-08	-7.020	-7.038	-0.019
H+	7.720e-08	7.413e-08	-7.112	-7.130	-0.018
H2O	5.551e+01	1.000e+00	-0.000	-0.000	0.000
Al	**9.007e-05**				
Al(OH)4-	8.213e-05	7.867e-05	-4.085	-4.104	-0.019
Al(OH)3	3.287e-06	3.289e-06	-5.483	-5.483	0.000
Al(OH)2+	2.527e-06	2.421e-06	-5.597	-5.616	-0.019
AlF2+	1.460e-06	1.399e-06	-5.836	-5.854	-0.019
AlF3	4.933e-07	4.935e-07	-6.307	-6.307	0.000
AlF+2	1.208e-07	1.017e-07	-6.918	-6.993	-0.075
AlOH+2	4.264e-08	3.590e-08	-7.370	-7.445	-0.075
AlF4-	5.772e-09	5.529e-09	-8.239	-8.257	-0.019
Al+3	5.482e-10	3.722e-10	-9.261	-9.429	-0.168
AlSO4+	1.522e-10	1.458e-10	-9.818	-9.836	-0.019
Al(SO4)2-	6.222e-13	5.960e-13	-12.206	-12.225	-0.019
AlHSO4+2	1.093e-18	9.200e-19	-17.961	-18.036	-0.075
As(3)	**6.541e-07**				
H3AsO3	6.496e-07	6.498e-07	-6.187	-6.187	0.000
H2AsO3-	4.482e-09	4.293e-09	-8.349	-8.367	-0.019
HAsO3-2	4.365e-14	3.675e-14	-13.360	-13.435	-0.075
H4AsO3+	2.492e-14	2.387e-14	-13.604	-13.622	-0.019
AsO3-3	2.365e-20	1.606e-20	-19.626	-19.794	-0.168
As(5)	**1.375e-06**				
HAsO4-2	9.951e-07	8.378e-07	-6.002	-6.077	-0.075
H2AsO4-	3.797e-07	3.637e-07	-6.421	-6.439	-0.019
AsO4-3	3.723e-11	2.528e-11	-10.429	-10.597	-0.168
H3AsO4	4.493e-12	4.494e-12	-11.348	-11.347	0.000
Ba	**1.420e-06**				
Ba+2	1.342e-06	1.130e-06	-5.872	-5.947	-0.075
BaSO4	7.490e-08	7.493e-08	-7.126	-7.125	0.000
BaHCO3+	3.106e-09	2.975e-09	-8.508	-8.526	-0.019
BaCO3	9.640e-11	9.644e-11	-10.016	-10.016	0.000
BaOH+	5.391e-13	5.164e-13	-12.268	-12.287	-0.019
C(4)	**3.971e-04**				
HCO3-	3.355e-04	3.216e-04	-3.474	-3.493	-0.018
CO2	5.741e-05	5.743e-05	-4.241	-4.241	0.000
FeHCO3+	1.719e-06	1.647e-06	-5.765	-5.783	-0.019
CaHCO3+	8.405e-07	8.051e-07	-6.075	-6.094	-0.019
MgHCO3+	4.168e-07	3.992e-07	-6.380	-6.399	-0.019
CuCO3	2.330e-07	2.331e-07	-6.633	-6.633	0.000
FeCO3	2.243e-07	2.244e-07	-6.649	-6.649	0.000
CO3-2	2.164e-07	1.827e-07	-6.665	-6.738	-0.074
NiCO3	1.764e-07	1.764e-07	-6.754	-6.753	0.000
PbCO3	1.046e-07	1.046e-07	-6.981	-6.980	0.000
CaCO3	5.969e-08	5.971e-08	-7.224	-7.224	0.000
ZnHCO3+	5.924e-08	5.675e-08	-7.227	-7.246	-0.019
ZnCO3	5.108e-08	5.109e-08	-7.292	-7.292	0.000
CuHCO3+	3.997e-08	3.829e-08	-7.398	-7.417	-0.019
MnHCO3+	3.040e-08	2.912e-08	-7.517	-7.536	-0.019
MgCO3	1.746e-08	1.747e-08	-7.758	-7.758	0.000
MnCO3	1.474e-08	1.475e-08	-7.831	-7.831	0.000
NaHCO3	1.340e-08	1.340e-08	-7.873	-7.873	0.000
PbHCO3+	8.786e-09	8.416e-09	-8.056	-8.075	-0.019
NiHCO3+	6.037e-09	5.783e-09	-8.219	-8.238	-0.019
BaHCO3+	3.106e-09	2.975e-09	-8.508	-8.526	-0.019
Zn(CO3)2-2	2.370e-10	1.996e-10	-9.625	-9.700	-0.075
NaCO3-	2.037e-10	1.951e-10	-9.691	-9.710	-0.019
BaCO3	9.640e-11	9.644e-11	-10.016	-10.016	0.000
Ni(CO3)2-2	6.653e-11	5.601e-11	-10.177	-10.252	-0.075
Cu(CO3)2-2	6.367e-11	5.360e-11	-10.196	-10.271	-0.075
Pb(CO3)2-2	5.701e-11	4.800e-11	-10.244	-10.319	-0.075
Ca	**2.595e-04**				
Ca+2	2.532e-04	2.137e-04	-3.597	-3.670	-0.074
CaSO4	5.379e-06	5.380e-06	-5.269	-5.269	0.000
CaHCO3+	8.405e-07	8.051e-07	-6.075	-6.094	-0.019
CaCO3	5.969e-08	5.971e-08	-7.224	-7.224	0.000
CaF+	4.862e-08	4.657e-08	-7.313	-7.332	-0.019
CaOH+	4.994e-10	4.784e-10	-9.302	-9.320	-0.019
CaHSO4+	2.299e-12	2.202e-12	-11.638	-11.657	-0.019
Cl	**5.642e-06**				
Cl-	5.641e-06	5.402e-06	-5.249	-5.267	-0.019
FeCl+	3.986e-10	3.819e-10	-9.399	-9.418	-0.019
MnCl+	2.335e-11	2.236e-11	-10.632	-10.650	-0.019
ZnCl+	1.700e-11	1.629e-11	-10.769	-10.788	-0.019
PbCl+	6.522e-12	6.247e-12	-11.186	-11.204	-0.019
ZnOHCl	3.381e-12	3.383e-12	-11.471	-11.471	0.000
CuCl+	2.811e-12	2.693e-12	-11.551	-11.570	-0.019
NiCl+	1.846e-12	1.768e-12	-11.734	-11.753	-0.019
CuCl2-	1.159e-13	1.111e-13	-12.936	-12.954	-0.019
ZnCl2	9.025e-17	9.028e-17	-16.045	-16.044	0.000
PbCl2	5.880e-17	5.882e-17	-16.231	-16.230	0.000
MnCl2	5.272e-17	5.274e-17	-16.278	-16.278	0.000
NiCl2	3.467e-17	3.468e-17	-16.460	-16.460	0.000
CuCl2	7.392e-18	7.395e-18	-17.131	-17.131	0.000
FeCl+2	6.104e-18	5.139e-18	-17.214	-17.289	-0.075
CuCl3-2	1.108e-18	9.325e-19	-17.956	-18.030	-0.075
ZnCl3-	5.541e-22	5.308e-22	-21.256	-21.275	-0.019
PbCl3-	2.554e-22	2.446e-22	-21.593	-21.612	-0.019
FeCl2+	1.521e-22	1.457e-22	-21.818	-21.837	-0.019
MnCl3-	8.193e-23	7.848e-23	-22.087	-22.105	-0.019
CuCl3-	1.352e-25	1.295e-25	-24.869	-24.888	-0.019
ZnCl4-2	1.640e-27	1.380e-27	-26.785	-26.860	-0.075
PbCl4-2	7.224e-28	6.082e-28	-27.141	-27.216	-0.075
FeCl3	7.869e-29	7.872e-29	-28.104	-28.104	0.000
CuCl4-2	3.703e-33	3.118e-33	-32.431	-32.506	-0.075
Cu(1)	**1.241e-08**				
Cu+	1.241e-08	1.189e-08	-7.906	-7.925	-0.019
CuCl2-	1.159e-13	1.111e-13	-12.936	-12.954	-0.019
CuCl3-2	1.108e-18	9.325e-19	-17.956	-18.030	-0.075
Cu(2)	**1.498e-06**				
Cu(OH)2	9.028e-07	9.031e-07	-6.044	-6.044	0.000
Cu+2	2.822e-07	2.376e-07	-6.549	-6.624	-0.075
CuCO3	2.330e-07	2.331e-07	-6.633	-6.633	0.000
CuHCO3+	3.997e-08	3.829e-08	-7.398	-7.417	-0.019
CuOH+	3.345e-08	3.205e-08	-7.476	-7.494	-0.019
CuSO4	6.195e-09	6.197e-09	-8.208	-8.208	0.000
Cu2(OH)2+2	3.221e-10	2.712e-10	-9.492	-9.567	-0.075
CuF+	1.214e-10	1.162e-10	-9.916	-9.935	-0.019
Cu(CO3)2-2	6.367e-11	5.360e-11	-10.196	-10.271	-0.075
CuCl+	2.811e-12	2.693e-12	-11.551	-11.570	-0.019
Cu(OH)3-	7.664e-13	7.341e-13	-12.116	-12.134	-0.019
CuCl2	7.392e-18	7.395e-18	-17.131	-17.131	0.000
Cu(OH)4-2	2.347e-18	1.976e-18	-17.630	-17.704	-0.075
CuCl3-	1.352e-25	1.295e-25	-24.869	-24.888	-0.019
CuCl4-2	3.703e-33	3.118e-33	-32.431	-32.506	-0.075
F	**3.422e-05**				
F-	2.941e-05	2.817e-05	-4.531	-4.550	-0.019
AlF2+	1.460e-06	1.399e-06	-5.836	-5.854	-0.019
AlF3	4.933e-07	4.935e-07	-6.307	-6.307	0.000
MgF+	1.918e-07	1.837e-07	-6.717	-6.736	-0.019
AlF+2	1.208e-07	1.017e-07	-6.918	-6.993	-0.075
CaF+	4.862e-08	4.657e-08	-7.313	-7.332	-0.019
FeF+	1.506e-08	1.443e-08	-7.822	-7.841	-0.019
AlF4-	5.772e-09	5.529e-09	-8.239	-8.257	-0.019
HF	2.864e-09	2.865e-09	-8.543	-8.543	0.000
NaF	1.201e-09	1.202e-09	-8.920	-8.920	0.000
ZnF+	5.463e-10	5.233e-10	-9.263	-9.281	-0.019
MnF+	2.068e-10	1.981e-10	-9.685	-9.703	-0.019
CuF+	1.214e-10	1.162e-10	-9.916	-9.935	-0.019
NiF+	7.645e-11	7.323e-11	-10.117	-10.135	-0.019
PbF+	1.723e-11	1.651e-11	-10.764	-10.782	-0.019
FeF+2	1.816e-12	1.529e-12	-11.741	-11.816	-0.075
FeF2+	1.685e-12	1.614e-12	-11.773	-11.792	-0.019
HF2-	3.101e-13	2.970e-13	-12.509	-12.527	-0.019
FeF3	7.082e-14	7.084e-14	-13.150	-13.150	0.000
PbF2	9.492e-15	9.495e-15	-14.023	-14.022	0.000
H2F2	2.556e-17	2.557e-17	-16.592	-16.592	0.000
PbF3-	2.023e-18	1.938e-18	-17.694	-17.713	-0.019
PbF4-2	3.104e-23	2.613e-23	-22.508	-22.583	-0.075
Fe(2)	**6.403e-05**				
Fe+2	6.082e-05	5.120e-05	-4.216	-4.291	-0.075
FeHCO3+	1.719e-06	1.647e-06	-5.765	-5.783	-0.019
FeSO4	1.098e-06	1.098e-06	-5.960	-5.959	0.000
FeCO3	2.243e-07	2.244e-07	-6.649	-6.649	0.000
FeOH+	1.559e-07	1.494e-07	-6.807	-6.826	-0.019
FeF+	1.506e-08	1.443e-08	-7.822	-7.841	-0.019
FeCl+	3.986e-10	3.819e-10	-9.399	-9.418	-0.019
Fe(OH)2	1.102e-11	1.102e-11	-10.958	-10.958	0.000
FeHSO4+	5.509e-13	5.277e-13	-12.259	-12.278	-0.019
Fe(OH)3-	5.485e-15	5.254e-15	-14.261	-14.280	-0.019

Fe(3)	2.157e-05					
	Fe(OH)3	1.225e-05	1.225e-05	-4.912	-4.912	0.000
	Fe(OH)2+	9.187e-06	8.800e-06	-5.037	-5.056	-0.019
	Fe(OH)4-	1.283e-07	1.229e-07	-6.892	-6.911	-0.019
	FeOH+2	2.838e-09	2.389e-09	-8.547	-8.622	-0.075
	FeF+2	1.816e-12	1.529e-12	-11.741	-11.816	-0.075
	FeF2+	1.685e-12	1.614e-12	-11.773	-11.792	-0.019
	FeF3	7.082e-14	7.084e-14	-13.150	-13.150	0.000
	Fe+3	5.451e-14	3.701e-14	-13.264	-13.432	-0.168
	FeSO4+	5.009e-14	4.798e-14	-13.300	-13.319	-0.019
	Fe2(OH)2+4	3.773e-16	1.896e-16	-15.423	-15.722	-0.299
	Fe(SO4)2-	1.422e-16	1.362e-16	-15.847	-15.866	-0.019
	FeCl+2	6.104e-18	5.139e-18	-17.214	-17.289	-0.075
	Fe3(OH)4+5	1.634e-18	5.573e-19	-17.787	-18.254	-0.467
	FeHSO4+2	1.138e-20	9.579e-21	-19.944	-20.019	-0.075
	FeCl2+	1.521e-22	1.457e-22	-21.818	-21.837	-0.019
	FeCl3	7.869e-29	7.872e-29	-28.104	-28.104	0.000
H(0)	7.873e-26					
	H2	3.936e-26	3.938e-26	-25.405	-25.405	0.000
K	5.883e-05					
	K+	5.877e-05	5.629e-05	-4.231	-4.250	-0.019
	KSO4-	5.160e-08	4.942e-08	-7.287	-7.306	-0.019
Mg	1.316e-04					
	Mg+2	1.281e-04	1.082e-04	-3.893	-3.966	-0.073
	MgSO4	2.944e-06	2.945e-06	-5.531	-5.531	0.000
	MgHCO3+	4.168e-07	3.992e-07	-6.380	-6.399	-0.019
	MgF+	1.918e-07	1.837e-07	-6.717	-6.736	-0.019
	MgCO3	1.746e-08	1.747e-08	-7.758	-7.758	0.000
	MgOH+	3.496e-09	3.348e-09	-8.456	-8.475	-0.019
Mn(2)	1.274e-06					
	Mn+2	1.207e-06	1.016e-06	-5.918	-5.993	-0.075
	MnHCO3+	3.040e-08	2.912e-08	-7.517	-7.536	-0.019
	MnSO4	2.169e-08	2.170e-08	-7.664	-7.664	0.000
	MnCO3	1.474e-08	1.475e-08	-7.831	-7.831	0.000
	MnOH+	2.430e-10	2.328e-10	-9.614	-9.633	-0.019
	MnF+	2.068e-10	1.981e-10	-9.685	-9.703	-0.019
	MnCl+	2.335e-11	2.236e-11	-10.632	-10.650	-0.019
	MnCl2	5.272e-17	5.274e-17	-16.278	-16.278	0.000
	Mn(OH)3-	4.127e-20	3.953e-20	-19.384	-19.403	-0.019
	MnCl3-	8.193e-23	7.848e-23	-22.087	-22.105	-0.019
Mn(3)	2.201e-28					
	Mn+3	2.201e-28	1.494e-28	-27.657	-27.826	-0.168
Mn(6)	0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-53.194	-53.269	-0.075
Mn(7)	0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-58.966	-58.985	-0.019
Na	7.743e-05					
	Na+	7.737e-05	7.413e-05	-4.111	-4.130	-0.019
	NaSO4-	4.970e-08	4.760e-08	-7.304	-7.322	-0.019
	NaHCO3	1.340e-08	1.340e-08	-7.873	-7.873	0.000
	NaF	1.201e-09	1.202e-09	-8.920	-8.920	0.000
	NaCO3-	2.037e-10	1.951e-10	-9.691	-9.710	-0.019
Ni	3.407e-07					
	NiCO3	1.764e-07	1.764e-07	-6.754	-6.753	0.000
	Ni+2	1.547e-07	1.303e-07	-6.810	-6.885	-0.075
	NiHCO3+	6.037e-09	5.783e-09	-8.219	-8.238	-0.019
	NiSO4	3.216e-09	3.218e-09	-8.493	-8.492	0.000
	NiOH+	1.771e-10	1.697e-10	-9.752	-9.770	-0.019
	NiF+	7.645e-11	7.323e-11	-10.117	-10.135	-0.019
	Ni(CO3)2-2	6.653e-11	5.601e-11	-10.177	-10.252	-0.075
	Ni(OH)2	2.370e-12	2.371e-12	-11.625	-11.625	0.000
	NiCl+	1.846e-12	1.768e-12	-11.734	-11.753	-0.019
	Ni(SO4)2-2	2.837e-14	2.389e-14	-13.547	-13.622	-0.075
	Ni(OH)3-	3.338e-16	3.198e-16	-15.476	-15.495	-0.019
	NiCl2	3.467e-17	3.468e-17	-16.460	-16.460	0.000
O(0)	0.000e+00					
	O2	0.000e+00	0.000e+00	-43.245	-43.245	0.000
Pb	1.641e-07					
	PbCO3	1.046e-07	1.046e-07	-6.981	-6.980	0.000
	Pb+2	3.914e-08	3.295e-08	-7.407	-7.482	-0.075
	PbOH+	9.047e-09	8.666e-09	-8.043	-8.062	-0.019
	PbHCO3+	8.786e-09	8.416e-09	-8.056	-8.075	-0.019
	PbSO4	2.451e-09	2.452e-09	-8.611	-8.610	0.000
	Pb(CO3)2-2	5.701e-11	4.800e-11	-10.244	-10.319	-0.075
	Pb(OH)2	4.546e-11	4.548e-11	-10.342	-10.342	0.000
	PbF+	1.723e-11	1.651e-11	-10.764	-10.782	-0.019
	PbCl+	6.522e-12	6.247e-12	-11.186	-11.204	-0.019
	Pb(SO4)2-2	2.023e-12	1.703e-12	-11.694	-11.769	-0.075
	PbF2	9.492e-15	9.495e-15	-14.023	-14.022	0.000
	Pb2OH+3	9.415e-15	6.392e-15	-14.026	-14.194	-0.168
	Pb(OH)3-	7.353e-15	7.044e-15	-14.134	-14.152	-0.019
	PbCl2	5.880e-17	5.882e-17	-16.231	-16.230	0.000
	PbF3-	2.023e-18	1.938e-18	-17.694	-17.713	-0.019
	Pb3(OH)4+2	8.648e-19	7.281e-19	-18.063	-18.138	-0.075
	Pb(OH)4-2	2.585e-19	2.177e-19	-18.587	-18.662	-0.075
	PbCl3-	2.554e-22	2.446e-22	-21.593	-21.612	-0.019
	PbF4-2	3.104e-23	2.613e-23	-22.508	-22.583	-0.075
	PbCl4-2	7.224e-28	6.082e-28	-27.141	-27.216	-0.075

S(6)	1.666e-04					
	SO4-2	1.569e-04	1.323e-04	-3.804	-3.878	-0.074
	CaSO4	5.379e-06	5.380e-06	-5.269	-5.269	0.000
	MgSO4	2.944e-06	2.945e-06	-5.531	-5.531	0.000
	FeSO4	1.098e-06	1.098e-06	-5.960	-5.959	0.000
	BaSO4	7.490e-08	7.493e-08	-7.126	-7.125	0.000
	KSO4-	5.160e-08	4.942e-08	-7.287	-7.306	-0.019
	NaSO4-	4.970e-08	4.760e-08	-7.304	-7.322	-0.019
	ZnSO4	4.180e-08	4.182e-08	-7.379	-7.379	0.000
	MnSO4	2.169e-08	2.170e-08	-7.664	-7.664	0.000
	CuSO4	6.195e-09	6.197e-09	-8.208	-8.208	0.000
	NiSO4	3.216e-09	3.218e-09	-8.493	-8.492	0.000
	PbSO4	2.451e-09	2.452e-09	-8.611	-8.610	0.000
	HSO4-	8.948e-10	8.571e-10	-9.048	-9.067	-0.019
	AlSO4+	1.522e-10	1.458e-10	-9.818	-9.836	-0.019
	Zn(SO4)2-2	5.556e-11	4.677e-11	-10.255	-10.330	-0.075
	CaHSO4+	2.299e-12	2.202e-12	-11.638	-11.657	-0.019
	Pb(SO4)2-2	2.023e-12	1.703e-12	-11.694	-11.769	-0.075
	Al(SO4)2-	6.222e-13	5.960e-13	-12.206	-12.225	-0.019
	FeHSO4+	5.509e-13	5.277e-13	-12.259	-12.278	-0.019
	FeSO4+	5.009e-14	4.798e-14	-13.300	-13.319	-0.019
	Ni(SO4)2-2	2.837e-14	2.389e-14	-13.547	-13.622	-0.075
	Fe(SO4)2-	1.422e-16	1.362e-16	-15.847	-15.866	-0.019
	AlHSO4+2	1.093e-18	9.200e-19	-17.961	-18.036	-0.075
	FeHSO4+2	1.138e-20	9.579e-21	-19.944	-20.019	-0.075
Zn	1.836e-06					
	Zn+2	1.665e-06	1.402e-06	-5.779	-5.853	-0.075
	ZnHCO3+	5.924e-08	5.675e-08	-7.227	-7.246	-0.019
	ZnCO3	5.108e-08	5.109e-08	-7.292	-7.292	0.000
	ZnSO4	4.180e-08	4.182e-08	-7.379	-7.379	0.000
	ZnOH+	1.472e-08	1.410e-08	-7.832	-7.851	-0.019
	Zn(OH)2	3.210e-09	3.211e-09	-8.494	-8.493	0.000
	ZnF+	5.463e-10	5.233e-10	-9.263	-9.281	-0.019
	Zn(CO3)2-2	2.370e-10	1.996e-10	-9.625	-9.700	-0.075
	Zn(SO4)2-2	5.556e-11	4.677e-11	-10.255	-10.330	-0.075
	ZnCl+	1.700e-11	1.629e-11	-10.769	-10.788	-0.019
	ZnOHCl	3.381e-12	3.383e-12	-11.471	-11.471	0.000
	Zn(OH)3-	1.430e-13	1.370e-13	-12.845	-12.863	-0.019
	ZnCl2	9.025e-17	9.028e-17	-16.045	-16.044	0.000
	Zn(OH)4-2	3.478e-19	2.928e-19	-18.459	-18.533	-0.075
	ZnCl3-	5.541e-22	5.308e-22	-21.256	-21.275	-0.019
	ZnCl4-2	1.640e-27	1.380e-27	-26.785	-26.860	-0.075

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	0.83	11.96	11.13	Al(OH)3
AlAsO4:2H2O	-4.19	0.61	4.80	AlAsO4:2H2O
AlumK	-16.18	-21.44	-5.26	KAl(SO4)2:12H2O
Alunite	3.26	2.49	-0.77	KAl3(SO4)2(OH)6
Anglesite	-3.54	-11.36	-7.82	PbSO4
Anhydrite	-3.20	-7.55	-4.34	CaSO4
Antlerite	-3.52	4.77	8.29	Cu3(OH)4SO4
Aragonite	-2.10	-10.41	-8.31	CaCO3
Arsenolite	-21.77	-24.75	-2.98	As4O6
Artinite	-10.37	-0.41	9.96	MgCO3:Mg(OH)2:3H2O
As2O5	-29.46	-22.69	6.77	As2O5
Atacamite	-4.70	2.87	7.57	Cu2(OH)3Cl
Azurite	-2.47	-19.09	-16.62	Cu3(OH)2(CO3)2
Ba3(AsO4)2	11.19	2.24	-8.95	Ba3(AsO4)2
BaF2	-9.27	-15.05	-5.77	BaF2
Barite	0.23	-9.83	-10.05	BaSO4
Basaluminite	7.00	29.70	22.70	Al4(OH)10SO4
Bianchite	-7.97	-9.73	-1.76	ZnSO4:6H2O
Birnessite	-13.07	30.53	43.60	MnO2
Bixbyite	-12.45	38.79	51.24	Mn2O3
Boehmite	3.02	11.96	8.94	AlOOH
Brochantite	-2.94	12.40	15.34	Cu4(OH)6SO4
Brucite	-6.88	10.29	17.18	Mg(OH)2
Bunsenite	-5.37	7.37	12.75	NiO
Ca3(AsO4)2:4w	-13.30	9.07	22.37	Ca3(AsO4)2:4H2O
Calcite	-1.96	-10.41	-8.45	CaCO3
Cerrusite	-1.03	-14.22	-13.19	PbCO3
Chalcanthite	-7.84	-10.50	-2.66	CuSO4:5H2O
Claudetite	-21.52	-24.75	-3.23	As4O6
CO2(g)	-2.83	-21.00	-18.16	CO2
Cotunnite	-13.18	-18.02	-4.84	PbCl2
Cu(OH)2	-1.19	7.64	8.83	Cu(OH)2
Cu2SO4	-17.84	-25.13	-7.29	Cu2SO4
Cu3(AsO4)2:6w	-5.94	0.21	6.16	Cu3(AsO4)2:6H2O
CuCO3	-3.73	-13.36	-9.63	CuCO3
CuF	-19.71	-15.17	4.54	CuF
CuF2	-15.27	-15.72	-0.45	CuF2
CuF2:2H2O	-11.22	-15.72	-4.50	CuF2:2H2O
CuMetal	-2.95	-14.62	-11.67	Cu
CuOCuSO4	-14.84	-2.87	11.97	CuO:CuSO4
CupricFerrite	17.19	49.83	32.65	CuFe2O4
Cuprite	0.04	-6.99	-7.03	Cu2O
CuprousFerrite	16.04	17.61	1.57	CuFeO2
CuSO4	-13.74	-10.50	3.24	CuSO4
Diaspore	4.77	11.96	7.19	AlOOH
Dolomite	-4.14	-21.11	-16.97	CaMg(CO3)2
Dolomite(d)	-4.71	-21.11	-16.40	CaMg(CO3)2
Epsomite	-5.67	-7.84	-2.18	MgSO4:7H2O
Fe(OH)2.7Cl.3	7.28	17.38	10.10	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	3.07	21.10	18.03	Fe(OH)3
Fe3(OH)8	5.66	52.17	46.50	Fe3(OH)8
Fluorite	-2.11	-12.77	-10.66	CaF2
Gibbsite	3.57	11.96	8.40	Al(OH)3
Goethite	8.96	21.10	12.14	FeOOH
Goslarite	-7.73	-9.73	-2.00	ZnSO4:7H2O
Gypsum	-2.97	-7.55	-4.58	CaSO4:2H2O
H2(g)	-22.21	-22.26	-0.05	H2
Halite	-10.97	-9.40	1.57	NaCl
Hausmannite	-15.23	47.06	62.29	Mn3O4
Hematite	19.54	42.20	22.66	Fe2O3
Huntite	-12.87	-42.52	-29.65	CaMg3(CO3)4
Hydrocerrusite	-4.20	-21.66	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-24.41	-32.52	-8.11	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-2.09	29.33	31.42	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-0.70	29.90	30.60	KFe3(SO4)2(OH)6
Jarosite-Na	-4.57	30.02	34.60	NaFe3(SO4)2(OH)6
JarositeH	-7.70	27.02	34.72	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-2.95	-6.18	-3.23	AlOHSO4
Langite	-4.88	12.40	17.29	Cu4(OH)6SO4:H2O
Larnakite	-4.38	-4.58	-0.20	PbO:PbSO4
Laurionite	-6.24	-5.62	0.62	PbOHCl
Litharge	-6.15	6.78	12.92	PbO
Maghemite	9.53	42.20	32.67	Fe2O3
Magnesite	-2.75	-10.70	-7.95	MgCO3
Magnetite	21.52	52.17	30.65	Fe3O4
Malachite	-0.75	-5.73	-4.98	Cu2(OH)2CO3
Manganite	-5.94	19.40	25.34	MnOOH
Massicot	-6.34	6.78	13.12	PbO
Matlockite	-7.77	-17.30	-9.53	PbClF
Melanothallite	-21.04	-17.16	3.88	CuCl2
Melanterite	-5.90	-8.17	-2.27	FeSO4:7H2O
Minium	-32.38	42.59	74.97	Pb3O4
Mirabilite	-10.79	-12.14	-1.35	Na2SO4:10H2O
Mn2(SO4)3	-62.06	-15.62	46.44	Mn2(SO4)3
Mn3(AsO4):8H2O	-10.47	2.11	12.57	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-19.02	-16.53	2.49	MnCl2:4H2O
MnSO4	-12.73	-9.87	2.86	MnSO4
Morenosite	-8.37	-10.76	-2.40	NiSO4:7H2O
Nahcolite	-7.03	-18.00	-10.97	NaHCO3
Nantokite	-6.31	-15.89	-9.58	CuCl
Natron	-13.49	-15.00	-1.51	Na2CO3:10H2O
Nesquehonite	-5.16	-10.70	-5.55	MgCO3:3H2O
Ni(OH)2	-3.04	7.37	10.42	Ni(OH)2
Ni3(AsO4)2:8H2O	-16.34	-0.57	15.77	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.64	11.36	32.00	Ni4(OH)6SO4
NiCO3	-6.91	-13.62	-6.72	NiCO3
Nsutite	-12.04	30.53	42.56	MnO2
O2(g)	-40.39	44.52	84.91	O2
Pb(OH)2	-1.55	6.78	8.32	Pb(OH)2
Pb2(OH)3Cl	-7.63	1.16	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-12.64	13.56	26.20	PbO:Pb(OH)2
Pb2O3	-25.22	35.82	61.04	Pb2O3
Pb2OCO3	-7.09	-7.44	-0.36	PbO:PbCO3
Pb3(AsO4)2	-8.24	-2.36	5.88	Pb3(AsO4)2
Pb3O2CO3	-12.02	-0.66	11.35	PbCO3:2PbO
Pb3O2SO4	-8.46	2.20	10.66	PbSO4:2PbO
Pb4(OH)6SO4	-12.13	8.97	21.10	Pb4(OH)6SO4
Pb4O3SO4	-13.57	8.97	22.54	PbSO4:3PbO
PbF2	-9.15	-16.58	-7.43	PbF2
PbMetal	-19.75	-15.48	4.26	Pb
PbO:0.3H2O	-6.20	6.78	12.98	PbO:0.33H2O
Phosgenite	-12.43	-32.24	-19.81	PbCl2:PbCO3
Plattnerite	-21.15	29.04	50.18	PbO2
Portlandite	-12.60	10.59	23.19	Ca(OH)2
Pyrochroite	-6.93	8.27	15.20	Mn(OH)2
Pyrolusite	-11.67	30.53	42.19	MnO2
Retgersite	-8.71	-10.76	-2.05	NiSO4:6H2O
Rhodochrosite	-1.62	-12.73	-11.11	MnCO3
Rhodochrosite(d)	-2.34	-12.73	-10.39	MnCO3
Scorodite	-3.78	9.75	13.53	FeAsO4:2H2O
Siderite	-0.17	-11.03	-10.86	FeCO3
Siderite(d)(3)	-0.58	-11.03	-10.45	FeCO3
Smithsonite	-2.65	-12.59	-9.95	ZnCO3
Tenorite	-0.17	7.64	7.81	CuO
Thenardite	-11.97	-12.14	-0.17	Na2SO4
Thermonatrite	-15.16	-15.00	0.16	Na2CO3:H2O
Trona	-22.05	-33.00	-10.95	NaHCO3:Na2CO3:2H2O
Witherite	-4.11	-12.69	-8.57	BaCO3
Zincite(c)	-3.01	8.41	11.41	ZnO
Zincosite	-12.98	-9.73	3.25	ZnSO4
Zn(OH)2-a	-4.04	8.41	12.45	Zn(OH)2
Zn(OH)2-b	-3.34	8.41	11.75	Zn(OH)2
Zn(OH)2-c	-3.79	8.41	12.20	Zn(OH)2
Zn(OH)2-e	-3.09	8.41	11.50	Zn(OH)2
Zn(OH)2-g	-3.30	8.41	11.71	Zn(OH)2
Zn2(OH)2SO4	-8.83	-1.33	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-10.78	4.42	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-11.21	2.53	13.73	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-30.85	-11.06	19.80	ZnO:2ZnSO4
Zn4(OH)6SO4	-12.91	15.49	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-21.26	17.24	38.50	Zn5(OH)8Cl2
ZnCl2	-23.64	-16.39	7.25	ZnCl2
ZnCO3:H2O	-2.33	-12.59	-10.26	ZnCO3:H2O
ZnF2	-13.60	-14.95	-1.36	ZnF2
ZnMetal	-40.07	-13.85	26.22	Zn
ZnO(a)	-2.90	8.41	11.31	ZnO
ZnSO4:H2O	-9.29	-9.73	-0.44	ZnSO4:H2O

End of simulation.

```
------------------
Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 5.5-6.5m
           SOLUTION        6
           units           mg/l
           temp            20.1
           pH              9.29
           F               0.96
           Cl              4
           S(6)            270       as SO4
           Na              170
           K               3.9
           Mg              0.75
           Ca              9.9
           Alkalinity      158.6      as HCO3
           Al              0.93
           As(+3)          0.0
           As(+5)          0.0
           Ba              0.034
           Cu              0.018
           Fe              0.57
           Mn              0.05
           Ni              0.012
           Pb              0.0065
           U               1.46
           Zn              0.013
           END
```

```
-----
TITLE
-----

   Schneckentein 5.5-6.5m

-------------------------------------------
Beginning of initial solution calculations.
-------------------------------------------

Initial solution 6.

-----------------------------Solution composition--------------
---------------

            Elements           Molality       Moles

            Al                3.449e-05   3.449e-05
            Alkalinity        2.601e-03   2.601e-03
            Ba                2.477e-07   2.477e-07
            Ca                2.472e-04   2.472e-04
            Cl                1.129e-04   1.129e-04
            Cu                2.834e-07   2.834e-07
            F                 5.056e-05   5.056e-05
            Fe                1.021e-05   1.021e-05
            K                 9.980e-05   9.980e-05
            Mg                3.087e-05   3.087e-05
            Mn                9.107e-07   9.107e-07
            Na                7.399e-03   7.399e-03
            Ni                2.045e-07   2.045e-07
            Pb                3.139e-08   3.139e-08
            S(6)              2.812e-03   2.812e-03
            U                 6.138e-06   6.138e-06
            Zn                1.990e-07   1.990e-07
```

```
----------------------------Description of solution----------------------------

                                    pH  =   9.290
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   1.107e-02
                     Mass of water (kg)  =   1.000e+00
                  Total carbon (mol/kg)  =   2.161e-03
                     Total CO2 (mol/kg)  =   2.161e-03
                    Temperature (deg C)  =  20.100
                 Electrical balance (eq)  =  -2.043e-04
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  -1.29
                               Iterations  =  16
                                  Total H  = 1.110145e+02
                                  Total O  = 5.552415e+01
```

```
------------------
Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 5.5-6.5m
           SOLUTION        6
           units           mg/l
           temp            20.1
           pH              9.29
           F               0.96
           Cl              4
           S(6)            270       as SO4
           Na              170
           K               3.9
           Mg              0.75
           Ca              9.9
           Alkalinity      158.6      as HCO3
           Al              0.93
           As(+3)          0.0
           As(+5)          0.0
           Ba              0.034
           Cu              0.018
           Fe              0.57
           Mn              0.05
           Ni              0.012
           Pb              0.0065
           U               1.46
           Zn              0.013
           END
```

```
-----
TITLE
-----

   Schneckentein 5.5-6.5m

-------------------------------------------
Beginning of initial solution calculations.
-------------------------------------------

Initial solution 6.

-----------------------------Solution composition--------------
---------------

            Elements           Molality       Moles

            Al                3.449e-05   3.449e-05
            Alkalinity        2.601e-03   2.601e-03
            Ba                2.477e-07   2.477e-07
            Ca                2.472e-04   2.472e-04
            Cl                1.129e-04   1.129e-04
            Cu                2.834e-07   2.834e-07
            F                 5.056e-05   5.056e-05
            Fe                1.021e-05   1.021e-05
            K                 9.980e-05   9.980e-05
            Mg                3.087e-05   3.087e-05
            Mn                9.107e-07   9.107e-07
            Na                7.399e-03   7.399e-03
            Ni                2.045e-07   2.045e-07
            Pb                3.139e-08   3.139e-08
            S(6)              2.812e-03   2.812e-03
            U                 6.138e-06   6.138e-06
            Zn                1.990e-07   1.990e-07
```

```
----------------------------Description of solution----------------------------

                                    pH  =   9.290
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   1.107e-02
                     Mass of water (kg)  =   1.000e+00
                  Total carbon (mol/kg)  =   2.161e-03
                     Total CO2 (mol/kg)  =   2.161e-03
                    Temperature (deg C)  =  20.100
                 Electrical balance (eq)  =  -2.043e-04
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  -1.29
                               Iterations  =  16
                                  Total H  = 1.110145e+02
                                  Total O  = 5.552415e+01
```

----------Distribution of species----------

	Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
	OH-	1.485e-05	1.334e-05	-4.828	-4.875	-0.046
	H+	5.631e-10	5.129e-10	-9.249	-9.290	-0.041
	H2O	5.551e+01	9.998e-01	-0.000	-0.000	0.000
Al	3.449e-05					
	Al(OH)4-	3.448e-05	3.098e-05	-4.462	-4.509	-0.046
	Al(OH)3	8.930e-09	8.953e-09	-8.049	-8.048	0.001
	Al(OH)2+	5.035e-11	4.524e-11	-10.298	-10.344	-0.046
	AlOH+2	7.054e-15	4.600e-15	-14.152	-14.337	-0.186
	AlF2+	3.532e-15	3.174e-15	-14.452	-14.498	-0.046
	AlF3	1.793e-15	1.797e-15	-14.747	-14.745	0.001
	AlF+2	2.205e-16	1.438e-16	-15.657	-15.842	-0.186
	AlF4-	3.595e-17	3.230e-17	-16.444	-16.491	-0.046
	AlSO4+	1.923e-18	1.728e-18	-17.716	-17.763	-0.046
	Al+3	8.579e-19	3.278e-19	-18.067	-18.484	-0.418
	Al(SO4)2-	1.056e-19	9.491e-20	-18.976	-19.023	-0.046
	AlHSO4+2	1.157e-28	7.548e-29	-27.936	-28.122	-0.186
Ba	2.477e-07					
	Ba+2	1.518e-07	9.897e-08	-6.819	-7.004	-0.186
	BaSO4	8.796e-08	8.818e-08	-7.056	-7.055	0.001
	BaCO3	6.442e-09	6.458e-09	-8.191	-8.190	0.001
	BaHCO3+	1.532e-09	1.377e-09	-8.815	-8.861	-0.046
	BaOH+	7.275e-12	6.537e-12	-11.138	-11.185	-0.046
C(4)	2.161e-03					
	HCO3-	1.877e-03	1.693e-03	-2.726	-2.771	-0.045
	CO3-2	2.106e-04	1.394e-04	-3.677	-3.856	-0.179
	CaCO3	2.524e-05	2.530e-05	-4.598	-4.597	0.001
	NaCO3-	1.478e-05	1.328e-05	-4.830	-4.877	-0.046
	NaHCO3	6.251e-06	6.267e-06	-5.204	-5.203	0.001
	UO2(CO3)3-4	5.912e-06	1.069e-06	-5.228	-5.971	-0.743
	CaHCO3+	2.621e-06	2.356e-06	-5.581	-5.628	-0.046
	CO2	2.084e-06	2.090e-06	-5.681	-5.680	0.001
	MgCO3	1.880e-06	1.885e-06	-5.726	-5.725	0.001
	MnCO3	7.695e-07	7.715e-07	-6.114	-6.113	0.001
	MgHCO3+	3.305e-07	2.970e-07	-6.481	-6.527	-0.046
	UO2(CO3)2-2	1.882e-07	1.227e-07	-6.725	-6.911	-0.186
	NiCO3	1.487e-07	1.491e-07	-6.828	-6.826	0.001
	Zn(CO3)2-2	1.223e-07	7.978e-08	-6.912	-7.098	-0.186
	Ni(CO3)2-2	5.539e-08	3.612e-08	-7.257	-7.442	-0.186
	ZnCO3	2.671e-08	2.677e-08	-7.573	-7.572	0.001
	PbCO3	2.000e-08	2.005e-08	-7.699	-7.698	0.001
	MnHCO3+	1.170e-08	1.052e-08	-7.932	-7.978	-0.046
	Pb(CO3)2-2	1.076e-08	7.019e-09	-7.968	-8.154	-0.186
	BaCO3	6.442e-09	6.458e-09	-8.191	-8.190	0.001
	CuCO3	2.639e-09	2.646e-09	-8.579	-8.577	0.001
	BaHCO3+	1.532e-09	1.377e-09	-8.815	-8.861	-0.046
	Cu(CO3)2-2	7.119e-10	4.642e-10	-9.148	-9.333	-0.186
	ZnHCO3+	2.284e-10	2.053e-10	-9.641	-9.688	-0.046
	UO2CO3	4.102e-11	4.112e-11	-10.387	-10.386	0.001
	NiHCO3+	3.754e-11	3.374e-11	-10.425	-10.472	-0.046
	FeCO3	1.762e-11	1.767e-11	-10.754	-10.753	0.001
	PbHCO3+	1.239e-11	1.114e-11	-10.907	-10.953	-0.046
	CuHCO3+	3.339e-12	3.000e-12	-11.476	-11.523	-0.046
	FeHCO3+	9.959e-13	8.949e-13	-12.002	-12.048	-0.046
	(UO2)3(CO3)6-6	1.259e-16	2.685e-18	-15.900	-17.571	-1.671
	UO2(CO3)3-5	2.330e-22	1.610e-23	-21.633	-22.793	-1.161
	U(CO3)4-4	2.377e-34	4.297e-35	-33.624	-34.367	-0.743
	U(CO3)5-6	2.012e-36	4.290e-38	-35.696	-37.368	-1.671
Ca	2.472e-04					
	Ca+2	1.792e-04	1.185e-04	-3.747	-3.926	-0.180
	CaSO4	4.002e-05	4.013e-05	-4.398	-4.397	0.001
	CaCO3	2.524e-05	2.530e-05	-4.598	-4.597	0.001
	CaHCO3+	2.621e-06	2.356e-06	-5.581	-5.628	-0.046
	CaF+	4.622e-08	4.153e-08	-7.335	-7.382	-0.046
	CaOH+	4.266e-08	3.834e-08	-7.370	-7.416	-0.046
	CaHSO4+	1.266e-13	1.137e-13	-12.898	-12.944	-0.046
Cl	1.129e-04					
	Cl-	1.129e-04	1.013e-04	-3.947	-3.995	-0.047
	MnCl+	3.199e-11	2.874e-11	-10.495	-10.541	-0.046
	ZnOHCl	6.277e-12	6.293e-12	-11.202	-11.201	0.001
	ZnCl+	2.344e-13	2.106e-13	-12.630	-12.676	-0.046
	NiCl+	4.085e-14	3.671e-14	-13.389	-13.435	-0.046
	PbCl+	3.282e-14	2.949e-14	-13.484	-13.530	-0.046
	MnCl2	1.267e-15	1.270e-15	-14.897	-14.896	0.001
	CuCl+	8.400e-16	7.548e-16	-15.076	-15.122	-0.046
	FeCl+	8.220e-16	7.386e-16	-15.085	-15.132	-0.046
	CuCl2-	6.465e-16	5.809e-16	-15.189	-15.236	-0.046
	ZnCl2	2.183e-17	2.189e-17	-16.661	-16.660	0.001
	NiCl2	1.346e-17	1.349e-17	-16.871	-16.870	0.001
	PbCl2	5.181e-18	5.194e-18	-17.286	-17.284	0.001
	CuCl3-2	1.402e-19	9.146e-20	-18.853	-19.039	-0.186
	MnCl3-	3.942e-20	3.543e-20	-19.404	-19.451	-0.046
	CuCl2	3.879e-20	3.889e-20	-19.411	-19.410	0.001
	UO2Cl+	1.130e-20	1.016e-20	-19.947	-19.993	-0.046
	ZnCl3-	2.686e-21	2.414e-21	-20.571	-20.617	-0.046
	PbCl3-	4.508e-22	4.051e-22	-21.346	-21.392	-0.046
	FeCl+2	1.538e-23	1.003e-23	-22.813	-22.999	-0.186
	ZnCl4-2	1.806e-25	1.177e-25	-24.743	-24.929	-0.186
	UO2Cl2	5.251e-26	5.264e-26	-25.280	-25.279	0.001
	PbCl4-2	2.897e-26	1.889e-26	-25.538	-25.724	-0.186
	CuCl3-	1.423e-26	1.279e-26	-25.847	-25.893	-0.046
	FeCl2+	5.911e-27	5.312e-27	-26.228	-26.275	-0.046
	FeCl3	5.365e-32	5.379e-32	-31.270	-31.269	0.001
	CuCl4-2	8.870e-33	5.784e-33	-32.052	-32.238	-0.186
	UCl+3	0.000e+00	0.000e+00	-53.645	-54.062	-0.418
Cu(1)	1.977e-13					
	Cu+	1.971e-13	1.771e-13	-12.705	-12.752	-0.046
	CuCl2-	6.465e-16	5.809e-16	-15.189	-15.236	-0.046
	CuCl3-2	1.402e-19	9.146e-20	-18.853	-19.039	-0.186
Cu(2)	2.834e-07					
	Cu(OH)2	2.800e-07	2.807e-07	-6.553	-6.552	0.001
	CuCO3	2.639e-09	2.646e-09	-8.579	-8.577	0.001
	Cu(CO3)2-2	7.119e-10	4.642e-10	-9.148	-9.333	-0.186
	CuOH+	7.669e-11	6.891e-11	-10.115	-10.162	-0.046
	Cu(OH)3-	3.669e-11	3.297e-11	-10.435	-10.482	-0.046
	Cu+2	5.421e-12	3.535e-12	-11.266	-11.452	-0.186
	CuHCO3+	3.339e-12	3.000e-12	-11.476	-11.523	-0.046
	CuSO4	1.237e-12	1.240e-12	-11.908	-11.907	0.001
	Cu(OH)4-2	1.967e-14	1.282e-14	-13.706	-13.892	-0.186
	CuF+	3.091e-15	2.778e-15	-14.510	-14.556	-0.046
	Cu2(OH)2+2	1.943e-15	1.267e-15	-14.711	-14.897	-0.186
	CuCl+	8.400e-16	7.548e-16	-15.076	-15.122	-0.046
	CuCl2	3.879e-20	3.889e-20	-19.411	-19.410	0.001
	CuCl3-	1.423e-26	1.279e-26	-25.847	-25.893	-0.046
	CuCl4-2	8.870e-33	5.784e-33	-32.052	-32.238	-0.186
F	5.056e-05					
	F-	5.030e-05	4.520e-05	-4.298	-4.345	-0.046
	NaF	1.707e-07	1.712e-07	-6.768	-6.767	0.001
	MgF+	4.640e-08	4.170e-08	-7.333	-7.380	-0.046
	CaF+	4.622e-08	4.153e-08	-7.335	-7.382	-0.046
	HF	3.178e-11	3.186e-11	-10.498	-10.497	0.001
	MnF+	2.425e-11	2.179e-11	-10.615	-10.662	-0.046
	ZnF+	6.426e-13	5.774e-13	-12.192	-12.239	-0.046
	NiF+	1.448e-13	1.302e-13	-12.839	-12.886	-0.046
	PbF+	7.405e-15	6.654e-15	-14.130	-14.177	-0.046
	HF2-	5.901e-15	5.303e-15	-14.229	-14.275	-0.046
	AlF2+	3.532e-15	3.174e-15	-14.452	-14.498	-0.046
	CuF+	3.091e-15	2.778e-15	-14.510	-14.556	-0.046
	FeF+	2.658e-15	2.389e-15	-14.575	-14.622	-0.046
	AlF3	1.793e-15	1.797e-15	-14.747	-14.745	0.001
	UO2F+	4.377e-16	3.933e-16	-15.359	-15.405	-0.046
	AlF+2	2.205e-16	1.438e-16	-15.657	-15.842	-0.186
	UO2F2	5.993e-17	6.008e-17	-16.222	-16.221	0.001
	AlF4-	3.595e-17	3.230e-17	-16.444	-16.491	-0.046
	PbF2	6.125e-18	6.141e-18	-17.213	-17.212	0.001
	UO2F3-	5.749e-19	5.166e-19	-18.240	-18.287	-0.046
	FeF2+	4.812e-19	4.325e-19	-18.318	-18.364	-0.046
	FeF+2	3.910e-19	2.550e-19	-18.408	-18.593	-0.186
	FeF3	3.038e-20	3.046e-20	-19.517	-19.516	0.001
	H2F2	3.142e-21	3.150e-21	-20.503	-20.502	0.001
	PbF3-	2.238e-21	2.011e-21	-20.650	-20.697	-0.046
	UO2F4-2	2.291e-22	1.494e-22	-21.640	-21.826	-0.186
	PbF4-2	6.671e-26	4.350e-26	-25.176	-25.362	-0.186
	UF3+	0.000e+00	0.000e+00	-43.233	-43.279	-0.046
	UF4	0.000e+00	0.000e+00	-43.713	-43.712	0.001
	UF2+2	0.000e+00	0.000e+00	-44.118	-44.303	-0.186
	UF+3	0.000e+00	0.000e+00	-46.455	-46.872	-0.418
	UF5-	0.000e+00	0.000e+00	-46.571	-46.617	-0.046
	UF6-2	0.000e+00	0.000e+00	-48.667	-48.853	-0.186
Fe(2)	3.077e-11					
	FeCO3	1.762e-11	1.767e-11	-10.754	-10.753	0.001
	Fe+2	8.104e-12	5.285e-12	-11.091	-11.277	-0.186
	FeOH+	2.499e-12	2.245e-12	-11.602	-11.649	-0.046
	FeSO4	1.521e-12	1.525e-12	-11.818	-11.817	0.001
	FeHCO3+	9.959e-13	8.949e-13	-12.002	-12.048	-0.046
	Fe(OH)2	2.409e-14	2.415e-14	-13.618	-13.617	0.001
	FeF+	2.658e-15	2.389e-15	-14.575	-14.622	-0.046
	Fe(OH)3-	1.854e-15	1.666e-15	-14.732	-14.778	-0.046
	FeCl+	8.220e-16	7.386e-16	-15.085	-15.132	-0.046
	FeHSO4+	5.644e-21	5.072e-21	-20.248	-20.295	-0.046

Fe(3)	1.021e-05					
	Fe(OH)4-	6.307e-06	5.667e-06	-5.200	-5.247	-0.046
	Fe(OH)3	3.884e-06	3.894e-06	-5.411	-5.410	0.001
	Fe(OH)2+	2.144e-08	1.927e-08	-7.669	-7.715	-0.046
	FeOH+2	5.530e-14	3.606e-14	-13.257	-13.443	-0.186
	FeF2+	4.812e-19	4.325e-19	-18.318	-18.364	-0.046
	FeF+2	3.910e-19	2.550e-19	-18.408	-18.593	-0.186
	FeSO4+	7.463e-20	6.706e-20	-19.127	-19.174	-0.046
	FeF3	3.038e-20	3.046e-20	-19.517	-19.516	0.001
	Fe+3	1.005e-20	3.841e-21	-19.998	-20.416	-0.418
	Fe(SO4)2-	2.847e-21	2.558e-21	-20.546	-20.592	-0.046
	FeCl+2	1.538e-23	1.003e-23	-22.813	-22.999	-0.186
	Fe2(OH)2+4	2.378e-25	4.299e-26	-24.624	-25.367	-0.743
	FeCl2+	5.911e-27	5.312e-27	-26.228	-26.275	-0.046
	FeHSO4+2	1.420e-28	9.261e-29	-27.848	-28.033	-0.186
	Fe3(OH)4+5	3.967e-30	2.741e-31	-29.402	-30.562	-1.161
	FeCl3	5.365e-32	5.379e-32	-31.270	-31.269	0.001
H(0)	3.759e-30					
	H2	1.879e-30	1.884e-30	-29.726	-29.725	0.001
K	9.980e-05					
	K+	9.864e-05	8.846e-05	-4.006	-4.053	-0.047
	KSO4-	1.163e-06	1.045e-06	-5.934	-5.981	-0.046
Mg	3.087e-05					
	Mg+2	2.295e-05	1.528e-05	-4.639	-4.816	-0.177
	MgSO4	5.588e-06	5.602e-06	-5.253	-5.252	0.001
	MgCO3	1.880e-06	1.885e-06	-5.726	-5.725	0.001
	MgHCO3+	3.305e-07	2.970e-07	-6.481	-6.527	-0.046
	MgOH+	7.676e-08	6.898e-08	-7.115	-7.161	-0.046
	MgF+	4.640e-08	4.170e-08	-7.333	-7.380	-0.046
Mn(2)	9.107e-07					
	MnCO3	7.695e-07	7.715e-07	-6.114	-6.113	0.001
	Mn+2	1.069e-07	6.968e-08	-6.971	-7.157	-0.186
	MnSO4	1.998e-08	2.003e-08	-7.699	-7.698	0.001
	MnHCO3+	1.170e-08	1.052e-08	-7.932	-7.978	-0.046
	MnOH+	2.589e-09	2.326e-09	-8.587	-8.633	-0.046
	MnCl+	3.199e-11	2.874e-11	-10.495	-10.541	-0.046
	MnF+	2.425e-11	2.179e-11	-10.615	-10.662	-0.046
	Mn(OH)3-	9.105e-15	8.182e-15	-14.041	-14.087	-0.046
	MnCl2	1.267e-15	1.270e-15	-14.897	-14.896	0.001
	MnCl3-	3.942e-20	3.543e-20	-19.404	-19.451	-0.046
Mn(3)	2.722e-29					
	Mn+3	2.722e-29	1.040e-29	-28.565	-28.983	-0.418
Mn(6)	1.178e-37					
	MnO4-2	1.178e-37	7.680e-38	-36.929	-37.115	-0.186
Mn(7)	0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-42.778	-42.824	-0.046
Na	7.399e-03					
	Na+	7.315e-03	6.581e-03	-2.136	-2.182	-0.046
	NaSO4-	6.323e-05	5.682e-05	-4.199	-4.246	-0.046
	NaCO3-	1.478e-05	1.328e-05	-4.830	-4.877	-0.046
	NaHCO3	6.251e-06	6.267e-06	-5.204	-5.203	0.001
	NaF	1.707e-07	1.712e-07	-6.768	-6.767	0.001
Ni	2.045e-07					
	NiCO3	1.487e-07	1.491e-07	-6.828	-6.826	0.001
	Ni(CO3)2-2	5.539e-08	3.612e-08	-7.257	-7.442	-0.186
	Ni+2	2.213e-10	1.443e-10	-9.655	-9.841	-0.186
	Ni(OH)2	5.471e-11	5.485e-11	-10.262	-10.261	0.001
	NiSO4	4.781e-11	4.793e-11	-10.320	-10.319	0.001
	NiHCO3+	3.754e-11	3.374e-11	-10.425	-10.472	-0.046
	NiOH+	3.045e-11	2.736e-11	-10.516	-10.563	-0.046
	Ni(OH)3-	1.190e-12	1.069e-12	-11.924	-11.971	-0.046
	NiF+	1.448e-13	1.302e-13	-12.839	-12.886	-0.046
	NiCl+	4.085e-14	3.671e-14	-13.389	-13.435	-0.046
	Ni(SO4)2-2	7.326e-15	4.777e-15	-14.135	-14.321	-0.186
	NiCl2	1.346e-17	1.349e-17	-16.871	-16.870	0.001
O(0)	5.356e-35					
	O2	2.678e-35	2.685e-35	-34.572	-34.571	0.001
Pb	3.139e-08					
	PbCO3	2.000e-08	2.005e-08	-7.699	-7.698	0.001
	Pb(CO3)2-2	1.076e-08	7.019e-09	-7.968	-8.154	-0.186
	PbOH+	3.502e-10	3.147e-10	-9.456	-9.502	-0.046
	Pb(OH)2	2.380e-10	2.386e-10	-9.623	-9.622	0.001
	Pb+2	1.270e-11	8.278e-12	-10.896	-11.082	-0.186
	PbHCO3+	1.239e-11	1.114e-11	-10.907	-10.953	-0.046
	PbSO4	8.255e-12	8.276e-12	-11.083	-11.082	0.001
	Pb(OH)3-	5.944e-12	5.342e-12	-11.226	-11.272	-0.046
	Pb(SO4)2-2	1.184e-13	7.722e-14	-12.927	-13.112	-0.186
	Pb(OH)4-2	3.658e-14	2.385e-14	-13.437	-13.622	-0.186
	PbCl+	3.282e-14	2.949e-14	-13.484	-13.530	-0.046
	PbF+	7.405e-15	6.654e-15	-14.130	-14.177	-0.046
	PbF2	6.125e-18	6.141e-18	-17.213	-17.212	0.001
	PbCl2	5.181e-18	5.194e-18	-17.286	-17.284	0.001
	Pb2OH+3	1.526e-19	5.832e-20	-18.816	-19.234	-0.418
	Pb3(OH)4+2	7.845e-21	5.116e-21	-20.105	-20.291	-0.186
	PbF3-	2.238e-21	2.011e-21	-20.650	-20.697	-0.046
	PbCl3-	4.508e-22	4.051e-22	-21.346	-21.392	-0.046
	PbF4-2	6.671e-26	4.350e-26	-25.176	-25.362	-0.186
	PbCl4-2	2.897e-26	1.889e-26	-25.538	-25.724	-0.186
S(6)	2.812e-03					
	SO4-2	2.702e-03	1.778e-03	-2.568	-2.750	-0.182
	NaSO4-	6.323e-05	5.682e-05	-4.199	-4.246	-0.046
	CaSO4	4.002e-05	4.013e-05	-4.398	-4.397	0.001
	MgSO4	5.588e-06	5.602e-06	-5.253	-5.252	0.001
	KSO4-	1.163e-06	1.045e-06	-5.934	-5.981	-0.046
	BaSO4	8.796e-08	8.818e-08	-7.056	-7.055	0.001
	MnSO4	1.998e-08	2.003e-08	-7.699	-7.698	0.001
	ZnSO4	3.852e-10	3.862e-10	-9.414	-9.413	0.001
	HSO4-	8.884e-11	7.983e-11	-10.051	-10.098	-0.046
	NiSO4	4.781e-11	4.793e-11	-10.320	-10.319	0.001
	Zn(SO4)2-2	8.893e-12	5.799e-12	-11.051	-11.237	-0.186
	PbSO4	8.255e-12	8.276e-12	-11.083	-11.082	0.001
	FeSO4	1.521e-12	1.525e-12	-11.818	-11.817	0.001
	CuSO4	1.237e-12	1.240e-12	-11.908	-11.907	0.001
	CaHSO4+	1.266e-13	1.137e-13	-12.898	-12.944	-0.046
	Pb(SO4)2-2	1.184e-13	7.722e-14	-12.927	-13.112	-0.186
	Ni(SO4)2-2	7.326e-15	4.777e-15	-14.135	-14.321	-0.186
	UO2SO4	1.570e-16	1.574e-16	-15.804	-15.803	0.001
	UO2(SO4)2-2	3.778e-18	2.463e-18	-17.423	-17.608	-0.186
	AlSO4+	1.923e-18	1.728e-18	-17.716	-17.763	-0.046
	Al(SO4)2-	1.056e-19	9.491e-20	-18.976	-19.023	-0.046
	FeSO4+	7.463e-20	6.706e-20	-19.127	-19.174	-0.046
	FeHSO4+	5.644e-21	5.072e-21	-20.248	-20.295	-0.046
	Fe(SO4)2-	2.847e-21	2.558e-21	-20.546	-20.592	-0.046
	FeHSO4+2	1.420e-28	9.261e-29	-27.848	-28.033	-0.186
	AlHSO4+2	1.157e-28	7.548e-29	-27.936	-28.122	-0.186
	U(SO4)2	0.000e+00	0.000e+00	-46.940	-46.939	0.001
	USO4+2	0.000e+00	0.000e+00	-47.851	-48.037	-0.186
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-64.521	-64.938	-0.418
U(4)	3.264e-24					
	U(OH)4	3.264e-24	3.272e-24	-23.486	-23.485	0.001
	U(OH)3+	7.249e-30	6.514e-30	-29.140	-29.186	-0.046
	U(CO3)4-4	2.377e-34	4.297e-35	-33.624	-34.367	-0.743
	U(OH)2+2	2.722e-36	1.775e-36	-35.565	-35.751	-0.186
	U(CO3)5-6	2.012e-36	4.290e-38	-35.696	-37.368	-1.671
	UOH+3	0.000e+00	0.000e+00	-42.813	-43.231	-0.418
	UF3+	0.000e+00	0.000e+00	-43.233	-43.279	-0.046
	UF4	0.000e+00	0.000e+00	-43.713	-43.712	0.001
	UF2+2	0.000e+00	0.000e+00	-44.118	-44.303	-0.186
	UF+3	0.000e+00	0.000e+00	-46.455	-46.872	-0.418
	UF5-	0.000e+00	0.000e+00	-46.571	-46.617	-0.046
	U(SO4)2	0.000e+00	0.000e+00	-46.940	-46.939	0.001
	USO4+2	0.000e+00	0.000e+00	-47.851	-48.037	-0.186
	UF6-2	0.000e+00	0.000e+00	-48.667	-48.853	-0.186
	U+4	0.000e+00	0.000e+00	-51.101	-51.844	-0.743
	UCl+3	0.000e+00	0.000e+00	-53.645	-54.062	-0.418
	U6(OH)15+9	0.000e+00	0.000e+00	-185.152	-188.912	-3.760
U(5)	2.703e-19					
	UO2+	2.701e-19	2.427e-19	-18.569	-18.615	-0.046
	UO2(CO3)3-5	2.330e-22	1.610e-23	-21.633	-22.793	-1.161
U(6)	6.138e-06					
	UO2(CO3)3-4	5.912e-06	1.069e-06	-5.228	-5.971	-0.743
	UO2(CO3)2-2	1.882e-07	1.227e-07	-6.725	-6.911	-0.186
	UO2(OH)3-	3.722e-08	3.345e-08	-7.429	-7.476	-0.046
	UO2CO3	4.102e-11	4.112e-11	-10.387	-10.386	0.001
	UO2(OH)4-2	1.585e-12	1.033e-12	-11.800	-11.986	-0.186
	UO2OH+	7.179e-13	6.451e-13	-12.144	-12.190	-0.046
	(UO2)3(OH)7-	4.361e-15	3.919e-15	-14.360	-14.407	-0.046
	UO2F+	4.377e-16	3.933e-16	-15.359	-15.405	-0.046
	UO2SO4	1.570e-16	1.574e-16	-15.804	-15.803	0.001
	(UO2)3(CO3)6-6	1.259e-16	2.685e-18	-15.900	-17.571	-1.671
	UO2+2	1.097e-16	7.155e-17	-15.960	-16.145	-0.186
	UO2F2	5.993e-17	6.008e-17	-16.222	-16.221	0.001
	UO2(SO4)2-2	3.778e-18	2.463e-18	-17.423	-17.608	-0.186
	(UO2)3(OH)5+	1.595e-18	1.433e-18	-17.797	-17.844	-0.046
	UO2F3-	5.749e-19	5.166e-19	-18.240	-18.287	-0.046
	(UO2)2(OH)2+2	5.364e-20	3.498e-20	-19.271	-19.456	-0.186
	UO2Cl+	1.130e-20	1.016e-20	-19.947	-19.993	-0.046
	(UO2)4(OH)7+	3.929e-22	3.530e-22	-21.406	-21.452	-0.046
	UO2F4-2	2.291e-22	1.494e-22	-21.640	-21.826	-0.186
	(UO2)3(OH)4+2	1.021e-23	6.660e-24	-22.991	-23.177	-0.186
	UO2Cl2	5.251e-26	5.264e-26	-25.280	-25.279	0.001
	(UO2)2OH+3	5.211e-26	1.991e-26	-25.283	-25.701	-0.418
Zn	1.990e-07					
	Zn(CO3)2-2	1.223e-07	7.978e-08	-6.912	-7.098	-0.186
	Zn(OH)2	4.595e-08	4.606e-08	-7.338	-7.337	0.001
	ZnCO3	2.671e-08	2.677e-08	-7.573	-7.572	0.001
	ZnOH+	1.569e-09	1.410e-09	-8.804	-8.851	-0.046
	Zn+2	1.477e-09	9.628e-10	-8.831	-9.016	-0.186
	ZnSO4	3.852e-10	3.862e-10	-9.414	-9.413	0.001
	Zn(OH)3-	3.160e-10	2.840e-10	-9.500	-9.547	-0.046
	ZnHCO3+	2.284e-10	2.053e-10	-9.641	-9.688	-0.046
	Zn(SO4)2-2	8.893e-12	5.799e-12	-11.051	-11.237	-0.186
	ZnOHCl	6.277e-12	6.293e-12	-11.202	-11.201	0.001
	ZnF+	6.426e-13	5.774e-13	-12.192	-12.239	-0.046
	ZnCl+	2.344e-13	2.106e-13	-12.630	-12.676	-0.046
	Zn(OH)4-2	1.345e-13	8.773e-14	-12.871	-13.057	-0.186
	ZnCl2	2.183e-17	2.189e-17	-16.661	-16.660	0.001
	ZnCl3-	2.686e-21	2.414e-21	-20.571	-20.617	-0.046
	ZnCl4-2	1.806e-25	1.177e-25	-24.743	-24.929	-0.186

-------------------Saturation indices-------------------------------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-1.74	9.39	11.12	Al(OH)3
AlumK	-22.78	-28.04	-5.26	KAl(SO4)2:12H2O
Alunite	-8.48	-9.27	-0.78	KAl3(SO4)2(OH)6
Anglesite	-6.02	-13.83	-7.82	PbSO4
Anhydrite	-2.33	-6.68	-4.34	CaSO4
Antlerite	-8.24	0.05	8.29	Cu3(OH)4SO4
Aragonite	0.52	-7.78	-8.31	CaCO3
Artinite	-4.86	5.09	9.95	MgCO3:Mg(OH)2:3H2O
Atacamite	-6.60	0.97	7.57	Cu2(OH)3Cl
Azurite	-6.87	-23.49	-16.62	Cu3(OH)2(CO3)2
B-UO2(OH)2	-3.28	2.43	5.71	UO2(OH)2
BaF2	-9.92	-15.69	-5.77	BaF2
Barite	0.30	-9.75	-10.05	BaSO4
Basaluminite	-6.49	16.21	22.70	Al4(OH)10SO4
Bianchite	-10.00	-11.77	-1.76	ZnSO4:6H2O
Birnessite	-5.60	38.00	43.60	MnO2
Bixbyite	-1.80	49.43	51.23	Mn2O3
Boehmite	0.46	9.39	8.93	AlOOH
Brochantite	-8.16	7.18	15.34	Cu4(OH)6SO4
Brucite	-3.41	13.76	17.17	Mg(OH)2
Bunsenite	-4.00	8.74	12.74	NiO
Calcite	0.67	-7.78	-8.45	CaCO3
Cerrusite	-1.75	-14.94	-13.19	PbCO3
Chalcanthite	-11.54	-14.20	-2.66	CuSO4:5H2O
CO2(g)	-4.27	-22.44	-18.16	CO2
Cotunnite	-14.23	-19.07	-4.84	PbCl2
Cu(OH)2	-1.70	7.13	8.83	Cu(OH)2
Cu2SO4	-26.36	-33.65	-7.29	Cu2SO4
CuCO3	-5.68	-15.31	-9.63	CuCO3
CuF	-24.33	-19.80	4.53	CuF
CuF2	-19.68	-20.14	-0.46	CuF2
CuF2:2H2O	-15.64	-20.14	-4.51	CuF2:2H2O
CuMetal	-7.78	-19.45	-11.67	Cu
CuOCuSO4	-19.04	-7.07	11.97	CuO:CuSO4
CupricFerrite	15.68	48.31	32.63	CuFe2O4
Cuprite	-5.30	-12.32	-7.03	Cu2O
CuprousFerrite	12.87	14.43	1.57	CuFeO2
CuSO4	-17.43	-14.20	3.23	CuSO4
Diaspore	2.20	9.39	7.18	AlOOH
Dolomite	0.52	-16.45	-16.97	CaMg(CO3)2
Dolomite(d)	-0.05	-16.45	-16.40	CaMg(CO3)2
Epsomite	-5.39	-7.57	-2.17	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.51	16.61	10.10	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.56	20.59	18.03	Fe(OH)3
Fe3(OH)8	1.99	48.49	46.50	Fe3(OH)8
Fluorite	-1.96	-12.62	-10.66	CaF2
Gibbsite	1.00	9.39	8.39	Al(OH)3
Goethite	8.45	20.59	12.14	FeOOH
Goslarite	-9.77	-11.77	-2.00	ZnSO4:7H2O
Gummite	-8.25	2.43	10.68	UO3
Gypsum	-2.10	-6.68	-4.58	CaSO4:2H2O
H2(g)	-26.53	-26.58	-0.05	H2
Halite	-7.75	-6.18	1.57	NaCl
Hausmannite	-1.41	60.85	62.26	Mn3O4
Hematite	18.54	41.19	22.65	Fe2O3
Huntite	-4.14	-33.80	-29.65	CaMg3(CO3)4
Hydrocerrusite	-4.92	-22.38	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-12.80	-20.92	-8.12	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-8.05	23.36	31.42	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-6.23	24.36	30.59	KFe3(SO4)2(OH)6
Jarosite-Na	-8.35	26.23	34.58	NaFe3(SO4)2(OH)6
JarositeH	-15.58	19.12	34.70	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-8.71	-11.94	-3.23	AlOHSO4
Langite	-10.09	7.18	17.28	Cu4(OH)6SO4:H2O
Larnakite	-6.13	-6.33	-0.20	PbO:PbSO4
Laurionite	-6.41	-5.79	0.62	PbOHCl
Litharge	-5.42	7.50	12.92	PbO
Maghemite	8.52	41.19	32.66	Fe2O3
Magnesite	-0.72	-8.67	-7.95	MgCO3
Magnetite	17.86	48.49	30.63	Fe3O4
Malachite	-3.20	-8.18	-4.98	Cu2(OH)2CO3
Manganite	-0.63	24.71	25.34	MnOOH
Massicot	-5.62	7.50	13.12	PbO
Matlockite	-9.89	-19.42	-9.53	PbClF
Melanothallite	-23.32	-19.44	3.88	CuCl2
Melanterite	-11.76	-14.03	-2.27	FeSO4:7H2O
Minium	-25.88	49.07	74.95	Pb3O4
Mirabilite	-5.77	-7.11	-1.35	Na2SO4:10H2O
Mn2(SO4)3	-60.98	-14.56	46.42	Mn2(SO4)3
MnCl2:4H2O	-17.64	-15.15	2.50	MnCl2:4H2O
MnSO4	-12.77	-9.91	2.86	MnSO4
Morenosite	-10.20	-12.59	-2.40	NiSO4:7H2O
Na4UO2(CO3)3	-20.15	-36.44	-16.29	Na4UO2(CO3)3
Nahcolite	-4.36	-15.33	-10.97	NaHCO3
Nantokite	-9.86	-19.45	-9.58	CuCl
Natron	-6.72	-8.22	-1.50	Na2CO3:10H2O
Nesquehonite	-3.12	-8.67	-5.55	MgCO3:3H2O
Ni(OH)2	-1.69	8.74	10.43	Ni(OH)2
Ni4(OH)6SO4	-18.37	13.63	32.00	Ni4(OH)6SO4
NiCO3	-6.98	-13.70	-6.72	NiCO3
Nsutite	-4.56	38.00	42.56	MnO2
O2(g)	-31.72	53.16	84.88	O2
Pb(OH)2	-0.82	7.50	8.32	Pb(OH)2
Pb2(OH)3Cl	-7.08	1.71	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-11.20	15.00	26.20	PbO:Pb(OH)2
Pb2O3	-19.46	41.58	61.04	Pb2O3
Pb2OCO3	-7.08	-7.44	-0.36	PbO:PbCO3
Pb3O2CO3	-11.29	0.06	11.34	PbCO3:2PbO
Pb3O2SO4	-9.49	1.16	10.65	PbSO4:2PbO
Pb4(OH)6SO4	-12.44	8.66	21.10	Pb4(OH)6SO4
Pb4O3SO4	-13.87	8.66	22.53	PbSO4:3PbO
PbF2	-12.34	-19.77	-7.43	PbF2
PbMetal	-23.35	-19.08	4.27	Pb
PbO:0.3H2O	-5.48	7.50	12.98	PbO:0.33H2O
Phosgenite	-14.20	-34.01	-19.81	PbCl2:PbCO3
Plattnerite	-16.09	34.08	50.17	PbO2
Portlandite	-8.53	14.65	23.18	Ca(OH)2
Pyrochroite	-3.78	11.42	15.20	Mn(OH)2
Pyrolusite	-4.17	38.00	42.18	MnO2
Retgersite	-10.54	-12.59	-2.05	NiSO4:6H2O
Rhodochrosite	0.10	-11.01	-11.11	MnCO3
Rhodochrosite(d)	-0.62	-11.01	-10.39	MnCO3
Rutherfordine	-5.57	-20.00	-14.43	UO2CO3
Schoepite	-3.12	2.43	5.55	UO2(OH)2:H2O
Siderite	-4.27	-15.13	-10.86	FeCO3
Siderite(d)(3)	-4.68	-15.13	-10.45	FeCO3
Smithsonite	-2.93	-12.87	-9.95	ZnCO3
Tenorite	-0.68	7.13	7.81	CuO
Thenardite	-6.94	-7.11	-0.17	Na2SO4
Thermonatrite	-8.38	-8.22	0.16	Na2CO3:H2O
Trona	-12.60	-23.55	-10.95	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-32.81	-45.48	-12.66	U(OH)2SO4
U3O8(c)	-12.84	-19.28	-6.43	U3O8
U4O9(c)	-30.01	-70.00	-39.99	U4O9
UF4(c)	-50.85	-78.68	-27.84	UF4
UF4:2.5H2O	-41.66	-78.68	-37.02	UF4:2.5H2O
UO2(a)	-14.78	-24.15	-9.36	UO2
UO3(gamma)	-5.52	2.43	7.96	UO3
Uraninite(c)	-10.11	-24.15	-14.03	UO2
Witherite	-2.29	-10.86	-8.57	BaCO3
Zincite(c)	-1.84	9.56	11.41	ZnO
Zincosite	-15.01	-11.77	3.25	ZnSO4
Zn(OH)2-a	-2.89	9.56	12.45	Zn(OH)2
Zn(OH)2-b	-2.19	9.56	11.75	Zn(OH)2
Zn(OH)2-c	-2.64	9.56	12.20	Zn(OH)2
Zn(OH)2-e	-1.94	9.56	11.50	Zn(OH)2
Zn(OH)2-g	-2.15	9.56	11.71	Zn(OH)2
Zn2(OH)2SO4	-9.70	-2.20	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.36	5.84	15.20	Zn2(OH)3Cl
Zn3O(SO4)2	-33.75	-13.97	19.78	ZnO:2ZnSO4
Zn4(OH)6SO4	-11.48	16.92	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-17.25	21.25	38.50	Zn5(OH)8Cl2
ZnCl2	-24.25	-17.01	7.24	ZnCl2
ZnCO3:H2O	-2.61	-12.87	-10.26	ZnCO3:H2O
ZnF2	-16.35	-17.71	-1.36	ZnF2
ZnMetal	-43.22	-17.02	26.21	Zn
ZnO(a)	-1.75	9.56	11.31	ZnO
ZnSO4:H2O	-11.33	-11.77	-0.44	ZnSO4:H2O

End of simulation.

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Reading data base.
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          SOLUTION_MASTER_SPECIES
          SOLUTION_SPECIES
          PHASES
          EXCHANGE_MASTER_SPECIES
          EXCHANGE_SPECIES
          SURFACE_MASTER_SPECIES
          SURFACE_SPECIES
          END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

          TITLE   Schneckentein 6.5-7.5m
          SOLUTION        7
          units           mg/l
          temp            22.9
          pH              9.84
          F               2.2
          Cl              27
          S(6)            170         as SO4
          Na              180
          K               3.0
          Mg              1.4
          Ca              11.8
          Alkalinity      183         as HCO3
          Al              0.75
          As(+3)          0.135
          As(+5)          0.565
          Ba              0.109
          Cu              0.047
          Fe              1.88
          Mn              0.05
          Ni              0.050
          Pb              0.035
          U               1.2
          Zn              0.037
          END
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TITLE
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   Schneckentein 6.5-7.5m

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Beginning of initial solution calculations.
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Initial solution 7.

----------------------------Solution composition------------
-----------------

            Elements           Molality       Moles

            Al                2.781e-05   2.781e-05
            Alkalinity        3.001e-03   3.001e-03
            As(3)             1.803e-06   1.803e-06
            As(5)             7.546e-06   7.546e-06
            Ba                7.941e-07   7.941e-07
            Ca                2.946e-04   2.946e-04
            Cl                7.620e-04   7.620e-04
            Cu                7.401e-07   7.401e-07
            F                 1.159e-04   1.159e-04
            Fe                3.368e-05   3.368e-05
            K                 7.677e-05   7.677e-05
            Mg                5.762e-05   5.762e-05
            Mn                9.106e-07   9.106e-07
            Na                7.834e-03   7.834e-03
            Ni                8.521e-07   8.521e-07
            Pb                1.690e-07   1.690e-07
            S(6)              1.771e-03   1.771e-03
            U                 5.044e-06   5.044e-06
            Zn                5.663e-07   5.663e-07
```

```
----------------------------Description of solution----------------------------

                                    pH  =   9.840
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   1.013e-02
                     Mass of water (kg)  =   1.000e+00
                   Total carbon (mol/kg)  =   2.042e-03
                      Total CO2 (mol/kg)  =   2.042e-03
                     Temperature (deg C)  =  22.900
                  Electrical balance (eq)  =   1.323e-03
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =   8.69
                                Iterations  =  15
                                   Total H  = 1.110141e+02
                                   Total O  = 5.551978e+01

---------------------------------Redox couples---------------------------------

          Redox couple             pe  Eh (volts)

          As(3)/As(5)         -5.0814     -0.2985
```

----------Distribution of species----------

	Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
	OH-	6.539e-05	5.897e-05	-4.185	-4.229	-0.045
	H+	1.583e-10	1.445e-10	-9.801	-9.840	-0.039
	H2O	5.551e+01	9.998e-01	-0.000	-0.000	0.000
Al	2.781e-05					
	Al(OH)4-	2.781e-05	2.508e-05	-4.556	-4.601	-0.045
	Al(OH)3	1.973e-09	1.977e-09	-8.705	-8.704	0.001
	Al(OH)2+	2.516e-12	2.269e-12	-11.599	-11.644	-0.045
	AlOH+2	7.618e-17	5.039e-17	-16.118	-16.298	-0.179
	AlF3	5.777e-17	5.790e-17	-16.238	-16.237	0.001
	AlF2+	4.923e-17	4.439e-17	-16.308	-16.353	-0.045
	AlF4-	2.653e-18	2.392e-18	-17.576	-17.621	-0.045
	AlF+2	1.304e-18	8.625e-19	-17.885	-18.064	-0.179
	AlSO4+	3.240e-21	2.922e-21	-20.489	-20.534	-0.045
	Al+3	2.132e-21	8.413e-22	-20.671	-21.075	-0.404
	Al(SO4)2-	1.145e-22	1.033e-22	-21.941	-21.986	-0.045
	AlHSO4+2	5.560e-32	3.678e-32	-31.255	-31.434	-0.179
As(3)	1.803e-06					
	H2AsO3-	1.449e-06	1.306e-06	-5.839	-5.884	-0.045
	H3AsO3	3.445e-07	3.453e-07	-6.463	-6.462	0.001
	HAsO3-2	9.859e-09	6.522e-09	-8.006	-8.186	-0.179
	AsO3-3	4.099e-12	1.618e-12	-11.387	-11.791	-0.404
	H4AsO3+	2.742e-17	2.473e-17	-16.562	-16.607	-0.045
As(5)	7.546e-06					
	HAsO4-2	7.336e-06	4.853e-06	-5.135	-5.314	-0.179
	AsO4-3	2.047e-07	8.080e-08	-6.689	-7.093	-0.404
	H2AsO4-	4.497e-09	4.055e-09	-8.347	-8.392	-0.045
	H3AsO4	1.003e-16	1.005e-16	-15.999	-15.998	0.001
Ba	7.941e-07					
	Ba+2	5.282e-07	3.494e-07	-6.277	-6.457	-0.179
	BaSO4	1.972e-07	1.977e-07	-6.705	-6.704	0.001
	BaCO3	6.441e-08	6.456e-08	-7.191	-7.190	0.001
	BaHCO3+	4.175e-09	3.765e-09	-8.379	-8.424	-0.045
	BaOH+	9.081e-11	8.189e-11	-10.042	-10.087	-0.045
C(4)	2.042e-03					
	HCO3-	1.327e-03	1.201e-03	-2.877	-2.920	-0.043
	CO3-2	5.561e-04	3.731e-04	-3.255	-3.428	-0.173
	CaCO3	7.572e-05	7.589e-05	-4.121	-4.120	0.001
	NaCO3-	4.837e-05	4.362e-05	-4.315	-4.360	-0.045
	MgCO3	9.338e-06	9.360e-06	-5.030	-5.029	0.001
	UO2(CO3)3-4	4.881e-06	9.347e-07	-5.311	-6.029	-0.718
	NaHCO3	4.707e-06	4.718e-06	-5.327	-5.326	0.001
	CaHCO3+	2.077e-06	1.873e-06	-5.683	-5.727	-0.045
	MnCO3	8.531e-07	8.551e-07	-6.069	-6.068	0.001
	NiCO3	4.292e-07	4.302e-07	-6.367	-6.366	0.001
	Ni(CO3)2-2	4.217e-07	2.789e-07	-6.375	-6.555	-0.179
	MgHCO3+	4.194e-07	3.782e-07	-6.377	-6.422	-0.045
	CO2	4.002e-07	4.011e-07	-6.398	-6.397	0.001
	Zn(CO3)2-2	3.184e-07	2.106e-07	-6.497	-6.677	-0.179
	Pb(CO3)2-2	9.582e-08	6.339e-08	-7.019	-7.198	-0.179
	UO2(CO3)2-2	7.549e-08	4.994e-08	-7.122	-7.302	-0.179
	PbCO3	6.749e-08	6.765e-08	-7.171	-7.170	0.001
	BaCO3	6.441e-08	6.456e-08	-7.191	-7.190	0.001
	ZnCO3	2.634e-08	2.640e-08	-7.579	-7.578	0.001
	BaHCO3+	4.175e-09	3.765e-09	-8.379	-8.424	-0.045
	MnHCO3+	3.425e-09	3.089e-09	-8.465	-8.510	-0.045
	CuCO3	1.477e-09	1.481e-09	-8.831	-8.829	0.001
	Cu(CO3)2-2	1.051e-09	6.955e-10	-8.978	-9.158	-0.179
	ZnHCO3+	5.947e-11	5.363e-11	-10.226	-10.271	-0.045
	NiHCO3+	2.860e-11	2.579e-11	-10.544	-10.589	-0.045
	PbHCO3+	1.104e-11	9.954e-12	-10.957	-11.002	-0.045
	UO2CO3	5.921e-12	5.935e-12	-11.228	-11.227	0.001
	FeCO3	7.032e-13	7.049e-13	-12.153	-12.152	0.001
	CuHCO3+	4.933e-13	4.449e-13	-12.307	-12.352	-0.045
	FeHCO3+	1.049e-14	9.459e-15	-13.979	-14.024	-0.045
	(UO2)3(CO3)6-6	6.018e-18	1.460e-19	-17.221	-18.836	-1.615
	UO2(CO3)3-5	2.161e-22	1.633e-23	-21.665	-22.787	-1.122
	U(CO3)4-4	2.198e-36	4.209e-37	-35.658	-36.376	-0.718
	U(CO3)5-6	6.414e-38	1.556e-39	-37.193	-38.808	-1.615
Ca	2.946e-04					
	Ca+2	1.886e-04	1.265e-04	-3.724	-3.898	-0.174
	CaCO3	7.572e-05	7.589e-05	-4.121	-4.120	0.001
	CaSO4	2.786e-05	2.792e-05	-4.555	-4.554	0.001
	CaHCO3+	2.077e-06	1.873e-06	-5.683	-5.727	-0.045
	CaOH+	1.610e-07	1.452e-07	-6.793	-6.838	-0.045
	CaF+	1.207e-07	1.089e-07	-6.918	-6.963	-0.045
	CaHSO4+	2.556e-14	2.305e-14	-13.593	-13.637	-0.045
Cl	7.620e-04					
	Cl-	7.620e-04	6.860e-04	-3.118	-3.164	-0.046
	MnCl+	8.943e-11	8.065e-11	-10.049	-10.093	-0.045
	ZnOHCl	5.561e-11	5.574e-11	-10.255	-10.254	0.001
	ZnCl+	6.616e-13	5.967e-13	-12.179	-12.224	-0.045
	PbCl+	2.998e-13	2.704e-13	-12.523	-12.568	-0.045
	NiCl+	2.973e-13	2.681e-13	-12.527	-12.572	-0.045
	MnCl2	2.409e-14	2.415e-14	-13.618	-13.617	0.001
	CuCl2-	6.308e-15	5.689e-15	-14.200	-14.245	-0.045
	CuCl+	1.364e-15	1.231e-15	-14.865	-14.910	-0.045
	NiCl2	6.662e-16	6.677e-16	-15.176	-15.175	0.001
	ZnCl2	4.240e-16	4.250e-16	-15.373	-15.372	0.001
	PbCl2	3.051e-16	3.058e-16	-15.516	-15.514	0.001
	FeCl+	8.271e-17	7.459e-17	-16.082	-16.127	-0.045
	CuCl3-2	9.274e-18	6.135e-18	-17.033	-17.212	-0.179
	MnCl3-	5.060e-18	4.563e-18	-17.296	-17.341	-0.045
	CuCl2	4.421e-19	4.431e-19	-18.355	-18.354	0.001
	ZnCl3-	3.581e-19	3.230e-19	-18.446	-18.491	-0.045
	PbCl3-	1.824e-19	1.645e-19	-18.739	-18.784	-0.045
	UO2Cl+	4.161e-21	3.753e-21	-20.381	-20.426	-0.045
	ZnCl4-2	1.651e-22	1.092e-22	-21.782	-21.962	-0.179
	PbCl4-2	8.033e-23	5.314e-23	-22.095	-22.275	-0.179
	FeCl+2	1.962e-24	1.298e-24	-23.707	-23.887	-0.179
	CuCl3-	1.152e-24	1.039e-24	-23.939	-23.983	-0.045
	UO2Cl2	1.351e-25	1.355e-25	-24.869	-24.868	0.001
	FeCl2+	4.716e-27	4.253e-27	-26.326	-26.371	-0.045
	CuCl4-2	5.141e-30	3.401e-30	-29.289	-29.468	-0.179
	FeCl3	2.911e-31	2.917e-31	-30.536	-30.535	0.001
	UCl+3	0.000e+00	0.000e+00	-56.579	-56.983	-0.404
Cu(1)	4.849e-14					
	Cu+	4.217e-14	3.803e-14	-13.375	-13.420	-0.045
	CuCl2-	6.308e-15	5.689e-15	-14.200	-14.245	-0.045
	CuCl3-2	9.274e-18	6.135e-18	-17.033	-17.212	-0.179
Cu(2)	7.401e-07					
	Cu(OH)2	7.371e-07	7.388e-07	-6.132	-6.131	0.001
	CuCO3	1.477e-09	1.481e-09	-8.831	-8.829	0.001
	Cu(CO3)2-2	1.051e-09	6.955e-10	-8.978	-9.158	-0.179
	Cu(OH)3-	3.414e-10	3.079e-10	-9.467	-9.512	-0.045
	CuOH+	5.669e-11	5.113e-11	-10.246	-10.291	-0.045
	Cu+2	1.117e-12	7.392e-13	-11.952	-12.131	-0.179
	Cu(OH)4-2	6.424e-13	4.250e-13	-12.192	-12.372	-0.179
	CuHCO3+	4.933e-13	4.449e-13	-12.307	-12.352	-0.045
	CuSO4	1.675e-13	1.679e-13	-12.776	-12.775	0.001
	CuF+	1.519e-15	1.370e-15	-14.818	-14.863	-0.045
	Cu2(OH)2+2	1.402e-15	9.272e-16	-14.853	-15.033	-0.179
	CuCl+	1.364e-15	1.231e-15	-14.865	-14.910	-0.045
	CuCl2	4.421e-19	4.431e-19	-18.355	-18.354	0.001
	CuCl3-	1.152e-24	1.039e-24	-23.939	-23.983	-0.045
	CuCl4-2	5.141e-30	3.401e-30	-29.289	-29.468	-0.179
F	1.159e-04					
	F-	1.151e-04	1.038e-04	-3.939	-3.984	-0.045
	NaF	4.164e-07	4.174e-07	-6.380	-6.379	0.001
	MgF+	1.988e-07	1.793e-07	-6.702	-6.746	-0.045
	CaF+	1.207e-07	1.089e-07	-6.918	-6.963	-0.045
	MnF+	2.299e-11	2.073e-11	-10.639	-10.683	-0.045
	HF	2.163e-11	2.168e-11	-10.665	-10.664	0.001
	ZnF+	5.618e-13	5.066e-13	-12.250	-12.295	-0.045
	NiF+	3.574e-13	3.223e-13	-12.447	-12.492	-0.045
	PbF+	2.136e-14	1.927e-14	-13.670	-13.715	-0.045
	HF2-	9.416e-15	8.492e-15	-14.026	-14.071	-0.045
	CuF+	1.519e-15	1.370e-15	-14.818	-14.863	-0.045
	FeF+	9.069e-17	8.178e-17	-16.042	-16.087	-0.045
	AlF3	5.777e-17	5.790e-17	-16.238	-16.237	0.001
	UO2F+	5.333e-17	4.809e-17	-16.273	-16.318	-0.045
	AlF2+	4.923e-17	4.439e-17	-16.308	-16.353	-0.045
	PbF2	4.075e-17	4.084e-17	-16.390	-16.389	0.001
	UO2F2	1.686e-17	1.690e-17	-16.773	-16.772	0.001
	AlF4-	2.653e-18	2.392e-18	-17.576	-17.621	-0.045
	AlF+2	1.304e-18	8.625e-19	-17.885	-18.064	-0.179
	UO2F3-	3.705e-19	3.342e-19	-18.431	-18.476	-0.045
	FeF2+	4.771e-20	4.302e-20	-19.321	-19.366	-0.045
	PbF3-	3.407e-20	3.072e-20	-19.468	-19.513	-0.045
	FeF+2	1.613e-20	1.067e-20	-19.792	-19.972	-0.179
	FeF3	7.013e-21	7.029e-21	-20.154	-20.153	0.001
	H2F2	1.317e-21	1.320e-21	-20.880	-20.879	0.001
	UO2F4-2	3.329e-22	2.202e-22	-21.478	-21.657	-0.179
	PbF4-2	2.308e-24	1.527e-24	-23.637	-23.816	-0.179
	UF3+	0.000e+00	0.000e+00	-45.870	-45.914	-0.045
	UF4	0.000e+00	0.000e+00	-45.994	-45.993	0.001
	UF2+2	0.000e+00	0.000e+00	-47.127	-47.306	-0.179
	UF5-	0.000e+00	0.000e+00	-48.452	-48.497	-0.045
	UF+3	0.000e+00	0.000e+00	-49.836	-50.240	-0.404
	UF6-2	0.000e+00	0.000e+00	-50.203	-50.382	-0.179
Fe(2)	1.020e-12					
	FeCO3	7.032e-13	7.049e-13	-12.153	-12.152	0.001
	FeOH+	1.631e-13	1.471e-13	-12.788	-12.832	-0.045
	Fe+2	1.191e-13	7.877e-14	-12.924	-13.104	-0.179
	FeSO4	1.518e-14	1.521e-14	-13.819	-13.818	0.001
	FeHCO3+	1.049e-14	9.459e-15	-13.979	-14.024	-0.045
	Fe(OH)2	7.188e-15	7.205e-15	-14.143	-14.142	0.001
	Fe(OH)3-	2.011e-15	1.814e-15	-14.697	-14.741	-0.045
	FeF+	9.069e-17	8.178e-17	-16.042	-16.087	-0.045
	FeCl+	8.271e-17	7.459e-17	-16.082	-16.127	-0.045
	FeHSO4+	1.592e-23	1.436e-23	-22.798	-22.843	-0.045

----------Distribution of species----------

	Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
	OH-	6.539e-05	5.897e-05	-4.185	-4.229	-0.045
	H+	1.583e-10	1.445e-10	-9.801	-9.840	-0.039
	H2O	5.551e+01	9.998e-01	-0.000	-0.000	0.000
Al	2.781e-05					
	Al(OH)4-	2.781e-05	2.508e-05	-4.556	-4.601	-0.045
	Al(OH)3	1.973e-09	1.977e-09	-8.705	-8.704	0.001
	Al(OH)2+	2.516e-12	2.269e-12	-11.599	-11.644	-0.045
	AlOH+2	7.618e-17	5.039e-17	-16.118	-16.298	-0.179
	AlF3	5.777e-17	5.790e-17	-16.238	-16.237	0.001
	AlF2+	4.923e-17	4.439e-17	-16.308	-16.353	-0.045
	AlF4-	2.653e-18	2.392e-18	-17.576	-17.621	-0.045
	AlF+2	1.304e-18	8.625e-19	-17.885	-18.064	-0.179
	AlSO4+	3.240e-21	2.922e-21	-20.489	-20.534	-0.045
	Al+3	2.132e-21	8.413e-22	-20.671	-21.075	-0.404
	Al(SO4)2-	1.145e-22	1.033e-22	-21.941	-21.986	-0.045
	AlHSO4+2	5.560e-32	3.678e-32	-31.255	-31.434	-0.179
As(3)	1.803e-06					
	H2AsO3-	1.449e-06	1.306e-06	-5.839	-5.884	-0.045
	H3AsO3	3.445e-07	3.453e-07	-6.463	-6.462	0.001
	HAsO3-2	9.859e-09	6.522e-09	-8.006	-8.186	-0.179
	AsO3-3	4.099e-12	1.618e-12	-11.387	-11.791	-0.404
	H4AsO3+	2.742e-17	2.473e-17	-16.562	-16.607	-0.045
As(5)	7.546e-06					
	HAsO4-2	7.336e-06	4.853e-06	-5.135	-5.314	-0.179
	AsO4-3	2.047e-07	8.080e-08	-6.689	-7.093	-0.404
	H2AsO4-	4.497e-09	4.055e-09	-8.347	-8.392	-0.045
	H3AsO4	1.003e-16	1.005e-16	-15.999	-15.998	0.001
Ba	7.941e-07					
	Ba+2	5.282e-07	3.494e-07	-6.277	-6.457	-0.179
	BaSO4	1.972e-07	1.977e-07	-6.705	-6.704	0.001
	BaCO3	6.441e-08	6.456e-08	-7.191	-7.190	0.001
	BaHCO3+	4.175e-09	3.765e-09	-8.379	-8.424	-0.045
	BaOH+	9.081e-11	8.189e-11	-10.042	-10.087	-0.045
C(4)	2.042e-03					
	HCO3-	1.327e-03	1.201e-03	-2.877	-2.920	-0.043
	CO3-2	5.561e-04	3.731e-04	-3.255	-3.428	-0.173
	CaCO3	7.572e-05	7.589e-05	-4.121	-4.120	0.001
	NaCO3-	4.837e-05	4.362e-05	-4.315	-4.360	-0.045
	MgCO3	9.338e-06	9.360e-06	-5.030	-5.029	0.001
	UO2(CO3)3-4	4.881e-06	9.347e-07	-5.311	-6.029	-0.718
	NaHCO3	4.707e-06	4.718e-06	-5.327	-5.326	0.001
	CaHCO3+	2.077e-06	1.873e-06	-5.683	-5.727	-0.045
	MnCO3	8.531e-07	8.551e-07	-6.069	-6.068	0.001
	NiCO3	4.292e-07	4.302e-07	-6.367	-6.366	0.001
	Ni(CO3)2-2	4.217e-07	2.789e-07	-6.375	-6.555	-0.179
	MgHCO3+	4.194e-07	3.782e-07	-6.377	-6.422	-0.045
	CO2	4.002e-07	4.011e-07	-6.398	-6.397	0.001
	Zn(CO3)2-2	3.184e-07	2.106e-07	-6.497	-6.677	-0.179
	Pb(CO3)2-2	9.582e-08	6.339e-08	-7.019	-7.198	-0.179
	UO2(CO3)2-2	7.549e-08	4.994e-08	-7.122	-7.302	-0.179
	PbCO3	6.749e-08	6.765e-08	-7.171	-7.170	0.001
	BaCO3	6.441e-08	6.456e-08	-7.191	-7.190	0.001
	ZnCO3	2.634e-08	2.640e-08	-7.579	-7.578	0.001
	BaHCO3+	4.175e-09	3.765e-09	-8.379	-8.424	-0.045
	MnHCO3+	3.425e-09	3.089e-09	-8.465	-8.510	-0.045
	CuCO3	1.477e-09	1.481e-09	-8.831	-8.829	0.001
	Cu(CO3)2-2	1.051e-09	6.955e-10	-8.978	-9.158	-0.179
	ZnHCO3+	5.947e-11	5.363e-11	-10.226	-10.271	-0.045
	NiHCO3+	2.860e-11	2.579e-11	-10.544	-10.589	-0.045
	PbHCO3+	1.104e-11	9.954e-12	-10.957	-11.002	-0.045
	UO2CO3	5.921e-12	5.935e-12	-11.228	-11.227	0.001
	FeCO3	7.032e-13	7.049e-13	-12.153	-12.152	0.001
	CuHCO3+	4.933e-13	4.449e-13	-12.307	-12.352	-0.045
	FeHCO3+	1.049e-14	9.459e-15	-13.979	-14.024	-0.045
	(UO2)3(CO3)6-6	6.018e-18	1.460e-19	-17.221	-18.836	-1.615
	UO2(CO3)3-5	2.161e-22	1.633e-23	-21.665	-22.787	-1.122
	U(CO3)4-4	2.198e-36	4.209e-37	-35.658	-36.376	-0.718
	U(CO3)5-6	6.414e-38	1.556e-39	-37.193	-38.808	-1.615
Ca	2.946e-04					
	Ca+2	1.886e-04	1.265e-04	-3.724	-3.898	-0.174
	CaCO3	7.572e-05	7.589e-05	-4.121	-4.120	0.001
	CaSO4	2.786e-05	2.792e-05	-4.555	-4.554	0.001
	CaHCO3+	2.077e-06	1.873e-06	-5.683	-5.727	-0.045
	CaOH+	1.610e-07	1.452e-07	-6.793	-6.838	-0.045
	CaF+	1.207e-07	1.089e-07	-6.918	-6.963	-0.045
	CaHSO4+	2.556e-14	2.305e-14	-13.593	-13.637	-0.045
Cl	7.620e-04					
	Cl-	7.620e-04	6.860e-04	-3.118	-3.164	-0.046
	MnCl+	8.943e-11	8.065e-11	-10.049	-10.093	-0.045
	ZnOHCl	5.561e-11	5.574e-11	-10.255	-10.254	0.001
	ZnCl+	6.616e-13	5.967e-13	-12.179	-12.224	-0.045
	PbCl+	2.998e-13	2.704e-13	-12.523	-12.568	-0.045
	NiCl+	2.973e-13	2.681e-13	-12.527	-12.572	-0.045
	MnCl2	2.409e-14	2.415e-14	-13.618	-13.617	0.001
	CuCl2-	6.308e-15	5.689e-15	-14.200	-14.245	-0.045
	CuCl+	1.364e-15	1.231e-15	-14.865	-14.910	-0.045
	NiCl2	6.662e-16	6.677e-16	-15.176	-15.175	0.001
	ZnCl2	4.240e-16	4.250e-16	-15.373	-15.372	0.001
	PbCl2	3.051e-16	3.058e-16	-15.516	-15.514	0.001
	FeCl+	8.271e-17	7.459e-17	-16.082	-16.127	-0.045
	CuCl3-2	9.274e-18	6.135e-18	-17.033	-17.212	-0.179
	MnCl3-	5.060e-18	4.563e-18	-17.296	-17.341	-0.045
	CuCl2	4.421e-19	4.431e-19	-18.355	-18.354	0.001
	ZnCl3-	3.581e-19	3.230e-19	-18.446	-18.491	-0.045
	PbCl3-	1.824e-19	1.645e-19	-18.739	-18.784	-0.045
	UO2Cl+	4.161e-21	3.753e-21	-20.381	-20.426	-0.045
	ZnCl4-2	1.651e-22	1.092e-22	-21.782	-21.962	-0.179
	PbCl4-2	8.033e-23	5.314e-23	-22.095	-22.275	-0.179
	FeCl+2	1.962e-24	1.298e-24	-23.707	-23.887	-0.179
	CuCl3-	1.152e-24	1.039e-24	-23.939	-23.983	-0.045
	UO2Cl2	1.351e-25	1.355e-25	-24.869	-24.868	0.001
	FeCl2+	4.716e-27	4.253e-27	-26.326	-26.371	-0.045
	CuCl4-2	5.141e-30	3.401e-30	-29.289	-29.468	-0.179
	FeCl3	2.911e-31	2.917e-31	-30.536	-30.535	0.001
	UCl+3	0.000e+00	0.000e+00	-56.579	-56.983	-0.404
Cu(1)	4.849e-14					
	Cu+	4.217e-14	3.803e-14	-13.375	-13.420	-0.045
	CuCl2-	6.308e-15	5.689e-15	-14.200	-14.245	-0.045
	CuCl3-2	9.274e-18	6.135e-18	-17.033	-17.212	-0.179
Cu(2)	7.401e-07					
	Cu(OH)2	7.371e-07	7.388e-07	-6.132	-6.131	0.001
	CuCO3	1.477e-09	1.481e-09	-8.831	-8.829	0.001
	Cu(CO3)2-2	1.051e-09	6.955e-10	-8.978	-9.158	-0.179
	Cu(OH)3-	3.414e-10	3.079e-10	-9.467	-9.512	-0.045
	CuOH+	5.669e-11	5.113e-11	-10.246	-10.291	-0.045
	Cu+2	1.117e-12	7.392e-13	-11.952	-12.131	-0.179
	Cu(OH)4-2	6.424e-13	4.250e-13	-12.192	-12.372	-0.179
	CuHCO3+	4.933e-13	4.449e-13	-12.307	-12.352	-0.045
	CuSO4	1.675e-13	1.679e-13	-12.776	-12.775	0.001
	CuF+	1.519e-15	1.370e-15	-14.818	-14.863	-0.045
	Cu2(OH)2+2	1.402e-15	9.272e-16	-14.853	-15.033	-0.179
	CuCl+	1.364e-15	1.231e-15	-14.865	-14.910	-0.045
	CuCl2	4.421e-19	4.431e-19	-18.355	-18.354	0.001
	CuCl3-	1.152e-24	1.039e-24	-23.939	-23.983	-0.045
	CuCl4-2	5.141e-30	3.401e-30	-29.289	-29.468	-0.179
F	1.159e-04					
	F-	1.151e-04	1.038e-04	-3.939	-3.984	-0.045
	NaF	4.164e-07	4.174e-07	-6.380	-6.379	0.001
	MgF+	1.988e-07	1.793e-07	-6.702	-6.746	-0.045
	CaF+	1.207e-07	1.089e-07	-6.918	-6.963	-0.045
	MnF+	2.299e-11	2.073e-11	-10.639	-10.683	-0.045
	HF	2.163e-11	2.168e-11	-10.665	-10.664	0.001
	ZnF+	5.618e-13	5.066e-13	-12.250	-12.295	-0.045
	NiF+	3.574e-13	3.223e-13	-12.447	-12.492	-0.045
	PbF+	2.136e-14	1.927e-14	-13.670	-13.715	-0.045
	HF2-	9.416e-15	8.492e-15	-14.026	-14.071	-0.045
	CuF+	1.519e-15	1.370e-15	-14.818	-14.863	-0.045
	FeF+	9.069e-17	8.178e-17	-16.042	-16.087	-0.045
	AlF3	5.777e-17	5.790e-17	-16.238	-16.237	0.001
	UO2F+	5.333e-17	4.809e-17	-16.273	-16.318	-0.045
	AlF2+	4.923e-17	4.439e-17	-16.308	-16.353	-0.045
	PbF2	4.075e-17	4.084e-17	-16.390	-16.389	0.001
	UO2F2	1.686e-17	1.690e-17	-16.773	-16.772	0.001
	AlF4-	2.653e-18	2.392e-18	-17.576	-17.621	-0.045
	AlF+2	1.304e-18	8.625e-19	-17.885	-18.064	-0.179
	UO2F3-	3.705e-19	3.342e-19	-18.431	-18.476	-0.045
	FeF2+	4.771e-20	4.302e-20	-19.321	-19.366	-0.045
	PbF3-	3.407e-20	3.072e-20	-19.468	-19.513	-0.045
	FeF+2	1.613e-20	1.067e-20	-19.792	-19.972	-0.179
	FeF3	7.013e-21	7.029e-21	-20.154	-20.153	0.001
	H2F2	1.317e-21	1.320e-21	-20.880	-20.879	0.001
	UO2F4-2	3.329e-22	2.202e-22	-21.478	-21.657	-0.179
	PbF4-2	2.308e-24	1.527e-24	-23.637	-23.816	-0.179
	UF3+	0.000e+00	0.000e+00	-45.870	-45.914	-0.045
	UF4	0.000e+00	0.000e+00	-45.994	-45.993	0.001
	UF2+2	0.000e+00	0.000e+00	-47.127	-47.306	-0.179
	UF5-	0.000e+00	0.000e+00	-48.452	-48.497	-0.045
	UF+3	0.000e+00	0.000e+00	-49.836	-50.240	-0.404
	UF6-2	0.000e+00	0.000e+00	-50.203	-50.382	-0.179
Fe(2)	1.020e-12					
	FeCO3	7.032e-13	7.049e-13	-12.153	-12.152	0.001
	FeOH+	1.631e-13	1.471e-13	-12.788	-12.832	-0.045
	Fe+2	1.191e-13	7.877e-14	-12.924	-13.104	-0.179
	FeSO4	1.518e-14	1.521e-14	-13.819	-13.818	0.001
	FeHCO3+	1.049e-14	9.459e-15	-13.979	-14.024	-0.045
	Fe(OH)2	7.188e-15	7.205e-15	-14.143	-14.142	0.001
	Fe(OH)3-	2.011e-15	1.814e-15	-14.697	-14.741	-0.045
	FeF+	9.069e-17	8.178e-17	-16.042	-16.087	-0.045
	FeCl+	8.271e-17	7.459e-17	-16.082	-16.127	-0.045
	FeHSO4+	1.592e-23	1.436e-23	-22.798	-22.843	-0.045

Fe(3)	3.368e-05					
	Fe(OH)4-	2.915e-05	2.629e-05	-4.535	-4.580	-0.045
	Fe(OH)3	4.527e-06	4.537e-06	-5.344	-5.343	0.001
	Fe(OH)2+	6.191e-09	5.584e-09	-8.208	-8.253	-0.045
	FeOH+2	3.993e-15	2.641e-15	-14.399	-14.578	-0.179
	FeF2+	4.771e-20	4.302e-20	-19.321	-19.366	-0.045
	FeF+2	1.613e-20	1.067e-20	-19.792	-19.972	-0.179
	FeF3	7.013e-21	7.029e-21	-20.154	-20.153	0.001
	FeSO4+	8.773e-22	7.912e-22	-21.057	-21.102	-0.045
	Fe+3	1.698e-22	6.699e-23	-21.770	-22.174	-0.404
	Fe(SO4)2-	2.149e-23	1.938e-23	-22.668	-22.713	-0.045
	FeCl+2	1.962e-24	1.298e-24	-23.707	-23.887	-0.179
	FeCl2+	4.716e-27	4.253e-27	-26.326	-26.371	-0.045
	Fe2(OH)2+4	1.070e-27	2.049e-28	-26.970	-27.688	-0.718
	FeHSO4+2	4.636e-31	3.067e-31	-30.334	-30.513	-0.179
	FeCl3	2.911e-31	2.917e-31	-30.536	-30.535	0.001
	Fe3(OH)4+5	3.846e-33	2.906e-34	-32.415	-33.537	-1.122
H(0)	2.966e-31					
	H2	1.483e-31	1.487e-31	-30.829	-30.828	0.001
K	7.677e-05					
	K+	7.618e-05	6.858e-05	-4.118	-4.164	-0.046
	KSO4-	5.915e-07	5.335e-07	-6.228	-6.273	-0.045
Mg	5.762e-05					
	Mg+2	4.025e-05	2.715e-05	-4.395	-4.566	-0.171
	MgCO3	9.338e-06	9.360e-06	-5.030	-5.029	0.001
	MgSO4	6.789e-06	6.805e-06	-5.168	-5.167	0.001
	MgOH+	6.247e-07	5.634e-07	-6.204	-6.249	-0.045
	MgHCO3+	4.194e-07	3.782e-07	-6.377	-6.422	-0.045
	MgF+	1.988e-07	1.793e-07	-6.702	-6.746	-0.045
Mn(2)	9.106e-07					
	MnCO3	8.531e-07	8.551e-07	-6.069	-6.068	0.001
	Mn+2	4.363e-08	2.886e-08	-7.360	-7.540	-0.179
	MnSO4	5.551e-09	5.564e-09	-8.256	-8.255	0.001
	MnOH+	4.788e-09	4.318e-09	-8.320	-8.365	-0.045
	MnHCO3+	3.425e-09	3.089e-09	-8.465	-8.510	-0.045
	MnCl+	8.943e-11	8.065e-11	-10.049	-10.093	-0.045
	MnF+	2.299e-11	2.073e-11	-10.639	-10.683	-0.045
	Mn(OH)3-	1.678e-13	1.514e-13	-12.775	-12.820	-0.045
	MnCl2	2.409e-14	2.415e-14	-13.618	-13.617	0.001
	MnCl3-	5.060e-18	4.563e-18	-17.296	-17.341	-0.045
Mn(3)	1.659e-29					
	Mn+3	1.659e-29	6.548e-30	-28.780	-29.184	-0.404
Mn(6)	1.378e-32					
	MnO4-2	1.378e-32	9.118e-33	-31.861	-32.040	-0.179
Mn(7)	3.037e-38					
	MnO4-	3.037e-38	2.739e-38	-37.518	-37.562	-0.045
Na	7.834e-03					
	Na+	7.737e-03	6.986e-03	-2.111	-2.156	-0.044
	NaCO3-	4.837e-05	4.362e-05	-4.315	-4.360	-0.045
	NaSO4-	4.324e-05	3.900e-05	-4.364	-4.409	-0.045
	NaHCO3	4.707e-06	4.718e-06	-5.327	-5.326	0.001
	NaF	4.164e-07	4.174e-07	-6.380	-6.379	0.001
Ni	8.521e-07					
	NiCO3	4.292e-07	4.302e-07	-6.367	-6.366	0.001
	Ni(CO3)2-2	4.217e-07	2.789e-07	-6.375	-6.555	-0.179
	Ni(OH)2	7.426e-10	7.443e-10	-9.129	-9.128	0.001
	Ni+2	2.352e-10	1.556e-10	-9.629	-9.808	-0.179
	NiOH+	1.420e-10	1.280e-10	-9.848	-9.893	-0.045
	Ni(OH)3-	5.709e-11	5.148e-11	-10.243	-10.288	-0.045
	NiSO4	3.355e-11	3.363e-11	-10.474	-10.473	0.001
	NiHCO3+	2.860e-11	2.579e-11	-10.544	-10.589	-0.045
	NiF+	3.574e-13	3.223e-13	-12.447	-12.492	-0.045
	NiCl+	2.973e-13	2.681e-13	-12.527	-12.572	-0.045
	Ni(SO4)2-2	3.138e-15	2.076e-15	-14.503	-14.683	-0.179
	NiCl2	6.662e-16	6.677e-16	-15.176	-15.175	0.001
O(0)	7.568e-32					
	O2	3.784e-32	3.793e-32	-31.422	-31.421	0.001
Pb	1.690e-07					
	Pb(CO3)2-2	9.582e-08	6.339e-08	-7.019	-7.198	-0.179
	PbCO3	6.749e-08	6.765e-08	-7.171	-7.170	0.001
	Pb(OH)2	3.778e-09	3.787e-09	-8.423	-8.422	0.001
	PbOH+	1.560e-09	1.407e-09	-8.807	-8.852	-0.045
	Pb(OH)3-	3.335e-10	3.007e-10	-9.477	-9.522	-0.045
	Pb+2	1.577e-11	1.043e-11	-10.802	-10.982	-0.179
	PbHCO3+	1.104e-11	9.954e-12	-10.957	-11.002	-0.045
	Pb(OH)4-2	7.204e-12	4.765e-12	-11.142	-11.322	-0.179
	PbSO4	6.608e-12	6.624e-12	-11.180	-11.179	0.001
	PbCl+	2.998e-13	2.704e-13	-12.523	-12.568	-0.045
	Pb(SO4)2-2	5.932e-14	3.924e-14	-13.227	-13.406	-0.179
	PbF+	2.136e-14	1.927e-14	-13.670	-13.715	-0.045
	PbCl2	3.051e-16	3.058e-16	-15.516	-15.514	0.001
	PbF2	4.075e-17	4.084e-17	-16.390	-16.389	0.001
	Pb3(OH)4+2	3.773e-18	2.496e-18	-17.423	-17.603	-0.179
	Pb2OH+3	8.330e-19	3.287e-19	-18.079	-18.483	-0.404
	PbCl3-	1.824e-19	1.645e-19	-18.739	-18.784	-0.045
	PbF3-	3.407e-20	3.072e-20	-19.468	-19.513	-0.045
	PbCl4-2	8.033e-23	5.314e-23	-22.095	-22.275	-0.179
	PbF4-2	2.308e-24	1.527e-24	-23.637	-23.816	-0.179
S(6)	1.771e-03					
	SO4-2	1.692e-03	1.129e-03	-2.772	-2.947	-0.176
	NaSO4-	4.324e-05	3.900e-05	-4.364	-4.409	-0.045
	CaSO4	2.786e-05	2.792e-05	-4.555	-4.554	0.001
	MgSO4	6.789e-06	6.805e-06	-5.168	-5.167	0.001
	KSO4-	5.915e-07	5.335e-07	-6.228	-6.273	-0.045
	BaSO4	1.972e-07	1.977e-07	-6.705	-6.704	0.001
	MnSO4	5.551e-09	5.564e-09	-8.256	-8.255	0.001
	ZnSO4	9.214e-11	9.235e-11	-10.036	-10.035	0.001
	NiSO4	3.355e-11	3.363e-11	-10.474	-10.473	0.001
	HSO4-	1.681e-11	1.516e-11	-10.774	-10.819	-0.045
	PbSO4	6.608e-12	6.624e-12	-11.180	-11.179	0.001
	Zn(SO4)2-2	1.302e-12	8.613e-13	-11.885	-12.065	-0.179
	CuSO4	1.675e-13	1.679e-13	-12.776	-12.775	0.001
	Pb(SO4)2-2	5.932e-14	3.924e-14	-13.227	-13.406	-0.179
	CaHSO4+	2.556e-14	2.305e-14	-13.593	-13.637	-0.045
	FeSO4	1.518e-14	1.521e-14	-13.819	-13.818	0.001
	Ni(SO4)2-2	3.138e-15	2.076e-15	-14.503	-14.683	-0.179
	UO2SO4	5.689e-18	5.702e-18	-17.245	-17.244	0.001
	UO2(SO4)2-2	9.097e-20	6.018e-20	-19.041	-19.221	-0.179
	AlSO4+	3.240e-21	2.922e-21	-20.489	-20.534	-0.045
	FeSO4+	8.773e-22	7.912e-22	-21.057	-21.102	-0.045
	Al(SO4)2-	1.145e-22	1.033e-22	-21.941	-21.986	-0.045
	Fe(SO4)2-	2.149e-23	1.938e-23	-22.668	-22.713	-0.045
	FeHSO4+	1.592e-23	1.436e-23	-22.798	-22.843	-0.045
	FeHSO4+2	4.636e-31	3.067e-31	-30.334	-30.513	-0.179
	AlHSO4+2	5.560e-32	3.678e-32	-31.255	-31.434	-0.179
	U(SO4)2	0.000e+00	0.000e+00	-50.999	-50.998	0.001
	USO4+2	0.000e+00	0.000e+00	-51.761	-51.940	-0.179
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-68.082	-68.486	-0.404
U(4)	1.476e-25					
	U(OH)4	1.476e-25	1.479e-25	-24.831	-24.830	0.001
	U(OH)3+	8.891e-32	8.018e-32	-31.051	-31.096	-0.045
	U(CO3)4-4	2.198e-36	4.209e-37	-35.658	-36.376	-0.718
	U(CO3)5-6	6.414e-38	1.556e-39	-37.193	-38.808	-1.615
	U(OH)2+2	8.594e-39	5.685e-39	-38.066	-38.245	-0.179
	UF3+	0.000e+00	0.000e+00	-45.870	-45.914	-0.045
	UOH+3	0.000e+00	0.000e+00	-45.917	-46.321	-0.404
	UF4	0.000e+00	0.000e+00	-45.994	-45.993	0.001
	UF2+2	0.000e+00	0.000e+00	-47.127	-47.306	-0.179
	UF5-	0.000e+00	0.000e+00	-48.452	-48.497	-0.045
	UF+3	0.000e+00	0.000e+00	-49.836	-50.240	-0.404
	UF6-2	0.000e+00	0.000e+00	-50.203	-50.382	-0.179
	U(SO4)2	0.000e+00	0.000e+00	-50.999	-50.998	0.001
	USO4+2	0.000e+00	0.000e+00	-51.761	-51.940	-0.179
	U+4	0.000e+00	0.000e+00	-54.845	-55.563	-0.718
	UCl+3	0.000e+00	0.000e+00	-56.579	-56.983	-0.404
	U6(OH)15+9	0.000e+00	0.000e+00	-199.345	-202.979	-3.634
U(5)	1.370e-20					
	UO2+	1.349e-20	1.216e-20	-19.870	-19.915	-0.045
	UO2(CO3)3-5	2.161e-22	1.633e-23	-21.665	-22.787	-1.122
U(6)	5.044e-06					
	UO2(CO3)3-4	4.881e-06	9.347e-07	-5.311	-6.029	-0.718
	UO2(OH)3-	8.759e-08	7.899e-08	-7.058	-7.102	-0.045
	UO2(CO3)2-2	7.549e-08	4.994e-08	-7.122	-7.302	-0.179
	UO2(OH)4-2	1.309e-11	8.660e-12	-10.883	-11.062	-0.179
	UO2CO3	5.921e-12	5.935e-12	-11.228	-11.227	0.001
	UO2OH+	1.605e-13	1.447e-13	-12.795	-12.839	-0.045
	(UO2)3(OH)7-	4.548e-15	4.102e-15	-14.342	-14.387	-0.045
	UO2F+	5.333e-17	4.809e-17	-16.273	-16.318	-0.045
	UO2F2	1.686e-17	1.690e-17	-16.773	-16.772	0.001
	(UO2)3(CO3)6-6	6.018e-18	1.460e-19	-17.221	-18.836	-1.615
	UO2+2	5.719e-18	3.783e-18	-17.243	-17.422	-0.179
	UO2SO4	5.689e-18	5.702e-18	-17.245	-17.244	0.001
	UO2F3-	3.705e-19	3.342e-19	-18.431	-18.476	-0.045
	(UO2)3(OH)5+	1.985e-19	1.790e-19	-18.702	-18.747	-0.045
	UO2(SO4)2-2	9.097e-20	6.018e-20	-19.041	-19.221	-0.179
	UO2Cl+	4.161e-21	3.753e-21	-20.381	-20.426	-0.045
	(UO2)2(OH)2+2	2.197e-21	1.453e-21	-20.658	-20.838	-0.179
	UO2F4-2	3.329e-22	2.202e-22	-21.478	-21.657	-0.179
	(UO2)4(OH)7+	2.166e-23	1.954e-23	-22.664	-22.709	-0.045
	(UO2)3(OH)4+2	2.359e-25	1.561e-25	-24.627	-24.807	-0.179
	UO2Cl2	1.351e-25	1.355e-25	-24.869	-24.868	0.001
	(UO2)2OH+3	5.006e-28	1.975e-28	-27.301	-27.704	-0.404
Zn	5.663e-07					
	Zn(CO3)2-2	3.184e-07	2.106e-07	-6.497	-6.677	-0.179
	Zn(OH)2	2.132e-07	2.137e-07	-6.671	-6.670	0.001
	ZnCO3	2.634e-08	2.640e-08	-7.579	-7.578	0.001
	Zn(OH)3-	5.182e-09	4.673e-09	-8.286	-8.330	-0.045
	ZnOH+	2.541e-09	2.292e-09	-8.595	-8.640	-0.045
	Zn+2	5.363e-10	3.547e-10	-9.271	-9.450	-0.179
	ZnSO4	9.214e-11	9.235e-11	-10.036	-10.035	0.001
	ZnHCO3+	5.947e-11	5.363e-11	-10.226	-10.271	-0.045
	ZnOHCl	5.561e-11	5.574e-11	-10.255	-10.254	0.001
	Zn(OH)4-2	7.745e-12	5.123e-12	-11.111	-11.290	-0.179
	Zn(SO4)2-2	1.302e-12	8.613e-13	-11.885	-12.065	-0.179
	ZnCl+	6.616e-13	5.967e-13	-12.179	-12.224	-0.045
	ZnF+	5.618e-13	5.066e-13	-12.250	-12.295	-0.045
	ZnCl2	4.240e-16	4.250e-16	-15.373	-15.372	0.001
	ZnCl3-	3.581e-19	3.230e-19	-18.446	-18.491	-0.045
	ZnCl4-2	1.651e-22	1.092e-22	-21.782	-21.962	-0.179

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-2.49	8.44	10.94	Al(OH)3
AlAsO4:2H2O	-12.33	-7.55	4.78	AlAsO4:2H2O
AlumK	-25.93	-31.13	-5.21	KAl(SO4)2:12H2O
Alunite	-13.11	-14.24	-1.14	KAl3(SO4)2(OH)6
Anglesite	-6.13	-13.93	-7.80	PbSO4
Anhydrite	-2.49	-6.85	-4.35	CaSO4
Antlerite	-8.27	0.02	8.29	Cu3(OH)4SO4
Aragonite	1.00	-7.33	-8.32	CaCO3
Arsenolite	-22.97	-25.85	-2.88	As4O6
Artinite	-2.63	7.12	9.75	MgCO3:Mg(OH)2:3H2O
As2O5	-38.72	-32.00	6.73	As2O5
Atacamite	-5.34	2.09	7.44	Cu2(OH)3Cl
Azurite	-6.79	-23.57	-16.79	Cu3(OH)2(CO3)2
B-UO2(OH)2	-3.36	2.26	5.62	UO2(OH)2
Ba3(AsO4)2	16.60	7.67	-8.93	Ba3(AsO4)2
BaF2	-8.66	-14.42	-5.77	BaF2
Barite	0.60	-9.40	-10.00	BaSO4
Basaluminite	-11.55	11.15	22.70	Al4(OH)10SO4
Bianchite	-10.63	-12.40	-1.76	ZnSO4:6H2O
Birnessite	-3.78	39.82	43.60	MnO2
Bixbyite	1.20	51.96	50.76	Mn2O3
Boehmite	-0.29	8.44	8.73	AlOOH
Brochantite	-7.77	7.57	15.34	Cu4(OH)6SO4
Brucite	-1.87	15.11	16.98	Mg(OH)2
Bunsenite	-2.70	9.87	12.57	NiO
Ca3(AsO4)2:4w	-6.97	15.35	22.32	Ca3(AsO4)2:4H2O
Calcite	1.14	-7.33	-8.47	CaCO3
Cerrusite	-1.25	-14.41	-13.16	PbCO3
Chalcanthite	-12.43	-15.08	-2.65	CuSO4:5H2O
Claudetite	-22.71	-25.85	-3.13	As4O6
CO2(g)	-4.95	-23.11	-18.15	CO2
Cotunnite	-12.51	-17.31	-4.80	PbCl2
Cu(OH)2	-1.17	7.55	8.72	Cu(OH)2
Cu2SO4	-27.86	-35.21	-7.35	Cu2SO4
Cu3(AsO4)2:6w	-15.46	-9.35	6.11	Cu3(AsO4)2:6H2O
CuCO3	-5.93	-15.56	-9.63	CuCO3
CuF	-24.55	-20.11	4.43	CuF
CuF2	-19.55	-20.10	-0.55	CuF2
CuF2:2H2O	-15.57	-20.10	-4.53	CuF2:2H2O
CuMetal	-8.57	-20.13	-11.56	Cu
CuOCuSO4	-19.24	-7.53	11.71	CuO:CuSO4
CupricFerrite	16.16	48.38	32.22	CuFe2O4
Cuprite	-5.58	-12.58	-7.01	Cu2O
CuprousFerrite	12.67	14.12	1.46	CuFeO2
CuSO4	-18.18	-15.08	3.10	CuSO4
Diaspore	1.44	8.44	7.01	AlOOH
Dolomite	1.72	-15.32	-17.04	CaMg(CO3)2
Dolomite(d)	1.16	-15.32	-16.48	CaMg(CO3)2
Epsomite	-5.36	-7.51	-2.15	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.48	16.51	10.03	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.45	20.42	17.96	Fe(OH)3
Fe3(OH)8	1.05	47.41	46.36	Fe3(OH)8
Fluorite	-1.24	-11.87	-10.62	CaF2
Gibbsite	0.22	8.44	8.23	Al(OH)3
Goethite	8.35	20.42	12.07	FeOOH
Goslarite	-10.42	-12.40	-1.98	ZnSO4:7H2O
Gummite	-8.26	2.26	10.52	UO3
Gypsum	-2.26	-6.85	-4.58	CaSO4:2H2O
H2(g)	-27.64	-27.68	-0.04	H2
Halite	-6.90	-5.32	1.58	NaCl
Hausmannite	2.55	64.10	61.55	Mn3O4
Hematite	18.54	40.83	22.29	Fe2O3
Huntite	-1.48	-31.31	-29.83	CaMg3(CO3)4
Hydrocerrusite	-2.66	-20.12	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-8.37	-16.86	-8.49	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-10.62	20.59	31.21	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-8.49	21.67	30.16	KFe3(SO4)2(OH)6
Jarosite-Na	-10.44	23.68	34.12	NaFe3(SO4)2(OH)6
JarositeH	-18.11	15.99	34.11	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-10.95	-14.18	-3.23	AlOHSO4
Langite	-9.43	7.57	17.00	Cu4(OH)6SO4:H2O
Larnakite	-4.98	-5.23	-0.25	PbO:PbSO4
Laurionite	-4.93	-4.31	0.62	PbOHCl
Litharge	-4.11	8.70	12.81	PbO
Maghemite	8.31	40.83	32.53	Fe2O3
Magnesite	0.00	-7.99	-8.00	MgCO3
Magnetite	17.27	47.41	30.14	Fe3O4
Malachite	-2.92	-8.01	-5.10	Cu2(OH)2CO3
Manganite	0.64	25.98	25.34	MnOOH
Massicot	-4.30	8.70	13.00	PbO
Matlockite	-8.66	-18.13	-9.47	PbClF
Melanothallite	-22.25	-18.46	3.79	CuCl2
Melanterite	-13.82	-16.05	-2.23	FeSO4:7H2O
Minium	-20.45	53.78	74.22	Pb3O4
Mirabilite	-6.05	-7.26	-1.21	Na2SO4:10H2O
Mn2(SO4)3	-61.70	-15.92	45.78	Mn2(SO4)3
Mn3(AsO4):8H2O	-8.10	4.42	12.52	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-16.49	-13.87	2.62	MnCl2:4H2O
MnSO4	-13.24	-10.49	2.75	MnSO4
Morenosite	-10.38	-12.76	-2.38	NiSO4:7H2O
Na4UO2(CO3)3	-20.04	-36.33	-16.29	Na4UO2(CO3)3
Nahcolite	-4.51	-15.42	-10.92	NaHCO3
Nantokite	-9.77	-19.29	-9.52	CuCl
Natron	-6.35	-7.74	-1.39	Na2CO3:10H2O
Nesquehonite	-2.40	-7.99	-5.59	MgCO3:3H2O
Ni(OH)2	-0.77	9.87	10.64	Ni(OH)2
Ni3(AsO4)2:8H2O	-18.10	-2.38	15.72	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-15.14	16.86	32.00	Ni4(OH)6SO4
NiCO3	-6.45	-13.24	-6.79	NiCO3
Nsutite	-2.74	39.82	42.56	MnO2
O2(g)	-28.54	55.36	83.90	O2
Pb(OH)2	0.48	8.70	8.22	Pb(OH)2
Pb2(OH)3Cl	-4.40	4.39	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-8.80	17.40	26.20	PbO:Pb(OH)2
Pb2O3	-15.96	45.08	61.04	Pb2O3
Pb2OCO3	-5.27	-5.71	-0.44	PbO:PbCO3
Pb3(AsO4)2	-11.73	-5.90	5.83	Pb3(AsO4)2
Pb3O2CO3	-8.17	2.99	11.16	PbCO3:2PbO
Pb3O2SO4	-7.04	3.47	10.51	PbSO4:2PbO
Pb4(OH)6SO4	-8.93	12.17	21.10	Pb4(OH)6SO4
Pb4O3SO4	-10.12	12.17	22.28	PbSO4:3PbO
PbF2	-11.51	-18.95	-7.44	PbF2
PbMetal	-23.25	-18.98	4.27	Pb
PbO:0.3H2O	-4.28	8.70	12.98	PbO:0.33H2O
Phosgenite	-11.91	-31.72	-19.81	PbCl2:PbCO3
Plattnerite	-13.29	36.38	49.67	PbO2
Portlandite	-7.18	15.78	22.96	Ca(OH)2
Pyrochroite	-3.06	12.14	15.20	Mn(OH)2
Pyrolusite	-1.90	39.82	41.72	MnO2
Retgersite	-10.71	-12.76	-2.05	NiSO4:6H2O
Rhodochrosite	0.15	-10.97	-11.12	MnCO3
Rhodochrosite(d)	-0.58	-10.97	-10.39	MnCO3
Rutherfordine	-6.41	-20.85	-14.44	UO2CO3
Schoepite	-3.21	2.26	5.47	UO2(OH)2:H2O
Scorodite	-9.02	4.42	13.44	FeAsO4:2H2O
Siderite	-5.65	-16.53	-10.88	FeCO3
Siderite(d)(3)	-6.08	-16.53	-10.45	FeCO3
Smithsonite	-2.90	-12.88	-9.98	ZnCO3
Tenorite	-0.15	7.55	7.70	CuO
Thenardite	-7.08	-7.26	-0.18	Na2SO4
Thermonatrite	-7.88	-7.74	0.14	Na2CO3:H2O
Trona	-12.11	-23.16	-11.05	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-35.63	-48.05	-12.42	U(OH)2SO4
U3O8(c)	-14.38	-20.91	-6.52	U3O8
U4O9(c)	-34.27	-74.01	-39.73	U4O9
UF4(c)	-52.99	-80.72	-27.73	UF4
UF4:2.5H2O	-43.93	-80.72	-36.79	UF4:2.5H2O
UO2(a)	-16.30	-25.42	-9.12	UO2
UO3(gamma)	-5.56	2.26	7.82	UO3
Uraninite(c)	-11.50	-25.42	-13.92	UO2
Witherite	-1.32	-9.88	-8.57	BaCO3
Zincite(c)	-1.02	10.23	11.25	ZnO
Zincosite	-15.51	-12.40	3.11	ZnSO4
Zn(OH)2-a	-2.22	10.23	12.45	Zn(OH)2
Zn(OH)2-b	-1.52	10.23	11.75	Zn(OH)2
Zn(OH)2-c	-1.97	10.23	12.20	Zn(OH)2
Zn(OH)2-e	-1.27	10.23	11.50	Zn(OH)2
Zn(OH)2-g	-1.48	10.23	11.71	Zn(OH)2
Zn2(OH)2SO4	-9.67	-2.17	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.74	7.46	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-14.99	-1.31	13.68	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-33.91	-14.57	19.34	ZnO:2ZnSO4
Zn4(OH)6SO4	-10.11	18.29	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-13.36	25.14	38.50	Zn5(OH)8Cl2
ZnCl2	-22.90	-15.78	7.12	ZnCl2
ZnCO3:H2O	-2.62	-12.88	-10.26	ZnCO3:H2O
ZnF2	-15.97	-17.42	-1.45	ZnF2
ZnMetal	-43.40	-17.45	25.95	Zn
ZnO(a)	-1.08	10.23	11.31	ZnO
ZnSO4:H2O	-11.88	-12.40	-0.51	ZnSO4:H2O

End of simulation.

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Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 7.5-8.5m
           SOLUTION        8
           units           mg/l
           temp            20.6
           pH              9.23
           F               2.4
           Cl              17
           S(6)            130         as SO4
           Na              160
           K               1.6
           Mg              3.1
           Ca              20.7
           Alkalinity      256.2       as HCO3
           Al              2.2
           As(+3)          0.210
           As(+5)          0.420
           Ba              0.143
           Cu              0.042
           Fe              1.53
           Mn              0.04
           Ni              0.046
           Pb              0.027
           U               1.65
           Zn              0.02
           END
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TITLE
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   Schneckentein 7.5-8.5m

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Beginning of initial solution calculations.
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Initial solution 8.

-----------------------------Solution composition--------------
---------------

                Elements           Molality       Moles

                Al                 8.159e-05   8.159e-05
                Alkalinity         4.201e-03   4.201e-03
                As(3)              2.805e-06   2.805e-06
                As(5)              5.609e-06   5.609e-06
                Ba                 1.042e-06   1.042e-06
                Ca                 5.168e-04   5.168e-04
                Cl                 4.798e-04   4.798e-04
                Cu                 6.613e-07   6.613e-07
                F                  1.264e-04   1.264e-04
                Fe                 2.741e-05   2.741e-05
                K                  4.094e-05   4.094e-05
                Mg                 1.276e-04   1.276e-04
                Mn                 7.285e-07   7.285e-07
                Na                 6.964e-03   6.964e-03
                Ni                 7.840e-07   7.840e-07
                Pb                 1.304e-07   1.304e-07
                S(6)               1.354e-03   1.354e-03
                U                  6.936e-06   6.936e-06
                Zn                 3.061e-07   3.061e-07
```

```
-----------------------------Description of solution-------------------------
---

                                    pH  =   9.230
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   9.489e-03
                     Mass of water (kg)  =   1.000e+00
                  Total carbon (mol/kg)  =   3.394e-03
                     Total CO2 (mol/kg)  =   3.394e-03
                   Temperature (deg C)   =  20.600
                Electrical balance (eq)  =   1.066e-03
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =   7.20
                                Iterations  =  12
                                   Total H  = 1.110159e+02
                                   Total O  = 5.552230e+01

---------------------------------Redox couples-----------------------------
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           Redox couple             pe  Eh (volts)

           As(3)/As(5)         -4.1456     -0.2416
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	1.336e-05	1.209e-05	-4.874	-4.918	-0.043
H+	6.431e-10	5.888e-10	-9.192	-9.230	-0.038
H2O	5.551e+01	9.998e-01	-0.000	-0.000	0.000
Al	**8.159e-05**				
Al(OH)4-	8.156e-05	7.380e-05	-4.089	-4.132	-0.043
Al(OH)3	2.430e-08	2.435e-08	-7.614	-7.614	0.001
Al(OH)2+	1.501e-10	1.359e-10	-9.823	-9.867	-0.043
AlF3	1.039e-13	1.041e-13	-12.983	-12.982	0.001
AlF2+	8.107e-14	7.335e-14	-13.091	-13.135	-0.043
AlOH+2	2.259e-14	1.514e-14	-13.646	-13.820	-0.174
AlF4-	5.186e-15	4.693e-15	-14.285	-14.329	-0.043
AlF+2	1.973e-15	1.322e-15	-14.705	-14.879	-0.174
AlSO4+	3.391e-18	3.069e-18	-17.470	-17.513	-0.043
Al+3	2.949e-18	1.199e-18	-17.530	-17.921	-0.391
Al(SO4)2-	9.011e-20	8.153e-20	-19.045	-19.089	-0.043
AlHSO4+2	2.305e-28	1.545e-28	-27.637	-27.811	-0.174
As(3)	**2.805e-06**				
H3AsO3	1.443e-06	1.446e-06	-5.841	-5.840	0.001
H2AsO3-	1.360e-06	1.230e-06	-5.866	-5.910	-0.043
HAsO3-2	2.032e-09	1.362e-09	-8.692	-8.866	-0.174
AsO3-3	1.883e-13	7.652e-14	-12.725	-13.116	-0.391
H4AsO3+	4.662e-16	4.218e-16	-15.331	-15.375	-0.043
As(5)	**5.609e-06**				
HAsO4-2	5.560e-06	3.726e-06	-5.255	-5.429	-0.174
AsO4-3	3.536e-08	1.437e-08	-7.452	-7.842	-0.391
H2AsO4-	1.416e-08	1.282e-08	-7.849	-7.892	-0.043
H3AsO4	1.263e-15	1.265e-15	-14.899	-14.898	0.001
Ba	**1.042e-06**				
Ba+2	7.630e-07	5.114e-07	-6.118	-6.291	-0.174
BaSO4	2.194e-07	2.198e-07	-6.659	-6.658	0.001
BaCO3	4.685e-08	4.696e-08	-7.329	-7.328	0.001
BaHCO3+	1.263e-08	1.143e-08	-7.899	-7.942	-0.043
BaOH+	3.251e-11	2.942e-11	-10.488	-10.531	-0.043
C(4)	**3.394e-03**				
HCO3-	2.950e-03	2.678e-03	-2.530	-2.572	-0.042
CO3-2	2.859e-04	1.942e-04	-3.544	-3.712	-0.168
CaCO3	7.840e-05	7.857e-05	-4.106	-4.105	0.001
NaCO3-	1.995e-05	1.805e-05	-4.700	-4.743	-0.043
MgCO3	1.184e-05	1.186e-05	-4.927	-4.926	0.001
NaHCO3	9.399e-06	9.419e-06	-5.027	-5.026	0.001
CaHCO3+	9.185e-06	8.311e-06	-5.037	-5.080	-0.043
UO2(CO3)3-4	6.750e-06	1.362e-06	-5.171	-5.866	-0.695
CO2	3.757e-06	3.766e-06	-5.425	-5.424	0.001
MgHCO3+	2.331e-06	2.109e-06	-5.632	-5.676	-0.043
MnCO3	6.473e-07	6.487e-07	-6.189	-6.188	0.001
NiCO3	5.205e-07	5.216e-07	-6.284	-6.283	0.001
Ni(CO3)2-2	2.626e-07	1.760e-07	-6.581	-6.754	-0.174
Zn(CO3)2-2	2.306e-07	1.545e-07	-6.637	-6.811	-0.174
UO2(CO3)2-2	1.742e-07	1.168e-07	-6.759	-6.933	-0.174
PbCO3	7.459e-08	7.476e-08	-7.127	-7.126	0.001
Pb(CO3)2-2	5.440e-08	3.646e-08	-7.264	-7.438	-0.174
BaCO3	4.685e-08	4.696e-08	-7.329	-7.328	0.001
ZnCO3	3.715e-08	3.723e-08	-7.430	-7.429	0.001
BaHCO3+	1.263e-08	1.143e-08	-7.899	-7.942	-0.043
CuCO3	1.118e-08	1.120e-08	-7.952	-7.951	0.001
MnHCO3+	1.109e-08	1.004e-08	-7.955	-7.998	-0.043
Cu(CO3)2-2	4.086e-09	2.739e-09	-8.389	-8.562	-0.174
ZnHCO3+	3.581e-10	3.240e-10	-9.446	-9.489	-0.043
NiHCO3+	1.481e-10	1.340e-10	-9.830	-9.873	-0.043
FeCO3	9.720e-11	9.741e-11	-10.012	-10.011	0.001
PbHCO3+	5.209e-11	4.713e-11	-10.283	-10.327	-0.043
UO2CO3	2.777e-11	2.783e-11	-10.556	-10.556	0.001
CuHCO3+	1.594e-11	1.442e-11	-10.798	-10.841	-0.043
FeHCO3+	6.190e-12	5.601e-12	-11.208	-11.252	-0.043
(UO2)3(CO3)6-6	8.154e-17	2.226e-18	-16.089	-17.652	-1.564
UO2(CO3)3-5	2.569e-22	2.107e-23	-21.590	-22.676	-1.086
U(CO3)4-4	6.102e-34	1.231e-34	-33.215	-33.910	-0.695
U(CO3)5-6	6.650e-36	1.815e-37	-35.177	-36.741	-1.564
Ca	**5.168e-04**				
Ca+2	3.859e-04	2.619e-04	-3.413	-3.582	-0.168
CaCO3	7.840e-05	7.857e-05	-4.106	-4.105	0.001
CaSO4	4.291e-05	4.300e-05	-4.367	-4.367	0.001
CaHCO3+	9.185e-06	8.311e-06	-5.037	-5.080	-0.043
CaF+	2.574e-07	2.329e-07	-6.589	-6.633	-0.043
CaOH+	8.157e-08	7.381e-08	-7.088	-7.132	-0.043
CaHSO4+	1.555e-13	1.407e-13	-12.808	-12.852	-0.043
Cl	**4.798e-04**				
Cl-	4.798e-04	4.334e-04	-3.319	-3.363	-0.044
MnCl+	8.207e-11	7.426e-11	-10.086	-10.129	-0.043
ZnOHCl	2.336e-11	2.341e-11	-10.631	-10.631	0.001
ZnCl+	1.017e-12	9.206e-13	-11.993	-12.036	-0.043
NiCl+	4.360e-13	3.945e-13	-12.360	-12.404	-0.043
PbCl+	3.782e-13	3.422e-13	-12.422	-12.466	-0.043
CuCl2-	3.589e-14	3.247e-14	-13.445	-13.489	-0.043
MnCl2	1.402e-14	1.405e-14	-13.853	-13.852	0.001
FeCl+	1.383e-14	1.251e-14	-13.859	-13.903	-0.043
CuCl+	1.113e-14	1.007e-14	-13.953	-13.997	-0.043
NiCl2	6.195e-16	6.208e-16	-15.208	-15.207	0.001
ZnCl2	4.095e-16	4.103e-16	-15.388	-15.387	0.001
PbCl2	2.550e-16	2.555e-16	-15.594	-15.593	0.001
CuCl3-2	3.271e-17	2.192e-17	-16.485	-16.659	-0.174
CuCl2	2.229e-18	2.234e-18	-17.652	-17.651	0.001
MnCl3-	1.853e-18	1.677e-18	-17.732	-17.775	-0.043
ZnCl3-	2.147e-19	1.943e-19	-18.668	-18.712	-0.043
PbCl3-	9.457e-20	8.557e-20	-19.024	-19.068	-0.043
UO2Cl+	2.339e-20	2.116e-20	-19.631	-19.674	-0.043
FeCl+2	2.651e-22	1.777e-22	-21.577	-21.750	-0.174
ZnCl4-2	6.077e-23	4.073e-23	-22.216	-22.390	-0.174
PbCl4-2	2.559e-23	1.715e-23	-22.592	-22.766	-0.174
CuCl3-	3.508e-24	3.174e-24	-23.455	-23.498	-0.043
UO2Cl2	4.708e-25	4.718e-25	-24.327	-24.326	0.001
FeCl2+	4.379e-25	3.962e-25	-24.359	-24.402	-0.043
FeCl3	1.714e-29	1.717e-29	-28.766	-28.765	0.001
CuCl4-2	9.276e-30	6.217e-30	-29.033	-29.206	-0.174
UCl+3	0.000e+00	0.000e+00	-53.165	-53.556	-0.391
Cu(1)	**6.337e-13**				
Cu+	5.978e-13	5.409e-13	-12.223	-12.267	-0.043
CuCl2-	3.589e-14	3.247e-14	-13.445	-13.489	-0.043
CuCl3-2	3.271e-17	2.192e-17	-16.485	-16.659	-0.174
Cu(2)	**6.613e-07**				
Cu(OH)2	6.458e-07	6.472e-07	-6.190	-6.189	0.001
CuCO3	1.118e-08	1.120e-08	-7.952	-7.951	0.001
Cu(CO3)2-2	4.086e-09	2.739e-09	-8.389	-8.562	-0.174
CuOH+	2.016e-10	1.824e-10	-9.695	-9.739	-0.043
Cu(OH)3-	7.318e-11	6.621e-11	-10.136	-10.179	-0.043
Cu+2	1.603e-11	1.075e-11	-10.795	-10.969	-0.174
CuHCO3+	1.594e-11	1.442e-11	-10.798	-10.841	-0.043
CuSO4	1.821e-12	1.825e-12	-11.740	-11.739	0.001
Cu(OH)4-2	3.346e-14	2.243e-14	-13.475	-13.649	-0.174
CuF+	2.350e-14	2.126e-14	-13.629	-13.672	-0.043
Cu2(OH)2+2	1.395e-14	9.348e-15	-13.856	-14.029	-0.174
CuCl+	1.113e-14	1.007e-14	-13.953	-13.997	-0.043
CuCl2	2.229e-18	2.234e-18	-17.652	-17.651	0.001
CuCl3-	3.508e-24	3.174e-24	-23.455	-23.498	-0.043
CuCl4-2	9.276e-30	6.217e-30	-29.033	-29.206	-0.174
F	**1.264e-04**				
F-	1.252e-04	1.133e-04	-3.902	-3.946	-0.043
MgF+	5.227e-07	4.730e-07	-6.282	-6.325	-0.043
NaF	4.069e-07	4.078e-07	-6.391	-6.390	0.001
CaF+	2.574e-07	2.329e-07	-6.589	-6.633	-0.043
HF	9.230e-11	9.250e-11	-10.035	-10.034	0.001
MnF+	3.643e-11	3.297e-11	-10.438	-10.482	-0.043
ZnF+	1.607e-12	1.454e-12	-11.794	-11.837	-0.043
NiF+	9.054e-13	8.192e-13	-12.043	-12.087	-0.043
AlF3	1.039e-13	1.041e-13	-12.983	-12.982	0.001
AlF2+	8.107e-14	7.335e-14	-13.091	-13.135	-0.043
PbF+	4.933e-14	4.464e-14	-13.307	-13.350	-0.043
HF2-	4.285e-14	3.877e-14	-13.368	-13.412	-0.043
FeF+	2.619e-14	2.370e-14	-13.582	-13.625	-0.043
CuF+	2.350e-14	2.126e-14	-13.629	-13.672	-0.043
AlF4-	5.186e-15	4.693e-15	-14.285	-14.329	-0.043
AlF+2	1.973e-15	1.322e-15	-14.705	-14.879	-0.174
UO2F+	5.280e-16	4.778e-16	-15.277	-15.321	-0.043
UO2F2	1.826e-16	1.830e-16	-15.739	-15.738	0.001
PbF2	1.030e-16	1.033e-16	-15.987	-15.986	0.001
FeF2+	1.240e-17	1.122e-17	-16.907	-16.950	-0.043
UO2F3-	4.359e-18	3.944e-18	-17.361	-17.404	-0.043
FeF+2	3.913e-18	2.623e-18	-17.407	-17.581	-0.174
FeF3	1.980e-18	1.984e-18	-17.703	-17.702	0.001
PbF3-	9.366e-20	8.475e-20	-19.028	-19.072	-0.043
H2F2	2.603e-20	2.609e-20	-19.585	-19.584	0.001
UO2F4-2	4.259e-21	2.855e-21	-20.371	-20.544	-0.174
PbF4-2	6.856e-24	4.596e-24	-23.164	-23.338	-0.174
UF3+	0.000e+00	0.000e+00	-42.157	-42.201	-0.043
UF4	0.000e+00	0.000e+00	-42.237	-42.236	0.001
UF2+2	0.000e+00	0.000e+00	-43.451	-43.625	-0.174
UF5-	0.000e+00	0.000e+00	-44.691	-44.734	-0.043
UF+3	0.000e+00	0.000e+00	-46.203	-46.594	-0.391
UF6-2	0.000e+00	0.000e+00	-46.399	-46.573	-0.174
Fe(2)	**1.465e-10**				
FeCO3	9.720e-11	9.741e-11	-10.012	-10.011	0.001
Fe+2	3.120e-11	2.091e-11	-10.506	-10.680	-0.174
FeOH+	8.889e-12	8.043e-12	-11.051	-11.095	-0.043
FeHCO3+	6.190e-12	5.601e-12	-11.208	-11.252	-0.043
FeSO4	2.934e-12	2.940e-12	-11.533	-11.532	0.001
Fe(OH)2	7.865e-14	7.882e-14	-13.104	-13.103	0.001
FeF+	2.619e-14	2.370e-14	-13.582	-13.625	-0.043
FeCl+	1.383e-14	1.251e-14	-13.859	-13.903	-0.043
Fe(OH)3-	5.259e-15	4.759e-15	-14.279	-14.323	-0.043
FeHSO4+	1.242e-20	1.124e-20	-19.906	-19.949	-0.043

Fe(3)	2.741e-05					
	Fe(OH)4-	1.611e-05	1.457e-05	-4.793	-4.836	-0.043
	Fe(OH)3	1.124e-05	1.126e-05	-4.949	-4.948	0.001
	Fe(OH)2+	6.913e-08	6.255e-08	-7.160	-7.204	-0.043
	FeOH+2	1.966e-13	1.318e-13	-12.706	-12.880	-0.174
	FeF2+	1.240e-17	1.122e-17	-16.907	-16.950	-0.043
	FeF+2	3.913e-18	2.623e-18	-17.407	-17.581	-0.174
	FeF3	1.980e-18	1.984e-18	-17.703	-17.702	0.001
	FeSO4+	1.473e-19	1.332e-19	-18.832	-18.875	-0.043
	Fe+3	3.847e-20	1.564e-20	-19.415	-19.806	-0.391
	Fe(SO4)2-	2.716e-21	2.457e-21	-20.566	-20.610	-0.043
	FeCl+2	2.651e-22	1.777e-22	-21.577	-21.750	-0.174
	Fe2(OH)2+4	2.786e-24	5.623e-25	-23.555	-24.250	-0.695
	FeCl2+	4.379e-25	3.962e-25	-24.359	-24.402	-0.043
	FeHSO4+2	3.149e-28	2.111e-28	-27.502	-27.676	-0.174
	Fe3(OH)4+5	1.353e-28	1.110e-29	-27.869	-28.955	-1.086
	FeCl3	1.714e-29	1.717e-29	-28.766	-28.765	0.001
H(0)	4.951e-30					
	H2	2.476e-30	2.481e-30	-29.606	-29.605	0.001
K	4.094e-05					
	K+	4.071e-05	3.677e-05	-4.390	-4.434	-0.044
	KSO4-	2.332e-07	2.110e-07	-6.632	-6.676	-0.043
Mg	1.276e-04					
	Mg+2	1.003e-04	6.851e-05	-3.999	-4.164	-0.166
	MgSO4	1.225e-05	1.228e-05	-4.912	-4.911	0.001
	MgCO3	1.184e-05	1.186e-05	-4.927	-4.926	0.001
	MgHCO3+	2.331e-06	2.109e-06	-5.632	-5.676	-0.043
	MgF+	5.227e-07	4.730e-07	-6.282	-6.325	-0.043
	MgOH+	3.118e-07	2.822e-07	-6.506	-6.549	-0.043
Mn(2)	7.285e-07					
	MnCO3	6.473e-07	6.487e-07	-6.189	-6.188	0.001
	Mn+2	6.275e-08	4.206e-08	-7.202	-7.376	-0.174
	MnHCO3+	1.109e-08	1.004e-08	-7.955	-7.998	-0.043
	MnSO4	5.879e-09	5.892e-09	-8.231	-8.230	0.001
	MnOH+	1.410e-09	1.275e-09	-8.851	-8.894	-0.043
	MnCl+	8.207e-11	7.426e-11	-10.086	-10.129	-0.043
	MnF+	3.643e-11	3.297e-11	-10.438	-10.482	-0.043
	MnCl2	1.402e-14	1.405e-14	-13.853	-13.852	0.001
	Mn(OH)3-	3.606e-15	3.263e-15	-14.443	-14.486	-0.043
	MnCl3-	1.853e-18	1.677e-18	-17.732	-17.775	-0.043
Mn(3)	1.666e-29					
	Mn+3	1.666e-29	6.770e-30	-28.778	-29.169	-0.391
Mn(6)	3.549e-38					
	MnO4-2	3.549e-38	2.379e-38	-37.450	-37.624	-0.174
Mn(7)	0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-43.256	-43.300	-0.043
Na	6.964e-03					
	Na+	6.905e-03	6.255e-03	-2.161	-2.204	-0.043
	NaSO4-	2.889e-05	2.614e-05	-4.539	-4.583	-0.043
	NaCO3-	1.995e-05	1.805e-05	-4.700	-4.743	-0.043
	NaHCO3	9.399e-06	9.419e-06	-5.027	-5.026	0.001
	NaF	4.069e-07	4.078e-07	-6.391	-6.390	0.001
Ni	7.840e-07					
	NiCO3	5.205e-07	5.216e-07	-6.284	-6.283	0.001
	Ni(CO3)2-2	2.626e-07	1.760e-07	-6.581	-6.754	-0.174
	Ni+2	5.407e-10	3.624e-10	-9.267	-9.441	-0.174
	NiHCO3+	1.481e-10	1.340e-10	-9.830	-9.873	-0.043
	Ni(OH)2	1.042e-10	1.045e-10	-9.982	-9.981	0.001
	NiOH+	6.857e-11	6.205e-11	-10.164	-10.207	-0.043
	NiSO4	5.820e-11	5.833e-11	-10.235	-10.234	0.001
	Ni(OH)3-	1.960e-12	1.774e-12	-11.708	-11.751	-0.043
	NiF+	9.054e-13	8.192e-13	-12.043	-12.087	-0.043
	NiCl+	4.360e-13	3.945e-13	-12.360	-12.404	-0.043
	Ni(SO4)2-2	4.166e-15	2.792e-15	-14.380	-14.554	-0.174
	NiCl2	6.195e-16	6.208e-16	-15.208	-15.207	0.001
O(0)	4.571e-35					
	O2	2.285e-35	2.290e-35	-34.641	-34.640	0.001
Pb	1.304e-07					
	PbCO3	7.459e-08	7.476e-08	-7.127	-7.126	0.001
	Pb(CO3)2-2	5.440e-08	3.646e-08	-7.264	-7.438	-0.174
	PbOH+	8.106e-10	7.335e-10	-9.091	-9.135	-0.043
	Pb(OH)2	4.834e-10	4.845e-10	-9.316	-9.315	0.001
	PbHCO3+	5.209e-11	4.713e-11	-10.283	-10.327	-0.043
	Pb+2	3.306e-11	2.216e-11	-10.481	-10.655	-0.174
	PbSO4	1.066e-11	1.069e-11	-10.972	-10.971	0.001
	Pb(OH)3-	1.044e-11	9.445e-12	-10.981	-11.025	-0.043
	PbCl+	3.782e-13	3.422e-13	-12.422	-12.466	-0.043
	Pb(SO4)2-2	7.178e-14	4.811e-14	-13.144	-13.318	-0.174
	Pb(OH)4-2	5.481e-14	3.674e-14	-13.261	-13.435	-0.174
	PbF+	4.933e-14	4.464e-14	-13.307	-13.350	-0.043
	PbCl2	2.550e-16	2.555e-16	-15.594	-15.593	0.001
	PbF2	1.030e-16	1.033e-16	-15.987	-15.986	0.001
	Pb2OH+3	8.950e-19	3.638e-19	-18.048	-18.439	-0.391
	PbCl3-	9.457e-20	8.557e-20	-19.024	-19.068	-0.043
	PbF3-	9.366e-20	8.475e-20	-19.028	-19.072	-0.043
	Pb3(OH)4+2	9.096e-20	6.097e-20	-19.041	-19.215	-0.174
	PbCl4-2	2.559e-23	1.715e-23	-22.592	-22.766	-0.174
	PbF4-2	6.856e-24	4.596e-24	-23.164	-23.338	-0.174
S(6)	1.354e-03					
	SO4-2	1.270e-03	8.578e-04	-2.896	-3.067	-0.170
	CaSO4	4.291e-05	4.300e-05	-4.367	-4.367	0.001
	NaSO4-	2.889e-05	2.614e-05	-4.539	-4.583	-0.043
	MgSO4	1.225e-05	1.228e-05	-4.912	-4.911	0.001
	KSO4-	2.332e-07	2.110e-07	-6.632	-6.676	-0.043
	BaSO4	2.194e-07	2.198e-07	-6.659	-6.658	0.001
	MnSO4	5.879e-09	5.892e-09	-8.231	-8.230	0.001
	ZnSO4	1.863e-10	1.867e-10	-9.730	-9.729	0.001
	NiSO4	5.820e-11	5.833e-11	-10.235	-10.234	0.001
	HSO4-	4.939e-11	4.469e-11	-10.306	-10.350	-0.043
	PbSO4	1.066e-11	1.069e-11	-10.972	-10.971	0.001
	FeSO4	2.934e-12	2.940e-12	-11.533	-11.532	0.001
	Zn(SO4)2-2	2.010e-12	1.347e-12	-11.697	-11.871	-0.174
	CuSO4	1.821e-12	1.825e-12	-11.740	-11.739	0.001
	CaHSO4+	1.555e-13	1.407e-13	-12.808	-12.852	-0.043
	Pb(SO4)2-2	7.178e-14	4.811e-14	-13.144	-13.318	-0.174
	Ni(SO4)2-2	4.166e-15	2.792e-15	-14.380	-14.554	-0.174
	UO2SO4	3.718e-17	3.726e-17	-16.430	-16.429	0.001
	AlSO4+	3.391e-18	3.069e-18	-17.470	-17.513	-0.043
	UO2(SO4)2-2	4.244e-19	2.845e-19	-18.372	-18.546	-0.174
	FeSO4+	1.473e-19	1.332e-19	-18.832	-18.875	-0.043
	Al(SO4)2-	9.011e-20	8.153e-20	-19.045	-19.089	-0.043
	FeHSO4+	1.242e-20	1.124e-20	-19.906	-19.949	-0.043
	Fe(SO4)2-	2.716e-21	2.457e-21	-20.566	-20.610	-0.043
	FeHSO4+2	3.149e-28	2.111e-28	-27.502	-27.676	-0.174
	AlHSO4+2	2.305e-28	1.545e-28	-27.637	-27.811	-0.174
	U(SO4)2	0.000e+00	0.000e+00	-47.682	-47.681	0.001
	USO4+2	0.000e+00	0.000e+00	-48.296	-48.470	-0.174
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-64.635	-65.026	-0.391
U(4)	1.536e-24					
	U(OH)4	1.536e-24	1.540e-24	-23.813	-23.813	0.001
	U(OH)3+	3.866e-30	3.498e-30	-29.413	-29.456	-0.043
	U(CO3)4-4	6.102e-34	1.231e-34	-33.215	-33.910	-0.695
	U(CO3)5-6	6.650e-36	1.815e-37	-35.177	-36.741	-1.564
	U(OH)2+2	1.609e-36	1.079e-36	-35.793	-35.967	-0.174
	UF3+	0.000e+00	0.000e+00	-42.157	-42.201	-0.043
	UF4	0.000e+00	0.000e+00	-42.237	-42.236	0.001
	UOH+3	0.000e+00	0.000e+00	-43.005	-43.395	-0.391
	UF2+2	0.000e+00	0.000e+00	-43.451	-43.625	-0.174
	UF5-	0.000e+00	0.000e+00	-44.691	-44.734	-0.043
	UF+3	0.000e+00	0.000e+00	-46.203	-46.594	-0.391
	UF6-2	0.000e+00	0.000e+00	-46.399	-46.573	-0.174
	U(SO4)2	0.000e+00	0.000e+00	-47.682	-47.681	0.001
	USO4+2	0.000e+00	0.000e+00	-48.296	-48.470	-0.174
	U+4	0.000e+00	0.000e+00	-51.267	-51.962	-0.695
	UCl+3	0.000e+00	0.000e+00	-53.165	-53.556	-0.391
	U6(OH)15+9	0.000e+00	0.000e+00	-187.007	-190.525	-3.519
U(5)	1.288e-19					
	UO2+	1.286e-19	1.163e-19	-18.891	-18.934	-0.043
	UO2(CO3)3-5	2.569e-22	2.107e-23	-21.590	-22.676	-1.086
U(6)	6.936e-06					
	UO2(CO3)3-4	6.750e-06	1.362e-06	-5.171	-5.866	-0.695
	UO2(CO3)2-2	1.742e-07	1.168e-07	-6.759	-6.933	-0.174
	UO2(OH)3-	1.182e-08	1.070e-08	-7.927	-7.971	-0.043
	UO2CO3	2.777e-11	2.783e-11	-10.556	-10.556	0.001
	UO2(OH)4-2	4.294e-13	2.878e-13	-12.367	-12.541	-0.174
	UO2OH+	3.104e-13	2.808e-13	-12.508	-12.552	-0.043
	UO2F+	5.280e-16	4.778e-16	-15.277	-15.321	-0.043
	(UO2)3(OH)7-	1.867e-16	1.690e-16	-15.729	-15.772	-0.043
	UO2F2	1.826e-16	1.830e-16	-15.739	-15.738	0.001
	(UO2)3(CO3)6-6	8.154e-17	2.226e-18	-16.089	-17.652	-1.564
	UO2+2	5.167e-17	3.463e-17	-16.287	-16.461	-0.174
	UO2SO4	3.718e-17	3.726e-17	-16.430	-16.429	0.001
	UO2F3-	4.359e-18	3.944e-18	-17.361	-17.404	-0.043
	UO2(SO4)2-2	4.244e-19	2.845e-19	-18.372	-18.546	-0.174
	(UO2)3(OH)5+	9.686e-20	8.764e-20	-19.014	-19.057	-0.043
	UO2Cl+	2.339e-20	2.116e-20	-19.631	-19.674	-0.043
	(UO2)2(OH)2+2	9.555e-21	6.404e-21	-20.020	-20.194	-0.174
	UO2F4-2	4.259e-21	2.855e-21	-20.371	-20.544	-0.174
	(UO2)4(OH)7+	8.142e-24	7.367e-24	-23.089	-23.133	-0.043
	(UO2)3(OH)4+2	6.484e-25	4.346e-25	-24.188	-24.362	-0.174
	UO2Cl2	4.708e-25	4.718e-25	-24.327	-24.326	0.001
	(UO2)2OH+3	9.997e-27	4.063e-27	-26.000	-26.391	-0.391
Zn	3.061e-07					
	Zn(CO3)2-2	2.306e-07	1.545e-07	-6.637	-6.811	-0.174
	ZnCO3	3.715e-08	3.723e-08	-7.430	-7.429	0.001
	Zn(OH)2	3.480e-08	3.487e-08	-7.458	-7.458	0.001
	Zn+2	1.434e-09	9.609e-10	-8.844	-9.017	-0.174
	ZnOH+	1.409e-09	1.275e-09	-8.851	-8.895	-0.043
	ZnHCO3+	3.581e-10	3.240e-10	-9.446	-9.489	-0.043
	Zn(OH)3-	2.069e-10	1.872e-10	-9.684	-9.728	-0.043
	ZnSO4	1.863e-10	1.867e-10	-9.730	-9.729	0.001
	ZnOHCl	2.336e-11	2.341e-11	-10.631	-10.631	0.001
	Zn(SO4)2-2	2.010e-12	1.347e-12	-11.697	-11.871	-0.174
	ZnF+	1.607e-12	1.454e-12	-11.794	-11.837	-0.043
	ZnCl+	1.017e-12	9.206e-13	-11.993	-12.036	-0.043
	Zn(OH)4-2	7.517e-14	5.039e-14	-13.124	-13.298	-0.174
	ZnCl2	4.095e-16	4.103e-16	-15.388	-15.387	0.001
	ZnCl3-	2.147e-19	1.943e-19	-18.668	-18.712	-0.043
	ZnCl4-2	6.077e-23	4.073e-23	-22.216	-22.390	-0.174

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-1.32	9.77	11.09	Al(OH)3
AlAsO4:2H2O	-9.93	-5.13	4.80	AlAsO4:2H2O
AlumK	-23.24	-28.49	-5.25	KAl(SO4)2:12H2O
Alunite	-8.10	-8.95	-0.85	KAl3(SO4)2(OH)6
Anglesite	-5.91	-13.72	-7.81	PbSO4
Anhydrite	-2.30	-6.65	-4.35	CaSO4
Antlerite	-7.34	0.95	8.29	Cu3(OH)4SO4
Aragonite	1.02	-7.29	-8.31	CaCO3
Arsenolite	-20.40	-23.36	-2.96	As4O6
Artinite	-3.50	6.42	9.92	MgCO3:Mg(OH)2:3H2O
As2O5	-36.55	-29.80	6.76	As2O5
Atacamite	-5.16	2.39	7.55	Cu2(OH)3Cl
Azurite	-5.22	-21.87	-16.65	Cu3(OH)2(CO3)2
B-UO2(OH)2	-3.70	2.00	5.69	UO2(OH)2
Ba3(AsO4)2	15.66	6.71	-8.94	Ba3(AsO4)2
BaF2	-8.41	-14.18	-5.77	BaF2
Barite	0.68	-9.36	-10.04	BaSO4
Basaluminite	-5.15	17.55	22.70	Al4(OH)10SO4
Bianchite	-10.32	-12.08	-1.76	ZnSO4:6H2O
Birnessite	-6.06	37.54	43.60	MnO2
Bixbyite	-2.52	48.63	51.14	Mn2O3
Boehmite	0.88	9.77	8.89	AlOOH
Brochantite	-6.90	8.44	15.34	Cu4(OH)6SO4
Brucite	-2.84	14.30	17.14	Mg(OH)2
Bunsenite	-3.69	9.02	12.71	NiO
Ca3(AsO4)2:4w	-7.53	14.84	22.36	Ca3(AsO4)2:4H2O
Calcite	1.16	-7.29	-8.46	CaCO3
Cerrusite	-1.18	-14.37	-13.18	PbCO3
Chalcanthite	-11.38	-14.04	-2.66	CuSO4:5H2O
Claudetite	-20.15	-23.36	-3.21	As4O6
CO2(g)	-4.01	-22.17	-18.16	CO2
Cotunnite	-12.55	-17.38	-4.83	PbCl2
Cu(OH)2	-1.32	7.49	8.81	Cu(OH)2
Cu2SO4	-25.70	-33.00	-7.30	Cu2SO4
Cu3(AsO4)2:6w	-13.47	-7.32	6.15	Cu3(AsO4)2:6H2O
CuCO3	-5.05	-14.68	-9.63	CuCO3
CuF	-23.43	-18.91	4.51	CuF
CuF2	-18.39	-18.86	-0.47	CuF2
CuF2:2H2O	-14.35	-18.86	-4.51	CuF2:2H2O
CuMetal	-7.32	-18.97	-11.65	Cu
CuOCuSO4	-18.46	-6.54	11.92	CuO:CuSO4
CupricFerrite	16.95	49.51	32.56	CuFe2O4
Cuprite	-4.46	-11.48	-7.02	Cu2O
CuprousFerrite	13.73	15.27	1.55	CuFeO2
CuSO4	-17.24	-14.04	3.21	CuSO4
Diaspore	2.62	9.77	7.15	AlOOH
Dolomite	1.82	-15.17	-16.99	CaMg(CO3)2
Dolomite(d)	1.25	-15.17	-16.42	CaMg(CO3)2
Epsomite	-5.06	-7.23	-2.17	MgSO4:7H2O
Fe(OH)2.7Cl.3	7.15	17.23	10.09	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.99	21.01	18.02	Fe(OH)3
Fe3(OH)8	3.33	49.80	46.47	Fe3(OH)8
Fluorite	-0.82	-11.47	-10.65	CaF2
Gibbsite	1.41	9.77	8.36	Al(OH)3
Goethite	8.88	21.01	12.13	FeOOH
Goslarite	-10.09	-12.08	-2.00	ZnSO4:7H2O
Gummite	-8.66	2.00	10.66	UO3
Gypsum	-2.07	-6.65	-4.58	CaSO4:2H2O
H2(g)	-26.41	-26.46	-0.05	H2
Halite	-7.14	-5.57	1.57	NaCl
Hausmannite	-2.42	59.71	62.13	Mn3O4
Hematite	19.44	42.02	22.58	Fe2O3
Huntite	-1.24	-30.92	-29.69	CaMg3(CO3)4
Hydrocerrusite	-3.47	-20.93	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-9.02	-17.21	-8.19	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-7.50	23.88	31.38	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-5.74	24.77	30.51	KFe3(SO4)2(OH)6
Jarosite-Na	-7.49	27.00	34.50	NaFe3(SO4)2(OH)6
JarositeH	-14.62	19.98	34.59	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-8.53	-11.76	-3.23	AlOHSO4
Langite	-8.79	8.44	17.22	Cu4(OH)6SO4:H2O
Larnakite	-5.71	-5.92	-0.21	PbO:PbSO4
Laurionite	-5.41	-4.79	0.62	PbOHCl
Litharge	-5.09	7.81	12.90	PbO
Maghemite	9.38	42.02	32.64	Fe2O3
Magnesite	0.09	-7.88	-7.96	MgCO3
Magnetite	19.26	49.80	30.54	Fe3O4
Malachite	-2.19	-7.19	-5.00	Cu2(OH)2CO3
Manganite	-1.03	24.31	25.34	MnOOH
Massicot	-5.29	7.81	13.09	PbO
Matlockite	-8.45	-17.96	-9.52	PbClF
Melanothallite	-21.56	-17.70	3.87	CuCl2
Melanterite	-11.48	-13.75	-2.26	FeSO4:7H2O
Minium	-24.94	49.88	74.82	Pb3O4
Mirabilite	-6.15	-7.48	-1.32	Na2SO4:10H2O
Mn2(SO4)3	-62.26	-15.95	46.30	Mn2(SO4)3
Mn3(AsO4):8H2O	-9.11	3.46	12.56	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-16.62	-14.10	2.52	MnCl2:4H2O
MnSO4	-13.28	-10.44	2.84	MnSO4
Morenosite	-10.12	-12.51	-2.39	NiSO4:7H2O
Na4UO2(CO3)3	-20.12	-36.41	-16.29	Na4UO2(CO3)3
Nahcolite	-4.19	-15.15	-10.96	NaHCO3
Nantokite	-8.76	-18.33	-9.57	CuCl
Natron	-6.64	-8.12	-1.48	Na2CO3:10H2O
Nesquehonite	-2.32	-7.88	-5.56	MgCO3:3H2O
Ni(OH)2	-1.45	9.02	10.47	Ni(OH)2
Ni3(AsO4)2:8H2O	-18.50	-2.74	15.76	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-17.45	14.55	32.00	Ni4(OH)6SO4
NiCO3	-6.42	-13.15	-6.73	NiCO3
Nsutite	-5.02	37.54	42.56	MnO2
O2(g)	-31.78	52.92	84.70	O2
Pb(OH)2	-0.50	7.81	8.30	Pb(OH)2
Pb2(OH)3Cl	-5.78	3.02	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-10.59	15.61	26.20	PbO:Pb(OH)2
Pb2O3	-18.97	42.07	61.04	Pb2O3
Pb2OCO3	-6.19	-6.56	-0.37	PbO:PbCO3
Pb3(AsO4)2	-12.25	-6.38	5.87	Pb3(AsO4)2
Pb3O2CO3	-10.07	1.24	11.31	PbCO3:2PbO
Pb3O2SO4	-8.74	1.89	10.63	PbSO4:2PbO
Pb4(OH)6SO4	-11.41	9.69	21.10	Pb4(OH)6SO4
Pb4O3SO4	-12.79	9.69	22.49	PbSO4:3PbO
PbF2	-11.11	-18.55	-7.43	PbF2
PbMetal	-22.92	-18.65	4.27	Pb
PbO:0.3H2O	-5.17	7.81	12.98	PbO:0.33H2O
Phosgenite	-11.94	-31.75	-19.81	PbCl2:PbCO3
Plattnerite	-15.81	34.27	50.08	PbO2
Portlandite	-8.26	14.88	23.14	Ca(OH)2
Pyrochroite	-4.12	11.08	15.20	Mn(OH)2
Pyrolusite	-4.55	37.54	42.09	MnO2
Retgersite	-10.46	-12.51	-2.05	NiSO4:6H2O
Rhodochrosite	0.03	-11.09	-11.11	MnCO3
Rhodochrosite(d)	-0.70	-11.09	-10.39	MnCO3
Rutherfordine	-5.74	-20.17	-14.43	UO2CO3
Schoepite	-3.54	2.00	5.54	UO2(OH)2:H2O
Scorodite	-7.40	6.11	13.51	FeAsO4:2H2O
Siderite	-3.53	-14.39	-10.86	FeCO3
Siderite(d)(3)	-3.94	-14.39	-10.45	FeCO3
Smithsonite	-2.78	-12.73	-9.95	ZnCO3
Tenorite	-0.30	7.49	7.79	CuO
Thenardite	-7.30	-7.47	-0.17	Na2SO4
Thermonatrite	-8.28	-8.12	0.16	Na2CO3:H2O
Trona	-12.30	-23.27	-10.97	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-33.37	-45.99	-12.62	U(OH)2SO4
U3O8(c)	-14.01	-20.46	-6.45	U3O8
U4O9(c)	-31.44	-71.38	-39.94	U4O9
UF4(c)	-49.35	-77.16	-27.82	UF4
UF4:2.5H2O	-40.18	-77.16	-36.98	UF4:2.5H2O
UO2(a)	-15.14	-24.46	-9.32	UO2
UO3(gamma)	-5.93	2.00	7.93	UO3
Uraninite(c)	-10.45	-24.46	-14.01	UO2
Witherite	-1.43	-10.00	-8.57	BaCO3
Zincite(c)	-1.94	9.44	11.38	ZnO
Zincosite	-15.30	-12.08	3.22	ZnSO4
Zn(OH)2-a	-3.01	9.44	12.45	Zn(OH)2
Zn(OH)2-b	-2.31	9.44	11.75	Zn(OH)2
Zn(OH)2-c	-2.76	9.44	12.20	Zn(OH)2
Zn(OH)2-e	-2.06	9.44	11.50	Zn(OH)2
Zn(OH)2-g	-2.27	9.44	11.71	Zn(OH)2
Zn2(OH)2SO4	-10.14	-2.64	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-8.91	6.29	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-15.19	-1.47	13.72	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-34.43	-14.73	19.70	ZnO:2ZnSO4
Zn4(OH)6SO4	-12.16	16.24	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-16.47	22.03	38.50	Zn5(OH)8Cl2
ZnCl2	-22.97	-15.74	7.22	ZnCl2
ZnCO3:H2O	-2.47	-12.73	-10.26	ZnCO3:H2O
ZnF2	-15.53	-16.91	-1.38	ZnF2
ZnMetal	-43.18	-17.02	26.16	Zn
ZnO(a)	-1.87	9.44	11.31	ZnO
ZnSO4:H2O	-11.63	-12.08	-0.45	ZnSO4:H2O

End of simulation.

```
------------------
Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 8.5-9.5m
           SOLUTION        9
           units           mg/l
           temp            23
           pH              9.93
           F               1.5
           Cl              13
           S(6)            44          as SO4
           Na              127
           K               2.7
           Mg              0.86
           Ca              10.5
           Alkalinity      146.4       as HCO3
           Al              3.02
           As(+3)          0.11
           As(+5)          0.27
           Ba              0.317
           Cu              0.091
           Fe              4.29
           Mn              0.2
           Ni              0.085
           Pb              0.058
           U               0.73
           Zn              0.075
           END
```

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TITLE
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   Schneckentein 8.5-9.5m

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Beginning of initial solution calculations.
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Initial solution 9.

-----------------------------Solution composition--------------
---------------

           Elements           Molality       Moles

           Al                1.120e-04   1.120e-04
           Alkalinity        2.400e-03   2.400e-03
           As(3)             1.469e-06   1.469e-06
           As(5)             3.605e-06   3.605e-06
           Ba                2.309e-06   2.309e-06
           Ca                2.621e-04   2.621e-04
           Cl                3.668e-04   3.668e-04
           Cu                1.433e-06   1.433e-06
           F                 7.898e-05   7.898e-05
           Fe                7.684e-05   7.684e-05
           K                 6.907e-05   6.907e-05
           Mg                3.539e-05   3.539e-05
           Mn                3.642e-06   3.642e-06
           Na                5.526e-03   5.526e-03
           Ni                1.448e-06   1.448e-06
           Pb                2.800e-07   2.800e-07
           S(6)              4.582e-04   4.582e-04
           U                 3.068e-06   3.068e-06
           Zn                1.148e-06   1.148e-06
```

```
----------------------------Description of solution----------------------
-----

                                    pH  =   9.930
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   5.621e-03
                     Mass of water (kg)  =   1.000e+00
                   Total carbon (mol/kg)  =   1.242e-03
                      Total CO2 (mol/kg)  =   1.242e-03
                     Temperature (deg C)  =  23.000
                  Electrical balance (eq)  =   2.864e-03
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  31.32
                                Iterations  =  13
                                   Total H  = 1.110140e+02
                                   Total O  = 5.551263e+01

---------------------------------Redox couples---------------------------
-----

           Redox couple             pe  Eh (volts)

           As(3)/As(5)         -5.3271     -0.3130
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	7.917e-05	7.312e-05	-4.101	-4.136	-0.035
H+	1.262e-10	1.175e-10	-9.899	-9.930	-0.031
H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	**1.120e-04**				
Al(OH)4-	1.120e-04	1.034e-04	-3.951	-3.985	-0.035
Al(OH)3	6.609e-09	6.617e-09	-8.180	-8.179	0.001
Al(OH)2+	6.633e-12	6.126e-12	-11.178	-11.213	-0.035
AlOH+2	1.506e-16	1.096e-16	-15.822	-15.960	-0.138
AlF2+	4.127e-17	3.812e-17	-16.384	-16.419	-0.035
AlF3	3.471e-17	3.475e-17	-16.460	-16.459	0.001
AlF+2	1.456e-18	1.059e-18	-17.837	-17.975	-0.138
AlF4-	1.087e-18	1.004e-18	-17.964	-17.998	-0.035
Al+3	3.022e-21	1.477e-21	-20.520	-20.831	-0.311
AlSO4+	1.582e-21	1.461e-21	-20.801	-20.835	-0.035
Al(SO4)2-	1.591e-23	1.469e-23	-22.798	-22.833	-0.035
AlHSO4+2	2.056e-32	1.496e-32	-31.687	-31.825	-0.138
As(3)	**1.469e-06**				
H2AsO3-	1.219e-06	1.125e-06	-5.914	-5.949	-0.035
H3AsO3	2.406e-07	2.409e-07	-6.619	-6.618	0.001
HAsO3-2	9.543e-09	6.942e-09	-8.020	-8.158	-0.138
AsO3-3	4.350e-12	2.126e-12	-11.362	-11.672	-0.311
H4AsO3+	1.518e-17	1.402e-17	-16.819	-16.853	-0.035
As(5)	**3.605e-06**				
HAsO4-2	3.496e-06	2.544e-06	-5.456	-5.595	-0.138
AsO4-3	1.069e-07	5.223e-08	-6.971	-7.282	-0.311
H2AsO4-	1.870e-09	1.727e-09	-8.728	-8.763	-0.035
H3AsO4	3.478e-17	3.482e-17	-16.459	-16.458	0.001
Ba	**2.309e-06**				
Ba+2	1.893e-06	1.377e-06	-5.723	-5.861	-0.138
BaSO4	2.213e-07	2.216e-07	-6.655	-6.655	0.001
BaCO3	1.848e-07	1.850e-07	-6.733	-6.733	0.001
BaHCO3+	9.487e-09	8.762e-09	-8.023	-8.057	-0.035
BaOH+	4.300e-10	3.971e-10	-9.367	-9.401	-0.035
C(4)	**1.242e-03**				
HCO3-	7.638e-04	7.069e-04	-3.117	-3.151	-0.034
CO3-2	3.689e-04	2.707e-04	-3.433	-3.567	-0.134
CaCO3	6.095e-05	6.103e-05	-4.215	-4.214	0.001
NaCO3-	2.502e-05	2.311e-05	-4.602	-4.636	-0.035
MgCO3	5.143e-06	5.150e-06	-5.289	-5.288	0.001
MnCO3	3.375e-06	3.379e-06	-5.472	-5.471	0.001
UO2(CO3)3-4	2.658e-06	7.445e-07	-5.575	-6.128	-0.553
NaHCO3	2.014e-06	2.017e-06	-5.696	-5.695	0.001
CaHCO3+	1.323e-06	1.222e-06	-5.879	-5.913	-0.035
NiCO3	8.763e-07	8.774e-07	-6.057	-6.057	0.001
Ni(CO3)2-2	5.674e-07	4.128e-07	-6.246	-6.384	-0.138
Zn(CO3)2-2	3.446e-07	2.507e-07	-6.463	-6.601	-0.138
CO2	1.914e-07	1.916e-07	-6.718	-6.718	0.001
BaCO3	1.848e-07	1.850e-07	-6.733	-6.733	0.001
MgHCO3+	1.825e-07	1.686e-07	-6.739	-6.773	-0.035
PbCO3	1.331e-07	1.333e-07	-6.876	-6.875	0.001
Pb(CO3)2-2	1.246e-07	9.062e-08	-6.905	-7.043	-0.138
UO2(CO3)2-2	7.594e-08	5.524e-08	-7.120	-7.258	-0.138
ZnCO3	4.326e-08	4.332e-08	-7.364	-7.363	0.001
MnHCO3+	1.072e-08	9.899e-09	-7.970	-8.004	-0.035
BaHCO3+	9.487e-09	8.762e-09	-8.023	-8.057	-0.035
CuCO3	1.374e-09	1.375e-09	-8.862	-8.862	0.001
Cu(CO3)2-2	6.444e-10	4.688e-10	-9.191	-9.329	-0.138
ZnHCO3+	7.727e-11	7.137e-11	-10.112	-10.147	-0.035
NiHCO3+	4.619e-11	4.266e-11	-10.335	-10.370	-0.035
PbHCO3+	1.722e-11	1.590e-11	-10.764	-10.798	-0.035
UO2CO3	9.018e-12	9.030e-12	-11.045	-11.044	0.001
FeCO3	5.205e-13	5.212e-13	-12.284	-12.283	0.001
CuHCO3+	3.629e-13	3.352e-13	-12.440	-12.475	-0.035
FeHCO3+	6.143e-15	5.673e-15	-14.212	-14.246	-0.035
(UO2)3(CO3)6-6	3.436e-18	1.961e-19	-17.464	-18.708	-1.244
UO2(CO3)3-5	9.553e-23	1.308e-23	-22.020	-22.883	-0.864
U(CO3)4-4	3.737e-37	1.047e-37	-36.428	-36.980	-0.553
U(CO3)5-6	4.976e-39	2.840e-40	-38.303	-39.547	-1.244
Ca	**2.621e-04**				
Ca+2	1.907e-04	1.399e-04	-3.720	-3.854	-0.135
CaCO3	6.095e-05	6.103e-05	-4.215	-4.214	0.001
CaSO4	8.781e-06	8.792e-06	-5.056	-5.056	0.001
CaHCO3+	1.323e-06	1.222e-06	-5.879	-5.913	-0.035
CaOH+	2.139e-07	1.976e-07	-6.670	-6.704	-0.035
CaF+	9.134e-08	8.435e-08	-7.039	-7.074	-0.035
CaHSO4+	6.394e-15	5.905e-15	-14.194	-14.229	-0.035
Cl	**3.668e-04**				
Cl-	3.668e-04	3.384e-04	-3.436	-3.471	-0.035
MnCl+	2.346e-10	2.166e-10	-9.630	-9.664	-0.035
ZnOHCl	7.638e-11	7.648e-11	-10.117	-10.116	0.001
ZnCl+	7.238e-13	6.684e-13	-12.140	-12.175	-0.035
NiCl+	4.024e-13	3.717e-13	-12.395	-12.430	-0.035
PbCl+	3.931e-13	3.631e-13	-12.405	-12.440	-0.035
MnCl2	3.196e-14	3.201e-14	-13.495	-13.495	0.001
CuCl2-	1.920e-15	1.773e-15	-14.717	-14.751	-0.035
CuCl+	8.455e-16	7.809e-16	-15.073	-15.107	-0.035
NiCl2	4.561e-16	4.567e-16	-15.341	-15.340	0.001
ZnCl2	2.347e-16	2.350e-16	-15.630	-15.629	0.001
PbCl2	2.019e-16	2.022e-16	-15.695	-15.694	0.001
FeCl+	4.060e-17	3.749e-17	-16.392	-16.426	-0.035
MnCl3-	3.230e-18	2.983e-18	-17.491	-17.525	-0.035
CuCl3-2	1.297e-18	9.439e-19	-17.887	-18.025	-0.138
CuCl2	1.387e-19	1.389e-19	-18.858	-18.857	0.001
ZnCl3-	9.546e-20	8.816e-20	-19.020	-19.055	-0.035
PbCl3-	5.814e-20	5.369e-20	-19.236	-19.270	-0.035
UO2Cl+	4.204e-21	3.883e-21	-20.376	-20.411	-0.035
ZnCl4-2	2.023e-23	1.472e-23	-22.694	-22.832	-0.138
PbCl4-2	1.177e-23	8.564e-24	-22.929	-23.067	-0.138
FeCl+2	9.046e-25	6.581e-25	-24.044	-24.182	-0.138
CuCl3-	1.742e-25	1.609e-25	-24.759	-24.793	-0.035
UO2Cl2	6.913e-26	6.922e-26	-25.160	-25.160	0.001
FeCl2+	1.148e-27	1.060e-27	-26.940	-26.974	-0.035
CuCl4-2	3.581e-31	2.605e-31	-30.446	-30.584	-0.138
FeCl3	3.585e-32	3.589e-32	-31.446	-31.445	0.001
UCl+3	0.000e+00	0.000e+00	-57.027	-57.338	-0.311
Cu(1)	**5.468e-14**				
Cu+	5.276e-14	4.872e-14	-13.278	-13.312	-0.035
CuCl2-	1.920e-15	1.773e-15	-14.717	-14.751	-0.035
CuCl3-2	1.297e-18	9.439e-19	-17.887	-18.025	-0.138
Cu(2)	**1.433e-06**				
Cu(OH)2	1.430e-06	1.431e-06	-5.845	-5.844	0.001
CuCO3	1.374e-09	1.375e-09	-8.862	-8.862	0.001
Cu(OH)3-	7.948e-10	7.341e-10	-9.100	-9.134	-0.035
Cu(CO3)2-2	6.444e-10	4.688e-10	-9.191	-9.329	-0.138
CuOH+	8.718e-11	8.051e-11	-10.060	-10.094	-0.035
Cu(OH)4-2	1.713e-12	1.246e-12	-11.766	-11.904	-0.138
Cu+2	1.300e-12	9.460e-13	-11.886	-12.024	-0.138
CuHCO3+	3.629e-13	3.352e-13	-12.440	-12.475	-0.035
CuSO4	6.107e-14	6.115e-14	-13.214	-13.214	0.001
Cu2(OH)2+2	3.192e-15	2.322e-15	-14.496	-14.634	-0.138
CuF+	1.328e-15	1.226e-15	-14.877	-14.911	-0.035
CuCl+	8.455e-16	7.809e-16	-15.073	-15.107	-0.035
CuCl2	1.387e-19	1.389e-19	-18.858	-18.857	0.001
CuCl3-	1.742e-25	1.609e-25	-24.759	-24.793	-0.035
CuCl4-2	3.581e-31	2.605e-31	-30.446	-30.584	-0.138
F	**7.898e-05**				
F-	7.858e-05	7.257e-05	-4.105	-4.139	-0.035
NaF	2.116e-07	2.119e-07	-6.674	-6.674	0.001
MgF+	1.029e-07	9.502e-08	-6.988	-7.022	-0.035
CaF+	9.134e-08	8.435e-08	-7.039	-7.074	-0.035
MnF+	8.542e-11	7.888e-11	-10.068	-10.103	-0.035
HF	1.232e-11	1.234e-11	-10.909	-10.909	0.001
ZnF+	8.678e-13	8.015e-13	-12.062	-12.096	-0.035
NiF+	6.854e-13	6.330e-13	-12.164	-12.199	-0.035
PbF+	3.958e-14	3.655e-14	-13.403	-13.437	-0.035
HF2-	3.660e-15	3.380e-15	-14.436	-14.471	-0.035
CuF+	1.328e-15	1.226e-15	-14.877	-14.911	-0.035
UO2F+	7.627e-17	7.044e-17	-16.118	-16.152	-0.035
FeF+	6.306e-17	5.824e-17	-16.200	-16.235	-0.035
PbF2	5.409e-17	5.416e-17	-16.267	-16.266	0.001
AlF2+	4.127e-17	3.812e-17	-16.384	-16.419	-0.035
AlF3	3.471e-17	3.475e-17	-16.460	-16.459	0.001
UO2F2	1.728e-17	1.730e-17	-16.762	-16.762	0.001
AlF+2	1.456e-18	1.059e-18	-17.837	-17.975	-0.138
AlF4-	1.087e-18	1.004e-18	-17.964	-17.998	-0.035
UO2F3-	2.589e-19	2.391e-19	-18.587	-18.621	-0.035
PbF3-	3.083e-20	2.847e-20	-19.511	-19.546	-0.035
FeF2+	2.338e-20	2.159e-20	-19.631	-19.666	-0.035
FeF+2	1.052e-20	7.654e-21	-19.978	-20.116	-0.138
FeF3	2.463e-21	2.466e-21	-20.609	-20.608	0.001
H2F2	4.255e-22	4.261e-22	-21.371	-21.371	0.001
UO2F4-2	1.513e-22	1.101e-22	-21.820	-21.958	-0.138
PbF4-2	1.359e-24	9.889e-25	-23.867	-24.005	-0.138
UF3+	0.000e+00	0.000e+00	-46.394	-46.429	-0.035
UF4	0.000e+00	0.000e+00	-46.664	-46.663	0.001
UF2+2	0.000e+00	0.000e+00	-47.527	-47.665	-0.138
UF5-	0.000e+00	0.000e+00	-49.286	-49.321	-0.035
UF+3	0.000e+00	0.000e+00	-50.132	-50.443	-0.311
UF6-2	0.000e+00	0.000e+00	-51.224	-51.362	-0.138
Fe(2)	**8.577e-13**				
FeCO3	5.205e-13	5.212e-13	-12.284	-12.283	0.001
FeOH+	2.012e-13	1.858e-13	-12.696	-12.731	-0.035
Fe+2	1.103e-13	8.025e-14	-12.957	-13.096	-0.138
Fe(OH)2	1.128e-14	1.130e-14	-13.948	-13.947	0.001
FeHCO3+	6.143e-15	5.673e-15	-14.212	-14.246	-0.035
FeSO4	4.410e-15	4.415e-15	-14.356	-14.355	0.001
Fe(OH)3-	3.792e-15	3.502e-15	-14.421	-14.456	-0.035
FeF+	6.306e-17	5.824e-17	-16.200	-16.235	-0.035
FeCl+	4.060e-17	3.749e-17	-16.392	-16.426	-0.035
FeHSO4+	3.668e-24	3.388e-24	-23.436	-23.470	-0.035

Fe(3)	7.684e-05					
	Fe(OH)4-	6.806e-05	6.286e-05	-4.167	-4.202	-0.035
	Fe(OH)3	8.770e-06	8.782e-06	-5.057	-5.056	0.001
	Fe(OH)2+	9.469e-09	8.745e-09	-8.024	-8.058	-0.035
	FeOH+2	4.604e-15	3.350e-15	-14.337	-14.475	-0.138
	FeF2+	2.338e-20	2.159e-20	-19.631	-19.666	-0.035
	FeF+2	1.052e-20	7.654e-21	-19.978	-20.116	-0.138
	FeF3	2.463e-21	2.466e-21	-20.609	-20.608	0.001
	FeSO4+	2.502e-22	2.310e-22	-21.602	-21.636	-0.035
	Fe+3	1.404e-22	6.863e-23	-21.853	-22.163	-0.311
	Fe(SO4)2-	1.743e-24	1.610e-24	-23.759	-23.793	-0.035
	FeCl+2	9.046e-25	6.581e-25	-24.044	-24.182	-0.138
	Fe2(OH)2+4	1.172e-27	3.282e-28	-26.931	-27.484	-0.553
	FeCl2+	1.148e-27	1.060e-27	-26.940	-26.974	-0.035
	FeHSO4+2	1.000e-31	7.278e-32	-31.000	-31.138	-0.138
	FeCl3	3.589e-32	3.589e-32	-31.446	-31.445	0.001
	Fe3(OH)4+5	5.274e-33	7.220e-34	-32.278	-33.141	-0.864
H(0)	1.961e-31					
	H2	9.807e-32	9.819e-32	-31.008	-31.008	0.001
K	6.907e-05					
	K+	6.892e-05	6.359e-05	-4.162	-4.197	-0.035
	KSO4-	1.525e-07	1.409e-07	-6.817	-6.851	-0.035
Mg	3.539e-05					
	Mg+2	2.792e-05	2.056e-05	-4.554	-4.687	-0.133
	MgCO3	5.143e-06	5.150e-06	-5.289	-5.288	0.001
	MgSO4	1.467e-06	1.469e-06	-5.834	-5.833	0.001
	MgOH+	5.734e-07	5.295e-07	-6.242	-6.276	-0.035
	MgHCO3+	1.825e-07	1.686e-07	-6.739	-6.773	-0.035
	MgF+	1.029e-07	9.502e-08	-6.988	-7.022	-0.035
Mn(2)	3.642e-06					
	MnCO3	3.375e-06	3.379e-06	-5.472	-5.471	0.001
	Mn+2	2.160e-07	1.571e-07	-6.666	-6.804	-0.138
	MnOH+	3.158e-08	2.917e-08	-7.501	-7.535	-0.035
	MnHCO3+	1.072e-08	9.899e-09	-7.970	-8.004	-0.035
	MnSO4	8.620e-09	8.631e-09	-8.064	-8.064	0.001
	MnCl+	2.346e-10	2.166e-10	-9.630	-9.664	-0.035
	MnF+	8.542e-11	7.888e-11	-10.068	-10.103	-0.035
	Mn(OH)3-	1.662e-12	1.535e-12	-11.779	-11.814	-0.035
	MnCl2	3.196e-14	3.201e-14	-13.495	-13.495	0.001
	MnCl3-	3.230e-18	2.983e-18	-17.491	-17.525	-0.035
Mn(3)	7.403e-29					
	Mn+3	7.403e-29	3.619e-29	-28.131	-28.441	-0.311
Mn(6)	3.905e-31					
	MnO4-2	3.905e-31	2.840e-31	-30.408	-30.547	-0.138
Mn(7)	9.381e-37					
	MnO4-	9.381e-37	8.664e-37	-36.028	-36.062	-0.035
Na	5.526e-03					
	Na+	5.490e-03	5.074e-03	-2.260	-2.295	-0.034
	NaCO3-	2.502e-05	2.311e-05	-4.602	-4.636	-0.035
	NaSO4-	8.727e-06	8.060e-06	-5.059	-5.094	-0.035
	NaHCO3	2.014e-06	2.017e-06	-5.696	-5.695	0.001
	NaF	2.116e-07	2.119e-07	-6.674	-6.674	0.001
Ni	1.448e-06					
	NiCO3	8.763e-07	8.774e-07	-6.057	-6.057	0.001
	Ni(CO3)2-2	5.674e-07	4.128e-07	-6.246	-6.384	-0.138
	Ni(OH)2	3.162e-09	3.166e-09	-8.500	-8.499	0.001
	Ni+2	6.010e-10	4.372e-10	-9.221	-9.359	-0.138
	NiOH+	4.827e-10	4.458e-10	-9.316	-9.351	-0.035
	Ni(OH)3-	2.918e-10	2.695e-10	-9.535	-9.570	-0.035
	NiHCO3+	4.619e-11	4.266e-11	-10.335	-10.370	-0.035
	NiSO4	2.686e-11	2.689e-11	-10.571	-10.570	0.001
	NiF+	6.854e-13	6.330e-13	-12.164	-12.199	-0.035
	NiCl+	4.024e-13	3.717e-13	-12.395	-12.430	-0.035
	Ni(SO4)2-2	6.485e-16	4.718e-16	-15.188	-15.326	-0.138
	NiCl2	4.561e-16	4.567e-16	-15.341	-15.340	0.001
O(0)	1.876e-31					
	O2	9.378e-32	9.390e-32	-31.028	-31.027	0.001
Pb	2.800e-07					
	PbCO3	1.331e-07	1.333e-07	-6.876	-6.875	0.001
	Pb(CO3)2-2	1.246e-07	9.062e-08	-6.905	-7.043	-0.138
	Pb(OH)2	1.554e-08	1.556e-08	-7.809	-7.808	0.001
	PbOH+	5.089e-09	4.700e-09	-8.293	-8.328	-0.035
	Pb(OH)3-	1.646e-09	1.521e-09	-8.783	-8.818	-0.035
	Pb(OH)4-2	4.075e-11	2.964e-11	-10.390	-10.528	-0.138
	Pb+2	3.894e-11	2.832e-11	-10.410	-10.548	-0.138
	PbHCO3+	1.722e-11	1.590e-11	-10.764	-10.798	-0.035
	PbSO4	5.107e-12	5.113e-12	-11.292	-11.291	0.001
	PbCl+	3.931e-13	3.631e-13	-12.405	-12.440	-0.035
	PbF+	3.958e-14	3.655e-14	-13.403	-13.437	-0.035
	Pb(SO4)2-2	1.184e-14	8.614e-15	-13.927	-14.065	-0.138
	PbCl2	2.019e-16	2.022e-16	-15.695	-15.694	0.001
	Pb3(OH)4+2	1.597e-16	1.162e-16	-15.797	-15.935	-0.138
	PbF2	5.409e-17	5.416e-17	-16.267	-16.266	0.001
	Pb2OH+3	6.098e-18	2.980e-18	-17.215	-17.526	-0.311
	PbCl3-	5.814e-20	5.369e-20	-19.236	-19.270	-0.035
	PbF3-	3.083e-20	2.847e-20	-19.511	-19.546	-0.035
	PbCl4-2	1.177e-23	8.564e-24	-22.929	-23.067	-0.138
	PbF4-2	1.359e-24	9.889e-25	-23.867	-24.005	-0.138
S(6)	4.582e-04					
	SO4-2	4.388e-04	3.210e-04	-3.358	-3.493	-0.136
	CaSO4	8.781e-06	8.792e-06	-5.056	-5.056	0.001
	NaSO4-	8.727e-06	8.060e-06	-5.059	-5.094	-0.035
	MgSO4	1.467e-06	1.469e-06	-5.834	-5.833	0.001
	BaSO4	2.213e-07	2.216e-07	-6.655	-6.655	0.001
	KSO4-	1.525e-07	1.409e-07	-6.817	-6.851	-0.035
	MnSO4	8.620e-09	8.631e-09	-8.064	-8.064	0.001
	ZnSO4	5.934e-11	5.942e-11	-10.227	-10.226	0.001
	NiSO4	2.686e-11	2.689e-11	-10.571	-10.570	0.001
	PbSO4	5.107e-12	5.113e-12	-11.292	-11.291	0.001
	HSO4-	3.802e-12	3.512e-12	-11.420	-11.455	-0.035
	Zn(SO4)2-2	2.164e-13	1.575e-13	-12.665	-12.803	-0.138
	CuSO4	6.107e-14	6.115e-14	-13.214	-13.214	0.001
	Pb(SO4)2-2	1.184e-14	8.614e-15	-13.927	-14.065	-0.138
	CaHSO4+	6.394e-15	5.905e-15	-14.194	-14.229	-0.035
	FeSO4	4.410e-15	4.415e-15	-14.356	-14.355	0.001
	Ni(SO4)2-2	6.485e-16	4.718e-16	-15.188	-15.326	-0.138
	UO2SO4	3.402e-18	3.407e-18	-17.468	-17.468	0.001
	UO2(SO4)2-2	1.408e-20	1.025e-20	-19.851	-19.989	-0.138
	AlSO4+	1.582e-21	1.461e-21	-20.801	-20.835	-0.035
	FeSO4+	2.502e-22	2.310e-22	-21.602	-21.636	-0.035
	Al(SO4)2-	1.591e-23	1.469e-23	-22.798	-22.833	-0.035
	FeHSO4+	3.668e-24	3.388e-24	-23.436	-23.470	-0.035
	Fe(SO4)2-	1.743e-24	1.610e-24	-23.759	-23.793	-0.035
	FeHSO4+2	1.000e-31	7.278e-32	-31.000	-31.138	-0.138
	AlHSO4+2	2.056e-32	1.496e-32	-31.687	-31.825	-0.138
	U(SO4)2	0.000e+00	0.000e+00	-52.136	-52.136	0.001
	USO4+2	0.000e+00	0.000e+00	-52.395	-52.533	-0.138
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-68.216	-68.527	-0.311
U(4)	3.078e-25					
	U(OH)4	3.078e-25	3.082e-25	-24.512	-24.511	0.001
	U(OH)3+	1.469e-31	1.356e-31	-30.833	-30.868	-0.035
	U(CO3)4-4	3.737e-37	1.047e-37	-36.428	-36.980	-0.553
	U(OH)2+2	1.071e-38	7.794e-39	-37.970	-38.108	-0.138
	U(CO3)5-6	4.976e-39	2.840e-40	-38.303	-39.547	-1.244
	UOH+3	0.000e+00	0.000e+00	-45.965	-46.276	-0.311
	UF3+	0.000e+00	0.000e+00	-46.394	-46.429	-0.035
	UF4	0.000e+00	0.000e+00	-46.664	-46.663	0.001
	UF2+2	0.000e+00	0.000e+00	-47.527	-47.665	-0.138
	UF5-	0.000e+00	0.000e+00	-49.286	-49.321	-0.035
	UF+3	0.000e+00	0.000e+00	-50.132	-50.443	-0.311
	UF6-2	0.000e+00	0.000e+00	-51.224	-51.362	-0.138
	U(SO4)2	0.000e+00	0.000e+00	-52.136	-52.136	0.001
	USO4+2	0.000e+00	0.000e+00	-52.395	-52.533	-0.138
	U+4	0.000e+00	0.000e+00	-55.058	-55.610	-0.553
	UCl+3	0.000e+00	0.000e+00	-57.027	-57.338	-0.311
	U6(OH)15+9	0.000e+00	0.000e+00	-199.115	-201.913	-2.798
U(5)	2.764e-20					
	UO2+	2.754e-20	2.543e-20	-19.560	-19.595	-0.035
	UO2(CO3)3-5	9.553e-23	1.308e-23	-22.020	-22.883	-0.864
U(6)	3.068e-06					
	UO2(CO3)3-4	2.658e-06	7.445e-07	-5.575	-6.128	-0.553
	UO2(OH)3-	3.338e-07	3.082e-07	-6.477	-6.511	-0.035
	UO2(CO3)2-2	7.594e-08	5.524e-08	-7.120	-7.258	-0.138
	UO2(OH)4-2	5.715e-11	4.158e-11	-10.243	-10.381	-0.138
	UO2CO3	9.018e-12	9.030e-12	-11.045	-11.044	0.001
	UO2OH+	4.065e-13	3.754e-13	-12.391	-12.426	-0.035
	(UO2)3(OH)7-	1.743e-13	1.610e-13	-12.759	-12.793	-0.035
	UO2F+	7.627e-17	7.044e-17	-16.118	-16.152	-0.035
	UO2F2	1.728e-17	1.730e-17	-16.762	-16.762	0.001
	UO2+2	1.090e-17	7.927e-18	-16.963	-17.101	-0.138
	(UO2)3(OH)5+	5.098e-18	4.708e-18	-17.293	-17.327	-0.035
	(UO2)3(CO3)6-6	3.436e-18	1.961e-19	-17.464	-18.708	-1.244
	UO2SO4	3.402e-18	3.407e-18	-17.468	-17.468	0.001
	UO2F3-	2.589e-19	2.391e-19	-18.587	-18.621	-0.035
	UO2(SO4)2-2	1.408e-20	1.025e-20	-19.851	-19.989	-0.138
	(UO2)2(OH)2+2	1.335e-20	9.714e-21	-19.874	-20.013	-0.138
	UO2Cl+	4.204e-21	3.883e-21	-20.376	-20.411	-0.035
	(UO2)4(OH)7+	1.740e-21	1.607e-21	-20.760	-20.794	-0.035
	UO2F4-2	1.513e-22	1.101e-22	-21.820	-21.958	-0.138
	(UO2)3(OH)4+2	4.520e-24	3.289e-24	-23.345	-23.483	-0.138
	UO2Cl2	6.913e-26	6.922e-26	-25.160	-25.160	0.001
	(UO2)2OH+3	2.183e-27	1.067e-27	-26.661	-26.972	-0.311
Zn	1.148e-06					
	Zn(OH)2	7.302e-07	7.312e-07	-6.137	-6.136	0.001
	Zn(CO3)2-2	3.446e-07	2.507e-07	-6.463	-6.601	-0.138
	ZnCO3	4.326e-08	4.332e-08	-7.364	-7.363	0.001
	Zn(OH)3-	2.131e-08	1.968e-08	-7.672	-7.706	-0.035
	ZnOH+	6.955e-09	6.423e-09	-8.158	-8.192	-0.035
	Zn+2	1.102e-09	8.019e-10	-8.958	-9.096	-0.138
	ZnHCO3+	7.727e-11	7.137e-11	-10.112	-10.147	-0.035
	ZnOHCl	7.638e-11	7.648e-11	-10.117	-10.116	0.001
	ZnSO4	5.934e-11	5.942e-11	-10.227	-10.226	0.001
	Zn(OH)4-2	3.648e-11	2.654e-11	-10.438	-10.576	-0.138
	ZnF+	8.678e-13	8.015e-13	-12.062	-12.096	-0.035
	ZnCl+	7.238e-13	6.684e-13	-12.140	-12.175	-0.035
	Zn(SO4)2-2	2.164e-13	1.575e-13	-12.665	-12.803	-0.138
	ZnCl2	2.347e-16	2.350e-16	-15.630	-15.629	0.001
	ZnCl3-	9.546e-20	8.816e-20	-19.020	-19.055	-0.035
	ZnCl4-2	2.023e-23	1.472e-23	-22.694	-22.832	-0.138

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-1.97	8.96	10.93	Al(OH)3
AlAsO4:2H2O	-12.28	-7.50	4.78	AlAsO4:2H2O
AlumK	-26.81	-32.01	-5.21	KAl(SO4)2:12H2O
Alunite	-12.94	-14.10	-1.15	KAl3(SO4)2(OH)6
Anglesite	-6.24	-14.04	-7.80	PbSO4
Anhydrite	-2.99	-7.35	-4.35	CaSO4
Antlerite	-8.14	0.15	8.29	Cu3(OH)4SO4
Aragonite	0.90	-7.42	-8.32	CaCO3
Arsenolite	-23.60	-26.47	-2.87	As4O6
Artinite	-2.82	6.92	9.74	MgCO3:Mg(OH)2:3H2O
As2O5	-39.64	-32.92	6.73	As2O5
Atacamite	-5.16	2.27	7.43	Cu2(OH)3Cl
Azurite	-6.56	-23.35	-16.79	Cu3(OH)2(CO3)2
B-UO2(OH)2	-2.85	2.76	5.61	UO2(OH)2
Ba3(AsO4)2	18.01	9.08	-8.93	Ba3(AsO4)2
BaF2	-8.37	-14.14	-5.76	BaF2
Barite	0.65	-9.35	-10.00	BaSO4
Basaluminite	-10.22	12.48	22.70	Al4(OH)10SO4
Bianchite	-10.83	-12.59	-1.76	ZnSO4:6H2O
Birnessite	-2.68	40.92	43.60	MnO2
Bixbyite	3.23	53.97	50.74	Mn2O3
Boehmite	0.24	8.96	8.72	AlOOH
Brochantite	-7.35	7.99	15.34	Cu4(OH)6SO4
Brucite	-1.80	15.17	16.97	Mg(OH)2
Bunsenite	-2.07	10.50	12.57	NiO
Ca3(AsO4)2:4w	-7.22	15.10	22.32	Ca3(AsO4)2:4H2O
Calcite	1.05	-7.42	-8.47	CaCO3
Cerrusite	-0.96	-14.12	-13.15	PbCO3
Chalcanthite	-12.87	-15.52	-2.65	CuSO4:5H2O
Claudetite	-23.34	-26.47	-3.13	As4O6
CO2(g)	-5.27	-23.43	-18.15	CO2
Cotunnite	-12.69	-17.49	-4.80	PbCl2
Cu(OH)2	-0.88	7.84	8.72	Cu(OH)2
Cu2SO4	-28.19	-35.54	-7.35	Cu2SO4
Cu3(AsO4)2:6w	-15.51	-9.41	6.10	Cu3(AsO4)2:6H2O
CuCO3	-5.96	-15.59	-9.63	CuCO3
CuF	-24.59	-20.16	4.43	CuF
CuF2	-19.75	-20.30	-0.55	CuF2
CuF2:2H2O	-15.77	-20.30	-4.53	CuF2:2H2O
CuMetal	-8.47	-20.02	-11.56	Cu
CuOCuSO4	-19.39	-7.68	11.71	CuO:CuSO4
CupricFerrite	17.02	49.22	32.21	CuFe2O4
Cuprite	-5.18	-12.19	-7.00	Cu2O
CuprousFerrite	13.15	14.60	1.45	CuFeO2
CuSO4	-18.62	-15.52	3.10	CuSO4
Diaspore	1.96	8.96	7.00	AlOOH
Dolomite	1.37	-15.68	-17.04	CaMg(CO3)2
Dolomite(d)	0.81	-15.68	-16.49	CaMg(CO3)2
Epsomite	-6.03	-8.18	-2.15	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.65	16.67	10.03	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.74	20.69	17.96	Fe(OH)3
Fe3(OH)8	1.80	48.15	46.36	Fe3(OH)8
Fluorite	-1.51	-12.13	-10.62	CaF2
Gibbsite	0.74	8.96	8.22	Al(OH)3
Goethite	8.63	20.69	12.07	FeOOH
Goslarite	-10.61	-12.59	-1.98	ZnSO4:7H2O
Gummite	-7.76	2.76	10.52	UO3
Gypsum	-2.77	-7.35	-4.58	CaSO4:2H2O
H2(g)	-27.82	-27.86	-0.04	H2
Halite	-7.34	-5.77	1.58	NaCl
Hausmannite	5.50	67.03	61.53	Mn3O4
Hematite	19.11	41.39	22.28	Fe2O3
Huntite	-2.34	-32.19	-29.84	CaMg3(CO3)4
Hydrocerrusite	-1.46	-18.92	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-9.34	-17.85	-8.50	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-11.18	20.02	31.20	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-9.04	21.11	30.15	KFe3(SO4)2(OH)6
Jarosite-Na	-11.09	23.01	34.10	NaFe3(SO4)2(OH)6
JarositeH	-18.71	15.38	34.09	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-11.16	-14.39	-3.23	AlOHSO4
Langite	-9.00	7.99	16.99	Cu4(OH)6SO4:H2O
Larnakite	-4.48	-4.73	-0.25	PbO:PbSO4
Laurionite	-4.71	-4.09	0.62	PbOHCl
Litharge	-3.49	9.31	12.80	PbO
Maghemite	8.87	41.39	32.52	Fe2O3
Magnesite	-0.26	-8.25	-8.00	MgCO3
Magnetite	18.03	48.15	30.12	Fe3O4
Malachite	-2.66	-7.76	-5.10	Cu2(OH)2CO3
Manganite	1.65	26.99	25.34	MnOOH
Massicot	-3.68	9.31	12.99	PbO
Matlockite	-8.69	-18.16	-9.47	PbClF
Melanothallite	-22.76	-18.97	3.79	CuCl2
Melanterite	-14.36	-16.59	-2.23	FeSO4:7H2O
Minium	-18.40	55.80	74.20	Pb3O4
Mirabilite	-6.88	-8.08	-1.21	Na2SO4:10H2O
Mn2(SO4)3	-61.85	-16.09	45.76	Mn2(SO4)3
Mn3(AsO4):8H2O	-6.27	6.25	12.52	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-16.37	-13.75	2.62	MnCl2:4H2O
MnSO4	-13.04	-10.30	2.75	MnSO4
Morenosite	-10.48	-12.85	-2.37	NiSO4:7H2O
Na4UO2(CO3)3	-20.69	-36.98	-16.29	Na4UO2(CO3)3
Nahcolite	-4.88	-15.79	-10.91	NaHCO3
Nantokite	-9.97	-19.49	-9.52	CuCl
Natron	-6.77	-8.16	-1.39	Na2CO3:10H2O
Nesquehonite	-2.66	-8.25	-5.59	MgCO3:3H2O
Ni(OH)2	-0.15	10.50	10.65	Ni(OH)2
Ni3(AsO4)2:8H2O	-17.13	-1.41	15.72	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-13.35	18.65	32.00	Ni4(OH)6SO4
NiCO3	-6.14	-12.93	-6.79	NiCO3
Nsutite	-1.65	40.92	42.56	MnO2
O2(g)	-28.15	55.72	83.87	O2
Pb(OH)2	1.09	9.31	8.22	Pb(OH)2
Pb2(OH)3Cl	-3.57	5.22	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-7.58	18.62	26.20	PbO:Pb(OH)2
Pb2O3	-14.56	46.48	61.04	Pb2O3
Pb2OCO3	-4.36	-4.80	-0.44	PbO:PbCO3
Pb3(AsO4)2	-10.80	-4.98	5.82	Pb3(AsO4)2
Pb3O2CO3	-6.64	4.51	11.15	PbCO3:2PbO
Pb3O2SO4	-5.92	4.58	10.50	PbSO4:2PbO
Pb4(OH)6SO4	-7.21	13.89	21.10	Pb4(OH)6SO4
Pb4O3SO4	-8.38	13.90	22.27	PbSO4:3PbO
PbF2	-11.39	-18.83	-7.44	PbF2
PbMetal	-22.82	-18.55	4.27	Pb
PbO:0.3H2O	-3.67	9.31	12.98	PbO:0.33H2O
Phosgenite	-11.79	-31.60	-19.81	PbCl2:PbCO3
Plattnerite	-12.48	37.17	49.65	PbO2
Portlandite	-6.95	16.01	22.95	Ca(OH)2
Pyrochroite	-2.14	13.06	15.20	Mn(OH)2
Pyrolusite	-0.79	40.92	41.70	MnO2
Retgersite	-10.81	-12.85	-2.05	NiSO4:6H2O
Rhodochrosite	0.75	-10.37	-11.12	MnCO3
Rhodochrosite(d)	0.02	-10.37	-10.39	MnCO3
Rutherfordine	-6.23	-20.67	-14.44	UO2CO3
Schoepite	-2.70	2.76	5.46	UO2(OH)2:H2O
Scorodite	-9.20	4.24	13.43	FeAsO4:2H2O
Siderite	-5.79	-16.66	-10.88	FeCO3
Siderite(d)(3)	-6.21	-16.66	-10.45	FeCO3
Smithsonite	-2.68	-12.66	-9.98	ZnCO3
Tenorite	0.14	7.84	7.70	CuO
Thenardite	-7.91	-8.08	-0.18	Na2SO4
Thermonatrite	-8.30	-8.16	0.14	Na2CO3:H2O
Trona	-12.90	-23.95	-11.05	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-36.04	-48.45	-12.41	U(OH)2SO4
U3O8(c)	-13.06	-19.58	-6.53	U3O8
U4O9(c)	-32.82	-72.54	-39.72	U4O9
UF4(c)	-53.65	-81.38	-27.72	UF4
UF4:2.5H2O	-44.60	-81.38	-36.78	UF4:2.5H2O
UO2(a)	-15.99	-25.10	-9.11	UO2
UO3(gamma)	-5.06	2.76	7.81	UO3
Uraninite(c)	-11.18	-25.10	-13.92	UO2
Witherite	-0.86	-9.43	-8.57	BaCO3
Zincite(c)	-0.48	10.76	11.25	ZnO
Zincosite	-15.69	-12.59	3.11	ZnSO4
Zn(OH)2-a	-1.69	10.76	12.45	Zn(OH)2
Zn(OH)2-b	-0.99	10.76	11.75	Zn(OH)2
Zn(OH)2-c	-1.44	10.76	12.20	Zn(OH)2
Zn(OH)2-e	-0.74	10.76	11.50	Zn(OH)2
Zn(OH)2-g	-0.95	10.76	11.71	Zn(OH)2
Zn2(OH)2SO4	-9.33	-1.83	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.07	8.13	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-14.31	-0.62	13.68	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-33.74	-14.41	19.33	ZnO:2ZnSO4
Zn4(OH)6SO4	-8.70	19.70	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-11.48	27.02	38.50	Zn5(OH)8Cl2
ZnCl2	-23.15	-16.04	7.12	ZnCl2
ZnCO3:H2O	-2.40	-12.66	-10.26	ZnCO3:H2O
ZnF2	-15.92	-17.37	-1.46	ZnF2
ZnMetal	-43.03	-17.10	25.94	Zn
ZnO(a)	-0.55	10.76	11.31	ZnO
ZnSO4:H2O	-12.07	-12.59	-0.52	ZnSO4:H2O

End of simulation.

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------------------
Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 0-1m
           SOLUTION        1
           units           mg/l
           temp            20.5
           pH              6.85
           F               0.63
           Cl              0.79
           S(6)            14          as SO4
           Na              1.48
           K               4.9
           Mg              2.8
           Ca              8.3
           Alkalinity      24.4        as HCO3
           Al              0.044
           As              0.0
           Ba              0.084
           Cu              0.002
           Fe              0.06
           Mn              0.61
           Ni              0.009
           Pb              0.002
           U               0.06
           Zn              0.012
           END
```

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-----
TITLE
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   Schneckentein 0-1m

-----------------------------------------
Beginning of initial solution calculations.
-----------------------------------------

Initial solution 1.

----------------------------Solution composition--------------
---------------

           Elements           Molality       Moles

           Al               1.631e-06   1.631e-06
           Alkalinity       3.999e-04   3.999e-04
           Ba               6.117e-07   6.117e-07
           Ca               2.071e-04   2.071e-04
           Cl               2.228e-05   2.228e-05
           Cu               3.148e-08   3.148e-08
           F                3.316e-05   3.316e-05
           Fe               1.074e-06   1.074e-06
           K                1.253e-04   1.253e-04
           Mg               1.152e-04   1.152e-04
           Mn               1.110e-05   1.110e-05
           Na               6.438e-05   6.438e-05
           Ni               1.533e-07   1.533e-07
           Pb               9.654e-09   9.654e-09
           S(6)             1.457e-04   1.457e-04
           U                2.521e-07   2.521e-07
           Zn               1.836e-07   1.836e-07
```

```
----------------------------Description of solution----------------------
-----

                                    pH  =   6.850
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   1.252e-03
                     Mass of water (kg)  =   1.000e+00
                 Total carbon (mol/kg)  =   5.218e-04
                    Total CO2 (mol/kg)  =   5.218e-04
                   Temperature (deg C)  =  20.500
                Electrical balance (eq)  =   1.191e-04
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =   7.57
                              Iterations  =  11
                                 Total H  = 1.110128e+02
                                 Total O  = 5.550824e+01
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
H+	1.466e-07	1.413e-07	-6.834	-6.850	-0.016
OH-	5.202e-08	5.001e-08	-7.284	-7.301	-0.017
H2O	5.551e+01	1.000e+00	-0.000	-0.000	0.000
Al	**1.631e-06**				
Al(OH)4-	1.053e-06	1.013e-06	-5.977	-5.995	-0.017
AlF2+	2.628e-07	2.527e-07	-6.580	-6.597	-0.017
Al(OH)2+	1.125e-07	1.082e-07	-6.949	-6.966	-0.017
AlF3	9.762e-08	9.765e-08	-7.010	-7.010	0.000
Al(OH)3	8.020e-08	8.022e-08	-7.096	-7.096	0.000
AlF+2	1.959e-08	1.674e-08	-7.708	-7.776	-0.068
AlOH+2	3.417e-09	2.919e-09	-8.466	-8.535	-0.068
AlF4-	1.246e-09	1.198e-09	-8.905	-8.922	-0.017
Al+3	7.949e-11	5.579e-11	-10.100	-10.253	-0.154
AlSO4+	2.058e-11	1.978e-11	-10.687	-10.704	-0.017
Al(SO4)2-	7.581e-14	7.288e-14	-13.120	-13.137	-0.017
AlHSO4+2	2.795e-19	2.388e-19	-18.554	-18.622	-0.068
Ba	**6.117e-07**				
Ba+2	5.804e-07	4.959e-07	-6.236	-6.305	-0.068
BaSO4	2.957e-08	2.958e-08	-7.529	-7.529	0.000
BaHCO3+	1.619e-09	1.556e-09	-8.791	-8.808	-0.017
BaCO3	2.662e-11	2.662e-11	-10.575	-10.575	0.000
BaOH+	1.237e-13	1.190e-13	-12.908	-12.925	-0.017
C(4)	**5.218e-04**				
HCO3-	3.921e-04	3.772e-04	-3.407	-3.423	-0.017
CO2	1.274e-04	1.274e-04	-3.895	-3.895	0.000
CaHCO3+	8.036e-07	7.726e-07	-6.095	-6.112	-0.017
MgHCO3+	4.334e-07	4.167e-07	-6.363	-6.380	-0.017
MnHCO3+	3.146e-07	3.024e-07	-6.502	-6.519	-0.017
UO2(CO3)2-2	1.792e-07	1.531e-07	-6.747	-6.815	-0.068
CO3-2	1.328e-07	1.137e-07	-6.877	-6.944	-0.067
MnCO3	8.126e-08	8.129e-08	-7.090	-7.090	0.000
UO2CO3	6.239e-08	6.241e-08	-7.205	-7.205	0.000
NiCO3	6.179e-08	6.181e-08	-7.209	-7.209	0.000
FeHCO3+	3.180e-08	3.057e-08	-7.498	-7.515	-0.017
CaCO3	3.037e-08	3.038e-08	-7.517	-7.517	0.000
NaHCO3	1.312e-08	1.312e-08	-7.882	-7.882	0.000
MgCO3	9.734e-09	9.737e-09	-8.012	-8.012	0.000
ZnHCO3+	7.104e-09	6.830e-09	-8.148	-8.166	-0.017
CuCO3	6.055e-09	6.056e-09	-8.218	-8.218	0.000
PbCO3	5.196e-09	5.198e-09	-8.284	-8.284	0.000
NiHCO3+	3.970e-09	3.817e-09	-8.401	-8.418	-0.017
ZnCO3	3.263e-09	3.264e-09	-8.486	-8.486	0.000
FeCO3	2.211e-09	2.212e-09	-8.655	-8.655	0.000
UO2(CO3)3-4	1.980e-09	1.055e-09	-8.703	-8.977	-0.273
CuHCO3+	1.949e-09	1.874e-09	-8.710	-8.727	-0.017
BaHCO3+	1.619e-09	1.556e-09	-8.791	-8.808	-0.017
PbHCO3+	8.195e-10	7.879e-10	-9.086	-9.104	-0.017
NaCO3-	1.082e-10	1.041e-10	-9.966	-9.983	-0.017
BaCO3	2.662e-11	2.662e-11	-10.575	-10.575	0.000
Ni(CO3)2-2	1.430e-11	1.222e-11	-10.845	-10.913	-0.068
Zn(CO3)2-2	9.292e-12	7.939e-12	-11.032	-11.100	-0.068
Pb(CO3)2-2	1.738e-12	1.485e-12	-11.760	-11.828	-0.068
Cu(CO3)2-2	1.015e-12	8.673e-13	-11.993	-12.062	-0.068
(UO2)3(CO3)6-6	2.085e-17	5.059e-18	-16.681	-17.296	-0.615
UO2(CO3)3-5	4.340e-26	1.623e-26	-25.363	-25.790	-0.427
U(CO3)4-4	3.522e-31	1.876e-31	-30.453	-30.727	-0.273
U(CO3)5-6	6.603e-37	1.602e-37	-36.180	-36.795	-0.615
Ca	**2.071e-04**				
Ca+2	2.023e-04	1.732e-04	-3.694	-3.761	-0.067
CaSO4	3.939e-06	3.940e-06	-5.405	-5.404	0.000
CaHCO3+	8.036e-07	7.726e-07	-6.095	-6.112	-0.017
CaF+	4.350e-08	4.182e-08	-7.362	-7.379	-0.017
CaCO3	3.037e-08	3.038e-08	-7.517	-7.517	0.000
CaOH+	2.116e-10	2.035e-10	-9.674	-9.691	-0.017
CaHSO4+	3.214e-12	3.090e-12	-11.493	-11.510	-0.017
Cl	**2.228e-05**				
Cl-	2.228e-05	2.142e-05	-4.652	-4.669	-0.017
MnCl+	8.165e-10	7.850e-10	-9.088	-9.105	-0.017
FeCl+	2.493e-11	2.396e-11	-10.603	-10.620	-0.017
ZnCl+	7.051e-12	6.779e-12	-11.152	-11.169	-0.017
NiCl+	4.102e-12	3.944e-12	-11.387	-11.404	-0.017
PbCl+	2.082e-12	2.002e-12	-11.681	-11.699	-0.017
ZnOHCl	7.220e-13	7.222e-13	-12.141	-12.141	0.000
CuCl+	4.753e-13	4.570e-13	-12.323	-12.340	-0.017
CuCl2-	7.606e-14	7.312e-14	-13.119	-13.136	-0.017
MnCl2	7.338e-15	7.340e-15	-14.134	-14.134	0.000
UO2Cl+	4.162e-15	4.002e-15	-14.381	-14.398	-0.017
NiCl2	3.066e-16	3.067e-16	-15.513	-15.513	0.000
ZnCl2	1.492e-16	1.493e-16	-15.826	-15.826	0.000
PbCl2	7.400e-17	7.402e-17	-16.131	-16.131	0.000
CuCl2	5.002e-18	5.003e-18	-17.301	-17.301	0.000
CuCl3-2	2.855e-18	2.439e-18	-17.544	-17.613	-0.068
FeCl+2	3.947e-19	3.372e-19	-18.404	-18.472	-0.068
MnCl3-	4.504e-20	4.330e-20	-19.346	-19.363	-0.017
UO2Cl2	4.404e-21	4.405e-21	-20.356	-20.356	0.000
ZnCl3-	3.631e-21	3.491e-21	-20.440	-20.457	-0.017
PbCl3-	1.274e-21	1.224e-21	-20.895	-20.912	-0.017
FeCl2+	3.879e-23	3.730e-23	-22.411	-22.428	-0.017
CuCl3-	3.648e-25	3.507e-25	-24.438	-24.455	-0.017
ZnCl4-2	4.230e-26	3.614e-26	-25.374	-25.442	-0.068
PbCl4-2	1.418e-26	1.212e-26	-25.848	-25.917	-0.068
FeCl3	7.986e-29	7.989e-29	-28.098	-28.098	0.000
CuCl4-2	3.964e-32	3.387e-32	-31.402	-31.470	-0.068
UCl+3	2.542e-39	1.784e-39	-38.595	-38.749	-0.154
Cu(1)	**5.186e-10**				
Cu+	5.186e-10	4.986e-10	-9.285	-9.302	-0.017
CuCl2-	7.606e-14	7.312e-14	-13.119	-13.136	-0.017
CuCl3-2	2.855e-18	2.439e-18	-17.544	-17.613	-0.068
Cu(2)	**3.096e-08**				
Cu+2	1.160e-08	9.914e-09	-7.935	-8.004	-0.068
Cu(OH)2	1.038e-08	1.038e-08	-7.984	-7.984	0.000
CuCO3	6.055e-09	6.056e-09	-8.218	-8.218	0.000
CuHCO3+	1.949e-09	1.874e-09	-8.710	-8.727	-0.017
CuOH+	7.300e-10	7.019e-10	-9.137	-9.154	-0.017
CuSO4	2.333e-10	2.334e-10	-9.632	-9.632	0.000
CuF+	5.550e-12	5.336e-12	-11.256	-11.273	-0.017
Cu(CO3)2-2	1.015e-12	8.673e-13	-11.993	-12.062	-0.068
CuCl+	4.753e-13	4.570e-13	-12.323	-12.340	-0.017
Cu2(OH)2+2	1.603e-13	1.369e-13	-12.795	-12.863	-0.068
Cu(OH)3-	4.606e-15	4.428e-15	-14.337	-14.354	-0.017
CuCl2	5.002e-18	5.003e-18	-17.301	-17.301	0.000
Cu(OH)4-2	7.321e-21	6.255e-21	-20.135	-20.204	-0.068
CuCl3-	3.648e-25	3.507e-25	-24.438	-24.455	-0.017
CuCl4-2	3.964e-32	3.387e-32	-31.402	-31.470	-0.068
F	**3.316e-05**				
F-	3.208e-05	3.084e-05	-4.494	-4.511	-0.017
AlF2+	2.628e-07	2.527e-07	-6.580	-6.597	-0.017
MgF+	1.875e-07	1.803e-07	-6.727	-6.744	-0.017
AlF3	9.762e-08	9.765e-08	-7.010	-7.010	0.000
CaF+	4.350e-08	4.182e-08	-7.362	-7.379	-0.017
AlF+2	1.959e-08	1.674e-08	-7.708	-7.776	-0.068
HF	6.028e-09	6.030e-09	-8.220	-8.220	0.000
MnF+	1.997e-09	1.920e-09	-8.700	-8.717	-0.017
AlF4-	1.246e-09	1.198e-09	-8.905	-8.922	-0.017
NaF	1.097e-09	1.098e-09	-8.960	-8.959	0.000
UO2F+	5.181e-10	4.981e-10	-9.286	-9.303	-0.017
FeF+	2.600e-10	2.500e-10	-9.585	-9.602	-0.017
ZnF+	6.154e-11	5.916e-11	-10.211	-10.228	-0.017
UO2F2	5.191e-11	5.193e-11	-10.285	-10.285	0.000
NiF+	4.691e-11	4.510e-11	-10.329	-10.346	-0.017
CuF+	5.550e-12	5.336e-12	-11.256	-11.273	-0.017
PbF+	1.500e-12	1.442e-12	-11.824	-11.841	-0.017
HF2-	7.149e-13	6.873e-13	-12.146	-12.163	-0.017
UO2F3-	3.169e-13	3.047e-13	-12.499	-12.516	-0.017
FeF2+	3.322e-14	3.194e-14	-13.479	-13.496	-0.017
FeF+2	3.215e-14	2.747e-14	-13.493	-13.561	-0.068
FeF3	1.537e-15	1.537e-15	-14.813	-14.813	0.000
PbF2	9.078e-16	9.081e-16	-15.042	-15.042	0.000
H2F2	1.112e-16	1.112e-16	-15.954	-15.954	0.000
UO2F4-2	7.028e-17	6.005e-17	-16.153	-16.222	-0.068
PbF3-	2.110e-19	2.029e-19	-18.676	-18.693	-0.017
PbF4-2	3.505e-24	2.995e-24	-23.455	-23.524	-0.068
UF3+	1.710e-28	1.644e-28	-27.767	-27.784	-0.017
UF4	4.127e-29	4.129e-29	-28.384	-28.384	0.000
UF2+2	2.661e-29	2.274e-29	-28.575	-28.643	-0.068
UF+3	1.280e-31	8.980e-32	-30.893	-31.047	-0.154
UF5-	3.696e-32	3.554e-32	-31.432	-31.449	-0.017
UF6-2	1.643e-34	1.404e-34	-33.784	-33.853	-0.068
Fe(2)	**1.000e-06**				
Fe+2	9.487e-07	8.105e-07	-6.023	-6.091	-0.068
FeHCO3+	3.180e-08	3.057e-08	-7.498	-7.515	-0.017
FeSO4	1.577e-08	1.578e-08	-7.802	-7.802	0.000
FeCO3	2.211e-09	2.212e-09	-8.655	-8.655	0.000
FeOH+	1.341e-09	1.290e-09	-8.872	-8.890	-0.017
FeF+	2.600e-10	2.500e-10	-9.585	-9.602	-0.017
FeCl+	2.493e-11	2.396e-11	-10.603	-10.620	-0.017
Fe(OH)2	5.221e-14	5.223e-14	-13.282	-13.282	0.000
FeHSO4+	1.504e-14	1.446e-14	-13.823	-13.840	-0.017
Fe(OH)3-	1.366e-17	1.313e-17	-16.865	-16.882	-0.017

Fe(3)	7.435e-08					
	Fe(OH)2+	4.315e-08	4.149e-08	-7.365	-7.382	-0.017
	Fe(OH)3	3.100e-08	3.101e-08	-7.509	-7.509	0.000
	Fe(OH)4-	1.733e-10	1.666e-10	-9.761	-9.778	-0.017
	FeOH+2	2.464e-11	2.105e-11	-10.608	-10.677	-0.068
	FeF2+	3.322e-14	3.194e-14	-13.479	-13.496	-0.017
	FeF+2	3.215e-14	2.747e-14	-13.493	-13.561	-0.068
	FeF3	1.537e-15	1.537e-15	-14.813	-14.813	0.000
	Fe+3	8.587e-16	6.026e-16	-15.066	-15.220	-0.154
	FeSO4+	7.391e-16	7.106e-16	-15.131	-15.148	-0.017
	Fe(SO4)2-	1.890e-18	1.817e-18	-17.724	-17.741	-0.017
	FeCl+2	3.947e-19	3.372e-19	-18.404	-18.472	-0.068
	Fe2(OH)2+4	2.703e-20	1.440e-20	-19.568	-19.842	-0.273
	FeHSO4+2	3.161e-22	2.701e-22	-21.500	-21.569	-0.068
	FeCl2+	3.879e-23	3.730e-23	-22.411	-22.428	-0.017
	Fe3(OH)4+5	5.089e-25	1.903e-25	-24.293	-24.721	-0.427
	FeCl3	7.986e-29	7.989e-29	-28.098	-28.098	0.000
H(0)	2.855e-25					
	H2	1.428e-25	1.428e-25	-24.845	-24.845	0.000
K	1.253e-04					
	K+	1.252e-04	1.204e-04	-3.902	-3.919	-0.017
	KSO4-	9.950e-08	9.566e-08	-7.002	-7.019	-0.017
Mg	1.152e-04					
	Mg+2	1.122e-04	9.612e-05	-3.950	-4.017	-0.067
	MgSO4	2.383e-06	2.384e-06	-5.623	-5.623	0.000
	MgHCO3+	4.334e-07	4.167e-07	-6.363	-6.380	-0.017
	MgF+	1.875e-07	1.803e-07	-6.727	-6.744	-0.017
	MgCO3	9.734e-09	9.737e-09	-8.012	-8.012	0.000
	MgOH+	1.701e-09	1.635e-09	-8.769	-8.786	-0.017
Mn(2)	1.110e-05					
	Mn+2	1.053e-05	8.996e-06	-4.978	-5.046	-0.068
	MnHCO3+	3.146e-07	3.024e-07	-6.502	-6.519	-0.017
	MnSO4	1.744e-07	1.745e-07	-6.758	-6.758	0.000
	MnCO3	8.126e-08	8.129e-08	-7.090	-7.090	0.000
	MnF+	1.997e-09	1.920e-09	-8.700	-8.717	-0.017
	MnOH+	1.173e-09	1.128e-09	-8.931	-8.948	-0.017
	MnCl+	8.165e-10	7.850e-10	-9.088	-9.105	-0.017
	MnCl2	7.338e-15	7.340e-15	-14.134	-14.134	0.000
	Mn(OH)3-	5.262e-20	5.059e-20	-19.279	-19.296	-0.017
	MnCl3-	4.504e-20	4.330e-20	-19.346	-19.363	-0.017
Mn(3)	2.033e-27					
	Mn+3	2.033e-27	1.427e-27	-26.692	-26.846	-0.154
Mn(6)	0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-54.303	-54.371	-0.068
Mn(7)	0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-60.037	-60.054	-0.017
Na	6.438e-05					
	Na+	6.433e-05	6.186e-05	-4.192	-4.209	-0.017
	NaSO4-	3.728e-08	3.584e-08	-7.429	-7.446	-0.017
	NaHCO3	1.312e-08	1.312e-08	-7.882	-7.882	0.000
	NaF	1.097e-09	1.098e-09	-8.960	-8.959	0.000
	NaCO3-	1.082e-10	1.041e-10	-9.966	-9.983	-0.017
Ni	1.533e-07					
	Ni+2	8.579e-08	7.330e-08	-7.067	-7.135	-0.068
	NiCO3	6.179e-08	6.181e-08	-7.209	-7.209	0.000
	NiHCO3+	3.970e-09	3.817e-09	-8.401	-8.418	-0.017
	NiSO4	1.635e-09	1.635e-09	-8.787	-8.786	0.000
	NiOH+	5.403e-11	5.195e-11	-10.267	-10.284	-0.017
	NiF+	4.691e-11	4.510e-11	-10.329	-10.346	-0.017
	Ni(CO3)2-2	1.430e-11	1.222e-11	-10.845	-10.913	-0.068
	NiCl+	4.102e-12	3.944e-12	-11.387	-11.404	-0.017
	Ni(OH)2	3.672e-13	3.673e-13	-12.435	-12.435	0.000
	Ni(SO4)2-2	1.272e-14	1.087e-14	-13.896	-13.964	-0.068
	NiCl2	3.066e-16	3.067e-16	-15.513	-15.513	0.000
	Ni(OH)3-	2.705e-17	2.601e-17	-16.568	-16.585	-0.017
O(0)	0.000e+00					
	O2	0.000e+00	0.000e+00	-44.194	-44.194	0.000
Pb	9.654e-09					
	PbCO3	5.196e-09	5.198e-09	-8.284	-8.284	0.000
	Pb+2	3.078e-09	2.630e-09	-8.512	-8.580	-0.068
	PbHCO3+	8.195e-10	7.879e-10	-9.086	-9.104	-0.017
	PbOH+	3.775e-10	3.630e-10	-9.423	-9.440	-0.017
	PbSO4	1.759e-10	1.760e-10	-9.755	-9.755	0.000
	PbCl+	2.082e-12	2.002e-12	-11.681	-11.699	-0.017
	Pb(CO3)2-2	1.738e-12	1.485e-12	-11.760	-11.828	-0.068
	PbF+	1.500e-12	1.442e-12	-11.824	-11.841	-0.017
	Pb(OH)2	9.994e-13	9.997e-13	-12.000	-12.000	0.000
	Pb(SO4)2-2	1.286e-13	1.099e-13	-12.891	-12.959	-0.068
	PbF2	9.078e-16	9.081e-16	-15.042	-15.042	0.000
	Pb(OH)3-	8.452e-17	8.126e-17	-16.073	-16.090	-0.017
	PbCl2	7.400e-17	7.402e-17	-16.131	-16.131	0.000
	Pb2OH+3	3.045e-17	2.137e-17	-16.516	-16.670	-0.154
	PbF3-	2.110e-19	2.029e-19	-18.676	-18.693	-0.017
	Pb(OH)4-2	1.542e-21	1.318e-21	-20.812	-20.880	-0.068
	PbCl3-	1.274e-21	1.224e-21	-20.895	-20.912	-0.017
	Pb3(OH)4+2	3.551e-23	3.033e-23	-22.450	-22.518	-0.068
	PbF4-2	3.505e-24	2.995e-24	-23.455	-23.524	-0.068
	PbCl4-2	1.418e-26	1.212e-26	-25.848	-25.917	-0.068
S(6)	1.457e-04					
	SO4-2	1.391e-04	1.190e-04	-3.857	-3.924	-0.068
	CaSO4	3.939e-06	3.940e-06	-5.405	-5.404	0.000
	MgSO4	2.383e-06	2.384e-06	-5.623	-5.623	0.000
	MnSO4	1.744e-07	1.745e-07	-6.758	-6.758	0.000
	KSO4-	9.950e-08	9.566e-08	-7.002	-7.019	-0.017
	NaSO4-	3.728e-08	3.584e-08	-7.429	-7.446	-0.017
	BaSO4	2.957e-08	2.958e-08	-7.529	-7.529	0.000
	FeSO4	1.577e-08	1.578e-08	-7.802	-7.802	0.000
	ZnSO4	3.872e-09	3.873e-09	-8.412	-8.412	0.000
	NiSO4	1.635e-09	1.635e-09	-8.787	-8.786	0.000
	HSO4-	1.544e-09	1.484e-09	-8.811	-8.829	-0.017
	CuSO4	2.333e-10	2.334e-10	-9.632	-9.632	0.000
	PbSO4	1.759e-10	1.760e-10	-9.755	-9.755	0.000
	AlSO4+	2.058e-11	1.978e-11	-10.687	-10.704	-0.017
	UO2SO4	1.974e-11	1.975e-11	-10.705	-10.704	0.000
	Zn(SO4)2-2	4.542e-12	3.880e-12	-11.343	-11.411	-0.068
	CaHSO4+	3.214e-12	3.090e-12	-11.493	-11.510	-0.017
	Pb(SO4)2-2	1.286e-13	1.099e-13	-12.891	-12.959	-0.068
	Al(SO4)2-	7.581e-14	7.288e-14	-13.120	-13.137	-0.017
	UO2(SO4)2-2	2.442e-14	2.087e-14	-13.612	-13.681	-0.068
	FeHSO4+	1.504e-14	1.446e-14	-13.823	-13.840	-0.017
	Ni(SO4)2-2	1.272e-14	1.087e-14	-13.896	-13.964	-0.068
	FeSO4+	7.391e-16	7.106e-16	-15.131	-15.148	-0.017
	Fe(SO4)2-	1.890e-18	1.817e-18	-17.724	-17.741	-0.017
	AlHSO4+2	2.795e-19	2.388e-19	-18.554	-18.622	-0.068
	FeHSO4+2	3.161e-22	2.701e-22	-21.500	-21.569	-0.068
	USO4+2	7.113e-34	6.077e-34	-33.148	-33.216	-0.068
	U(SO4)2	5.162e-34	5.164e-34	-33.287	-33.287	0.000
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-48.767	-48.921	-0.154
U(4)	5.936e-18					
	U(OH)4	5.933e-18	5.934e-18	-17.227	-17.227	0.000
	U(OH)3+	3.367e-21	3.237e-21	-20.473	-20.490	-0.017
	U(OH)2+2	2.810e-25	2.401e-25	-24.551	-24.620	-0.068
	UF3+	1.710e-28	1.644e-28	-27.767	-27.784	-0.017
	UF4	4.127e-29	4.129e-29	-28.384	-28.384	0.000
	UF2+2	2.661e-29	2.274e-29	-28.575	-28.643	-0.068
	UOH+3	3.072e-30	2.156e-30	-29.513	-29.666	-0.154
	U(CO3)4-4	3.522e-31	1.876e-31	-30.453	-30.727	-0.273
	UF+3	1.280e-31	8.980e-32	-30.893	-31.047	-0.154
	UF5-	3.696e-32	3.554e-32	-31.432	-31.449	-0.017
	USO4+2	7.113e-34	6.077e-34	-33.148	-33.216	-0.068
	U(SO4)2	5.162e-34	5.164e-34	-33.287	-33.287	0.000
	UF6-2	1.643e-34	1.404e-34	-33.784	-33.853	-0.068
	U+4	2.648e-36	1.411e-36	-35.577	-35.850	-0.273
	U(CO3)5-6	6.603e-37	1.602e-37	-36.180	-36.795	-0.615
	UCl+3	2.542e-39	1.784e-39	-38.595	-38.749	-0.154
	U6(OH)15+9	0.000e+00	0.000e+00	-128.169	-129.553	-1.384
U(5)	4.644e-13					
	UO2+	4.644e-13	4.465e-13	-12.333	-12.350	-0.017
	UO2(CO3)3-5	4.340e-26	1.623e-26	-25.363	-25.790	-0.427
U(6)	2.521e-07					
	UO2(CO3)2-2	1.792e-07	1.531e-07	-6.747	-6.815	-0.068
	UO2CO3	6.239e-08	6.241e-08	-7.205	-7.205	0.000
	UO2OH+	4.636e-09	4.457e-09	-8.334	-8.351	-0.017
	UO2(OH)3-	3.089e-09	2.970e-09	-8.510	-8.527	-0.017
	UO2(CO3)3-4	1.980e-09	1.055e-09	-8.703	-8.977	-0.273
	UO2F+	5.181e-10	4.981e-10	-9.286	-9.303	-0.017
	UO2+2	1.553e-10	1.327e-10	-9.809	-9.877	-0.068
	UO2F2	5.191e-11	5.193e-11	-10.285	-10.285	0.000
	UO2SO4	1.974e-11	1.975e-11	-10.705	-10.704	0.000
	(UO2)3(OH)5+	6.364e-12	6.118e-12	-11.196	-11.213	-0.017
	(UO2)2(OH)2+2	1.901e-12	1.624e-12	-11.721	-11.789	-0.068
	UO2F3-	3.169e-13	3.047e-13	-12.499	-12.516	-0.017
	(UO2)3(OH)7-	2.165e-13	2.081e-13	-12.665	-12.682	-0.017
	(UO2)4(OH)7+	3.615e-14	3.476e-14	-13.442	-13.459	-0.017
	UO2(SO4)2-2	2.442e-14	2.087e-14	-13.612	-13.681	-0.068
	(UO2)3(OH)4+2	8.643e-15	7.384e-15	-14.063	-14.132	-0.068
	UO2Cl+	4.162e-15	4.002e-15	-14.381	-14.398	-0.017
	UO2(OH)4-2	3.900e-16	3.332e-16	-15.409	-15.477	-0.068
	(UO2)2OH+3	3.543e-16	2.486e-16	-15.451	-15.604	-0.154
	UO2F4-2	7.028e-17	6.005e-17	-16.153	-16.222	-0.068
	(UO2)3(CO3)6-6	2.085e-17	5.059e-18	-16.681	-17.296	-0.615
	UO2Cl2	4.404e-21	4.405e-21	-20.356	-20.356	0.000
Zn	1.836e-07					
	Zn+2	1.683e-07	1.438e-07	-6.774	-6.842	-0.068
	ZnHCO3+	7.104e-09	6.830e-09	-8.148	-8.166	-0.017
	ZnSO4	3.872e-09	3.873e-09	-8.412	-8.412	0.000
	ZnCO3	3.263e-09	3.264e-09	-8.486	-8.486	0.000
	ZnOH+	8.211e-10	7.895e-10	-9.086	-9.103	-0.017
	Zn(OH)2	9.072e-11	9.075e-11	-10.042	-10.042	0.000
	ZnF+	6.154e-11	5.916e-11	-10.211	-10.228	-0.017
	Zn(CO3)2-2	9.292e-12	7.939e-12	-11.032	-11.100	-0.068
	ZnCl+	7.051e-12	6.779e-12	-11.152	-11.169	-0.017
	Zn(SO4)2-2	4.542e-12	3.880e-12	-11.343	-11.411	-0.068
	ZnOHCl	7.220e-13	7.222e-13	-12.141	-12.141	0.000
	Zn(OH)3-	2.113e-15	2.032e-15	-14.675	-14.692	-0.017
	ZnCl2	1.492e-16	1.493e-16	-15.826	-15.826	0.000
	ZnCl3-	3.631e-21	3.491e-21	-20.440	-20.457	-0.017
	Zn(OH)4-2	2.668e-21	2.279e-21	-20.574	-20.642	-0.068
	ZnCl4-2	4.230e-26	3.614e-26	-25.374	-25.442	-0.068

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-0.80	10.30	11.10	Al(OH)3
AlumK	-16.77	-22.02	-5.25	KAl(SO4)2:12H2O
Alunite	-0.59	-1.43	-0.84	KAl3(SO4)2(OH)6
Anglesite	-4.69	-12.50	-7.81	PbSO4
Anhydrite	-3.34	-7.69	-4.35	CaSO4
Antlerite	-8.83	-0.54	8.29	Cu3(OH)4SO4
Aragonite	-2.40	-10.71	-8.31	CaCO3
Artinite	-11.20	-1.28	9.92	MgCO3:Mg(OH)2:3H2O
Atacamite	-7.68	-0.13	7.55	Cu2(OH)3Cl
Azurite	-7.55	-24.20	-16.64	Cu3(OH)2(CO3)2
B-UO2(OH)2	-1.88	3.82	5.70	UO2(OH)2
BaF2	-9.56	-15.33	-5.77	BaF2
Barite	-0.18	-10.23	-10.04	BaSO4
Basaluminite	0.86	23.56	22.70	Al4(OH)10SO4
Bianchite	-9.00	-10.77	-1.76	ZnSO4:6H2O
Birnessite	-13.25	30.35	43.60	MnO2
Bixbyite	-12.15	39.01	51.16	Mn2O3
Boehmite	1.40	10.30	8.90	AlOOH
Brochantite	-10.18	5.16	15.34	Cu4(OH)6SO4
Brucite	-7.46	9.68	17.14	Mg(OH)2
Bunsenite	-6.15	6.57	12.72	NiO
Calcite	-2.25	-10.71	-8.46	CaCO3
Cerrusite	-2.34	-15.52	-13.18	PbCO3
Chalcanthite	-9.27	-11.93	-2.66	CuSO4:5H2O
CO2(g)	-2.48	-20.64	-18.16	CO2
Cotunnite	-13.09	-17.92	-4.83	PbCl2
Cu(OH)2	-3.12	5.70	8.81	Cu(OH)2
Cu2SO4	-20.63	-27.93	-7.30	Cu2SO4
CuCO3	-5.32	-14.95	-9.63	CuCO3
CuF	-21.03	-16.51	4.52	CuF
CuF2	-16.56	-17.03	-0.47	CuF2
CuF2:2H2O	-12.52	-17.03	-4.51	CuF2:2H2O
CuMetal	-4.35	-16.00	-11.65	Cu
CuOCuSO4	-18.16	-6.23	11.93	CuO:CuSO4
CupricFerrite	10.04	42.61	32.57	CuFe2O4
Cuprite	-3.28	-10.31	-7.02	Cu2O
CuprousFerrite	11.76	13.31	1.55	CuFeO2
CuSO4	-15.14	-11.93	3.21	CuSO4
Diaspore	3.14	10.30	7.16	AlOOH
Dolomite	-4.68	-21.67	-16.98	CaMg(CO3)2
Dolomite(d)	-5.25	-21.67	-16.42	CaMg(CO3)2
Epsomite	-5.77	-7.94	-2.17	MgSO4:7H2O
Fe(OH)2.7Cl.3	4.91	15.00	10.09	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	0.44	18.46	18.02	Fe(OH)3
Fe3(OH)8	-1.95	44.53	46.48	Fe3(OH)8
Fluorite	-2.13	-12.78	-10.65	CaF2
Gibbsite	1.93	10.30	8.37	Al(OH)3
Goethite	6.33	18.46	12.13	FeOOH
Goslarite	-8.77	-10.77	-2.00	ZnSO4:7H2O
Gummite	-6.84	3.82	10.66	UO3
Gypsum	-3.11	-7.69	-4.58	CaSO4:2H2O
H2(g)	-21.65	-21.70	-0.05	H2
Halite	-10.45	-8.88	1.57	NaCl
Hausmannite	-14.50	47.66	62.16	Mn3O4
Hematite	14.32	36.92	22.60	Fe2O3
Huntite	-13.91	-43.59	-29.68	CaMg3(CO3)4
Hydrocerrusite	-8.47	-25.93	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-25.99	-34.16	-8.18	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-8.92	22.46	31.39	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-7.47	23.06	30.53	KFe3(SO4)2(OH)6
Jarosite-Na	-11.74	22.77	34.51	NaFe3(SO4)2(OH)6
JarositeH	-14.49	20.13	34.62	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-4.10	-7.33	-3.23	AlOHSO4
Langite	-12.07	5.16	17.23	Cu4(OH)6SO4:H2O
Larnakite	-7.18	-7.38	-0.21	PbO:PbSO4
Laurionite	-7.02	-6.40	0.62	PbOHCl
Litharge	-7.78	5.12	12.90	PbO
Maghemite	4.27	36.92	32.64	Fe2O3
Magnesite	-3.00	-10.96	-7.96	MgCO3
Magnetite	13.97	44.53	30.56	Fe3O4
Malachite	-4.25	-9.25	-5.00	Cu2(OH)2CO3
Manganite	-5.84	19.50	25.34	MnOOH
Massicot	-7.98	5.12	13.10	PbO
Matlockite	-8.24	-17.76	-9.52	PbClF
Melanothallite	-21.21	-17.34	3.87	CuCl2
Melanterite	-7.75	-10.02	-2.27	FeSO4:7H2O
Minium	-37.78	37.06	74.84	Pb3O4
Mirabilite	-11.01	-12.34	-1.33	Na2SO4:10H2O
Mn2(SO4)3	-60.19	-13.87	46.33	Mn2(SO4)3
MnCl2:4H2O	-16.90	-14.38	2.51	MnCl2:4H2O
MnSO4	-11.81	-8.97	2.84	MnSO4
Morenosite	-8.67	-11.06	-2.39	NiSO4:7H2O
Na4UO2(CO3)3	-31.25	-47.54	-16.29	Na4UO2(CO3)3
Nahcolite	-7.04	-18.00	-10.96	NaHCO3
Nantokite	-7.10	-16.67	-9.57	CuCl
Natron	-13.87	-15.36	-1.49	Na2CO3:10H2O
Nesquehonite	-5.41	-10.96	-5.56	MgCO3:3H2O
Ni(OH)2	-3.89	6.57	10.46	Ni(OH)2
Ni4(OH)6SO4	-23.36	8.64	32.00	Ni4(OH)6SO4
NiCO3	-7.35	-14.08	-6.73	NiCO3
Nsutite	-12.21	30.35	42.56	MnO2
O2(g)	-41.34	43.40	84.74	O2
Pb(OH)2	-3.19	5.12	8.31	Pb(OH)2
Pb2(OH)3Cl	-10.07	-1.28	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.96	10.24	26.20	PbO:Pb(OH)2
Pb2O3	-29.10	31.94	61.04	Pb2O3
Pb2OCO3	-10.03	-10.40	-0.37	PbO:PbCO3
Pb3O2CO3	-16.60	-5.28	11.32	PbCO3:2PbO
Pb3O2SO4	-12.90	-2.26	10.63	PbSO4:2PbO
Pb4(OH)6SO4	-18.25	2.85	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.64	2.86	22.49	PbSO4:3PbO
PbF2	-10.17	-17.60	-7.43	PbF2
PbMetal	-20.85	-16.58	4.27	Pb
PbO:0.3H2O	-7.86	5.12	12.98	PbO:0.33H2O
Phosgenite	-13.63	-33.44	-19.81	PbCl2:PbCO3
Plattnerite	-23.27	26.82	50.09	PbO2
Portlandite	-13.21	9.94	23.15	Ca(OH)2
Pyrochroite	-6.55	8.65	15.20	Mn(OH)2
Pyrolusite	-11.76	30.35	42.11	MnO2
Retgersite	-9.01	-11.06	-2.05	NiSO4:6H2O
Rhodochrosite	-0.88	-11.99	-11.11	MnCO3
Rhodochrosite(d)	-1.60	-11.99	-10.39	MnCO3
Rutherfordine	-2.39	-16.82	-14.43	UO2CO3
Schoepite	-1.72	3.82	5.54	UO2(OH)2:H2O
Siderite	-2.17	-13.04	-10.86	FeCO3
Siderite(d)(3)	-2.59	-13.04	-10.45	FeCO3
Smithsonite	-3.84	-13.79	-9.95	ZnCO3
Tenorite	-2.09	5.70	7.79	CuO
Thenardite	-12.17	-12.34	-0.17	Na2SO4
Thermonatrite	-15.52	-15.36	0.16	Na2CO3:H2O
Trona	-22.40	-33.36	-10.96	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-22.87	-35.50	-12.63	U(OH)2SO4
U3O8(c)	-3.78	-10.23	-6.45	U3O8
U4O9(c)	-9.86	-49.81	-39.95	U4O9
UF4(c)	-35.50	-63.32	-27.82	UF4
UF4:2.5H2O	-26.33	-63.32	-36.99	UF4:2.5H2O
UO2(a)	-8.55	-17.88	-9.33	UO2
UO3(gamma)	-4.11	3.82	7.94	UO3
Uraninite(c)	-3.86	-17.88	-14.02	UO2
Witherite	-4.68	-13.25	-8.57	BaCO3
Zincite(c)	-4.53	6.86	11.39	ZnO
Zincosite	-13.99	-10.77	3.23	ZnSO4
Zn(OH)2-a	-5.59	6.86	12.45	Zn(OH)2
Zn(OH)2-b	-4.89	6.86	11.75	Zn(OH)2
Zn(OH)2-c	-5.34	6.86	12.20	Zn(OH)2
Zn(OH)2-e	-4.64	6.86	11.50	Zn(OH)2
Zn(OH)2-g	-4.85	6.86	11.71	Zn(OH)2
Zn2(OH)2SO4	-11.41	-3.91	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-13.00	2.20	15.20	Zn2(OH)3Cl
Zn3O(SO4)2	-34.39	-14.68	19.72	ZnO:2ZnSO4
Zn4(OH)6SO4	-18.59	9.81	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-27.25	11.25	38.50	Zn5(OH)8Cl2
ZnCl2	-23.41	-16.18	7.23	ZnCl2
ZnCO3:H2O	-3.53	-13.79	-10.26	ZnCO3:H2O
ZnF2	-14.49	-15.86	-1.37	ZnF2
ZnMetal	-41.01	-14.84	26.17	Zn
ZnO(a)	-4.45	6.86	11.31	ZnO
ZnSO4:H2O	-10.32	-10.77	-0.45	ZnSO4:H2O

End of simulation.

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Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 2-3m
           SOLUTION        3
           units           mg/l
           temp            20.3
           pH              7.79
           F               0.37
           Cl              0.1
           S(6)            8.1         as SO4
           Na              0.55
           K               1.3
           Mg              1.4
           Ca              15.7
           Alkalinity      48.8        as HCO3
           Al              0.47
           As              0.59
           Ba              0.086
           Cu              0.003
           Fe              0.07
           Mn              0.02
           Ni              0.001
           Pb              0.001
           U               0.0
           Zn              0.001
           END
```

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TITLE
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   Schneckentein 2-3m

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Beginning of initial solution calculations.
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Initial solution 3.

-----------------------------Solution composition----------------
-------------

            Elements           Molality       Moles

            Al               1.742e-05   1.742e-05
            Alkalinity       7.998e-04   7.998e-04
            As               7.876e-06   7.876e-06
            Ba               6.262e-07   6.262e-07
            Ca               3.917e-04   3.917e-04
            Cl               2.821e-06   2.821e-06
            Cu               4.721e-08   4.721e-08
            F                1.948e-05   1.948e-05
            Fe               1.254e-06   1.254e-06
            K                3.325e-05   3.325e-05
            Mg               5.759e-05   5.759e-05
            Mn               3.641e-07   3.641e-07
            Na               2.393e-05   2.393e-05
            Ni               1.703e-08   1.703e-08
            Pb               4.827e-09   4.827e-09
            S(6)             8.433e-05   8.433e-05
            Zn               1.530e-08   1.530e-08
```

```
----------------------------Description of solution----------------------------

                                    pH  =   7.790
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   1.467e-03
                     Mass of water (kg)  =   1.000e+00
                  Total carbon (mol/kg)  =   7.449e-04
                     Total CO2 (mol/kg)  =   7.449e-04
                    Temperature (deg C)  =  20.300
                  Electrical balance (eq)  =   1.293e-05
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =   0.69
                               Iterations  =   8
                                  Total H  = 1.110132e+02
                                  Total O  = 5.550887e+01
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	4.473e-07	4.287e-07	-6.349	-6.368	-0.018
H+	1.688e-08	1.622e-08	-7.773	-7.790	-0.017
H2O	5.551e+01	1.000e+00	-0.000	-0.000	0.000
Al	**1.742e-05**				
Al(OH)4-	1.724e-05	1.653e-05	-4.763	-4.782	-0.018
Al(OH)3	1.506e-07	1.507e-07	-6.822	-6.822	0.000
Al(OH)2+	2.473e-08	2.370e-08	-7.607	-7.625	-0.018
AlF2+	2.841e-10	2.723e-10	-9.547	-9.565	-0.018
AlOH+2	8.861e-11	7.478e-11	-10.053	-10.126	-0.074
AlF3	6.331e-11	6.333e-11	-10.199	-10.198	0.000
AlF+2	3.555e-11	3.000e-11	-10.449	-10.523	-0.074
AlF4-	4.879e-13	4.676e-13	-12.312	-12.330	-0.018
Al+3	2.436e-13	1.663e-13	-12.613	-12.779	-0.166
AlSO4+	3.464e-14	3.320e-14	-13.460	-13.479	-0.018
Al(SO4)2-	7.197e-17	6.898e-17	-16.143	-16.161	-0.018
AlHSO4+2	5.443e-23	4.594e-23	-22.264	-22.338	-0.074
As(3)	**7.599e-17**				
H3AsO3	7.364e-17	7.367e-17	-16.133	-16.133	0.000
H2AsO3-	2.348e-18	2.250e-18	-17.629	-17.648	-0.018
HAsO3-2	1.057e-22	8.924e-23	-21.976	-22.049	-0.074
H4AsO3+	6.176e-25	5.919e-25	-24.209	-24.228	-0.018
AsO3-3	2.638e-28	1.801e-28	-27.579	-27.744	-0.166
As(5)	**7.876e-06**				
HAsO4-2	7.267e-06	6.133e-06	-5.139	-5.212	-0.074
H2AsO4-	6.070e-07	5.818e-07	-6.217	-6.235	-0.018
AsO4-3	1.249e-09	8.524e-10	-8.904	-9.069	-0.166
H3AsO4	1.577e-12	1.577e-12	-11.802	-11.802	0.000
Ba	**6.262e-07**				
Ba+2	6.056e-07	5.111e-07	-6.218	-6.291	-0.074
BaSO4	1.720e-08	1.721e-08	-7.764	-7.764	0.000
BaHCO3+	3.011e-09	2.886e-09	-8.521	-8.540	-0.018
BaCO3	4.288e-10	4.290e-10	-9.368	-9.368	0.000
BaOH+	1.114e-12	1.068e-12	-11.953	-11.972	-0.018
C(4)	**7.449e-04**				
HCO3-	7.120e-04	6.829e-04	-3.148	-3.166	-0.018
CO2	2.655e-05	2.656e-05	-4.576	-4.576	0.000
CaHCO3+	2.727e-06	2.613e-06	-5.564	-5.583	-0.018
CO3-2	2.110e-06	1.786e-06	-5.676	-5.748	-0.073
CaCO3	8.912e-07	8.915e-07	-6.050	-6.050	0.000
MgHCO3+	3.909e-07	3.746e-07	-6.408	-6.426	-0.018
MgCO3	7.569e-08	7.572e-08	-7.121	-7.121	0.000
MnCO3	3.681e-08	3.682e-08	-7.434	-7.434	0.000
MnHCO3+	1.649e-08	1.580e-08	-7.783	-7.801	-0.018
NiCO3	1.546e-08	1.546e-08	-7.811	-7.811	0.000
NaHCO3	8.799e-09	8.802e-09	-8.056	-8.055	0.000
CuCO3	4.959e-09	4.961e-09	-8.305	-8.304	0.000
PbCO3	4.371e-09	4.372e-09	-8.359	-8.359	0.000
ZnCO3	3.097e-09	3.098e-09	-8.509	-8.509	0.000
BaHCO3+	3.011e-09	2.886e-09	-8.521	-8.540	-0.018
FeHCO3+	2.910e-09	2.789e-09	-8.536	-8.555	-0.018
FeCO3	1.749e-09	1.749e-09	-8.757	-8.757	0.000
ZnHCO3+	7.800e-10	7.476e-10	-9.108	-9.126	-0.018
NaCO3-	6.249e-10	5.989e-10	-9.204	-9.223	-0.018
BaCO3	4.288e-10	4.290e-10	-9.368	-9.368	0.000
CuHCO3+	1.847e-10	1.771e-10	-9.733	-9.752	-0.018
Zn(CO3)2-2	1.401e-10	1.183e-10	-9.853	-9.927	-0.074
NiHCO3+	1.149e-10	1.101e-10	-9.940	-9.958	-0.018
PbHCO3+	7.975e-11	7.644e-11	-10.098	-10.117	-0.018
Ni(CO3)2-2	5.684e-11	4.797e-11	-10.245	-10.319	-0.074
Pb(CO3)2-2	2.323e-11	1.961e-11	-10.634	-10.708	-0.074
Cu(CO3)2-2	1.321e-11	1.115e-11	-10.879	-10.953	-0.074
Ca	**3.917e-04**				
Ca+2	3.839e-04	3.248e-04	-3.416	-3.488	-0.073
CaSO4	4.162e-06	4.164e-06	-5.381	-5.381	0.000
CaHCO3+	2.727e-06	2.613e-06	-5.564	-5.583	-0.018
CaCO3	8.912e-07	8.915e-07	-6.050	-6.050	0.000
CaF+	4.902e-08	4.699e-08	-7.310	-7.328	-0.018
CaOH+	3.468e-09	3.324e-09	-8.460	-8.478	-0.018
CaHSO4+	3.903e-13	3.741e-13	-12.409	-12.427	-0.018
Cl	**2.821e-06**				
Cl-	2.821e-06	2.703e-06	-5.550	-5.568	-0.019
MnCl+	2.983e-12	2.859e-12	-11.525	-11.544	-0.018
FeCl+	1.590e-13	1.524e-13	-12.799	-12.817	-0.018
ZnCl+	5.348e-14	5.126e-14	-13.272	-13.290	-0.018
ZnOHCl	4.798e-14	4.799e-14	-13.319	-13.319	0.000
PbCl+	1.405e-14	1.347e-14	-13.852	-13.871	-0.018
NiCl+	8.275e-15	7.931e-15	-14.082	-14.101	-0.018
CuCl+	3.108e-15	2.979e-15	-14.508	-14.526	-0.018
CuCl2-	6.331e-17	6.068e-17	-16.199	-16.217	-0.018
MnCl2	3.372e-18	3.373e-18	-17.472	-17.472	0.000
ZnCl2	1.423e-19	1.423e-19	-18.847	-18.847	0.000
NiCl2	7.781e-20	7.784e-20	-19.109	-19.109	0.000
PbCl2	6.307e-20	6.309e-20	-19.200	-19.200	0.000
CuCl2	4.106e-21	4.107e-21	-20.387	-20.386	0.000
FeCl+2	2.496e-21	2.106e-21	-20.603	-20.676	-0.074
CuCl3-2	3.024e-22	2.552e-22	-21.519	-21.593	-0.074
MnCl3-	2.620e-24	2.511e-24	-23.582	-23.600	-0.018
ZnCl3-	4.376e-25	4.195e-25	-24.359	-24.377	-0.018
PbCl3-	1.372e-25	1.315e-25	-24.863	-24.881	-0.018
FeCl2+	3.087e-26	2.959e-26	-25.510	-25.529	-0.018
CuCl3-	3.776e-29	3.619e-29	-28.423	-28.441	-0.018
ZnCl4-2	6.483e-31	5.472e-31	-30.188	-30.262	-0.074
PbCl4-2	1.944e-31	1.640e-31	-30.711	-30.785	-0.074
FeCl3	7.996e-33	7.999e-33	-32.097	-32.097	0.000
CuCl4-2	5.202e-37	4.390e-37	-36.284	-36.358	-0.074
Cu(1)	**2.709e-11**				
Cu+	2.709e-11	2.597e-11	-10.567	-10.586	-0.018
CuCl2-	6.331e-17	6.068e-17	-16.199	-16.217	-0.018
CuCl3-2	3.024e-22	2.552e-22	-21.519	-21.593	-0.074
Cu(2)	**4.719e-08**				
Cu(OH)2	4.108e-08	4.109e-08	-7.386	-7.386	0.000
CuCO3	4.959e-09	4.961e-09	-8.305	-8.304	0.000
Cu+2	6.130e-10	5.173e-10	-9.213	-9.286	-0.074
CuOH+	3.328e-10	3.190e-10	-9.478	-9.496	-0.018
CuHCO3+	1.847e-10	1.771e-10	-9.733	-9.752	-0.018
Cu(CO3)2-2	1.321e-11	1.115e-11	-10.879	-10.953	-0.074
CuSO4	6.863e-12	6.865e-12	-11.163	-11.163	0.000
CuF+	1.745e-13	1.673e-13	-12.758	-12.777	-0.018
Cu(OH)3-	1.593e-13	1.527e-13	-12.798	-12.816	-0.018
Cu2(OH)2+2	3.283e-14	2.771e-14	-13.484	-13.557	-0.074
CuCl+	3.108e-15	2.979e-15	-14.508	-14.526	-0.018
Cu(OH)4-2	2.225e-18	1.878e-18	-17.653	-17.726	-0.074
CuCl2	4.106e-21	4.107e-21	-20.387	-20.386	0.000
CuCl3-	3.776e-29	3.619e-29	-28.423	-28.441	-0.018
CuCl4-2	5.202e-37	4.390e-37	-36.284	-36.358	-0.074
F	**1.948e-05**				
F-	1.937e-05	1.857e-05	-4.713	-4.731	-0.018
MgF+	5.606e-08	5.374e-08	-7.251	-7.270	-0.018
CaF+	4.902e-08	4.699e-08	-7.310	-7.328	-0.018
HF	4.151e-10	4.153e-10	-9.382	-9.382	0.000
AlF2+	2.841e-10	2.723e-10	-9.547	-9.565	-0.018
NaF	2.448e-10	2.449e-10	-9.611	-9.611	0.000
AlF3	6.331e-11	6.333e-11	-10.199	-10.198	0.000
AlF+2	3.555e-11	3.000e-11	-10.449	-10.523	-0.074
MnF+	3.479e-11	3.335e-11	-10.459	-10.477	-0.018
FeF+	7.910e-12	7.582e-12	-11.102	-11.120	-0.018
ZnF+	2.241e-12	2.148e-12	-11.650	-11.668	-0.018
AlF4-	4.879e-13	4.676e-13	-12.312	-12.330	-0.018
NiF+	4.514e-13	4.327e-13	-12.345	-12.364	-0.018
CuF+	1.745e-13	1.673e-13	-12.758	-12.777	-0.018
PbF+	4.854e-14	4.652e-14	-13.314	-13.332	-0.018
HF2-	2.968e-14	2.845e-14	-13.528	-13.546	-0.018
FeF+2	9.730e-16	8.212e-16	-15.012	-15.086	-0.074
FeF2+	5.983e-16	5.735e-16	-15.223	-15.241	-0.018
PbF2	1.763e-17	1.763e-17	-16.754	-16.754	0.000
FeF3	1.660e-17	1.660e-17	-16.780	-16.780	0.000
H2F2	5.312e-19	5.314e-19	-18.275	-18.275	0.000
PbF3-	2.475e-21	2.372e-21	-20.606	-20.625	-0.018
PbF4-2	2.497e-26	2.108e-26	-25.603	-25.676	-0.074
Fe(2)	**5.408e-08**				
Fe+2	4.839e-08	4.084e-08	-7.315	-7.389	-0.074
FeHCO3+	2.910e-09	2.789e-09	-8.536	-8.555	-0.018
FeCO3	1.749e-09	1.749e-09	-8.757	-8.757	0.000
FeOH+	5.814e-10	5.573e-10	-9.235	-9.254	-0.018
FeSO4	4.469e-10	4.471e-10	-9.350	-9.350	0.000
FeF+	7.910e-12	7.582e-12	-11.102	-11.120	-0.018
Fe(OH)2	1.930e-13	1.931e-13	-12.714	-12.714	0.000
FeCl+	1.590e-13	1.524e-13	-12.799	-12.817	-0.018
Fe(OH)3-	4.403e-16	4.220e-16	-15.356	-15.375	-0.018
FeHSO4+	4.907e-17	4.703e-17	-16.309	-16.328	-0.018

Fe(3)	1.199e-06					
	Fe(OH)3	9.911e-07	9.914e-07	-6.004	-6.004	0.000
	Fe(OH)2+	1.604e-07	1.537e-07	-6.795	-6.813	-0.018
	Fe(OH)4-	4.801e-08	4.601e-08	-7.319	-7.337	-0.018
	FeOH+2	1.069e-11	9.022e-12	-10.971	-11.045	-0.074
	FeF+2	9.730e-16	8.212e-16	-15.012	-15.086	-0.074
	FeF2+	5.983e-16	5.735e-16	-15.223	-15.241	-0.018
	Fe+3	4.397e-17	3.002e-17	-16.357	-16.523	-0.166
	FeSO4+	2.076e-17	1.989e-17	-16.683	-16.701	-0.018
	FeF3	1.660e-17	1.660e-17	-16.780	-16.780	0.000
	Fe(SO4)2-	2.994e-20	2.870e-20	-19.524	-19.542	-0.018
	Fe2(OH)2+4	5.261e-21	2.669e-21	-20.279	-20.574	-0.295
	FeCl+2	2.496e-21	2.106e-21	-20.603	-20.676	-0.074
	FeHSO4+2	1.029e-24	8.684e-25	-23.988	-24.061	-0.074
	Fe3(OH)4+5	3.844e-25	1.332e-25	-24.415	-24.876	-0.460
	FeCl2+	3.087e-26	2.959e-26	-25.510	-25.529	-0.018
	FeCl3	7.996e-33	7.999e-33	-32.097	-32.097	0.000
H(0)	3.765e-27					
	H2	1.883e-27	1.883e-27	-26.725	-26.725	0.000
K	3.325e-05					
	K+	3.323e-05	3.185e-05	-4.478	-4.497	-0.019
	KSO4-	1.487e-08	1.425e-08	-7.828	-7.846	-0.018
Mg	5.759e-05					
	Mg+2	5.639e-05	4.776e-05	-4.249	-4.321	-0.072
	MgSO4	6.649e-07	6.651e-07	-6.177	-6.177	0.000
	MgHCO3+	3.909e-07	3.746e-07	-6.408	-6.426	-0.018
	MgCO3	7.569e-08	7.572e-08	-7.121	-7.121	0.000
	MgF+	5.606e-08	5.374e-08	-7.251	-7.270	-0.018
	MgOH+	7.248e-09	6.947e-09	-8.140	-8.158	-0.018
Mn(2)	3.641e-07					
	Mn+2	3.076e-07	2.596e-07	-6.512	-6.586	-0.074
	MnCO3	3.681e-08	3.682e-08	-7.434	-7.434	0.000
	MnHCO3+	1.649e-08	1.580e-08	-7.783	-7.801	-0.018
	MnSO4	2.830e-09	2.831e-09	-8.548	-8.548	0.000
	MnOH+	2.909e-10	2.788e-10	-9.536	-9.555	-0.018
	MnF+	3.479e-11	3.335e-11	-10.459	-10.477	-0.018
	MnCl+	2.983e-12	2.859e-12	-11.525	-11.544	-0.018
	MnCl2	3.372e-18	3.373e-18	-17.472	-17.472	0.000
	Mn(OH)3-	1.006e-18	9.645e-19	-17.997	-18.016	-0.018
	MnCl3-	2.620e-24	2.511e-24	-23.582	-23.600	-0.018
Mn(3)	5.851e-29					
	Mn+3	5.851e-29	3.994e-29	-28.233	-28.399	-0.166
Mn(6)	0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-48.393	-48.467	-0.074
Mn(7)	0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-54.145	-54.163	-0.018
Na	2.393e-05					
	Na+	2.391e-05	2.292e-05	-4.621	-4.640	-0.018
	NaHCO3	8.799e-09	8.802e-09	-8.056	-8.055	0.000
	NaSO4-	7.811e-09	7.487e-09	-8.107	-8.126	-0.018
	NaCO3-	6.249e-10	5.989e-10	-9.204	-9.223	-0.018
	NaF	2.448e-10	2.449e-10	-9.611	-9.611	0.000
Ni	1.703e-08					
	NiCO3	1.546e-08	1.546e-08	-7.811	-7.811	0.000
	Ni+2	1.384e-09	1.168e-09	-8.859	-8.933	-0.074
	NiHCO3+	1.149e-10	1.101e-10	-9.940	-9.958	-0.018
	Ni(CO3)2-2	5.684e-11	4.797e-11	-10.245	-10.319	-0.074
	NiSO4	1.468e-11	1.468e-11	-10.833	-10.833	0.000
	NiOH+	7.414e-12	7.106e-12	-11.130	-11.148	-0.018
	NiF+	4.514e-13	4.327e-13	-12.345	-12.364	-0.018
	Ni(OH)2	4.439e-13	4.441e-13	-12.353	-12.353	0.000
	NiCl+	8.275e-15	7.931e-15	-14.082	-14.101	-0.018
	Ni(OH)3-	2.857e-16	2.738e-16	-15.544	-15.563	-0.018
	Ni(SO4)2-2	6.540e-17	5.519e-17	-16.184	-16.258	-0.074
	NiCl2	7.781e-20	7.784e-20	-19.109	-19.109	0.000
O(0)	0.000e+00					
	O2	0.000e+00	0.000e+00	-40.503	-40.502	0.000
Pb	4.827e-09					
	PbCO3	4.371e-09	4.372e-09	-8.359	-8.359	0.000
	PbOH+	1.767e-10	1.694e-10	-9.753	-9.771	-0.018
	Pb+2	1.670e-10	1.409e-10	-9.777	-9.851	-0.074
	PbHCO3+	7.975e-11	7.644e-11	-10.098	-10.117	-0.018
	Pb(CO3)2-2	2.323e-11	1.961e-11	-10.634	-10.708	-0.074
	PbSO4	5.321e-12	5.323e-12	-11.274	-11.274	0.000
	Pb(OH)2	4.062e-12	4.064e-12	-11.391	-11.391	0.000
	PbF+	4.854e-14	4.652e-14	-13.314	-13.332	-0.018
	PbCl+	1.405e-14	1.347e-14	-13.852	-13.871	-0.018
	Pb(OH)3-	3.001e-15	2.877e-15	-14.523	-14.541	-0.018
	Pb(SO4)2-2	2.223e-15	1.877e-15	-14.653	-14.727	-0.074
	PbF2	1.763e-17	1.763e-17	-16.754	-16.754	0.000
	Pb2OH+3	7.828e-19	5.344e-19	-18.106	-18.272	-0.166
	Pb(OH)4-2	4.815e-19	4.063e-19	-18.317	-18.391	-0.074
	PbCl2	6.307e-20	6.309e-20	-19.200	-19.200	0.000
	PbF3-	2.475e-21	2.372e-21	-20.606	-20.625	-0.018
	Pb3(OH)4+2	3.086e-23	2.604e-23	-22.511	-22.584	-0.074
	PbCl3-	1.372e-25	1.315e-25	-24.863	-24.881	-0.018
	PbF4-2	2.497e-26	2.108e-26	-25.603	-25.676	-0.074
	PbCl4-2	1.944e-31	1.640e-31	-30.711	-30.785	-0.074
S(6)	8.433e-05					
	SO4-2	7.945e-05	6.718e-05	-4.100	-4.173	-0.073
	CaSO4	4.162e-06	4.164e-06	-5.381	-5.381	0.000
	MgSO4	6.649e-07	6.651e-07	-6.177	-6.177	0.000
	BaSO4	1.720e-08	1.721e-08	-7.764	-7.764	0.000
	KSO4-	1.487e-08	1.425e-08	-7.828	-7.846	-0.018
	NaSO4-	7.811e-09	7.487e-09	-8.107	-8.126	-0.018
	MnSO4	2.830e-09	2.831e-09	-8.548	-8.548	0.000
	FeSO4	4.469e-10	4.471e-10	-9.350	-9.350	0.000
	ZnSO4	1.320e-10	1.320e-10	-9.880	-9.879	0.000
	HSO4-	9.994e-11	9.579e-11	-10.000	-10.019	-0.018
	NiSO4	1.468e-11	1.468e-11	-10.833	-10.833	0.000
	CuSO4	6.863e-12	6.865e-12	-11.163	-11.163	0.000
	PbSO4	5.321e-12	5.323e-12	-11.274	-11.274	0.000
	CaHSO4+	3.903e-13	3.741e-13	-12.409	-12.427	-0.018
	Zn(SO4)2-2	8.860e-14	7.478e-14	-13.053	-13.126	-0.074
	AlSO4+	3.464e-14	3.320e-14	-13.460	-13.479	-0.018
	Pb(SO4)2-2	2.223e-15	1.877e-15	-14.653	-14.727	-0.074
	Al(SO4)2-	7.197e-17	6.898e-17	-16.143	-16.161	-0.018
	Ni(SO4)2-2	6.540e-17	5.519e-17	-16.184	-16.258	-0.074
	FeHSO4+	4.907e-17	4.703e-17	-16.309	-16.328	-0.018
	FeSO4+	2.076e-17	1.989e-17	-16.683	-16.701	-0.018
	Fe(SO4)2-	2.994e-20	2.870e-20	-19.524	-19.542	-0.018
	AlHSO4+2	5.443e-23	4.594e-23	-22.264	-22.338	-0.074
	FeHSO4+2	1.029e-24	8.684e-25	-23.988	-24.061	-0.074
Zn	1.530e-08					
	Zn+2	1.030e-08	8.696e-09	-7.987	-8.061	-0.074
	ZnCO3	3.097e-09	3.098e-09	-8.509	-8.509	0.000
	ZnHCO3+	7.800e-10	7.476e-10	-9.108	-9.126	-0.018
	ZnOH+	4.270e-10	4.093e-10	-9.370	-9.388	-0.018
	Zn(OH)2	4.161e-10	4.162e-10	-9.381	-9.381	0.000
	Zn(CO3)2-2	1.401e-10	1.183e-10	-9.853	-9.927	-0.074
	ZnSO4	1.320e-10	1.320e-10	-9.880	-9.879	0.000
	ZnF+	2.241e-12	2.148e-12	-11.650	-11.668	-0.018
	Zn(SO4)2-2	8.860e-14	7.478e-14	-13.053	-13.126	-0.074
	Zn(OH)3-	8.467e-14	8.115e-14	-13.072	-13.091	-0.018
	ZnCl+	5.348e-14	5.126e-14	-13.272	-13.290	-0.018
	ZnOHCl	4.798e-14	4.799e-14	-13.319	-13.319	0.000
	Zn(OH)4-2	9.396e-19	7.930e-19	-18.027	-18.101	-0.074
	ZnCl2	1.423e-19	1.423e-19	-18.847	-18.847	0.000
	ZnCl3-	4.376e-25	4.195e-25	-24.359	-24.377	-0.018
	ZnCl4-2	6.483e-31	5.472e-31	-30.188	-30.262	-0.074

-------------------Saturation indices-------------------------------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-0.52	10.59	11.11	Al(OH)3
AlAsO4:2H2O	-6.01	-1.21	4.80	AlAsO4:2H2O
AlumK	-20.37	-25.62	-5.25	KAl(SO4)2:12H2O
Alunite	-3.63	-4.44	-0.81	KAl3(SO4)2(OH)6
Anglesite	-6.21	-14.02	-7.82	PbSO4
Anhydrite	-3.32	-7.66	-4.34	CaSO4
Antlerite	-9.16	-0.87	8.29	Cu3(OH)4SO4
Aragonite	-0.93	-9.24	-8.31	CaCO3
Arsenolite	-61.56	-141.53	-79.97	As4O6
Artinite	-8.75	1.19	9.94	MgCO3:Mg(OH)2:3H2O
As2O5	-30.37	-23.60	6.76	As2O5
Atacamite	-8.33	-0.77	7.56	Cu2(OH)3Cl
Azurite	-7.14	-23.78	-16.63	Cu3(OH)2(CO3)2
Ba3(AsO4)2	13.21	4.26	-8.95	Ba3(AsO4)2
BaF2	-9.98	-15.75	-5.77	BaF2
Barite	-0.42	-10.46	-10.05	BaSO4
Basaluminite	-0.09	22.61	22.70	Al4(OH)10SO4
Bianchite	-10.47	-12.23	-1.76	ZnSO4:6H2O
Birnessite	-11.03	32.57	43.60	MnO2
Bixbyite	-9.63	41.57	51.19	Mn2O3
Boehmite	1.68	10.59	8.91	AlOOH
Brochantite	-9.92	5.42	15.34	Cu4(OH)6SO4
Brucite	-5.90	11.26	17.16	Mg(OH)2
Bunsenite	-6.08	6.65	12.73	NiO
Ca3(AsO4)2:4w	-9.70	12.67	22.37	Ca3(AsO4)2:4H2O
Calcite	-0.78	-9.24	-8.45	CaCO3
Cerrusite	-2.41	-15.60	-13.19	PbCO3
Chalcanthite	-10.80	-13.46	-2.66	CuSO4:5H2O
Claudetite	-61.31	-141.53	-80.22	As4O6
CO2(g)	-3.17	-21.33	-18.16	CO2
Cotunnite	-16.15	-20.99	-4.84	PbCl2
Cu(OH)2	-2.53	6.29	8.82	Cu(OH)2
Cu2SO4	-23.45	-30.75	-7.30	Cu2SO4
Cu3(AsO4)2:6w	-10.87	-4.72	6.15	Cu3(AsO4)2:6H2O
CuCO3	-5.40	-15.03	-9.63	CuCO3
CuF	-22.54	-18.02	4.52	CuF
CuF2	-18.29	-18.75	-0.46	CuF2
CuF2:2H2O	-14.24	-18.75	-4.51	CuF2:2H2O
CuMetal	-5.62	-17.29	-11.66	Cu
CuOCuSO4	-19.11	-7.17	11.95	CuO:CuSO4
CupricFerrite	13.65	46.26	32.60	CuFe2O4
Cuprite	-3.97	-10.99	-7.02	Cu2O
CuprousFerrite	12.93	14.48	1.56	CuFeO2
CuSO4	-16.68	-13.46	3.22	CuSO4
Diaspore	3.42	10.59	7.17	AlOOH
Dolomite	-2.33	-19.31	-16.98	CaMg(CO3)2
Dolomite(d)	-2.90	-19.31	-16.41	CaMg(CO3)2
Epsomite	-6.32	-8.49	-2.17	MgSO4:7H2O
Fe(OH)2.7Cl.3	5.88	15.97	10.09	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	1.96	19.98	18.02	Fe(OH)3
Fe3(OH)8	1.66	48.15	46.49	Fe3(OH)8
Fluorite	-2.29	-12.95	-10.66	CaF2
Gibbsite	2.21	10.59	8.38	Al(OH)3
Goethite	7.85	19.98	12.13	FeOOH
Goslarite	-10.23	-12.23	-2.00	ZnSO4:7H2O
Gypsum	-3.08	-7.66	-4.58	CaSO4:2H2O
H2(g)	-23.53	-23.58	-0.05	H2
Halite	-11.78	-10.21	1.57	NaCl
Hausmannite	-11.65	50.56	62.21	Mn3O4
Hematite	17.34	39.96	22.62	Fe2O3
Huntite	-9.78	-39.44	-29.67	CaMg3(CO3)4
Hydrocerrusite	-8.01	-25.47	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-20.87	-29.02	-8.15	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-8.33	23.07	31.40	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-6.83	23.73	30.56	KFe3(SO4)2(OH)6
Jarosite-Na	-10.96	23.59	34.55	NaFe3(SO4)2(OH)6
JarositeH	-14.22	20.44	34.66	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-5.93	-9.16	-3.23	AlOHSO4
Langite	-11.83	5.42	17.26	Cu4(OH)6SO4:H2O
Larnakite	-8.09	-8.29	-0.20	PbO:PbSO4
Laurionite	-8.25	-7.63	0.62	PbOHCl
Litharge	-7.18	5.73	12.91	PbO
Maghemite	7.31	39.96	32.65	Fe2O3
Magnesite	-2.11	-10.07	-7.96	MgCO3
Magnetite	17.56	48.15	30.60	Fe3O4
Malachite	-3.75	-8.74	-4.99	Cu2(OH)2CO3
Manganite	-4.56	20.78	25.34	MnOOH
Massicot	-7.38	5.73	13.11	PbO
Matlockite	-10.63	-20.15	-9.52	PbClF
Melanothallite	-24.30	-20.42	3.87	CuCl2
Melanterite	-9.29	-11.56	-2.27	FeSO4:7H2O
Minium	-34.13	40.77	74.90	Pb3O4
Mirabilite	-12.12	-13.45	-1.34	Na2SO4:10H2O
Mn2(SO4)3	-64.06	-17.69	46.37	Mn2(SO4)3
Mn3(AsO4):8H2O	-9.19	3.38	12.57	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-20.23	-17.72	2.51	MnCl2:4H2O
MnSO4	-13.61	-10.76	2.85	MnSO4
Morenosite	-10.71	-13.11	-2.39	NiSO4:7H2O
Nahcolite	-7.21	-18.18	-10.96	NaHCO3
Nantokite	-9.28	-18.85	-9.58	CuCl
Natron	-13.53	-15.03	-1.50	Na2CO3:10H2O
Nesquehonite	-4.52	-10.07	-5.55	MgCO3:3H2O
Ni(OH)2	-3.80	6.65	10.44	Ni(OH)2
Ni3(AsO4)2:8H2O	-19.43	-3.66	15.76	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-25.16	6.84	32.00	Ni4(OH)6SO4
NiCO3	-7.96	-14.68	-6.72	NiCO3
Nsutite	-9.99	32.57	42.56	MnO2
O2(g)	-37.65	47.16	84.81	O2
Pb(OH)2	-2.59	5.73	8.31	Pb(OH)2
Pb2(OH)3Cl	-10.69	-1.90	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.74	11.46	26.20	PbO:Pb(OH)2
Pb2O3	-26.00	35.04	61.04	Pb2O3
Pb2OCO3	-9.50	-9.87	-0.37	PbO:PbCO3
Pb3(AsO4)2	-12.29	-6.42	5.87	Pb3(AsO4)2
Pb3O2CO3	-15.47	-4.14	11.33	PbCO3:2PbO
Pb3O2SO4	-13.21	-2.57	10.64	PbSO4:2PbO
Pb4(OH)6SO4	-17.94	3.16	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.35	3.16	22.51	PbSO4:3PbO
PbF2	-11.88	-19.31	-7.43	PbF2
PbMetal	-22.12	-17.85	4.27	Pb
PbO:0.3H2O	-7.25	5.73	12.98	PbO:0.33H2O
Phosgenite	-16.78	-36.59	-19.81	PbCl2:PbCO3
Plattnerite	-20.82	29.31	50.13	PbO2
Portlandite	-11.07	12.09	23.16	Ca(OH)2
Pyrochroite	-6.21	8.99	15.20	Mn(OH)2
Pyrolusite	-9.57	32.57	42.14	MnO2
Retgersite	-11.05	-13.11	-2.05	NiSO4:6H2O
Rhodochrosite	-1.22	-12.33	-11.11	MnCO3
Rhodochrosite(d)	-1.94	-12.33	-10.39	MnCO3
Scorodite	-5.34	8.18	13.52	FeAsO4:2H2O
Siderite	-2.28	-13.14	-10.86	FeCO3
Siderite(d)(3)	-2.69	-13.14	-10.45	FeCO3
Smithsonite	-3.86	-13.81	-9.95	ZnCO3
Tenorite	-1.51	6.29	7.80	CuO
Thenardite	-13.28	-13.45	-0.17	Na2SO4
Thermonatrite	-15.19	-15.03	0.16	Na2CO3:H2O
Trona	-22.25	-33.21	-10.96	NaHCO3:Na2CO3:2H2O
Witherite	-3.47	-12.04	-8.57	BaCO3
Zincite(c)	-3.88	7.52	11.40	ZnO
Zincosite	-15.47	-12.23	3.24	ZnSO4
Zn(OH)2-a	-4.93	7.52	12.45	Zn(OH)2
Zn(OH)2-b	-4.23	7.52	11.75	Zn(OH)2
Zn(OH)2-c	-4.68	7.52	12.20	Zn(OH)2
Zn(OH)2-e	-3.98	7.52	11.50	Zn(OH)2
Zn(OH)2-g	-4.19	7.52	11.71	Zn(OH)2
Zn2(OH)2SO4	-12.21	-4.71	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-13.52	1.68	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-14.77	-1.05	13.73	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-36.70	-16.95	19.75	ZnO:2ZnSO4
Zn4(OH)6SO4	-18.08	10.32	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-27.62	10.88	38.50	Zn5(OH)8Cl2
ZnCl2	-26.43	-19.20	7.24	ZnCl2
ZnCO3:H2O	-3.55	-13.81	-10.26	ZnCO3:H2O
ZnF2	-16.16	-17.52	-1.37	ZnF2
ZnMetal	-42.25	-16.06	26.19	Zn
ZnO(a)	-3.79	7.52	11.31	ZnO
ZnSO4:H2O	-11.79	-12.23	-0.45	ZnSO4:H2O

End of simulation.

```
------------------
Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 3-4m
           SOLUTION        4
           units           mg/l
           temp            20.3
           pH              7.77
           F               0.42
           Cl              1
           S(6)            29          as SO4
           Na              7.2
           K               4.6
           Mg              5.9
           Ca              25
           Alkalinity      97.6        as HCO3
           Al              0.01
           As              0.520
           Ba              0.092
           Cu              0.014
           Fe              0.09
           Mn              0.13
           Ni              0.004
           Pb              0.004
           U               1.61
           Zn              0.005
           END
```

```
-----
TITLE
-----

   Schneckentein 3-4m

-----------------------------------------
Beginning of initial solution calculations.
-----------------------------------------

Initial solution 4.

----------------------------Solution composition------------
-----------------

           Elements           Molality       Moles

           Al               3.707e-07   3.707e-07
           Alkalinity       1.600e-03   1.600e-03
           As               6.942e-06   6.942e-06
           Ba               6.700e-07   6.700e-07
           Ca               6.239e-04   6.239e-04
           Cl               2.821e-05   2.821e-05
           Cu               2.204e-07   2.204e-07
           F                2.211e-05   2.211e-05
           Fe               1.612e-06   1.612e-06
           K                1.177e-04   1.177e-04
           Mg               2.427e-04   2.427e-04
           Mn               2.367e-06   2.367e-06
           Na               3.132e-04   3.132e-04
           Ni               6.814e-08   6.814e-08
           Pb               1.931e-08   1.931e-08
           S(6)             3.019e-04   3.019e-04
           U                6.765e-06   6.765e-06
           Zn               7.650e-08   7.650e-08
```

```
----------------------------Description of solution----------------------
-----

                                    pH  =   7.770
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   3.262e-03
                     Mass of water (kg)  =   1.000e+00
                 Total carbon (mol/kg)  =   1.624e-03
                    Total CO2 (mol/kg)  =   1.624e-03
                   Temperature (deg C)  =  20.300
                Electrical balance (eq)  =  -7.366e-05
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  -1.73
                              Iterations  =  16
                                 Total H  = 1.110140e+02
                                 Total O  = 5.551229e+01
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	4.355e-07	4.094e-07	-6.361	-6.388	-0.027
H+	1.798e-08	1.698e-08	-7.745	-7.770	-0.025
H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	**3.707e-07**				
Al(OH)4-	3.668e-07	3.449e-07	-6.436	-6.462	-0.027
Al(OH)3	3.289e-09	3.292e-09	-8.483	-8.483	0.000
Al(OH)2+	5.767e-10	5.422e-10	-9.239	-9.266	-0.027
AlF2+	8.844e-12	8.315e-12	-11.053	-11.080	-0.027
AlOH+2	2.293e-12	1.792e-12	-11.640	-11.747	-0.107
AlF3	2.132e-12	2.134e-12	-11.671	-11.671	0.000
AlF+2	1.063e-12	8.303e-13	-11.974	-12.081	-0.107
AlF4-	1.849e-14	1.738e-14	-13.733	-13.760	-0.027
Al+3	7.270e-15	4.171e-15	-14.138	-14.380	-0.241
AlSO4+	2.835e-15	2.665e-15	-14.548	-14.574	-0.027
Al(SO4)2-	1.884e-17	1.772e-17	-16.725	-16.752	-0.027
AlHSO4+2	4.942e-24	3.861e-24	-23.306	-23.413	-0.107
As(3)	**7.452e-17**				
H3AsO3	7.228e-17	7.233e-17	-16.141	-16.141	0.000
H2AsO3-	2.244e-18	2.110e-18	-17.649	-17.676	-0.027
HAsO3-2	1.023e-22	7.991e-23	-21.990	-22.097	-0.107
H4AsO3+	6.473e-25	6.086e-25	-24.189	-24.216	-0.027
AsO3-3	2.685e-28	1.540e-28	-27.571	-27.812	-0.241
As(5)	**6.942e-06**				
HAsO4-2	6.411e-06	5.009e-06	-5.193	-5.300	-0.107
H2AsO4-	5.291e-07	4.975e-07	-6.276	-6.303	-0.027
AsO4-3	1.159e-09	6.647e-10	-8.936	-9.177	-0.241
H3AsO4	1.411e-12	1.412e-12	-11.850	-11.850	0.000
Ba	**6.700e-07**				
Ba+2	6.117e-07	4.779e-07	-6.213	-6.321	-0.107
BaSO4	5.144e-08	5.147e-08	-7.289	-7.288	0.000
BaHCO3+	6.052e-09	5.690e-09	-8.218	-8.245	-0.027
BaCO3	8.072e-10	8.079e-10	-9.093	-9.093	0.000
BaOH+	1.014e-12	9.534e-13	-11.994	-12.021	-0.027
C(4)	**1.624e-03**				
HCO3-	1.530e-03	1.440e-03	-2.815	-2.842	-0.026
CO2	5.862e-05	5.866e-05	-4.232	-4.232	0.000
CaHCO3+	8.414e-06	7.910e-06	-5.075	-5.102	-0.027
CO3-2	4.578e-06	3.596e-06	-5.339	-5.444	-0.105
UO2(CO3)2-2	4.559e-06	3.562e-06	-5.341	-5.448	-0.107
MgHCO3+	3.193e-06	3.002e-06	-5.496	-5.523	-0.027
CaCO3	2.575e-06	2.577e-06	-5.589	-5.589	0.000
UO2(CO3)3-4	2.116e-06	7.881e-07	-5.674	-6.103	-0.429
MgCO3	5.790e-07	5.794e-07	-6.237	-6.237	0.000
MnCO3	3.886e-07	3.889e-07	-6.410	-6.410	0.000
NaHCO3	2.380e-07	2.382e-07	-6.623	-6.623	0.000
MnHCO3+	1.859e-07	1.748e-07	-6.731	-6.758	-0.027
NiCO3	6.394e-08	6.399e-08	-7.194	-7.194	0.000
UO2CO3	4.606e-08	4.609e-08	-7.337	-7.336	0.000
CuCO3	4.497e-08	4.500e-08	-7.347	-7.347	0.000
ZnCO3	2.285e-08	2.286e-08	-7.641	-7.641	0.000
PbCO3	1.799e-08	1.800e-08	-7.745	-7.745	0.000
NaCO3-	1.646e-08	1.548e-08	-7.783	-7.810	-0.027
FeHCO3+	9.031e-09	8.491e-09	-8.044	-8.071	-0.027
ZnHCO3+	6.145e-09	5.777e-09	-8.211	-8.238	-0.027
BaHCO3+	6.052e-09	5.690e-09	-8.218	-8.245	-0.027
FeCO3	5.082e-09	5.086e-09	-8.294	-8.294	0.000
Zn(CO3)2-2	2.250e-09	1.758e-09	-8.648	-8.755	-0.107
CuHCO3+	1.789e-09	1.682e-09	-8.747	-8.774	-0.027
BaCO3	8.072e-10	8.079e-10	-9.093	-9.093	0.000
Ni(CO3)2-2	5.119e-10	3.999e-10	-9.291	-9.398	-0.107
NiHCO3+	5.076e-10	4.772e-10	-9.295	-9.321	-0.027
PbHCO3+	3.505e-10	3.295e-10	-9.455	-9.482	-0.027
Cu(CO3)2-2	2.608e-10	2.038e-10	-9.584	-9.691	-0.107
Pb(CO3)2-2	2.082e-10	1.626e-10	-9.682	-9.789	-0.107
(UO2)3(CO3)6-6	5.968e-13	6.467e-14	-12.224	-13.189	-0.965
UO2(CO3)3-5	5.614e-23	1.200e-23	-22.251	-22.921	-0.670
U(CO3)4-4	2.561e-30	9.539e-31	-29.592	-30.020	-0.429
U(CO3)5-6	2.321e-34	2.515e-35	-33.634	-34.599	-0.965
Ca	**6.239e-04**				
Ca+2	5.937e-04	4.661e-04	-3.226	-3.331	-0.105
CaSO4	1.910e-05	1.912e-05	-4.719	-4.719	0.000
CaHCO3+	8.414e-06	7.910e-06	-5.075	-5.102	-0.027
CaCO3	2.575e-06	2.577e-06	-5.589	-5.589	0.000
CaF+	7.914e-08	7.440e-08	-7.102	-7.128	-0.027
CaOH+	4.845e-09	4.555e-09	-8.315	-8.342	-0.027
CaHSO4+	1.913e-12	1.799e-12	-11.718	-11.745	-0.027
Cl	**2.821e-05**				
Cl-	2.821e-05	2.651e-05	-4.550	-4.577	-0.027
MnCl+	1.564e-10	1.470e-10	-9.806	-9.833	-0.027
FeCl+	2.294e-12	2.157e-12	-11.639	-11.666	-0.027
ZnCl+	1.959e-12	1.842e-12	-11.708	-11.735	-0.027
ZnOHCl	1.645e-12	1.647e-12	-11.784	-11.783	0.000
PbCl+	2.872e-13	2.700e-13	-12.542	-12.569	-0.027
NiCl+	1.700e-13	1.598e-13	-12.770	-12.796	-0.027
CuCl+	1.400e-13	1.316e-13	-12.854	-12.881	-0.027
CuCl2-	2.796e-14	2.629e-14	-13.553	-13.580	-0.027
MnCl2	1.700e-15	1.701e-15	-14.770	-14.769	0.000
UO2Cl+	1.229e-16	1.156e-16	-15.910	-15.937	-0.027
ZnCl2	5.011e-17	5.015e-17	-16.300	-16.300	0.000
NiCl2	1.537e-17	1.538e-17	-16.813	-16.813	0.000
PbCl2	1.239e-17	1.240e-17	-16.907	-16.906	0.000
CuCl2	1.778e-18	1.779e-18	-17.750	-17.750	0.000
CuCl3-2	1.388e-18	1.084e-18	-17.858	-17.965	-0.107
FeCl+2	3.817e-20	2.982e-20	-19.418	-19.526	-0.107
MnCl3-	1.321e-20	1.242e-20	-19.879	-19.906	-0.027
ZnCl3-	1.542e-21	1.449e-21	-20.812	-20.839	-0.027
PbCl3-	2.697e-22	2.536e-22	-21.569	-21.596	-0.027
UO2Cl2	1.570e-22	1.572e-22	-21.804	-21.804	0.000
FeCl2+	4.369e-24	4.108e-24	-23.360	-23.386	-0.027
CuCl3-	1.635e-25	1.537e-25	-24.786	-24.813	-0.027
ZnCl4-2	2.373e-26	1.854e-26	-25.625	-25.732	-0.107
PbCl4-2	3.970e-27	3.101e-27	-26.401	-26.508	-0.107
FeCl3	1.088e-29	1.089e-29	-28.963	-28.963	0.000
CuCl4-2	2.341e-32	1.829e-32	-31.631	-31.738	-0.107
UCl+3	0.000e+00	0.000e+00	-43.706	-43.947	-0.241
Cu(1)	**1.244e-10**				
Cu+	1.244e-10	1.170e-10	-9.905	-9.932	-0.027
CuCl2-	2.796e-14	2.629e-14	-13.553	-13.580	-0.027
CuCl3-2	1.388e-18	1.084e-18	-17.858	-17.965	-0.107
Cu(2)	**2.202e-07**				
Cu(OH)2	1.687e-07	1.688e-07	-6.773	-6.773	0.000
CuCO3	4.497e-08	4.500e-08	-7.347	-7.347	0.000
Cu+2	2.983e-09	2.330e-09	-8.525	-8.633	-0.107
CuHCO3+	1.789e-09	1.682e-09	-8.747	-8.774	-0.027
CuOH+	1.459e-09	1.372e-09	-8.836	-8.863	-0.027
Cu(CO3)2-2	2.608e-10	2.038e-10	-9.584	-9.691	-0.107
CuSO4	9.886e-11	9.894e-11	-10.005	-10.005	0.000
CuF+	8.843e-13	8.313e-13	-12.053	-12.080	-0.027
Cu2(OH)2+2	6.563e-13	5.127e-13	-12.183	-12.290	-0.107
Cu(OH)3-	6.370e-13	5.989e-13	-12.196	-12.223	-0.027
CuCl+	1.400e-13	1.316e-13	-12.854	-12.881	-0.027
Cu(OH)4-2	9.006e-18	7.036e-18	-17.045	-17.153	-0.107
CuCl2	1.778e-18	1.779e-18	-17.750	-17.750	0.000
CuCl3-	1.635e-25	1.537e-25	-24.786	-24.813	-0.027
CuCl4-2	2.341e-32	1.829e-32	-31.631	-31.738	-0.107
F	**2.211e-05**				
F-	2.179e-05	2.048e-05	-4.662	-4.689	-0.027
MgF+	2.396e-07	2.253e-07	-6.621	-6.647	-0.027
CaF+	7.914e-08	7.440e-08	-7.102	-7.128	-0.027
NaF	3.464e-09	3.466e-09	-8.460	-8.460	0.000
HF	4.794e-10	4.798e-10	-9.319	-9.319	0.000
MnF+	2.052e-10	1.929e-10	-9.688	-9.715	-0.027
FeF+	1.284e-11	1.208e-11	-10.891	-10.918	-0.027
ZnF+	9.235e-12	8.682e-12	-11.035	-11.061	-0.027
AlF2+	8.844e-12	8.315e-12	-11.053	-11.080	-0.027
UO2F+	8.227e-12	7.735e-12	-11.085	-11.112	-0.027
AlF3	2.132e-12	2.134e-12	-11.671	-11.671	0.000
AlF+2	1.063e-12	8.303e-13	-11.974	-12.081	-0.107
NiF+	1.043e-12	9.809e-13	-11.982	-12.008	-0.027
CuF+	8.843e-13	8.313e-13	-12.053	-12.080	-0.027
UO2F2	5.351e-13	5.355e-13	-12.272	-12.271	0.000
PbF+	1.116e-13	1.049e-13	-12.952	-12.979	-0.027
HF2-	3.857e-14	3.626e-14	-13.414	-13.441	-0.027
AlF4-	1.849e-14	1.738e-14	-13.733	-13.760	-0.027
UO2F3-	2.220e-15	2.087e-15	-14.654	-14.681	-0.027
FeF+2	1.674e-15	1.308e-15	-14.776	-14.883	-0.107
FeF2+	1.072e-15	1.008e-15	-14.970	-14.997	-0.027
PbF2	4.385e-17	4.388e-17	-16.358	-16.358	0.000
FeF3	3.216e-17	3.219e-17	-16.493	-16.492	0.000
H2F2	7.087e-19	7.093e-19	-18.150	-18.149	0.000
UO2F4-2	3.499e-19	2.733e-19	-18.456	-18.563	-0.107
PbF3-	6.926e-21	6.511e-21	-20.160	-20.186	-0.027
PbF4-2	8.172e-26	6.384e-26	-25.088	-25.195	-0.107
UF3+	2.606e-34	2.450e-34	-33.584	-33.611	-0.027
UF2+2	6.539e-35	5.109e-35	-34.184	-34.292	-0.107
UF4	4.089e-35	4.092e-35	-34.388	-34.388	0.000
UF+3	5.297e-37	3.039e-37	-36.276	-36.517	-0.241
UF5-	2.472e-38	2.324e-38	-37.607	-37.634	-0.027
UF6-2	0.000e+00	0.000e+00	-40.107	-40.214	-0.107
Fe(2)	**9.247e-08**				
Fe+2	7.546e-08	5.895e-08	-7.122	-7.230	-0.107
FeHCO3+	9.031e-09	8.491e-09	-8.044	-8.071	-0.027
FeCO3	5.082e-09	5.086e-09	-8.294	-8.294	0.000
FeSO4	2.063e-09	2.065e-09	-8.685	-8.685	0.000
FeOH+	8.172e-10	7.682e-10	-9.088	-9.115	-0.027
FeF+	1.284e-11	1.208e-11	-10.891	-10.918	-0.027
FeCl+	2.294e-12	2.157e-12	-11.639	-11.666	-0.027
Fe(OH)2	2.540e-13	2.542e-13	-12.595	-12.595	0.000
Fe(OH)3-	5.643e-16	5.305e-16	-15.248	-15.275	-0.027
FeHSO4+	2.419e-16	2.274e-16	-15.616	-15.643	-0.027

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-2.18	8.93	11.11	Al(OH)3
AlAsO4:2H2O	-7.72	-2.92	4.80	AlAsO4:2H2O
AlumK	-20.42	-25.67	-5.25	KAl(SO4)2:12H2O
Alunite	-7.00	-7.81	-0.81	KAl3(SO4)2(OH)6
Anglesite	-5.39	-13.21	-7.82	PbSO4
Anhydrite	-2.65	-7.00	-4.34	CaSO4
Antlerite	-6.78	1.51	8.29	Cu3(OH)4SO4
Aragonite	-0.47	-8.78	-8.31	CaCO3
Arsenolite	-61.59	-141.56	-79.97	As4O6
Artinite	-7.32	2.61	9.94	MgCO3:Mg(OH)2:3H2O
As2O5	-30.46	-23.70	6.76	As2O5
Atacamite	-6.09	1.47	7.56	Cu2(OH)3Cl
Azurite	-4.61	-21.25	-16.63	Cu3(OH)2(CO3)2
B-UO2(OH)2	-1.67	4.03	5.71	UO2(OH)2
Ba3(AsO4)2	12.90	3.96	-8.95	Ba3(AsO4)2
BaF2	-9.93	-15.70	-5.77	BaF2
Barite	0.06	-9.99	-10.05	BaSO4
Basaluminite	-6.19	16.51	22.70	Al4(OH)10SO4
Bianchite	-9.40	-11.16	-1.76	ZnSO4:6H2O
Birnessite	-10.39	33.21	43.60	MnO2
Bixbyite	-8.31	42.89	51.19	Mn2O3
Boehmite	0.02	8.93	8.91	AlOOH
Brochantite	-6.92	8.42	15.34	Cu4(OH)6SO4
Brucite	-5.36	11.80	17.16	Mg(OH)2
Bunsenite	-5.81	6.92	12.73	NiO
Ca3(AsO4)2:4w	-9.44	12.93	22.37	Ca3(AsO4)2:4H2O
Calcite	-0.32	-8.78	-8.45	CaCO3
Cerrusite	-1.80	-14.98	-13.19	PbCO3
Chalcanthite	-9.64	-12.30	-2.66	CuSO4:5H2O
Claudetite	-61.34	-141.56	-80.22	As4O6
CO2(g)	-2.82	-20.98	-18.16	CO2
Cotunnite	-13.86	-18.69	-4.84	PbCl2
Cu(OH)2	-1.91	6.91	8.82	Cu(OH)2
Cu2SO4	-21.64	-28.93	-7.30	Cu2SO4
Cu3(AsO4)2:6w	-9.13	-2.98	6.15	Cu3(AsO4)2:6H2O
CuCO3	-4.45	-14.08	-9.63	CuCO3
CuF	-21.85	-17.32	4.52	CuF
CuF2	-17.55	-18.01	-0.46	CuF2
CuF2:2H2O	-13.50	-18.01	-4.51	CuF2:2H2O
CuMetal	-4.97	-16.63	-11.66	Cu
CuOCuSO4	-17.34	-5.39	11.95	CuO:CuSO4
CupricFerrite	14.47	47.07	32.60	CuFe2O4
Cuprite	-2.70	-9.73	-7.02	Cu2O
CuprousFerrite	13.66	15.22	1.56	CuFeO2
CuSO4	-15.52	-12.30	3.22	CuSO4
Diaspore	1.76	8.93	7.17	AlOOH
Dolomite	-0.98	-17.96	-16.98	CaMg(CO3)2
Dolomite(d)	-1.55	-17.96	-16.41	CaMg(CO3)2
Epsomite	-5.24	-7.41	-2.17	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.28	16.38	10.09	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.06	20.08	18.02	Fe(OH)3
Fe3(OH)8	1.98	48.47	46.49	Fe3(OH)8
Fluorite	-2.05	-12.71	-10.66	CaF2
Gibbsite	0.55	8.93	8.38	Al(OH)3
Goethite	7.95	20.08	12.13	FeOOH
Goslarite	-9.17	-11.16	-2.00	ZnSO4:7H2O
Gummite	-6.64	4.03	10.67	UO3
Gypsum	-2.42	-7.00	-4.58	CaSO4:2H2O
H2(g)	-23.49	-23.54	-0.05	H2
Halite	-9.68	-8.11	1.57	NaCl
Hausmannite	-9.65	52.56	62.21	Mn3O4
Hematite	17.54	40.16	22.62	Fe2O3
Huntite	-6.67	-36.33	-29.67	CaMg3(CO3)4
Hydrocerrusite	-6.51	-23.97	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-16.79	-24.94	-8.15	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-6.51	24.89	31.40	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-4.92	25.64	30.56	KFe3(SO4)2(OH)6
Jarosite-Na	-8.48	26.06	34.55	NaFe3(SO4)2(OH)6
JarositeH	-12.83	21.83	34.66	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-7.05	-10.28	-3.23	AlOHSO4
Langite	-8.83	8.42	17.26	Cu4(OH)6SO4:H2O
Larnakite	-7.00	-7.21	-0.20	PbO:PbSO4
Laurionite	-6.97	-6.35	0.62	PbOHCl
Litharge	-6.91	6.00	12.91	PbO
Maghemite	7.51	40.16	32.65	Fe2O3
Magnesite	-1.23	-9.19	-7.96	MgCO3
Magnetite	17.87	48.47	30.60	Fe3O4
Malachite	-2.18	-7.17	-4.99	Cu2(OH)2CO3
Manganite	-3.90	21.44	25.34	MnOOH
Massicot	-7.11	6.00	13.11	PbO
Matlockite	-9.28	-18.81	-9.52	PbClF
Melanothallite	-21.66	-17.79	3.87	CuCl2
Melanterite	-8.63	-10.90	-2.27	FeSO4:7H2O
Minium	-33.36	41.54	74.90	Pb3O4
Mirabilite	-9.39	-10.73	-1.34	Na2SO4:10H2O
Mn2(SO4)3	-61.11	-14.74	46.37	Mn2(SO4)3
Mn3(AsO4):8H2O	-7.25	5.32	12.57	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-17.53	-15.02	2.51	MnCl2:4H2O
MnSO4	-12.38	-9.53	2.85	MnSO4
Morenosite	-9.89	-12.29	-2.39	NiSO4:7H2O
Na4UO2(CO3)3	-25.68	-41.97	-16.29	Na4UO2(CO3)3
Nahcolite	-5.78	-16.75	-10.96	NaHCO3
Nantokite	-7.63	-17.21	-9.58	CuCl
Natron	-11.01	-12.51	-1.50	Na2CO3:10H2O
Nesquehonite	-3.63	-9.19	-5.55	MgCO3:3H2O
Ni(OH)2	-3.52	6.92	10.44	Ni(OH)2
Ni3(AsO4)2:8H2O	-18.70	-2.94	15.76	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-23.53	8.47	32.00	Ni4(OH)6SO4
NiCO3	-7.34	-14.06	-6.72	NiCO3
Nsutite	-9.35	33.21	42.56	MnO2
O2(g)	-37.73	47.08	84.81	O2
Pb(OH)2	-2.31	6.00	8.31	Pb(OH)2
Pb2(OH)3Cl	-9.14	-0.35	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.20	12.00	26.20	PbO:Pb(OH)2
Pb2O3	-25.50	35.54	61.04	Pb2O3
Pb2OCO3	-8.62	-8.99	-0.37	PbO:PbCO3
Pb3(AsO4)2	-11.57	-5.70	5.87	Pb3(AsO4)2
Pb3O2CO3	-14.32	-2.99	11.33	PbCO3:2PbO
Pb3O2SO4	-11.85	-1.21	10.64	PbSO4:2PbO
Pb4(OH)6SO4	-16.31	4.79	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.72	4.79	22.51	PbSO4:3PbO
PbF2	-11.49	-18.92	-7.43	PbF2
PbMetal	-21.81	-17.54	4.27	Pb
PbO:0.3H2O	-6.98	6.00	12.98	PbO:0.33H2O
Phosgenite	-13.87	-33.68	-19.81	PbCl2:PbCO3
Plattnerite	-20.59	29.54	50.13	PbO2
Portlandite	-10.96	12.21	23.16	Ca(OH)2
Pyrochroite	-5.53	9.67	15.20	Mn(OH)2
Pyrolusite	-8.93	33.21	42.14	MnO2
Retgersite	-10.23	-12.29	-2.05	NiSO4:6H2O
Rhodochrosite	-0.20	-11.31	-11.11	MnCO3
Rhodochrosite(d)	-0.92	-11.31	-10.39	MnCO3
Rutherfordine	-2.52	-16.95	-14.43	UO2CO3
Schoepite	-1.51	4.03	5.55	UO2(OH)2:H2O
Scorodite	-5.29	8.23	13.52	FeAsO4:2H2O
Siderite	-1.81	-12.67	-10.86	FeCO3
Siderite(d)(3)	-2.22	-12.67	-10.45	FeCO3
Smithsonite	-2.99	-12.94	-9.95	ZnCO3
Tenorite	-0.89	6.91	7.80	CuO
Thenardite	-10.56	-10.73	-0.17	Na2SO4
Thermonatrite	-12.67	-12.51	0.16	Na2CO3:H2O
Trona	-18.30	-29.25	-10.96	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-26.07	-38.72	-12.64	U(OH)2SO4
U3O8(c)	-5.00	-11.44	-6.44	U3O8
U4O9(c)	-14.52	-54.49	-39.97	U4O9
UF4(c)	-41.51	-69.34	-27.83	UF4
UF4:2.5H2O	-32.34	-69.34	-37.01	UF4:2.5H2O
UO2(a)	-10.16	-19.51	-9.34	UO2
UO3(gamma)	-3.91	4.03	7.95	UO3
Uraninite(c)	-5.48	-19.51	-14.03	UO2
Witherite	-3.19	-11.76	-8.57	BaCO3
Zincite(c)	-3.35	8.04	11.40	ZnO
Zincosite	-14.40	-11.16	3.24	ZnSO4
Zn(OH)2-a	-4.41	8.04	12.45	Zn(OH)2
Zn(OH)2-b	-3.71	8.04	11.75	Zn(OH)2
Zn(OH)2-c	-4.16	8.04	12.20	Zn(OH)2
Zn(OH)2-e	-3.46	8.04	11.50	Zn(OH)2
Zn(OH)2-g	-3.67	8.04	11.71	Zn(OH)2
Zn2(OH)2SO4	-10.62	-3.12	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-11.46	3.74	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-13.30	0.43	13.73	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-34.03	-14.29	19.75	ZnO:2ZnSO4
Zn4(OH)6SO4	-15.43	12.97	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-22.98	15.52	38.50	Zn5(OH)8Cl2
ZnCl2	-23.89	-16.65	7.24	ZnCl2
ZnCO3:H2O	-2.68	-12.94	-10.26	ZnCO3:H2O
ZnF2	-15.51	-16.87	-1.37	ZnF2
ZnMetal	-41.69	-15.50	26.19	Zn
ZnO(a)	-3.27	8.04	11.31	ZnO
ZnSO4:H2O	-10.72	-11.16	-0.45	ZnSO4:H2O

End of simulation.

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Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 4-5m
           SOLUTION        5
           units           mg/l
           temp            20.4
           pH              7.73
           F               2.4
           Cl              1.2
           S(6)            81          as SO4
           Na              22.5
           K               5.9
           Mg              8.6
           Ca              28
           Alkalinity      88.45       as HCO3
           Al              0.04
           As              0.32
           Ba              0.066
           Cu              0.006
           Fe              0.09
           Mn              0.37
           Ni              0.004
           Pb              0.003
           U               1.42
           Zn              0.008
           END
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TITLE
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   Schneckentein 4-5m

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Beginning of initial solution calculations.
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Initial solution 5.

----------------------------Solution composition------------
----------------

           Elements           Molality       Moles

           Al               1.483e-06   1.483e-06
           Alkalinity       1.450e-03   1.450e-03
           As               4.272e-06   4.272e-06
           Ba               4.807e-07   4.807e-07
           Ca               6.988e-04   6.988e-04
           Cl               3.386e-05   3.386e-05
           Cu               9.444e-08   9.444e-08
           F                1.264e-04   1.264e-04
           Fe               1.612e-06   1.612e-06
           K                1.509e-04   1.509e-04
           Mg               3.538e-04   3.538e-04
           Mn               6.736e-06   6.736e-06
           Na               9.789e-04   9.789e-04
           Ni               6.815e-08   6.815e-08
           Pb               1.448e-08   1.448e-08
           S(6)             8.434e-04   8.434e-04
           U                5.967e-06   5.967e-06
           Zn               1.224e-07   1.224e-07
```

```
----------------------------Description of solution----------------------
-----

                                    pH  =   7.730
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   4.824e-03
                     Mass of water (kg)  =   1.000e+00
                 Total carbon (mol/kg)  =   1.474e-03
                    Total CO2 (mol/kg)  =   1.474e-03
                   Temperature (deg C)  =  20.400
                Electrical balance (eq)  =  -3.298e-05
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  -0.54
                              Iterations  =  28
                                 Total H  = 1.110138e+02
                                 Total O  = 5.551399e+01
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	4.052e-07	3.764e-07	-6.392	-6.424	-0.032
H+	1.991e-08	1.862e-08	-7.701	-7.730	-0.029
H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	**1.483e-06**				
Al(OH)4-	1.462e-06	1.358e-06	-5.835	-5.867	-0.032
Al(OH)3	1.418e-08	1.420e-08	-7.848	-7.848	0.000
Al(OH)2+	2.739e-09	2.544e-09	-8.562	-8.594	-0.032
AlF3	2.107e-09	2.109e-09	-8.676	-8.676	0.000
AlF2+	1.574e-09	1.462e-09	-8.803	-8.835	-0.032
AlF4-	1.040e-10	9.661e-11	-9.983	-10.015	-0.032
AlF+2	3.486e-11	2.594e-11	-10.458	-10.586	-0.128
AlOH+2	1.227e-11	9.133e-12	-10.911	-11.039	-0.128
Al+3	4.504e-14	2.316e-14	-13.346	-13.635	-0.289
AlSO4+	4.217e-14	3.916e-14	-13.375	-13.407	-0.032
Al(SO4)2-	7.411e-16	6.883e-16	-15.130	-15.162	-0.032
AlHSO4+2	8.367e-23	6.226e-23	-22.077	-22.206	-0.128
As(3)	**6.165e-17**				
H3AsO3	5.993e-17	5.999e-17	-16.222	-16.222	0.000
H2AsO3-	1.725e-18	1.602e-18	-17.763	-17.795	-0.032
HAsO3-2	7.471e-23	5.559e-23	-22.127	-22.255	-0.128
H4AsO3+	5.959e-25	5.535e-25	-24.225	-24.257	-0.032
AsO3-3	1.907e-28	9.807e-29	-27.720	-28.008	-0.289
As(5)	**4.272e-06**				
HAsO4-2	3.929e-06	2.923e-06	-5.406	-5.534	-0.128
H2AsO4-	3.426e-07	3.182e-07	-6.465	-6.497	-0.032
AsO4-3	6.899e-10	3.548e-10	-9.161	-9.450	-0.289
H3AsO4	9.905e-13	9.916e-13	-12.004	-12.004	0.000
Ba	**4.807e-07**				
Ba+2	3.936e-07	2.929e-07	-6.405	-6.533	-0.128
BaSO4	8.329e-08	8.338e-08	-7.079	-7.079	0.000
BaHCO3+	3.365e-09	3.125e-09	-8.473	-8.505	-0.032
BaCO3	4.047e-10	4.051e-10	-9.393	-9.392	0.000
BaOH+	5.738e-13	5.329e-13	-12.241	-12.273	-0.032
C(4)	**1.474e-03**				
HCO3-	1.383e-03	1.287e-03	-2.859	-2.891	-0.031
CO2	5.731e-05	5.737e-05	-4.242	-4.241	0.000
CaHCO3+	7.802e-06	7.246e-06	-5.108	-5.140	-0.032
UO2(CO3)2-2	4.094e-06	3.047e-06	-5.388	-5.516	-0.128
CO3-2	3.916e-06	2.937e-06	-5.407	-5.532	-0.125
MgHCO3+	3.820e-06	3.548e-06	-5.418	-5.450	-0.032
CaCO3	2.155e-06	2.157e-06	-5.667	-5.666	0.000
UO2(CO3)3-4	1.781e-06	5.461e-07	-5.749	-6.263	-0.513
MnCO3	8.746e-07	8.755e-07	-6.058	-6.058	0.000
NaHCO3	6.552e-07	6.559e-07	-6.184	-6.183	0.000
MgCO3	6.260e-07	6.267e-07	-6.203	-6.203	0.000
MnHCO3+	4.634e-07	4.304e-07	-6.334	-6.366	-0.032
NiCO3	6.294e-08	6.301e-08	-7.201	-7.201	0.000
UO2CO3	4.814e-08	4.819e-08	-7.317	-7.317	0.000
NaCO3-	4.217e-08	3.916e-08	-7.375	-7.407	-0.032
ZnCO3	3.030e-08	3.033e-08	-7.519	-7.518	0.000
CuCO3	1.888e-08	1.890e-08	-7.724	-7.724	0.000
PbCO3	1.333e-08	1.334e-08	-7.875	-7.875	0.000
FeHCO3+	1.022e-08	9.495e-09	-7.990	-8.022	-0.032
ZnHCO3+	9.028e-09	8.385e-09	-8.044	-8.077	-0.032
FeCO3	5.193e-09	5.199e-09	-8.285	-8.284	0.000
BaHCO3+	3.365e-09	3.125e-09	-8.473	-8.505	-0.032
Zn(CO3)2-2	2.559e-09	1.904e-09	-8.592	-8.720	-0.128
CuHCO3+	8.321e-10	7.729e-10	-9.080	-9.112	-0.032
NiHCO3+	5.535e-10	5.141e-10	-9.257	-9.289	-0.032
Ni(CO3)2-2	4.321e-10	3.215e-10	-9.364	-9.493	-0.128
BaCO3	4.047e-10	4.051e-10	-9.393	-9.392	0.000
PbHCO3+	2.877e-10	2.672e-10	-9.541	-9.573	-0.032
Pb(CO3)2-2	1.323e-10	9.841e-11	-9.879	-10.007	-0.128
Cu(CO3)2-2	9.391e-11	6.988e-11	-10.027	-10.156	-0.128
(UO2)3(CO3)6-6	5.743e-13	4.016e-14	-12.241	-13.396	-1.155
UO2(CO3)3-5	5.302e-23	8.358e-24	-22.276	-23.078	-0.802
U(CO3)4-4	2.508e-30	7.688e-31	-29.601	-30.114	-0.513
U(CO3)5-6	2.395e-34	1.675e-35	-33.621	-34.776	-1.155
Ca	**6.988e-04**				
Ca+2	6.366e-04	4.771e-04	-3.196	-3.321	-0.125
CaSO4	5.171e-05	5.176e-05	-4.286	-4.286	0.000
CaHCO3+	7.802e-06	7.246e-06	-5.108	-5.140	-0.032
CaCO3	2.155e-06	2.157e-06	-5.667	-5.666	0.000
CaF+	4.621e-07	4.292e-07	-6.335	-6.367	-0.032
CaOH+	4.578e-09	4.252e-09	-8.339	-8.371	-0.032
CaHSO4+	5.756e-12	5.346e-12	-11.240	-11.272	-0.032
Cl	**3.386e-05**				
Cl-	3.386e-05	3.142e-05	-4.470	-4.503	-0.032
MnCl+	5.173e-10	4.804e-10	-9.286	-9.318	-0.032
ZnCl+	3.836e-12	3.562e-12	-11.416	-11.448	-0.032
FeCl+	3.446e-12	3.201e-12	-11.463	-11.495	-0.032
ZnOHCl	2.889e-12	2.892e-12	-11.539	-11.539	0.000
PbCl+	3.136e-13	2.912e-13	-12.504	-12.536	-0.032
NiCl+	2.460e-13	2.284e-13	-12.609	-12.641	-0.032
CuCl+	8.681e-14	8.063e-14	-13.061	-13.094	-0.032
CuCl2-	2.046e-14	1.901e-14	-13.689	-13.721	-0.032
MnCl2	6.582e-15	6.589e-15	-14.182	-14.181	0.000
UO2Cl+	1.890e-16	1.755e-16	-15.724	-15.756	-0.032
ZnCl2	1.149e-16	1.150e-16	-15.940	-15.939	0.000
NiCl2	2.603e-17	2.606e-17	-16.585	-16.584	0.000
PbCl2	1.581e-17	1.582e-17	-16.801	-16.801	0.000
CuCl2	1.292e-18	1.293e-18	-17.889	-17.888	0.000
CuCl3-2	1.249e-18	9.296e-19	-17.903	-18.032	-0.128
MnCl3-	6.139e-20	5.702e-20	-19.212	-19.244	-0.032
FeCl+2	5.999e-20	4.464e-20	-19.222	-19.350	-0.128
ZnCl3-	4.245e-21	3.943e-21	-20.372	-20.404	-0.032
PbCl3-	4.131e-22	3.837e-22	-21.384	-21.416	-0.032
UO2Cl2	2.828e-22	2.831e-22	-21.549	-21.548	0.000
FeCl2+	7.822e-24	7.265e-24	-23.107	-23.139	-0.032
CuCl3-	1.429e-25	1.327e-25	-24.845	-24.877	-0.032
ZnCl4-2	8.040e-26	5.983e-26	-25.095	-25.223	-0.128
PbCl4-2	7.480e-27	5.566e-27	-26.126	-26.254	-0.128
FeCl3	2.280e-29	2.283e-29	-28.642	-28.642	0.000
CuCl4-2	2.521e-32	1.876e-32	-31.598	-31.727	-0.128
UCl+3	0.000e+00	0.000e+00	-43.327	-43.616	-0.289
Cu(1)	**6.485e-11**				
Cu+	6.483e-11	6.022e-11	-10.188	-10.220	-0.032
CuCl2-	2.046e-14	1.901e-14	-13.689	-13.721	-0.032
CuCl3-2	1.249e-18	9.296e-19	-17.903	-18.032	-0.128
Cu(2)	**9.438e-08**				
Cu(OH)2	7.213e-08	7.221e-08	-7.142	-7.141	0.000
CuCO3	1.888e-08	1.890e-08	-7.724	-7.724	0.000
Cu+2	1.611e-09	1.199e-09	-8.793	-8.921	-0.128
CuHCO3+	8.321e-10	7.729e-10	-9.080	-9.112	-0.032
CuOH+	6.930e-10	6.436e-10	-9.159	-9.191	-0.032
CuSO4	1.344e-10	1.346e-10	-9.871	-9.871	0.000
Cu(CO3)2-2	9.391e-11	6.988e-11	-10.027	-10.156	-0.128
CuF+	2.591e-12	2.407e-12	-11.586	-11.619	-0.032
Cu(OH)3-	2.516e-13	2.336e-13	-12.599	-12.631	-0.032
Cu2(OH)2+2	1.532e-13	1.140e-13	-12.815	-12.943	-0.128
CuCl+	8.681e-14	8.063e-14	-13.061	-13.094	-0.032
Cu(OH)4-2	3.364e-18	2.503e-18	-17.473	-17.601	-0.128
CuCl2	1.292e-18	1.293e-18	-17.889	-17.888	0.000
CuCl3-	1.429e-25	1.327e-25	-24.845	-24.877	-0.032
CuCl4-2	2.521e-32	1.876e-32	-31.598	-31.727	-0.128
F	**1.264e-04**				
F-	1.240e-04	1.152e-04	-3.907	-3.939	-0.032
MgF+	1.807e-06	1.678e-06	-5.743	-5.775	-0.032
CaF+	4.621e-07	4.292e-07	-6.335	-6.367	-0.032
NaF	6.002e-08	6.009e-08	-7.222	-7.221	0.000
MnF+	3.220e-09	2.991e-09	-8.492	-8.524	-0.032
HF	2.960e-09	2.963e-09	-8.529	-8.528	0.000
AlF3	2.107e-09	2.109e-09	-8.676	-8.676	0.000
AlF2+	1.574e-09	1.462e-09	-8.803	-8.835	-0.032
AlF4-	1.040e-10	9.661e-11	-9.983	-10.015	-0.032
FeF+	9.152e-11	8.500e-11	-10.038	-10.071	-0.032
ZnF+	8.551e-11	7.942e-11	-10.068	-10.100	-0.032
UO2F+	5.994e-11	5.567e-11	-10.222	-10.254	-0.032
AlF+2	3.486e-11	2.594e-11	-10.458	-10.586	-0.128
UO2F2	2.165e-11	2.167e-11	-10.665	-10.664	0.000
NiF+	7.162e-12	6.652e-12	-11.145	-11.177	-0.032
CuF+	2.591e-12	2.407e-12	-11.586	-11.619	-0.032
HF2-	1.357e-12	1.260e-12	-11.867	-11.900	-0.032
PbF+	5.765e-13	5.355e-13	-12.239	-12.271	-0.032
UO2F3-	5.113e-13	4.749e-13	-12.291	-12.323	-0.032
FeF2+	4.331e-14	4.022e-14	-13.363	-13.396	-0.032
FeF+2	1.246e-14	9.273e-15	-13.904	-14.033	-0.128
FeF3	7.219e-15	7.227e-15	-14.142	-14.141	0.000
PbF2	1.258e-15	1.259e-15	-14.900	-14.900	0.000
UO2F4-2	4.699e-16	3.496e-16	-15.328	-15.456	-0.128
H2F2	2.693e-17	2.696e-17	-16.570	-16.569	0.000
PbF3-	1.131e-18	1.051e-18	-17.946	-17.979	-0.032
PbF4-2	7.784e-23	5.792e-23	-22.109	-22.237	-0.128
UF3+	8.502e-32	7.896e-32	-31.070	-31.103	-0.032
UF4	7.404e-32	7.412e-32	-31.131	-31.130	0.000
UF2+2	3.933e-33	2.927e-33	-32.405	-32.534	-0.128
UF5-	2.557e-34	2.375e-34	-33.592	-33.624	-0.032
UF+3	6.020e-36	3.096e-36	-35.220	-35.509	-0.289
UF6-2	4.711e-36	3.506e-36	-35.327	-35.455	-0.128
Fe(2)	**1.225e-07**				
Fe+2	9.918e-08	7.380e-08	-7.004	-7.132	-0.128
FeHCO3+	1.022e-08	9.495e-09	-7.990	-8.022	-0.032
FeSO4	6.837e-09	6.844e-09	-8.165	-8.165	0.000
FeCO3	5.193e-09	5.199e-09	-8.285	-8.284	0.000
FeOH+	9.517e-10	8.839e-10	-9.021	-9.054	-0.032
FeF+	9.152e-11	8.500e-11	-10.038	-10.071	-0.032
FeCl+	3.446e-12	3.201e-12	-11.463	-11.495	-0.032
Fe(OH)2	2.688e-13	2.691e-13	-12.571	-12.570	0.000
FeHSO4+	8.903e-16	8.269e-16	-15.050	-15.083	-0.032
Fe(OH)3-	5.521e-16	5.128e-16	-15.258	-15.290	-0.032

Fe(3)	1.489e-06					
	Fe(OH)3	1.206e-06	1.208e-06	-5.919	-5.918	0.000
	Fe(OH)2+	2.304e-07	2.140e-07	-6.638	-6.670	-0.032
	Fe(OH)4-	5.278e-08	4.902e-08	-7.278	-7.310	-0.032
	FeOH+2	1.931e-11	1.437e-11	-10.714	-10.843	-0.128
	FeF2+	4.331e-14	4.022e-14	-13.363	-13.396	-0.032
	FeF+2	1.246e-14	9.273e-15	-13.904	-14.033	-0.128
	FeF3	7.219e-15	7.227e-15	-14.142	-14.141	0.000
	FeSO4+	3.299e-16	3.064e-16	-15.482	-15.514	-0.032
	Fe+3	1.061e-16	5.456e-17	-15.974	-16.263	-0.289
	Fe(SO4)2-	4.026e-18	3.739e-18	-17.395	-17.427	-0.032
	FeCl+2	5.999e-20	4.464e-20	-19.222	-19.350	-0.128
	Fe2(OH)2+4	2.198e-20	6.739e-21	-19.658	-20.171	-0.513
	FeHSO4+2	2.064e-23	1.535e-23	-22.685	-22.814	-0.128
	FeCl2+	7.822e-24	7.265e-24	-23.107	-23.139	-0.032
	Fe3(OH)4+5	2.941e-24	4.637e-25	-23.531	-24.334	-0.802
	FeCl3	2.280e-29	2.283e-29	-28.642	-28.642	0.000
H(0)	4.959e-27					
	H2	2.479e-27	2.482e-27	-26.606	-26.605	0.000
K	1.509e-04					
	K+	1.504e-04	1.395e-04	-3.823	-3.855	-0.032
	KSO4-	5.692e-07	5.287e-07	-6.245	-6.277	-0.032
Mg	3.538e-04					
	Mg+2	3.192e-04	2.400e-04	-3.496	-3.620	-0.124
	MgSO4	2.831e-05	2.834e-05	-4.548	-4.548	0.000
	MgHCO3+	3.820e-06	3.548e-06	-5.418	-5.450	-0.032
	MgF+	1.807e-06	1.678e-06	-5.743	-5.775	-0.032
	MgCO3	6.260e-07	6.267e-07	-6.203	-6.203	0.000
	MgOH+	3.304e-08	3.069e-08	-7.481	-7.513	-0.032
Mn(2)	6.736e-06					
	Mn+2	5.045e-06	3.754e-06	-5.297	-5.426	-0.128
	MnCO3	8.746e-07	8.755e-07	-6.058	-6.058	0.000
	MnHCO3+	4.634e-07	4.304e-07	-6.334	-6.366	-0.032
	MnSO4	3.464e-07	3.468e-07	-6.460	-6.460	0.000
	MnOH+	3.812e-09	3.540e-09	-8.419	-8.451	-0.032
	MnF+	3.220e-09	2.991e-09	-8.492	-8.524	-0.032
	MnCl+	5.173e-10	4.804e-10	-9.286	-9.318	-0.032
	MnCl2	6.582e-15	6.589e-15	-14.182	-14.181	0.000
	Mn(OH)3-	9.918e-18	9.212e-18	-17.004	-17.036	-0.032
	MnCl3-	6.139e-20	5.702e-20	-19.212	-19.244	-0.032
Mn(3)	1.140e-27					
	Mn+3	1.140e-27	5.863e-28	-26.943	-27.232	-0.289
Mn(6)	0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-47.620	-47.749	-0.128
Mn(7)	0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-53.406	-53.438	-0.032
Na	9.789e-04					
	Na+	9.755e-04	9.066e-04	-3.011	-3.043	-0.032
	NaSO4-	2.698e-06	2.506e-06	-5.569	-5.601	-0.032
	NaHCO3	6.552e-07	6.559e-07	-6.184	-6.183	0.000
	NaF	6.002e-08	6.009e-08	-7.222	-7.221	0.000
	NaCO3-	4.217e-08	3.916e-08	-7.375	-7.407	-0.032
Ni	6.815e-08					
	NiCO3	6.294e-08	6.301e-08	-7.201	-7.201	0.000
	Ni+2	3.890e-09	2.895e-09	-8.410	-8.538	-0.128
	NiHCO3+	5.535e-10	5.141e-10	-9.257	-9.289	-0.032
	Ni(CO3)2-2	4.321e-10	3.215e-10	-9.364	-9.493	-0.128
	NiSO4	3.076e-10	3.079e-10	-9.512	-9.512	0.000
	NiOH+	1.663e-11	1.545e-11	-10.779	-10.811	-0.032
	NiF+	7.162e-12	6.652e-12	-11.145	-11.177	-0.032
	Ni(OH)2	8.337e-13	8.347e-13	-12.079	-12.078	0.000
	NiCl+	2.460e-13	2.284e-13	-12.609	-12.641	-0.032
	Ni(SO4)2-2	1.314e-14	9.779e-15	-13.881	-14.010	-0.128
	Ni(OH)3-	4.826e-16	4.482e-16	-15.316	-15.349	-0.032
	NiCl2	2.603e-17	2.606e-17	-16.585	-16.584	0.000
O(0)	0.000e+00					
	O2	0.000e+00	0.000e+00	-40.709	-40.708	0.000
Pb	1.448e-08					
	PbCO3	1.333e-08	1.334e-08	-7.875	-7.875	0.000
	Pb+2	3.513e-10	2.614e-10	-9.454	-9.583	-0.128
	PbOH+	2.947e-10	2.737e-10	-9.531	-9.563	-0.032
	PbHCO3+	2.877e-10	2.672e-10	-9.541	-9.573	-0.032
	Pb(CO3)2-2	1.323e-10	9.841e-11	-9.879	-10.007	-0.128
	PbSO4	8.342e-11	8.351e-11	-10.079	-10.078	0.000
	Pb(OH)2	5.712e-12	5.719e-12	-11.243	-11.243	0.000
	PbF+	5.765e-13	5.355e-13	-12.239	-12.271	-0.032
	Pb(SO4)2-2	3.345e-13	2.489e-13	-12.476	-12.604	-0.128
	PbCl+	3.136e-13	2.912e-13	-12.504	-12.536	-0.032
	Pb(OH)3-	3.796e-15	3.526e-15	-14.421	-14.453	-0.032
	PbF2	1.258e-15	1.259e-15	-14.900	-14.900	0.000
	PbCl2	1.581e-17	1.582e-17	-16.801	-16.801	0.000
	Pb2OH+3	3.116e-18	1.602e-18	-17.506	-17.795	-0.289
	PbF3-	1.131e-18	1.051e-18	-17.946	-17.979	-0.032
	Pb(OH)4-2	5.829e-19	4.337e-19	-18.234	-18.363	-0.128
	PbCl3-	4.131e-22	3.837e-22	-21.384	-21.416	-0.032
	Pb3(OH)4+2	1.306e-22	9.718e-23	-21.884	-22.012	-0.128
	PbF4-2	7.784e-23	5.792e-23	-22.109	-22.237	-0.128
	PbCl4-2	7.480e-27	5.566e-27	-26.126	-26.254	-0.128
S(6)	1.666e-04					
	SO4-2	1.569e-04	1.323e-04	-3.804	-3.878	-0.074
	CaSO4	5.379e-06	5.380e-06	-5.269	-5.269	0.000
	MgSO4	2.944e-06	2.945e-06	-5.531	-5.531	0.000
	FeSO4	1.098e-06	1.098e-06	-5.960	-5.959	0.000
	BaSO4	7.490e-08	7.493e-08	-7.126	-7.125	0.000
	KSO4-	5.160e-08	4.942e-08	-7.287	-7.306	-0.019
	NaSO4-	4.970e-08	4.760e-08	-7.304	-7.322	-0.019
	ZnSO4	4.180e-08	4.182e-08	-7.379	-7.379	0.000
	MnSO4	2.169e-08	2.170e-08	-7.664	-7.664	0.000
	CuSO4	6.195e-09	6.197e-09	-8.208	-8.208	0.000
	NiSO4	3.216e-09	3.218e-09	-8.493	-8.492	0.000
	PbSO4	2.451e-09	2.452e-09	-8.611	-8.610	0.000
	HSO4-	8.948e-10	8.571e-10	-9.048	-9.067	-0.019
	AlSO4+	1.522e-10	1.458e-10	-9.818	-9.836	-0.019
	Zn(SO4)2-2	5.556e-11	4.677e-11	-10.255	-10.330	-0.075
	CaHSO4+	2.299e-12	2.202e-12	-11.638	-11.657	-0.019
	Pb(SO4)2-2	2.023e-12	1.703e-12	-11.694	-11.769	-0.075
	Al(SO4)2-	6.222e-13	5.960e-13	-12.206	-12.225	-0.019
	FeHSO4+	5.509e-13	5.277e-13	-12.259	-12.278	-0.019
	FeSO4+	5.009e-14	4.798e-14	-13.300	-13.319	-0.019
	Ni(SO4)2-2	2.837e-14	2.389e-14	-13.547	-13.622	-0.075
	Fe(SO4)2-	1.422e-16	1.362e-16	-15.847	-15.866	-0.019
	AlHSO4+2	1.093e-18	9.200e-19	-17.961	-18.036	-0.075
	FeHSO4+2	1.138e-20	9.579e-21	-19.944	-20.019	-0.075
Zn	1.836e-06					
	Zn+2	1.665e-06	1.402e-06	-5.779	-5.853	-0.075
	ZnHCO3+	5.924e-08	5.675e-08	-7.227	-7.246	-0.019
	ZnCO3	5.108e-08	5.109e-08	-7.292	-7.292	0.000
	ZnSO4	4.180e-08	4.182e-08	-7.379	-7.379	0.000
	ZnOH+	1.472e-08	1.410e-08	-7.832	-7.851	-0.019
	Zn(OH)2	3.210e-09	3.211e-09	-8.494	-8.493	0.000
	ZnF+	5.463e-10	5.233e-10	-9.263	-9.281	-0.019
	Zn(CO3)2-2	2.370e-10	1.996e-10	-9.625	-9.700	-0.075
	Zn(SO4)2-2	5.556e-11	4.677e-11	-10.255	-10.330	-0.075
	ZnCl+	1.700e-11	1.629e-11	-10.769	-10.788	-0.019
	ZnOHCl	3.381e-12	3.383e-12	-11.471	-11.471	0.000
	Zn(OH)3-	1.430e-13	1.370e-13	-12.845	-12.863	-0.019
	ZnCl2	9.025e-17	9.028e-17	-16.045	-16.044	0.000
	Zn(OH)4-2	3.478e-19	2.928e-19	-18.459	-18.533	-0.075
	ZnCl3-	5.541e-22	5.308e-22	-21.256	-21.275	-0.019
	ZnCl4-2	1.640e-27	1.380e-27	-26.785	-26.860	-0.075

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-1.55	9.55	11.10	Al(OH)3
AlAsO4:2H2O	-7.25	-2.45	4.80	AlAsO4:2H2O
AlumK	-18.73	-23.98	-5.25	KAl(SO4)2:12H2O
Alunite	-4.05	-4.87	-0.82	KAl3(SO4)2(OH)6
Anglesite	-5.01	-12.83	-7.81	PbSO4
Anhydrite	-2.22	-6.57	-4.34	CaSO4
Antlerite	-7.38	0.91	8.29	Cu3(OH)4SO4
Aragonite	-0.55	-8.85	-8.31	CaCO3
Arsenolite	-61.92	-141.85	-79.93	As4O6
Artinite	-7.24	2.69	9.93	MgCO3:Mg(OH)2:3H2O
As2O5	-30.77	-24.01	6.76	As2O5
Atacamite	-6.71	0.84	7.55	Cu2(OH)3Cl
Azurite	-5.73	-22.37	-16.64	Cu3(OH)2(CO3)2
B-UO2(OH)2	-1.64	4.06	5.70	UO2(OH)2
Ba3(AsO4)2	11.72	2.77	-8.95	Ba3(AsO4)2
BaF2	-8.64	-14.41	-5.77	BaF2
Barite	0.27	-9.78	-10.05	BaSO4
Basaluminite	-3.19	19.51	22.70	Al4(OH)10SO4
Bianchite	-8.77	-10.53	-1.76	ZnSO4:6H2O
Birnessite	-10.11	33.49	43.60	MnO2
Bixbyite	-7.65	43.53	51.18	Mn2O3
Boehmite	0.65	9.55	8.91	AlOOH
Brochantite	-7.89	7.45	15.34	Cu4(OH)6SO4
Brucite	-5.31	11.84	17.15	Mg(OH)2
Bunsenite	-5.80	6.92	12.72	NiO
Ca3(AsO4)2:4w	-9.96	12.41	22.37	Ca3(AsO4)2:4H2O
Calcite	-0.40	-8.85	-8.46	CaCO3
Cerrusite	-1.93	-15.11	-13.19	PbCO3
Chalcanthite	-9.51	-12.17	-2.66	CuSO4:5H2O
Claudetite	-61.67	-141.85	-80.18	As4O6
CO2(g)	-2.83	-20.99	-18.16	CO2
Cotunnite	-13.75	-18.59	-4.83	PbCl2
Cu(OH)2	-2.28	6.54	8.82	Cu(OH)2
Cu2SO4	-21.79	-29.09	-7.30	Cu2SO4
Cu3(AsO4)2:6w	-10.54	-4.39	6.15	Cu3(AsO4)2:6H2O
CuCO3	-4.82	-14.45	-9.63	CuCO3
CuF	-21.38	-16.86	4.52	CuF
CuF2	-16.33	-16.80	-0.47	CuF2
CuF2:2H2O	-12.29	-16.80	-4.51	CuF2:2H2O
CuMetal	-5.26	-16.92	-11.66	Cu
CuOCuSO4	-17.57	-5.63	11.94	CuO:CuSO4
CupricFerrite	14.07	46.65	32.59	CuFe2O4
Cuprite	-3.36	-10.38	-7.02	Cu2O
CuprousFerrite	13.31	14.87	1.55	CuFeO2
CuSO4	-15.39	-12.17	3.22	CuSO4
Diaspore	2.39	9.55	7.16	AlOOH
Dolomite	-1.02	-18.01	-16.98	CaMg(CO3)2
Dolomite(d)	-1.59	-18.01	-16.41	CaMg(CO3)2
Epsomite	-4.69	-6.87	-2.17	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.30	16.39	10.09	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.04	20.06	18.02	Fe(OH)3
Fe3(OH)8	1.96	48.44	46.48	Fe3(OH)8
Fluorite	-0.54	-11.20	-10.65	CaF2
Gibbsite	1.18	9.55	8.37	Al(OH)3
Goethite	7.93	20.06	12.13	FeOOH
Goslarite	-8.53	-10.53	-2.00	ZnSO4:7H2O
Gummite	-6.61	4.06	10.67	UO3
Gypsum	-1.99	-6.57	-4.58	CaSO4:2H2O
H2(g)	-23.41	-23.46	-0.05	H2
Halite	-9.12	-7.55	1.57	NaCl
Hausmannite	-8.62	53.56	62.19	Mn3O4
Hematite	17.51	40.12	22.61	Fe2O3
Huntite	-6.64	-36.31	-29.67	CaMg3(CO3)4
Hydrocerrusite	-6.89	-24.35	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-16.61	-24.77	-8.16	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-5.51	25.89	31.39	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-3.91	26.64	30.54	KFe3(SO4)2(OH)6
Jarosite-Na	-7.08	27.45	34.53	NaFe3(SO4)2(OH)6
JarositeH	-11.87	22.76	34.64	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-5.92	-9.15	-3.23	AlOHSO4
Langite	-9.80	7.45	17.24	Cu4(OH)6SO4:H2O
Larnakite	-6.74	-6.95	-0.21	PbO:PbSO4
Laurionite	-6.98	-6.36	0.62	PbOHCl
Litharge	-7.03	5.88	12.91	PbO
Maghemite	7.47	40.12	32.65	Fe2O3
Magnesite	-1.19	-9.15	-7.96	MgCO3
Magnetite	17.87	48.44	30.58	Fe3O4
Malachite	-2.92	-7.91	-4.99	Cu2(OH)2CO3
Manganite	-3.58	21.76	25.34	MnOOH
Massicot	-7.23	5.88	13.10	PbO
Matlockite	-8.50	-18.02	-9.52	PbClF
Melanothallite	-21.80	-17.93	3.87	CuCl2
Melanterite	-8.11	-10.38	-2.27	FeSO4:7H2O
Minium	-33.78	41.09	74.87	Pb3O4
Mirabilite	-8.00	-9.33	-1.33	Na2SO4:10H2O
Mn2(SO4)3	-58.94	-12.59	46.35	Mn2(SO4)3
Mn3(AsO4):8H2O	-6.47	6.10	12.57	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-16.94	-14.43	2.51	MnCl2:4H2O
MnSO4	-11.52	-8.67	2.85	MnSO4
Morenosite	-9.39	-11.78	-2.39	NiSO4:7H2O
Na4UO2(CO3)3	-23.88	-40.17	-16.29	Na4UO2(CO3)3
Nahcolite	-5.34	-16.30	-10.96	NaHCO3
Nantokite	-7.85	-17.42	-9.58	CuCl
Natron	-10.13	-11.62	-1.49	Na2CO3:10H2O
Nesquehonite	-3.60	-9.15	-5.55	MgCO3:3H2O
Ni(OH)2	-3.53	6.92	10.45	Ni(OH)2
Ni3(AsO4)2:8H2O	-19.00	-3.24	15.76	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-23.02	8.98	32.00	Ni4(OH)6SO4
NiCO3	-7.34	-14.07	-6.73	NiCO3
Nsutite	-9.07	33.49	42.56	MnO2
O2(g)	-37.85	46.92	84.77	O2
Pb(OH)2	-2.43	5.88	8.31	Pb(OH)2
Pb2(OH)3Cl	-9.27	-0.48	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.45	11.75	26.20	PbO:Pb(OH)2
Pb2O3	-25.83	35.21	61.04	Pb2O3
Pb2OCO3	-8.87	-9.24	-0.37	PbO:PbCO3
Pb3(AsO4)2	-12.25	-6.38	5.87	Pb3(AsO4)2
Pb3O2CO3	-14.68	-3.36	11.32	PbCO3:2PbO
Pb3O2SO4	-11.71	-1.07	10.64	PbSO4:2PbO
Pb4(OH)6SO4	-16.30	4.80	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.70	4.80	22.50	PbSO4:3PbO
PbF2	-10.03	-17.46	-7.43	PbF2
PbMetal	-21.85	-17.58	4.27	Pb
PbO:0.3H2O	-7.10	5.88	12.98	PbO:0.33H2O
Phosgenite	-13.89	-33.70	-19.81	PbCl2:PbCO3
Plattnerite	-20.78	29.34	50.11	PbO2
Portlandite	-11.02	12.14	23.16	Ca(OH)2
Pyrochroite	-5.17	10.03	15.20	Mn(OH)2
Pyrolusite	-8.63	33.49	42.13	MnO2
Retgersite	-9.73	-11.78	-2.05	NiSO4:6H2O
Rhodochrosite	0.16	-10.96	-11.11	MnCO3
Rhodochrosite(d)	-0.57	-10.96	-10.39	MnCO3
Rutherfordine	-2.50	-16.93	-14.43	UO2CO3
Schoepite	-1.48	4.06	5.54	UO2(OH)2:H2O
Scorodite	-5.46	8.05	13.52	FeAsO4:2H2O
Siderite	-1.80	-12.66	-10.86	FeCO3
Siderite(d)(3)	-2.21	-12.66	-10.45	FeCO3
Smithsonite	-2.87	-12.82	-9.95	ZnCO3
Tenorite	-1.26	6.54	7.80	CuO
Thenardite	-9.16	-9.33	-0.17	Na2SO4
Thermonatrite	-11.77	-11.62	0.16	Na2CO3:H2O
Trona	-16.96	-27.92	-10.96	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-25.47	-38.11	-12.64	U(OH)2SO4
U3O8(c)	-4.84	-11.28	-6.44	U3O8
U4O9(c)	-14.18	-54.14	-39.96	U4O9
UF4(c)	-38.25	-66.08	-27.82	UF4
UF4:2.5H2O	-29.08	-66.08	-37.00	UF4:2.5H2O
UO2(a)	-10.07	-19.40	-9.34	UO2
UO3(gamma)	-3.88	4.06	7.94	UO3
Uraninite(c)	-5.38	-19.40	-14.02	UO2
Witherite	-3.49	-12.07	-8.57	BaCO3
Zincite(c)	-3.22	8.17	11.39	ZnO
Zincosite	-13.76	-10.53	3.23	ZnSO4
Zn(OH)2-a	-4.28	8.17	12.45	Zn(OH)2
Zn(OH)2-b	-3.58	8.17	11.75	Zn(OH)2
Zn(OH)2-c	-4.03	8.17	12.20	Zn(OH)2
Zn(OH)2-e	-3.33	8.17	11.50	Zn(OH)2
Zn(OH)2-g	-3.54	8.17	11.71	Zn(OH)2
Zn2(OH)2SO4	-9.86	-2.36	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-11.08	4.12	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-13.21	0.51	13.73	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-32.62	-12.89	19.73	ZnO:2ZnSO4
Zn4(OH)6SO4	-14.41	13.99	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-22.10	16.40	38.50	Zn5(OH)8Cl2
ZnCl2	-23.52	-16.29	7.23	ZnCl2
ZnCO3:H2O	-2.56	-12.82	-10.26	ZnCO3:H2O
ZnF2	-13.79	-15.16	-1.37	ZnF2
ZnMetal	-41.47	-15.29	26.18	Zn
ZnO(a)	-3.14	8.17	11.31	ZnO
ZnSO4:H2O	-10.08	-10.53	-0.45	ZnSO4:H2O

End of simulation.

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Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 5-6m
           SOLUTION        6
           units           mg/l
           temp            20.6
           pH              7.75
           F               0.86
           Cl              0.65
           S(6)            32          as SO4
           Na              18.7
           K               10
           Mg              3
           Ca              12.3
           Alkalinity      76.25       as HCO3
           Al              2.2
           As              0.36
           Ba              0.111
           Cu              0.030
           Fe              1.42
           Mn              0.08
           Ni              0.008
           Pb              0.016
           U               1.19
           Zn              0.021
           END
```

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TITLE
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   Schneckentein 5-6m

-----------------------------------------
Beginning of initial solution calculations.
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Initial solution 6.

----------------------------Solution composition------------
-----------------

           Elements           Molality       Moles

           Al                8.155e-05   8.155e-05
           Alkalinity        1.250e-03   1.250e-03
           As                4.806e-06   4.806e-06
           Ba                8.083e-07   8.083e-07
           Ca                3.069e-04   3.069e-04
           Cl                1.834e-05   1.834e-05
           Cu                4.722e-07   4.722e-07
           F                 4.527e-05   4.527e-05
           Fe                2.543e-05   2.543e-05
           K                 2.558e-04   2.558e-04
           Mg                1.234e-04   1.234e-04
           Mn                1.456e-06   1.456e-06
           Na                8.135e-04   8.135e-04
           Ni                1.363e-07   1.363e-07
           Pb                7.724e-08   7.724e-08
           S(6)              3.332e-04   3.332e-04
           U                 5.000e-06   5.000e-06
           Zn                3.213e-07   3.213e-07
```

```
----------------------------Description of solution-------------------------
---

                                    pH  =   7.750
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   2.528e-03
                     Mass of water (kg)  =   1.000e+00
                 Total carbon (mol/kg)  =   9.176e-04
                    Total CO2 (mol/kg)  =   9.176e-04
                   Temperature (deg C)  =  20.600
                Electrical balance (eq)  =   2.335e-04
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =   6.55
                              Iterations  =  16
                                 Total H  = 1.110137e+02
                                 Total O  = 5.551069e+01
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	4.230e-07	4.004e-07	-6.374	-6.397	-0.024
H+	1.871e-08	1.778e-08	-7.728	-7.750	-0.022
H2O	5.551e+01	1.000e+00	-0.000	-0.000	0.000
Al	**8.155e-05**				
Al(OH)4-	8.064e-05	7.634e-05	-4.093	-4.117	-0.024
Al(OH)3	7.600e-07	7.605e-07	-6.119	-6.119	0.000
Al(OH)2+	1.353e-07	1.281e-07	-6.869	-6.892	-0.024
AlF2+	9.367e-09	8.867e-09	-8.028	-8.052	-0.024
AlF3	4.718e-09	4.721e-09	-8.326	-8.326	0.000
AlOH+2	5.370e-10	4.312e-10	-9.270	-9.365	-0.095
AlF+2	5.308e-10	4.263e-10	-9.275	-9.370	-0.095
AlF4-	8.426e-11	7.976e-11	-10.074	-10.098	-0.024
Al+3	1.688e-12	1.031e-12	-11.773	-11.987	-0.214
AlSO4+	8.245e-13	7.805e-13	-12.084	-12.108	-0.024
Al(SO4)2-	6.481e-15	6.135e-15	-14.188	-14.212	-0.024
AlHSO4+2	1.478e-21	1.187e-21	-20.830	-20.926	-0.095
As(3)	**6.022e-17**				
H3AsO3	5.847e-17	5.851e-17	-16.233	-16.233	0.000
H2AsO3-	1.742e-18	1.649e-18	-17.759	-17.783	-0.024
HAsO3-2	7.526e-23	6.044e-23	-22.123	-22.219	-0.095
H4AsO3+	5.445e-25	5.155e-25	-24.264	-24.288	-0.024
AsO3-3	1.842e-28	1.124e-28	-27.735	-27.949	-0.214
As(5)	**4.806e-06**				
HAsO4-2	4.416e-06	3.546e-06	-5.355	-5.450	-0.095
H2AsO4-	3.891e-07	3.683e-07	-6.410	-6.434	-0.024
AsO4-3	7.419e-10	4.529e-10	-9.130	-9.344	-0.214
H3AsO4	1.097e-12	1.098e-12	-11.960	-11.959	0.000
Ba	**8.083e-07**				
Ba+2	7.291e-07	5.855e-07	-6.137	-6.232	-0.095
BaSO4	7.442e-08	7.447e-08	-7.128	-7.128	0.000
BaHCO3+	4.229e-09	4.003e-09	-8.374	-8.398	-0.024
BaCO3	5.443e-10	5.446e-10	-9.264	-9.264	0.000
BaOH+	1.179e-12	1.116e-12	-11.929	-11.952	-0.024
C(4)	**9.176e-04**				
HCO3-	8.645e-04	8.192e-04	-3.063	-3.087	-0.023
CO2	3.476e-05	3.478e-05	-4.459	-4.459	0.000
UO2(CO3)2-2	3.920e-06	3.148e-06	-5.407	-5.502	-0.095
CO3-2	2.439e-06	1.967e-06	-5.613	-5.706	-0.093
CaHCO3+	2.416e-06	2.287e-06	-5.617	-5.641	-0.024
MgHCO3+	9.405e-07	8.904e-07	-6.027	-6.050	-0.024
UO2(CO3)3-4	8.947e-07	3.720e-07	-6.048	-6.429	-0.381
CaCO3	7.156e-07	7.160e-07	-6.145	-6.145	0.000
NaHCO3	3.541e-07	3.543e-07	-6.451	-6.451	0.000
MgCO3	1.657e-07	1.658e-07	-6.781	-6.780	0.000
MnCO3	1.495e-07	1.496e-07	-6.825	-6.825	0.000
NiCO3	1.237e-07	1.238e-07	-6.908	-6.907	0.000
FeHCO3+	8.687e-08	8.223e-08	-7.061	-7.085	-0.024
UO2CO3	7.403e-08	7.407e-08	-7.131	-7.130	0.000
MnHCO3+	7.383e-08	6.989e-08	-7.132	-7.156	-0.024
PbCO3	7.011e-08	7.016e-08	-7.154	-7.154	0.000
ZnCO3	6.592e-08	6.596e-08	-7.181	-7.181	0.000
CuCO3	6.310e-08	6.314e-08	-7.200	-7.200	0.000
FeCO3	4.733e-08	4.736e-08	-7.325	-7.325	0.000
NaCO3-	2.375e-08	2.249e-08	-7.624	-7.648	-0.024
ZnHCO3+	1.831e-08	1.734e-08	-7.737	-7.761	-0.024
BaHCO3+	4.229e-09	4.003e-09	-8.374	-8.398	-0.024
Zn(CO3)2-2	3.454e-09	2.774e-09	-8.462	-8.557	-0.095
CuHCO3+	2.593e-09	2.454e-09	-8.586	-8.610	-0.024
PbHCO3+	1.411e-09	1.336e-09	-8.850	-8.874	-0.024
NiHCO3+	1.014e-09	9.600e-10	-8.994	-9.018	-0.024
BaCO3	5.443e-10	5.446e-10	-9.264	-9.264	0.000
Ni(CO3)2-2	5.268e-10	4.231e-10	-9.278	-9.374	-0.095
Pb(CO3)2-2	4.316e-10	3.466e-10	-9.365	-9.460	-0.095
Cu(CO3)2-2	1.947e-10	1.563e-10	-9.711	-9.806	-0.095
(UO2)3(CO3)6-6	3.142e-13	4.362e-14	-12.503	-13.360	-0.857
UO2(CO3)3-5	2.267e-23	5.754e-24	-22.645	-23.240	-0.595
U(CO3)4-4	6.812e-31	2.832e-31	-30.167	-30.548	-0.381
U(CO3)5-6	3.046e-35	4.230e-36	-34.516	-35.374	-0.857
Ca	**3.069e-04**				
Ca+2	2.923e-04	2.357e-04	-3.534	-3.628	-0.094
CaSO4	1.144e-05	1.144e-05	-4.942	-4.941	0.000
CaHCO3+	2.416e-06	2.287e-06	-5.617	-5.641	-0.024
CaCO3	7.156e-07	7.160e-07	-6.145	-6.145	0.000
CaF+	8.300e-08	7.857e-08	-7.081	-7.105	-0.024
CaOH+	2.323e-09	2.199e-09	-8.634	-8.658	-0.024
CaHSO4+	1.195e-12	1.131e-12	-11.923	-11.946	-0.024
Cl	**1.834e-05**				
Cl-	1.834e-05	1.735e-05	-4.737	-4.761	-0.024
MnCl+	7.148e-11	6.767e-11	-10.146	-10.170	-0.024
FeCl+	2.540e-11	2.404e-11	-10.595	-10.619	-0.024
ZnCl+	6.810e-12	6.447e-12	-11.167	-11.191	-0.024
ZnOHCl	5.427e-12	5.431e-12	-11.265	-11.265	0.000
PbCl+	1.341e-12	1.269e-12	-11.873	-11.896	-0.024
NiCl+	3.909e-13	3.700e-13	-12.408	-12.432	-0.024
CuCl+	2.370e-13	2.243e-13	-12.625	-12.649	-0.024
CuCl2-	3.058e-14	2.895e-14	-13.515	-13.538	-0.024
MnCl2	5.122e-16	5.125e-16	-15.291	-15.290	0.000
UO2Cl+	2.352e-16	2.226e-16	-15.629	-15.652	-0.024
ZnCl2	1.150e-16	1.150e-16	-15.939	-15.939	0.000
PbCl2	3.792e-17	3.794e-17	-16.421	-16.421	0.000
NiCl2	2.330e-17	2.331e-17	-16.633	-16.632	0.000
CuCl2	1.991e-18	1.992e-18	-17.701	-17.701	0.000
CuCl3-2	9.746e-19	7.826e-19	-18.011	-18.106	-0.095
FeCl+2	4.251e-19	3.414e-19	-18.372	-18.467	-0.095
MnCl3-	2.587e-21	2.449e-21	-20.587	-20.611	-0.024
ZnCl3-	2.304e-21	2.181e-21	-20.638	-20.661	-0.024
PbCl3-	5.374e-22	5.087e-22	-21.270	-21.294	-0.024
UO2Cl2	1.986e-22	1.987e-22	-21.702	-21.702	0.000
FeCl2+	3.220e-23	3.048e-23	-22.492	-22.516	-0.024
CuCl3-	1.197e-25	1.133e-25	-24.922	-24.946	-0.024
ZnCl4-2	2.279e-26	1.830e-26	-25.642	-25.737	-0.095
PbCl4-2	5.083e-27	4.082e-27	-26.294	-26.389	-0.095
FeCl3	5.286e-29	5.289e-29	-28.277	-28.277	0.000
CuCl4-2	1.106e-32	8.885e-33	-31.956	-32.051	-0.095
UCl+3	0.000e+00	0.000e+00	-43.399	-43.614	-0.214
Cu(1)	**3.179e-10**				
Cu+	3.179e-10	3.009e-10	-9.498	-9.522	-0.024
CuCl2-	3.058e-14	2.895e-14	-13.515	-13.538	-0.024
CuCl3-2	9.746e-19	7.826e-19	-18.011	-18.106	-0.095
Cu(2)	**4.719e-07**				
Cu(OH)2	3.947e-07	3.949e-07	-6.404	-6.404	0.000
CuCO3	6.310e-08	6.314e-08	-7.200	-7.200	0.000
Cu+2	7.444e-09	5.978e-09	-8.128	-8.223	-0.095
CuOH+	3.551e-09	3.361e-09	-8.450	-8.474	-0.024
CuHCO3+	2.593e-09	2.454e-09	-8.586	-8.610	-0.024
CuSO4	3.001e-10	3.003e-10	-9.523	-9.522	0.000
Cu(CO3)2-2	1.947e-10	1.563e-10	-9.711	-9.806	-0.095
CuF+	4.686e-12	4.436e-12	-11.329	-11.353	-0.024
Cu2(OH)2+2	3.952e-12	3.173e-12	-11.403	-11.499	-0.095
Cu(OH)3-	1.413e-12	1.338e-12	-11.850	-11.874	-0.024
CuCl+	2.370e-13	2.243e-13	-12.625	-12.649	-0.024
Cu(OH)4-2	1.869e-17	1.501e-17	-16.728	-16.824	-0.095
CuCl2	1.991e-18	1.992e-18	-17.701	-17.701	0.000
CuCl3-	1.197e-25	1.133e-25	-24.922	-24.946	-0.024
CuCl4-2	1.106e-32	8.885e-33	-31.956	-32.051	-0.095
F	**4.527e-05**				
F-	4.488e-05	4.248e-05	-4.348	-4.372	-0.024
MgF+	2.585e-07	2.447e-07	-6.588	-6.611	-0.024
CaF+	8.300e-08	7.857e-08	-7.081	-7.105	-0.024
NaF	1.879e-08	1.880e-08	-7.726	-7.726	0.000
AlF2+	9.367e-09	8.867e-09	-8.028	-8.052	-0.024
AlF3	4.718e-09	4.721e-09	-8.326	-8.326	0.000
HF	1.047e-09	1.047e-09	-8.980	-8.980	0.000
AlF+2	5.308e-10	4.263e-10	-9.275	-9.370	-0.095
FeF+	4.505e-10	4.264e-10	-9.346	-9.370	-0.024
MnF+	2.972e-10	2.814e-10	-9.527	-9.551	-0.024
ZnF+	1.007e-10	9.536e-11	-9.997	-10.021	-0.024
AlF4-	8.426e-11	7.976e-11	-10.074	-10.098	-0.024
UO2F+	4.973e-11	4.707e-11	-10.303	-10.327	-0.024
NiF+	7.602e-12	7.196e-12	-11.119	-11.143	-0.024
UO2F2	6.757e-12	6.761e-12	-11.170	-11.170	0.000
CuF+	4.686e-12	4.436e-12	-11.329	-11.353	-0.024
PbF+	1.638e-12	1.551e-12	-11.786	-11.809	-0.024
HF2-	1.739e-13	1.646e-13	-12.760	-12.784	-0.024
FeF2+	7.997e-14	7.570e-14	-13.097	-13.121	-0.024
FeF+2	5.878e-14	4.720e-14	-13.231	-13.326	-0.095
UO2F3-	5.773e-14	5.465e-14	-13.239	-13.262	-0.024
FeF3	5.017e-15	5.020e-15	-14.300	-14.299	0.000
PbF2	1.344e-15	1.345e-15	-14.872	-14.871	0.000
UO2F4-2	1.847e-17	1.483e-17	-16.734	-16.829	-0.095
H2F2	3.343e-18	3.345e-18	-17.476	-17.476	0.000
PbF3-	4.373e-19	4.140e-19	-18.359	-18.383	-0.024
PbF4-2	1.048e-23	8.417e-24	-22.980	-23.075	-0.095
UF3+	7.665e-33	7.256e-33	-32.116	-32.139	-0.024
UF4	2.508e-33	2.509e-33	-32.601	-32.600	0.000
UF2+2	9.070e-34	7.283e-34	-33.042	-33.138	-0.095
UF+3	3.420e-36	2.087e-36	-35.466	-35.680	-0.214
UF5-	3.153e-36	2.985e-36	-35.501	-35.525	-0.024
UF6-2	2.020e-38	1.622e-38	-37.695	-37.790	-0.095
Fe(2)	**1.440e-06**				
Fe+2	1.250e-06	1.004e-06	-5.903	-5.998	-0.095
FeHCO3+	8.687e-08	8.223e-08	-7.061	-7.085	-0.024
FeCO3	4.733e-08	4.736e-08	-7.325	-7.325	0.000
FeSO4	4.172e-08	4.175e-08	-7.380	-7.379	0.000
FeOH+	1.351e-08	1.278e-08	-7.869	-7.893	-0.024
FeF+	4.505e-10	4.264e-10	-9.346	-9.370	-0.024
FeCl+	2.540e-11	2.404e-11	-10.595	-10.619	-0.024
Fe(OH)2	4.147e-12	4.149e-12	-11.382	-11.382	0.000
Fe(OH)3-	8.765e-15	8.297e-15	-14.057	-14.081	-0.024
FeHSO4+	5.090e-15	4.818e-15	-14.293	-14.317	-0.024

Fe(3)	2.399e-05					
	Fe(OH)3	1.962e-05	1.963e-05	-4.707	-4.707	0.000
	Fe(OH)2+	3.479e-06	3.293e-06	-5.459	-5.482	-0.024
	Fe(OH)4-	8.889e-07	8.415e-07	-6.051	-6.075	-0.024
	FeOH+2	2.609e-10	2.095e-10	-9.584	-9.679	-0.095
	FeF2+	7.997e-14	7.570e-14	-13.097	-13.121	-0.024
	FeF+2	5.878e-14	4.720e-14	-13.231	-13.326	-0.095
	FeF3	5.017e-15	5.020e-15	-14.300	-14.299	0.000
	FeSO4+	1.998e-15	1.892e-15	-14.699	-14.723	-0.024
	Fe+3	1.230e-15	7.505e-16	-14.910	-15.125	-0.214
	Fe(SO4)2-	1.090e-17	1.032e-17	-16.962	-16.986	-0.024
	Fe2(OH)2+4	3.416e-18	1.421e-18	-17.466	-17.848	-0.381
	FeCl+2	4.251e-19	3.414e-19	-18.372	-18.467	-0.095
	Fe3(OH)4+5	5.814e-21	1.476e-21	-20.236	-20.831	-0.595
	FeHSO4+2	1.127e-22	9.050e-23	-21.948	-22.043	-0.095
	FeCl2+	3.220e-23	3.048e-23	-22.492	-22.516	-0.024
	FeCl3	5.286e-29	5.289e-29	-28.277	-28.277	0.000
H(0)	4.523e-27					
	H2	2.261e-27	2.263e-27	-26.646	-26.645	0.000
K	2.558e-04					
	K+	2.553e-04	2.416e-04	-3.593	-3.617	-0.024
	KSO4-	4.332e-07	4.101e-07	-6.363	-6.387	-0.024
Mg	1.234e-04					
	Mg+2	1.170e-04	9.453e-05	-3.932	-4.024	-0.093
	MgSO4	5.009e-06	5.012e-06	-5.300	-5.300	0.000
	MgHCO3+	9.405e-07	8.904e-07	-6.027	-6.050	-0.024
	MgF+	2.585e-07	2.447e-07	-6.588	-6.611	-0.024
	MgCO3	1.657e-07	1.658e-07	-6.781	-6.780	0.000
	MgOH+	1.362e-08	1.289e-08	-7.866	-7.890	-0.024
Mn(2)	1.456e-06					
	Mn+2	1.192e-06	9.573e-07	-5.924	-6.019	-0.095
	MnCO3	1.495e-07	1.496e-07	-6.825	-6.825	0.000
	MnHCO3+	7.383e-08	6.989e-08	-7.132	-7.156	-0.024
	MnSO4	3.965e-08	3.967e-08	-7.402	-7.402	0.000
	MnOH+	1.016e-09	9.614e-10	-8.993	-9.017	-0.024
	MnF+	2.972e-10	2.814e-10	-9.527	-9.551	-0.024
	MnCl+	7.148e-11	6.767e-11	-10.146	-10.170	-0.024
	MnCl2	5.122e-16	5.125e-16	-15.291	-15.290	0.000
	Mn(OH)3-	2.850e-18	2.698e-18	-17.545	-17.569	-0.024
	MnCl3-	2.587e-21	2.449e-21	-20.587	-20.611	-0.024
Mn(3)	2.524e-28					
	Mn+3	2.524e-28	1.541e-28	-27.598	-27.812	-0.214
Mn(6)	0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-48.011	-48.106	-0.095
Mn(7)	0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-53.758	-53.782	-0.024
Na	8.135e-04					
	Na+	8.121e-04	7.691e-04	-3.090	-3.114	-0.024
	NaSO4-	1.004e-06	9.508e-07	-5.998	-6.022	-0.024
	NaHCO3	3.541e-07	3.543e-07	-6.451	-6.451	0.000
	NaCO3-	2.375e-08	2.249e-08	-7.624	-7.648	-0.024
	NaF	1.879e-08	1.880e-08	-7.726	-7.726	0.000
Ni	1.363e-07					
	NiCO3	1.237e-07	1.238e-07	-6.908	-6.907	0.000
	Ni+2	1.057e-08	8.490e-09	-7.976	-8.071	-0.095
	NiHCO3+	1.014e-09	9.600e-10	-8.994	-9.018	-0.024
	Ni(CO3)2-2	5.268e-10	4.231e-10	-9.278	-9.374	-0.095
	NiSO4	4.040e-10	4.042e-10	-9.394	-9.393	0.000
	NiOH+	5.085e-11	4.814e-11	-10.294	-10.317	-0.024
	NiF+	7.602e-12	7.196e-12	-11.119	-11.143	-0.024
	Ni(OH)2	2.683e-12	2.684e-12	-11.571	-11.571	0.000
	NiCl+	3.909e-13	3.700e-13	-12.408	-12.432	-0.024
	Ni(SO4)2-2	7.129e-15	5.724e-15	-14.147	-14.242	-0.095
	Ni(OH)3-	1.595e-15	1.509e-15	-14.797	-14.821	-0.024
	NiCl2	2.330e-17	2.331e-17	-16.633	-16.632	0.000
O(0)	0.000e+00					
	O2	0.000e+00	0.000e+00	-40.560	-40.560	0.000
Pb	7.724e-08					
	PbCO3	7.011e-08	7.016e-08	-7.154	-7.154	0.000
	Pb+2	2.556e-09	2.053e-09	-8.592	-8.688	-0.095
	PbOH+	2.377e-09	2.251e-09	-8.624	-8.648	-0.024
	PbHCO3+	1.411e-09	1.336e-09	-8.850	-8.874	-0.024
	Pb(CO3)2-2	4.316e-10	3.466e-10	-9.365	-9.460	-0.095
	PbSO4	2.927e-10	2.929e-10	-9.534	-9.533	0.000
	Pb(OH)2	4.921e-11	4.923e-11	-10.308	-10.308	0.000
	PbF+	1.638e-12	1.551e-12	-11.786	-11.809	-0.024
	PbCl+	1.341e-12	1.269e-12	-11.873	-11.896	-0.024
	Pb(SO4)2-2	4.858e-13	3.901e-13	-12.314	-12.409	-0.095
	Pb(OH)3-	3.358e-14	3.179e-14	-13.474	-13.498	-0.024
	PbF2	1.344e-15	1.345e-15	-14.872	-14.871	0.000
	Pb2OH+3	1.694e-16	1.034e-16	-15.771	-15.985	-0.214
	PbCl2	3.792e-17	3.794e-17	-16.421	-16.421	0.000
	Pb(OH)4-2	5.099e-18	4.095e-18	-17.293	-17.388	-0.095
	PbF3-	4.373e-19	4.140e-19	-18.359	-18.383	-0.024
	Pb3(OH)4+2	7.264e-20	5.833e-20	-19.139	-19.234	-0.095
	PbCl3-	5.374e-22	5.087e-22	-21.270	-21.294	-0.024
	PbF4-2	1.048e-23	8.417e-24	-22.980	-23.075	-0.095
	PbCl4-2	5.083e-27	4.082e-27	-26.294	-26.389	-0.095
S(6)	3.332e-04					
	SO4-2	3.151e-04	2.538e-04	-3.502	-3.596	-0.094
	CaSO4	1.144e-05	1.144e-05	-4.942	-4.941	0.000
	MgSO4	5.009e-06	5.012e-06	-5.300	-5.300	0.000
	NaSO4-	1.004e-06	9.508e-07	-5.998	-6.022	-0.024
	KSO4-	4.332e-07	4.101e-07	-6.363	-6.387	-0.024
	BaSO4	7.442e-08	7.447e-08	-7.128	-7.128	0.000
	FeSO4	4.172e-08	4.175e-08	-7.380	-7.379	0.000
	MnSO4	3.965e-08	3.967e-08	-7.402	-7.402	0.000
	ZnSO4	9.656e-09	9.661e-09	-8.015	-8.015	0.000
	HSO4-	4.218e-10	3.993e-10	-9.375	-9.399	-0.024
	NiSO4	4.040e-10	4.042e-10	-9.394	-9.393	0.000
	CuSO4	3.001e-10	3.003e-10	-9.523	-9.522	0.000
	PbSO4	2.927e-10	2.929e-10	-9.534	-9.533	0.000
	Zn(SO4)2-2	2.568e-11	2.062e-11	-10.590	-10.686	-0.095
	UO2SO4	2.895e-12	2.897e-12	-11.538	-11.538	0.000
	CaHSO4+	1.195e-12	1.131e-12	-11.923	-11.946	-0.024
	AlSO4+	8.245e-13	7.805e-13	-12.084	-12.108	-0.024
	Pb(SO4)2-2	4.858e-13	3.901e-13	-12.314	-12.409	-0.095
	UO2(SO4)2-2	8.146e-15	6.542e-15	-14.089	-14.184	-0.095
	Ni(SO4)2-2	7.129e-15	5.724e-15	-14.147	-14.242	-0.095
	Al(SO4)2-	6.481e-15	6.135e-15	-14.188	-14.212	-0.024
	FeHSO4+	5.090e-15	4.818e-15	-14.293	-14.317	-0.024
	FeSO4+	1.998e-15	1.892e-15	-14.699	-14.723	-0.024
	Fe(SO4)2-	1.090e-17	1.032e-17	-16.962	-16.986	-0.024
	AlHSO4+2	1.478e-21	1.187e-21	-20.830	-20.926	-0.095
	FeHSO4+2	1.127e-22	9.050e-23	-21.948	-22.043	-0.095
	U(SO4)2	3.982e-38	3.984e-38	-37.400	-37.400	0.000
	USO4+2	2.729e-38	2.191e-38	-37.564	-37.659	-0.095
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-53.472	-53.687	-0.214
U(4)	4.045e-19					
	U(OH)4	4.045e-19	4.048e-19	-18.393	-18.393	0.000
	U(OH)3+	2.933e-23	2.776e-23	-22.533	-22.557	-0.024
	U(OH)2+2	3.219e-28	2.585e-28	-27.492	-27.588	-0.095
	U(CO3)4-4	6.812e-31	2.832e-31	-30.167	-30.548	-0.381
	UF3+	7.665e-33	7.256e-33	-32.116	-32.139	-0.024
	UF4	2.508e-33	2.509e-33	-32.601	-32.600	0.000
	UF2+2	9.070e-34	7.283e-34	-33.042	-33.138	-0.095
	UOH+3	4.769e-34	2.911e-34	-33.322	-33.536	-0.214
	U(CO3)5-6	3.046e-35	4.230e-36	-34.516	-35.374	-0.857
	UF+3	3.420e-36	2.087e-36	-35.466	-35.680	-0.214
	UF5-	3.153e-36	2.985e-36	-35.501	-35.525	-0.024
	U(SO4)2	3.982e-38	3.984e-38	-37.400	-37.400	0.000
	USO4+2	2.729e-38	2.191e-38	-37.564	-37.659	-0.095
	UF6-2	2.020e-38	1.622e-38	-37.695	-37.790	-0.095
	U+4	0.000e+00	0.000e+00	-40.242	-40.623	-0.381
	UCl+3	0.000e+00	0.000e+00	-43.399	-43.614	-0.214
	U6(OH)15+9	0.000e+00	0.000e+00	-142.758	-144.688	-1.929
U(5)	3.229e-14					
	UO2+	3.229e-14	3.057e-14	-13.491	-13.515	-0.024
	UO2(CO3)3-5	2.267e-23	5.754e-24	-22.645	-23.240	-0.595
U(6)	5.000e-06					
	UO2(CO3)2-2	3.920e-06	3.148e-06	-5.407	-5.502	-0.095
	UO2(CO3)3-4	8.947e-07	3.720e-07	-6.048	-6.429	-0.381
	UO2(OH)3-	1.078e-07	1.021e-07	-6.967	-6.991	-0.024
	UO2CO3	7.403e-08	7.407e-08	-7.131	-7.130	0.000
	UO2OH+	2.582e-09	2.444e-09	-8.588	-8.612	-0.024
	(UO2)3(OH)7-	1.415e-10	1.340e-10	-9.849	-9.873	-0.024
	(UO2)3(OH)5+	6.693e-11	6.335e-11	-10.174	-10.198	-0.024
	UO2F+	4.973e-11	4.707e-11	-10.303	-10.327	-0.024
	UO2+2	1.133e-11	9.100e-12	-10.946	-11.041	-0.095
	UO2F2	6.757e-12	6.761e-12	-11.170	-11.170	0.000
	UO2SO4	2.895e-12	2.897e-12	-11.538	-11.538	0.000
	(UO2)4(OH)7+	1.622e-12	1.535e-12	-11.790	-11.814	-0.024
	(UO2)2(OH)2+2	6.040e-13	4.850e-13	-12.219	-12.314	-0.095
	(UO2)3(CO3)6-6	3.142e-13	4.362e-14	-12.503	-13.360	-0.857
	UO2(OH)4-2	1.133e-13	9.099e-14	-12.946	-13.041	-0.095
	UO2F3-	5.773e-14	5.465e-14	-13.239	-13.262	-0.024
	(UO2)3(OH)4+2	1.181e-14	9.486e-15	-13.928	-14.023	-0.095
	UO2(SO4)2-2	8.146e-15	6.542e-15	-14.089	-14.184	-0.095
	UO2Cl+	2.352e-16	2.226e-16	-15.629	-15.652	-0.024
	UO2F4-2	1.847e-17	1.483e-17	-16.734	-16.829	-0.095
	(UO2)2OH+3	1.522e-17	9.292e-18	-16.818	-17.032	-0.214
	UO2Cl2	1.986e-22	1.987e-22	-21.702	-21.702	0.000
Zn	3.213e-07					
	Zn+2	2.093e-07	1.681e-07	-6.679	-6.774	-0.095
	ZnCO3	6.592e-08	6.596e-08	-7.181	-7.181	0.000
	ZnHCO3+	1.831e-08	1.734e-08	-7.737	-7.761	-0.024
	ZnSO4	9.656e-09	9.661e-09	-8.015	-8.015	0.000
	ZnOH+	7.802e-09	7.386e-09	-8.108	-8.132	-0.024
	Zn(OH)2	6.687e-09	6.691e-09	-8.175	-8.175	0.000
	Zn(CO3)2-2	3.454e-09	2.774e-09	-8.462	-8.557	-0.095
	ZnF+	1.007e-10	9.536e-11	-9.997	-10.021	-0.024
	Zn(SO4)2-2	2.568e-11	2.062e-11	-10.590	-10.686	-0.095
	ZnCl+	6.810e-12	6.447e-12	-11.167	-11.191	-0.024
	ZnOHCl	5.427e-12	5.431e-12	-11.265	-11.265	0.000
	Zn(OH)3-	1.257e-12	1.190e-12	-11.901	-11.925	-0.024
	ZnCl2	1.150e-16	1.150e-16	-15.939	-15.939	0.000
	Zn(OH)4-2	1.320e-17	1.060e-17	-16.879	-16.975	-0.095
	ZnCl3-	2.304e-21	2.181e-21	-20.638	-20.661	-0.024
	ZnCl4-2	2.279e-26	1.830e-26	-25.642	-25.737	-0.095

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	0.17	11.26	11.09	Al(OH)3
AlAsO4:2H2O	-5.49	-0.70	4.80	AlAsO4:2H2O
AlumK	-17.55	-22.80	-5.25	KAl(SO4)2:12H2O
Alunite	0.58	-0.27	-0.85	KAl3(SO4)2(OH)6
Anglesite	-4.47	-12.28	-7.81	PbSO4
Anhydrite	-2.88	-7.22	-4.35	CaSO4
Antlerite	-5.56	2.73	8.29	Cu3(OH)4SO4
Aragonite	-1.02	-9.33	-8.31	CaCO3
Arsenolite	-61.97	-141.84	-79.86	As4O6
Artinite	-8.17	1.74	9.92	MgCO3:Mg(OH)2:3H2O
As2O5	-30.68	-23.92	6.76	As2O5
Atacamite	-5.50	2.04	7.55	Cu2(OH)3Cl
Azurite	-3.93	-20.58	-16.65	Cu3(OH)2(CO3)2
B-UO2(OH)2	-1.24	4.46	5.69	UO2(OH)2
Ba3(AsO4)2	12.83	3.88	-8.94	Ba3(AsO4)2
BaF2	-9.21	-14.98	-5.77	BaF2
Barite	0.21	-9.83	-10.04	BaSO4
Basaluminite	3.26	25.96	22.70	Al4(OH)10SO4
Bianchite	-8.61	-10.37	-1.76	ZnSO4:6H2O
Birnessite	-10.62	32.98	43.60	MnO2
Bixbyite	-8.68	42.46	51.14	Mn2O3
Boehmite	2.37	11.26	8.89	AlOOH
Brochantite	-5.33	10.01	15.34	Cu4(OH)6SO4
Brucite	-5.66	11.48	17.14	Mg(OH)2
Bunsenite	-5.28	7.43	12.71	NiO
Ca3(AsO4)2:4w	-10.67	11.70	22.36	Ca3(AsO4)2:4H2O
Calcite	-0.88	-9.33	-8.46	CaCO3
Cerrusite	-1.21	-14.39	-13.18	PbCO3
Chalcanthite	-9.16	-11.82	-2.66	CuSO4:5H2O
Claudetite	-61.72	-141.84	-80.12	As4O6
CO2(g)	-3.04	-21.21	-18.16	CO2
Cotunnite	-13.38	-18.21	-4.83	PbCl2
Cu(OH)2	-1.53	7.28	8.81	Cu(OH)2
Cu2SO4	-20.74	-28.04	-7.30	Cu2SO4
Cu3(AsO4)2:6w	-8.24	-2.09	6.15	Cu3(AsO4)2:6H2O
CuCO3	-4.30	-13.93	-9.63	CuCO3
CuF	-21.11	-16.60	4.51	CuF
CuF2	-16.49	-16.97	-0.47	CuF2
CuF2:2H2O	-12.46	-16.97	-4.51	CuF2:2H2O
CuMetal	-4.57	-16.22	-11.65	Cu
CuOCuSO4	-16.46	-4.54	11.92	CuO:CuSO4
CupricFerrite	17.22	49.78	32.56	CuFe2O4
Cuprite	-1.92	-8.95	-7.02	Cu2O
CuprousFerrite	15.23	16.78	1.55	CuFeO2
CuSO4	-15.03	-11.82	3.21	CuSO4
Diaspore	4.11	11.26	7.15	AlOOH
Dolomite	-2.08	-19.06	-16.99	CaMg(CO3)2
Dolomite(d)	-2.65	-19.06	-16.42	CaMg(CO3)2
Epsomite	-5.45	-7.62	-2.17	MgSO4:7H2O
Fe(OH)2.7Cl.3	7.41	17.50	10.09	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	3.23	21.25	18.02	Fe(OH)3
Fe3(OH)8	5.53	52.00	46.47	Fe3(OH)8
Fluorite	-1.72	-12.37	-10.65	CaF2
Gibbsite	2.90	11.26	8.36	Al(OH)3
Goethite	9.13	21.25	12.13	FeOOH
Goslarite	-8.37	-10.37	-2.00	ZnSO4:7H2O
Gummite	-6.20	4.46	10.66	UO3
Gypsum	-2.64	-7.22	-4.58	CaSO4:2H2O
H2(g)	-23.45	-23.50	-0.05	H2
Halite	-9.45	-7.87	1.57	NaCl
Hausmannite	-10.19	51.94	62.13	Mn3O4
Hematite	19.92	42.50	22.58	Fe2O3
Huntite	-8.84	-38.53	-29.69	CaMg3(CO3)4
Hydrocerrusite	-4.52	-21.98	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-19.26	-27.45	-8.19	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-2.49	28.89	31.38	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-0.82	29.70	30.51	KFe3(SO4)2(OH)6
Jarosite-Na	-4.30	30.20	34.50	NaFe3(SO4)2(OH)6
JarositeH	-9.03	25.56	34.59	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-4.60	-7.83	-3.23	AlOHSO4
Langite	-7.21	10.01	17.22	Cu4(OH)6SO4:H2O
Larnakite	-5.26	-5.47	-0.21	PbO:PbSO4
Laurionite	-6.32	-5.70	0.62	PbOHCl
Litharge	-6.09	6.81	12.90	PbO
Maghemite	9.86	42.50	32.64	Fe2O3
Magnesite	-1.77	-9.73	-7.96	MgCO3
Magnetite	21.46	52.00	30.54	Fe3O4
Malachite	-1.65	-6.65	-5.00	Cu2(OH)2CO3
Manganite	-4.11	21.23	25.34	MnOOH
Massicot	-6.28	6.81	13.09	PbO
Matlockite	-8.30	-17.82	-9.52	PbClF
Melanothallite	-21.61	-17.74	3.87	CuCl2
Melanterite	-7.33	-9.59	-2.26	FeSO4:7H2O
Minium	-30.88	43.94	74.82	Pb3O4
Mirabilite	-8.50	-9.82	-1.32	Na2SO4:10H2O
Mn2(SO4)3	-61.13	-14.82	46.30	Mn2(SO4)3
Mn3(AsO4):8H2O	-8.04	4.52	12.56	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-18.06	-15.54	2.52	MnCl2:4H2O
MnSO4	-12.45	-9.61	2.84	MnSO4
Morenosite	-9.27	-11.67	-2.39	NiSO4:7H2O
Na4UO2(CO3)3	-24.33	-40.62	-16.29	Na4UO2(CO3)3
Nahcolite	-5.61	-16.57	-10.96	NaHCO3
Nantokite	-7.41	-16.98	-9.57	CuCl
Natron	-10.45	-11.93	-1.48	Na2CO3:10H2O
Nesquehonite	-4.17	-9.73	-5.56	MgCO3:3H2O
Ni(OH)2	-3.04	7.43	10.47	Ni(OH)2
Ni3(AsO4)2:8H2O	-17.39	-1.63	15.76	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-21.38	10.62	32.00	Ni4(OH)6SO4
NiCO3	-7.05	-13.78	-6.73	NiCO3
Nsutite	-9.58	32.98	42.56	MnO2
O2(g)	-37.70	47.00	84.70	O2
Pb(OH)2	-1.49	6.81	8.30	Pb(OH)2
Pb2(OH)3Cl	-7.68	1.11	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-12.58	13.62	26.20	PbO:Pb(OH)2
Pb2O3	-23.92	37.12	61.04	Pb2O3
Pb2OCO3	-7.21	-7.58	-0.37	PbO:PbCO3
Pb3(AsO4)2	-9.35	-3.48	5.87	Pb3(AsO4)2
Pb3O2CO3	-12.08	-0.77	11.31	PbCO3:2PbO
Pb3O2SO4	-9.29	1.34	10.63	PbSO4:2PbO
Pb4(OH)6SO4	-12.95	8.15	21.10	Pb4(OH)6SO4
Pb4O3SO4	-14.33	8.15	22.49	PbSO4:3PbO
PbF2	-10.00	-17.43	-7.43	PbF2
PbMetal	-20.95	-16.69	4.27	Pb
PbO:0.3H2O	-6.17	6.81	12.98	PbO:0.33H2O
Phosgenite	-12.79	-32.60	-19.81	PbCl2:PbCO3
Plattnerite	-19.76	30.31	50.08	PbO2
Portlandite	-11.27	11.87	23.14	Ca(OH)2
Pyrochroite	-5.72	9.48	15.20	Mn(OH)2
Pyrolusite	-9.11	32.98	42.09	MnO2
Retgersite	-9.61	-11.67	-2.05	NiSO4:6H2O
Rhodochrosite	-0.61	-11.73	-11.11	MnCO3
Rhodochrosite(d)	-1.34	-11.73	-10.39	MnCO3
Rutherfordine	-2.31	-16.75	-14.43	UO2CO3
Schoepite	-1.08	4.46	5.54	UO2(OH)2:H2O
Scorodite	-4.22	9.29	13.51	FeAsO4:2H2O
Siderite	-0.84	-11.70	-10.86	FeCO3
Siderite(d)(3)	-1.25	-11.70	-10.45	FeCO3
Smithsonite	-2.53	-12.48	-9.95	ZnCO3
Tenorite	-0.51	7.28	7.79	CuO
Thenardite	-9.65	-9.82	-0.17	Na2SO4
Thermonatrite	-12.09	-11.93	0.16	Na2CO3:H2O
Trona	-17.54	-28.50	-10.97	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-25.52	-38.14	-12.62	U(OH)2SO4
U3O8(c)	-3.67	-10.12	-6.45	U3O8
U4O9(c)	-12.72	-52.66	-39.94	U4O9
UF4(c)	-39.71	-67.53	-27.82	UF4
UF4:2.5H2O	-30.55	-67.53	-36.98	UF4:2.5H2O
UO2(a)	-9.72	-19.04	-9.32	UO2
UO3(gamma)	-3.47	4.46	7.93	UO3
Uraninite(c)	-5.03	-19.04	-14.01	UO2
Witherite	-3.37	-11.94	-8.57	BaCO3
Zincite(c)	-2.65	8.73	11.38	ZnO
Zincosite	-13.59	-10.37	3.22	ZnSO4
Zn(OH)2-a	-3.72	8.73	12.45	Zn(OH)2
Zn(OH)2-b	-3.02	8.73	11.75	Zn(OH)2
Zn(OH)2-c	-3.47	8.73	12.20	Zn(OH)2
Zn(OH)2-e	-2.77	8.73	11.50	Zn(OH)2
Zn(OH)2-g	-2.98	8.73	11.71	Zn(OH)2
Zn2(OH)2SO4	-9.14	-1.64	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-10.26	4.94	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-11.47	2.26	13.72	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-31.72	-12.01	19.70	ZnO:2ZnSO4
Zn4(OH)6SO4	-12.59	15.81	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-19.89	18.61	38.50	Zn5(OH)8Cl2
ZnCl2	-23.52	-16.30	7.22	ZnCl2
ZnCO3:H2O	-2.22	-12.48	-10.26	ZnCO3:H2O
ZnF2	-14.14	-15.52	-1.38	ZnF2
ZnMetal	-40.94	-14.77	26.16	Zn
ZnO(a)	-2.58	8.73	11.31	ZnO
ZnSO4:H2O	-9.92	-10.37	-0.45	ZnSO4:H2O

End of simulation.

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Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 6-7m
           SOLUTION        7
           units           mg/l
           temp            19.6
           pH              7.94
           F               0.72
           Cl              0.7
           S(6)            36          as SO4
           Na              23.4
           K               3.6
           Mg              2.7
           Ca              13.9
           Alkalinity      76.25       as HCO3
           Al              1.54
           As              0.080
           Ba              0.061
           Cu              0.022
           Fe              1.06
           Mn              0.14
           Ni              0.006
           Pb              0.009
           U               0.34
           Zn              0.032
           END
```

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TITLE
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   Schneckentein 6-7m

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Beginning of initial solution calculations.
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Initial solution 7.

----------------------------Solution composition------------
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           Elements           Molality       Moles

           Al                 5.709e-05   5.709e-05
           Alkalinity         1.250e-03   1.250e-03
           As                 1.068e-06   1.068e-06
           Ba                 4.442e-07   4.442e-07
           Ca                 3.469e-04   3.469e-04
           Cl                 1.975e-05   1.975e-05
           Cu                 3.463e-07   3.463e-07
           F                  3.790e-05   3.790e-05
           Fe                 1.898e-05   1.898e-05
           K                  9.208e-05   9.208e-05
           Mg                 1.111e-04   1.111e-04
           Mn                 2.549e-06   2.549e-06
           Na                 1.018e-03   1.018e-03
           Ni                 1.022e-07   1.022e-07
           Pb                 4.345e-08   4.345e-08
           S(6)               3.748e-04   3.748e-04
           U                  1.429e-06   1.429e-06
           Zn                 4.896e-07   4.896e-07
```

```
----------------------------Description of solution--------------------
--------

                                    pH  =   7.940
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   2.701e-03
                     Mass of water (kg)  =   1.000e+00
                   Total carbon (mol/kg) =   1.018e-03
                      Total CO2 (mol/kg) =   1.018e-03
                    Temperature (deg C)  =  19.600
                  Electrical balance (eq)  =   1.693e-04
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =   4.45
                                Iterations  =  10
                                   Total H  = 1.110137e+02
                                   Total O  = 5.551103e+01
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----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	6.060e-07	5.727e-07	-6.218	-6.242	-0.025
H+	1.210e-08	1.148e-08	-7.917	-7.940	-0.023
H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	**5.709e-05**				
Al(OH)4-	5.669e-05	5.358e-05	-4.246	-4.271	-0.025
Al(OH)3	3.481e-07	3.484e-07	-6.458	-6.458	0.000
Al(OH)2+	4.337e-08	4.099e-08	-7.363	-7.387	-0.025
AlF2+	1.015e-09	9.597e-10	-8.993	-9.018	-0.025
AlF3	4.268e-10	4.271e-10	-9.370	-9.369	0.000
AlOH+2	1.225e-10	9.772e-11	-9.912	-10.010	-0.098
AlF+2	6.948e-11	5.543e-11	-10.158	-10.256	-0.098
AlF4-	6.387e-12	6.037e-12	-11.195	-11.219	-0.025
Al+3	2.679e-13	1.611e-13	-12.572	-12.793	-0.221
AlSO4+	1.423e-13	1.345e-13	-12.847	-12.871	-0.025
Al(SO4)2-	1.243e-15	1.175e-15	-14.906	-14.930	-0.025
AlHSO4+2	1.642e-22	1.310e-22	-21.785	-21.883	-0.098
As(3)	**2.860e-18**				
H3AsO3	2.738e-18	2.740e-18	-17.563	-17.562	0.000
H2AsO3-	1.218e-19	1.151e-19	-18.914	-18.939	-0.025
HAsO3-2	7.831e-24	6.248e-24	-23.106	-23.204	-0.098
H4AsO3+	1.649e-26	1.559e-26	-25.783	-25.807	-0.025
AsO3-3	2.889e-29	1.738e-29	-28.539	-28.760	-0.221
As(5)	**1.068e-06**				
HAsO4-2	1.010e-06	8.060e-07	-5.996	-6.094	-0.098
H2AsO4-	5.745e-08	5.429e-08	-7.241	-7.265	-0.025
AsO4-3	2.584e-10	1.554e-10	-9.588	-9.808	-0.221
H3AsO4	1.034e-13	1.035e-13	-12.985	-12.985	0.000
Ba	**4.442e-07**				
Ba+2	3.963e-07	3.162e-07	-6.402	-6.500	-0.098
BaSO4	4.488e-08	4.491e-08	-7.348	-7.348	0.000
BaHCO3+	2.503e-09	2.365e-09	-8.602	-8.626	-0.025
BaCO3	4.924e-10	4.927e-10	-9.308	-9.307	0.000
BaOH+	9.873e-13	9.331e-13	-12.006	-12.030	-0.025
C(4)	**1.018e-03**				
HCO3-	9.775e-04	9.249e-04	-3.010	-3.034	-0.024
CO2	2.573e-05	2.574e-05	-4.590	-4.589	0.000
CO3-2	4.194e-06	3.362e-06	-5.377	-5.473	-0.096
CaHCO3+	2.993e-06	2.829e-06	-5.524	-5.548	-0.025
CaCO3	1.343e-06	1.344e-06	-5.872	-5.872	0.000
UO2(CO3)2-2	9.667e-07	7.712e-07	-6.015	-6.113	-0.098
MgHCO3+	9.436e-07	8.918e-07	-6.025	-6.050	-0.025
NaHCO3	4.993e-07	4.996e-07	-6.302	-6.301	0.000
UO2(CO3)3-4	4.163e-07	1.686e-07	-6.381	-6.773	-0.392
MnCO3	4.110e-07	4.113e-07	-6.386	-6.386	0.000
MgCO3	2.483e-07	2.484e-07	-6.605	-6.605	0.000
ZnCO3	1.406e-07	1.407e-07	-6.852	-6.852	0.000
MnHCO3+	1.343e-07	1.270e-07	-6.872	-6.896	-0.025
NiCO3	9.592e-08	9.598e-08	-7.018	-7.018	0.000
NaCO3-	4.821e-08	4.556e-08	-7.317	-7.341	-0.025
PbCO3	4.023e-08	4.026e-08	-7.395	-7.395	0.000
CuCO3	3.484e-08	3.486e-08	-7.458	-7.458	0.000
ZnHCO3+	2.585e-08	2.443e-08	-7.588	-7.612	-0.025
FeHCO3+	2.581e-08	2.439e-08	-7.588	-7.613	-0.025
FeCO3	2.125e-08	2.127e-08	-7.673	-7.672	0.000
Zn(CO3)2-2	1.268e-08	1.011e-08	-7.897	-7.995	-0.098
UO2CO3	1.081e-08	1.082e-08	-7.966	-7.966	0.000
BaHCO3+	2.503e-09	2.365e-09	-8.602	-8.626	-0.025
CuHCO3+	9.473e-10	8.953e-10	-9.024	-9.048	-0.025
Ni(CO3)2-2	7.028e-10	5.607e-10	-9.153	-9.251	-0.098
PbHCO3+	5.357e-10	5.063e-10	-9.271	-9.296	-0.025
NiHCO3+	5.203e-10	4.918e-10	-9.284	-9.308	-0.025
BaCO3	4.924e-10	4.927e-10	-9.308	-9.307	0.000
Pb(CO3)2-2	4.261e-10	3.399e-10	-9.371	-9.469	-0.098
Cu(CO3)2-2	1.849e-10	1.475e-10	-9.733	-9.831	-0.098
(UO2)3(CO3)6-6	5.294e-15	6.931e-16	-14.276	-15.159	-0.883
UO2(CO3)3-5	1.015e-23	2.472e-24	-22.994	-23.607	-0.613
U(CO3)4-4	1.091e-31	4.421e-32	-30.962	-31.354	-0.392
U(CO3)5-6	7.668e-36	1.004e-36	-35.115	-35.998	-0.883
Ca	**3.469e-04**				
Ca+2	3.283e-04	2.631e-04	-3.484	-3.580	-0.096
CaSO4	1.412e-05	1.413e-05	-4.850	-4.850	0.000
CaHCO3+	2.993e-06	2.829e-06	-5.524	-5.548	-0.025
CaCO3	1.343e-06	1.344e-06	-5.872	-5.872	0.000
CaF+	7.581e-08	7.164e-08	-7.120	-7.145	-0.025
CaOH+	4.023e-09	3.802e-09	-8.395	-8.420	-0.025
CaHSO4+	9.434e-13	8.916e-13	-12.025	-12.050	-0.025
Cl	**1.975e-05**				
Cl-	1.975e-05	1.865e-05	-4.704	-4.729	-0.025
MnCl+	1.239e-10	1.171e-10	-9.907	-9.932	-0.025
ZnOHCl	1.128e-11	1.129e-11	-10.948	-10.947	0.000
ZnCl+	8.745e-12	8.265e-12	-11.058	-11.083	-0.025
FeCl+	7.186e-12	6.792e-12	-11.143	-11.168	-0.025
PbCl+	4.725e-13	4.466e-13	-12.326	-12.350	-0.025
NiCl+	1.910e-13	1.805e-13	-12.719	-12.744	-0.025
CuCl+	7.838e-14	7.408e-14	-13.106	-13.130	-0.025
CuCl2-	1.136e-14	1.074e-14	-13.945	-13.969	-0.025
MnCl2	9.526e-16	9.532e-16	-15.021	-15.021	0.000
ZnCl2	1.578e-16	1.579e-16	-15.802	-15.802	0.000
UO2Cl+	2.155e-17	2.037e-17	-16.666	-16.691	-0.025
PbCl2	1.462e-17	1.463e-17	-16.835	-16.835	0.000
NiCl2	1.222e-17	1.222e-17	-16.913	-16.913	0.000
CuCl2	6.989e-19	6.993e-19	-18.156	-18.155	0.000
CuCl3-2	3.895e-19	3.108e-19	-18.409	-18.508	-0.098
FeCl+2	1.105e-19	8.818e-20	-18.956	-19.055	-0.098
MnCl3-	5.182e-21	4.898e-21	-20.285	-20.310	-0.025
ZnCl3-	3.384e-21	3.198e-21	-20.471	-20.495	-0.025
PbCl3-	2.218e-22	2.096e-22	-21.654	-21.679	-0.025
UO2Cl2	1.934e-23	1.935e-23	-22.713	-22.713	0.000
FeCl2+	9.256e-24	8.748e-24	-23.034	-23.058	-0.025
CuCl3-	4.443e-26	4.199e-26	-25.352	-25.377	-0.025
ZnCl4-2	3.588e-26	2.863e-26	-25.445	-25.543	-0.098
PbCl4-2	2.248e-27	1.794e-27	-26.648	-26.746	-0.098
FeCl3	1.631e-29	1.632e-29	-28.788	-28.787	0.000
CuCl4-2	4.333e-33	3.456e-33	-32.363	-32.461	-0.098
UCl+3	0.000e+00	0.000e+00	-45.088	-45.308	-0.221
Cu(1)	**1.019e-10**				
Cu+	1.019e-10	9.628e-11	-9.992	-10.016	-0.025
CuCl2-	1.136e-14	1.074e-14	-13.945	-13.969	-0.025
CuCl3-2	3.895e-19	3.108e-19	-18.409	-18.508	-0.098
Cu(2)	**3.462e-07**				
Cu(OH)2	3.059e-07	3.061e-07	-6.514	-6.514	0.000
CuCO3	3.484e-08	3.486e-08	-7.458	-7.458	0.000
Cu+2	2.421e-09	1.931e-09	-8.616	-8.714	-0.098
CuOH+	1.780e-09	1.682e-09	-8.750	-8.774	-0.025
CuHCO3+	9.473e-10	8.953e-10	-9.024	-9.048	-0.025
Cu(CO3)2-2	1.849e-10	1.475e-10	-9.733	-9.831	-0.098
CuSO4	1.075e-10	1.076e-10	-9.969	-9.968	0.000
Cu(OH)3-	1.699e-12	1.606e-12	-11.770	-11.794	-0.025
CuF+	1.257e-12	1.188e-12	-11.901	-11.925	-0.025
Cu2(OH)2+2	8.989e-13	7.171e-13	-12.046	-12.144	-0.098
CuCl+	7.838e-14	7.408e-14	-13.106	-13.130	-0.025
Cu(OH)4-2	3.498e-17	2.791e-17	-16.456	-16.554	-0.098
CuCl2	6.989e-19	6.993e-19	-18.156	-18.155	0.000
CuCl3-	4.443e-26	4.199e-26	-25.352	-25.377	-0.025
CuCl4-2	4.333e-33	3.456e-33	-32.363	-32.461	-0.098
F	**3.790e-05**				
F-	3.761e-05	3.555e-05	-4.425	-4.449	-0.025
MgF+	1.893e-07	1.789e-07	-6.723	-6.747	-0.025
CaF+	7.581e-08	7.164e-08	-7.120	-7.145	-0.025
NaF	1.964e-08	1.965e-08	-7.707	-7.707	0.000
AlF2+	1.015e-09	9.597e-10	-8.993	-9.018	-0.025
HF	5.557e-10	5.560e-10	-9.255	-9.255	0.000
AlF3	4.268e-10	4.271e-10	-9.370	-9.369	0.000
MnF+	4.008e-10	3.788e-10	-9.397	-9.422	-0.025
ZnF+	1.040e-10	9.831e-11	-9.983	-10.007	-0.025
FeF+	9.921e-11	9.376e-11	-10.003	-10.028	-0.025
AlF+2	6.948e-11	5.543e-11	-10.158	-10.256	-0.098
AlF4-	6.387e-12	6.037e-12	-11.195	-11.219	-0.025
UO2F+	3.578e-12	3.382e-12	-11.446	-11.471	-0.025
NiF+	2.891e-12	2.732e-12	-11.539	-11.564	-0.025
CuF+	1.257e-12	1.188e-12	-11.901	-11.925	-0.025
PbF+	4.610e-13	4.356e-13	-12.336	-12.361	-0.025
UO2F2	4.060e-13	4.062e-13	-12.392	-12.391	0.000
HF2-	7.668e-14	7.247e-14	-13.115	-13.140	-0.025
FeF2+	1.354e-14	1.280e-14	-13.868	-13.893	-0.025
FeF+2	1.210e-14	9.652e-15	-13.917	-14.015	-0.098
UO2F3-	2.906e-15	2.747e-15	-14.537	-14.561	-0.025
FeF3	7.072e-16	7.076e-16	-15.150	-15.150	0.000
PbF2	3.160e-16	3.162e-16	-15.500	-15.500	0.000
H2F2	9.759e-19	9.765e-19	-18.011	-18.010	0.000
UO2F4-2	7.841e-19	6.255e-19	-18.106	-18.204	-0.098
PbF3-	8.616e-20	8.143e-20	-19.065	-19.089	-0.025
PbF4-2	1.737e-24	1.386e-24	-23.760	-23.858	-0.098
UF3+	8.224e-35	7.772e-35	-34.085	-34.109	-0.025
UF4	2.261e-35	2.262e-35	-34.646	-34.645	0.000
UF2+2	1.175e-35	9.373e-36	-34.930	-35.028	-0.098
UF+3	5.353e-38	3.220e-38	-37.271	-37.492	-0.221
UF5-	2.304e-38	2.178e-38	-37.637	-37.662	-0.025
UF6-2	1.253e-40	0.000e+00	-39.902	-40.000	-0.098
Fe(2)	**3.949e-07**				
Fe+2	3.306e-07	2.637e-07	-6.481	-6.579	-0.098
FeHCO3+	2.581e-08	2.439e-08	-7.588	-7.613	-0.025
FeCO3	2.125e-08	2.127e-08	-7.673	-7.672	0.000
FeSO4	1.201e-08	1.202e-08	-7.920	-7.920	0.000
FeOH+	5.096e-09	4.816e-09	-8.293	-8.317	-0.025
FeF+	9.921e-11	9.376e-11	-10.003	-10.028	-0.025
FeCl+	7.186e-12	6.792e-12	-11.143	-11.168	-0.025
Fe(OH)2	2.211e-12	2.213e-12	-11.655	-11.655	0.000
Fe(OH)3-	7.178e-15	6.783e-15	-14.144	-14.169	-0.025
FeHSO4+	9.459e-16	8.939e-16	-15.024	-15.049	-0.025

Fe(3)	1.859e-05					
	Fe(OH)3	1.566e-05	1.567e-05	-4.805	-4.805	0.000
	Fe(OH)2+	1.878e-06	1.774e-06	-5.726	-5.751	-0.025
	Fe(OH)4-	1.055e-06	9.975e-07	-5.977	-6.001	-0.025
	FeOH+2	9.501e-11	7.580e-11	-10.022	-10.120	-0.098
	FeF2+	1.354e-14	1.280e-14	-13.868	-13.893	-0.025
	FeF+2	1.210e-14	9.652e-15	-13.917	-14.015	-0.098
	FeF3	7.072e-16	7.076e-16	-15.150	-15.150	0.000
	FeSO4+	5.424e-16	5.126e-16	-15.266	-15.290	-0.025
	Fe+3	3.098e-16	1.863e-16	-15.509	-15.730	-0.221
	Fe(SO4)2-	3.291e-18	3.111e-18	-17.483	-17.507	-0.025
	Fe2(OH)2+4	4.792e-19	1.941e-19	-18.320	-18.712	-0.392
	FeCl+2	1.105e-19	8.818e-20	-18.956	-19.055	-0.098
	Fe3(OH)4+5	4.906e-22	1.195e-22	-21.309	-21.922	-0.613
	FeHSO4+2	1.989e-23	1.586e-23	-22.701	-22.800	-0.098
	FeCl2+	9.256e-24	8.748e-24	-23.034	-23.058	-0.025
	FeCl3	1.631e-29	1.632e-29	-28.788	-28.787	0.000
H(0)	1.890e-27					
	H2	9.450e-28	9.455e-28	-27.025	-27.024	0.000
K	9.208e-05					
	K+	9.191e-05	8.682e-05	-4.037	-4.061	-0.025
	KSO4-	1.718e-07	1.624e-07	-6.765	-6.789	-0.025
Mg	1.111e-04					
	Mg+2	1.048e-04	8.415e-05	-3.980	-4.075	-0.095
	MgSO4	4.849e-06	4.852e-06	-5.314	-5.314	0.000
	MgHCO3+	9.436e-07	8.918e-07	-6.025	-6.050	-0.025
	MgCO3	2.483e-07	2.484e-07	-6.605	-6.605	0.000
	MgF+	1.893e-07	1.789e-07	-6.723	-6.747	-0.025
	MgOH+	1.714e-08	1.619e-08	-7.766	-7.791	-0.025
Mn(2)	2.549e-06					
	Mn+2	1.931e-06	1.540e-06	-5.714	-5.812	-0.098
	MnCO3	4.110e-07	4.113e-07	-6.386	-6.386	0.000
	MnHCO3+	1.343e-07	1.270e-07	-6.872	-6.896	-0.025
	MnSO4	6.984e-08	6.989e-08	-7.156	-7.156	0.000
	MnOH+	2.330e-09	2.202e-09	-8.633	-8.657	-0.025
	MnF+	4.008e-10	3.788e-10	-9.397	-9.422	-0.025
	MnCl+	1.239e-10	1.171e-10	-9.907	-9.932	-0.025
	MnCl2	9.526e-16	9.532e-16	-15.021	-15.021	0.000
	Mn(OH)3-	1.706e-17	1.613e-17	-16.768	-16.792	-0.025
	MnCl3-	5.182e-21	4.898e-21	-20.285	-20.310	-0.025
Mn(3)	3.544e-28					
	Mn+3	3.544e-28	2.132e-28	-27.450	-27.671	-0.221
Mn(6)	0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-46.663	-46.761	-0.098
Mn(7)	0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-52.480	-52.504	-0.025
Na	1.018e-03					
	Na+	1.016e-03	9.606e-04	-2.993	-3.017	-0.024
	NaSO4-	1.394e-06	1.318e-06	-5.856	-5.880	-0.025
	NaHCO3	4.993e-07	4.996e-07	-6.302	-6.301	0.000
	NaCO3-	4.821e-08	4.556e-08	-7.317	-7.341	-0.025
	NaF	1.964e-08	1.965e-08	-7.707	-7.707	0.000
Ni	1.022e-07					
	NiCO3	9.592e-08	9.598e-08	-7.018	-7.018	0.000
	Ni+2	4.828e-09	3.852e-09	-8.316	-8.414	-0.098
	Ni(CO3)2-2	7.028e-10	5.607e-10	-9.153	-9.251	-0.098
	NiHCO3+	5.203e-10	4.918e-10	-9.284	-9.308	-0.025
	NiSO4	2.029e-10	2.030e-10	-9.693	-9.693	0.000
	NiOH+	3.328e-11	3.146e-11	-10.478	-10.502	-0.025
	Ni(OH)2	2.920e-12	2.921e-12	-11.535	-11.534	0.000
	NiF+	2.891e-12	2.732e-12	-11.539	-11.564	-0.025
	NiCl+	1.910e-13	1.805e-13	-12.719	-12.744	-0.025
	Ni(SO4)2-2	4.060e-15	3.239e-15	-14.392	-14.490	-0.098
	Ni(OH)3-	2.692e-15	2.544e-15	-14.570	-14.594	-0.025
	NiCl2	1.222e-17	1.222e-17	-16.913	-16.913	0.000
O(0)	0.000e+00					
	O2	0.000e+00	0.000e+00	-40.143	-40.142	0.000
Pb	4.345e-08					
	PbCO3	4.023e-08	4.026e-08	-7.395	-7.395	0.000
	PbOH+	1.238e-09	1.170e-09	-8.907	-8.932	-0.025
	Pb+2	8.638e-10	6.891e-10	-9.064	-9.162	-0.098
	PbHCO3+	5.357e-10	5.063e-10	-9.271	-9.296	-0.025
	Pb(CO3)2-2	4.261e-10	3.399e-10	-9.371	-9.469	-0.098
	PbSO4	1.097e-10	1.098e-10	-9.960	-9.959	0.000
	Pb(OH)2	3.963e-11	3.965e-11	-10.402	-10.402	0.000
	PbCl+	4.725e-13	4.466e-13	-12.326	-12.350	-0.025
	PbF+	4.610e-13	4.356e-13	-12.336	-12.361	-0.025
	Pb(SO4)2-2	2.047e-13	1.633e-13	-12.689	-12.787	-0.098
	Pb(OH)3-	4.195e-14	3.965e-14	-13.377	-13.402	-0.025
	PbF2	3.160e-16	3.162e-16	-15.500	-15.500	0.000
	Pb2OH+3	3.001e-17	1.805e-17	-16.523	-16.743	-0.221
	PbCl2	1.462e-17	1.463e-17	-16.835	-16.835	0.000
	Pb(OH)4-2	9.916e-18	7.911e-18	-17.004	-17.102	-0.098
	PbF3-	8.616e-20	8.143e-20	-19.065	-19.089	-0.025
	Pb3(OH)4+2	1.363e-20	1.088e-20	-19.865	-19.963	-0.098
	PbCl3-	2.218e-22	2.096e-22	-21.654	-21.679	-0.025
	PbF4-2	1.737e-24	1.386e-24	-23.760	-23.858	-0.098
	PbCl4-2	2.248e-27	1.794e-27	-26.648	-26.746	-0.098

S(6)	3.748e-04					
	SO4-2	3.541e-04	2.834e-04	-3.451	-3.548	-0.097
	CaSO4	1.412e-05	1.413e-05	-4.850	-4.850	0.000
	MgSO4	4.849e-06	4.852e-06	-5.314	-5.314	0.000
	NaSO4-	1.394e-06	1.318e-06	-5.856	-5.880	-0.025
	KSO4-	1.718e-07	1.624e-07	-6.765	-6.789	-0.025
	MnSO4	6.984e-08	6.989e-08	-7.156	-7.156	0.000
	BaSO4	4.488e-08	4.491e-08	-7.348	-7.348	0.000
	ZnSO4	1.335e-08	1.336e-08	-7.875	-7.874	0.000
	FeSO4	1.201e-08	1.202e-08	-7.920	-7.920	0.000
	HSO4-	2.983e-10	2.819e-10	-9.525	-9.550	-0.025
	NiSO4	2.029e-10	2.030e-10	-9.693	-9.693	0.000
	PbSO4	1.097e-10	1.098e-10	-9.960	-9.959	0.000
	CuSO4	1.075e-10	1.076e-10	-9.969	-9.968	0.000
	Zn(SO4)2-2	4.023e-11	3.210e-11	-10.395	-10.494	-0.098
	CaHSO4+	9.434e-13	8.916e-13	-12.025	-12.050	-0.025
	UO2SO4	2.707e-13	2.708e-13	-12.568	-12.567	0.000
	Pb(SO4)2-2	2.047e-13	1.633e-13	-12.689	-12.787	-0.098
	AlSO4+	1.423e-13	1.345e-13	-12.847	-12.871	-0.025
	Ni(SO4)2-2	4.060e-15	3.239e-15	-14.392	-14.490	-0.098
	Al(SO4)2-	1.243e-15	1.175e-15	-14.906	-14.930	-0.025
	FeHSO4+	9.459e-16	8.939e-16	-15.024	-15.049	-0.025
	UO2(SO4)2-2	8.378e-16	6.684e-16	-15.077	-15.175	-0.098
	FeSO4+	5.424e-16	5.126e-16	-15.266	-15.290	-0.025
	Fe(SO4)2-	3.291e-18	3.111e-18	-17.483	-17.507	-0.025
	AlHSO4+2	1.642e-22	1.310e-22	-21.785	-21.883	-0.098
	FeHSO4+2	1.989e-23	1.586e-23	-22.701	-22.800	-0.098
	U(SO4)2	8.678e-40	8.683e-40	-39.062	-39.061	0.000
	USO4+2	5.549e-40	4.427e-40	-39.256	-39.354	-0.098
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-55.266	-55.486	-0.221
U(4)	3.684e-20					
	U(OH)4	3.684e-20	3.686e-20	-19.434	-19.433	0.000
	U(OH)3+	1.749e-24	1.653e-24	-23.757	-23.782	-0.025
	U(OH)2+2	1.282e-29	1.022e-29	-28.892	-28.990	-0.098
	U(CO3)4-4	1.091e-31	4.421e-32	-30.962	-31.354	-0.392
	UF3+	8.224e-35	7.772e-35	-34.085	-34.109	-0.025
	UF4	2.261e-35	2.262e-35	-34.646	-34.645	0.000
	UOH+3	1.284e-35	7.724e-36	-34.891	-35.112	-0.221
	UF2+2	1.175e-35	9.373e-36	-34.930	-35.028	-0.098
	U(CO3)5-6	7.668e-36	1.004e-36	-35.115	-35.998	-0.883
	UF+3	5.353e-38	3.220e-38	-37.271	-37.492	-0.221
	UF5-	2.304e-38	2.178e-38	-37.637	-37.662	-0.025
	U(SO4)2	8.678e-40	8.683e-40	-39.062	-39.061	0.000
	USO4+2	5.549e-40	4.427e-40	-39.256	-39.354	-0.098
	UF6-2	1.253e-40	0.000e+00	-39.902	-40.000	-0.098
	U+4	0.000e+00	0.000e+00	-41.968	-42.361	-0.392
	UCl+3	0.000e+00	0.000e+00	-45.088	-45.308	-0.221
	U6(OH)15+9	0.000e+00	0.000e+00	-150.277	-152.264	-1.987
U(5)	2.838e-15					
	UO2+	2.838e-15	2.682e-15	-14.547	-14.572	-0.025
	UO2(CO3)3-5	1.015e-23	2.472e-24	-22.994	-23.607	-0.613
U(6)	1.429e-06					
	UO2(CO3)2-2	9.667e-07	7.712e-07	-6.015	-6.113	-0.098
	UO2(CO3)3-4	4.163e-07	1.686e-07	-6.381	-6.773	-0.392
	UO2(OH)3-	3.454e-08	3.264e-08	-7.462	-7.486	-0.025
	UO2CO3	1.081e-08	1.082e-08	-7.966	-7.966	0.000
	UO2OH+	3.232e-10	3.054e-10	-9.491	-9.515	-0.025
	UO2F+	3.578e-12	3.382e-12	-11.446	-11.471	-0.025
	(UO2)3(OH)7-	1.932e-12	1.826e-12	-11.714	-11.739	-0.025
	UO2+2	9.817e-13	7.832e-13	-12.008	-12.106	-0.098
	UO2F2	4.060e-13	4.062e-13	-12.392	-12.391	0.000
	(UO2)3(OH)5+	3.288e-13	3.108e-13	-12.483	-12.508	-0.025
	UO2SO4	2.707e-13	2.708e-13	-12.568	-12.567	0.000
	UO2(OH)4-2	5.648e-14	4.506e-14	-13.248	-13.346	-0.098
	(UO2)2(OH)2+2	1.017e-14	8.117e-15	-13.993	-14.091	-0.098
	(UO2)3(CO3)6-6	5.294e-15	6.931e-16	-14.276	-15.159	-0.883
	UO2F3-	2.906e-15	2.747e-15	-14.537	-14.561	-0.025
	(UO2)4(OH)7+	1.905e-15	1.800e-15	-14.720	-14.745	-0.025
	UO2(SO4)2-2	8.378e-16	6.684e-16	-15.077	-15.175	-0.098
	(UO2)3(OH)4+2	4.361e-17	3.479e-17	-16.360	-16.458	-0.098
	UO2Cl+	2.155e-17	2.037e-17	-16.666	-16.691	-0.025
	UO2F4-2	7.841e-19	6.255e-19	-18.106	-18.204	-0.098
	(UO2)2OH+3	1.772e-19	1.066e-19	-18.752	-18.972	-0.221
	UO2Cl2	1.934e-23	1.935e-23	-22.713	-22.713	0.000
Zn	4.896e-07					
	Zn+2	2.630e-07	2.098e-07	-6.580	-6.678	-0.098
	ZnCO3	1.406e-07	1.407e-07	-6.852	-6.852	0.000
	ZnHCO3+	2.585e-08	2.443e-08	-7.588	-7.612	-0.025
	Zn(OH)2	2.002e-08	2.003e-08	-7.699	-7.698	0.000
	ZnOH+	1.397e-08	1.320e-08	-7.855	-7.879	-0.025
	ZnSO4	1.335e-08	1.336e-08	-7.875	-7.874	0.000
	Zn(CO3)2-2	1.268e-08	1.011e-08	-7.897	-7.995	-0.098
	ZnF+	1.040e-10	9.831e-11	-9.983	-10.007	-0.025
	Zn(SO4)2-2	4.023e-11	3.210e-11	-10.395	-10.494	-0.098
	ZnOHCl	1.128e-11	1.129e-11	-10.948	-10.947	0.000
	ZnCl+	8.745e-12	8.265e-12	-11.058	-11.083	-0.025
	Zn(OH)3-	5.838e-12	5.517e-12	-11.234	-11.258	-0.025
	ZnCl2	1.578e-16	1.579e-16	-15.802	-15.802	0.000
	Zn(OH)4-2	9.545e-17	7.615e-17	-16.020	-16.118	-0.098
	ZnCl3-	3.384e-21	3.198e-21	-20.471	-20.495	-0.025
	ZnCl4-2	3.588e-26	2.863e-26	-25.445	-25.543	-0.098

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-0.13	11.03	11.16	Al(OH)3
AlAsO4:2H2O	-6.76	-1.96	4.81	AlAsO4:2H2O
AlumK	-18.68	-23.95	-5.27	KAl(SO4)2:12H2O
Alunite	-1.17	-1.90	-0.72	KAl3(SO4)2(OH)6
Anglesite	-4.89	-12.71	-7.82	PbSO4
Anhydrite	-2.78	-7.13	-4.34	CaSO4
Antlerite	-6.22	2.07	8.29	Cu3(OH)4SO4
Aragonite	-0.75	-9.05	-8.30	CaCO3
Arsenolite	-67.25	-147.46	-80.21	As4O6
Artinite	-7.73	2.26	9.99	MgCO3:Mg(OH)2:3H2O
As2O5	-32.74	-25.97	6.77	As2O5
Atacamite	-5.93	1.66	7.59	Cu2(OH)3Cl
Azurite	-4.62	-21.21	-16.59	Cu3(OH)2(CO3)2
B-UO2(OH)2	-1.96	3.77	5.73	UO2(OH)2
Ba3(AsO4)2	11.12	2.17	-8.95	Ba3(AsO4)2
BaF2	-9.62	-15.40	-5.77	BaF2
Barite	0.01	-10.05	-10.06	BaSO4
Basaluminite	1.98	24.68	22.70	Al4(OH)10SO4
Bianchite	-8.46	-10.23	-1.76	ZnSO4:6H2O
Birnessite	-9.65	33.95	43.60	MnO2
Bixbyite	-7.30	44.02	51.31	Mn2O3
Boehmite	2.06	11.03	8.97	AlOOH
Brochantite	-6.10	9.24	15.34	Cu4(OH)6SO4
Brucite	-5.40	11.81	17.21	Mg(OH)2
Bunsenite	-5.31	7.47	12.77	NiO
Ca3(AsO4)2:4w	-11.45	10.93	22.38	Ca3(AsO4)2:4H2O
Calcite	-0.60	-9.05	-8.45	CaCO3
Cerrusite	-1.44	-14.64	-13.20	PbCO3
Chalcanthite	-9.60	-12.26	-2.66	CuSO4:5H2O
Claudetite	-67.00	-147.46	-80.46	As4O6
CO2(g)	-3.19	-21.35	-18.17	CO2
Cotunnite	-13.77	-18.62	-4.85	PbCl2
Cu(OH)2	-1.68	7.17	8.85	Cu(OH)2
Cu2SO4	-21.69	-28.98	-7.28	Cu2SO4
Cu3(AsO4)2:6w	-10.64	-4.47	6.16	Cu3(AsO4)2:6H2O
CuCO3	-4.56	-14.19	-9.63	CuCO3
CuF	-21.71	-17.16	4.55	CuF
CuF2	-17.17	-17.61	-0.44	CuF2
CuF2:2H2O	-13.11	-17.61	-4.50	CuF2:2H2O
CuMetal	-5.02	-16.71	-11.69	Cu
CuOCuSO4	-17.11	-5.10	12.01	CuO:CuSO4
CupricFerrite	16.94	49.65	32.70	CuFe2O4
Cuprite	-2.52	-9.55	-7.03	Cu2O
CuprousFerrite	14.88	16.47	1.58	CuFeO2
CuSO4	-15.52	-12.26	3.26	CuSO4
Diaspore	3.81	11.03	7.21	AlOOH
Dolomite	-1.64	-18.60	-16.96	CaMg(CO3)2
Dolomite(d)	-2.21	-18.60	-16.39	CaMg(CO3)2
Epsomite	-5.44	-7.62	-2.18	MgSO4:7H2O
Fe(OH)2.7Cl.3	7.33	17.44	10.11	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	3.20	21.24	18.04	Fe(OH)3
Fe3(OH)8	5.26	51.78	46.52	Fe3(OH)8
Fluorite	-1.81	-12.48	-10.66	CaF2
Gibbsite	2.61	11.03	8.42	Al(OH)3
Goethite	9.09	21.24	12.15	FeOOH
Goslarite	-8.22	-10.23	-2.00	ZnSO4:7H2O
Gummite	-6.94	3.77	10.71	UO3
Gypsum	-2.55	-7.13	-4.58	CaSO4:2H2O
H2(g)	-23.83	-23.88	-0.05	H2
Halite	-9.32	-7.75	1.57	NaCl
Hausmannite	-8.31	54.08	62.39	Mn3O4
Hematite	19.77	42.48	22.71	Fe2O3
Huntite	-8.08	-37.70	-29.62	CaMg3(CO3)4
Hydrocerrusite	-5.09	-22.55	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-18.33	-26.39	-8.06	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-3.45	28.00	31.45	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-1.92	28.75	30.67	KFe3(SO4)2(OH)6
Jarosite-Na	-4.87	29.79	34.66	NaFe3(SO4)2(OH)6
JarositeH	-9.94	24.87	34.81	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-5.17	-8.40	-3.23	AlOHSO4
Langite	-8.09	9.24	17.33	Cu4(OH)6SO4:H2O
Larnakite	-5.80	-5.99	-0.19	PbO:PbSO4
Laurionite	-6.57	-5.95	0.62	PbOHCl
Litharge	-6.22	6.72	12.94	PbO
Maghemite	9.79	42.48	32.69	Fe2O3
Magnesite	-1.60	-9.55	-7.95	MgCO3
Magnetite	21.06	51.78	30.72	Fe3O4
Malachite	-2.06	-7.02	-4.96	Cu2(OH)2CO3
Manganite	-3.33	22.01	25.34	MnOOH
Massicot	-6.42	6.72	13.14	PbO
Matlockite	-8.80	-18.34	-9.54	PbClF
Melanothallite	-22.07	-18.17	3.90	CuCl2
Melanterite	-7.85	-10.13	-2.28	FeSO4:7H2O
Minium	-31.04	44.03	75.08	Pb3O4
Mirabilite	-8.21	-9.58	-1.37	Na2SO4:10H2O
Mn2(SO4)3	-60.80	-14.27	46.53	Mn2(SO4)3
Mn3(AsO4):8H2O	-8.35	4.23	12.58	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-17.75	-15.27	2.48	MnCl2:4H2O
MnSO4	-12.24	-9.36	2.88	MnSO4
Morenosite	-9.56	-11.96	-2.40	NiSO4:7H2O
Na4UO2(CO3)3	-24.31	-40.60	-16.29	Na4UO2(CO3)3
Nahcolite	-5.45	-16.43	-10.98	NaHCO3
Nantokite	-7.85	-17.44	-9.59	CuCl
Natron	-9.98	-11.51	-1.52	Na2CO3:10H2O
Nesquehonite	-4.01	-9.55	-5.54	MgCO3:3H2O
Ni(OH)2	-2.92	7.47	10.39	Ni(OH)2
Ni3(AsO4)2:8H2O	-19.35	-3.57	15.78	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-21.57	10.43	32.00	Ni4(OH)6SO4
NiCO3	-7.18	-13.89	-6.71	NiCO3
Nsutite	-8.62	33.95	42.56	MnO2
O2(g)	-37.29	47.76	85.05	O2
Pb(OH)2	-1.62	6.72	8.34	Pb(OH)2
Pb2(OH)3Cl	-8.03	0.77	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-12.76	13.44	26.20	PbO:Pb(OH)2
Pb2O3	-23.72	37.32	61.04	Pb2O3
Pb2OCO3	-7.57	-7.92	-0.35	PbO:PbCO3
Pb3(AsO4)2	-11.70	-5.82	5.88	Pb3(AsO4)2
Pb3O2CO3	-12.58	-1.20	11.38	PbCO3:2PbO
Pb3O2SO4	-9.95	0.73	10.68	PbSO4:2PbO
Pb4(OH)6SO4	-13.65	7.45	21.10	Pb4(OH)6SO4
Pb4O3SO4	-15.13	7.45	22.57	PbSO4:3PbO
PbF2	-10.63	-18.06	-7.43	PbF2
PbMetal	-21.43	-17.16	4.26	Pb
PbO:0.3H2O	-6.26	6.72	12.98	PbO:0.33H2O
Phosgenite	-13.45	-33.26	-19.81	PbCl2:PbCO3
Plattnerite	-19.66	30.60	50.26	PbO2
Portlandite	-10.92	12.30	23.22	Ca(OH)2
Pyrochroite	-5.13	10.07	15.20	Mn(OH)2
Pyrolusite	-8.31	33.95	42.26	MnO2
Retgersite	-9.91	-11.96	-2.05	NiSO4:6H2O
Rhodochrosite	-0.18	-11.29	-11.11	MnCO3
Rhodochrosite(d)	-0.90	-11.29	-10.39	MnCO3
Rutherfordine	-3.15	-17.58	-14.43	UO2CO3
Schoepite	-1.79	3.77	5.57	UO2(OH)2:H2O
Scorodite	-5.29	8.26	13.55	FeAsO4:2H2O
Siderite	-1.20	-12.05	-10.86	FeCO3
Siderite(d)(3)	-1.60	-12.05	-10.45	FeCO3
Smithsonite	-2.21	-12.15	-9.94	ZnCO3
Tenorite	-0.66	7.17	7.83	CuO
Thenardite	-9.41	-9.58	-0.17	Na2SO4
Thermonatrite	-11.67	-11.51	0.16	Na2CO3:H2O
Trona	-17.01	-27.94	-10.93	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-26.83	-39.53	-12.71	U(OH)2SO4
U3O8(c)	-6.14	-12.56	-6.42	U3O8
U4O9(c)	-16.51	-56.54	-40.04	U4O9
UF4(c)	-41.81	-69.66	-27.86	UF4
UF4:2.5H2O	-32.60	-69.66	-37.07	UF4:2.5H2O
UO2(a)	-10.70	-20.11	-9.41	UO2
UO3(gamma)	-4.21	3.77	7.98	UO3
Uraninite(c)	-6.05	-20.11	-14.05	UO2
Witherite	-3.40	-11.97	-8.58	BaCO3
Zincite(c)	-2.23	9.20	11.44	ZnO
Zincosite	-13.50	-10.23	3.27	ZnSO4
Zn(OH)2-a	-3.25	9.20	12.45	Zn(OH)2
Zn(OH)2-b	-2.55	9.20	11.75	Zn(OH)2
Zn(OH)2-c	-3.00	9.20	12.20	Zn(OH)2
Zn(OH)2-e	-2.30	9.20	11.50	Zn(OH)2
Zn(OH)2-g	-2.51	9.20	11.71	Zn(OH)2
Zn2(OH)2SO4	-8.52	-1.02	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.47	5.73	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-12.11	1.64	13.74	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-31.11	-11.25	19.86	ZnO:2ZnSO4
Zn4(OH)6SO4	-11.02	17.38	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-17.83	20.67	38.50	Zn5(OH)8Cl2
ZnCl2	-23.40	-16.14	7.27	ZnCl2
ZnCO3:H2O	-1.89	-12.15	-10.26	ZnCO3:H2O
ZnF2	-14.23	-15.58	-1.34	ZnF2
ZnMetal	-40.93	-14.68	26.25	Zn
ZnO(a)	-2.11	9.20	11.31	ZnO
ZnSO4:H2O	-9.80	-10.23	-0.43	ZnSO4:H2O

End of simulation.

```
------------------
Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 7-8m
           SOLUTION        8
           units           mg/l
           temp            20.3
           pH              7.86
           F               0.47
           Cl              1.4
           S(6)            44          as SO4
           Na              23
           K               3.9
           Mg              2.9
           Ca              15.4
           Alkalinity      67.1        as HCO3
           Al              0.16
           As              0.37
           Ba              0.064
           Cu              0.008
           Fe              0.31
           Mn              0.06
           Ni              0.005
           Pb              0.003
           U               0.97
           Zn              0.000
           END
```

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TITLE
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   Schneckentein 7-8m

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Beginning of initial solution calculations.
-----------------------------------------

Initial solution 8.

----------------------------Solution composition------------
-----------------

            Elements           Molality       Moles

            Al                5.931e-06   5.931e-06
            Alkalinity        1.100e-03   1.100e-03
            As                4.939e-06   4.939e-06
            Ba                4.661e-07   4.661e-07
            Ca                3.843e-04   3.843e-04
            Cl                3.950e-05   3.950e-05
            Cu                1.259e-07   1.259e-07
            F                 2.474e-05   2.474e-05
            Fe                5.552e-06   5.552e-06
            K                 9.976e-05   9.976e-05
            Mg                1.193e-04   1.193e-04
            Mn                1.092e-06   1.092e-06
            Na                1.001e-03   1.001e-03
            Ni                8.518e-08   8.518e-08
            Pb                1.448e-08   1.448e-08
            S(6)              4.581e-04   4.581e-04
            U                 4.076e-06   4.076e-06
```

```
----------------------------Description of solution----------------------
-----

                                    pH  =   7.860
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   2.945e-03
                     Mass of water (kg)  =   1.000e+00
                 Total carbon (mol/kg)  =   1.083e-03
                    Total CO2 (mol/kg)  =   1.083e-03
                   Temperature (deg C)  =  20.300
                Electrical balance (eq)  =   5.757e-05
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =   1.42
                              Iterations  =  10
                                 Total H  = 1.110135e+02
                                 Total O  = 5.551133e+01
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	5.342e-07	5.037e-07	-6.272	-6.298	-0.026
H+	1.458e-08	1.380e-08	-7.836	-7.860	-0.024
H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	**5.931e-06**				
Al(OH)4-	5.882e-06	5.545e-06	-5.230	-5.256	-0.026
Al(OH)3	4.300e-08	4.303e-08	-7.367	-7.366	0.000
Al(OH)2+	6.110e-09	5.760e-09	-8.214	-8.240	-0.026
AlF2+	7.900e-11	7.448e-11	-10.102	-10.128	-0.026
AlF3	2.158e-11	2.159e-11	-10.666	-10.666	0.000
AlOH+2	1.958e-11	1.547e-11	-10.708	-10.810	-0.102
AlF+2	8.332e-12	6.584e-12	-11.079	-11.182	-0.102
AlF4-	2.107e-13	1.987e-13	-12.676	-12.702	-0.026
Al+3	4.974e-14	2.928e-14	-13.303	-13.533	-0.230
AlSO4+	3.155e-14	2.975e-14	-13.501	-13.527	-0.026
Al(SO4)2-	3.336e-16	3.145e-16	-15.477	-15.502	-0.026
AlHSO4+2	4.433e-23	3.503e-23	-22.353	-22.456	-0.102
As(3)	**2.390e-17**				
H3AsO3	2.302e-17	2.304e-17	-16.638	-16.638	0.000
H2AsO3-	8.771e-19	8.269e-19	-18.057	-18.083	-0.026
HAsO3-2	4.876e-23	3.853e-23	-22.312	-22.414	-0.102
H4AsO3+	1.671e-25	1.576e-25	-24.777	-24.803	-0.026
AsO3-3	1.552e-28	9.136e-29	-27.809	-28.039	-0.230
As(5)	**4.939e-06**				
HAsO4-2	4.625e-06	3.655e-06	-5.335	-5.437	-0.102
H2AsO4-	3.130e-07	2.951e-07	-6.505	-6.530	-0.026
AsO4-3	1.014e-09	5.968e-10	-8.994	-9.224	-0.230
H3AsO4	6.804e-13	6.809e-13	-12.167	-12.167	0.000
Ba	**4.661e-07**				
Ba+2	4.077e-07	3.222e-07	-6.390	-6.492	-0.102
BaSO4	5.516e-08	5.519e-08	-7.258	-7.258	0.000
BaHCO3+	2.750e-09	2.593e-09	-8.561	-8.586	-0.026
BaCO3	4.525e-10	4.528e-10	-9.344	-9.344	0.000
BaOH+	8.388e-13	7.908e-13	-12.076	-12.102	-0.026
C(4)	**1.083e-03**				
HCO3-	1.031e-03	9.733e-04	-2.987	-3.012	-0.025
CO2	3.220e-05	3.222e-05	-4.492	-4.492	0.000
CO3-2	3.765e-06	2.990e-06	-5.424	-5.524	-0.100
CaHCO3+	3.484e-06	3.284e-06	-5.458	-5.484	-0.026
UO2(CO3)2-2	2.889e-06	2.283e-06	-5.539	-5.642	-0.102
CaCO3	1.315e-06	1.316e-06	-5.881	-5.881	0.000
UO2(CO3)3-4	1.077e-06	4.200e-07	-5.968	-6.377	-0.409
MgHCO3+	1.053e-06	9.923e-07	-5.978	-6.003	-0.026
NaHCO3	5.151e-07	5.154e-07	-6.288	-6.288	0.000
MgCO3	2.355e-07	2.356e-07	-6.628	-6.628	0.000
MnCO3	1.569e-07	1.570e-07	-6.804	-6.804	0.000
NiCO3	7.935e-08	7.941e-08	-7.100	-7.100	0.000
MnHCO3+	6.084e-08	5.736e-08	-7.216	-7.241	-0.026
NaCO3-	4.371e-08	4.121e-08	-7.359	-7.385	-0.026
UO2CO3	3.551e-08	3.553e-08	-7.450	-7.449	0.000
CuCO3	1.574e-08	1.575e-08	-7.803	-7.803	0.000
PbCO3	1.337e-08	1.338e-08	-7.874	-7.874	0.000
FeHCO3+	1.178e-08	1.111e-08	-7.929	-7.954	-0.026
FeCO3	8.181e-09	8.186e-09	-8.087	-8.087	0.000
BaHCO3+	2.750e-09	2.593e-09	-8.561	-8.586	-0.026
Ni(CO3)2-2	5.221e-10	4.126e-10	-9.282	-9.384	-0.102
NiHCO3+	5.105e-10	4.813e-10	-9.292	-9.318	-0.026
CuHCO3+	5.075e-10	4.785e-10	-9.295	-9.320	-0.026
BaCO3	4.525e-10	4.528e-10	-9.344	-9.344	0.000
PbHCO3+	2.112e-10	1.991e-10	-9.675	-9.701	-0.026
Pb(CO3)2-2	1.272e-10	1.005e-10	-9.896	-9.998	-0.102
Cu(CO3)2-2	7.503e-11	5.929e-11	-10.125	-10.227	-0.102
(UO2)3(CO3)6-6	1.417e-13	1.702e-14	-12.849	-13.769	-0.920
UO2(CO3)3-5	2.785e-23	6.393e-24	-22.555	-23.194	-0.639
U(CO3)4-4	4.731e-31	1.845e-31	-30.325	-30.734	-0.409
U(CO3)5-6	3.366e-35	4.044e-36	-34.473	-35.393	-0.920
Ca	**3.843e-04**				
Ca+2	3.608e-04	2.864e-04	-3.443	-3.543	-0.100
CaSO4	1.867e-05	1.868e-05	-4.729	-4.729	0.000
CaHCO3+	3.484e-06	3.284e-06	-5.458	-5.484	-0.026
CaCO3	1.315e-06	1.316e-06	-5.881	-5.881	0.000
CaF+	5.477e-08	5.164e-08	-7.261	-7.287	-0.026
CaOH+	3.652e-09	3.443e-09	-8.437	-8.463	-0.026
CaHSO4+	1.515e-12	1.428e-12	-11.820	-11.845	-0.026
Cl	**3.950e-05**				
Cl-	3.950e-05	3.722e-05	-4.403	-4.429	-0.026
MnCl+	1.063e-10	1.003e-10	-9.973	-9.999	-0.026
FeCl+	6.220e-12	5.864e-12	-11.206	-11.232	-0.026
PbCl+	3.595e-13	3.390e-13	-12.444	-12.470	-0.026
NiCl+	3.552e-13	3.349e-13	-12.449	-12.475	-0.026
CuCl+	8.250e-14	7.778e-14	-13.084	-13.109	-0.026
CuCl2-	2.314e-14	2.181e-14	-13.636	-13.661	-0.026
MnCl2	1.628e-15	1.629e-15	-14.788	-14.788	0.000
UO2Cl+	1.596e-16	1.505e-16	-15.797	-15.823	-0.026
NiCl2	4.523e-17	4.526e-17	-16.345	-16.344	0.000
PbCl2	2.185e-17	2.186e-17	-16.661	-16.660	0.000
CuCl3-2	1.599e-18	1.263e-18	-17.796	-17.898	-0.102
CuCl2	1.475e-18	1.476e-18	-17.831	-17.831	0.000
FeCl+2	1.026e-19	8.106e-20	-18.989	-19.091	-0.102
MnCl3-	1.771e-20	1.670e-20	-19.752	-19.777	-0.026
PbCl3-	6.656e-22	6.275e-22	-21.177	-21.202	-0.026
UO2Cl2	2.871e-22	2.873e-22	-21.542	-21.542	0.000
FeCl2+	1.663e-23	1.568e-23	-22.779	-22.805	-0.026
CuCl3-	1.900e-25	1.792e-25	-24.721	-24.747	-0.026
PbCl4-2	1.364e-26	1.078e-26	-25.865	-25.968	-0.102
FeCl3	5.832e-29	5.836e-29	-28.234	-28.234	0.000
CuCl4-2	3.787e-32	2.992e-32	-31.422	-31.524	-0.102
UCl+3	0.000e+00	0.000e+00	-43.963	-44.193	-0.230
Cu(1)	**5.224e-11**				
Cu+	5.222e-11	4.924e-11	-10.282	-10.308	-0.026
CuCl2-	2.314e-14	2.181e-14	-13.636	-13.661	-0.026
CuCl3-2	1.599e-18	1.263e-18	-17.796	-17.898	-0.102
Cu(2)	**1.259e-07**				
Cu(OH)2	1.075e-07	1.075e-07	-6.969	-6.968	0.000
CuCO3	1.574e-08	1.575e-08	-7.803	-7.803	0.000
Cu+2	1.241e-09	9.810e-10	-8.906	-9.008	-0.102
CuOH+	7.537e-10	7.106e-10	-9.123	-9.148	-0.026
CuHCO3+	5.075e-10	4.785e-10	-9.295	-9.320	-0.026
Cu(CO3)2-2	7.503e-11	5.929e-11	-10.125	-10.227	-0.102
CuSO4	6.619e-11	6.624e-11	-10.179	-10.179	0.000
Cu(OH)3-	4.979e-13	4.694e-13	-12.303	-12.328	-0.026
CuF+	4.193e-13	3.954e-13	-12.377	-12.403	-0.026
Cu2(OH)2+2	1.740e-13	1.375e-13	-12.759	-12.862	-0.102
CuCl+	8.250e-14	7.778e-14	-13.084	-13.109	-0.026
Cu(OH)4-2	8.586e-18	6.785e-18	-17.066	-17.168	-0.102
CuCl2	1.475e-18	1.476e-18	-17.831	-17.831	0.000
CuCl3-	1.900e-25	1.792e-25	-24.721	-24.747	-0.026
CuCl4-2	3.787e-32	2.992e-32	-31.422	-31.524	-0.102
F	**2.474e-05**				
F-	2.454e-05	2.314e-05	-4.610	-4.636	-0.026
MgF+	1.320e-07	1.245e-07	-6.879	-6.905	-0.026
CaF+	5.477e-08	5.164e-08	-7.261	-7.287	-0.026
NaF	1.253e-08	1.254e-08	-7.902	-7.902	0.000
HF	4.402e-10	4.405e-10	-9.356	-9.356	0.000
MnF+	1.123e-10	1.059e-10	-9.950	-9.975	-0.026
AlF2+	7.900e-11	7.448e-11	-10.102	-10.128	-0.026
FeF+	2.801e-11	2.641e-11	-10.553	-10.578	-0.026
AlF3	2.158e-11	2.159e-11	-10.666	-10.666	0.000
UO2F+	8.593e-12	8.101e-12	-11.066	-11.091	-0.026
AlF+2	8.332e-12	6.584e-12	-11.079	-11.182	-0.102
NiF+	1.754e-12	1.654e-12	-11.756	-11.781	-0.026
UO2F2	6.332e-13	6.337e-13	-12.198	-12.198	0.000
CuF+	4.193e-13	3.954e-13	-12.377	-12.403	-0.026
AlF4-	2.107e-13	1.987e-13	-12.676	-12.702	-0.026
PbF+	1.124e-13	1.060e-13	-12.949	-12.975	-0.026
HF2-	3.989e-14	3.761e-14	-13.399	-13.425	-0.026
FeF+2	3.620e-15	2.861e-15	-14.441	-14.544	-0.102
UO2F3-	2.959e-15	2.789e-15	-14.529	-14.554	-0.026
FeF2+	2.641e-15	2.490e-15	-14.578	-14.604	-0.026
FeF3	8.978e-17	8.984e-17	-16.047	-16.047	0.000
PbF2	5.003e-17	5.006e-17	-16.301	-16.300	0.000
H2F2	5.976e-19	5.980e-19	-18.224	-18.223	0.000
UO2F4-2	5.223e-19	4.127e-19	-18.282	-18.384	-0.102
PbF3-	8.901e-21	8.392e-21	-20.051	-20.076	-0.026
PbF4-2	1.176e-25	9.295e-26	-24.930	-25.032	-0.102
UF3+	1.516e-34	1.429e-34	-33.819	-33.845	-0.026
UF2+2	3.339e-35	2.639e-35	-34.476	-34.579	-0.102
UF4	2.695e-35	2.697e-35	-34.569	-34.569	0.000
UF+3	2.360e-37	1.390e-37	-36.627	-36.857	-0.230
UF5-	1.835e-38	1.730e-38	-37.736	-37.762	-0.026
UF6-2	0.000e+00	0.000e+00	-40.187	-40.289	-0.102
Fe(2)	**1.727e-07**				
Fe+2	1.444e-07	1.141e-07	-6.840	-6.943	-0.102
FeHCO3+	1.178e-08	1.111e-08	-7.929	-7.954	-0.026
FeCO3	8.181e-09	8.186e-09	-8.087	-8.087	0.000
FeSO4	6.353e-09	6.358e-09	-8.197	-8.197	0.000
FeOH+	1.941e-09	1.830e-09	-8.712	-8.738	-0.026
FeF+	2.801e-11	2.641e-11	-10.553	-10.578	-0.026
FeCl+	6.220e-12	5.864e-12	-11.206	-11.232	-0.026
Fe(OH)2	7.443e-13	7.448e-13	-12.128	-12.128	0.000
Fe(OH)3-	2.029e-15	1.913e-15	-14.693	-14.718	-0.026
FeHSO4+	6.038e-16	5.693e-16	-15.219	-15.245	-0.026

Fe(3)	5.379e-06					
	Fe(OH)3	4.490e-06	4.493e-06	-5.348	-5.347	0.000
	Fe(OH)2+	6.289e-07	5.929e-07	-6.201	-6.227	-0.026
	Fe(OH)4-	2.599e-07	2.450e-07	-6.585	-6.611	-0.026
	FeOH+2	3.749e-11	2.963e-11	-10.426	-10.528	-0.102
	FeF+2	3.620e-15	2.861e-15	-14.441	-14.544	-0.102
	FeF2+	2.641e-15	2.490e-15	-14.578	-14.604	-0.026
	FeSO4+	3.001e-16	2.829e-16	-15.523	-15.548	-0.026
	Fe+3	1.425e-16	8.390e-17	-15.846	-16.076	-0.230
	FeF3	8.978e-17	8.984e-17	-16.047	-16.047	0.000
	Fe(SO4)2-	2.203e-18	2.077e-18	-17.657	-17.683	-0.026
	FeCl+2	1.026e-19	8.106e-20	-18.989	-19.091	-0.102
	Fe2(OH)2+4	7.380e-20	2.878e-20	-19.132	-19.541	-0.409
	Fe3(OH)4+5	2.413e-23	5.538e-24	-22.617	-23.257	-0.639
	FeCl2+	1.663e-23	1.568e-23	-22.779	-22.805	-0.026
	FeHSO4+2	1.330e-23	1.051e-23	-22.876	-22.978	-0.102
	FeCl3	5.832e-29	5.836e-29	-28.234	-28.234	0.000
H(0)	2.727e-27					
	H2	1.363e-27	1.364e-27	-26.865	-26.865	0.000
K	9.976e-05					
	K+	9.953e-05	9.379e-05	-4.002	-4.028	-0.026
	KSO4-	2.265e-07	2.136e-07	-6.645	-6.670	-0.026
Mg	1.193e-04					
	Mg+2	1.116e-04	8.877e-05	-3.952	-4.052	-0.099
	MgSO4	6.285e-06	6.290e-06	-5.202	-5.201	0.000
	MgHCO3+	1.053e-06	9.923e-07	-5.978	-6.003	-0.026
	MgCO3	2.355e-07	2.356e-07	-6.628	-6.628	0.000
	MgF+	1.320e-07	1.245e-07	-6.879	-6.905	-0.026
	MgOH+	1.609e-08	1.517e-08	-7.793	-7.819	-0.026
Mn(2)	1.092e-06					
	Mn+2	8.368e-07	6.612e-07	-6.077	-6.180	-0.102
	MnCO3	1.569e-07	1.570e-07	-6.804	-6.804	0.000
	MnHCO3+	6.084e-08	5.736e-08	-7.216	-7.241	-0.026
	MnSO4	3.667e-08	3.669e-08	-7.436	-7.435	0.000
	MnOH+	8.848e-10	8.342e-10	-9.053	-9.079	-0.026
	MnF+	1.123e-10	1.059e-10	-9.950	-9.975	-0.026
	MnCl+	1.063e-10	1.003e-10	-9.973	-9.999	-0.026
	MnCl2	1.628e-15	1.629e-15	-14.788	-14.788	0.000
	Mn(OH)3-	4.225e-18	3.984e-18	-17.374	-17.400	-0.026
	MnCl3-	1.771e-20	1.670e-20	-19.752	-19.777	-0.026
Mn(3)	1.728e-28					
	Mn+3	1.728e-28	1.017e-28	-27.762	-27.993	-0.230
Mn(6)	0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-47.399	-47.501	-0.102
Mn(7)	0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-53.172	-53.197	-0.026
Na	1.001e-03					
	Na+	9.984e-04	9.417e-04	-3.001	-3.026	-0.025
	NaSO4-	1.660e-06	1.565e-06	-5.780	-5.805	-0.026
	NaHCO3	5.151e-07	5.154e-07	-6.288	-6.288	0.000
	NaCO3-	4.371e-08	4.121e-08	-7.359	-7.385	-0.026
	NaF	1.253e-08	1.254e-08	-7.902	-7.902	0.000
Ni	8.518e-08					
	NiCO3	7.935e-08	7.941e-08	-7.100	-7.100	0.000
	Ni+2	4.534e-09	3.582e-09	-8.344	-8.446	-0.102
	Ni(CO3)2-2	5.221e-10	4.126e-10	-9.282	-9.384	-0.102
	NiHCO3+	5.105e-10	4.813e-10	-9.292	-9.318	-0.026
	NiSO4	2.290e-10	2.292e-10	-9.640	-9.640	0.000
	NiOH+	2.716e-11	2.561e-11	-10.566	-10.592	-0.026
	Ni(OH)2	1.879e-12	1.880e-12	-11.726	-11.726	0.000
	NiF+	1.754e-12	1.654e-12	-11.756	-11.781	-0.026
	NiCl+	3.552e-13	3.349e-13	-12.449	-12.475	-0.026
	Ni(SO4)2-2	5.546e-15	4.383e-15	-14.256	-14.358	-0.102
	Ni(OH)3-	1.444e-15	1.362e-15	-14.840	-14.866	-0.026
	NiCl2	4.523e-17	4.526e-17	-16.345	-16.344	0.000
O(0)	0.000e+00					
	O2	0.000e+00	0.000e+00	-40.223	-40.222	0.000
Pb	1.448e-08					
	PbCO3	1.337e-08	1.338e-08	-7.874	-7.874	0.000
	PbOH+	3.858e-10	3.637e-10	-9.414	-9.439	-0.026
	Pb+2	3.259e-10	2.575e-10	-9.487	-9.589	-0.102
	PbHCO3+	2.112e-10	1.991e-10	-9.675	-9.701	-0.026
	Pb(CO3)2-2	1.272e-10	1.005e-10	-9.896	-9.998	-0.102
	PbSO4	4.946e-11	4.950e-11	-10.306	-10.305	0.000
	Pb(OH)2	1.024e-11	1.025e-11	-10.990	-10.989	0.000
	PbCl+	3.595e-13	3.390e-13	-12.444	-12.470	-0.026
	PbF+	1.124e-13	1.060e-13	-12.949	-12.975	-0.026
	Pb(SO4)2-2	1.124e-13	8.879e-14	-12.949	-13.052	-0.102
	Pb(OH)3-	9.043e-15	8.526e-15	-14.044	-14.069	-0.026
	PbF2	5.003e-17	5.006e-17	-16.301	-16.300	0.000
	PbCl2	2.185e-17	2.186e-17	-16.661	-16.660	0.000
	Pb2OH+3	3.562e-18	2.097e-18	-17.448	-17.678	-0.230
	Pb(OH)4-2	1.790e-18	1.415e-18	-17.747	-17.849	-0.102
	PbF3-	8.901e-21	8.392e-21	-20.051	-20.076	-0.026
	PbCl3-	6.656e-22	6.275e-22	-21.177	-21.202	-0.026
	Pb3(OH)4+2	3.832e-22	3.028e-22	-21.417	-21.519	-0.102
	PbF4-2	1.176e-25	9.295e-26	-24.930	-25.032	-0.102
	PbCl4-2	1.364e-26	1.078e-26	-25.865	-25.968	-0.102
S(6)	4.581e-04					
	SO4-2	4.312e-04	3.418e-04	-3.365	-3.466	-0.101
	CaSO4	1.867e-05	1.868e-05	-4.729	-4.729	0.000
	MgSO4	6.285e-06	6.290e-06	-5.202	-5.201	0.000
	NaSO4-	1.660e-06	1.565e-06	-5.780	-5.805	-0.026
	KSO4-	2.265e-07	2.136e-07	-6.645	-6.670	-0.026
	BaSO4	5.516e-08	5.519e-08	-7.258	-7.258	0.000
	MnSO4	3.667e-08	3.669e-08	-7.436	-7.435	0.000
	FeSO4	6.353e-09	6.358e-09	-8.197	-8.197	0.000
	HSO4-	4.400e-10	4.148e-10	-9.357	-9.382	-0.026
	NiSO4	2.290e-10	2.292e-10	-9.640	-9.640	0.000
	CuSO4	6.619e-11	6.624e-11	-10.179	-10.179	0.000
	PbSO4	4.946e-11	4.950e-11	-10.306	-10.305	0.000
	CaHSO4+	1.515e-12	1.428e-12	-11.820	-11.845	-0.026
	UO2SO4	1.223e-12	1.224e-12	-11.913	-11.912	0.000
	Pb(SO4)2-2	1.124e-13	8.879e-14	-12.949	-13.052	-0.102
	AlSO4+	3.155e-14	2.975e-14	-13.501	-13.527	-0.026
	Ni(SO4)2-2	5.546e-15	4.383e-15	-14.256	-14.358	-0.102
	UO2(SO4)2-2	4.680e-15	3.698e-15	-14.330	-14.432	-0.102
	FeHSO4+	6.038e-16	5.693e-16	-15.219	-15.245	-0.026
	Al(SO4)2-	3.336e-16	3.145e-16	-15.477	-15.502	-0.026
	FeSO4+	3.001e-16	2.829e-16	-15.523	-15.548	-0.026
	Fe(SO4)2-	2.203e-18	2.077e-18	-17.657	-17.683	-0.026
	AlHSO4+2	4.433e-23	3.503e-23	-22.353	-22.456	-0.102
	FeHSO4+2	1.330e-23	1.051e-23	-22.876	-22.978	-0.102
	U(SO4)2	8.689e-39	8.695e-39	-38.061	-38.061	0.000
	USO4+2	4.539e-39	3.587e-39	-38.343	-38.445	-0.102
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-54.389	-54.619	-0.230
U(4)	1.301e-19					
	U(OH)4	1.301e-19	1.302e-19	-18.886	-18.886	0.000
	U(OH)3+	7.378e-24	6.956e-24	-23.132	-23.158	-0.026
	U(OH)2+2	6.417e-29	5.071e-29	-28.193	-28.295	-0.102
	U(CO3)4-4	4.731e-31	1.845e-31	-30.325	-30.734	-0.409
	UF3+	1.516e-34	1.429e-34	-33.819	-33.845	-0.026
	UOH+3	7.616e-35	4.484e-35	-34.118	-34.348	-0.230
	U(CO3)5-6	3.366e-35	4.044e-36	-34.473	-35.393	-0.920
	UF2+2	3.339e-35	2.639e-35	-34.476	-34.579	-0.102
	UF4	2.695e-35	2.697e-35	-34.569	-34.569	0.000
	UF+3	2.360e-37	1.390e-37	-36.627	-36.857	-0.230
	UF5-	1.835e-38	1.730e-38	-37.736	-37.762	-0.026
	U(SO4)2	8.689e-39	8.695e-39	-38.061	-38.061	0.000
	USO4+2	4.539e-39	3.587e-39	-38.343	-38.445	-0.102
	UF6-2	0.000e+00	0.000e+00	-40.187	-40.289	-0.102
	U+4	0.000e+00	0.000e+00	-41.128	-41.537	-0.409
	UCl+3	0.000e+00	0.000e+00	-43.963	-44.193	-0.230
	U6(OH)15+9	0.000e+00	0.000e+00	-146.450	-148.521	-2.071
U(5)	1.031e-14					
	UO2+	1.031e-14	9.722e-15	-13.987	-14.012	-0.026
	UO2(CO3)3-5	2.785e-23	6.393e-24	-22.555	-23.194	-0.639
U(6)	4.076e-06					
	UO2(CO3)2-2	2.889e-06	2.283e-06	-5.539	-5.642	-0.102
	UO2(CO3)3-4	1.077e-06	4.200e-07	-5.968	-6.377	-0.409
	UO2(OH)3-	7.320e-08	6.902e-08	-7.135	-7.161	-0.026
	UO2CO3	3.551e-08	3.553e-08	-7.450	-7.449	0.000
	UO2OH+	1.036e-09	9.765e-10	-8.985	-9.010	-0.026
	(UO2)3(OH)7-	2.645e-11	2.494e-11	-10.578	-10.603	-0.026
	UO2F+	8.593e-12	8.101e-12	-11.066	-11.091	-0.026
	(UO2)3(OH)5+	7.213e-12	6.801e-12	-11.142	-11.167	-0.026
	UO2+2	3.641e-12	2.878e-12	-11.439	-11.541	-0.102
	UO2SO4	1.223e-12	1.224e-12	-11.913	-11.912	0.000
	UO2F2	6.332e-13	6.337e-13	-12.198	-12.198	0.000
	(UO2)3(CO3)6-6	1.417e-13	1.702e-14	-12.849	-13.769	-0.920
	UO2(OH)4-2	1.003e-13	7.924e-14	-12.999	-13.101	-0.102
	(UO2)2(OH)2+2	1.000e-13	7.905e-14	-13.000	-13.102	-0.102
	(UO2)4(OH)7+	9.583e-14	9.035e-14	-13.019	-13.044	-0.026
	UO2(SO4)2-2	4.680e-15	3.698e-15	-14.330	-14.432	-0.102
	UO2F3-	2.959e-15	2.789e-15	-14.529	-14.554	-0.026
	(UO2)3(OH)4+2	1.045e-15	8.260e-16	-14.981	-15.083	-0.102
	UO2Cl+	1.596e-16	1.505e-16	-15.797	-15.823	-0.026
	(UO2)2OH+3	2.033e-18	1.197e-18	-17.692	-17.922	-0.230
	UO2F4-2	5.223e-19	4.127e-19	-18.282	-18.384	-0.102
	UO2Cl2	2.871e-22	2.873e-22	-21.542	-21.542	0.000

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-1.06	10.05	11.11	Al(OH)3
AlAsO4:2H2O	-6.92	-2.12	4.80	AlAsO4:2H2O
AlumK	-19.24	-24.49	-5.25	KAl(SO4)2:12H2O
Alunite	-3.59	-4.40	-0.81	KAl3(SO4)2(OH)6
Anglesite	-5.24	-13.06	-7.82	PbSO4
Anhydrite	-2.66	-7.01	-4.34	CaSO4
Antlerite	-7.34	0.95	8.29	Cu3(OH)4SO4
Aragonite	-0.76	-9.07	-8.31	CaCO3
Arsenolite	-63.58	-143.55	-79.97	As4O6
Artinite	-7.85	2.09	9.94	MgCO3:Mg(OH)2:3H2O
As2O5	-31.10	-24.33	6.76	As2O5
Atacamite	-6.43	1.13	7.56	Cu2(OH)3Cl
Azurite	-5.72	-22.35	-16.63	Cu3(OH)2(CO3)2
B-UO2(OH)2	-1.53	4.18	5.71	UO2(OH)2
Ba3(AsO4)2	12.30	3.35	-8.95	Ba3(AsO4)2
BaF2	-9.99	-15.76	-5.77	BaF2
Barite	0.09	-9.96	-10.05	BaSO4
Basaluminite	-1.70	21.00	22.70	Al4(OH)10SO4
Birnessite	-10.34	33.26	43.60	MnO2
Bixbyite	-8.39	42.80	51.19	Mn2O3
Boehmite	1.13	10.05	8.91	AlOOH
Brochantite	-7.68	7.66	15.34	Cu4(OH)6SO4
Brucite	-5.49	11.67	17.16	Mg(OH)2
Bunsenite	-5.46	7.27	12.73	NiO
Ca3(AsO4)2:4w	-10.17	12.20	22.37	Ca3(AsO4)2:4H2O
Calcite	-0.61	-9.07	-8.45	CaCO3
Cerrusite	-1.93	-15.11	-13.19	PbCO3
Chalcanthite	-9.82	-12.47	-2.66	CuSO4:5H2O
Claudetite	-63.33	-143.55	-80.22	As4O6
CO2(g)	-3.08	-21.24	-18.16	CO2
Cotunnite	-13.61	-18.45	-4.84	PbCl2
Cu(OH)2	-2.11	6.71	8.82	Cu(OH)2
Cu2SO4	-22.19	-29.48	-7.30	Cu2SO4
Cu3(AsO4)2:6w	-10.35	-4.20	6.15	Cu3(AsO4)2:6H2O
CuCO3	-4.90	-14.53	-9.63	CuCO3
CuF	-22.17	-17.64	4.52	CuF
CuF2	-17.82	-18.28	-0.46	CuF2
CuF2:2H2O	-13.77	-18.28	-4.51	CuF2:2H2O
CuMetal	-5.35	-17.01	-11.66	Cu
CuOCuSO4	-17.71	-5.76	11.95	CuO:CuSO4
CupricFerrite	15.38	47.99	32.60	CuFe2O4
Cuprite	-3.27	-10.30	-7.02	Cu2O
CuprousFerrite	13.93	15.49	1.56	CuFeO2
CuSO4	-15.70	-12.47	3.22	CuSO4
Diaspore	2.88	10.05	7.17	AlOOH
Dolomite	-1.66	-18.64	-16.98	CaMg(CO3)2
Dolomite(d)	-2.23	-18.64	-16.41	CaMg(CO3)2
Epsomite	-5.35	-7.52	-2.17	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.86	16.95	10.09	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.61	20.64	18.02	Fe(OH)3
Fe3(OH)8	3.56	50.05	46.49	Fe3(OH)8
Fluorite	-2.16	-12.81	-10.66	CaF2
Gibbsite	1.67	10.05	8.38	Al(OH)3
Goethite	8.50	20.64	12.13	FeOOH
Gummite	-6.49	4.18	10.67	UO3
Gypsum	-2.43	-7.01	-4.58	CaSO4:2H2O
H2(g)	-23.67	-23.72	-0.05	H2
Halite	-9.03	-7.46	1.57	NaCl
Hausmannite	-9.87	52.34	62.21	Mn3O4
Hematite	18.65	41.27	22.62	Fe2O3
Huntite	-8.13	-37.80	-29.67	CaMg3(CO3)4
Hydrocerrusite	-6.64	-24.10	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-18.49	-26.64	-8.15	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-4.77	26.64	31.40	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-3.19	27.37	30.56	KFe3(SO4)2(OH)6
Jarosite-Na	-6.17	28.37	34.55	NaFe3(SO4)2(OH)6
JarositeH	-11.12	23.54	34.66	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-5.91	-9.14	-3.23	AlOHSO4
Langite	-9.59	7.66	17.26	Cu4(OH)6SO4:H2O
Larnakite	-6.72	-6.92	-0.20	PbO:PbSO4
Laurionite	-6.78	-6.16	0.62	PbOHCl
Litharge	-6.78	6.13	12.91	PbO
Maghemite	8.62	41.27	32.65	Fe2O3
Magnesite	-1.62	-9.58	-7.96	MgCO3
Magnetite	19.46	50.05	30.60	Fe3O4
Malachite	-2.83	-7.82	-4.99	Cu2(OH)2CO3
Manganite	-3.94	21.40	25.34	MnOOH
Massicot	-6.98	6.13	13.11	PbO
Matlockite	-9.13	-18.65	-9.52	PbClF
Melanothallite	-21.74	-17.87	3.87	CuCl2
Melanterite	-8.14	-10.41	-2.27	FeSO4:7H2O
Minium	-32.78	42.11	74.90	Pb3O4
Mirabilite	-8.18	-9.52	-1.34	Na2SO4:10H2O
Mn2(SO4)3	-61.13	-14.76	46.37	Mn2(SO4)3
Mn3(AsO4):8H2O	-8.28	4.29	12.57	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-17.54	-15.04	2.51	MnCl2:4H2O
MnSO4	-12.50	-9.65	2.85	MnSO4
Morenosite	-9.52	-11.91	-2.39	NiSO4:7H2O
Na4UO2(CO3)3	-23.93	-40.22	-16.29	Na4UO2(CO3)3
Nahcolite	-5.45	-16.41	-10.96	NaHCO3
Nantokite	-7.86	-17.44	-9.58	CuCl
Natron	-10.08	-11.58	-1.50	Na2CO3:10H2O
Nesquehonite	-4.02	-9.58	-5.55	MgCO3:3H2O
Ni(OH)2	-3.17	7.27	10.44	Ni(OH)2
Ni3(AsO4)2:8H2O	-18.28	-2.51	15.76	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-22.09	9.91	32.00	Ni4(OH)6SO4
NiCO3	-7.25	-13.97	-6.72	NiCO3
Nsutite	-9.30	33.26	42.56	MnO2
O2(g)	-37.37	47.44	84.81	O2
Pb(OH)2	-2.18	6.13	8.31	Pb(OH)2
Pb2(OH)3Cl	-8.82	-0.03	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.94	12.26	26.20	PbO:Pb(OH)2
Pb2O3	-25.06	35.98	61.04	Pb2O3
Pb2OCO3	-8.62	-8.98	-0.37	PbO:PbCO3
Pb3(AsO4)2	-11.81	-5.94	5.87	Pb3(AsO4)2
Pb3O2CO3	-14.18	-2.85	11.33	PbCO3:2PbO
Pb3O2SO4	-11.44	-0.79	10.64	PbSO4:2PbO
Pb4(OH)6SO4	-15.76	5.34	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.17	5.34	22.51	PbSO4:3PbO
PbF2	-11.43	-18.86	-7.43	PbF2
PbMetal	-21.85	-17.59	4.27	Pb
PbO:0.3H2O	-6.85	6.13	12.98	PbO:0.33H2O
Phosgenite	-13.75	-33.56	-19.81	PbCl2:PbCO3
Plattnerite	-20.28	29.85	50.13	PbO2
Portlandite	-10.99	12.18	23.16	Ca(OH)2
Pyrochroite	-5.66	9.54	15.20	Mn(OH)2
Pyrolusite	-8.88	33.26	42.14	MnO2
Retgersite	-9.86	-11.91	-2.05	NiSO4:6H2O
Rhodochrosite	-0.59	-11.70	-11.11	MnCO3
Rhodochrosite(d)	-1.31	-11.70	-10.39	MnCO3
Rutherfordine	-2.63	-17.07	-14.43	UO2CO3
Schoepite	-1.37	4.18	5.55	UO2(OH)2:H2O
Scorodite	-5.05	8.47	13.52	FeAsO4:2H2O
Siderite	-1.61	-12.47	-10.86	FeCO3
Siderite(d)(3)	-2.02	-12.47	-10.45	FeCO3
Tenorite	-1.09	6.71	7.80	CuO
Thenardite	-9.35	-9.52	-0.17	Na2SO4
Thermonatrite	-11.73	-11.58	0.16	Na2CO3:H2O
Trona	-17.03	-27.99	-10.96	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-26.08	-38.73	-12.64	U(OH)2SO4
U3O8(c)	-4.74	-11.18	-6.44	U3O8
U4O9(c)	-14.47	-54.44	-39.97	U4O9
UF4(c)	-41.70	-69.52	-27.83	UF4
UF4:2.5H2O	-32.52	-69.52	-37.01	UF4:2.5H2O
UO2(a)	-10.20	-19.54	-9.34	UO2
UO3(gamma)	-3.77	4.18	7.95	UO3
Uraninite(c)	-5.52	-19.54	-14.03	UO2
Witherite	-3.44	-12.02	-8.57	BaCO3

End of simulation.

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Reading data base.
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          SOLUTION_MASTER_SPECIES
          SOLUTION_SPECIES
          PHASES
          EXCHANGE_MASTER_SPECIES
          EXCHANGE_SPECIES
          SURFACE_MASTER_SPECIES
          SURFACE_SPECIES
          END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

          TITLE   Schneckentein 9.5-10.5m
          SOLUTION        10
          units           mg/l
          temp            19.8
          pH              9.8
          F               1.2
          Cl              18.5
          S(6)            52          as SO4
          Na              111
          K               1.8
          Mg              1.6
          Ca              10.1
          Alkalinity      134.2       as HCO3
          Al              1.21
          As(+3)          0.115
          As(+5)          0.865
          Ba              0.079
          Cu              0.019
          Fe              0.82
          Mn              0.02
          Ni              0.02
          Pb              0.013
          U               0.76
          Zn              0.021
          END


----------------------------Description of solution------
----------------------

                                    pH  =   9.800
                                    pe  =   4.000
                     Activity of water  =   1.000
                        Ionic strength  =   5.573e-03
                    Mass of water (kg)  =   1.000e+00
                   Total carbon (mol/kg)  =   1.494e-03
                      Total CO2 (mol/kg)  =   1.494e-03
                     Temperature (deg C)  =  19.800
                  Electrical balance (eq)  =   1.792e-03
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  20.20
                                Iterations  =  15
                                   Total H  = 1.110138e+02
                                   Total O  = 5.551320e+01

---------------------------------Redox couples-----------
----------------------

          Redox couple             pe  Eh (volts)

          As(3)/As(5)         -4.7782     -0.2777
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TITLE
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   Schneckentein 9.5-10.5m

-----------------------------------------
Beginning of initial solution calculations.
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Initial solution 10.

----------------------------Solution composition---------------
---------------

          Elements           Molality       Moles

          Al                4.486e-05   4.486e-05
          Alkalinity        2.200e-03   2.200e-03
          As(3)             1.535e-06   1.535e-06
          As(5)             1.155e-05   1.155e-05
          Ba                5.754e-07   5.754e-07
          Ca                2.521e-04   2.521e-04
          Cl                5.220e-04   5.220e-04
          Cu                2.991e-07   2.991e-07
          F                 6.318e-05   6.318e-05
          Fe                1.469e-05   1.469e-05
          K                 4.605e-05   4.605e-05
          Mg                6.583e-05   6.583e-05
          Mn                3.642e-07   3.642e-07
          Na                4.830e-03   4.830e-03
          Ni                3.408e-07   3.408e-07
          Pb                6.277e-08   6.277e-08
          S(6)              5.415e-04   5.415e-04
          U                 3.194e-06   3.194e-06
          Zn                3.214e-07   3.214e-07
```

----------Distribution of species----------

	Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
	OH-	4.561e-05	4.215e-05	-4.341	-4.375	-0.034
	H+	1.702e-10	1.585e-10	-9.769	-9.800	-0.031
	H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	4.486e-05					
	Al(OH)4-	4.486e-05	4.146e-05	-4.348	-4.382	-0.034
	Al(OH)3	3.708e-09	3.713e-09	-8.431	-8.430	0.001
	Al(OH)2+	6.424e-12	5.937e-12	-11.192	-11.226	-0.034
	AlOH+2	2.629e-16	1.918e-16	-15.580	-15.717	-0.137
	AlF2+	7.423e-17	6.860e-17	-16.129	-16.164	-0.034
	AlF3	4.981e-17	4.988e-17	-16.303	-16.302	0.001
	AlF+2	3.322e-18	2.423e-18	-17.479	-17.616	-0.137
	AlF4-	1.246e-18	1.151e-18	-17.905	-17.939	-0.034
	Al+3	8.758e-21	4.309e-21	-20.058	-20.366	-0.308
	AlSO4+	5.245e-21	4.848e-21	-20.280	-20.314	-0.034
	Al(SO4)2-	6.167e-23	5.700e-23	-22.210	-22.244	-0.034
	AlHSO4+2	8.950e-32	6.530e-32	-31.048	-31.185	-0.137
As(3)	1.535e-06					
	H2AsO3-	1.176e-06	1.087e-06	-5.930	-5.964	-0.034
	H3AsO3	3.539e-07	3.543e-07	-6.451	-6.451	0.001
	HAsO3-2	5.910e-09	4.312e-09	-8.228	-8.365	-0.137
	AsO3-3	1.778e-12	8.749e-13	-11.750	-12.058	-0.308
	H4AsO3+	3.010e-17	2.782e-17	-16.521	-16.556	-0.034
As(5)	1.155e-05					
	HAsO4-2	1.131e-05	8.248e-06	-4.947	-5.084	-0.137
	AsO4-3	2.354e-07	1.158e-07	-6.628	-6.936	-0.308
	H2AsO4-	8.291e-09	7.663e-09	-8.081	-8.116	-0.034
	H3AsO4	2.018e-16	2.020e-16	-15.695	-15.695	0.001
Ba	5.754e-07					
	Ba+2	4.668e-07	3.406e-07	-6.331	-6.468	-0.137
	BaSO4	6.496e-08	6.504e-08	-7.187	-7.187	0.001
	BaCO3	4.068e-08	4.073e-08	-7.391	-7.390	0.001
	BaHCO3+	2.914e-09	2.693e-09	-8.536	-8.570	-0.034
	BaOH+	7.877e-11	7.280e-11	-10.104	-10.138	-0.034
C(4)	1.494e-03					
	HCO3-	1.049e-03	9.717e-04	-2.979	-3.012	-0.033
	CO3-2	3.493e-04	2.570e-04	-3.457	-3.590	-0.133
	CaCO3	5.370e-05	5.377e-05	-4.270	-4.269	0.001
	NaCO3-	1.761e-05	1.627e-05	-4.754	-4.789	-0.034
	MgCO3	8.811e-06	8.822e-06	-5.055	-5.054	0.001
	UO2(CO3)3-4	2.972e-06	8.421e-07	-5.527	-6.075	-0.548
	NaHCO3	2.423e-06	2.426e-06	-5.616	-5.615	0.001
	CaHCO3+	1.684e-06	1.556e-06	-5.774	-5.808	-0.034
	MgHCO3+	4.697e-07	4.341e-07	-6.328	-6.362	-0.034
	CO2	3.717e-07	3.722e-07	-6.430	-6.429	0.001
	MnCO3	3.370e-07	3.375e-07	-6.472	-6.472	0.001
	NiCO3	2.108e-07	2.111e-07	-6.676	-6.676	0.001
	Zn(CO3)2-2	1.299e-07	9.478e-08	-6.886	-7.023	-0.137
	Ni(CO3)2-2	1.292e-07	9.428e-08	-6.889	-7.026	-0.137
	UO2(CO3)2-2	7.015e-08	5.118e-08	-7.154	-7.291	-0.137
	BaCO3	4.068e-08	4.073e-08	-7.391	-7.390	0.001
	PbCO3	3.155e-08	3.159e-08	-7.501	-7.500	0.001
	Pb(CO3)2-2	2.795e-08	2.039e-08	-7.554	-7.690	-0.137
	ZnCO3	1.723e-08	1.725e-08	-7.764	-7.763	0.001
	BaHCO3+	2.914e-09	2.693e-09	-8.536	-8.570	-0.034
	MnHCO3+	1.549e-09	1.431e-09	-8.810	-8.844	-0.034
	CuCO3	4.950e-10	4.957e-10	-9.305	-9.305	0.001
	Cu(CO3)2-2	2.198e-10	1.604e-10	-9.658	-9.795	-0.137
	ZnHCO3+	4.452e-11	4.115e-11	-10.351	-10.386	-0.034
	NiHCO3+	1.608e-11	1.486e-11	-10.794	-10.828	-0.034
	UO2CO3	9.344e-12	9.356e-12	-11.029	-11.029	0.001
	PbHCO3+	5.907e-12	5.459e-12	-11.229	-11.263	-0.034
	FeCO3	6.377e-13	6.385e-13	-12.195	-12.195	0.001
	CuHCO3+	1.892e-13	1.749e-13	-12.723	-12.757	-0.034
	FeHCO3+	1.089e-14	1.006e-14	-13.963	-13.997	-0.034
	(UO2)3(CO3)6-6	3.406e-18	1.995e-19	-17.468	-18.700	-1.232
	UO2(CO3)3-5	8.953e-23	1.248e-23	-22.048	-22.904	-0.856
	U(CO3)4-4	2.100e-36	5.951e-37	-35.678	-36.225	-0.548
	U(CO3)5-6	1.806e-38	1.058e-39	-37.743	-38.976	-1.232
Ca	2.521e-04					
	Ca+2	1.866e-04	1.372e-04	-3.729	-3.863	-0.133
	CaCO3	5.370e-05	5.377e-05	-4.270	-4.269	0.001
	CaSO4	9.917e-06	9.929e-06	-5.004	-5.003	0.001
	CaHCO3+	1.684e-06	1.556e-06	-5.774	-5.808	-0.034
	CaOH+	1.554e-07	1.437e-07	-6.808	-6.843	-0.034
	CaF+	6.636e-08	6.133e-08	-7.178	-7.212	-0.034
	CaHSO4+	9.379e-15	8.669e-15	-14.028	-14.062	-0.034
Cl	5.220e-04					
	Cl-	5.220e-04	4.820e-04	-3.282	-3.317	-0.035
	MnCl+	3.512e-11	3.246e-11	-10.454	-10.489	-0.034
	ZnOHCl	3.382e-11	3.387e-11	-10.471	-10.470	0.001
	ZnCl+	3.739e-13	3.455e-13	-12.427	-12.462	-0.034
	NiCl+	1.451e-13	1.341e-13	-12.838	-12.872	-0.034
	PbCl+	1.288e-13	1.190e-13	-12.890	-12.924	-0.034
	MnCl2	6.820e-15	6.828e-15	-14.166	-14.166	0.001
	CuCl2-	1.444e-15	1.334e-15	-14.840	-14.875	-0.034
	CuCl+	3.890e-16	3.595e-16	-15.410	-15.444	-0.034
	NiCl2	2.344e-16	2.347e-16	-15.630	-15.629	0.001
	ZnCl2	1.705e-16	1.707e-16	-15.768	-15.768	0.001
	PbCl2	1.002e-16	1.004e-16	-15.999	-15.998	0.001
	FeCl+	7.455e-17	6.890e-17	-16.128	-16.162	-0.034
	CuCl3-2	1.369e-18	9.987e-19	-17.864	-18.001	-0.137
	MnCl3-	9.808e-19	9.065e-19	-18.008	-18.043	-0.034
	ZnCl3-	9.677e-20	8.943e-20	-19.014	-19.048	-0.034
	CuCl2	8.777e-20	8.788e-20	-19.057	-19.056	0.001
	PbCl3-	4.024e-20	3.719e-20	-19.395	-19.430	-0.034
	UO2Cl+	6.446e-21	5.957e-21	-20.191	-20.225	-0.034
	ZnCl4-2	2.839e-23	2.072e-23	-22.547	-22.684	-0.137
	PbCl4-2	1.129e-23	8.237e-24	-22.947	-23.084	-0.137
	FeCl+2	1.248e-24	9.108e-25	-23.904	-24.041	-0.137
	CuCl3-	1.481e-25	1.368e-25	-24.830	-24.864	-0.034
	UO2Cl2	1.463e-25	1.465e-25	-24.835	-24.834	0.001
	FeCl2+	2.509e-27	2.319e-27	-26.600	-26.635	-0.034
	CuCl4-2	4.008e-31	2.924e-31	-30.397	-30.534	-0.137
	FeCl3	1.116e-31	1.118e-31	-30.952	-30.952	0.001
	UCl+3	0.000e+00	0.000e+00	-55.995	-56.303	-0.308
Cu(1)	2.085e-14					
	Cu+	1.941e-14	1.794e-14	-13.712	-13.746	-0.034
	CuCl2-	1.444e-15	1.334e-15	-14.840	-14.875	-0.034
	CuCl3-2	1.369e-18	9.987e-19	-17.864	-18.001	-0.137
Cu(2)	2.991e-07					
	Cu(OH)2	2.982e-07	2.986e-07	-6.525	-6.525	0.001
	CuCO3	4.950e-10	4.957e-10	-9.305	-9.305	0.001
	Cu(CO3)2-2	2.198e-10	1.604e-10	-9.658	-9.795	-0.137
	Cu(OH)3-	1.228e-10	1.135e-10	-9.911	-9.945	-0.034
	CuOH+	2.451e-11	2.266e-11	-10.611	-10.645	-0.034
	Cu+2	4.922e-13	3.591e-13	-12.308	-12.445	-0.137
	Cu(OH)4-2	1.958e-13	1.429e-13	-12.708	-12.845	-0.137
	CuHCO3+	1.892e-13	1.749e-13	-12.723	-12.757	-0.034
	CuSO4	2.690e-14	2.694e-14	-13.570	-13.570	0.001
	CuF+	3.911e-16	3.614e-16	-15.408	-15.442	-0.034
	CuCl+	3.890e-16	3.595e-16	-15.410	-15.444	-0.034
	Cu2(OH)2+2	1.820e-16	1.328e-16	-15.740	-15.877	-0.137
	CuCl2	8.777e-20	8.788e-20	-19.057	-19.056	0.001
	CuCl3-	1.481e-25	1.368e-25	-24.830	-24.864	-0.034
	CuCl4-2	4.008e-31	2.924e-31	-30.397	-30.534	-0.137
F	6.318e-05					
	F-	6.282e-05	5.806e-05	-4.202	-4.236	-0.034
	NaF	1.482e-07	1.483e-07	-6.829	-6.829	0.001
	MgF+	1.469e-07	1.358e-07	-6.833	-6.867	-0.034
	CaF+	6.636e-08	6.133e-08	-7.178	-7.212	-0.034
	HF	1.256e-11	1.258e-11	-10.901	-10.900	0.001
	MnF+	7.184e-12	6.640e-12	-11.144	-11.178	-0.034
	ZnF+	2.793e-13	2.581e-13	-12.554	-12.588	-0.034
	NiF+	1.389e-13	1.284e-13	-12.857	-12.892	-0.034
	PbF+	7.902e-15	7.303e-15	-14.102	-14.137	-0.034
	HF2-	2.903e-15	2.683e-15	-14.537	-14.571	-0.034
	CuF+	3.911e-16	3.614e-16	-15.408	-15.442	-0.034
	AlF2+	7.423e-17	6.860e-17	-16.129	-16.164	-0.034
	UO2F+	6.753e-17	6.241e-17	-16.170	-16.205	-0.034
	FeF+	6.506e-17	6.013e-17	-16.187	-16.221	-0.034
	AlF3	4.981e-17	4.988e-17	-16.303	-16.302	0.001
	UO2F2	1.223e-17	1.225e-17	-16.913	-16.912	0.001
	PbF2	8.646e-18	8.657e-18	-17.063	-17.063	0.001
	AlF+2	3.322e-18	2.423e-18	-17.479	-17.616	-0.137
	AlF4-	1.246e-18	1.151e-18	-17.905	-17.939	-0.034
	UO2F3-	1.463e-19	1.352e-19	-18.835	-18.869	-0.034
	FeF2+	1.475e-20	1.363e-20	-19.831	-19.865	-0.034
	FeF+2	8.609e-21	6.281e-21	-20.065	-20.202	-0.137
	PbF3-	3.940e-21	3.641e-21	-20.404	-20.439	-0.034
	FeF3	1.231e-21	1.232e-21	-20.910	-20.909	0.001
	H2F2	4.957e-22	4.963e-22	-21.305	-21.304	0.001
	UO2F4-2	6.891e-23	5.028e-23	-22.162	-22.299	-0.137
	PbF4-2	1.387e-25	1.012e-25	-24.858	-24.995	-0.137
	UF3+	0.000e+00	0.000e+00	-45.841	-45.875	-0.034
	UF4	0.000e+00	0.000e+00	-46.199	-46.198	0.001
	UF2+2	0.000e+00	0.000e+00	-46.870	-47.007	-0.137
	UF5-	0.000e+00	0.000e+00	-48.965	-48.999	-0.034
	UF+3	0.000e+00	0.000e+00	-49.376	-49.684	-0.308
	UF6-2	0.000e+00	0.000e+00	-50.988	-51.125	-0.137
Fe(2)	9.534e-13					
	FeCO3	6.377e-13	6.385e-13	-12.195	-12.195	0.001
	FeOH+	1.505e-13	1.391e-13	-12.822	-12.857	-0.034
	Fe+2	1.419e-13	1.036e-13	-12.848	-12.985	-0.137
	FeHCO3+	1.089e-14	1.006e-14	-13.963	-13.997	-0.034
	FeSO4	6.362e-15	6.371e-15	-14.196	-14.196	0.001
	Fe(OH)2	4.708e-15	4.715e-15	-14.327	-14.327	0.001
	Fe(OH)3-	1.135e-15	1.049e-15	-14.945	-14.979	-0.034
	FeCl+	7.455e-17	6.890e-17	-16.128	-16.162	-0.034
	FeF+	6.506e-17	6.013e-17	-16.187	-16.221	-0.034
	FeHSO4+	7.079e-24	6.543e-24	-23.150	-23.184	-0.034

Fe(3)	1.469e-05					
	Fe(OH)4-	1.225e-05	1.132e-05	-4.912	-4.946	-0.034
	Fe(OH)3	2.431e-06	2.435e-06	-5.614	-5.614	0.001
	Fe(OH)2+	4.082e-09	3.773e-09	-8.389	-8.423	-0.034
	FeOH+2	3.026e-15	2.207e-15	-14.519	-14.656	-0.137
	FeF2+	1.475e-20	1.363e-20	-19.831	-19.865	-0.034
	FeF+2	8.609e-21	6.281e-21	-20.065	-20.202	-0.137
	FeF3	1.231e-21	1.232e-21	-20.910	-20.909	0.001
	FeSO4+	2.976e-22	2.750e-22	-21.526	-21.561	-0.034
	Fe+3	1.504e-22	7.401e-23	-21.823	-22.131	-0.308
	Fe(SO4)2-	2.430e-24	2.246e-24	-23.614	-23.649	-0.034
	FeCl+2	1.248e-24	9.108e-25	-23.904	-24.041	-0.137
	FeCl2+	2.509e-27	2.319e-27	-26.600	-26.635	-0.034
	Fe2(OH)2+4	5.761e-28	1.632e-28	-27.240	-27.787	-0.548
	FeHSO4+2	1.610e-31	1.174e-31	-30.793	-30.930	-0.137
	FeCl3	1.116e-31	1.118e-31	-30.952	-30.952	0.001
	Fe3(OH)4+5	1.504e-33	2.097e-34	-32.823	-33.678	-0.856
H(0)	3.597e-31					
	H2	1.799e-31	1.801e-31	-30.745	-30.745	0.001
K	4.605e-05					
	K+	4.593e-05	4.241e-05	-4.338	-4.373	-0.035
	KSO4-	1.157e-07	1.070e-07	-6.937	-6.971	-0.034
Mg	6.583e-05					
	Mg+2	5.277e-05	3.896e-05	-4.278	-4.409	-0.132
	MgCO3	8.811e-06	8.822e-06	-5.055	-5.054	0.001
	MgSO4	3.033e-06	3.037e-06	-5.518	-5.518	0.001
	MgOH+	5.988e-07	5.534e-07	-6.223	-6.257	-0.034
	MgHCO3+	4.697e-07	4.341e-07	-6.328	-6.362	-0.034
	MgF+	1.469e-07	1.358e-07	-6.833	-6.867	-0.034
Mn(2)	3.642e-07					
	MnCO3	3.370e-07	3.375e-07	-6.472	-6.472	0.001
	Mn+2	2.266e-08	1.653e-08	-7.645	-7.782	-0.137
	MnOH+	1.884e-09	1.741e-09	-8.725	-8.759	-0.034
	MnHCO3+	1.549e-09	1.431e-09	-8.810	-8.844	-0.034
	MnSO4	1.011e-09	1.013e-09	-8.995	-8.995	0.001
	MnCl+	3.512e-11	3.246e-11	-10.454	-10.489	-0.034
	MnF+	7.184e-12	6.640e-12	-11.144	-11.178	-0.034
	Mn(OH)3-	7.118e-14	6.578e-14	-13.148	-13.182	-0.034
	MnCl2	6.820e-15	6.828e-15	-14.166	-14.166	0.001
	MnCl3-	9.808e-19	9.065e-19	-18.008	-18.043	-0.034
Mn(3)	4.794e-30					
	Mn+3	4.794e-30	2.358e-30	-29.319	-29.627	-0.308
Mn(6)	2.307e-34					
	MnO4-2	2.307e-34	1.683e-34	-33.637	-33.774	-0.137
Mn(7)	3.391e-40					
	MnO4-	3.391e-40	3.134e-40	-39.470	-39.504	-0.034
Na	4.830e-03					
	Na+	4.801e-03	4.440e-03	-2.319	-2.353	-0.034
	NaCO3-	1.761e-05	1.627e-05	-4.754	-4.789	-0.034
	NaSO4-	8.873e-06	8.200e-06	-5.052	-5.086	-0.034
	NaHCO3	2.423e-06	2.426e-06	-5.616	-5.615	0.001
	NaF	1.482e-07	1.483e-07	-6.829	-6.829	0.001
Ni	3.408e-07					
	NiCO3	2.108e-07	2.111e-07	-6.676	-6.676	0.001
	Ni(CO3)2-2	1.292e-07	9.428e-08	-6.889	-7.026	-0.137
	Ni(OH)2	4.404e-10	4.410e-10	-9.356	-9.356	0.001
	Ni+2	1.519e-10	1.108e-10	-9.819	-9.955	-0.137
	NiOH+	7.196e-11	6.651e-11	-10.143	-10.177	-0.034
	Ni(OH)3-	3.010e-11	2.782e-11	-10.521	-10.556	-0.034
	NiHCO3+	1.608e-11	1.486e-11	-10.794	-10.828	-0.034
	NiSO4	7.856e-12	7.866e-12	-11.105	-11.104	0.001
	NiCl+	1.451e-13	1.341e-13	-12.838	-12.872	-0.034
	NiF+	1.389e-13	1.284e-13	-12.857	-12.892	-0.034
	NiCl2	2.344e-16	2.347e-16	-15.630	-15.629	0.001
	Ni(SO4)2-2	2.309e-16	1.685e-16	-15.637	-15.773	-0.137
O(0)	4.641e-33					
	O2	2.321e-33	2.324e-33	-32.634	-32.634	0.001
Pb	6.277e-08					
	PbCO3	3.155e-08	3.159e-08	-7.501	-7.500	0.001
	Pb(CO3)2-2	2.795e-08	2.039e-08	-7.554	-7.690	-0.137
	Pb(OH)2	2.133e-09	2.135e-09	-8.671	-8.671	0.001
	PbOH+	9.414e-10	8.701e-10	-9.026	-9.060	-0.034
	Pb(OH)3-	1.674e-10	1.547e-10	-9.776	-9.811	-0.034
	Pb+2	9.695e-12	7.073e-12	-11.013	-11.150	-0.137
	PbHCO3+	5.907e-12	5.459e-12	-11.229	-11.263	-0.034
	Pb(OH)4-2	3.064e-12	2.236e-12	-11.514	-11.651	-0.137
	PbSO4	1.514e-12	1.516e-12	-11.820	-11.819	0.001
	PbCl+	1.288e-13	1.190e-13	-12.890	-12.924	-0.034
	PbF+	7.902e-15	7.303e-15	-14.102	-14.137	-0.034
	Pb(SO4)2-2	4.155e-15	3.031e-15	-14.381	-14.518	-0.137
	PbCl2	1.002e-16	1.004e-16	-15.999	-15.998	0.001
	PbF2	8.646e-18	8.657e-18	-17.063	-17.063	0.001
	Pb3(OH)4+2	4.579e-19	3.340e-19	-18.339	-18.476	-0.137
	Pb2OH+3	2.801e-19	1.378e-19	-18.553	-18.861	-0.308
	PbCl3-	4.024e-20	3.719e-20	-19.395	-19.430	-0.034
	PbF3-	3.940e-21	3.641e-21	-20.404	-20.439	-0.034
	PbCl4-2	1.129e-23	8.237e-24	-22.947	-23.084	-0.137
	PbF4-2	1.387e-25	1.012e-25	-24.858	-24.995	-0.137
S(6)	5.415e-04					
	SO4-2	5.195e-04	3.811e-04	-3.284	-3.419	-0.135
	CaSO4	9.917e-06	9.929e-06	-5.004	-5.003	0.001
	NaSO4-	8.873e-06	8.200e-06	-5.052	-5.086	-0.034
	MgSO4	3.033e-06	3.037e-06	-5.518	-5.518	0.001
	KSO4-	1.157e-07	1.070e-07	-6.937	-6.971	-0.034
	BaSO4	6.496e-08	6.504e-08	-7.187	-7.187	0.001
	MnSO4	1.011e-09	1.013e-09	-8.995	-8.995	0.001
	ZnSO4	2.881e-11	2.885e-11	-10.540	-10.540	0.001
	NiSO4	7.856e-12	7.866e-12	-11.105	-11.104	0.001
	HSO4-	5.686e-12	5.255e-12	-11.245	-11.279	-0.034
	PbSO4	1.514e-12	1.516e-12	-11.820	-11.819	0.001
	Zn(SO4)2-2	1.276e-13	9.307e-14	-12.894	-13.031	-0.137
	CuSO4	2.690e-14	2.694e-14	-13.570	-13.570	0.001
	CaHSO4+	9.379e-15	8.669e-15	-14.028	-14.062	-0.034
	FeSO4	6.362e-15	6.371e-15	-14.196	-14.196	0.001
	Pb(SO4)2-2	4.155e-15	3.031e-15	-14.381	-14.518	-0.137
	Ni(SO4)2-2	2.309e-16	1.685e-16	-15.637	-15.773	-0.137
	UO2SO4	4.131e-18	4.136e-18	-17.384	-17.383	0.001
	UO2(SO4)2-2	1.890e-20	1.379e-20	-19.724	-19.861	-0.137
	AlSO4+	5.245e-21	4.848e-21	-20.280	-20.314	-0.034
	FeSO4+	2.976e-22	2.750e-22	-21.526	-21.561	-0.034
	Al(SO4)2-	6.167e-23	5.700e-23	-22.210	-22.244	-0.034
	FeHSO4+	7.079e-24	6.543e-24	-23.150	-23.184	-0.034
	Fe(SO4)2-	2.430e-24	2.246e-24	-23.614	-23.649	-0.034
	FeHSO4+2	1.610e-31	1.174e-31	-30.793	-30.930	-0.137
	AlHSO4+2	8.950e-32	6.530e-32	-31.048	-31.185	-0.137
	U(SO4)2	0.000e+00	0.000e+00	-51.205	-51.205	0.001
	USO4+2	0.000e+00	0.000e+00	-51.492	-51.629	-0.137
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-67.571	-67.879	-0.308
U(4)	4.110e-25					
	U(OH)4	4.110e-25	4.116e-25	-24.386	-24.386	0.001
	U(OH)3+	2.749e-31	2.541e-31	-30.561	-30.595	-0.034
	U(CO3)4-4	2.100e-36	5.951e-37	-35.678	-36.225	-0.548
	U(OH)2+2	2.958e-38	2.158e-38	-37.529	-37.666	-0.137
	U(CO3)5-6	1.806e-38	1.058e-39	-37.743	-38.976	-1.232
	UOH+3	0.000e+00	0.000e+00	-45.343	-45.651	-0.308
	UF3+	0.000e+00	0.000e+00	-45.841	-45.875	-0.034
	UF4	0.000e+00	0.000e+00	-46.199	-46.198	0.001
	UF2+2	0.000e+00	0.000e+00	-46.870	-47.007	-0.137
	UF5-	0.000e+00	0.000e+00	-48.965	-48.999	-0.034
	UF+3	0.000e+00	0.000e+00	-49.376	-49.684	-0.308
	UF6-2	0.000e+00	0.000e+00	-50.988	-51.125	-0.137
	U(SO4)2	0.000e+00	0.000e+00	-51.205	-51.205	0.001
	USO4+2	0.000e+00	0.000e+00	-51.492	-51.629	-0.137
	U+4	0.000e+00	0.000e+00	-54.217	-54.765	-0.548
	UCl+3	0.000e+00	0.000e+00	-55.995	-56.303	-0.308
	U6(OH)15+9	0.000e+00	0.000e+00	-196.019	-198.792	-2.773
U(5)	3.274e-20					
	UO2+	3.265e-20	3.018e-20	-19.486	-19.520	-0.034
	UO2(CO3)3-5	8.953e-23	1.248e-23	-22.048	-22.904	-0.856
U(6)	3.194e-06					
	UO2(CO3)3-4	2.972e-06	8.421e-07	-5.527	-6.075	-0.548
	UO2(OH)3-	1.516e-07	1.401e-07	-6.819	-6.853	-0.034
	UO2(CO3)2-2	7.015e-08	5.118e-08	-7.154	-7.291	-0.137
	UO2(OH)4-2	1.921e-11	1.401e-11	-10.717	-10.853	-0.137
	UO2CO3	9.344e-12	9.356e-12	-11.029	-11.029	0.001
	UO2OH+	2.739e-13	2.531e-13	-12.562	-12.597	-0.034
	(UO2)3(OH)7-	2.979e-14	2.753e-14	-13.526	-13.560	-0.034
	UO2F+	6.753e-17	6.241e-17	-16.170	-16.205	-0.034
	UO2F2	1.223e-17	1.225e-17	-16.913	-16.912	0.001
	UO2+2	1.212e-17	8.846e-18	-16.916	-17.053	-0.137
	UO2SO4	4.131e-18	4.136e-18	-17.384	-17.383	0.001
	(UO2)3(CO3)6-6	3.406e-18	1.995e-19	-17.468	-18.700	-1.232
	(UO2)3(OH)5+	9.952e-19	9.197e-19	-18.002	-18.036	-0.034
	UO2F3-	1.463e-19	1.352e-19	-18.835	-18.869	-0.034
	UO2(SO4)2-2	1.890e-20	1.379e-20	-19.724	-19.861	-0.137
	(UO2)2(OH)2+2	7.537e-21	5.499e-21	-20.123	-20.260	-0.137
	UO2Cl+	6.446e-21	5.957e-21	-20.191	-20.225	-0.034
	(UO2)4(OH)7+	3.317e-22	3.066e-22	-21.479	-21.513	-0.034
	UO2F4-2	6.891e-23	5.028e-23	-22.162	-22.299	-0.137
	(UO2)3(OH)4+2	1.892e-24	1.380e-24	-23.723	-23.860	-0.137
	UO2Cl2	1.463e-25	1.465e-25	-24.835	-24.834	0.001
	(UO2)2OH+3	2.002e-27	9.849e-28	-26.699	-27.007	-0.308
Zn	3.214e-07					
	Zn(OH)2	1.683e-07	1.685e-07	-6.774	-6.773	0.001
	Zn(CO3)2-2	1.299e-07	9.478e-08	-6.886	-7.023	-0.137
	ZnCO3	1.723e-08	1.725e-08	-7.764	-7.763	0.001
	Zn(OH)3-	3.638e-09	3.362e-09	-8.439	-8.473	-0.034
	ZnOH+	1.685e-09	1.557e-09	-8.773	-8.808	-0.034
	Zn+2	4.610e-10	3.364e-10	-9.336	-9.473	-0.137
	ZnHCO3+	4.452e-11	4.115e-11	-10.351	-10.386	-0.034
	ZnOHCl	3.382e-11	3.387e-11	-10.471	-10.470	0.001
	ZnSO4	2.881e-11	2.885e-11	-10.540	-10.540	0.001
	Zn(OH)4-2	4.608e-12	3.362e-12	-11.336	-11.473	-0.137
	ZnCl+	3.739e-13	3.455e-13	-12.427	-12.462	-0.034
	ZnF+	2.793e-13	2.581e-13	-12.554	-12.588	-0.034
	Zn(SO4)2-2	1.276e-13	9.307e-14	-12.894	-13.031	-0.137
	ZnCl2	1.705e-16	1.707e-16	-15.768	-15.768	0.001
	ZnCl3-	9.677e-20	8.943e-20	-19.014	-19.048	-0.034
	ZnCl4-2	2.839e-23	2.072e-23	-22.547	-22.684	-0.137

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-2.11	9.03	11.14	Al(OH)3
AlAsO4:2H2O	-11.47	-6.66	4.80	AlAsO4:2H2O
AlumK	-26.31	-31.58	-5.26	KAl(SO4)2:12H2O
Alunite	-12.76	-13.51	-0.75	KAl3(SO4)2(OH)6
Anglesite	-6.75	-14.57	-7.82	PbSO4
Anhydrite	-2.94	-7.28	-4.34	CaSO4
Antlerite	-9.84	-1.55	8.29	Cu3(OH)4SO4
Aragonite	0.85	-7.45	-8.30	CaCO3
Arsenolite	-22.81	-25.80	-2.99	As4O6
Artinite	-2.78	7.19	9.97	MgCO3:Mg(OH)2:3H2O
As2O5	-38.16	-31.39	6.77	As2O5
Atacamite	-6.39	1.19	7.58	Cu2(OH)3Cl
Azurite	-8.31	-24.91	-16.60	Cu3(OH)2(CO3)2
B-UO2(OH)2	-3.18	2.55	5.72	UO2(OH)2
Ba3(AsO4)2	16.96	8.01	-8.95	Ba3(AsO4)2
BaF2	-9.17	-14.94	-5.77	BaF2
Barite	0.17	-9.89	-10.06	BaSO4
Basaluminite	-9.58	13.12	22.70	Al4(OH)10SO4
Bianchite	-11.13	-12.89	-1.76	ZnSO4:6H2O
Birnessite	-4.18	39.42	43.60	MnO2
Bixbyite	-0.04	51.24	51.28	Mn2O3
Boehmite	0.08	9.03	8.95	AlOOH
Brochantite	-9.74	5.60	15.34	Cu4(OH)6SO4
Brucite	-2.00	15.19	17.19	Mg(OH)2
Bunsenite	-3.12	9.64	12.76	NiO
Ca3(AsO4)2:4w	-6.56	15.82	22.38	Ca3(AsO4)2:4H2O
Calcite	1.00	-7.45	-8.45	CaCO3
Cerrusite	-1.55	-14.74	-13.19	PbCO3
Chalcanthite	-13.21	-15.86	-2.66	CuSO4:5H2O
Claudetite	-22.56	-25.80	-3.24	As4O6
CO2(g)	-5.02	-23.19	-18.17	CO2
Cotunnite	-12.94	-17.78	-4.84	PbCl2
Cu(OH)2	-1.68	7.16	8.84	Cu(OH)2
Cu2SO4	-29.02	-36.31	-7.29	Cu2SO4
Cu3(AsO4)2:6w	-16.08	-9.92	6.16	Cu3(AsO4)2:6H2O
CuCO3	-6.40	-16.03	-9.63	CuCO3
CuF	-25.22	-20.68	4.54	CuF
CuF2	-20.47	-20.92	-0.45	CuF2
CuF2:2H2O	-16.41	-20.92	-4.50	CuF2:2H2O
CuMetal	-8.76	-20.44	-11.68	Cu
CuOCuSO4	-20.70	-8.71	11.99	CuO:CuSO4
CupricFerrite	15.31	47.99	32.68	CuFe2O4
Cuprite	-6.26	-13.29	-7.03	Cu2O
CuprousFerrite	12.19	13.77	1.58	CuFeO2
CuSO4	-19.11	-15.86	3.25	CuSO4
Diaspore	1.83	9.03	7.20	AlOOH
Dolomite	1.52	-15.45	-16.97	CaMg(CO3)2
Dolomite(d)	0.94	-15.45	-16.40	CaMg(CO3)2
Epsomite	-5.65	-7.83	-2.18	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.37	16.48	10.11	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.38	20.42	18.04	Fe(OH)3
Fe3(OH)8	0.93	47.45	46.51	Fe3(OH)8
Fluorite	-1.67	-12.33	-10.66	CaF2
Gibbsite	0.63	9.03	8.41	Al(OH)3
Goethite	8.27	20.42	12.15	FeOOH
Goslarite	-10.89	-12.89	-2.00	ZnSO4:7H2O
Gummite	-8.16	2.55	10.70	UO3
Gypsum	-2.70	-7.28	-4.58	CaSO4:2H2O
H2(g)	-27.55	-27.60	-0.05	H2
Halite	-7.24	-5.67	1.57	NaCl
Hausmannite	0.72	63.05	62.34	Mn3O4
Hematite	18.15	40.83	22.69	Fe2O3
Huntite	-1.82	-31.45	-29.63	CaMg3(CO3)4
Hydrocerrusite	-3.57	-21.03	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-8.73	-16.81	-8.08	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-11.83	19.61	31.44	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-10.00	20.63	30.63	KFe3(SO4)2(OH)6
Jarosite-Na	-11.97	22.65	34.63	NaFe3(SO4)2(OH)6
JarositeH	-19.56	15.21	34.77	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-10.75	-13.98	-3.23	AlOHSO4
Langite	-11.70	5.60	17.31	Cu4(OH)6SO4:H2O
Larnakite	-5.92	-6.12	-0.20	PbO:PbSO4
Laurionite	-5.29	-4.67	0.62	PbOHCl
Litharge	-4.48	8.45	12.93	PbO
Maghemite	8.15	40.83	32.68	Fe2O3
Magnesite	-0.05	-8.00	-7.95	MgCO3
Magnetite	16.76	47.45	30.69	Fe3O4
Malachite	-3.91	-8.88	-4.97	Cu2(OH)2CO3
Manganite	0.28	25.62	25.34	MnOOH
Massicot	-4.68	8.45	13.13	PbO
Matlockite	-9.17	-18.70	-9.53	PbClF
Melanothallite	-22.97	-19.08	3.89	CuCl2
Melanterite	-14.13	-16.40	-2.27	FeSO4:7H2O
Minium	-22.08	52.95	75.03	Pb3O4
Mirabilite	-6.76	-8.12	-1.36	Na2SO4:10H2O
Mn2(SO4)3	-64.31	-17.82	46.49	Mn2(SO4)3
Mn3(AsO4):8H2O	-8.51	4.07	12.58	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-16.90	-14.42	2.48	MnCl2:4H2O
MnSO4	-14.07	-11.20	2.87	MnSO4
Morenosite	-10.98	-13.37	-2.40	NiSO4:7H2O
Na4UO2(CO3)3	-20.94	-37.23	-16.29	Na4UO2(CO3)3
Nahcolite	-4.77	-15.74	-10.97	NaHCO3
Nantokite	-10.17	-19.76	-9.59	CuCl
Natron	-6.78	-8.30	-1.52	Na2CO3:10H2O
Nesquehonite	-2.45	-8.00	-5.55	MgCO3:3H2O
Ni(OH)2	-0.76	9.64	10.40	Ni(OH)2
Ni3(AsO4)2:8H2O	-18.23	-2.46	15.77	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-16.44	15.56	32.00	Ni4(OH)6SO4
NiCO3	-6.83	-13.55	-6.71	NiCO3
Nsutite	-3.15	39.42	42.56	MnO2
O2(g)	-29.78	55.20	84.98	O2
Pb(OH)2	0.12	8.45	8.33	Pb(OH)2
Pb2(OH)3Cl	-5.01	3.78	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-9.30	16.90	26.20	PbO:Pb(OH)2
Pb2O3	-16.54	44.50	61.04	Pb2O3
Pb2OCO3	-5.94	-6.29	-0.35	PbO:PbCO3
Pb3(AsO4)2	-11.92	-6.04	5.88	Pb3(AsO4)2
Pb3O2CO3	-9.21	2.16	11.36	PbCO3:2PbO
Pb3O2SO4	-8.34	2.33	10.67	PbSO4:2PbO
Pb4(OH)6SO4	-10.32	10.78	21.10	Pb4(OH)6SO4
Pb4O3SO4	-11.78	10.78	22.56	PbSO4:3PbO
PbF2	-12.19	-19.62	-7.43	PbF2
PbMetal	-23.42	-19.15	4.26	Pb
PbO:0.3H2O	-4.53	8.45	12.98	PbO:0.33H2O
Phosgenite	-12.71	-32.52	-19.81	PbCl2:PbCO3
Plattnerite	-14.17	36.05	50.22	PbO2
Portlandite	-7.47	15.74	23.20	Ca(OH)2
Pyrochroite	-3.38	11.82	15.20	Mn(OH)2
Pyrolusite	-2.81	39.42	42.23	MnO2
Retgersite	-11.32	-13.37	-2.05	NiSO4:6H2O
Rhodochrosite	-0.26	-11.37	-11.11	MnCO3
Rhodochrosite(d)	-0.98	-11.37	-10.39	MnCO3
Rutherfordine	-6.21	-20.64	-14.43	UO2CO3
Schoepite	-3.01	2.55	5.56	UO2(OH)2:H2O
Scorodite	-8.82	4.72	13.54	FeAsO4:2H2O
Siderite	-5.72	-16.57	-10.86	FeCO3
Siderite(d)(3)	-6.12	-16.57	-10.45	FeCO3
Smithsonite	-3.12	-13.06	-9.94	ZnCO3
Tenorite	-0.66	7.16	7.82	CuO
Thenardite	-7.95	-8.12	-0.17	Na2SO4
Thermonatrite	-8.46	-8.30	0.16	Na2CO3:H2O
Trona	-13.10	-24.04	-10.94	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-35.38	-48.07	-12.69	U(OH)2SO4
U3O8(c)	-13.54	-19.96	-6.42	U3O8
U4O9(c)	-32.59	-72.61	-40.02	U4O9
UF4(c)	-53.35	-81.20	-27.85	UF4
UF4:2.5H2O	-44.15	-81.20	-37.05	UF4:2.5H2O
UO2(a)	-15.67	-25.05	-9.39	UO2
UO3(gamma)	-5.42	2.55	7.97	UO3
Uraninite(c)	-11.01	-25.05	-14.05	UO2
Witherite	-1.48	-10.06	-8.58	BaCO3
Zincite(c)	-1.30	10.13	11.42	ZnO
Zincosite	-16.15	-12.89	3.26	ZnSO4
Zn(OH)2-a	-2.32	10.13	12.45	Zn(OH)2
Zn(OH)2-b	-1.62	10.13	11.75	Zn(OH)2
Zn(OH)2-c	-2.07	10.13	12.20	Zn(OH)2
Zn(OH)2-e	-1.37	10.13	11.50	Zn(OH)2
Zn(OH)2-g	-1.58	10.13	11.71	Zn(OH)2
Zn2(OH)2SO4	-10.27	-2.77	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-8.06	7.14	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-14.75	-1.01	13.74	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-35.48	-15.66	19.83	ZnO:2ZnSO4
Zn4(OH)6SO4	-10.91	17.49	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-14.10	24.40	38.50	Zn5(OH)8Cl2
ZnCl2	-23.36	-16.11	7.26	ZnCl2
ZnCO3:H2O	-2.80	-13.06	-10.26	ZnCO3:H2O
ZnF2	-16.60	-17.95	-1.35	ZnF2
ZnMetal	-43.71	-17.47	26.24	Zn
ZnO(a)	-1.18	10.13	11.31	ZnO
ZnSO4:H2O	-12.46	-12.89	-0.43	ZnSO4:H2O

End of simulation.

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Reading data base.
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           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 10.5-11.5m
           SOLUTION        11
           units           mg/l
           temp            23.4
           pH              9.94
           F               1.0
           Cl              24
           S(6)            42          as SO4
           Na              117
           K               2.3
           Mg              2.1
           Ca              10.6
           Alkalinity      146.4       as HCO3
           Al              1.34
           As              2.81
           Ba              0.141
           Cu              0.050
           Fe              1.88
           Mn              0.09
           Ni              0.026
           Pb              0.042
           U               0.56
           Zn              0.052
           END
```

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TITLE
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   Schneckentein 10.5-11.5m

-----------------------------------------
Beginning of initial solution calculations.
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Initial solution 11.

-----------------------------Solution composition--------------
---------------

            Elements           Molality       Moles

            Al                4.968e-05   4.968e-05
            Alkalinity        2.400e-03   2.400e-03
            As                3.752e-05   3.752e-05
            Ba                1.027e-06   1.027e-06
            Ca                2.646e-04   2.646e-04
            Cl                6.772e-04   6.772e-04
            Cu                7.871e-07   7.871e-07
            F                 5.265e-05   5.265e-05
            Fe                3.368e-05   3.368e-05
            K                 5.884e-05   5.884e-05
            Mg                8.641e-05   8.641e-05
            Mn                1.639e-06   1.639e-06
            Na                5.091e-03   5.091e-03
            Ni                4.430e-07   4.430e-07
            Pb                2.028e-07   2.028e-07
            S(6)              4.374e-04   4.374e-04
            U                 2.353e-06   2.353e-06
            Zn                7.958e-07   7.958e-07
```

```
----------------------------Description of solution----------------------------

                                    pH  =   9.940
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   5.779e-03
                     Mass of water (kg)  =   1.000e+00
                    Total carbon (mol/kg)  =   1.448e-03
                       Total CO2 (mol/kg)  =   1.448e-03
                     Temperature (deg C)  =  23.400
                   Electrical balance (eq)  =   2.007e-03
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  21.74
                                 Iterations  =  15
                                    Total H  = 1.110138e+02
                                    Total O  = 5.551288e+01
```

----------Distribution of species----------

	Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
	OH-	8.364e-05	7.716e-05	-4.078	-4.113	-0.035
	H+	1.235e-10	1.148e-10	-9.908	-9.940	-0.032
	H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	4.968e-05					
	Al(OH)4-	4.968e-05	4.583e-05	-4.304	-4.339	-0.035
	Al(OH)3	2.848e-09	2.852e-09	-8.545	-8.545	0.001
	Al(OH)2+	2.713e-12	2.503e-12	-11.566	-11.601	-0.035
	AlOH+2	5.829e-17	4.223e-17	-16.234	-16.374	-0.140
	AlF2+	6.732e-18	6.211e-18	-17.172	-17.207	-0.035
	AlF3	3.762e-18	3.767e-18	-17.425	-17.424	0.001
	AlF+2	3.575e-19	2.590e-19	-18.447	-18.587	-0.140
	AlF4-	7.840e-20	7.233e-20	-19.106	-19.141	-0.035
	Al+3	1.119e-21	5.419e-22	-20.951	-21.266	-0.315
	AlSO4+	5.541e-22	5.112e-22	-21.256	-21.291	-0.035
	Al(SO4)2-	5.298e-24	4.888e-24	-23.276	-23.311	-0.035
	AlHSO4+2	7.086e-33	5.133e-33	-32.150	-32.290	-0.140
As(3)	2.972e-24					
	H2AsO3-	2.481e-24	2.289e-24	-23.605	-23.640	-0.035
	H3AsO3	4.710e-25	4.716e-25	-24.327	-24.326	0.001
	HAsO3-2	2.030e-26	1.470e-26	-25.693	-25.833	-0.140
	AsO3-3	9.650e-30	4.672e-30	-29.015	-29.331	-0.315
	H4AsO3+	2.908e-35	2.683e-35	-34.536	-34.571	-0.035
As(5)	3.752e-05					
	HAsO4-2	3.635e-05	2.633e-05	-4.440	-4.580	-0.140
	AsO4-3	1.154e-06	5.588e-07	-5.938	-6.253	-0.315
	H2AsO4-	1.890e-08	1.744e-08	-7.724	-7.759	-0.035
	H3AsO4	3.445e-16	3.450e-16	-15.463	-15.462	0.001
Ba	1.027e-06					
	Ba+2	8.329e-07	6.034e-07	-6.079	-6.219	-0.140
	BaCO3	9.703e-08	9.716e-08	-7.013	-7.012	0.001
	BaSO4	9.199e-08	9.211e-08	-7.036	-7.036	0.001
	BaHCO3+	4.855e-09	4.479e-09	-8.314	-8.349	-0.035
	BaOH+	1.930e-10	1.780e-10	-9.714	-9.749	-0.035
C(4)	1.448e-03					
	HCO3-	8.808e-04	8.144e-04	-3.055	-3.089	-0.034
	CO3-2	4.404e-04	3.219e-04	-3.356	-3.492	-0.136
	CaCO3	7.033e-05	7.042e-05	-4.153	-4.152	0.001
	NaCO3-	2.795e-05	2.578e-05	-4.554	-4.589	-0.035
	MgCO3	1.457e-05	1.459e-05	-4.836	-4.836	0.001
	NaHCO3	2.134e-06	2.137e-06	-5.671	-5.670	0.001
	UO2(CO3)3-4	2.130e-06	5.865e-07	-5.672	-6.232	-0.560
	MnCO3	1.535e-06	1.537e-06	-5.814	-5.813	0.001
	CaHCO3+	1.479e-06	1.365e-06	-5.830	-5.865	-0.035
	MgHCO3+	4.995e-07	4.609e-07	-6.301	-6.336	-0.035
	Zn(CO3)2-2	2.912e-07	2.110e-07	-6.536	-6.676	-0.140
	NiCO3	2.492e-07	2.495e-07	-6.603	-6.603	0.001
	CO2	2.143e-07	2.146e-07	-6.669	-6.668	0.001
	Ni(CO3)2-2	1.927e-07	1.396e-07	-6.715	-6.855	-0.140
	Pb(CO3)2-2	1.000e-07	7.248e-08	-7.000	-7.140	-0.140
	BaCO3	9.703e-08	9.716e-08	-7.013	-7.012	0.001
	PbCO3	8.952e-08	8.964e-08	-7.048	-7.048	0.001
	UO2(CO3)2-2	5.212e-08	3.776e-08	-7.283	-7.423	-0.140
	ZnCO3	3.061e-08	3.065e-08	-7.514	-7.514	0.001
	BaHCO3+	4.855e-09	4.479e-09	-8.314	-8.349	-0.035
	MnHCO3+	4.730e-09	4.363e-09	-8.325	-8.360	-0.035
	CuCO3	8.567e-10	8.579e-10	-9.067	-9.067	0.001
	Cu(CO3)2-2	4.799e-10	3.476e-10	-9.319	-9.459	-0.140
	ZnHCO3+	5.305e-11	4.894e-11	-10.275	-10.310	-0.035
	NiHCO3+	1.274e-11	1.176e-11	-10.895	-10.930	-0.035
	PbHCO3+	1.124e-11	1.037e-11	-10.949	-10.984	-0.035
	UO2CO3	5.146e-12	5.153e-12	-11.289	-11.288	0.001
	FeCO3	2.256e-13	2.259e-13	-12.647	-12.646	0.001
	CuHCO3+	2.196e-13	2.026e-13	-12.658	-12.693	-0.035
	FeHCO3+	2.583e-15	2.383e-15	-14.588	-14.623	-0.035
	(UO2)3(CO3)6-6	1.106e-18	6.074e-20	-17.956	-19.217	-1.260
	UO2(CO3)3-5	7.892e-23	1.052e-23	-22.103	-22.978	-0.875
	U(CO3)4-4	3.064e-37	8.437e-38	-36.514	-37.074	-0.560
	U(CO3)5-6	5.187e-39	2.849e-40	-38.285	-39.545	-1.260
Ca	2.646e-04					
	Ca+2	1.844e-04	1.347e-04	-3.734	-3.871	-0.136
	CaCO3	7.033e-05	7.042e-05	-4.153	-4.152	0.001
	CaSO4	8.055e-06	8.066e-06	-5.094	-5.093	0.001
	CaHCO3+	1.479e-06	1.365e-06	-5.830	-5.865	-0.035
	CaOH+	2.111e-07	1.947e-07	-6.676	-6.711	-0.035
	CaF+	5.911e-08	5.454e-08	-7.228	-7.263	-0.035
	CaHSO4+	5.766e-15	5.320e-15	-14.239	-14.274	-0.035
Cl	6.772e-04					
	Cl-	6.772e-04	6.241e-04	-3.169	-3.205	-0.035
	MnCl+	1.657e-10	1.528e-10	-9.781	-9.816	-0.035
	ZnOHCl	8.579e-11	8.591e-11	-10.067	-10.066	0.001
	ZnCl+	8.096e-13	7.469e-13	-12.092	-12.127	-0.035
	PbCl+	4.147e-13	3.826e-13	-12.382	-12.417	-0.035
	NiCl+	1.777e-13	1.639e-13	-12.750	-12.785	-0.035
	MnCl2	4.159e-14	4.164e-14	-13.381	-13.380	0.001
	CuCl2-	3.439e-15	3.173e-15	-14.464	-14.499	-0.035
	CuCl+	8.352e-16	7.705e-16	-15.078	-15.113	-0.035
	ZnCl2	4.844e-16	4.850e-16	-15.315	-15.314	0.001
	PbCl2	3.895e-16	3.900e-16	-15.409	-15.409	0.001
	NiCl2	3.710e-16	3.715e-16	-15.431	-15.430	0.001
	FeCl+	2.732e-17	2.521e-17	-16.563	-16.598	-0.035
	MnCl3-	7.759e-18	7.159e-18	-17.110	-17.145	-0.035
	CuCl3-2	4.306e-18	3.119e-18	-17.366	-17.506	-0.140
	ZnCl3-	3.646e-19	3.364e-19	-18.438	-18.473	-0.035
	CuCl2	2.535e-19	2.538e-19	-18.596	-18.595	0.001
	PbCl3-	2.075e-19	1.915e-19	-18.683	-18.718	-0.035
	UO2Cl+	3.731e-21	3.442e-21	-20.428	-20.463	-0.035
	ZnCl4-2	1.434e-22	1.039e-22	-21.843	-21.983	-0.140
	PbCl4-2	7.798e-23	5.649e-23	-22.108	-22.248	-0.140
	FeCl+2	6.326e-25	4.583e-25	-24.199	-24.339	-0.140
	CuCl3-	5.922e-25	5.463e-25	-24.228	-24.263	-0.035
	UO2Cl2	1.135e-25	1.136e-25	-24.945	-24.945	0.001
	FeCl2+	1.457e-27	1.344e-27	-26.836	-26.871	-0.035
	CuCl4-2	2.273e-30	1.646e-30	-29.643	-29.783	-0.140
	FeCl3	8.380e-32	8.391e-32	-31.077	-31.076	0.001
	UCl+3	0.000e+00	0.000e+00	-57.156	-57.471	-0.315
Cu(1)	3.125e-14					
	Cu+	2.781e-14	2.566e-14	-13.556	-13.591	-0.035
	CuCl2-	3.439e-15	3.173e-15	-14.464	-14.499	-0.035
	CuCl3-2	4.306e-18	3.119e-18	-17.366	-17.506	-0.140
Cu(2)	7.871e-07					
	Cu(OH)2	7.853e-07	7.863e-07	-6.105	-6.104	0.001
	CuCO3	8.567e-10	8.579e-10	-9.067	-9.067	0.001
	Cu(CO3)2-2	4.799e-10	3.476e-10	-9.319	-9.459	-0.140
	Cu(OH)3-	4.472e-10	4.126e-10	-9.349	-9.384	-0.035
	CuOH+	4.685e-11	4.322e-11	-10.329	-10.364	-0.035
	Cu(OH)4-2	9.897e-13	7.169e-13	-12.005	-12.145	-0.140
	Cu+2	6.851e-13	4.963e-13	-12.164	-12.304	-0.140
	CuHCO3+	2.196e-13	2.026e-13	-12.658	-12.693	-0.035
	CuSO4	3.048e-14	3.052e-14	-13.516	-13.515	0.001
	Cu2(OH)2+2	9.617e-16	6.966e-16	-15.017	-15.157	-0.140
	CuCl+	8.352e-16	7.705e-16	-15.078	-15.113	-0.035
	CuF+	4.654e-16	4.294e-16	-15.332	-15.367	-0.035
	CuCl2	2.535e-19	2.538e-19	-18.596	-18.595	0.001
	CuCl3-	5.922e-25	5.463e-25	-24.228	-24.263	-0.035
	CuCl4-2	2.273e-30	1.646e-30	-29.643	-29.783	-0.140
F	5.265e-05					
	F-	5.230e-05	4.825e-05	-4.281	-4.316	-0.035
	MgF+	1.634e-07	1.508e-07	-6.787	-6.822	-0.035
	NaF	1.294e-07	1.295e-07	-6.888	-6.888	0.001
	CaF+	5.911e-08	5.454e-08	-7.228	-7.263	-0.035
	MnF+	2.175e-11	2.007e-11	-10.663	-10.698	-0.035
	HF	8.063e-12	8.074e-12	-11.094	-11.093	0.001
	ZnF+	3.456e-13	3.188e-13	-12.461	-12.496	-0.035
	NiF+	1.091e-13	1.007e-13	-12.962	-12.997	-0.035
	PbF+	1.490e-14	1.375e-14	-13.827	-13.862	-0.035
	HF2-	1.600e-15	1.476e-15	-14.796	-14.831	-0.035
	CuF+	4.654e-16	4.294e-16	-15.332	-15.367	-0.035
	UO2F+	2.432e-17	2.244e-17	-16.614	-16.649	-0.035
	FeF+	1.530e-17	1.412e-17	-16.815	-16.850	-0.035
	PbF2	1.353e-17	1.355e-17	-16.869	-16.868	0.001
	AlF2+	6.732e-18	6.211e-18	-17.172	-17.207	-0.035
	AlF3	3.762e-18	3.767e-18	-17.425	-17.424	0.001
	UO2F2	3.661e-18	3.666e-18	-17.436	-17.436	0.001
	AlF+2	3.575e-19	2.590e-19	-18.447	-18.587	-0.140
	AlF4-	7.840e-20	7.233e-20	-19.106	-19.141	-0.035
	UO2F3-	3.651e-20	3.369e-20	-19.438	-19.473	-0.035
	PbF3-	5.133e-21	4.735e-21	-20.290	-20.325	-0.035
	FeF2+	3.900e-21	3.598e-21	-20.409	-20.444	-0.035
	FeF+2	2.635e-21	1.909e-21	-20.579	-20.719	-0.140
	FeF3	2.733e-22	2.736e-22	-21.563	-21.563	0.001
	H2F2	1.797e-22	1.799e-22	-21.746	-21.745	0.001
	UO2F4-2	1.422e-23	1.030e-23	-22.847	-22.987	-0.140
	PbF4-2	1.510e-25	1.094e-25	-24.821	-24.961	-0.140
	UF3+	0.000e+00	0.000e+00	-47.319	-47.354	-0.035
	UF4	0.000e+00	0.000e+00	-47.768	-47.767	0.001
	UF2+2	0.000e+00	0.000e+00	-48.274	-48.414	-0.140
	UF5-	0.000e+00	0.000e+00	-50.561	-50.596	-0.035
	UF+3	0.000e+00	0.000e+00	-50.701	-51.016	-0.315
	UF6-2	0.000e+00	0.000e+00	-52.677	-52.817	-0.140
Fe(2)	3.538e-13					
	FeCO3	2.256e-13	2.259e-13	-12.647	-12.646	0.001
	FeOH+	7.745e-14	7.145e-14	-13.111	-13.146	-0.035
	Fe+2	4.039e-14	2.926e-14	-13.394	-13.534	-0.140
	Fe(OH)2	4.598e-15	4.604e-15	-14.337	-14.337	0.001
	FeHCO3+	2.583e-15	2.383e-15	-14.588	-14.623	-0.035
	Fe(OH)3-	1.589e-15	1.466e-15	-14.799	-14.834	-0.035
	FeSO4	1.537e-15	1.539e-15	-14.813	-14.813	0.001
	FeCl+	2.732e-17	2.521e-17	-16.563	-16.598	-0.035
	FeF+	1.530e-17	1.412e-17	-16.815	-16.850	-0.035
	FeHSO4+	1.252e-24	1.155e-24	-23.902	-23.937	-0.035

Fe(3)	3.368e-05					
	Fe(OH)4-	2.996e-05	2.764e-05	-4.523	-4.558	-0.035
	Fe(OH)3	3.708e-06	3.713e-06	-5.431	-5.430	0.001
	Fe(OH)2+	3.848e-09	3.550e-09	-8.415	-8.450	-0.035
	FeOH+2	1.806e-15	1.309e-15	-14.743	-14.883	-0.140
	FeF2+	3.900e-21	3.598e-21	-20.409	-20.444	-0.035
	FeF+2	2.635e-21	1.909e-21	-20.579	-20.719	-0.140
	FeF3	2.733e-22	2.736e-22	-21.563	-21.563	0.001
	FeSO4+	8.938e-23	8.246e-23	-22.049	-22.084	-0.035
	Fe+3	5.285e-23	2.558e-23	-22.277	-22.592	-0.315
	FeCl+2	6.326e-25	4.583e-25	-24.199	-24.339	-0.140
	Fe(SO4)2-	5.919e-25	5.461e-25	-24.228	-24.263	-0.035
	FeCl2+	1.457e-27	1.344e-27	-26.836	-26.871	-0.035
	Fe2(OH)2+4	1.789e-28	4.926e-29	-27.747	-28.308	-0.560
	FeCl3	8.380e-32	8.391e-32	-31.077	-31.076	0.001
	FeHSO4+2	3.503e-32	2.538e-32	-31.456	-31.596	-0.140
	Fe3(OH)4+5	3.179e-34	4.238e-35	-33.498	-34.373	-0.875
H(0)	1.871e-31					
	H2	9.356e-32	9.368e-32	-31.029	-31.028	0.001
K	5.884e-05					
	K+	5.872e-05	5.412e-05	-4.231	-4.267	-0.035
	KSO4-	1.239e-07	1.143e-07	-6.907	-6.942	-0.035
Mg	8.641e-05					
	Mg+2	6.640e-05	4.869e-05	-4.178	-4.313	-0.135
	MgCO3	1.457e-05	1.459e-05	-4.836	-4.836	0.001
	MgSO4	3.331e-06	3.336e-06	-5.477	-5.477	0.001
	MgOH+	1.443e-06	1.331e-06	-5.841	-5.876	-0.035
	MgHCO3+	4.995e-07	4.609e-07	-6.301	-6.336	-0.035
	MgF+	1.634e-07	1.508e-07	-6.787	-6.822	-0.035
Mn(2)	1.639e-06					
	MnCO3	1.535e-06	1.537e-06	-5.814	-5.813	0.001
	Mn+2	8.298e-08	6.011e-08	-7.081	-7.221	-0.140
	MnOH+	1.279e-08	1.180e-08	-7.893	-7.928	-0.035
	MnHCO3+	4.730e-09	4.363e-09	-8.325	-8.360	-0.035
	MnSO4	3.154e-09	3.158e-09	-8.501	-8.501	0.001
	MnCl+	1.657e-10	1.528e-10	-9.781	-9.816	-0.035
	MnF+	2.175e-11	2.007e-11	-10.663	-10.698	-0.035
	Mn(OH)3-	6.820e-13	6.292e-13	-12.166	-12.201	-0.035
	MnCl2	4.159e-14	4.164e-14	-13.381	-13.380	0.001
	MnCl3-	7.759e-18	7.159e-18	-17.110	-17.145	-0.035
Mn(3)	3.034e-29					
	Mn+3	3.034e-29	1.469e-29	-28.518	-28.833	-0.315
Mn(6)	2.544e-31					
	MnO4-2	2.544e-31	1.843e-31	-30.595	-30.735	-0.140
Mn(7)	6.475e-37					
	MnO4-	6.475e-37	5.974e-37	-36.189	-36.224	-0.035
Na	5.091e-03					
	Na+	5.053e-03	4.665e-03	-2.296	-2.331	-0.035
	NaCO3-	2.795e-05	2.578e-05	-4.554	-4.589	-0.035
	NaSO4-	7.642e-06	7.050e-06	-5.117	-5.152	-0.035
	NaHCO3	2.134e-06	2.137e-06	-5.671	-5.670	0.001
	NaF	1.294e-07	1.295e-07	-6.888	-6.888	0.001
Ni	4.430e-07					
	NiCO3	2.492e-07	2.495e-07	-6.603	-6.603	0.001
	Ni(CO3)2-2	1.927e-07	1.396e-07	-6.715	-6.855	-0.140
	Ni(OH)2	7.920e-10	7.930e-10	-9.101	-9.101	0.001
	Ni+2	1.444e-10	1.046e-10	-9.841	-9.981	-0.140
	NiOH+	1.217e-10	1.123e-10	-9.915	-9.950	-0.035
	Ni(OH)3-	7.486e-11	6.906e-11	-10.126	-10.161	-0.035
	NiHCO3+	1.274e-11	1.176e-11	-10.895	-10.930	-0.035
	NiSO4	6.117e-12	6.125e-12	-11.213	-11.213	0.001
	NiCl+	1.777e-13	1.639e-13	-12.750	-12.785	-0.035
	NiF+	1.091e-13	1.007e-13	-12.962	-12.997	-0.035
	NiCl2	3.710e-16	3.715e-16	-15.431	-15.430	0.001
	Ni(SO4)2-2	1.402e-16	1.016e-16	-15.853	-15.993	-0.140
O(0)	2.801e-31					
	O2	1.400e-31	1.402e-31	-30.854	-30.853	0.001
Pb	2.028e-07					
	Pb(CO3)2-2	1.000e-07	7.248e-08	-7.000	-7.140	-0.140
	PbCO3	8.952e-08	8.964e-08	-7.048	-7.048	0.001
	Pb(OH)2	9.207e-09	9.219e-09	-8.036	-8.035	0.001
	PbOH+	2.949e-09	2.721e-09	-8.530	-8.565	-0.035
	Pb(OH)3-	9.991e-10	9.218e-10	-9.000	-9.035	-0.035
	Pb(OH)4-2	2.538e-11	1.839e-11	-10.595	-10.735	-0.140
	Pb+2	2.212e-11	1.602e-11	-10.655	-10.795	-0.140
	PbHCO3+	1.124e-11	1.037e-11	-10.949	-10.984	-0.035
	PbSO4	2.741e-12	2.745e-12	-11.562	-11.561	0.001
	PbCl+	4.147e-13	3.826e-13	-12.382	-12.417	-0.035
	PbF+	1.490e-14	1.375e-14	-13.827	-13.862	-0.035
	Pb(SO4)2-2	6.057e-15	4.388e-15	-14.218	-14.358	-0.140
	PbCl2	3.895e-16	3.900e-16	-15.409	-15.409	0.001
	Pb3(OH)4+2	3.384e-17	2.451e-17	-16.471	-16.611	-0.140
	PbF2	1.353e-17	1.355e-17	-16.869	-16.868	0.001
	Pb2OH+3	2.016e-18	9.762e-19	-17.695	-18.010	-0.315
	PbCl3-	2.075e-19	1.915e-19	-18.683	-18.718	-0.035
	PbF3-	5.133e-21	4.735e-21	-20.290	-20.325	-0.035
	PbCl4-2	7.798e-23	5.649e-23	-22.108	-22.248	-0.140
	PbF4-2	1.510e-25	1.094e-25	-24.821	-24.961	-0.140
S(6)	4.374e-04					
	SO4-2	4.181e-04	3.046e-04	-3.379	-3.516	-0.138
	CaSO4	8.055e-06	8.066e-06	-5.094	-5.093	0.001
	NaSO4-	7.642e-06	7.050e-06	-5.117	-5.152	-0.035
	MgSO4	3.331e-06	3.336e-06	-5.477	-5.477	0.001
	KSO4-	1.239e-07	1.143e-07	-6.907	-6.942	-0.035
	BaSO4	9.199e-08	9.211e-08	-7.036	-7.036	0.001
	MnSO4	3.154e-09	3.158e-09	-8.501	-8.501	0.001
	ZnSO4	3.362e-11	3.366e-11	-10.473	-10.473	0.001
	NiSO4	6.117e-12	6.125e-12	-11.213	-11.213	0.001
	HSO4-	3.560e-12	3.284e-12	-11.449	-11.484	-0.035
	PbSO4	2.741e-12	2.745e-12	-11.562	-11.561	0.001
	Zn(SO4)2-2	1.165e-13	8.439e-14	-12.934	-13.074	-0.140
	CuSO4	3.048e-14	3.052e-14	-13.516	-13.515	0.001
	Pb(SO4)2-2	6.057e-15	4.388e-15	-14.218	-14.358	-0.140
	CaHSO4+	5.766e-15	5.320e-15	-14.239	-14.274	-0.035
	FeSO4	1.537e-15	1.539e-15	-14.813	-14.813	0.001
	Ni(SO4)2-2	1.402e-16	1.016e-16	-15.853	-15.993	-0.140
	UO2SO4	1.562e-18	1.564e-18	-17.806	-17.806	0.001
	UO2(SO4)2-2	6.214e-21	4.501e-21	-20.207	-20.347	-0.140
	AlSO4+	5.541e-22	5.112e-22	-21.256	-21.291	-0.035
	FeSO4+	8.938e-23	8.246e-23	-22.049	-22.084	-0.035
	Al(SO4)2-	5.298e-24	4.888e-24	-23.276	-23.311	-0.035
	FeHSO4+	1.252e-24	1.155e-24	-23.902	-23.937	-0.035
	Fe(SO4)2-	5.919e-25	5.461e-25	-24.228	-24.263	-0.035
	FeHSO4+2	3.503e-32	2.538e-32	-31.456	-31.596	-0.140
	AlHSO4+2	7.086e-33	5.133e-33	-32.150	-32.290	-0.140
	U(SO4)2	0.000e+00	0.000e+00	-52.569	-52.568	0.001
	USO4+2	0.000e+00	0.000e+00	-52.808	-52.948	-0.140
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-68.582	-68.897	-0.315
U(4)	1.441e-25					
	U(OH)4	1.441e-25	1.443e-25	-24.841	-24.841	0.001
	U(OH)3+	6.693e-32	6.175e-32	-31.174	-31.209	-0.035
	U(CO3)4-4	3.064e-37	8.437e-38	-36.514	-37.074	-0.560
	U(CO3)5-6	5.187e-39	2.849e-40	-38.285	-39.545	-1.260
	U(OH)2+2	4.733e-39	3.429e-39	-38.325	-38.465	-0.140
	UOH+3	0.000e+00	0.000e+00	-46.334	-46.649	-0.315
	UF3+	0.000e+00	0.000e+00	-47.319	-47.354	-0.035
	UF4	0.000e+00	0.000e+00	-47.768	-47.767	0.001
	UF2+2	0.000e+00	0.000e+00	-48.274	-48.414	-0.140
	UF5-	0.000e+00	0.000e+00	-50.561	-50.596	-0.035
	UF+3	0.000e+00	0.000e+00	-50.701	-51.016	-0.315
	U(SO4)2	0.000e+00	0.000e+00	-52.569	-52.568	0.001
	UF6-2	0.000e+00	0.000e+00	-52.677	-52.817	-0.140
	USO4+2	0.000e+00	0.000e+00	-52.808	-52.948	-0.140
	U+4	0.000e+00	0.000e+00	-55.445	-56.005	-0.560
	UCl+3	0.000e+00	0.000e+00	-57.156	-57.471	-0.315
	U6(OH)15+9	0.000e+00	0.000e+00	-201.293	-204.129	-2.835
U(5)	1.318e-20					
	UO2+	1.310e-20	1.208e-20	-19.883	-19.918	-0.035
	UO2(CO3)3-5	7.892e-23	1.052e-23	-22.103	-22.978	-0.875
U(6)	2.353e-06					
	UO2(CO3)3-4	2.130e-06	5.865e-07	-5.672	-6.232	-0.560
	UO2(OH)3-	1.714e-07	1.581e-07	-6.766	-6.801	-0.035
	UO2(CO3)2-2	5.212e-08	3.776e-08	-7.283	-7.423	-0.140
	UO2(OH)4-2	3.012e-11	2.182e-11	-10.521	-10.661	-0.140
	UO2CO3	5.146e-12	5.153e-12	-11.289	-11.288	0.001
	UO2OH+	2.044e-13	1.886e-13	-12.690	-12.725	-0.035
	(UO2)3(OH)7-	2.248e-14	2.074e-14	-13.648	-13.683	-0.035
	UO2F+	2.432e-17	2.244e-17	-16.614	-16.649	-0.035
	UO2+2	5.237e-18	3.794e-18	-17.281	-17.421	-0.140
	UO2F2	3.661e-18	3.666e-18	-17.436	-17.436	0.001
	UO2SO4	1.562e-18	1.564e-18	-17.806	-17.806	0.001
	(UO2)3(CO3)6-6	1.106e-18	6.074e-20	-17.956	-19.217	-1.260
	(UO2)3(OH)5+	6.650e-19	6.135e-19	-18.177	-18.212	-0.035
	UO2F3-	3.651e-20	3.369e-20	-19.438	-19.473	-0.035
	UO2(SO4)2-2	6.214e-21	4.501e-21	-20.207	-20.347	-0.140
	UO2Cl+	3.731e-21	3.442e-21	-20.428	-20.463	-0.035
	(UO2)2(OH)2+2	3.293e-21	2.386e-21	-20.482	-20.622	-0.140
	(UO2)4(OH)7+	1.074e-22	9.908e-23	-21.969	-22.004	-0.035
	UO2F4-2	1.422e-23	1.030e-23	-22.847	-22.987	-0.140
	(UO2)3(OH)4+2	5.459e-25	3.954e-25	-24.263	-24.403	-0.140
	UO2Cl2	1.135e-25	1.136e-25	-24.945	-24.945	0.001
	(UO2)2OH+3	5.166e-28	2.501e-28	-27.287	-27.602	-0.315
Zn	7.958e-07					
	Zn(OH)2	4.551e-07	4.557e-07	-6.342	-6.341	0.001
	Zn(CO3)2-2	2.912e-07	2.110e-07	-6.536	-6.676	-0.140
	ZnCO3	3.061e-08	3.065e-08	-7.514	-7.514	0.001
	Zn(OH)3-	1.360e-08	1.255e-08	-7.866	-7.901	-0.035
	ZnOH+	4.373e-09	4.034e-09	-8.359	-8.394	-0.035
	Zn+2	6.589e-10	4.773e-10	-9.181	-9.321	-0.140
	ZnOHCl	8.579e-11	8.591e-11	-10.067	-10.066	0.001
	ZnHCO3+	5.305e-11	4.894e-11	-10.275	-10.310	-0.035
	ZnSO4	3.362e-11	3.366e-11	-10.473	-10.473	0.001
	Zn(OH)4-2	2.391e-11	1.732e-11	-10.621	-10.761	-0.140
	ZnCl+	8.096e-13	7.469e-13	-12.092	-12.127	-0.035
	ZnF+	3.456e-13	3.188e-13	-12.461	-12.496	-0.035
	Zn(SO4)2-2	1.165e-13	8.439e-14	-12.934	-13.074	-0.140
	ZnCl2	4.844e-16	4.850e-16	-15.315	-15.314	0.001
	ZnCl3-	3.646e-19	3.364e-19	-18.438	-18.473	-0.035
	ZnCl4-2	1.434e-22	1.039e-22	-21.843	-21.983	-0.140

-------------------Saturation Indices-------------------------------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-2.35	8.55	10.90	Al(OH)3
AlAsO4:2H2O	-11.68	-6.91	4.77	AlAsO4:2H2O
AlumK	-27.37	-32.57	-5.20	KAl(SO4)2:12H2O
Alunite	-14.26	-15.46	-1.20	KAl3(SO4)2(OH)6
Anglesite	-6.51	-14.31	-7.80	PbSO4
Anhydrite	-3.03	-7.39	-4.35	CaSO4
Antlerite	-8.96	-0.67	8.29	Cu3(OH)4SO4
Aragonite	0.96	-7.36	-8.33	CaCO3
Arsenolite	-94.45	-173.37	-78.92	As4O6
Artinite	-1.95	7.76	9.71	MgCO3:Mg(OH)2:3H2O
As2O5	-37.64	-30.92	6.72	As2O5
Atacamite	-5.41	2.01	7.41	Cu2(OH)3Cl
Azurite	-7.20	-24.02	-16.81	Cu3(OH)2(CO3)2
B-UO2(OH)2	-3.14	2.46	5.60	UO2(OH)2
Ba3(AsO4)2	18.98	10.06	-8.93	Ba3(AsO4)2
BaF2	-9.09	-14.85	-5.76	BaF2
Barite	0.26	-9.74	-10.00	BaSO4
Basaluminite	-11.88	10.82	22.70	Al4(OH)10SO4
Bianchite	-11.07	-12.84	-1.76	ZnSO4:6H2O
Birnessite	-3.06	40.54	43.60	MnO2
Bixbyite	2.52	53.20	50.67	Mn2O3
Boehmite	-0.14	8.55	8.70	AlOOH
Brochantite	-8.43	6.91	15.34	Cu4(OH)6SO4
Brucite	-1.38	15.57	16.95	Mg(OH)2
Bunsenite	-2.65	9.90	12.54	NiO
Ca3(AsO4)2:4w	-5.21	17.10	22.32	Ca3(AsO4)2:4H2O
Calcite	1.11	-7.36	-8.47	CaCO3
Cerrusite	-1.14	-14.29	-13.15	PbCO3
Chalcanthite	-13.18	-15.82	-2.65	CuSO4:5H2O
Claudetite	-94.19	-173.37	-79.18	As4O6
CO2(g)	-5.22	-23.37	-18.15	CO2
Cotunnite	-12.41	-17.20	-4.79	PbCl2
Cu(OH)2	-1.12	7.58	8.70	Cu(OH)2
Cu2SO4	-28.77	-36.12	-7.36	Cu2SO4
Cu3(AsO4)2:6w	-14.30	-8.20	6.10	Cu3(AsO4)2:6H2O
CuCO3	-6.17	-15.80	-9.63	CuCO3
CuF	-25.04	-20.62	4.42	CuF
CuF2	-20.37	-20.94	-0.57	CuF2
CuF2:2H2O	-16.40	-20.94	-4.54	CuF2:2H2O
CuMetal	-8.76	-20.30	-11.54	Cu
CuOCuSO4	-19.92	-8.24	11.67	CuO:CuSO4
CupricFerrite	16.00	48.15	32.15	CuFe2O4
Cuprite	-5.73	-12.73	-7.00	Cu2O
CuprousFerrite	12.48	13.92	1.44	CuFeO2
CuSO4	-18.90	-15.82	3.08	CuSO4
Diaspore	1.58	8.55	6.98	AlOOH
Dolomite	1.89	-15.17	-17.05	CaMg(CO3)2
Dolomite(d)	1.33	-15.17	-16.50	CaMg(CO3)2
Epsomite	-5.68	-7.83	-2.15	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.32	16.34	10.02	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.34	20.29	17.95	Fe(OH)3
Fe3(OH)8	0.58	46.92	46.34	Fe3(OH)8
Fluorite	-1.89	-12.50	-10.62	CaF2
Gibbsite	0.35	8.55	8.20	Al(OH)3
Goethite	8.23	20.29	12.06	FeOOH
Goslarite	-10.86	-12.84	-1.97	ZnSO4:7H2O
Gummite	-8.03	2.46	10.49	UO3
Gypsum	-2.81	-7.39	-4.58	CaSO4:2H2O
H2(g)	-27.84	-27.88	-0.04	H2
Halite	-7.11	-5.54	1.58	NaCl
Hausmannite	4.43	65.86	61.43	Mn3O4
Hematite	18.34	40.57	22.23	Fe2O3
Huntite	-0.91	-30.78	-29.87	CaMg3(CO3)4
Hydrocerrusite	-2.03	-19.49	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-7.10	-15.65	-8.56	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-12.51	18.66	31.17	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)
Jarosite-K	-10.35	19.74	30.09	KFe3(SO4)2(OH)6
Jarosite-Na	-12.36	21.67	34.04	NaFe3(SO4)2(OH)6
JarositeH	-19.94	14.07	34.00	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-11.61	-14.84	-3.23	AlOHSO4
Langite	-10.04	6.91	16.95	Cu4(OH)6SO4:H2O
Larnakite	-4.97	-5.23	-0.25	PbO:PbSO4
Laurionite	-4.68	-4.06	0.62	PbOHCl
Litharge	-3.70	9.08	12.78	PbO
Magnemite	8.07	40.57	32.50	Fe2O3
Magnesite	0.20	-7.80	-8.00	MgCO3
Magnetite	16.87	46.92	30.05	Fe3O4
Malachite	-3.11	-8.22	-5.12	Cu2(OH)2CO3
Manganite	1.26	26.60	25.34	MnOOH
Massicot	-3.89	9.08	12.98	PbO
Matlockite	-8.85	-18.32	-9.46	PbClF
Melanothallite	-22.49	-18.71	3.78	CuCl2
Melanterite	-14.82	-17.05	-2.23	FeSO4:7H2O
Minium	-18.96	55.13	74.10	Pb3O4
Mirabilite	-6.99	-8.18	-1.19	Na2SO4:10H2O
Mn2(SO4)3	-62.66	-16.99	45.67	Mn2(SO4)3
Mn3(AsO4):8H2O	-5.46	7.05	12.51	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-16.27	-13.63	2.64	MnCl2:4H2O
MnSO4	-13.47	-10.74	2.73	MnSO4
Morenosite	-11.13	-13.50	-2.37	NiSO4:7H2O
Na4UO2(CO3)3	-20.93	-37.22	-16.29	Na4UO2(CO3)3
Nahcolite	-4.86	-15.76	-10.91	NaHCO3
Nantokite	-10.00	-19.51	-9.51	CuCl
Natron	-6.78	-8.16	-1.37	Na2CO3:10H2O
Nesquehonite	-2.21	-7.81	-5.60	MgCO3:3H2O
Ni(OH)2	-0.78	9.90	10.68	Ni(OH)2
Ni3(AsO4)2:8H2O	-16.94	-1.23	15.71	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-15.80	16.20	32.00	Ni4(OH)6SO4
NiCO3	-6.67	-13.47	-6.80	NiCO3
Nsutite	-2.03	40.54	42.56	MnO2
O2(g)	-27.97	55.76	83.73	O2
Pb(OH)2	0.88	9.08	8.21	Pb(OH)2
Pb2(OH)3Cl	-3.77	5.02	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-8.03	18.17	26.20	PbO:Pb(OH)2
Pb2O3	-14.99	46.05	61.04	Pb2O3
Pb2OCO3	-4.75	-5.20	-0.45	PbO:PbCO3
Pb3(AsO4)2	-9.49	-3.67	5.82	Pb3(AsO4)2
Pb3O2CO3	-7.24	3.88	11.12	PbCO3:2PbO
Pb3O2SO4	-6.62	3.86	10.48	PbSO4:2PbO
Pb4(OH)6SO4	-8.16	12.94	21.10	Pb4(OH)6SO4
Pb4O3SO4	-9.30	12.94	22.24	PbSO4:3PbO
PbF2	-11.99	-19.43	-7.44	PbF2
PbMetal	-23.06	-18.80	4.27	Pb
PbO:0.3H2O	-3.90	9.08	12.98	PbO:0.33H2O
Phosgenite	-11.68	-31.49	-19.81	PbCl2:PbCO3
Plattnerite	-12.62	36.96	49.58	PbO2
Portlandite	-6.91	16.01	22.92	Ca(OH)2
Pyrochroite	-2.54	12.66	15.20	Mn(OH)2
Pyrolusite	-1.10	40.54	41.64	MnO2
Retgersite	-11.45	-13.50	-2.04	NiSO4:6H2O
Rhodochrosite	0.41	-10.71	-11.12	MnCO3
Rhodochrosite(d)	-0.32	-10.71	-10.39	MnCO3
Rutherfordine	-6.47	-20.91	-14.44	UO2CO3
Schoepite	-2.99	2.46	5.45	UO2(OH)2:H2O
Scorodite	-8.60	4.82	13.42	FeAsO4:2H2O
Siderite	-6.15	-17.03	-10.88	FeCO3
Siderite(d)(3)	-6.58	-17.03	-10.45	FeCO3
Smithsonite	-2.83	-12.81	-9.98	ZnCO3
Tenorite	-0.10	7.58	7.68	CuO
Thenardite	-8.00	-8.18	-0.18	Na2SO4
Thermonatrite	-8.29	-8.15	0.14	Na2CO3:H2O
Trona	-12.85	-23.92	-11.07	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-36.44	-48.82	-12.38	U(OH)2SO4
U3O8(c)	-13.96	-20.50	-6.54	U3O8
U4O9(c)	-34.12	-73.80	-39.69	U4O9
UF4(c)	-54.74	-82.45	-27.71	UF4
UF4:2.5H2O	-45.70	-82.45	-36.74	UF4:2.5H2O
UO2(a)	-16.34	-25.42	-9.08	UO2
UO3(gamma)	-5.34	2.46	7.80	UO3
Uraninite(c)	-11.52	-25.42	-13.90	UO2
Witherite	-1.15	-9.71	-8.56	BaCO3
Zincite(c)	-0.67	10.56	11.23	ZnO
Zincosite	-15.92	-12.84	3.09	ZnSO4
Zn(OH)2-a	-1.89	10.56	12.45	Zn(OH)2
Zn(OH)2-b	-1.19	10.56	11.75	Zn(OH)2
Zn(OH)2-c	-1.64	10.56	12.20	Zn(OH)2
Zn(OH)2-e	-0.94	10.56	11.50	Zn(OH)2
Zn(OH)2-g	-1.15	10.56	11.71	Zn(OH)2
Zn2(OH)2SO4	-9.78	-2.28	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.23	7.97	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-12.92	0.75	13.68	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-34.38	-15.12	19.27	ZnO:2ZnSO4
Zn4(OH)6SO4	-9.56	18.84	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-12.00	26.50	38.50	Zn5(OH)8Cl2
ZnCl2	-22.83	-15.73	7.10	ZnCl2
ZnCO3:H2O	-2.55	-12.81	-10.26	ZnCO3:H2O
ZnF2	-16.49	-17.95	-1.47	ZnF2
ZnMetal	-43.22	-17.32	25.90	Zn
ZnO(a)	-0.75	10.56	11.31	ZnO
ZnSO4:H2O	-12.31	-12.84	-0.53	ZnSO4:H2O

End of simulation.

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------------------
Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 11.5-12.5m
           SOLUTION        12
           units           mg/l
           temp            22.5
           pH              9.89
           F               0.6
           Cl              23
           S(6)            39          as SO4
           Na              115
           K               2.3
           Mg              1.5
           Ca              14
           Alkalinity      146.4       as HCO3
           Al              1.51
           As              2.62
           Ba              0.120
           Cu              0.085
           Fe              1.86
           Mn              0.11
           Ni              0.028
           Pb              0.034
           U               1.15
           Zn              0.051
           END
```

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-----
TITLE
-----

   Schneckentein 11.5-12.5m

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Beginning of initial solution calculations.
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Initial solution 12.

-----------------------------Solution composition--------------
---------------

                Elements           Molality       Moles

                Al                 5.598e-05   5.598e-05
                Alkalinity         2.400e-03   2.400e-03
                As                 3.498e-05   3.498e-05
                Ba                 8.740e-07   8.740e-07
                Ca                 3.494e-04   3.494e-04
                Cl                 6.490e-04   6.490e-04
                Cu                 1.338e-06   1.338e-06
                F                  3.159e-05   3.159e-05
                Fe                 3.332e-05   3.332e-05
                K                  5.884e-05   5.884e-05
                Mg                 6.172e-05   6.172e-05
                Mn                 2.003e-06   2.003e-06
                Na                 5.004e-03   5.004e-03
                Ni                 4.771e-07   4.771e-07
                Pb                 1.642e-07   1.642e-07
                S(6)               4.061e-04   4.061e-04
                U                  4.833e-06   4.833e-06
                Zn                 7.804e-07   7.804e-07
```

```
----------------------------Description of solution----------------------------
-

                                    pH  =   9.890
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   5.696e-03
                     Mass of water (kg)  =   1.000e+00
                  Total carbon (mol/kg)  =   1.464e-03
                     Total CO2 (mol/kg)  =   1.464e-03
                   Temperature (deg C)   =  22.500
                Electrical balance (eq)  =   2.179e-03
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  23.98
                                Iterations  =  17
                                   Total H  = 1.110138e+02
                                   Total O  = 5.551281e+01
```

-----------Saturation Indices-----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-2.21	8.75	10.96	Al(OH)3
AlAsO4:2H2O	-11.42	-6.64	4.78	AlAsO4:2H2O
AlumK	-27.07	-32.28	-5.21	KAl(SO4)2:12H2O
Alunite	-13.69	-14.78	-1.09	KAl3(SO4)2(OH)6
Anglesite	-6.57	-14.37	-7.80	PbSO4
Anhydrite	-2.93	-7.29	-4.35	CaSO4
Antlerite	-8.20	0.09	8.29	Cu3(OH)4SO4
Aragonite	1.05	-7.27	-8.32	CaCO3
Arsenolite	-93.46	-172.69	-79.22	As4O6
Artinite	-2.42	7.35	9.78	MgCO3:Mg(OH)2:3H2O
As2O5	-37.52	-30.78	6.73	As2O5
Atacamite	-4.96	2.50	7.46	Cu2(OH)3Cl
Azurite	-6.44	-23.20	-16.76	Cu3(OH)2(CO3)2
B-UO2(OH)2	-2.85	2.77	5.63	UO2(OH)2
Ba3(AsO4)2	18.64	9.71	-8.93	Ba3(AsO4)2
BaF2	-9.59	-15.36	-5.77	BaF2
Barite	0.18	-9.83	-10.01	BaSO4
Basaluminite	-11.03	11.67	22.70	Al4(OH)10SO4
Bianchite	-11.02	-12.79	-1.76	ZnSO4:6H2O
Birnessite	-3.14	40.46	43.60	MnO2
Bixbyite	2.32	53.15	50.82	Mn2O3
Boehmite	-0.01	8.75	8.76	AlOOH
Brochantite	-7.45	7.89	15.34	Cu4(OH)6SO4
Brucite	-1.68	15.33	17.01	Mg(OH)2
Bunsenite	-2.71	9.89	12.60	NiO
Ca3(AsO4)2:4w	-4.98	17.35	22.33	Ca3(AsO4)2:4H2O
Calcite	1.20	-7.27	-8.47	CaCO3
Cerrusite	-1.20	-14.36	-13.16	PbCO3
Chalcanthite	-12.87	-15.52	-2.65	CuSO4:5H2O
Claudetite	-93.21	-172.69	-79.48	As4O6
CO2(g)	-5.16	-23.31	-18.16	CO2
Cotunnite	-12.47	-17.27	-4.80	PbCl2
Cu(OH)2	-0.93	7.81	8.73	Cu(OH)2
Cu2SO4	-28.16	-35.50	-7.34	Cu2SO4
Cu3(AsO4)2:6w	-13.48	-7.37	6.11	Cu3(AsO4)2:6H2O
CuCO3	-5.87	-15.50	-9.63	CuCO3
CuF	-24.96	-20.51	4.45	CuF
CuF2	-20.51	-21.05	-0.54	CuF2
CuF2:2H2O	-16.52	-21.05	-4.53	CuF2:2H2O
CuMetal	-8.40	-19.97	-11.58	Cu
CuOCuSO4	-19.47	-7.72	11.75	CuO:CuSO4
CupricFerrite	16.36	48.64	32.28	CuFe2O4
Cuprite	-5.16	-12.17	-7.01	Cu2O
CuprousFerrite	12.86	14.33	1.47	CuFeO2
CuSO4	-18.65	-15.52	3.12	CuSO4
Diaspore	1.72	8.75	7.03	AlOOH
Dolomite	1.79	-15.25	-17.03	CaMg(CO3)2
Dolomite(d)	1.23	-15.25	-16.47	CaMg(CO3)2
Epsomite	-5.84	-8.00	-2.16	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.44	16.48	10.04	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.45	20.42	17.97	Fe(OH)3
Fe3(OH)8	0.98	47.36	46.38	Fe3(OH)8
Fluorite	-2.18	-12.81	-10.63	CaF2
Gibbsite	0.50	8.75	8.25	Al(OH)3
Goethite	8.34	20.42	12.08	FeOOH
Goslarite	-10.81	-12.79	-1.98	ZnSO4:7H2O
Gummite	-7.77	2.77	10.55	UO3
Gypsum	-2.70	-7.29	-4.58	CaSO4:2H2O
H2(g)	-27.73	-27.78	-0.05	H2
Halite	-7.14	-5.56	1.58	NaCl
Hausmannite	4.18	65.83	61.65	Mn3O4
Hematite	18.49	40.83	22.34	Fe2O3
Huntite	-1.39	-31.20	-29.81	CaMg3(CO3)4
Hydrocerrusite	-2.30	-19.76	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-8.14	-16.58	-8.44	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-12.09	19.15	31.24	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-10.01	20.22	30.22	KFe3(SO4)2(OH)6
Jarosite-Na	-12.04	22.15	34.18	NaFe3(SO4)2(OH)6
JarositeH	-19.60	14.59	34.19	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-11.35	-14.58	-3.23	AlOHSO4
Langite	-9.14	7.89	17.04	Cu4(OH)6SO4:H2O
Larnakite	-5.18	-5.42	-0.24	PbO:PbSO4
Laurionite	-4.78	-4.16	0.62	PbOHCl
Litharge	-3.87	8.95	12.82	PbO
Magnemite	8.29	40.83	32.55	Fe2O3
Magnesite	0.01	-7.98	-7.99	MgCO3
Magnetite	17.15	47.36	30.21	Fe3O4
Malachite	-2.62	-7.70	-5.08	Cu2(OH)2CO3
Manganite	1.23	26.57	25.34	MnOOH
Massicot	-4.06	8.95	13.01	PbO
Matlockite	-9.11	-18.59	-9.48	PbClF
Melanothallite	-22.23	-18.42	3.81	CuCl2
Melanterite	-14.56	-16.80	-2.24	FeSO4:7H2O
Minium	-19.68	54.64	74.33	Pb3O4
Mirabilite	-6.99	-8.23	-1.23	Na2SO4:10H2O
Mn2(SO4)3	-62.71	-16.84	45.87	Mn2(SO4)3
Mn3(AsO4):8H2O	-5.26	7.26	12.53	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-16.15	-13.54	2.60	MnCl2:4H2O
MnSO4	-13.41	-10.65	2.76	MnSO4
Morenosite	-11.06	-13.44	-2.38	NiSO4:7H2O
Na4UO2(CO3)3	-20.66	-36.95	-16.29	Na4UO2(CO3)3
Nahcolite	-4.84	-15.76	-10.92	NaHCO3
Nantokite	-9.67	-19.20	-9.53	CuCl
Natron	-6.80	-8.21	-1.41	Na2CO3:10H2O
Nesquehonite	-2.39	-7.98	-5.59	MgCO3:3H2O
Ni(OH)2	-0.72	9.89	10.61	Ni(OH)2
Ni3(AsO4)2:8H2O	-16.85	-1.12	15.73	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-15.78	16.22	32.00	Ni4(OH)6SO4
NiCO3	-6.65	-13.42	-6.78	NiCO3
Nsutite	-2.10	40.46	42.56	MnO2
O2(g)	-28.48	55.56	84.04	O2
Pb(OH)2	0.72	8.95	8.24	Pb(OH)2
Pb2(OH)3Cl	-4.00	4.80	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-8.29	17.91	26.20	PbO:Pb(OH)2
Pb2O3	-15.35	45.69	61.04	Pb2O3
Pb2OCO3	-4.97	-5.40	-0.43	PbO:PbCO3
Pb3(AsO4)2	-9.75	-3.92	5.83	Pb3(AsO4)2
Pb3O2CO3	-7.63	3.55	11.18	PbCO3:2PbO
Pb3O2SO4	-6.99	3.53	10.53	PbSO4:2PbO
Pb4(OH)6SO4	-8.61	12.49	21.10	Pb4(OH)6SO4
Pb4O3SO4	-9.83	12.49	22.32	PbSO4:3PbO
PbF2	-12.47	-19.90	-7.44	PbF2
PbMetal	-23.09	-18.83	4.27	Pb
PbO:0.3H2O	-4.03	8.95	12.98	PbO:0.33H2O
Phosgenite	-11.82	-31.63	-19.81	PbCl2:PbCO3
Plattnerite	-13.00	36.73	49.74	PbO2
Portlandite	-6.95	16.04	22.99	Ca(OH)2
Pyrochroite	-2.52	12.68	15.20	Mn(OH)2
Pyrolusite	-1.32	40.46	41.78	MnO2
Retgersite	-11.40	-13.44	-2.05	NiSO4:6H2O
Rhodochrosite	0.49	-10.63	-11.12	MnCO3
Rhodochrosite(d)	-0.24	-10.63	-10.39	MnCO3
Rutherfordine	-6.09	-20.54	-14.44	UO2CO3
Schoepite	-2.70	2.77	5.48	UO2(OH)2:H2O
Scorodite	-8.42	5.03	13.45	FeAsO4:2H2O
Siderite	-5.91	-16.78	-10.87	FeCO3
Siderite(d)(3)	-6.33	-16.78	-10.45	FeCO3
Smithsonite	-2.80	-12.77	-9.97	ZnCO3
Tenorite	0.09	7.81	7.71	CuO
Thenardite	-8.05	-8.23	-0.18	Na2SO4
Thermonatrite	-8.35	-8.21	0.14	Na2CO3:H2O
Trona	-12.93	-23.97	-11.03	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-35.88	-48.33	-12.45	U(OH)2SO4
U3O8(c)	-12.94	-19.45	-6.51	U3O8
U4O9(c)	-32.47	-72.24	-39.77	U4O9
UF4(c)	-54.97	-82.72	-27.74	UF4
UF4:2.5H2O	-45.90	-82.72	-36.82	UF4:2.5H2O
UO2(a)	-15.85	-25.00	-9.15	UO2
UO3(gamma)	-5.06	2.77	7.84	UO3
Uraninite(c)	-11.07	-25.00	-13.94	UO2
Witherite	-1.25	-9.81	-8.57	BaCO3
Zincite(c)	-0.74	10.54	11.28	ZnO
Zincosite	-15.92	-12.79	3.13	ZnSO4
Zn(OH)2-a	-1.91	10.54	12.45	Zn(OH)2
Zn(OH)2-b	-1.21	10.54	11.75	Zn(OH)2
Zn(OH)2-c	-1.66	10.54	12.20	Zn(OH)2
Zn(OH)2-e	-0.96	10.54	11.50	Zn(OH)2
Zn(OH)2-g	-1.17	10.54	11.71	Zn(OH)2
Zn2(OH)2SO4	-9.75	-2.25	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.23	7.97	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-12.85	0.84	13.69	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-34.44	-15.04	19.40	ZnO:2ZnSO4
Zn4(OH)6SO4	-9.57	18.83	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-12.02	26.48	38.50	Zn5(OH)8Cl2
ZnCl2	-22.82	-15.69	7.14	ZnCl2
ZnCO3:H2O	-2.51	-12.77	-10.26	ZnCO3:H2O
ZnF2	-16.88	-18.32	-1.44	ZnF2
ZnMetal	-43.22	-17.24	25.98	Zn
ZnO(a)	-0.77	10.54	11.31	ZnO
ZnSO4:H2O	-12.28	-12.79	-0.50	ZnSO4:H2O

End of simulation.

Fe(3)	3.332e-05					
	Fe(OH)4-	2.912e-05	2.688e-05	-4.536	-4.571	-0.035
	Fe(OH)3	4.197e-06	4.202e-06	-5.377	-5.377	0.001
	Fe(OH)2+	5.081e-09	4.691e-09	-8.294	-8.329	-0.035
	FeOH+2	2.765e-15	2.008e-15	-14.558	-14.697	-0.139
	FeF+2	2.829e-21	2.055e-21	-20.548	-20.687	-0.139
	FeF2+	2.493e-21	2.301e-21	-20.603	-20.638	-0.035
	FeSO4+	1.475e-22	1.361e-22	-21.831	-21.866	-0.035
	FeF3	1.047e-22	1.048e-22	-21.980	-21.980	0.001
	Fe+3	9.547e-23	4.649e-23	-22.020	-22.333	-0.313
	FeCl+2	1.068e-24	7.758e-25	-23.971	-24.110	-0.139
	Fe(SO4)2-	9.023e-25	8.330e-25	-24.045	-24.079	-0.035
	FeCl2+	2.434e-27	2.247e-27	-26.614	-26.648	-0.035
	Fe2(OH)2+4	4.330e-28	1.205e-28	-27.363	-27.919	-0.556
	FeCl3	1.343e-31	1.345e-31	-30.872	-30.871	0.001
	FeHSO4+2	6.478e-32	4.705e-32	-31.189	-31.327	-0.139
	Fe3(OH)4+5	1.100e-33	1.490e-34	-32.959	-33.827	-0.868
H(0)	2.361e-31					
	H2	1.180e-31	1.182e-31	-30.928	-30.927	0.001
K	5.884e-05					
	K+	5.873e-05	5.416e-05	-4.231	-4.266	-0.035
	KSO4-	1.136e-07	1.049e-07	-6.945	-6.979	-0.035
Mg	6.172e-05					
	Mg+2	4.855e-05	3.569e-05	-4.314	-4.447	-0.134
	MgCO3	9.637e-06	9.649e-06	-5.016	-5.015	0.001
	MgSO4	2.212e-06	2.214e-06	-5.655	-5.655	0.001
	MgOH+	8.677e-07	8.010e-07	-6.062	-6.096	-0.035
	MgHCO3+	3.814e-07	3.521e-07	-6.419	-6.453	-0.035
	MgF+	7.074e-08	6.530e-08	-7.150	-7.185	-0.035
Mn(2)	2.003e-06					
	MnCO3	1.868e-06	1.871e-06	-5.729	-5.728	0.001
	Mn+2	1.101e-07	7.999e-08	-6.958	-7.097	-0.139
	MnOH+	1.407e-08	1.299e-08	-7.852	-7.886	-0.035
	MnHCO3+	6.579e-09	6.074e-09	-8.182	-8.217	-0.035
	MnSO4	3.823e-09	3.829e-09	-8.418	-8.417	0.001
	MnCl+	2.113e-10	1.950e-10	-9.675	-9.710	-0.035
	MnF+	1.738e-11	1.604e-11	-10.760	-10.795	-0.035
	Mn(OH)3-	6.421e-13	5.927e-13	-12.192	-12.227	-0.035
	MnCl2	5.089e-14	5.096e-14	-13.293	-13.293	0.001
	MnCl3-	9.099e-18	8.400e-18	-17.041	-17.076	-0.035
Mn(3)	3.513e-29					
	Mn+3	3.513e-29	1.710e-29	-28.454	-28.767	-0.313
Mn(6)	6.192e-32					
	MnO4-2	6.192e-32	4.497e-32	-31.208	-31.347	-0.139
Mn(7)	1.377e-37					
	MnO4-	1.377e-37	1.271e-37	-36.861	-36.896	-0.035
Na	5.004e-03					
	Na+	4.971e-03	4.592e-03	-2.304	-2.338	-0.034
	NaCO3-	2.401e-05	2.217e-05	-4.620	-4.654	-0.035
	NaSO4-	6.929e-06	6.397e-06	-5.159	-5.194	-0.035
	NaHCO3	2.197e-06	2.200e-06	-5.658	-5.658	0.001
	NaF	7.649e-08	7.659e-08	-7.116	-7.116	0.001
Ni	4.771e-07					
	NiCO3	2.791e-07	2.794e-07	-6.554	-6.554	0.001
	Ni(CO3)2-2	1.969e-07	1.430e-07	-6.706	-6.845	-0.139
	Ni(OH)2	7.703e-10	7.713e-10	-9.113	-9.113	0.001
	Ni+2	1.763e-10	1.280e-10	-9.754	-9.893	-0.139
	NiOH+	1.245e-10	1.149e-10	-9.905	-9.940	-0.035
	Ni(OH)3-	6.485e-11	5.986e-11	-10.188	-10.223	-0.035
	NiHCO3+	1.631e-11	1.506e-11	-10.788	-10.822	-0.035
	NiSO4	6.890e-12	6.899e-12	-11.162	-11.161	0.001
	NiCl+	2.085e-13	1.925e-13	-12.681	-12.716	-0.035
	NiF+	8.021e-14	7.405e-14	-13.096	-13.130	-0.035
	NiCl2	4.178e-16	4.183e-16	-15.379	-15.378	0.001
	Ni(SO4)2-2	1.472e-16	1.069e-16	-15.832	-15.971	-0.139
O(0)	8.809e-32					
	O2	4.404e-32	4.410e-32	-31.356	-31.356	0.001
Pb	1.642e-07					
	Pb(CO3)2-2	7.784e-08	5.653e-08	-7.109	-7.248	-0.139
	PbCO3	7.634e-08	7.644e-08	-7.117	-7.117	0.001
	Pb(OH)2	6.819e-09	6.828e-09	-8.166	-8.166	0.001
	PbOH+	2.449e-09	2.261e-09	-8.611	-8.646	-0.035
	Pb(OH)3-	6.591e-10	6.084e-10	-9.181	-9.216	-0.035
	Pb+2	2.057e-11	1.494e-11	-10.687	-10.826	-0.139
	Pb(OH)4-2	1.490e-11	1.082e-11	-10.827	-10.966	-0.139
	PbHCO3+	1.095e-11	1.011e-11	-10.960	-10.995	-0.035
	PbSO4	2.370e-12	2.373e-12	-11.625	-11.625	0.001
	PbCl+	3.623e-13	3.345e-13	-12.441	-12.476	-0.035
	PbF+	8.343e-15	7.701e-15	-14.079	-14.113	-0.035
	Pb(SO4)2-2	4.843e-15	3.517e-15	-14.315	-14.454	-0.139
	PbCl2	3.321e-16	3.326e-16	-15.479	-15.478	0.001
	Pb3(OH)4+2	1.505e-17	1.093e-17	-16.822	-16.961	-0.139
	PbF2	4.552e-18	4.558e-18	-17.342	-17.341	0.001
	Pb2OH+3	1.553e-18	7.564e-19	-17.809	-18.121	-0.313
	PbCl3-	1.686e-19	1.557e-19	-18.773	-18.808	-0.035
	PbF3-	1.037e-21	9.570e-22	-20.984	-21.019	-0.035
	PbCl4-2	6.022e-23	4.374e-23	-22.220	-22.359	-0.139
	PbF4-2	1.828e-26	1.328e-26	-25.738	-25.877	-0.139
S(6)	4.061e-04					
	SO4-2	3.867e-04	2.824e-04	-3.413	-3.549	-0.136
	CaSO4	1.009e-05	1.011e-05	-4.996	-4.995	0.001
	NaSO4-	6.929e-06	6.397e-06	-5.159	-5.194	-0.035
	MgSO4	2.212e-06	2.214e-06	-5.655	-5.655	0.001
	KSO4-	1.136e-07	1.049e-07	-6.945	-6.979	-0.035
	BaSO4	7.393e-08	7.403e-08	-7.131	-7.131	0.001
	MnSO4	3.823e-09	3.829e-09	-8.418	-8.417	0.001
	ZnSO4	3.736e-11	3.741e-11	-10.428	-10.427	0.001
	NiSO4	6.890e-12	6.899e-12	-11.162	-11.161	0.001
	HSO4-	3.630e-12	3.351e-12	-11.440	-11.475	-0.035
	PbSO4	2.370e-12	2.373e-12	-11.625	-11.625	0.001
	Zn(SO4)2-2	1.206e-13	8.756e-14	-12.919	-13.058	-0.139
	CuSO4	6.010e-14	6.018e-14	-13.221	-13.221	0.001
	CaHSO4+	8.014e-15	7.398e-15	-14.096	-14.131	-0.035
	Pb(SO4)2-2	4.843e-15	3.517e-15	-14.315	-14.454	-0.139
	FeSO4	2.677e-15	2.681e-15	-14.572	-14.572	0.001
	Ni(SO4)2-2	1.472e-16	1.069e-16	-15.832	-15.971	-0.139
	UO2SO4	3.683e-18	3.688e-18	-17.434	-17.433	0.001
	UO2(SO4)2-2	1.329e-20	9.655e-21	-19.876	-20.015	-0.139
	AlSO4+	1.129e-21	1.042e-21	-20.947	-20.982	-0.035
	FeSO4+	1.475e-22	1.361e-22	-21.831	-21.866	-0.035
	Al(SO4)2-	9.962e-24	9.196e-24	-23.002	-23.036	-0.035
	FeHSO4+	2.439e-24	2.252e-24	-23.613	-23.647	-0.035
	Fe(SO4)2-	9.023e-25	8.330e-25	-24.045	-24.079	-0.035
	FeHSO4+2	6.478e-32	4.705e-32	-31.189	-31.327	-0.139
	AlHSO4+2	1.604e-32	1.165e-32	-31.795	-31.934	-0.139
	U(SO4)2	0.000e+00	0.000e+00	-51.959	-51.958	0.001
	USO4+2	0.000e+00	0.000e+00	-52.153	-52.292	-0.139
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-67.946	-68.259	-0.313
U(4)	3.947e-25					
	U(OH)4	3.947e-25	3.952e-25	-24.404	-24.403	0.001
	U(OH)3+	2.079e-31	1.919e-31	-30.682	-30.717	-0.035
	U(CO3)4-4	1.047e-36	2.913e-37	-35.980	-36.536	-0.556
	U(OH)2+2	1.688e-38	1.226e-38	-37.773	-37.911	-0.139
	U(CO3)5-6	1.444e-38	8.116e-40	-37.841	-39.091	-1.250
	UOH+3	0.000e+00	0.000e+00	-45.718	-46.031	-0.313
	UF3+	0.000e+00	0.000e+00	-47.291	-47.326	-0.035
	UF4	0.000e+00	0.000e+00	-47.958	-47.957	0.001
	UF2+2	0.000e+00	0.000e+00	-48.023	-48.162	-0.139
	UF+3	0.000e+00	0.000e+00	-50.229	-50.541	-0.313
	UF5-	0.000e+00	0.000e+00	-50.986	-51.021	-0.035
	U(SO4)2	0.000e+00	0.000e+00	-51.959	-51.958	0.001
	USO4+2	0.000e+00	0.000e+00	-52.153	-52.292	-0.139
	UF6-2	0.000e+00	0.000e+00	-53.320	-53.459	-0.139
	U+4	0.000e+00	0.000e+00	-54.756	-55.311	-0.556
	UCl+3	0.000e+00	0.000e+00	-56.474	-56.786	-0.313
	U6(OH)15+9	0.000e+00	0.000e+00	-197.907	-200.720	-2.813
U(5)	3.485e-20					
	UO2+	3.469e-20	3.203e-20	-19.460	-19.495	-0.035
	UO2(CO3)3-5	1.548e-22	2.097e-23	-21.810	-22.678	-0.868
U(6)	4.833e-06					
	UO2(CO3)3-4	4.406e-06	1.226e-06	-5.356	-5.912	-0.556
	UO2(OH)3-	3.159e-07	2.917e-07	-6.500	-6.535	-0.035
	UO2(CO3)2-2	1.108e-07	8.045e-08	-6.956	-7.094	-0.139
	UO2(OH)4-2	4.940e-11	3.588e-11	-10.306	-10.445	-0.139
	UO2CO3	1.219e-11	1.221e-11	-10.914	-10.913	0.001
	UO2OH+	4.482e-13	4.137e-13	-12.349	-12.383	-0.035
	(UO2)3(OH)7-	1.776e-13	1.639e-13	-12.751	-12.785	-0.035
	UO2F+	3.797e-17	3.505e-17	-16.421	-16.455	-0.035
	UO2+2	1.361e-17	9.886e-18	-16.866	-17.005	-0.139
	(UO2)3(CO3)6-6	1.119e-17	6.292e-19	-16.951	-18.201	-1.250
	(UO2)3(OH)5+	5.809e-18	5.363e-18	-17.236	-17.271	-0.035
	UO2SO4	3.683e-18	3.688e-18	-17.434	-17.433	0.001
	UO2F2	3.433e-18	3.438e-18	-17.464	-17.464	0.001
	UO2F3-	2.055e-20	1.897e-20	-19.687	-19.722	-0.035
	(UO2)2(OH)2+2	1.681e-20	1.221e-20	-19.775	-19.913	-0.139
	UO2(SO4)2-2	1.329e-20	9.655e-21	-19.876	-20.015	-0.139
	UO2Cl+	9.227e-21	8.518e-21	-20.035	-20.070	-0.035
	(UO2)4(OH)7+	2.210e-21	2.041e-21	-20.656	-20.690	-0.035
	(UO2)3(OH)4+2	6.078e-24	4.415e-24	-23.216	-23.355	-0.139
	UO2F4-2	4.811e-24	3.494e-24	-23.318	-23.457	-0.139
	UO2Cl2	2.669e-25	2.672e-25	-24.574	-24.573	0.001
	(UO2)2OH+3	3.109e-27	1.514e-27	-26.507	-26.820	-0.313
Zn	7.804e-07					
	Zn(OH)2	4.363e-07	4.369e-07	-6.360	-6.360	0.001
	Zn(CO3)2-2	2.933e-07	2.130e-07	-6.533	-6.672	-0.139
	ZnCO3	3.380e-08	3.384e-08	-7.471	-7.471	0.001
	Zn(OH)3-	1.162e-08	1.072e-08	-7.935	-7.970	-0.035
	ZnOH+	4.387e-09	4.050e-09	-8.358	-8.393	-0.035
	Zn+2	7.933e-10	5.761e-10	-9.101	-9.239	-0.139
	ZnOHCl	8.851e-11	8.862e-11	-10.053	-10.052	0.001
	ZnHCO3+	6.694e-11	6.179e-11	-10.174	-10.209	-0.035
	ZnSO4	3.736e-11	3.741e-11	-10.428	-10.427	0.001
	Zn(OH)4-2	1.816e-11	1.319e-11	-10.741	-10.880	-0.139
	ZnCl+	8.996e-13	8.305e-13	-12.046	-12.081	-0.035
	ZnF+	2.475e-13	2.285e-13	-12.606	-12.641	-0.035
	Zn(SO4)2-2	1.206e-13	8.756e-14	-12.919	-13.058	-0.139
	ZnCl2	5.146e-16	5.152e-16	-15.289	-15.288	0.001
	ZnCl3-	3.692e-19	3.408e-19	-18.433	-18.467	-0.035
	ZnCl4-2	1.380e-22	1.002e-22	-21.860	-21.999	-0.139

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Reading data base.
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           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
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Reading input data for simulation 1.
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           TITLE   Schneckentein 12.5-13.5m
           SOLUTION        13
           units           mg/l
           temp            21.8
           pH              9.96
           F               0.8
           Cl              22
           S(6)            39          as SO4
           Na              115
           K               4.5
           Mg              1.6
           Ca              11
           Alkalinity      131.15      as HCO3
           Al              1.29
           As              2.8
           Ba              0.043
           Cu              0.034
           Fe              0.7
           Mn              0.02
           Ni              0.007
           Pb              0.032
           U               1.26
           Zn              0.011
           END
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TITLE
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   Schneckentein 12.5-13.5m

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Beginning of initial solution calculations.
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Initial solution 13.

-----------------------------Solution composition--------------
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            Elements           Molality       Moles

            Al               4.783e-05   4.783e-05
            Alkalinity       2.150e-03   2.150e-03
            As               3.738e-05   3.738e-05
            Ba               3.132e-07   3.132e-07
            Ca               2.745e-04   2.745e-04
            Cl               6.207e-04   6.207e-04
            Cu               5.352e-07   5.352e-07
            F                4.212e-05   4.212e-05
            Fe               1.254e-05   1.254e-05
            K                1.151e-04   1.151e-04
            Mg               6.583e-05   6.583e-05
            Mn               3.642e-07   3.642e-07
            Na               5.004e-03   5.004e-03
            Ni               1.193e-07   1.193e-07
            Pb               1.545e-07   1.545e-07
            S(6)             4.061e-04   4.061e-04
            U                5.295e-06   5.295e-06
            Zn               1.683e-07   1.683e-07
```

```
----------------------------Description of solution----------------------------

                                    pH  =   9.960
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   5.540e-03
                     Mass of water (kg)  =   1.000e+00
                  Total carbon (mol/kg)  =   1.304e-03
                     Total CO2 (mol/kg)  =   1.304e-03
                    Temperature (deg C)  =  21.800
                  Electrical balance (eq)  =   2.307e-03
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  26.00
                               Iterations  =  16
                                  Total H  = 1.110136e+02
                                  Total O  = 5.551223e+01
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	7.722e-05	7.137e-05	-4.112	-4.146	-0.034
H+	1.177e-10	1.096e-10	-9.929	-9.960	-0.031
H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	**4.783e-05**				
Al(OH)4-	4.782e-05	4.420e-05	-4.320	-4.355	-0.034
Al(OH)3	2.675e-09	2.678e-09	-8.573	-8.572	0.001
Al(OH)2+	2.743e-12	2.535e-12	-11.562	-11.596	-0.034
AlOH+2	6.465e-17	4.716e-17	-16.189	-16.326	-0.137
AlF2+	5.028e-18	4.646e-18	-17.299	-17.333	-0.034
AlF3	2.253e-18	2.256e-18	-17.647	-17.647	0.001
AlF+2	3.340e-19	2.437e-19	-18.476	-18.613	-0.137
AlF4-	3.758e-20	3.473e-20	-19.425	-19.459	-0.034
Al+3	1.306e-21	6.420e-22	-20.884	-21.192	-0.308
AlSO4+	6.003e-22	5.548e-22	-21.222	-21.256	-0.034
Al(SO4)2-	5.329e-24	4.925e-24	-23.273	-23.308	-0.034
AlHSO4+2	7.197e-33	5.250e-33	-32.143	-32.280	-0.137
As(3)	**3.199e-24**				
H2AsO3-	2.664e-24	2.462e-24	-23.575	-23.609	-0.034
H3AsO3	5.138e-25	5.145e-25	-24.289	-24.289	0.001
HAsO3-2	2.116e-26	1.543e-26	-25.675	-25.812	-0.137
AsO3-3	9.876e-30	4.857e-30	-29.005	-29.314	-0.308
H4AsO3+	3.024e-35	2.795e-35	-34.519	-34.554	-0.034
As(5)	**3.738e-05**				
HAsO4-2	3.622e-05	2.642e-05	-4.441	-4.578	-0.137
AsO4-3	1.147e-06	5.641e-07	-5.940	-6.249	-0.308
H2AsO4-	1.821e-08	1.683e-08	-7.740	-7.774	-0.034
H3AsO4	3.127e-16	3.131e-16	-15.505	-15.504	0.001
Ba	**3.132e-07**				
Ba+2	2.583e-07	1.885e-07	-6.588	-6.725	-0.137
BaSO4	2.688e-08	2.691e-08	-7.571	-7.570	0.001
BaCO3	2.661e-08	2.665e-08	-7.575	-7.574	0.001
BaHCO3+	1.290e-09	1.192e-09	-8.889	-8.924	-0.034
BaOH+	6.301e-11	5.823e-11	-10.201	-10.235	-0.034
C(4)	**1.304e-03**				
HCO3-	7.881e-04	7.299e-04	-3.103	-3.137	-0.033
CO3-2	3.967e-04	2.919e-04	-3.402	-3.535	-0.133
CaCO3	6.691e-05	6.699e-05	-4.175	-4.174	0.001
NaCO3-	2.297e-05	2.123e-05	-4.639	-4.673	-0.034
MgCO3	1.014e-05	1.015e-05	-4.994	-4.993	0.001
UO2(CO3)3-4	4.640e-06	1.314e-06	-5.334	-5.882	-0.548
NaHCO3	1.885e-06	1.887e-06	-5.725	-5.724	0.001
CaHCO3+	1.392e-06	1.286e-06	-5.857	-5.891	-0.034
MgHCO3+	3.492e-07	3.227e-07	-6.457	-6.491	-0.034
MnCO3	3.394e-07	3.399e-07	-6.469	-6.469	0.001
CO2	1.875e-07	1.878e-07	-6.727	-6.726	0.001
UO2(CO3)2-2	1.129e-07	8.233e-08	-6.947	-7.084	-0.137
Pb(CO3)2-2	7.120e-08	5.194e-08	-7.148	-7.285	-0.137
PbCO3	7.075e-08	7.084e-08	-7.150	-7.150	0.001
NiCO3	7.009e-08	7.018e-08	-7.154	-7.154	0.001
Zn(CO3)2-2	5.098e-08	3.719e-08	-7.293	-7.430	-0.137
Ni(CO3)2-2	4.880e-08	3.560e-08	-7.312	-7.449	-0.137
BaCO3	2.661e-08	2.665e-08	-7.575	-7.574	0.001
ZnCO3	5.952e-09	5.960e-09	-8.225	-8.225	0.001
BaHCO3+	1.290e-09	1.192e-09	-8.889	-8.924	-0.034
MnHCO3+	1.032e-09	9.536e-10	-8.986	-9.021	-0.034
CuCO3	4.819e-10	4.825e-10	-9.317	-9.316	0.001
Cu(CO3)2-2	2.431e-10	1.773e-10	-9.614	-9.751	-0.137
UO2CO3	1.275e-11	1.276e-11	-10.895	-10.894	0.001
ZnHCO3+	1.018e-11	9.404e-12	-10.992	-11.027	-0.034
PbHCO3+	8.762e-12	8.098e-12	-11.057	-11.092	-0.034
NiHCO3+	3.536e-12	3.268e-12	-11.451	-11.486	-0.034
CuHCO3+	1.219e-13	1.126e-13	-12.914	-12.948	-0.034
FeCO3	9.285e-14	9.297e-14	-13.032	-13.032	0.001
FeHCO3+	1.049e-15	9.692e-16	-14.979	-15.014	-0.034
(UO2)3(CO3)6-6	1.216e-17	7.113e-19	-16.915	-18.148	-1.233
UO2(CO3)3-5	1.556e-22	2.166e-23	-21.808	-22.664	-0.856
U(CO3)4-4	6.353e-37	1.799e-37	-36.197	-36.745	-0.548
U(CO3)5-6	7.837e-39	4.583e-40	-38.106	-39.339	-1.233
Ca	**2.745e-04**				
Ca+2	1.979e-04	1.456e-04	-3.703	-3.837	-0.134
CaCO3	6.691e-05	6.699e-05	-4.175	-4.174	0.001
CaSO4	8.019e-06	8.029e-06	-5.096	-5.095	0.001
CaHCO3+	1.392e-06	1.286e-06	-5.857	-5.891	-0.034
CaOH+	2.383e-07	2.203e-07	-6.623	-6.657	-0.034
CaF+	4.922e-08	4.549e-08	-7.308	-7.342	-0.034
CaHSO4+	5.369e-15	4.962e-15	-14.270	-14.304	-0.034
Cl	**6.207e-04**				
Cl-	6.207e-04	5.731e-04	-3.207	-3.242	-0.035
MnCl+	3.704e-11	3.423e-11	-10.431	-10.466	-0.034
ZnOHCl	1.769e-11	1.771e-11	-10.752	-10.752	0.001
PbCl+	3.183e-13	2.941e-13	-12.497	-12.531	-0.034
ZnCl+	1.481e-13	1.369e-13	-12.829	-12.864	-0.034
NiCl+	5.053e-14	4.670e-14	-13.296	-13.331	-0.034
MnCl2	8.553e-15	8.563e-15	-14.068	-14.067	0.001
CuCl2-	1.775e-15	1.641e-15	-14.751	-14.785	-0.034
CuCl+	4.386e-16	4.053e-16	-15.358	-15.392	-0.034
PbCl2	2.835e-16	2.838e-16	-15.548	-15.547	0.001
NiCl2	9.705e-17	9.717e-17	-16.013	-16.012	0.001
ZnCl2	8.099e-17	8.109e-17	-16.092	-16.091	0.001
FeCl+	1.137e-17	1.051e-17	-16.944	-16.979	-0.034
CuCl3-2	2.018e-18	1.472e-18	-17.695	-17.832	-0.137
MnCl3-	1.463e-18	1.352e-18	-17.835	-17.869	-0.034
PbCl3-	1.371e-19	1.267e-19	-18.863	-18.897	-0.034
CuCl2	1.203e-19	1.205e-19	-18.920	-18.919	0.001
ZnCl3-	5.534e-20	5.115e-20	-19.257	-19.291	-0.034
UO2Cl+	9.284e-21	8.580e-21	-20.032	-20.067	-0.034
PbCl4-2	4.646e-23	3.389e-23	-22.333	-22.470	-0.137
ZnCl4-2	1.963e-23	1.432e-23	-22.707	-22.844	-0.137
UO2Cl2	2.557e-25	2.560e-25	-24.592	-24.592	0.001
CuCl3-	2.503e-25	2.313e-25	-24.602	-24.636	-0.034
FeCl+2	2.275e-25	1.659e-25	-24.643	-24.780	-0.137
FeCl2+	5.093e-28	4.706e-28	-27.293	-27.327	-0.034
CuCl4-2	8.452e-31	6.166e-31	-30.073	-30.210	-0.137
FeCl3	2.694e-32	2.697e-32	-31.570	-31.569	0.001
UCl+3	0.000e+00	0.000e+00	-56.683	-56.991	-0.308
Cu(1)	**1.874e-14**				
Cu+	1.696e-14	1.568e-14	-13.771	-13.805	-0.034
CuCl2-	1.775e-15	1.641e-15	-14.751	-14.785	-0.034
CuCl3-2	2.018e-18	1.472e-18	-17.695	-17.832	-0.137
Cu(2)	**5.352e-07**				
Cu(OH)2	5.341e-07	5.348e-07	-6.272	-6.272	0.001
CuCO3	4.819e-10	4.825e-10	-9.317	-9.316	0.001
Cu(OH)3-	3.180e-10	2.939e-10	-9.498	-9.532	-0.034
Cu(CO3)2-2	2.431e-10	1.773e-10	-9.614	-9.751	-0.137
CuOH+	3.038e-11	2.807e-11	-10.517	-10.552	-0.034
Cu(OH)4-2	7.330e-13	5.347e-13	-12.135	-12.272	-0.137
Cu+2	4.220e-13	3.078e-13	-12.375	-12.512	-0.137
CuHCO3+	1.219e-13	1.126e-13	-12.914	-12.948	-0.034
CuSO4	1.749e-14	1.752e-14	-13.757	-13.757	0.001
CuCl+	4.386e-16	4.053e-16	-15.358	-15.392	-0.034
Cu2(OH)2+2	3.429e-16	2.501e-16	-15.465	-15.602	-0.137
CuF+	2.277e-16	2.104e-16	-15.643	-15.677	-0.034
CuCl2	1.203e-19	1.205e-19	-18.920	-18.919	0.001
CuCl3-	2.503e-25	2.313e-25	-24.602	-24.636	-0.034
CuCl4-2	8.452e-31	6.166e-31	-30.073	-30.210	-0.137
F	**4.212e-05**				
F-	4.187e-05	3.870e-05	-4.378	-4.412	-0.034
NaF	1.023e-07	1.024e-07	-6.990	-6.990	0.001
MgF+	9.989e-08	9.231e-08	-7.000	-7.035	-0.034
CaF+	4.922e-08	4.549e-08	-7.308	-7.342	-0.034
HF	6.002e-12	6.009e-12	-11.222	-11.221	0.001
MnF+	4.247e-12	3.925e-12	-11.372	-11.406	-0.034
ZnF+	5.812e-14	5.371e-14	-13.236	-13.270	-0.034
NiF+	2.710e-14	2.504e-14	-13.567	-13.601	-0.034
PbF+	1.040e-14	9.611e-15	-13.983	-14.017	-0.034
HF2-	9.406e-16	8.693e-16	-15.027	-15.061	-0.034
CuF+	2.277e-16	2.104e-16	-15.643	-15.677	-0.034
UO2F+	5.358e-17	4.951e-17	-16.271	-16.305	-0.034
PbF2	7.584e-18	7.594e-18	-17.120	-17.120	0.001
UO2F2	6.473e-18	6.481e-18	-17.189	-17.188	0.001
FeF+	5.560e-18	5.138e-18	-17.255	-17.289	-0.034
AlF2+	5.028e-18	4.646e-18	-17.299	-17.333	-0.034
AlF3	2.253e-18	2.256e-18	-17.647	-17.647	0.001
AlF+2	3.340e-19	2.437e-19	-18.476	-18.613	-0.137
UO2F3-	5.165e-20	4.774e-20	-19.287	-19.321	-0.034
AlF4-	3.758e-20	3.473e-20	-19.425	-19.459	-0.034
PbF3-	2.303e-21	2.129e-21	-20.638	-20.672	-0.034
FeF2+	9.944e-22	9.190e-22	-21.002	-21.037	-0.034
FeF+2	8.499e-22	6.200e-22	-21.071	-21.208	-0.137
H2F2	1.054e-22	1.055e-22	-21.977	-21.977	0.001
FeF3	5.568e-23	5.575e-23	-22.254	-22.254	0.001
UO2F4-2	1.612e-23	1.176e-23	-22.793	-22.930	-0.137
PbF4-2	5.405e-26	3.943e-26	-25.267	-25.404	-0.137
UF3+	0.000e+00	0.000e+00	-47.109	-47.144	-0.034
UF4	0.000e+00	0.000e+00	-47.649	-47.648	0.001
UF2+2	0.000e+00	0.000e+00	-47.967	-48.104	-0.137
UF+3	0.000e+00	0.000e+00	-50.300	-50.608	-0.308
UF5-	0.000e+00	0.000e+00	-50.562	-50.596	-0.034
UF6-2	0.000e+00	0.000e+00	-52.769	-52.906	-0.137
Fe(2)	**1.477e-13**				
FeCO3	9.285e-14	9.297e-14	-13.032	-13.032	0.001
FeOH+	3.254e-14	3.007e-14	-13.488	-13.522	-0.034
Fe+2	1.820e-14	1.328e-14	-13.740	-13.877	-0.137
Fe(OH)2	1.759e-15	1.761e-15	-14.755	-14.754	0.001
FeHCO3+	1.049e-15	9.692e-16	-14.979	-15.014	-0.034
FeSO4	6.334e-16	6.342e-16	-15.198	-15.198	0.001
Fe(OH)3-	6.256e-16	5.781e-16	-15.204	-15.238	-0.034
FeCl+	1.137e-17	1.051e-17	-16.944	-16.979	-0.034
FeF+	5.560e-18	5.138e-18	-17.255	-17.289	-0.034
FeHSO4+	4.898e-25	4.527e-25	-24.310	-24.344	-0.034

Fe(3)	1.254e-05					
	Fe(OH)4-	1.113e-05	1.029e-05	-4.953	-4.988	-0.034
	Fe(OH)3	1.407e-06	1.409e-06	-5.852	-5.851	0.001
	Fe(OH)2+	1.494e-09	1.381e-09	-8.826	-8.860	-0.034
	FeOH+2	7.086e-16	5.169e-16	-15.150	-15.287	-0.137
	FeF2+	9.944e-22	9.190e-22	-21.002	-21.037	-0.034
	FeF+2	8.499e-22	6.200e-22	-21.071	-21.208	-0.137
	FeF3	5.568e-23	5.575e-23	-22.254	-22.254	0.001
	FeSO4+	3.343e-23	3.089e-23	-22.476	-22.510	-0.034
	Fe+3	2.160e-23	1.062e-23	-22.666	-22.974	-0.308
	FeCl+2	2.275e-25	1.659e-25	-24.643	-24.780	-0.137
	Fe(SO4)2-	2.058e-25	1.902e-25	-24.687	-24.721	-0.034
	FeCl2+	5.093e-28	4.706e-28	-27.293	-27.327	-0.034
	Fe2(OH)2+4	2.903e-29	8.220e-30	-28.537	-29.085	-0.548
	FeCl3	2.694e-32	2.697e-32	-31.570	-31.569	0.001
	FeHSO4+2	1.247e-32	9.095e-33	-31.904	-32.041	-0.137
	Fe3(OH)4+5	2.295e-35	3.196e-36	-34.639	-35.495	-0.856
H(0)	1.713e-31					
	H2	8.566e-32	8.577e-32	-31.067	-31.067	0.001
K	1.151e-04					
	K+	1.149e-04	1.061e-04	-3.940	-3.974	-0.035
	KSO4-	2.222e-07	2.054e-07	-6.653	-6.687	-0.034
Mg	6.583e-05					
	Mg+2	5.187e-05	3.829e-05	-4.285	-4.417	-0.132
	MgCO3	1.014e-05	1.015e-05	-4.994	-4.993	0.001
	MgSO4	2.350e-06	2.353e-06	-5.629	-5.628	0.001
	MgOH+	1.024e-06	9.465e-07	-5.990	-6.024	-0.034
	MgHCO3+	3.492e-07	3.227e-07	-6.457	-6.491	-0.034
	MgF+	9.989e-08	9.231e-08	-7.000	-7.035	-0.034
Mn(2)	3.642e-07					
	MnCO3	3.394e-07	3.399e-07	-6.469	-6.469	0.001
	Mn+2	2.010e-08	1.466e-08	-7.697	-7.834	-0.137
	MnOH+	2.856e-09	2.640e-09	-8.544	-8.578	-0.034
	MnHCO3+	1.032e-09	9.536e-10	-8.986	-9.021	-0.034
	MnSO4	6.975e-10	6.984e-10	-9.156	-9.156	0.001
	MnCl+	3.704e-11	3.423e-11	-10.431	-10.466	-0.034
	MnF+	4.247e-12	3.925e-12	-11.372	-11.406	-0.034
	Mn(OH)3-	1.906e-13	1.762e-13	-12.720	-12.754	-0.034
	MnCl2	8.553e-15	8.563e-15	-14.068	-14.067	0.001
	MnCl3-	1.463e-18	1.352e-18	-17.835	-17.869	-0.034
Mn(3)	5.744e-30					
	Mn+3	5.744e-30	2.825e-30	-29.241	-29.549	-0.308
Mn(6)	2.238e-32					
	MnO4-2	2.238e-32	1.633e-32	-31.650	-31.787	-0.137
Mn(7)	4.483e-38					
	MnO4-	4.483e-38	4.143e-38	-37.348	-37.383	-0.034
Na	5.004e-03					
	Na+	4.972e-03	4.598e-03	-2.303	-2.337	-0.034
	NaCO3-	2.297e-05	2.123e-05	-4.639	-4.673	-0.034
	NaSO4-	6.962e-06	6.434e-06	-5.157	-5.192	-0.034
	NaHCO3	1.885e-06	1.887e-06	-5.725	-5.724	0.001
	NaF	1.023e-07	1.024e-07	-6.990	-6.990	0.001
Ni	1.193e-07					
	NiCO3	7.009e-08	7.018e-08	-7.154	-7.154	0.001
	Ni(CO3)2-2	4.880e-08	3.560e-08	-7.312	-7.449	-0.137
	Ni(OH)2	2.694e-10	2.697e-10	-9.570	-9.569	0.001
	Ni+2	4.447e-11	3.244e-11	-10.352	-10.489	-0.137
	NiOH+	3.519e-11	3.252e-11	-10.454	-10.488	-0.034
	Ni(OH)3-	2.661e-11	2.460e-11	-10.575	-10.609	-0.034
	NiHCO3+	3.536e-12	3.268e-12	-11.451	-11.486	-0.034
	NiSO4	1.751e-12	1.753e-12	-11.757	-11.756	0.001
	NiCl+	5.053e-14	4.670e-14	-13.296	-13.331	-0.034
	NiF+	2.710e-14	2.504e-14	-13.567	-13.601	-0.034
	NiCl2	9.705e-17	9.717e-17	-16.013	-16.012	0.001
	Ni(SO4)2-2	3.781e-17	2.758e-17	-16.422	-16.559	-0.137
O(0)	9.738e-32					
	O2	4.869e-32	4.875e-32	-31.313	-31.312	0.001
Pb	1.545e-07					
	Pb(CO3)2-2	7.120e-08	5.194e-08	-7.148	-7.285	-0.137
	PbCO3	7.075e-08	7.084e-08	-7.150	-7.150	0.001
	Pb(OH)2	8.799e-09	8.811e-09	-8.056	-8.055	0.001
	PbOH+	2.687e-09	2.483e-09	-8.571	-8.605	-0.034
	Pb(OH)3-	9.981e-10	9.225e-10	-9.001	-9.035	-0.034
	Pb(OH)4-2	2.642e-11	1.927e-11	-10.578	-10.715	-0.137
	Pb+2	1.915e-11	1.397e-11	-10.718	-10.855	-0.137
	PbHCO3+	8.762e-12	8.098e-12	-11.057	-11.092	-0.034
	PbSO4	2.235e-12	2.238e-12	-11.651	-11.650	0.001
	PbCl+	3.183e-13	2.941e-13	-12.497	-12.531	-0.034
	PbF+	1.040e-14	9.611e-15	-13.983	-14.017	-0.034
	Pb(SO4)2-2	4.589e-15	3.347e-15	-14.338	-14.475	-0.137
	PbCl2	2.835e-16	2.838e-16	-15.548	-15.547	0.001
	Pb3(OH)4+2	2.096e-17	1.529e-17	-16.679	-16.816	-0.137
	PbF2	7.584e-18	7.594e-18	-17.120	-17.120	0.001
	Pb2OH+3	1.579e-18	7.766e-19	-17.802	-18.110	-0.308
	PbCl3-	1.371e-19	1.267e-19	-18.863	-18.897	-0.034
	PbF3-	2.303e-21	2.129e-21	-20.638	-20.672	-0.034
	PbCl4-2	4.646e-23	3.389e-23	-22.333	-22.470	-0.137
	PbF4-2	5.405e-26	3.943e-26	-25.267	-25.404	-0.137
S(6)	4.061e-04					
	SO4-2	3.885e-04	2.850e-04	-3.411	-3.545	-0.135
	CaSO4	8.019e-06	8.029e-06	-5.096	-5.095	0.001
	NaSO4-	6.962e-06	6.434e-06	-5.157	-5.192	-0.034
	MgSO4	2.350e-06	2.353e-06	-5.629	-5.628	0.001
	KSO4-	2.222e-07	2.054e-07	-6.653	-6.687	-0.034
	BaSO4	2.688e-08	2.691e-08	-7.571	-7.570	0.001
	MnSO4	6.975e-10	6.984e-10	-9.156	-9.156	0.001
	ZnSO4	6.660e-12	6.669e-12	-11.177	-11.176	0.001
	HSO4-	3.068e-12	2.836e-12	-11.513	-11.547	-0.034
	PbSO4	2.235e-12	2.238e-12	-11.651	-11.650	0.001
	NiSO4	1.751e-12	1.753e-12	-11.757	-11.756	0.001
	Zn(SO4)2-2	2.171e-14	1.584e-14	-13.663	-13.800	-0.137
	CuSO4	1.749e-14	1.752e-14	-13.757	-13.757	0.001
	CaHSO4+	5.369e-15	4.962e-15	-14.270	-14.304	-0.034
	Pb(SO4)2-2	4.589e-15	3.347e-15	-14.338	-14.475	-0.137
	FeSO4	6.334e-16	6.342e-16	-15.198	-15.198	0.001
	Ni(SO4)2-2	3.781e-17	2.758e-17	-16.422	-16.559	-0.137
	UO2SO4	3.865e-18	3.870e-18	-17.413	-17.412	0.001
	UO2(SO4)2-2	1.381e-20	1.007e-20	-19.860	-19.997	-0.137
	AlSO4+	6.003e-22	5.548e-22	-21.222	-21.256	-0.034
	FeSO4+	3.343e-23	3.089e-23	-22.476	-22.510	-0.034
	Al(SO4)2-	5.329e-24	4.925e-24	-23.273	-23.308	-0.034
	FeHSO4+	4.898e-25	4.527e-25	-24.310	-24.344	-0.034
	Fe(SO4)2-	2.058e-25	1.902e-25	-24.687	-24.721	-0.034
	FeHSO4+2	1.247e-32	9.095e-33	-31.904	-32.041	-0.137
	AlHSO4+2	7.197e-33	5.250e-33	-32.143	-32.280	-0.137
	U(SO4)2	0.000e+00	0.000e+00	-52.159	-52.158	0.001
	USO4+2	0.000e+00	0.000e+00	-52.349	-52.486	-0.137
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-68.188	-68.496	-0.308
U(4)	4.351e-25					
	U(OH)4	4.351e-25	4.356e-25	-24.361	-24.361	0.001
	U(OH)3+	1.964e-31	1.815e-31	-30.707	-30.741	-0.034
	U(CO3)4-4	6.353e-37	1.799e-37	-36.197	-36.745	-0.548
	U(OH)2+2	1.381e-38	1.007e-38	-37.860	-37.997	-0.137
	U(CO3)5-6	7.837e-39	4.583e-40	-38.106	-39.339	-1.233
	UOH+3	0.000e+00	0.000e+00	-45.867	-46.175	-0.308
	UF3+	0.000e+00	0.000e+00	-47.109	-47.144	-0.034
	UF4	0.000e+00	0.000e+00	-47.649	-47.648	0.001
	UF2+2	0.000e+00	0.000e+00	-47.967	-48.104	-0.137
	UF+3	0.000e+00	0.000e+00	-50.300	-50.608	-0.308
	UF5-	0.000e+00	0.000e+00	-50.562	-50.596	-0.034
	U(SO4)2	0.000e+00	0.000e+00	-52.159	-52.158	0.001
	USO4+2	0.000e+00	0.000e+00	-52.349	-52.486	-0.137
	UF6-2	0.000e+00	0.000e+00	-52.769	-52.906	-0.137
	U+4	0.000e+00	0.000e+00	-54.958	-55.506	-0.548
	UCl+3	0.000e+00	0.000e+00	-56.683	-56.991	-0.308
	U6(OH)15+9	0.000e+00	0.000e+00	-198.061	-200.835	-2.774
U(5)	3.738e-20					
	UO2+	3.722e-20	3.440e-20	-19.429	-19.463	-0.034
	UO2(CO3)3-5	1.556e-22	2.166e-23	-21.808	-22.664	-0.856
U(6)	5.295e-06					
	UO2(CO3)3-4	4.640e-06	1.314e-06	-5.334	-5.882	-0.548
	UO2(OH)3-	5.425e-07	5.013e-07	-6.266	-6.300	-0.034
	UO2(CO3)2-2	1.129e-07	8.233e-08	-6.947	-7.084	-0.137
	UO2(OH)4-2	9.933e-11	7.246e-11	-10.003	-10.140	-0.137
	UO2CO3	1.275e-11	1.276e-11	-10.895	-10.894	0.001
	(UO2)3(OH)7-	6.528e-13	6.033e-13	-12.185	-12.219	-0.034
	UO2OH+	5.332e-13	4.928e-13	-12.273	-12.307	-0.034
	UO2F+	5.358e-17	4.951e-17	-16.271	-16.305	-0.034
	UO2+2	1.437e-17	1.048e-17	-16.843	-16.980	-0.137
	(UO2)3(OH)5+	1.398e-17	1.292e-17	-16.855	-16.889	-0.034
	(UO2)3(CO3)6-6	1.216e-17	7.113e-19	-16.915	-18.148	-1.233
	UO2F2	6.473e-18	6.481e-18	-17.189	-17.188	0.001
	UO2SO4	3.865e-18	3.870e-18	-17.413	-17.412	0.001
	UO2F3-	5.165e-20	4.774e-20	-19.287	-19.321	-0.034
	(UO2)2(OH)2+2	2.490e-20	1.816e-20	-19.604	-19.741	-0.137
	UO2(SO4)2-2	1.381e-20	1.007e-20	-19.860	-19.997	-0.137
	UO2Cl+	9.284e-21	8.580e-21	-20.032	-20.067	-0.034
	(UO2)4(OH)7+	8.612e-21	7.959e-21	-20.065	-20.099	-0.034
	UO2F4-2	1.612e-23	1.176e-23	-22.793	-22.930	-0.137
	(UO2)3(OH)4+2	1.373e-23	1.002e-23	-22.862	-22.999	-0.137
	UO2Cl2	2.557e-25	2.560e-25	-24.592	-24.592	0.001
	(UO2)2OH+3	4.063e-27	1.998e-27	-26.391	-26.699	-0.308
Zn	1.683e-07					
	Zn(OH)2	1.070e-07	1.071e-07	-6.971	-6.970	0.001
	Zn(CO3)2-2	5.098e-08	3.719e-08	-7.293	-7.430	-0.137
	ZnCO3	5.952e-09	5.960e-09	-8.225	-8.225	0.001
	Zn(OH)3-	3.343e-09	3.089e-09	-8.476	-8.510	-0.034
	ZnOH+	8.663e-10	8.006e-10	-9.062	-9.097	-0.034
	Zn+2	1.403e-10	1.023e-10	-9.853	-9.990	-0.137
	ZnOHCl	1.769e-11	1.771e-11	-10.752	-10.752	0.001
	ZnHCO3+	1.018e-11	9.404e-12	-10.992	-11.027	-0.034
	ZnSO4	6.660e-12	6.669e-12	-11.177	-11.176	0.001
	Zn(OH)4-2	6.121e-12	4.465e-12	-11.213	-11.350	-0.137
	ZnCl+	1.481e-13	1.369e-13	-12.829	-12.864	-0.034
	ZnF+	5.812e-14	5.371e-14	-13.236	-13.270	-0.034
	Zn(SO4)2-2	2.171e-14	1.584e-14	-13.663	-13.800	-0.137
	ZnCl2	8.099e-17	8.109e-17	-16.092	-16.091	0.001
	ZnCl3-	5.534e-20	5.115e-20	-19.257	-19.291	-0.034
	ZnCl4-2	1.963e-23	1.432e-23	-22.707	-22.844	-0.137

----------Saturation Indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-2.32	8.69	11.01	Al(OH)3
AlAsO4:2H2O	-11.60	-6.82	4.79	AlAsO4:2H2O
AlumK	-27.03	-32.26	-5.23	KAl(SO4)2:12H2O
Alunite	-13.88	-14.88	-1.00	KAl3(SO4)2(OH)6
Anglesite	-6.59	-14.40	-7.81	PbSO4
Anhydrite	-3.03	-7.38	-4.35	CaSO4
Antlerite	-9.53	-1.24	8.29	Cu3(OH)4SO4
Aragonite	0.94	-7.37	-8.32	CaCO3
Arsenolite	-94.24	-173.70	-79.46	As4O6
Artinite	-2.28	7.55	9.83	MgCO3:Mg(OH)2:3H2O
As2O5	-37.75	-31.01	6.74	As2O5
Atacamite	-5.87	1.61	7.49	Cu2(OH)3Cl
Azurite	-7.96	-24.68	-16.72	Cu3(OH)2(CO3)2
B-UO2(OH)2	-2.71	2.94	5.65	UO2(OH)2
Ba3(AsO4)2	17.51	8.58	-8.94	Ba3(AsO4)2
BaF2	-9.78	-15.55	-5.77	BaF2
Barite	-0.25	-10.27	-10.02	BaSO4
Basaluminite	-11.42	11.28	22.70	Al4(OH)10SO4
Bianchite	-11.77	-13.54	-1.76	ZnSO4:6H2O
Birnessite	-3.59	40.01	43.60	MnO2
Bixbyite	1.15	52.09	50.94	Mn2O3
Boehmite	-0.12	8.69	8.81	AlOOH
Brochantite	-9.17	6.17	15.34	Cu4(OH)6SO4
Brucite	-1.55	15.50	17.06	Mg(OH)2
Bunsenite	-3.21	9.43	12.64	NiO
Ca3(AsO4)2:4w	-5.10	17.24	22.34	Ca3(AsO4)2:4H2O
Calcite	1.09	-7.37	-8.46	CaCO3
Cerrusite	-1.22	-14.39	-13.17	PbCO3
Chalcanthite	-13.41	-16.06	-2.65	CuSO4:5H2O
Claudetite	-93.98	-173.70	-79.71	As4O6
CO2(g)	-5.30	-23.45	-18.16	CO2
Cotunnite	-12.52	-17.34	-4.81	PbCl2
Cu(OH)2	-1.35	7.41	8.76	Cu(OH)2
Cu2SO4	-29.24	-36.57	-7.33	Cu2SO4
Cu3(AsO4)2:6w	-14.91	-8.78	6.13	Cu3(AsO4)2:6H2O
CuCO3	-6.42	-16.05	-9.63	CuCO3
CuF	-25.40	-20.92	4.47	CuF
CuF2	-20.82	-21.34	-0.51	CuF2
CuF2:2H2O	-16.82	-21.34	-4.52	CuF2:2H2O
CuMetal	-8.91	-20.51	-11.60	Cu
CuOCuSO4	-20.46	-8.65	11.81	CuO:CuSO4
CupricFerrite	15.03	47.41	32.38	CuFe2O4
Cuprite	-6.09	-13.10	-7.01	Cu2O
CuprousFerrite	11.95	13.45	1.50	CuFeO2
CuSO4	-19.21	-16.06	3.15	CuSO4
Diaspore	1.61	8.69	7.08	AlOOH
Dolomite	1.69	-15.32	-17.01	CaMg(CO3)2
Dolomite(d)	1.13	-15.32	-16.45	CaMg(CO3)2
Epsomite	-5.80	-7.96	-2.16	MgSO4:7H2O
Fe(OH)2.7Cl.3	5.99	16.04	10.06	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.01	20.00	17.99	Fe(OH)3
Fe3(OH)8	-0.37	46.05	46.42	Fe3(OH)8
Fluorite	-2.02	-12.66	-10.64	CaF2
Gibbsite	0.40	8.69	8.29	Al(OH)3
Goethite	7.91	20.00	12.10	FeOOH
Goslarite	-11.55	-13.54	-1.99	ZnSO4:7H2O
Gummite	-7.65	2.94	10.59	UO3
Gypsum	-2.80	-7.38	-4.58	CaSO4:2H2O
H2(g)	-27.87	-27.92	-0.05	H2
Halite	-7.15	-5.58	1.57	NaCl
Hausmannite	2.35	64.18	61.83	Mn3O4
Hematite	17.57	40.01	22.43	Fe2O3
Huntite	-1.46	-31.23	-29.76	CaMg3(CO3)4
Hydrocerrusite	-2.25	-19.71	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-7.96	-16.30	-8.35	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-13.37	17.92	31.29	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-11.27	19.06	30.33	KFe3(SO4)2(OH)6
Jarosite-Na	-13.60	20.70	34.30	NaFe3(SO4)2(OH)6
JarositeH	-21.26	13.08	34.34	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-11.55	-14.78	-3.23	AlOHSO4
Langite	-10.94	6.17	17.10	Cu4(OH)6SO4:H2O
Larnakite	-5.11	-5.34	-0.23	PbO:PbSO4
Laurionite	-4.76	-4.14	0.62	PbOHCl
Litharge	-3.79	9.07	12.85	PbO
Magnemite	7.43	40.01	32.58	Fe2O3
Magnesite	0.03	-7.95	-7.98	MgCO3
Magnetite	15.72	46.05	30.33	Fe3O4
Malachite	-3.59	-8.64	-5.05	Cu2(OH)2CO3
Manganite	0.71	26.05	25.34	MnOOH
Massicot	-3.98	9.07	13.04	PbO
Matlockite	-9.02	-18.51	-9.49	PbClF
Melanothallite	-22.82	-19.00	3.83	CuCl2
Melanterite	-15.17	-17.42	-2.25	FeSO4:7H2O
Minium	-19.39	55.12	74.51	Pb3O4
Mirabilite	-6.96	-8.22	-1.26	Na2SO4:10H2O
Mn2(SO4)3	-64.33	-18.30	46.03	Mn2(SO4)3
Mn3(AsO4):8H2O	-7.29	5.25	12.54	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-16.89	-14.32	2.57	MnCl2:4H2O
MnSO4	-14.17	-11.38	2.79	MnSO4
Morenosite	-11.65	-14.03	-2.38	NiSO4:7H2O
Na4UO2(CO3)3	-20.64	-36.93	-16.29	Na4UO2(CO3)3
Nahcolite	-4.90	-15.83	-10.94	NaHCO3
Nantokite	-10.21	-19.75	-9.55	CuCl
Natron	-6.77	-8.21	-1.44	Na2CO3:10H2O
Nesquehonite	-2.38	-7.95	-5.57	MgCO3:3H2O
Ni(OH)2	-1.13	9.43	10.56	Ni(OH)2
Ni3(AsO4)2:8H2O	-18.45	-2.72	15.74	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-17.74	14.26	32.00	Ni4(OH)6SO4
NiCO3	-7.26	-14.02	-6.76	NiCO3
Nsutite	-2.56	40.01	42.56	MnO2
O2(g)	-28.44	55.84	84.28	O2
Pb(OH)2	0.80	9.07	8.26	Pb(OH)2
Pb2(OH)3Cl	-3.86	4.93	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-8.07	18.13	26.20	PbO:Pb(OH)2
Pb2O3	-14.99	46.05	61.04	Pb2O3
Pb2OCO3	-4.92	-5.32	-0.41	PbO:PbCO3
Pb3(AsO4)2	-9.66	-3.81	5.85	Pb3(AsO4)2
Pb3O2CO3	-7.49	3.74	11.23	PbCO3:2PbO
Pb3O2SO4	-6.83	3.73	10.57	PbSO4:2PbO
Pb4(OH)6SO4	-8.31	12.79	21.10	Pb4(OH)6SO4
Pb4O3SO4	-9.58	12.80	22.38	PbSO4:3PbO
PbF2	-12.25	-19.68	-7.43	PbF2
PbMetal	-23.12	-18.85	4.27	Pb
PbO:0.3H2O	-3.91	9.07	12.98	PbO:0.33H2O
Phosgenite	-11.92	-31.73	-19.81	PbCl2:PbCO3
Plattnerite	-12.88	36.99	49.86	PbO2
Portlandite	-6.96	16.08	23.05	Ca(OH)2
Pyrochroite	-3.11	12.09	15.20	Mn(OH)2
Pyrolusite	-1.89	40.01	41.90	MnO2
Retgersite	-11.99	-14.03	-2.05	NiSO4:6H2O
Rhodochrosite	-0.25	-11.37	-11.12	MnCO3
Rhodochrosite(d)	-0.98	-11.37	-10.39	MnCO3
Rutherfordine	-6.08	-20.51	-14.44	UO2CO3
Schoepite	-2.56	2.94	5.50	UO2(OH)2:H2O
Scorodite	-8.97	4.50	13.47	FeAsO4:2H2O
Siderite	-6.54	-17.41	-10.87	FeCO3
Siderite(d)(3)	-6.96	-17.41	-10.45	FeCO3
Smithsonite	-3.56	-13.52	-9.97	ZnCO3
Tenorite	-0.33	7.41	7.74	CuO
Thenardite	-8.05	-8.22	-0.17	Na2SO4
Thermonatrite	-8.36	-8.21	0.15	Na2CO3:H2O
Trona	-13.03	-24.04	-11.01	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-35.93	-48.44	-12.51	U(OH)2SO4
U3O8(c)	-12.61	-19.10	-6.49	U3O8
U4O9(c)	-32.16	-72.00	-39.83	U4O9
UF4(c)	-54.70	-82.47	-27.77	UF4
UF4:2.5H2O	-45.59	-82.47	-36.88	UF4:2.5H2O
UO2(a)	-15.77	-24.98	-9.21	UO2
UO3(gamma)	-4.93	2.94	7.87	UO3
Uraninite(c)	-11.01	-24.98	-13.97	UO2
Witherite	-1.69	-10.26	-8.57	BaCO3
Zincite(c)	-1.38	9.93	11.31	ZnO
Zincosite	-16.70	-13.54	3.16	ZnSO4
Zn(OH)2-a	-2.52	9.93	12.45	Zn(OH)2
Zn(OH)2-b	-1.82	9.93	11.75	Zn(OH)2
Zn(OH)2-c	-2.27	9.93	12.20	Zn(OH)2
Zn(OH)2-e	-1.57	9.93	11.50	Zn(OH)2
Zn(OH)2-g	-1.78	9.93	11.71	Zn(OH)2
Zn2(OH)2SO4	-11.11	-3.61	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-8.54	6.66	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-14.92	-1.22	13.70	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-36.65	-17.14	19.51	ZnO:2ZnSO4
Zn4(OH)6SO4	-12.15	16.25	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-15.25	23.25	38.50	Zn5(OH)8Cl2
ZnCl2	-23.64	-16.47	7.17	ZnCl2
ZnCO3:H2O	-3.26	-13.52	-10.26	ZnCO3:H2O
ZnF2	-17.40	-18.81	-1.42	ZnF2
ZnMetal	-44.04	-17.99	26.05	Zn
ZnO(a)	-1.38	9.93	11.31	ZnO
ZnSO4:H2O	-13.05	-13.54	-0.49	ZnSO4:H2O

End of simulation.

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Reading data base.
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           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
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           TITLE   Schneckentein 13.5-14.5m
           SOLUTION        14
           units           mg/l
           temp            22.7
           pH              9.74
           F               0.7
           Cl              19
           S(6)            41          as SO4
           Na              105
           K               18
           Mg              1.3
           Ca              9.2
           Alkalinity      149.45      as HCO3
           Al              2.4
           As              2.06
           Ba              0.121
           Cu              0.12
           Fe              2.7
           Mn              0.19
           Ni              0.025
           Pb              0.066
           U               1.49
           Zn              0.14
           END
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TITLE
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   Schneckentein 13.5-14.5m

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Beginning of initial solution calculations.
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Initial solution 14.

----------------------------Solution composition--------------
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           Elements           Molality       Moles

           Al               8.898e-05   8.898e-05
           Alkalinity       2.450e-03   2.450e-03
           As               2.751e-05   2.751e-05
           Ba               8.813e-07   8.813e-07
           Ca               2.296e-04   2.296e-04
           Cl               5.361e-04   5.361e-04
           Cu               1.889e-06   1.889e-06
           F                3.686e-05   3.686e-05
           Fe               4.836e-05   4.836e-05
           K                4.605e-04   4.605e-04
           Mg               5.349e-05   5.349e-05
           Mn               3.460e-06   3.460e-06
           Na               4.569e-03   4.569e-03
           Ni               4.260e-07   4.260e-07
           Pb               3.187e-07   3.187e-07
           S(6)             4.269e-04   4.269e-04
           U                6.262e-06   6.262e-06
           Zn               2.142e-06   2.142e-06
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```
----------------------------Description of solution----------------------------

                                    pH  =   9.740
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   5.435e-03
                     Mass of water (kg)  =   1.000e+00
                  Total carbon (mol/kg)  =   1.494e-03
                     Total CO2 (mol/kg)  =   1.494e-03
                    Temperature (deg C)  =  22.700
                  Electrical balance (eq)  =   2.037e-03
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  23.06
                               Iterations  =  15
                                  Total H  = 1.110141e+02
                                  Total O  = 5.551313e+01
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	4.988e-05	4.612e-05	-4.302	-4.336	-0.034
H+	1.953e-10	1.820e-10	-9.709	-9.740	-0.031
H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	**8.898e-05**				
Al(OH)4-	8.897e-05	8.227e-05	-4.051	-4.085	-0.034
Al(OH)3	8.175e-09	8.185e-09	-8.088	-8.087	0.001
Al(OH)2+	1.298e-11	1.200e-11	-10.887	-10.921	-0.034
AlOH+2	4.673e-16	3.417e-16	-15.330	-15.466	-0.136
AlF2+	4.416e-17	4.084e-17	-16.355	-16.389	-0.034
AlF3	1.737e-17	1.739e-17	-16.760	-16.760	0.001
AlF+2	3.327e-18	2.433e-18	-17.478	-17.614	-0.136
AlF4-	2.537e-19	2.346e-19	-18.596	-18.630	-0.034
Al+3	1.472e-20	7.276e-21	-19.832	-20.138	-0.306
AlSO4+	7.270e-21	6.722e-21	-20.138	-20.173	-0.034
Al(SO4)2-	6.847e-23	6.332e-23	-22.164	-22.198	-0.034
AlHSO4+2	1.455e-31	1.063e-31	-30.837	-30.973	-0.136
As(3)	**1.062e-23**				
H2AsO3-	8.075e-24	7.467e-24	-23.093	-23.127	-0.034
H3AsO3	2.500e-24	2.503e-24	-23.602	-23.601	0.001
HAsO3-2	4.014e-26	2.935e-26	-25.396	-25.532	-0.136
AsO3-3	1.162e-29	5.743e-30	-28.935	-29.241	-0.306
H4AsO3+	2.441e-34	2.257e-34	-33.612	-33.646	-0.034
As(5)	**2.751e-05**				
HAsO4-2	2.696e-05	1.971e-05	-4.569	-4.705	-0.136
AsO4-3	5.247e-07	2.593e-07	-6.280	-6.586	-0.306
H2AsO4-	2.244e-08	2.075e-08	-7.649	-7.683	-0.034
H3AsO4	6.455e-16	6.463e-16	-15.190	-15.190	0.001
Ba	**8.813e-07**				
Ba+2	7.317e-07	5.350e-07	-6.136	-6.272	-0.136
BaSO4	8.063e-08	8.073e-08	-7.094	-7.093	0.001
BaCO3	6.378e-08	6.386e-08	-7.195	-7.195	0.001
BaHCO3+	5.080e-09	4.698e-09	-8.294	-8.328	-0.034
BaOH+	1.077e-10	9.960e-11	-9.968	-10.002	-0.034
C(4)	**1.494e-03**				
HCO3-	1.063e-03	9.849e-04	-2.974	-3.007	-0.033
CO3-2	3.282e-04	2.420e-04	-3.484	-3.616	-0.132
CaCO3	4.894e-05	4.900e-05	-4.310	-4.310	0.001
NaCO3-	1.822e-05	1.685e-05	-4.739	-4.773	-0.034
MgCO3	7.117e-06	7.126e-06	-5.148	-5.147	0.001
UO2(CO3)3-4	5.803e-06	1.658e-06	-5.236	-5.780	-0.544
MnCO3	3.187e-06	3.191e-06	-5.497	-5.496	0.001
NaHCO3	2.325e-06	2.327e-06	-5.634	-5.633	0.001
CaHCO3+	1.654e-06	1.530e-06	-5.781	-5.815	-0.034
Zn(CO3)2-2	9.339e-07	6.828e-07	-6.030	-6.166	-0.136
CO2	4.147e-07	4.152e-07	-6.382	-6.382	0.001
MgHCO3+	3.946e-07	3.649e-07	-6.404	-6.438	-0.034
NiCO3	2.698e-07	2.701e-07	-6.569	-6.568	0.001
UO2(CO3)2-2	1.839e-07	1.344e-07	-6.735	-6.871	-0.136
PbCO3	1.661e-07	1.663e-07	-6.780	-6.779	0.001
Ni(CO3)2-2	1.554e-07	1.136e-07	-6.809	-6.945	-0.136
Pb(CO3)2-2	1.382e-07	1.011e-07	-6.859	-6.995	-0.136
ZnCO3	1.318e-07	1.320e-07	-6.880	-6.880	0.001
BaCO3	6.378e-08	6.386e-08	-7.195	-7.195	0.001
MnHCO3+	1.576e-08	1.457e-08	-7.802	-7.836	-0.034
BaHCO3+	5.080e-09	4.698e-09	-8.294	-8.328	-0.034
CuCO3	3.879e-09	3.883e-09	-8.411	-8.411	0.001
Cu(CO3)2-2	1.618e-09	1.183e-09	-8.791	-8.927	-0.136
ZnHCO3+	3.665e-10	3.389e-10	-9.436	-9.470	-0.034
PbHCO3+	3.345e-11	3.093e-11	-10.476	-10.510	-0.034
UO2CO3	2.469e-11	2.472e-11	-10.607	-10.607	0.001
NiHCO3+	2.214e-11	2.047e-11	-10.655	-10.689	-0.034
FeCO3	1.701e-12	1.703e-12	-11.769	-11.769	0.001
CuHCO3+	1.595e-12	1.475e-12	-11.797	-11.831	-0.034
FeHCO3+	3.126e-14	2.890e-14	-13.505	-13.539	-0.034
(UO2)3(CO3)6-6	4.846e-17	2.892e-18	-16.315	-17.539	-1.224
UO2(CO3)3-5	2.030e-22	2.866e-23	-21.693	-22.543	-0.850
U(CO3)4-4	4.382e-36	1.252e-36	-35.358	-35.902	-0.544
U(CO3)5-6	4.916e-38	2.934e-39	-37.308	-38.533	-1.224
Ca	**2.296e-04**				
Ca+2	1.714e-04	1.263e-04	-3.766	-3.898	-0.133
CaCO3	4.894e-05	4.900e-05	-4.310	-4.310	0.001
CaSO4	7.418e-06	7.427e-06	-5.130	-5.129	0.001
CaHCO3+	1.654e-06	1.530e-06	-5.781	-5.815	-0.034
CaOH+	1.246e-07	1.152e-07	-6.904	-6.939	-0.034
CaF+	3.822e-08	3.534e-08	-7.418	-7.452	-0.034
CaHSO4+	8.326e-15	7.699e-15	-14.080	-14.114	-0.034
Cl	**5.361e-04**				
Cl-	5.361e-04	4.953e-04	-3.271	-3.305	-0.034
MnCl+	3.622e-10	3.350e-10	-9.441	-9.475	-0.034
ZnOHCl	2.460e-10	2.463e-10	-9.609	-9.608	0.001
ZnCl+	3.558e-12	3.290e-12	-11.449	-11.483	-0.034
PbCl+	7.961e-13	7.361e-13	-12.099	-12.133	-0.034
NiCl+	2.026e-13	1.873e-13	-12.693	-12.727	-0.034
MnCl2	7.233e-14	7.242e-14	-13.141	-13.140	0.001
CuCl2-	1.295e-14	1.197e-14	-13.888	-13.922	-0.034
CuCl+	3.846e-15	3.556e-15	-14.415	-14.449	-0.034
ZnCl2	1.688e-15	1.690e-15	-14.773	-14.772	0.001
PbCl2	6.026e-16	6.034e-16	-15.220	-15.219	0.001
NiCl2	3.365e-16	3.369e-16	-15.473	-15.473	0.001
FeCl+	2.170e-16	2.006e-16	-15.664	-15.698	-0.034
CuCl3-2	1.274e-17	9.314e-18	-16.895	-17.031	-0.136
MnCl3-	1.068e-17	9.879e-18	-16.971	-17.005	-0.034
ZnCl3-	1.002e-18	9.264e-19	-17.999	-18.033	-0.034
CuCl2	9.214e-19	9.225e-19	-18.036	-18.035	0.001
PbCl3-	2.531e-19	2.340e-19	-18.597	-18.631	-0.034
UO2Cl+	1.880e-20	1.739e-20	-19.726	-19.760	-0.034
ZnCl4-2	3.088e-22	2.258e-22	-21.510	-21.646	-0.136
PbCl4-2	7.454e-23	5.449e-23	-22.128	-22.264	-0.136
FeCl+2	4.692e-24	3.430e-24	-23.329	-23.465	-0.136
CuCl3-	1.683e-24	1.556e-24	-23.774	-23.808	-0.034
UO2Cl2	4.517e-25	4.522e-25	-24.345	-24.345	0.001
FeCl2+	8.833e-27	8.168e-27	-26.054	-26.088	-0.034
CuCl4-2	5.007e-30	3.660e-30	-29.300	-29.436	-0.136
FeCl3	4.040e-31	4.045e-31	-30.394	-30.393	0.001
UCl+3	0.000e+00	0.000e+00	-55.591	-55.897	-0.306
Cu(1)	**1.789e-13**				
Cu+	1.660e-13	1.535e-13	-12.780	-12.814	-0.034
CuCl2-	1.295e-14	1.197e-14	-13.888	-13.922	-0.034
CuCl3-2	1.274e-17	9.314e-18	-16.895	-17.031	-0.136
Cu(2)	**1.889e-06**				
Cu(OH)2	1.883e-06	1.885e-06	-5.725	-5.725	0.001
CuCO3	3.879e-09	3.883e-09	-8.411	-8.411	0.001
Cu(CO3)2-2	1.618e-09	1.183e-09	-8.791	-8.927	-0.136
Cu(OH)3-	6.750e-10	6.241e-10	-9.171	-9.205	-0.034
CuOH+	1.776e-10	1.642e-10	-9.751	-9.785	-0.034
Cu+2	4.088e-12	2.988e-12	-11.389	-11.525	-0.136
CuHCO3+	1.595e-12	1.475e-12	-11.797	-11.831	-0.034
Cu(OH)4-2	9.359e-13	6.842e-13	-12.029	-12.165	-0.136
CuSO4	1.806e-13	1.808e-13	-12.743	-12.743	0.001
Cu2(OH)2+2	1.282e-14	9.373e-15	-13.892	-14.028	-0.136
CuCl+	3.846e-15	3.556e-15	-14.415	-14.449	-0.034
CuF+	1.952e-15	1.805e-15	-14.710	-14.744	-0.034
CuCl2	9.214e-19	9.225e-19	-18.036	-18.035	0.001
CuCl3-	1.683e-24	1.556e-24	-23.774	-23.808	-0.034
CuCl4-2	5.007e-30	3.660e-30	-29.300	-29.436	-0.136
F	**3.686e-05**				
F-	3.666e-05	3.390e-05	-4.436	-4.470	-0.034
NaF	8.188e-08	8.198e-08	-7.087	-7.086	0.001
MgF+	7.426e-08	6.867e-08	-7.129	-7.163	-0.034
CaF+	3.822e-08	3.534e-08	-7.418	-7.452	-0.034
MnF+	4.211e-11	3.894e-11	-10.376	-10.410	-0.034
HF	8.868e-12	8.879e-12	-11.052	-11.052	0.001
ZnF+	1.375e-12	1.271e-12	-11.862	-11.896	-0.034
NiF+	1.102e-13	1.019e-13	-12.958	-12.992	-0.034
PbF+	2.578e-14	2.384e-14	-13.589	-13.623	-0.034
CuF+	1.952e-15	1.805e-15	-14.710	-14.744	-0.034
HF2-	1.226e-15	1.134e-15	-14.911	-14.945	-0.034
UO2F+	1.092e-16	1.009e-16	-15.962	-15.996	-0.034
FeF+	1.076e-16	9.949e-17	-15.968	-16.002	-0.034
AlF2+	4.416e-17	4.084e-17	-16.355	-16.389	-0.034
AlF3	1.737e-17	1.739e-17	-16.760	-16.760	0.001
PbF2	1.648e-17	1.650e-17	-16.783	-16.782	0.001
UO2F2	1.157e-17	1.158e-17	-16.937	-16.936	0.001
AlF+2	3.327e-18	2.433e-18	-17.478	-17.614	-0.136
AlF4-	2.537e-19	2.346e-19	-18.596	-18.630	-0.034
UO2F3-	8.085e-20	7.476e-20	-19.092	-19.126	-0.034
FeF2+	1.818e-20	1.681e-20	-19.740	-19.774	-0.034
FeF+2	1.751e-20	1.280e-20	-19.757	-19.893	-0.136
PbF3-	4.383e-21	4.053e-21	-20.358	-20.392	-0.034
FeF3	8.949e-22	8.960e-22	-21.048	-21.048	0.001
H2F2	2.228e-22	2.231e-22	-21.652	-21.652	0.001
UO2F4-2	2.201e-23	1.609e-23	-22.657	-22.793	-0.136
PbF4-2	8.995e-26	6.576e-26	-25.046	-25.182	-0.136
UF3+	0.000e+00	0.000e+00	-46.113	-46.147	-0.034
UF4	0.000e+00	0.000e+00	-46.712	-46.712	0.001
UF2+2	0.000e+00	0.000e+00	-46.916	-47.053	-0.136
UF+3	0.000e+00	0.000e+00	-49.194	-49.500	-0.306
UF5-	0.000e+00	0.000e+00	-49.670	-49.704	-0.034
UF6-2	0.000e+00	0.000e+00	-51.939	-52.075	-0.136
Fe(2)	**2.633e-12**				
FeCO3	1.701e-12	1.703e-12	-11.769	-11.769	0.001
FeOH+	4.637e-13	4.288e-13	-12.334	-12.368	-0.034
Fe+2	4.014e-13	2.935e-13	-12.396	-12.532	-0.136
FeHCO3+	3.126e-14	2.890e-14	-13.505	-13.539	-0.034
Fe(OH)2	1.637e-14	1.639e-14	-13.786	-13.785	0.001
FeSO4	1.504e-14	1.506e-14	-13.823	-13.822	0.001
Fe(OH)3-	3.538e-15	3.271e-15	-14.451	-14.485	-0.034
FeCl+	2.170e-16	2.006e-16	-15.664	-15.698	-0.034
FeF+	1.076e-16	9.949e-17	-15.968	-16.002	-0.034
FeHSO4+	1.934e-23	1.788e-23	-22.714	-22.748	-0.034

Fe(3)	4.836e-05					
	Fe(OH)4-	4.021e-05	3.719e-05	-4.396	-4.430	-0.034
	Fe(OH)3	8.135e-06	8.145e-06	-5.090	-5.089	0.001
	Fe(OH)2+	1.377e-08	1.273e-08	-7.861	-7.895	-0.034
	FeOH+2	1.045e-14	7.640e-15	-13.981	-14.117	-0.136
	FeF2+	1.818e-20	1.681e-20	-19.740	-19.774	-0.034
	FeF+2	1.751e-20	1.280e-20	-19.757	-19.893	-0.136
	FeF3	8.949e-22	8.960e-22	-21.048	-21.048	0.001
	FeSO4+	8.371e-22	7.741e-22	-21.077	-21.111	-0.034
	Fe+3	4.994e-22	2.468e-22	-21.302	-21.608	-0.306
	Fe(SO4)2-	5.464e-24	5.053e-24	-23.262	-23.296	-0.034
	FeCl+2	4.692e-24	3.430e-24	-23.329	-23.465	-0.136
	FeCl2+	8.833e-27	8.168e-27	-26.054	-26.088	-0.034
	Fe2(OH)2+4	6.051e-27	1.729e-27	-26.218	-26.762	-0.544
	FeHSO4+2	5.168e-31	3.778e-31	-30.287	-30.423	-0.136
	FeCl3	4.040e-31	4.045e-31	-30.394	-30.393	0.001
	Fe3(OH)4+5	4.033e-32	5.694e-33	-31.394	-32.245	-0.850
H(0)	4.708e-31					
	H2	2.354e-31	2.357e-31	-30.628	-30.628	0.001
K	4.605e-04					
	K+	4.595e-04	4.245e-04	-3.338	-3.372	-0.034
	KSO4-	9.502e-07	8.786e-07	-6.022	-6.056	-0.034
Mg	5.349e-05					
	Mg+2	4.322e-05	3.197e-05	-4.364	-4.495	-0.131
	MgCO3	7.117e-06	7.126e-06	-5.148	-5.147	0.001
	MgSO4	2.123e-06	2.126e-06	-5.673	-5.673	0.001
	MgOH+	5.595e-07	5.174e-07	-6.252	-6.286	-0.034
	MgHCO3+	3.946e-07	3.649e-07	-6.404	-6.438	-0.034
	MgF+	7.426e-08	6.867e-08	-7.129	-7.163	-0.034
Mn(2)	3.460e-06					
	MnCO3	3.187e-06	3.191e-06	-5.497	-5.496	0.001
	Mn+2	2.271e-07	1.660e-07	-6.644	-6.780	-0.136
	MnOH+	2.099e-08	1.941e-08	-7.678	-7.712	-0.034
	MnHCO3+	1.576e-08	1.457e-08	-7.802	-7.836	-0.034
	MnSO4	8.493e-09	8.504e-09	-8.071	-8.070	0.001
	MnCl+	3.622e-10	3.350e-10	-9.441	-9.475	-0.034
	MnF+	4.211e-11	3.894e-11	-10.376	-10.410	-0.034
	Mn(OH)3-	4.720e-13	4.365e-13	-12.326	-12.360	-0.034
	MnCl2	7.233e-14	7.242e-14	-13.141	-13.140	0.001
	MnCl3-	1.068e-17	9.879e-18	-16.971	-17.005	-0.034
Mn(3)	7.399e-29					
	Mn+3	7.399e-29	3.657e-29	-28.131	-28.437	-0.306
Mn(6)	9.573e-33					
	MnO4-2	9.573e-33	6.999e-33	-32.019	-32.155	-0.136
Mn(7)	2.205e-38					
	MnO4-	2.205e-38	2.039e-38	-37.657	-37.691	-0.034
Na	4.569e-03					
	Na+	4.541e-03	4.202e-03	-2.343	-2.376	-0.034
	NaCO3-	1.822e-05	1.685e-05	-4.739	-4.773	-0.034
	NaSO4-	6.758e-06	6.249e-06	-5.170	-5.204	-0.034
	NaHCO3	2.325e-06	2.327e-06	-5.634	-5.633	0.001
	NaF	8.188e-08	8.198e-08	-7.087	-7.086	0.001
Ni	4.260e-07					
	NiCO3	2.698e-07	2.701e-07	-6.569	-6.568	0.001
	Ni(CO3)2-2	1.554e-07	1.136e-07	-6.809	-6.945	-0.136
	Ni(OH)2	4.541e-10	4.546e-10	-9.343	-9.342	0.001
	Ni+2	2.060e-10	1.506e-10	-9.686	-9.822	-0.136
	NiOH+	1.049e-10	9.704e-11	-9.979	-10.013	-0.034
	Ni(OH)3-	2.702e-11	2.498e-11	-10.568	-10.602	-0.034
	NiHCO3+	2.214e-11	2.047e-11	-10.655	-10.689	-0.034
	NiSO4	8.655e-12	8.666e-12	-11.063	-11.062	0.001
	NiCl+	2.026e-13	1.873e-13	-12.693	-12.727	-0.034
	NiF+	1.102e-13	1.019e-13	-12.958	-12.992	-0.034
	NiCl2	3.365e-16	3.369e-16	-15.473	-15.473	0.001
	Ni(SO4)2-2	1.955e-16	1.429e-16	-15.709	-15.845	-0.136
O(0)	2.584e-32					
	O2	1.292e-32	1.294e-32	-31.889	-31.888	0.001
Pb	3.187e-07					
	PbCO3	1.661e-07	1.663e-07	-6.780	-6.779	0.001
	Pb(CO3)2-2	1.382e-07	1.011e-07	-6.859	-6.995	-0.136
	Pb(OH)2	9.045e-09	9.056e-09	-8.044	-8.043	0.001
	PbOH+	4.581e-09	4.236e-09	-8.339	-8.373	-0.034
	Pb(OH)3-	6.179e-10	5.713e-10	-9.209	-9.243	-0.034
	Pb+2	5.409e-11	3.954e-11	-10.267	-10.403	-0.136
	PbHCO3+	3.345e-11	3.093e-11	-10.476	-10.510	-0.034
	Pb(OH)4-2	9.837e-12	7.192e-12	-11.007	-11.143	-0.136
	PbSO4	6.686e-12	6.695e-12	-11.175	-11.174	0.001
	PbCl+	7.961e-13	7.361e-13	-12.099	-12.133	-0.034
	PbF+	2.578e-14	2.384e-14	-13.589	-13.623	-0.034
	Pb(SO4)2-2	1.447e-14	1.058e-14	-13.840	-13.976	-0.136
	PbCl2	6.026e-16	6.034e-16	-15.220	-15.219	0.001
	Pb3(OH)4+2	7.177e-17	5.247e-17	-16.144	-16.280	-0.136
	PbF2	1.648e-17	1.650e-17	-16.783	-16.782	0.001
	Pb2OH+3	7.588e-18	3.750e-18	-17.120	-17.426	-0.306
	PbCl3-	2.531e-19	2.340e-19	-18.597	-18.631	-0.034
	PbF3-	4.383e-21	4.053e-21	-20.358	-20.392	-0.034
	PbCl4-2	7.454e-23	5.449e-23	-22.128	-22.264	-0.136
	PbF4-2	8.995e-26	6.576e-26	-25.046	-25.182	-0.136
S(6)	4.269e-04					
	SO4-2	4.096e-04	3.011e-04	-3.388	-3.521	-0.134
	CaSO4	7.418e-06	7.427e-06	-5.130	-5.129	0.001
	NaSO4-	6.758e-06	6.249e-06	-5.170	-5.204	-0.034
	MgSO4	2.123e-06	2.126e-06	-5.673	-5.673	0.001
	KSO4-	9.502e-07	8.786e-07	-6.022	-6.056	-0.034
	BaSO4	8.063e-08	8.073e-08	-7.094	-7.093	0.001
	MnSO4	8.493e-09	8.504e-09	-8.071	-8.070	0.001
	ZnSO4	1.893e-10	1.895e-10	-9.723	-9.722	0.001
	NiSO4	8.655e-12	8.666e-12	-11.063	-11.062	0.001
	PbSO4	6.686e-12	6.695e-12	-11.175	-11.174	0.001
	HSO4-	5.481e-12	5.068e-12	-11.261	-11.295	-0.034
	Zn(SO4)2-2	6.458e-13	4.722e-13	-12.190	-12.326	-0.136
	CuSO4	1.806e-13	1.808e-13	-12.743	-12.743	0.001
	FeSO4	1.504e-14	1.506e-14	-13.823	-13.822	0.001
	Pb(SO4)2-2	1.447e-14	1.058e-14	-13.840	-13.976	-0.136
	CaHSO4+	8.326e-15	7.699e-15	-14.080	-14.114	-0.034
	Ni(SO4)2-2	1.955e-16	1.429e-16	-15.709	-15.845	-0.136
	UO2SO4	9.717e-18	9.729e-18	-17.012	-17.012	0.001
	UO2(SO4)2-2	3.730e-20	2.727e-20	-19.428	-19.564	-0.136
	AlSO4+	7.270e-21	6.722e-21	-20.138	-20.173	-0.034
	FeSO4+	8.371e-22	7.741e-22	-21.077	-21.111	-0.034
	Al(SO4)2-	6.847e-23	6.332e-23	-22.164	-22.198	-0.034
	FeHSO4+	1.934e-23	1.788e-23	-22.714	-22.748	-0.034
	Fe(SO4)2-	5.464e-24	5.053e-24	-23.262	-23.296	-0.034
	FeHSO4+2	5.168e-31	3.778e-31	-30.287	-30.423	-0.136
	AlHSO4+2	1.455e-31	1.063e-31	-30.837	-30.973	-0.136
	U(SO4)2	0.000e+00	0.000e+00	-50.925	-50.925	0.001
	USO4+2	0.000e+00	0.000e+00	-51.154	-51.290	-0.136
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-66.967	-67.273	-0.306
U(4)	9.607e-25					
	U(OH)4	9.607e-25	9.619e-25	-24.017	-24.017	0.001
	U(OH)3+	7.116e-31	6.580e-31	-30.148	-30.182	-0.034
	U(CO3)4-4	4.382e-36	1.252e-36	-35.358	-35.902	-0.544
	U(OH)2+2	8.079e-38	5.906e-38	-37.093	-37.229	-0.136
	U(CO3)5-6	4.916e-38	2.934e-39	-37.308	-38.533	-1.224
	UOH+3	0.000e+00	0.000e+00	-44.895	-45.201	-0.306
	UF3+	0.000e+00	0.000e+00	-46.113	-46.147	-0.034
	UF4	0.000e+00	0.000e+00	-46.712	-46.712	0.001
	UF2+2	0.000e+00	0.000e+00	-46.916	-47.053	-0.136
	UF+3	0.000e+00	0.000e+00	-49.194	-49.500	-0.306
	UF5-	0.000e+00	0.000e+00	-49.670	-49.704	-0.034
	U(SO4)2	0.000e+00	0.000e+00	-50.925	-50.925	0.001
	USO4+2	0.000e+00	0.000e+00	-51.154	-51.290	-0.136
	UF6-2	0.000e+00	0.000e+00	-51.939	-52.075	-0.136
	U+4	0.000e+00	0.000e+00	-53.793	-54.338	-0.544
	UCl+3	0.000e+00	0.000e+00	-55.591	-55.897	-0.306
	U6(OH)15+9	0.000e+00	0.000e+00	-194.372	-197.126	-2.755
U(5)	8.511e-20					
	UO2+	8.491e-20	7.852e-20	-19.071	-19.105	-0.034
	UO2(CO3)3-5	2.030e-22	2.866e-23	-21.693	-22.543	-0.850
U(6)	6.262e-06					
	UO2(CO3)3-4	5.803e-06	1.658e-06	-5.236	-5.780	-0.544
	UO2(OH)3-	2.754e-07	2.547e-07	-6.560	-6.594	-0.034
	UO2(CO3)2-2	1.839e-07	1.344e-07	-6.735	-6.871	-0.136
	UO2(OH)4-2	3.034e-11	2.218e-11	-10.518	-10.654	-0.136
	UO2CO3	2.469e-11	2.472e-11	-10.607	-10.607	0.001
	UO2OH+	7.895e-13	7.300e-13	-12.103	-12.137	-0.034
	(UO2)3(OH)7-	2.355e-13	2.178e-13	-12.628	-12.662	-0.034
	UO2F+	1.092e-16	1.009e-16	-15.962	-15.996	-0.034
	(UO2)3(CO3)6-6	4.846e-17	2.892e-18	-16.315	-17.539	-1.224
	UO2+2	3.328e-17	2.433e-17	-16.478	-16.614	-0.136
	(UO2)3(OH)5+	1.582e-17	1.463e-17	-16.801	-16.835	-0.034
	UO2F2	1.157e-17	1.158e-17	-16.937	-16.936	0.001
	UO2SO4	9.717e-18	9.729e-18	-17.012	-17.012	0.001
	UO2F3-	8.085e-20	7.476e-20	-19.092	-19.126	-0.034
	(UO2)2(OH)2+2	5.128e-20	3.749e-20	-19.290	-19.426	-0.136
	UO2(SO4)2-2	3.730e-20	2.727e-20	-19.428	-19.564	-0.136
	UO2Cl+	1.880e-20	1.739e-20	-19.726	-19.760	-0.034
	(UO2)4(OH)7+	7.215e-21	6.671e-21	-20.142	-20.176	-0.034
	(UO2)3(OH)4+2	2.261e-23	1.653e-23	-22.646	-22.782	-0.136
	UO2F4-2	2.201e-23	1.609e-23	-22.657	-22.793	-0.136
	UO2Cl2	4.517e-25	4.522e-25	-24.345	-24.345	0.001
	(UO2)2OH+3	1.313e-26	6.490e-27	-25.882	-26.188	-0.306
Zn	2.142e-06					
	Zn(OH)2	1.038e-06	1.039e-06	-5.984	-5.983	0.001
	Zn(CO3)2-2	9.339e-07	6.828e-07	-6.030	-6.166	-0.136
	ZnCO3	1.318e-07	1.320e-07	-6.880	-6.880	0.001
	Zn(OH)3-	1.952e-08	1.805e-08	-7.709	-7.743	-0.034
	ZnOH+	1.494e-08	1.381e-08	-7.826	-7.860	-0.034
	Zn+2	3.739e-09	2.733e-09	-8.427	-8.563	-0.136
	ZnHCO3+	3.665e-10	3.389e-10	-9.436	-9.470	-0.034
	ZnOHCl	2.460e-10	2.463e-10	-9.609	-9.608	0.001
	ZnSO4	1.893e-10	1.895e-10	-9.723	-9.722	0.001
	Zn(OH)4-2	2.150e-11	1.572e-11	-10.667	-10.804	-0.136
	ZnCl+	3.558e-12	3.290e-12	-11.449	-11.483	-0.034
	ZnF+	1.375e-12	1.271e-12	-11.862	-11.896	-0.034
	Zn(SO4)2-2	6.458e-13	4.722e-13	-12.190	-12.326	-0.136
	ZnCl2	1.688e-15	1.690e-15	-14.773	-14.772	0.001
	ZnCl3-	1.002e-18	9.264e-19	-17.999	-18.033	-0.034
	ZnCl4-2	3.088e-22	2.258e-22	-21.510	-21.646	-0.136

Fe(3)	4.836e-05					
	Fe(OH)4-	4.021e-05	3.719e-05	-4.396	-4.430	-0.034
	Fe(OH)3	8.135e-06	8.145e-06	-5.090	-5.089	0.001
	Fe(OH)2+	1.377e-08	1.273e-08	-7.861	-7.895	-0.034
	FeOH+2	1.045e-14	7.640e-15	-13.981	-14.117	-0.136
	FeF2+	1.818e-20	1.681e-20	-19.740	-19.774	-0.034
	FeF+2	1.751e-20	1.280e-20	-19.757	-19.893	-0.136
	FeF3	8.949e-22	8.960e-22	-21.048	-21.048	0.001
	FeSO4+	8.371e-22	7.741e-22	-21.077	-21.111	-0.034
	Fe+3	4.994e-22	2.468e-22	-21.302	-21.608	-0.306
	Fe(SO4)2-	5.464e-24	5.053e-24	-23.262	-23.296	-0.034
	FeCl+2	4.692e-24	3.430e-24	-23.329	-23.465	-0.136
	FeCl2+	8.833e-27	8.168e-27	-26.054	-26.088	-0.034
	Fe2(OH)2+4	6.051e-27	1.729e-27	-26.218	-26.762	-0.544
	FeHSO4+2	5.168e-31	3.778e-31	-30.287	-30.423	-0.136
	FeCl3	4.040e-31	4.045e-31	-30.394	-30.393	0.001
	Fe3(OH)4+5	4.033e-32	5.694e-33	-31.394	-32.245	-0.850
H(0)	4.708e-31					
	H2	2.354e-31	2.357e-31	-30.628	-30.628	0.001
K	4.605e-04					
	K+	4.595e-04	4.245e-04	-3.338	-3.372	-0.034
	KSO4-	9.502e-07	8.786e-07	-6.022	-6.056	-0.034
Mg	5.349e-05					
	Mg+2	4.322e-05	3.197e-05	-4.364	-4.495	-0.131
	MgCO3	7.117e-06	7.126e-06	-5.148	-5.147	0.001
	MgSO4	2.123e-06	2.126e-06	-5.673	-5.673	0.001
	MgOH+	5.595e-07	5.174e-07	-6.252	-6.286	-0.034
	MgHCO3+	3.946e-07	3.649e-07	-6.404	-6.438	-0.034
	MgF+	7.426e-08	6.867e-08	-7.129	-7.163	-0.034
Mn(2)	3.460e-06					
	MnCO3	3.187e-06	3.191e-06	-5.497	-5.496	0.001
	Mn+2	2.271e-07	1.660e-07	-6.644	-6.780	-0.136
	MnOH+	2.099e-08	1.941e-08	-7.678	-7.712	-0.034
	MnHCO3+	1.576e-08	1.457e-08	-7.802	-7.836	-0.034
	MnSO4	8.493e-09	8.504e-09	-8.071	-8.070	0.001
	MnCl+	3.622e-10	3.350e-10	-9.441	-9.475	-0.034
	MnF+	4.211e-11	3.894e-11	-10.376	-10.410	-0.034
	Mn(OH)3-	4.720e-13	4.365e-13	-12.326	-12.360	-0.034
	MnCl2	7.233e-14	7.242e-14	-13.141	-13.140	0.001
	MnCl3-	1.068e-17	9.879e-18	-16.971	-17.005	-0.034
Mn(3)	7.399e-29					
	Mn+3	7.399e-29	3.657e-29	-28.131	-28.437	-0.306
Mn(6)	9.573e-33					
	MnO4-2	9.573e-33	6.999e-33	-32.019	-32.155	-0.136
Mn(7)	2.205e-38					
	MnO4-	2.205e-38	2.039e-38	-37.657	-37.691	-0.034
Na	4.569e-03					
	Na+	4.541e-03	4.202e-03	-2.343	-2.376	-0.034
	NaCO3-	1.822e-05	1.685e-05	-4.739	-4.773	-0.034
	NaSO4-	6.758e-06	6.249e-06	-5.170	-5.204	-0.034
	NaHCO3	2.325e-06	2.327e-06	-5.634	-5.633	0.001
	NaF	8.188e-08	8.198e-08	-7.087	-7.086	0.001
Ni	4.260e-07					
	NiCO3	2.698e-07	2.701e-07	-6.569	-6.568	0.001
	Ni(CO3)2-2	1.554e-07	1.136e-07	-6.809	-6.945	-0.136
	Ni(OH)2	4.541e-10	4.546e-10	-9.343	-9.342	0.001
	Ni+2	2.060e-10	1.506e-10	-9.686	-9.822	-0.136
	NiOH+	1.049e-10	9.704e-11	-9.979	-10.013	-0.034
	Ni(OH)3-	2.702e-11	2.498e-11	-10.568	-10.602	-0.034
	NiHCO3+	2.214e-11	2.047e-11	-10.655	-10.689	-0.034
	NiSO4	8.655e-12	8.666e-12	-11.063	-11.062	0.001
	NiCl+	2.026e-13	1.873e-13	-12.693	-12.727	-0.034
	NiF+	1.102e-13	1.019e-13	-12.958	-12.992	-0.034
	NiCl2	3.365e-16	3.369e-16	-15.473	-15.473	0.001
	Ni(SO4)2-2	1.955e-16	1.429e-16	-15.709	-15.845	-0.136
O(0)	2.584e-32					
	O2	1.292e-32	1.294e-32	-31.889	-31.888	0.001
Pb	3.187e-07					
	PbCO3	1.661e-07	1.663e-07	-6.780	-6.779	0.001
	Pb(CO3)2-2	1.382e-07	1.011e-07	-6.859	-6.995	-0.136
	Pb(OH)2	9.045e-09	9.056e-09	-8.044	-8.043	0.001
	PbOH+	4.581e-09	4.236e-09	-8.339	-8.373	-0.034
	Pb(OH)3-	6.179e-10	5.713e-10	-9.209	-9.243	-0.034
	Pb+2	5.409e-11	3.954e-11	-10.267	-10.403	-0.136
	PbHCO3+	3.345e-11	3.093e-11	-10.476	-10.510	-0.034
	Pb(OH)4-2	9.837e-12	7.192e-12	-11.007	-11.143	-0.136
	PbSO4	6.686e-12	6.695e-12	-11.175	-11.174	0.001
	PbCl+	7.961e-13	7.361e-13	-12.099	-12.133	-0.034
	PbF+	2.578e-14	2.384e-14	-13.589	-13.623	-0.034
	Pb(SO4)2-2	1.447e-14	1.058e-14	-13.840	-13.976	-0.136
	PbCl2	6.026e-16	6.034e-16	-15.220	-15.219	0.001
	Pb3(OH)4+2	7.177e-17	5.247e-17	-16.144	-16.280	-0.136
	PbF2	1.648e-17	1.650e-17	-16.783	-16.782	0.001
	Pb2OH+3	7.588e-18	3.750e-18	-17.120	-17.426	-0.306
	PbCl3-	2.531e-19	2.340e-19	-18.597	-18.631	-0.034
	PbF3-	4.383e-21	4.053e-21	-20.358	-20.392	-0.034
	PbCl4-2	7.454e-23	5.449e-23	-22.128	-22.264	-0.136
	PbF4-2	8.995e-26	6.576e-26	-25.046	-25.182	-0.136
S(6)	4.269e-04					
	SO4-2	4.096e-04	3.011e-04	-3.388	-3.521	-0.134
	CaSO4	7.418e-06	7.427e-06	-5.130	-5.129	0.001
	NaSO4-	6.758e-06	6.249e-06	-5.170	-5.204	-0.034
	MgSO4	2.123e-06	2.126e-06	-5.673	-5.673	0.001
	KSO4-	9.502e-07	8.786e-07	-6.022	-6.056	-0.034
	BaSO4	8.063e-08	8.073e-08	-7.094	-7.093	0.001
	MnSO4	8.493e-09	8.504e-09	-8.071	-8.070	0.001
	ZnSO4	1.893e-10	1.895e-10	-9.723	-9.722	0.001
	NiSO4	8.655e-12	8.666e-12	-11.063	-11.062	0.001
	PbSO4	6.686e-12	6.695e-12	-11.175	-11.174	0.001
	HSO4-	5.481e-12	5.068e-12	-11.261	-11.295	-0.034
	Zn(SO4)2-2	6.458e-13	4.722e-13	-12.190	-12.326	-0.136
	CuSO4	1.806e-13	1.808e-13	-12.743	-12.743	0.001
	FeSO4	1.504e-14	1.506e-14	-13.823	-13.822	0.001
	Pb(SO4)2-2	1.447e-14	1.058e-14	-13.840	-13.976	-0.136
	CaHSO4+	8.326e-15	7.699e-15	-14.080	-14.114	-0.034
	Ni(SO4)2-2	1.955e-16	1.429e-16	-15.709	-15.845	-0.136
	UO2SO4	9.717e-18	9.729e-18	-17.012	-17.012	0.001
	UO2(SO4)2-2	3.730e-20	2.727e-20	-19.428	-19.564	-0.136
	AlSO4+	7.270e-21	6.722e-21	-20.138	-20.173	-0.034
	FeSO4+	8.371e-22	7.741e-22	-21.077	-21.111	-0.034
	Al(SO4)2-	6.847e-23	6.332e-23	-22.164	-22.198	-0.034
	FeHSO4+	1.934e-23	1.788e-23	-22.714	-22.748	-0.034
	Fe(SO4)2-	5.464e-24	5.053e-24	-23.262	-23.296	-0.034
	FeHSO4+2	5.168e-31	3.778e-31	-30.287	-30.423	-0.136
	AlHSO4+2	1.455e-31	1.063e-31	-30.837	-30.973	-0.136
	U(SO4)2	0.000e+00	0.000e+00	-50.925	-50.925	0.001
	USO4+2	0.000e+00	0.000e+00	-51.154	-51.290	-0.136
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-66.967	-67.273	-0.306
U(4)	9.607e-25					
	U(OH)4	9.607e-25	9.619e-25	-24.017	-24.017	0.001
	U(OH)3+	7.116e-31	6.580e-31	-30.148	-30.182	-0.034
	U(CO3)4-4	4.382e-36	1.252e-36	-35.358	-35.902	-0.544
	U(OH)2+2	8.079e-38	5.906e-38	-37.093	-37.229	-0.136
	U(CO3)5-6	4.916e-38	2.934e-39	-37.308	-38.533	-1.224
	UOH+3	0.000e+00	0.000e+00	-44.895	-45.201	-0.306
	UF3+	0.000e+00	0.000e+00	-46.113	-46.147	-0.034
	UF4	0.000e+00	0.000e+00	-46.712	-46.712	0.001
	UF2+2	0.000e+00	0.000e+00	-46.916	-47.053	-0.136
	UF+3	0.000e+00	0.000e+00	-49.194	-49.500	-0.306
	UF5-	0.000e+00	0.000e+00	-49.670	-49.704	-0.034
	U(SO4)2	0.000e+00	0.000e+00	-50.925	-50.925	0.001
	USO4+2	0.000e+00	0.000e+00	-51.154	-51.290	-0.136
	UF6-2	0.000e+00	0.000e+00	-51.939	-52.075	-0.136
	U+4	0.000e+00	0.000e+00	-53.793	-54.338	-0.544
	UCl+3	0.000e+00	0.000e+00	-55.591	-55.897	-0.306
	U6(OH)15+9	0.000e+00	0.000e+00	-194.372	-197.126	-2.755
U(5)	8.511e-20					
	UO2+	8.491e-20	7.852e-20	-19.071	-19.105	-0.034
	UO2(CO3)3-5	2.030e-22	2.866e-23	-21.693	-22.543	-0.850
U(6)	6.262e-06					
	UO2(CO3)3-4	5.803e-06	1.658e-06	-5.236	-5.780	-0.544
	UO2(OH)3-	2.754e-07	2.547e-07	-6.560	-6.594	-0.034
	UO2(CO3)2-2	1.839e-07	1.344e-07	-6.735	-6.871	-0.136
	UO2(OH)4-2	3.034e-11	2.218e-11	-10.518	-10.654	-0.136
	UO2CO3	2.469e-11	2.472e-11	-10.607	-10.607	0.001
	UO2OH+	7.895e-13	7.300e-13	-12.103	-12.137	-0.034
	(UO2)3(OH)7-	2.355e-13	2.178e-13	-12.628	-12.662	-0.034
	UO2F+	1.092e-16	1.009e-16	-15.962	-15.996	-0.034
	(UO2)3(CO3)6-6	4.846e-17	2.892e-18	-16.315	-17.539	-1.224
	UO2+2	3.328e-17	2.433e-17	-16.478	-16.614	-0.136
	(UO2)3(OH)5+	1.582e-17	1.463e-17	-16.801	-16.835	-0.034
	UO2F2	1.157e-17	1.158e-17	-16.937	-16.936	0.001
	UO2SO4	9.717e-18	9.729e-18	-17.012	-17.012	0.001
	UO2F3-	8.085e-20	7.476e-20	-19.092	-19.126	-0.034
	(UO2)2(OH)2+2	5.128e-20	3.749e-20	-19.290	-19.426	-0.136
	UO2(SO4)2-2	3.730e-20	2.727e-20	-19.428	-19.564	-0.136
	UO2Cl+	1.880e-20	1.739e-20	-19.726	-19.760	-0.034
	(UO2)4(OH)7+	7.215e-21	6.671e-21	-20.142	-20.176	-0.034
	(UO2)3(OH)4+2	2.261e-23	1.653e-23	-22.646	-22.782	-0.136
	UO2F4-2	2.201e-23	1.609e-23	-22.657	-22.793	-0.136
	UO2Cl2	4.517e-25	4.522e-25	-24.345	-24.345	0.001
	(UO2)2OH+3	1.313e-26	6.490e-27	-25.882	-26.188	-0.306
Zn	2.142e-06					
	Zn(OH)2	1.038e-06	1.039e-06	-5.984	-5.983	0.001
	Zn(CO3)2-2	9.339e-07	6.828e-07	-6.030	-6.166	-0.136
	ZnCO3	1.318e-07	1.320e-07	-6.880	-6.880	0.001
	Zn(OH)3-	1.952e-08	1.805e-08	-7.709	-7.743	-0.034
	ZnOH+	1.494e-08	1.381e-08	-7.826	-7.860	-0.034
	Zn+2	3.739e-09	2.733e-09	-8.427	-8.563	-0.136
	ZnHCO3+	3.665e-10	3.389e-10	-9.436	-9.470	-0.034
	ZnOHCl	2.460e-10	2.463e-10	-9.609	-9.608	0.001
	ZnSO4	1.893e-10	1.895e-10	-9.723	-9.722	0.001
	Zn(OH)4-2	2.150e-11	1.572e-11	-10.667	-10.804	-0.136
	ZnCl+	3.558e-12	3.290e-12	-11.449	-11.483	-0.034
	ZnF+	1.375e-12	1.271e-12	-11.862	-11.896	-0.034
	Zn(SO4)2-2	6.458e-13	4.722e-13	-12.190	-12.326	-0.136
	ZnCl2	1.688e-15	1.690e-15	-14.773	-14.772	0.001
	ZnCl3-	1.002e-18	9.264e-19	-17.999	-18.033	-0.034
	ZnCl4-2	3.088e-22	2.258e-22	-21.510	-21.646	-0.136

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-1.87	9.08	10.95	Al(OH)3
AlAsO4:2H2O	-10.89	-6.11	4.78	AlAsO4:2H2O
AlumK	-25.34	-30.55	-5.21	KAl(SO4)2:12H2O
Alunite	-11.28	-12.39	-1.11	KAl3(SO4)2(OH)6
Anglesite	-6.12	-13.92	-7.80	PbSO4
Anhydrite	-3.07	-7.42	-4.35	CaSO4
Antlerite	-7.43	0.86	8.29	Cu3(OH)4SO4
Aragonite	0.81	-7.51	-8.32	CaCO3
Arsenolite	-91.52	-170.68	-79.15	As4O6
Artinite	-2.89	6.87	9.76	MgCO3:Mg(OH)2:3H2O
As2O5	-37.11	-30.38	6.73	As2O5
Atacamite	-4.58	2.87	7.45	Cu2(OH)3Cl
Azurite	-5.55	-22.33	-16.77	Cu3(OH)2(CO3)2
B-UO2(OH)2	-2.76	2.87	5.62	UO2(OH)2
Ba3(AsO4)2	18.18	9.25	-8.93	Ba3(AsO4)2
BaF2	-9.45	-15.21	-5.77	BaF2
Barite	0.21	-9.79	-10.01	BaSO4
Basaluminite	-9.37	13.33	22.70	Al4(OH)10SO4
Bianchite	-10.32	-12.08	-1.76	ZnSO4:6H2O
Birnessite	-3.42	40.18	43.60	MnO2
Bixbyite	2.09	52.88	50.79	Mn2O3
Boehmite	0.34	9.08	8.74	AlOOH
Brochantite	-6.52	8.82	15.34	Cu4(OH)6SO4
Brucite	-2.01	14.98	16.99	Mg(OH)2
Bunsenite	-2.93	9.66	12.59	NiO
Ca3(AsO4)2:4w	-5.96	16.37	22.33	Ca3(AsO4)2:4H2O
Calcite	0.95	-7.51	-8.47	CaCO3
Cerrusite	-0.86	-14.02	-13.16	PbCO3
Chalcanthite	-12.40	-15.05	-2.65	CuSO4:5H2O
Claudetite	-91.26	-170.68	-79.41	As4O6
CO2(g)	-4.94	-23.10	-18.15	CO2
Cotunnite	-12.21	-17.01	-4.80	PbCl2
Cu(OH)2	-0.77	7.96	8.73	Cu(OH)2
Cu2SO4	-27.23	-34.57	-7.35	Cu2SO4
Cu3(AsO4)2:6w	-12.62	-6.51	6.11	Cu3(AsO4)2:6H2O
CuCO3	-5.51	-15.14	-9.63	CuCO3
CuF	-24.43	-19.99	4.44	CuF
CuF2	-19.92	-20.46	-0.54	CuF2
CuF2:2H2O	-15.94	-20.46	-4.53	CuF2:2H2O
CuMetal	-7.96	-19.52	-11.57	Cu
CuOCuSO4	-18.82	-7.09	11.73	CuO:CuSO4
CupricFerrite	17.08	49.33	32.25	CuFe2O4
Cuprite	-4.56	-11.57	-7.01	Cu2O
CuprousFerrite	13.44	14.90	1.47	CuFeO2
CuSO4	-18.16	-15.05	3.11	CuSO4
Diaspore	2.06	9.08	7.02	AlOOH
Dolomite	1.41	-15.63	-17.04	CaMg(CO3)2
Dolomite(d)	0.85	-15.63	-16.48	CaMg(CO3)2
Epsomite	-5.86	-8.02	-2.16	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.74	16.77	10.04	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.72	20.69	17.97	Fe(OH)3
Fe3(OH)8	1.95	48.32	46.37	Fe3(OH)8
Fluorite	-2.21	-12.84	-10.63	CaF2
Gibbsite	0.84	9.08	8.24	Al(OH)3
Goethite	8.61	20.69	12.08	FeOOH
Goslarite	-10.11	-12.09	-1.98	ZnSO4:7H2O
Gummite	-7.67	2.87	10.53	UO3
Gypsum	-2.84	-7.42	-4.58	CaSO4:2H2O
H2(g)	-27.43	-27.48	-0.05	H2
Halite	-7.26	-5.68	1.58	NaCl
Hausmannite	3.98	65.58	61.60	Mn3O4
Hematite	19.06	41.37	22.32	Fe2O3
Huntite	-2.03	-31.85	-29.82	CaMg3(CO3)4
Hydrocerrusite	-1.50	-18.96	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-9.00	-17.46	-8.46	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-10.04	21.18	31.23	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-7.77	22.43	30.19	KFe3(SO4)2(OH)6
Jarosite-Na	-10.73	23.42	34.15	NaFe3(SO4)2(OH)6
JarositeH	-18.09	16.06	34.15	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-10.69	-13.92	-3.23	AlOHSO4
Langite	-8.20	8.82	17.02	Cu4(OH)6SO4:H2O
Larnakite	-4.60	-4.85	-0.24	PbO:PbSO4
Laurionite	-4.59	-3.97	0.62	PbOHCl
Litharge	-3.74	9.08	12.81	PbO
Maghemite	8.84	41.37	32.54	Fe2O3
Magnesite	-0.12	-8.11	-7.99	MgCO3
Magnetite	18.15	48.32	30.17	Fe3O4
Malachite	-2.10	-7.19	-5.09	Cu2(OH)2CO3
Manganite	1.10	26.44	25.34	MnOOH
Massicot	-3.93	9.08	13.01	PbO
Matlockite	-8.70	-18.18	-9.48	PbClF
Melanothallite	-21.94	-18.13	3.80	CuCl2
Melanterite	-13.82	-16.05	-2.24	FeSO4:7H2O
Minium	-19.56	54.71	74.28	Pb3O4
Mirabilite	-7.05	-8.27	-1.22	Na2SO4:10H2O
Mn2(SO4)3	-61.95	-16.12	45.83	Mn2(SO4)3
Mn3(AsO4):8H2O	-4.81	7.72	12.53	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-16.00	-13.39	2.61	MnCl2:4H2O
MnSO4	-13.06	-10.30	2.76	MnSO4
Morenosite	-10.97	-13.34	-2.38	NiSO4:7H2O
Na4UO2(CO3)3	-20.68	-36.97	-16.29	Na4UO2(CO3)3
Nahcolite	-4.81	-15.73	-10.92	NaHCO3
Nantokite	-9.30	-18.83	-9.53	CuCl
Natron	-6.97	-8.37	-1.40	Na2CO3:10H2O
Nesquehonite	-2.52	-8.11	-5.59	MgCO3:3H2O
Ni(OH)2	-0.97	9.66	10.63	Ni(OH)2
Ni3(AsO4)2:8H2O	-17.13	-1.41	15.72	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-16.37	15.63	32.00	Ni4(OH)6SO4
NiCO3	-6.66	-13.44	-6.78	NiCO3
Nsutite	-2.38	40.18	42.56	MnO2
O2(g)	-29.01	54.96	83.97	O2
Pb(OH)2	0.85	9.08	8.23	Pb(OH)2
Pb2(OH)3Cl	-3.68	5.11	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-8.05	18.15	26.20	PbO:Pb(OH)2
Pb2O3	-15.41	45.63	61.04	Pb2O3
Pb2OCO3	-4.51	-4.94	-0.43	PbO:PbCO3
Pb3(AsO4)2	-8.98	-3.15	5.83	Pb3(AsO4)2
Pb3O2CO3	-7.04	4.13	11.17	PbCO3:2PbO
Pb3O2SO4	-6.29	4.23	10.52	PbSO4:2PbO
Pb4(OH)6SO4	-7.79	13.31	21.10	Pb4(OH)6SO4
Pb4O3SO4	-8.99	13.31	22.30	PbSO4:3PbO
PbF2	-11.91	-19.34	-7.44	PbF2
PbMetal	-22.67	-18.40	4.27	Pb
PbO:0.3H2O	-3.90	9.08	12.98	PbO:0.33H2O
Phosgenite	-11.22	-31.03	-19.81	PbCl2:PbCO3
Plattnerite	-13.15	36.56	49.70	PbO2
Portlandite	-7.40	15.58	22.98	Ca(OH)2
Pyrochroite	-2.50	12.70	15.20	Mn(OH)2
Pyrolusite	-1.57	40.18	41.75	MnO2
Retgersite	-11.30	-13.34	-2.05	NiSO4:6H2O
Rhodochrosite	0.73	-10.40	-11.12	MnCO3
Rhodochrosite(d)	-0.01	-10.40	-10.39	MnCO3
Rutherfordine	-5.79	-20.23	-14.44	UO2CO3
Schoepite	-2.61	2.87	5.47	UO2(OH)2:H2O
Scorodite	-7.94	5.50	13.44	FeAsO4:2H2O
Siderite	-5.27	-16.15	-10.88	FeCO3
Siderite(d)(3)	-5.70	-16.15	-10.45	FeCO3
Smithsonite	-2.20	-12.18	-9.98	ZnCO3
Tenorite	0.25	7.96	7.71	CuO
Thenardite	-8.10	-8.27	-0.18	Na2SO4
Thermonatrite	-8.51	-8.37	0.14	Na2CO3:H2O
Trona	-13.06	-24.10	-11.04	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-35.18	-47.62	-12.44	U(OH)2SO4
U3O8(c)	-12.36	-18.88	-6.52	U3O8
U4O9(c)	-31.22	-70.98	-39.75	U4O9
UF4(c)	-53.72	-81.45	-27.73	UF4
UF4:2.5H2O	-44.65	-81.45	-36.80	UF4:2.5H2O
UO2(a)	-15.48	-24.61	-9.14	UO2
UO3(gamma)	-4.96	2.87	7.83	UO3
Uraninite(c)	-10.68	-24.61	-13.93	UO2
Witherite	-1.32	-9.89	-8.57	BaCO3
Zincite(c)	-0.35	10.92	11.26	ZnO
Zincosite	-15.20	-12.08	3.12	ZnSO4
Zn(OH)2-a	-1.53	10.92	12.45	Zn(OH)2
Zn(OH)2-b	-0.83	10.92	11.75	Zn(OH)2
Zn(OH)2-c	-1.28	10.92	12.20	Zn(OH)2
Zn(OH)2-e	-0.58	10.92	11.50	Zn(OH)2
Zn(OH)2-g	-0.79	10.92	11.71	Zn(OH)2
Zn2(OH)2SO4	-8.67	-1.17	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.41	8.79	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-11.32	2.37	13.69	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-32.63	-13.25	19.37	ZnO:2ZnSO4
Zn4(OH)6SO4	-7.73	20.67	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-10.01	28.49	38.50	Zn5(OH)8Cl2
ZnCl2	-22.30	-15.17	7.13	ZnCl2
ZnCO3:H2O	-1.92	-12.18	-10.26	ZnCO3:H2O
ZnF2	-16.06	-17.50	-1.45	ZnF2
ZnMetal	-42.53	-16.56	25.97	Zn
ZnO(a)	-0.39	10.92	11.31	ZnO
ZnSO4:H2O	-11.58	-12.08	-0.51	ZnSO4:H2O

End of simulation.

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Reading data base.
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           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 14.5-15.5m
           SOLUTION        15
           units           mg/l
           temp            20
           pH              9.67
           F               1
           Cl              24
           S(6)            28          as SO4
           Na              116
           K               23
           Mg              1.2
           Ca              10.2
           Alkalinity      152.5       as HCO3
           Al              5.51
           As              2.6
           Ba              0.198
           Cu              0.076
           Fe              3.46
           Mn              0.15
           Ni              0.017
           Pb              0.047
           U               1.15
           Zn              0.066
           END
```

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TITLE
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   Schneckentein 14.5-15.5m

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Beginning of initial solution calculations.
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Initial solution 15.

----------------------------Solution composition--------------
---------------

            Elements           Molality       Moles

            Al                2.043e-04   2.043e-04
            Alkalinity        2.500e-03   2.500e-03
            As                3.472e-05   3.472e-05
            Ba                1.442e-06   1.442e-06
            Ca                2.546e-04   2.546e-04
            Cl                6.772e-04   6.772e-04
            Cu                1.196e-06   1.196e-06
            F                 5.266e-05   5.266e-05
            Fe                6.198e-05   6.198e-05
            K                 5.884e-04   5.884e-04
            Mg                4.938e-05   4.938e-05
            Mn                2.731e-06   2.731e-06
            Na                5.048e-03   5.048e-03
            Ni                2.897e-07   2.897e-07
            Pb                2.269e-07   2.269e-07
            S(6)              2.916e-04   2.916e-04
            U                 4.833e-06   4.833e-06
            Zn                1.010e-06   1.010e-06
```

```
----------------------------Description of solution-------------------------
---

                                    pH  =   9.670
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   5.392e-03
                     Mass of water (kg)  =   1.000e+00
                    Total carbon (mol/kg)  =   1.202e-03
                       Total CO2 (mol/kg)  =   1.202e-03
                      Temperature (deg C)  =  20.000
                  Electrical balance (eq)  =   3.094e-03
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  33.81
                                Iterations  =  18
                                   Total H  = 1.110145e+02
                                   Total O  = 5.551223e+01
```

----------Distribution of species----------

	Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
	OH-	3.432e-05	3.175e-05	-4.465	-4.498	-0.034
	H+	2.293e-10	2.138e-10	-9.640	-9.670	-0.030
	H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	2.043e-04					
	Al(OH)4-	2.043e-04	1.890e-04	-3.690	-3.724	-0.034
	Al(OH)3	2.276e-08	2.279e-08	-7.643	-7.642	0.001
	Al(OH)2+	5.229e-11	4.838e-11	-10.282	-10.315	-0.034
	AlOH+2	2.824e-15	2.069e-15	-14.549	-14.684	-0.135
	AlF2+	7.433e-16	6.878e-16	-15.129	-15.163	-0.034
	AlF3	4.168e-16	4.173e-16	-15.380	-15.380	0.001
	AlF+2	3.968e-17	2.908e-17	-16.401	-16.536	-0.135
	AlF4-	8.690e-18	8.041e-18	-17.061	-17.095	-0.034
	Al+3	1.245e-19	6.189e-20	-18.905	-19.208	-0.304
	AlSO4+	4.061e-20	3.758e-20	-19.391	-19.425	-0.034
	Al(SO4)2-	2.572e-22	2.380e-22	-21.590	-21.623	-0.034
	AlHSO4+2	9.330e-31	6.838e-31	-30.030	-30.165	-0.135
As(3)	3.330e-23					
	H2AsO3-	2.366e-23	2.189e-23	-22.626	-22.660	-0.034
	H3AsO3	9.545e-24	9.557e-24	-23.020	-23.020	0.001
	HAsO3-2	8.866e-26	6.498e-26	-25.052	-25.187	-0.135
	AsO3-3	1.980e-29	9.844e-30	-28.703	-29.007	-0.304
	H4AsO3+	1.094e-33	1.012e-33	-32.961	-32.995	-0.034
As(5)	3.472e-05					
	HAsO4-2	3.415e-05	2.503e-05	-4.467	-4.601	-0.135
	AsO4-3	5.269e-07	2.619e-07	-6.278	-6.582	-0.304
	H2AsO4-	3.387e-08	3.134e-08	-7.470	-7.504	-0.034
	H3AsO4	1.116e-15	1.117e-15	-14.953	-14.952	0.001
Ba	1.442e-06					
	Ba+2	1.268e-06	9.295e-07	-5.897	-6.032	-0.135
	BaSO4	9.543e-08	9.554e-08	-7.020	-7.020	0.001
	BaCO3	7.149e-08	7.158e-08	-7.146	-7.145	0.001
	BaHCO3+	6.884e-09	6.369e-09	-8.162	-8.196	-0.034
	BaOH+	1.592e-10	1.473e-10	-9.798	-9.832	-0.034
C(4)	1.202e-03					
	HCO3-	9.024e-04	8.367e-04	-3.045	-3.077	-0.033
	CO3-2	2.230e-04	1.648e-04	-3.652	-3.783	-0.131
	CaCO3	3.870e-05	3.875e-05	-4.412	-4.412	0.001
	NaCO3-	1.195e-05	1.106e-05	-4.923	-4.956	-0.034
	MgCO3	4.600e-06	4.605e-06	-5.337	-5.337	0.001
	UO2(CO3)3-4	4.319e-06	1.246e-06	-5.365	-5.904	-0.540
	MnCO3	2.439e-06	2.442e-06	-5.613	-5.612	0.001
	NaHCO3	2.188e-06	2.191e-06	-5.660	-5.659	0.001
	CaHCO3+	1.628e-06	1.507e-06	-5.788	-5.822	-0.034
	CO2	4.305e-07	4.310e-07	-6.366	-6.366	0.001
	Zn(CO3)2-2	3.356e-07	2.460e-07	-6.474	-6.609	-0.135
	MgHCO3+	3.281e-07	3.035e-07	-6.484	-6.518	-0.034
	NiCO3	2.077e-07	2.079e-07	-6.683	-6.682	0.001
	UO2(CO3)2-2	1.638e-07	1.200e-07	-6.786	-6.921	-0.135
	PbCO3	1.365e-07	1.367e-07	-6.865	-6.864	0.001
	Ni(CO3)2-2	8.126e-08	5.955e-08	-7.090	-7.225	-0.135
	Pb(CO3)2-2	7.721e-08	5.659e-08	-7.112	-7.247	-0.135
	BaCO3	7.149e-08	7.158e-08	-7.146	-7.145	0.001
	ZnCO3	6.973e-08	6.981e-08	-7.157	-7.156	0.001
	MnHCO3+	1.503e-08	1.391e-08	-7.823	-7.857	-0.034
	BaHCO3+	6.884e-09	6.369e-09	-8.162	-8.196	-0.034
	CuCO3	2.311e-09	2.314e-09	-8.636	-8.636	0.001
	Cu(CO3)2-2	6.549e-10	4.800e-10	-9.184	-9.319	-0.135
	ZnHCO3+	2.417e-10	2.236e-10	-9.617	-9.650	-0.034
	PbHCO3+	3.428e-11	3.172e-11	-10.465	-10.499	-0.034
	UO2CO3	3.404e-11	3.408e-11	-10.468	-10.467	0.001
	NiHCO3+	2.124e-11	1.966e-11	-10.673	-10.707	-0.034
	FeCO3	5.158e-12	5.164e-12	-11.288	-11.287	0.001
	CuHCO3+	1.185e-12	1.096e-12	-11.926	-11.960	-0.034
	FeHCO3+	1.181e-13	1.093e-13	-12.928	-12.961	-0.034
	(UO2)3(CO3)6-6	4.150e-17	2.533e-18	-16.382	-17.596	-1.214
	UO2(CO3)3-5	1.302e-22	1.867e-23	-21.885	-22.729	-0.843
	U(CO3)4-4	6.292e-36	1.816e-36	-35.201	-35.741	-0.540
	U(CO3)5-6	3.471e-38	2.118e-39	-37.460	-38.674	-1.214
Ca	2.546e-04					
	Ca+2	2.081e-04	1.537e-04	-3.682	-3.813	-0.132
	CaCO3	3.870e-05	3.875e-05	-4.412	-4.412	0.001
	CaSO4	5.990e-06	5.998e-06	-5.223	-5.222	0.001
	CaHCO3+	1.628e-06	1.507e-06	-5.788	-5.822	-0.034
	CaOH+	1.289e-07	1.193e-07	-6.890	-6.923	-0.034
	CaF+	6.226e-08	5.761e-08	-7.206	-7.240	-0.034
	CaHSO4+	7.651e-15	7.079e-15	-14.116	-14.150	-0.034
Cl	6.772e-04					
	Cl-	6.772e-04	6.260e-04	-3.169	-3.203	-0.034
	MnCl+	5.142e-10	4.757e-10	-9.289	-9.323	-0.034
	ZnOHCl	2.056e-10	2.058e-10	-9.687	-9.687	0.001
	ZnCl+	3.090e-12	2.859e-12	-11.510	-11.544	-0.034
	PbCl+	1.133e-12	1.049e-12	-11.946	-11.979	-0.034
	NiCl+	2.892e-13	2.676e-13	-12.539	-12.572	-0.034
	MnCl2	1.298e-13	1.300e-13	-12.887	-12.886	0.001
	CuCl2-	1.773e-14	1.641e-14	-13.751	-13.785	-0.034
	CuCl+	3.711e-15	3.434e-15	-14.431	-14.464	-0.034
	ZnCl2	1.834e-15	1.836e-15	-14.737	-14.736	0.001
	FeCl+	1.220e-15	1.129e-15	-14.914	-14.947	-0.034
	PbCl2	1.143e-15	1.144e-15	-14.942	-14.942	0.001
	NiCl2	6.075e-16	6.083e-16	-15.216	-15.216	0.001
	MnCl3-	2.423e-17	2.242e-17	-16.616	-16.649	-0.034
	CuCl3-2	2.178e-17	1.597e-17	-16.662	-16.797	-0.135
	ZnCl3-	1.352e-18	1.251e-18	-17.869	-17.903	-0.034
	CuCl2	1.091e-18	1.093e-18	-17.962	-17.962	0.001
	PbCl3-	5.959e-19	5.513e-19	-18.225	-18.259	-0.034
	UO2Cl+	4.755e-20	4.399e-20	-19.323	-19.357	-0.034
	ZnCl4-2	5.143e-22	3.770e-22	-21.289	-21.424	-0.135
	PbCl4-2	2.167e-22	1.589e-22	-21.664	-21.799	-0.135
	FeCl+2	2.073e-23	1.519e-23	-22.683	-22.818	-0.135
	CuCl3-	2.397e-24	2.218e-24	-23.620	-23.654	-0.034
	UO2Cl2	1.407e-24	1.408e-24	-23.852	-23.851	0.001
	FeCl2+	5.394e-26	4.991e-26	-25.268	-25.302	-0.034
	CuCl4-2	8.439e-30	6.185e-30	-29.074	-29.209	-0.135
	FeCl3	3.120e-30	3.124e-30	-29.506	-29.505	0.001
	UCl+3	0.000e+00	0.000e+00	-54.632	-54.936	-0.304
Cu(1)	1.591e-13					
	Cu+	1.414e-13	1.308e-13	-12.850	-12.883	-0.034
	CuCl2-	1.773e-14	1.641e-14	-13.751	-13.785	-0.034
	CuCl3-2	2.178e-17	1.597e-17	-16.662	-16.797	-0.135
Cu(2)	1.196e-06					
	Cu(OH)2	1.193e-06	1.194e-06	-5.923	-5.923	0.001
	CuCO3	2.311e-09	2.314e-09	-8.636	-8.636	0.001
	Cu(CO3)2-2	6.549e-10	4.800e-10	-9.184	-9.319	-0.135
	Cu(OH)3-	3.638e-10	3.366e-10	-9.439	-9.473	-0.034
	CuOH+	1.321e-10	1.222e-10	-9.879	-9.913	-0.034
	Cu+2	3.566e-12	2.614e-12	-11.448	-11.583	-0.135
	CuHCO3+	1.185e-12	1.096e-12	-11.926	-11.960	-0.034
	Cu(OH)4-2	4.285e-13	3.141e-13	-12.368	-12.503	-0.135
	CuSO4	1.055e-13	1.057e-13	-12.977	-12.976	0.001
	Cu2(OH)2+2	5.385e-15	3.947e-15	-14.269	-14.404	-0.135
	CuCl+	3.711e-15	3.434e-15	-14.431	-14.464	-0.034
	CuF+	2.377e-15	2.200e-15	-14.624	-14.658	-0.034
	CuCl2	1.091e-18	1.093e-18	-17.962	-17.962	0.001
	CuCl3-	2.397e-24	2.218e-24	-23.620	-23.654	-0.034
	CuCl4-2	8.439e-30	6.185e-30	-29.074	-29.209	-0.135
F	5.266e-05					
	F-	5.236e-05	4.845e-05	-4.281	-4.315	-0.034
	NaF	1.296e-07	1.298e-07	-6.887	-6.887	0.001
	MgF+	9.977e-08	9.231e-08	-7.001	-7.035	-0.034
	CaF+	6.226e-08	5.761e-08	-7.206	-7.240	-0.034
	MnF+	6.758e-11	6.253e-11	-10.170	-10.204	-0.034
	HF	1.419e-11	1.421e-11	-10.848	-10.847	0.001
	ZnF+	1.473e-12	1.363e-12	-11.832	-11.866	-0.034
	NiF+	1.778e-13	1.645e-13	-12.750	-12.784	-0.034
	PbF+	4.444e-14	4.112e-14	-13.352	-13.386	-0.034
	HF2-	2.738e-15	2.533e-15	-14.563	-14.596	-0.034
	CuF+	2.377e-15	2.200e-15	-14.624	-14.658	-0.034
	AlF2+	7.433e-16	6.878e-16	-15.129	-15.163	-0.034
	FeF+	6.840e-16	6.329e-16	-15.165	-15.199	-0.034
	AlF3	4.168e-16	4.173e-16	-15.380	-15.380	0.001
	UO2F+	3.195e-16	2.956e-16	-15.496	-15.529	-0.034
	UO2F2	4.834e-17	4.840e-17	-16.316	-16.315	0.001
	PbF2	4.063e-17	4.068e-17	-16.391	-16.391	0.001
	AlF+2	3.968e-17	2.908e-17	-16.401	-16.536	-0.135
	AlF4-	8.690e-18	8.041e-18	-17.061	-17.095	-0.034
	UO2F3-	4.821e-19	4.461e-19	-18.317	-18.351	-0.034
	FeF2+	1.316e-19	1.218e-19	-18.881	-18.914	-0.034
	FeF+2	9.151e-20	6.707e-20	-19.039	-19.173	-0.135
	PbF3-	1.543e-20	1.428e-20	-19.812	-19.845	-0.034
	FeF3	9.180e-21	9.191e-21	-20.037	-20.037	0.001
	H2F2	6.281e-22	6.289e-22	-21.202	-21.201	0.001
	UO2F4-2	1.887e-22	1.383e-22	-21.724	-21.859	-0.135
	PbF4-2	4.518e-25	3.311e-25	-24.345	-24.480	-0.135
	UF3+	0.000e+00	0.000e+00	-44.821	-44.854	-0.034
	UF4	0.000e+00	0.000e+00	-45.257	-45.257	0.001
	UF2+2	0.000e+00	0.000e+00	-45.773	-45.908	-0.135
	UF5-	0.000e+00	0.000e+00	-48.099	-48.133	-0.034
	UF+3	0.000e+00	0.000e+00	-48.204	-48.507	-0.304
	UF6-2	0.000e+00	0.000e+00	-50.203	-50.338	-0.135
Fe(2)	8.571e-12					
	FeCO3	5.158e-12	5.164e-12	-11.288	-11.287	0.001
	Fe+2	1.782e-12	1.306e-12	-11.749	-11.884	-0.135
	FeOH+	1.428e-12	1.321e-12	-11.845	-11.879	-0.034
	FeHCO3+	1.181e-13	1.093e-13	-12.928	-12.961	-0.034
	FeSO4	4.335e-14	4.341e-14	-13.363	-13.362	0.001
	Fe(OH)2	3.375e-14	3.379e-14	-13.472	-13.471	0.001
	Fe(OH)3-	6.036e-15	5.585e-15	-14.219	-14.253	-0.034
	FeCl+	1.220e-15	1.129e-15	-14.914	-14.947	-0.034
	FeF+	6.840e-16	6.329e-16	-15.165	-15.199	-0.034
	FeHSO4+	6.502e-23	6.016e-23	-22.187	-22.221	-0.034

Fe(3)	6.198e-05					
	Fe(OH)4-	4.894e-05	4.528e-05	-4.310	-4.344	-0.034
	Fe(OH)3	1.301e-05	1.302e-05	-4.886	-4.885	0.001
	Fe(OH)2+	2.916e-08	2.698e-08	-7.535	-7.569	-0.034
	FeOH+2	2.883e-14	2.113e-14	-13.540	-13.675	-0.135
	FeF2+	1.316e-19	1.218e-19	-18.881	-18.914	-0.034
	FeF+2	9.151e-20	6.707e-20	-19.039	-19.173	-0.135
	FeF3	9.180e-21	9.191e-21	-20.037	-20.037	0.001
	FeSO4+	2.050e-21	1.897e-21	-20.688	-20.722	-0.034
	Fe+3	1.899e-21	9.440e-22	-20.721	-21.025	-0.304
	FeCl+2	2.073e-23	1.519e-23	-22.683	-22.818	-0.135
	Fe(SO4)2-	9.018e-24	8.344e-24	-23.045	-23.079	-0.034
	FeCl2+	5.394e-26	4.991e-26	-25.268	-25.302	-0.034
	Fe2(OH)2+4	5.139e-26	1.483e-26	-25.289	-25.829	-0.540
	FeCl3	3.120e-30	3.124e-30	-29.506	-29.505	0.001
	FeHSO4+2	1.490e-30	1.092e-30	-29.827	-29.962	-0.135
	Fe3(OH)4+5	9.318e-31	1.336e-31	-30.031	-30.874	-0.843
H(0)	6.543e-31					
	H2	3.271e-31	3.275e-31	-30.485	-30.485	0.001
K	5.884e-04					
	K+	5.876e-04	5.432e-04	-3.231	-3.265	-0.034
	KSO4-	7.989e-07	7.392e-07	-6.097	-6.131	-0.034
Mg	4.938e-05					
	Mg+2	4.265e-05	3.162e-05	-4.370	-4.500	-0.130
	MgCO3	4.600e-06	4.605e-06	-5.337	-5.337	0.001
	MgSO4	1.332e-06	1.334e-06	-5.876	-5.875	0.001
	MgOH+	3.666e-07	3.392e-07	-6.436	-6.470	-0.034
	MgHCO3+	3.281e-07	3.035e-07	-6.484	-6.518	-0.034
	MgF+	9.977e-08	9.231e-08	-7.001	-7.035	-0.034
Mn(2)	2.731e-06					
	MnCO3	2.439e-06	2.442e-06	-5.613	-5.612	0.001
	Mn+2	2.545e-07	1.865e-07	-6.594	-6.729	-0.135
	MnOH+	1.601e-08	1.481e-08	-7.796	-7.829	-0.034
	MnHCO3+	1.503e-08	1.391e-08	-7.823	-7.857	-0.034
	MnSO4	6.167e-09	6.174e-09	-8.210	-8.209	0.001
	MnCl+	5.142e-10	4.757e-10	-9.289	-9.323	-0.034
	MnF+	6.758e-11	6.253e-11	-10.170	-10.204	-0.034
	Mn(OH)3-	3.268e-13	3.024e-13	-12.486	-12.519	-0.034
	MnCl2	1.298e-13	1.300e-13	-12.887	-12.886	0.001
	MnCl3-	2.423e-17	2.242e-17	-16.616	-16.649	-0.034
Mn(3)	5.519e-29					
	Mn+3	5.519e-29	2.743e-29	-28.258	-28.562	-0.304
Mn(6)	2.818e-34					
	MnO4-2	2.818e-34	2.065e-34	-33.550	-33.685	-0.135
Mn(7)	4.287e-40					
	MnO4-	4.287e-40	3.967e-40	-39.368	-39.402	-0.034
Na	5.048e-03					
	Na+	5.028e-03	4.656e-03	-2.299	-2.332	-0.033
	NaCO3-	1.195e-05	1.106e-05	-4.923	-4.956	-0.034
	NaSO4-	5.008e-06	4.634e-06	-5.300	-5.334	-0.034
	NaHCO3	2.188e-06	2.191e-06	-5.660	-5.659	0.001
	NaF	1.296e-07	1.298e-07	-6.887	-6.887	0.001
Ni	2.897e-07					
	NiCO3	2.077e-07	2.079e-07	-6.683	-6.682	0.001
	Ni(CO3)2-2	8.126e-08	5.955e-08	-7.090	-7.225	-0.135
	Ni(OH)2	3.718e-10	3.722e-10	-9.430	-9.429	0.001
	Ni+2	2.322e-10	1.702e-10	-9.634	-9.769	-0.135
	NiOH+	8.305e-11	7.684e-11	-10.081	-10.114	-0.034
	NiHCO3+	2.124e-11	1.966e-11	-10.673	-10.707	-0.034
	Ni(OH)3-	1.881e-11	1.741e-11	-10.726	-10.759	-0.034
	NiSO4	6.506e-12	6.514e-12	-11.187	-11.186	0.001
	NiCl+	2.892e-13	2.676e-13	-12.539	-12.572	-0.034
	NiF+	1.778e-13	1.645e-13	-12.750	-12.784	-0.034
	NiCl2	6.075e-16	6.083e-16	-15.216	-15.216	0.001
	Ni(SO4)2-2	1.023e-16	7.496e-17	-15.990	-16.125	-0.135
O(0)	1.641e-33					
	O2	8.207e-34	8.218e-34	-33.086	-33.085	0.001
Pb	2.269e-07					
	PbCO3	1.365e-07	1.367e-07	-6.865	-6.864	0.001
	Pb(CO3)2-2	7.721e-08	5.659e-08	-7.112	-7.247	-0.135
	Pb(OH)2	7.909e-09	7.919e-09	-8.102	-8.101	0.001
	PbOH+	4.704e-09	4.352e-09	-8.328	-8.361	-0.034
	Pb(OH)3-	4.595e-10	4.252e-10	-9.338	-9.371	-0.034
	Pb+2	6.512e-11	4.773e-11	-10.186	-10.321	-0.135
	PbHCO3+	3.428e-11	3.172e-11	-10.465	-10.499	-0.034
	Pb(OH)4-2	6.215e-12	4.555e-12	-11.207	-11.341	-0.135
	PbSO4	5.498e-12	5.505e-12	-11.260	-11.259	0.001
	PbCl+	1.133e-12	1.049e-12	-11.946	-11.979	-0.034
	PbF+	4.444e-14	4.112e-14	-13.352	-13.386	-0.034
	Pb(SO4)2-2	8.084e-15	5.925e-15	-14.092	-14.227	-0.135
	PbCl2	1.143e-15	1.144e-15	-14.942	-14.942	0.001
	Pb3(OH)4+2	4.362e-17	3.197e-17	-16.360	-16.495	-0.135
	PbF2	4.063e-17	4.068e-17	-16.391	-16.391	0.001
	Pb2OH+3	9.357e-18	4.650e-18	-17.029	-17.333	-0.304
	PbCl3-	5.959e-19	5.513e-19	-18.225	-18.259	-0.034
	PbF3-	1.543e-20	1.428e-20	-19.812	-19.845	-0.034
	PbCl4-2	2.167e-22	1.589e-22	-21.664	-21.799	-0.135
	PbF4-2	4.518e-25	3.311e-25	-24.345	-24.480	-0.135
S(6)	2.916e-04					
	SO4-2	2.783e-04	2.051e-04	-3.555	-3.688	-0.133
	CaSO4	5.990e-06	5.998e-06	-5.223	-5.222	0.001
	NaSO4-	5.008e-06	4.634e-06	-5.300	-5.334	-0.034
	MgSO4	1.332e-06	1.334e-06	-5.876	-5.875	0.001
	KSO4-	7.989e-07	7.392e-07	-6.097	-6.131	-0.034
	BaSO4	9.543e-08	9.554e-08	-7.020	-7.020	0.001
	MnSO4	6.167e-09	6.174e-09	-8.210	-8.209	0.001
	ZnSO4	9.803e-11	9.815e-11	-10.009	-10.008	0.001
	NiSO4	6.506e-12	6.514e-12	-11.187	-11.186	0.001
	PbSO4	5.498e-12	5.505e-12	-11.260	-11.259	0.001
	HSO4-	4.141e-12	3.831e-12	-11.383	-11.417	-0.034
	Zn(SO4)2-2	2.322e-13	1.702e-13	-12.634	-12.769	-0.135
	CuSO4	1.055e-13	1.057e-13	-12.977	-12.976	0.001
	FeSO4	4.335e-14	4.341e-14	-13.363	-13.362	0.001
	Pb(SO4)2-2	8.084e-15	5.925e-15	-14.092	-14.227	-0.135
	CaHSO4+	7.651e-15	7.079e-15	-14.116	-14.150	-0.034
	Ni(SO4)2-2	1.023e-16	7.496e-17	-15.990	-16.125	-0.135
	UO2SO4	1.268e-17	1.270e-17	-16.897	-16.896	0.001
	AlSO4+	4.061e-20	3.758e-20	-19.391	-19.425	-0.034
	UO2(SO4)2-2	3.121e-20	2.288e-20	-19.506	-19.641	-0.135
	FeSO4+	2.050e-21	1.897e-21	-20.688	-20.722	-0.034
	Al(SO4)2-	2.572e-22	2.380e-22	-21.590	-21.623	-0.034
	FeHSO4+	6.502e-23	6.016e-23	-22.187	-22.221	-0.034
	Fe(SO4)2-	9.018e-24	8.344e-24	-23.045	-23.079	-0.034
	FeHSO4+2	1.490e-30	1.092e-30	-29.827	-29.962	-0.135
	AlHSO4+2	9.330e-31	6.838e-31	-30.030	-30.165	-0.135
	U(SO4)2	0.000e+00	0.000e+00	-50.483	-50.483	0.001
	USO4+2	0.000e+00	0.000e+00	-50.506	-50.641	-0.135
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-66.306	-66.610	-0.304
U(4)	2.306e-24					
	U(OH)4	2.306e-24	2.308e-24	-23.637	-23.637	0.001
	U(OH)3+	2.073e-30	1.918e-30	-29.683	-29.717	-0.034
	U(CO3)4-4	6.292e-36	1.816e-36	-35.201	-35.741	-0.540
	U(OH)2+2	2.980e-37	2.184e-37	-36.526	-36.661	-0.135
	U(CO3)5-6	3.471e-38	2.118e-39	-37.460	-38.674	-1.214
	UOH+3	0.000e+00	0.000e+00	-44.215	-44.519	-0.304
	UF3+	0.000e+00	0.000e+00	-44.821	-44.854	-0.034
	UF4	0.000e+00	0.000e+00	-45.257	-45.257	0.001
	UF2+2	0.000e+00	0.000e+00	-45.773	-45.908	-0.135
	UF5-	0.000e+00	0.000e+00	-48.099	-48.133	-0.034
	UF+3	0.000e+00	0.000e+00	-48.204	-48.507	-0.304
	UF6-2	0.000e+00	0.000e+00	-50.203	-50.338	-0.135
	U(SO4)2	0.000e+00	0.000e+00	-50.483	-50.483	0.001
	USO4+2	0.000e+00	0.000e+00	-50.506	-50.641	-0.135
	U+4	0.000e+00	0.000e+00	-52.969	-53.509	-0.540
	UCl+3	0.000e+00	0.000e+00	-54.632	-54.936	-0.304
	U6(OH)15+9	0.000e+00	0.000e+00	-190.472	-193.204	-2.733
U(5)	1.844e-19					
	UO2+	1.843e-19	1.705e-19	-18.734	-18.768	-0.034
	UO2(CO3)3-5	1.302e-22	1.867e-23	-21.885	-22.729	-0.843
U(6)	4.833e-06					
	UO2(CO3)3-4	4.319e-06	1.246e-06	-5.365	-5.904	-0.540
	UO2(OH)3-	3.500e-07	3.239e-07	-6.456	-6.490	-0.034
	UO2(CO3)2-2	1.638e-07	1.200e-07	-6.786	-6.921	-0.135
	UO2CO3	3.404e-11	3.408e-11	-10.468	-10.467	0.001
	UO2(OH)4-2	3.275e-11	2.400e-11	-10.485	-10.620	-0.135
	UO2OH+	1.165e-12	1.078e-12	-11.933	-11.967	-0.034
	(UO2)3(OH)7-	6.682e-13	6.183e-13	-12.175	-12.209	-0.034
	UO2F+	3.195e-16	2.956e-16	-15.496	-15.529	-0.034
	UO2+2	6.847e-17	5.018e-17	-16.165	-16.299	-0.135
	UO2F2	4.834e-17	4.840e-17	-16.316	-16.315	0.001
	(UO2)3(OH)5+	4.184e-17	3.871e-17	-16.378	-16.412	-0.034
	(UO2)3(CO3)6-6	4.150e-17	2.533e-18	-16.382	-17.596	-1.214
	UO2SO4	1.268e-17	1.270e-17	-16.897	-16.896	0.001
	UO2F3-	4.821e-19	4.461e-19	-18.317	-18.351	-0.034
	(UO2)2(OH)2+2	1.343e-19	9.842e-20	-18.872	-19.007	-0.135
	UO2Cl+	4.755e-20	4.399e-20	-19.323	-19.357	-0.034
	(UO2)4(OH)7+	4.222e-20	3.906e-20	-19.375	-19.408	-0.034
	UO2(SO4)2-2	3.121e-20	2.288e-20	-19.506	-19.641	-0.135
	UO2F4-2	1.887e-22	1.383e-22	-21.724	-21.859	-0.135
	(UO2)3(OH)4+2	1.038e-22	7.610e-23	-21.984	-22.119	-0.135
	UO2Cl2	1.407e-24	1.408e-24	-23.852	-23.851	0.001
	(UO2)2OH+3	4.728e-26	2.350e-26	-25.325	-25.629	-0.304
Zn	1.010e-06					
	Zn(OH)2	5.838e-07	5.846e-07	-6.234	-6.233	0.001
	Zn(CO3)2-2	3.356e-07	2.460e-07	-6.474	-6.609	-0.135
	ZnCO3	6.973e-08	6.981e-08	-7.157	-7.156	0.001
	Zn(OH)3-	9.343e-09	8.645e-09	-8.029	-8.063	-0.034
	ZnOH+	8.000e-09	7.402e-09	-8.097	-8.131	-0.034
	Zn+2	2.897e-09	2.123e-09	-8.538	-8.673	-0.135
	ZnHCO3+	2.417e-10	2.236e-10	-9.617	-9.650	-0.034
	ZnOHCl	2.056e-10	2.058e-10	-9.687	-9.687	0.001
	ZnSO4	9.803e-11	9.815e-11	-10.009	-10.008	0.001
	Zn(OH)4-2	8.743e-12	6.408e-12	-11.058	-11.193	-0.135
	ZnCl+	3.090e-12	2.859e-12	-11.510	-11.544	-0.034
	ZnF+	1.473e-12	1.363e-12	-11.832	-11.866	-0.034
	Zn(SO4)2-2	2.322e-13	1.702e-13	-12.634	-12.769	-0.135
	ZnCl2	1.834e-15	1.836e-15	-14.737	-14.736	0.001
	ZnCl3-	1.352e-18	1.251e-18	-17.869	-17.903	-0.034
	ZnCl4-2	5.143e-22	3.770e-22	-21.289	-21.424	-0.135

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-1.33	9.80	11.13	Al(OH)3
AlAsO4:2H2O	-9.95	-5.15	4.80	AlAsO4:2H2O
AlumK	-24.59	-29.85	-5.26	KAl(SO4)2:12H2O
Alunite	-9.47	-10.25	-0.77	KAl3(SO4)2(OH)6
Anglesite	-6.19	-14.01	-7.82	PbSO4
Anhydrite	-3.16	-7.50	-4.34	CaSO4
Antlerite	-8.05	0.24	8.29	Cu3(OH)4SO4
Aragonite	0.71	-7.60	-8.31	CaCO3
Arsenolite	-89.10	-169.17	-80.07	As4O6
Artinite	-3.40	6.56	9.96	MgCO3:Mg(OH)2:3H2O
As2O5	-36.67	-29.90	6.77	As2O5
Atacamite	-4.93	2.64	7.57	Cu2(OH)3Cl
Azurite	-6.36	-22.97	-16.62	Cu3(OH)2(CO3)2
B-UO2(OH)2	-2.68	3.04	5.72	UO2(OH)2
Ba3(AsO4)2	18.97	10.02	-8.95	Ba3(AsO4)2
BaF2	-8.89	-14.66	-5.77	BaF2
Barite	0.33	-9.72	-10.05	BaSO4
Basaluminite	-6.52	16.18	22.70	Al4(OH)10SO4
Bianchite	-10.60	-12.36	-1.76	ZnSO4:6H2O
Birnessite	-3.65	39.95	43.60	MnO2
Bixbyite	1.32	52.56	51.24	Mn2O3
Boehmite	0.87	9.80	8.94	AlOOH
Brochantite	-7.34	8.00	15.34	Cu4(OH)6SO4
Brucite	-2.34	14.84	17.18	Mg(OH)2
Bunsenite	-3.18	9.57	12.75	NiO
Ca3(AsO4)2:4w	-5.70	16.68	22.37	Ca3(AsO4)2:4H2O
Calcite	0.86	-7.60	-8.45	CaCO3
Cerrusite	-0.91	-14.10	-13.19	PbCO3
Chalcanthite	-12.61	-15.27	-2.66	CuSO4:5H2O
Claudetite	-88.85	-169.17	-80.32	As4O6
CO2(g)	-4.96	-23.12	-18.16	CO2
Cotunnite	-11.89	-16.73	-4.84	PbCl2
Cu(OH)2	-1.07	7.76	8.83	Cu(OH)2
Cu2SO4	-27.56	-34.85	-7.29	Cu2SO4
Cu3(AsO4)2:6w	-12.79	-6.63	6.16	Cu3(AsO4)2:6H2O
CuCO3	-5.74	-15.37	-9.63	CuCO3
CuF	-24.43	-19.90	4.54	CuF
CuF2	-19.76	-20.21	-0.45	CuF2
CuF2:2H2O	-15.71	-20.21	-4.50	CuF2:2H2O
CuMetal	-7.91	-19.58	-11.67	Cu
CuOCuSO4	-19.49	-7.51	11.97	CuO:CuSO4
CupricFerrite	17.36	50.01	32.65	CuFe2O4
Cuprite	-4.80	-11.83	-7.03	Cu2O
CuprousFerrite	13.64	15.21	1.57	CuFeO2
CuSO4	-18.51	-15.27	3.24	CuSO4
Diaspore	2.61	9.80	7.19	AlOOH
Dolomite	1.09	-15.88	-16.97	CaMg(CO3)2
Dolomite(d)	0.52	-15.88	-16.40	CaMg(CO3)2
Epsomite	-6.01	-8.19	-2.18	MgSO4:7H2O
Fe(OH)2.7Cl.3	7.16	17.26	10.10	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	3.09	21.13	18.03	Fe(OH)3
Fe3(OH)8	3.20	49.71	46.50	Fe3(OH)8
Fluorite	-1.78	-12.44	-10.66	CaF2
Gibbsite	1.41	9.80	8.40	Al(OH)3
Goethite	8.98	21.13	12.14	FeOOH
Goslarite	-10.36	-12.36	-2.00	ZnSO4:7H2O
Gummite	-7.65	3.04	10.69	UO3
Gypsum	-2.92	-7.50	-4.58	CaSO4:2H2O
H2(g)	-27.29	-27.34	-0.05	H2
Halite	-7.11	-5.54	1.57	NaCl
Hausmannite	2.88	65.17	62.29	Mn3O4
Hematite	19.59	42.25	22.66	Fe2O3
Huntite	-2.80	-32.45	-29.65	CaMg3(CO3)4
Hydrocerrusite	-1.73	-19.19	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-10.18	-18.29	-8.11	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-8.95	22.47	31.42	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-6.88	23.73	30.60	KFe3(SO4)2(OH)6
Jarosite-Na	-9.94	24.66	34.60	NaFe3(SO4)2(OH)6
JarositeH	-17.40	17.32	34.72	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-10.00	-13.23	-3.23	AlOHSO4
Langite	-9.28	8.00	17.29	Cu4(OH)6SO4:H2O
Larnakite	-4.79	-4.99	-0.20	PbO:PbSO4
Laurionite	-4.48	-3.85	0.62	PbOHCl
Litharge	-3.91	9.02	12.92	PbO
Maghemite	9.58	42.25	32.67	Fe2O3
Magnesite	-0.33	-8.28	-7.95	MgCO3
Magnetite	19.06	49.71	30.65	Fe3O4
Malachite	-2.63	-7.61	-4.98	Cu2(OH)2CO3
Manganite	0.94	26.28	25.34	MnOOH
Massicot	-4.10	9.02	13.12	PbO
Matlockite	-8.31	-17.84	-9.53	PbClF
Melanothallite	-21.87	-17.99	3.88	CuCl2
Melanterite	-13.30	-15.57	-2.27	FeSO4:7H2O
Minium	-20.58	54.40	74.97	Pb3O4
Mirabilite	-7.00	-8.35	-1.35	Na2SO4:10H2O
Mn2(SO4)3	-62.97	-16.52	46.44	Mn2(SO4)3
Mn3(AsO4):8H2O	-4.64	7.93	12.57	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-15.63	-13.14	2.49	MnCl2:4H2O
MnSO4	-13.28	-10.42	2.86	MnSO4
Morenosite	-11.06	-13.46	-2.40	NiSO4:7H2O
Na4UO2(CO3)3	-20.69	-36.98	-16.29	Na4UO2(CO3)3
Nahcolite	-4.81	-15.79	-10.97	NaHCO3
Nantokite	-9.20	-18.79	-9.58	CuCl
Natron	-6.94	-8.45	-1.51	Na2CO3:10H2O
Nesquehonite	-2.73	-8.28	-5.55	MgCO3:3H2O
Ni(OH)2	-0.85	9.57	10.42	Ni(OH)2
Ni3(AsO4)2:8H2O	-16.96	-1.19	15.77	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-16.74	15.26	32.00	Ni4(OH)6SO4
NiCO3	-6.84	-13.55	-6.72	NiCO3
Nsutite	-2.61	39.95	42.56	MnO2
O2(g)	-30.23	54.68	84.91	O2
Pb(OH)2	0.69	9.02	8.32	Pb(OH)2
Pb2(OH)3Cl	-3.63	5.16	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-8.16	18.04	26.20	PbO:Pb(OH)2
Pb2O3	-15.66	45.38	61.04	Pb2O3
Pb2OCO3	-4.73	-5.09	-0.36	PbO:PbCO3
Pb3(AsO4)2	-8.72	-2.85	5.88	Pb3(AsO4)2
Pb3O2CO3	-7.42	3.93	11.35	PbCO3:2PbO
Pb3O2SO4	-6.63	4.03	10.66	PbSO4:2PbO
Pb4(OH)6SO4	-8.05	13.05	21.10	Pb4(OH)6SO4
Pb4O3SO4	-9.49	13.05	22.54	PbSO4:3PbO
PbF2	-11.52	-18.95	-7.43	PbF2
PbMetal	-22.59	-18.32	4.26	Pb
PbO:0.3H2O	-3.96	9.02	12.98	PbO:0.33H2O
Phosgenite	-11.02	-30.83	-19.81	PbCl2:PbCO3
Plattnerite	-13.83	36.36	50.18	PbO2
Portlandite	-7.66	15.53	23.19	Ca(OH)2
Pyrochroite	-2.59	12.61	15.20	Mn(OH)2
Pyrolusite	-2.24	39.95	42.19	MnO2
Retgersite	-11.40	-13.46	-2.05	NiSO4:6H2O
Rhodochrosite	0.60	-10.51	-11.11	MnCO3
Rhodochrosite(d)	-0.12	-10.51	-10.39	MnCO3
Rutherfordine	-5.65	-20.08	-14.43	UO2CO3
Schoepite	-2.51	3.04	5.55	UO2(OH)2:H2O
Scorodite	-7.36	6.17	13.53	FeAsO4:2H2O
Siderite	-4.81	-15.67	-10.86	FeCO3
Siderite(d)(3)	-5.22	-15.67	-10.45	FeCO3
Smithsonite	-2.51	-12.46	-9.95	ZnCO3
Tenorite	-0.05	7.76	7.81	CuO
Thenardite	-8.18	-8.35	-0.17	Na2SO4
Thermonatrite	-8.61	-8.45	0.16	Na2CO3:H2O
Trona	-13.29	-24.23	-10.95	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-34.66	-47.33	-12.67	U(OH)2SO4
U3O8(c)	-11.79	-18.22	-6.43	U3O8
U4O9(c)	-29.86	-69.86	-40.00	U4O9
UF4(c)	-52.40	-80.24	-27.84	UF4
UF4:2.5H2O	-43.21	-80.24	-37.03	UF4:2.5H2O
UO2(a)	-14.93	-24.30	-9.37	UO2
UO3(gamma)	-4.92	3.04	7.96	UO3
Uraninite(c)	-10.26	-24.30	-14.04	UO2
Witherite	-1.24	-9.81	-8.57	BaCO3
Zincite(c)	-0.75	10.67	11.41	ZnO
Zincosite	-15.61	-12.36	3.25	ZnSO4
Zn(OH)2-a	-1.78	10.67	12.45	Zn(OH)2
Zn(OH)2-b	-1.08	10.67	11.75	Zn(OH)2
Zn(OH)2-c	-1.53	10.67	12.20	Zn(OH)2
Zn(OH)2-e	-0.83	10.67	11.50	Zn(OH)2
Zn(OH)2-g	-1.04	10.67	11.71	Zn(OH)2
Zn2(OH)2SO4	-9.19	-1.69	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.74	8.46	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-11.64	2.10	13.73	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-33.85	-14.06	19.80	ZnO:2ZnSO4
Zn4(OH)6SO4	-8.76	19.64	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-10.91	27.59	38.50	Zn5(OH)8Cl2
ZnCl2	-22.33	-15.08	7.25	ZnCl2
ZnCO3:H2O	-2.20	-12.46	-10.26	ZnCO3:H2O
ZnF2	-15.95	-17.30	-1.36	ZnF2
ZnMetal	-42.89	-16.67	26.22	Zn
ZnO(a)	-0.64	10.67	11.31	ZnO
ZnSO4:H2O	-11.92	-12.36	-0.44	ZnSO4:H2O

End of simulation.

```
------------------
Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 15.5-16.5m
           SOLUTION        16
           units           mg/l
           temp            21.2
           pH              9.72
           F               0.8
           Cl              18
           S(6)            39          as SO4
           Na              102
           K               19
           Mg              1.1
           Ca              8.2
           Alkalinity      140.3       as HCO3
           Al              3.61
           As              1.78
           Ba              0.079
           Cu              0.036
           Fe              2.08
           Mn              0.09
           Ni              0.010
           Pb              0.023
           U               1.9
           Zn              0.043
           END
```

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-----
TITLE
-----

   Schneckentein 15.5-16.5m

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Beginning of initial solution calculations.
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Initial solution 16.

----------------------------Solution composition------------
-----------------

           Elements           Molality       Moles

           Al                1.338e-04   1.338e-04
           Alkalinity        2.300e-03   2.300e-03
           As                2.377e-05   2.377e-05
           Ba                5.754e-07   5.754e-07
           Ca                2.047e-04   2.047e-04
           Cl                5.079e-04   5.079e-04
           Cu                5.667e-07   5.667e-07
           F                 4.212e-05   4.212e-05
           Fe                3.726e-05   3.726e-05
           K                 4.861e-04   4.861e-04
           Mg                4.526e-05   4.526e-05
           Mn                1.639e-06   1.639e-06
           Na                4.438e-03   4.438e-03
           Ni                1.704e-07   1.704e-07
           Pb                1.110e-07   1.110e-07
           S(6)              4.061e-04   4.061e-04
           U                 7.985e-06   7.985e-06
           Zn                6.580e-07   6.580e-07
```

```
----------------------------Description of solution----------------------------
-
                                     pH  =   9.720
                                     pe  =   4.000
                        Activity of water  =   1.000
                           Ionic strength  =   5.123e-03
                       Mass of water (kg)  =   1.000e+00
                   Total carbon (mol/kg)  =   1.283e-03
                      Total CO2 (mol/kg)  =   1.283e-03
                     Temperature (deg C)  =  21.200
                  Electrical balance (eq)  =   2.200e-03
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  26.19
                                Iterations  =  12
                                   Total H  = 1.110141e+02
                                   Total O  = 5.551252e+01
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	4.227e-05	3.918e-05	-4.374	-4.407	-0.033
H+	2.041e-10	1.905e-10	-9.690	-9.720	-0.030
H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	**1.338e-04**				
Al(OH)4-	1.338e-04	1.240e-04	-3.873	-3.906	-0.033
Al(OH)3	1.314e-08	1.315e-08	-7.882	-7.881	0.001
Al(OH)2+	2.445e-11	2.266e-11	-10.612	-10.645	-0.033
AlOH+2	1.049e-15	7.736e-16	-14.979	-15.112	-0.132
AlF2+	1.489e-16	1.380e-16	-15.827	-15.860	-0.033
AlF3	6.713e-17	6.721e-17	-16.173	-16.173	0.001
AlF+2	9.798e-18	7.228e-18	-17.009	-17.141	-0.132
AlF4-	1.121e-18	1.039e-18	-17.951	-17.984	-0.033
Al+3	3.775e-20	1.904e-20	-19.423	-19.720	-0.297
AlSO4+	1.790e-20	1.659e-20	-19.747	-19.780	-0.033
Al(SO4)2-	1.610e-22	1.492e-22	-21.793	-21.826	-0.033
AlHSO4+2	3.680e-31	2.715e-31	-30.434	-30.566	-0.132
As(3)	**1.324e-23**				
H2AsO3-	9.822e-24	9.102e-24	-23.008	-23.041	-0.033
H3AsO3	3.378e-24	3.382e-24	-23.471	-23.471	0.001
HAsO3-2	4.335e-26	3.198e-26	-25.363	-25.495	-0.132
AsO3-3	1.124e-29	5.670e-30	-28.949	-29.246	-0.297
H4AsO3+	3.446e-34	3.193e-34	-33.463	-33.496	-0.033
As(5)	**2.377e-05**				
HAsO4-2	2.333e-05	1.721e-05	-4.632	-4.764	-0.132
AsO4-3	4.130e-07	2.083e-07	-6.384	-6.681	-0.297
H2AsO4-	2.061e-08	1.911e-08	-7.686	-7.719	-0.033
H3AsO4	6.133e-16	6.140e-16	-15.212	-15.212	0.001
Ba	**5.754e-07**				
Ba+2	4.866e-07	3.590e-07	-6.313	-6.445	-0.132
BaSO4	5.204e-08	5.210e-08	-7.284	-7.283	0.001
BaCO3	3.382e-08	3.386e-08	-7.471	-7.470	0.001
BaHCO3+	2.858e-09	2.649e-09	-8.544	-8.577	-0.033
BaOH+	6.888e-11	6.383e-11	-10.162	-10.195	-0.033
C(4)	**1.283e-03**				
HCO3-	9.343e-04	8.677e-04	-3.030	-3.062	-0.032
CO3-2	2.649e-04	1.970e-04	-3.577	-3.705	-0.129
CaCO3	3.653e-05	3.657e-05	-4.437	-4.437	0.001
NaCO3-	1.335e-05	1.238e-05	-4.874	-4.907	-0.033
UO2(CO3)3-4	7.202e-06	2.133e-06	-5.143	-5.671	-0.528
MgCO3	4.989e-06	4.995e-06	-5.302	-5.301	0.001
NaHCO3	1.996e-06	1.998e-06	-5.700	-5.699	0.001
MnCO3	1.487e-06	1.489e-06	-5.828	-5.827	0.001
CaHCO3+	1.334e-06	1.236e-06	-5.875	-5.908	-0.033
CO2	3.908e-07	3.913e-07	-6.408	-6.408	0.001
MgHCO3+	3.038e-07	2.816e-07	-6.517	-6.550	-0.033
UO2(CO3)2-2	2.561e-07	1.889e-07	-6.592	-6.724	-0.132
Zn(CO3)2-2	2.373e-07	1.751e-07	-6.625	-6.757	-0.132
NiCO3	1.161e-07	1.162e-07	-6.935	-6.935	0.001
PbCO3	6.275e-08	6.283e-08	-7.202	-7.202	0.001
Ni(CO3)2-2	5.393e-08	3.978e-08	-7.268	-7.400	-0.132
Pb(CO3)2-2	4.215e-08	3.109e-08	-7.375	-7.507	-0.132
ZnCO3	4.151e-08	4.156e-08	-7.382	-7.381	0.001
BaCO3	3.382e-08	3.386e-08	-7.471	-7.470	0.001
MnHCO3+	7.937e-09	7.356e-09	-8.100	-8.133	-0.033
BaHCO3+	2.858e-09	2.649e-09	-8.544	-8.577	-0.033
CuCO3	1.039e-09	1.041e-09	-8.983	-8.983	0.001
Cu(CO3)2-2	3.499e-10	2.581e-10	-9.456	-9.588	-0.132
ZnHCO3+	1.246e-10	1.155e-10	-9.904	-9.938	-0.033
UO2CO3	4.382e-11	4.387e-11	-10.358	-10.358	0.001
PbHCO3+	1.364e-11	1.265e-11	-10.865	-10.898	-0.033
NiHCO3+	1.028e-11	9.528e-12	-10.988	-11.021	-0.033
FeCO3	1.809e-12	1.811e-12	-11.743	-11.742	0.001
CuHCO3+	4.614e-13	4.276e-13	-12.336	-12.369	-0.033
FeHCO3+	3.587e-14	3.324e-14	-13.445	-13.478	-0.033
(UO2)3(CO3)6-6	1.391e-16	9.001e-18	-15.857	-17.046	-1.189
UO2(CO3)3-5	2.280e-22	3.407e-23	-21.642	-22.468	-0.826
U(CO3)4-4	6.630e-36	1.964e-36	-35.179	-35.707	-0.528
U(CO3)5-6	4.867e-38	3.150e-39	-37.313	-38.502	-1.189
Ca	**2.047e-04**				
Ca+2	1.600e-04	1.189e-04	-3.796	-3.925	-0.129
CaCO3	3.653e-05	3.657e-05	-4.437	-4.437	0.001
CaSO4	6.622e-06	6.629e-06	-5.179	-5.179	0.001
CaHCO3+	1.334e-06	1.236e-06	-5.875	-5.908	-0.033
CaOH+	1.118e-07	1.036e-07	-6.952	-6.985	-0.033
CaF+	3.970e-08	3.679e-08	-7.401	-7.434	-0.033
CaHSO4+	7.629e-15	7.070e-15	-14.118	-14.151	-0.033
Cl	**5.079e-04**				
Cl-	5.079e-04	4.703e-04	-3.294	-3.328	-0.033
MnCl+	1.966e-10	1.822e-10	-9.706	-9.739	-0.033
ZnOHCl	8.628e-11	8.639e-11	-10.064	-10.064	0.001
ZnCl+	1.218e-12	1.129e-12	-11.914	-11.947	-0.033
PbCl+	3.369e-13	3.123e-13	-12.472	-12.505	-0.033
NiCl+	1.014e-13	9.398e-14	-12.994	-13.027	-0.033
MnCl2	3.737e-14	3.741e-14	-13.427	-13.427	0.001
CuCl2-	3.792e-15	3.514e-15	-14.421	-14.454	-0.033
CuCl+	1.112e-15	1.031e-15	-14.954	-14.987	-0.033
ZnCl2	5.469e-16	5.476e-16	-15.262	-15.262	0.001
FeCl+	2.683e-16	2.487e-16	-15.571	-15.604	-0.033
PbCl2	2.498e-16	2.501e-16	-15.602	-15.602	0.001
NiCl2	1.603e-16	1.605e-16	-15.795	-15.795	0.001
MnCl3-	5.229e-18	4.846e-18	-17.282	-17.315	-0.033
CuCl3-2	3.498e-18	2.581e-18	-17.456	-17.588	-0.132
ZnCl3-	3.046e-19	2.823e-19	-18.516	-18.549	-0.033
CuCl2	2.495e-19	2.498e-19	-18.603	-18.602	0.001
PbCl3-	9.845e-20	9.124e-20	-19.007	-19.040	-0.033
UO2Cl+	3.859e-20	3.576e-20	-19.414	-19.447	-0.033
ZnCl4-2	8.750e-23	6.455e-23	-22.058	-22.190	-0.132
PbCl4-2	2.703e-23	1.994e-23	-22.568	-22.700	-0.132
FeCl+2	5.049e-24	3.725e-24	-23.297	-23.429	-0.132
UO2Cl2	8.693e-25	8.704e-25	-24.061	-24.060	0.001
CuCl3-	4.201e-25	3.893e-25	-24.377	-24.410	-0.033
FeCl2+	9.538e-27	8.840e-27	-26.021	-26.054	-0.033
CuCl4-2	1.138e-30	8.394e-31	-29.944	-30.076	-0.132
FeCl3	4.152e-31	4.157e-31	-30.382	-30.381	0.001
UCl+3	0.000e+00	0.000e+00	-55.053	-55.350	-0.297
Cu(1)	**5.752e-14**				
Cu+	5.372e-14	4.979e-14	-13.270	-13.303	-0.033
CuCl2-	3.792e-15	3.514e-15	-14.421	-14.454	-0.033
CuCl3-2	3.498e-18	2.581e-18	-17.456	-17.588	-0.132
Cu(2)	**5.667e-07**				
Cu(OH)2	5.651e-07	5.657e-07	-6.248	-6.247	0.001
CuCO3	1.039e-09	1.041e-09	-8.983	-8.983	0.001
Cu(CO3)2-2	3.499e-10	2.581e-10	-9.456	-9.588	-0.132
Cu(OH)3-	1.930e-10	1.789e-10	-9.714	-9.747	-0.033
CuOH+	5.568e-11	5.160e-11	-10.254	-10.287	-0.033
Cu+2	1.333e-12	9.834e-13	-11.875	-12.007	-0.132
CuHCO3+	4.614e-13	4.276e-13	-12.336	-12.369	-0.033
Cu(OH)4-2	2.539e-13	1.873e-13	-12.595	-12.727	-0.132
CuSO4	5.655e-14	5.661e-14	-13.248	-13.247	0.001
CuCl+	1.112e-15	1.031e-15	-14.954	-14.987	-0.033
Cu2(OH)2+2	1.078e-15	7.951e-16	-14.967	-15.100	-0.132
CuF+	7.241e-16	6.711e-16	-15.140	-15.173	-0.033
CuCl2	2.495e-19	2.498e-19	-18.603	-18.602	0.001
CuCl3-	4.201e-25	3.893e-25	-24.377	-24.410	-0.033
CuCl4-2	1.138e-30	8.394e-31	-29.944	-30.076	-0.132
F	**4.212e-05**				
F-	4.192e-05	3.885e-05	-4.378	-4.411	-0.033
NaF	9.146e-08	9.157e-08	-7.039	-7.038	0.001
MgF+	7.275e-08	6.742e-08	-7.138	-7.171	-0.033
CaF+	3.970e-08	3.679e-08	-7.401	-7.434	-0.033
MnF+	2.759e-11	2.557e-11	-10.559	-10.592	-0.033
HF	1.036e-11	1.037e-11	-10.985	-10.984	0.001
ZnF+	5.964e-13	5.527e-13	-12.224	-12.257	-0.033
NiF+	6.654e-14	6.166e-14	-13.177	-13.210	-0.033
PbF+	1.368e-14	1.268e-14	-13.864	-13.897	-0.033
HF2-	1.617e-15	1.499e-15	-14.791	-14.824	-0.033
CuF+	7.241e-16	6.711e-16	-15.140	-15.173	-0.033
UO2F+	2.739e-16	2.538e-16	-15.562	-15.595	-0.033
FeF+	1.606e-16	1.488e-16	-15.794	-15.827	-0.033
AlF2+	1.489e-16	1.380e-16	-15.827	-15.860	-0.033
AlF3	6.713e-17	6.721e-17	-16.173	-16.173	0.001
UO2F2	3.331e-17	3.335e-17	-16.477	-16.477	0.001
PbF2	1.004e-17	1.005e-17	-16.998	-16.998	0.001
AlF+2	9.798e-18	7.228e-18	-17.009	-17.141	-0.132
AlF4-	1.121e-18	1.039e-18	-17.951	-17.984	-0.033
UO2F3-	2.660e-19	2.465e-19	-18.575	-18.608	-0.033
FeF2+	2.742e-20	2.541e-20	-19.562	-19.595	-0.033
FeF+2	2.332e-20	1.720e-20	-19.632	-19.764	-0.132
PbF3-	3.053e-21	2.830e-21	-20.515	-20.548	-0.033
FeF3	1.543e-21	1.544e-21	-20.812	-20.811	0.001
H2F2	3.208e-22	3.212e-22	-21.494	-21.493	0.001
UO2F4-2	8.280e-23	6.108e-23	-22.082	-22.214	-0.132
PbF4-2	7.133e-26	5.262e-26	-25.147	-25.279	-0.132
UF3+	0.000e+00	0.000e+00	-45.385	-45.418	-0.033
UF4	0.000e+00	0.000e+00	-45.920	-45.919	0.001
UF2+2	0.000e+00	0.000e+00	-46.247	-46.379	-0.132
UF+3	0.000e+00	0.000e+00	-48.586	-48.883	-0.297
UF5-	0.000e+00	0.000e+00	-48.841	-48.874	-0.033
UF6-2	0.000e+00	0.000e+00	-51.048	-51.180	-0.132
Fe(2)	**2.915e-12**				
FeCO3	1.809e-12	1.811e-12	-11.743	-11.742	0.001
Fe+2	5.193e-13	3.831e-13	-12.285	-12.417	-0.132
FeOH+	5.145e-13	4.768e-13	-12.289	-12.322	-0.033
FeHCO3+	3.587e-14	3.324e-14	-13.445	-13.478	-0.033
FeSO4	1.836e-14	1.839e-14	-13.736	-13.736	0.001
Fe(OH)2	1.522e-14	1.524e-14	-13.818	-13.817	0.001
Fe(OH)3-	3.086e-15	2.860e-15	-14.511	-14.544	-0.033
FeCl+	2.683e-16	2.487e-16	-15.571	-15.604	-0.033
FeF+	1.606e-16	1.488e-16	-15.794	-15.827	-0.033
FeHSO4+	2.457e-23	2.277e-23	-22.610	-22.643	-0.033

Fe(3)	3.726e-05					
	Fe(OH)4-	3.038e-05	2.816e-05	-4.517	-4.550	-0.033
	Fe(OH)3	6.860e-06	6.868e-06	-5.164	-5.163	0.001
	Fe(OH)2+	1.297e-08	1.202e-08	-7.887	-7.920	-0.033
	FeOH+2	1.085e-14	8.003e-15	-13.965	-14.097	-0.132
	FeF2+	2.742e-20	2.541e-20	-19.562	-19.595	-0.033
	FeF+2	2.332e-20	1.720e-20	-19.632	-19.764	-0.132
	FeF3	1.543e-21	1.544e-21	-20.812	-20.811	0.001
	FeSO4+	9.321e-22	8.639e-22	-21.031	-21.064	-0.033
	Fe+3	5.874e-22	2.963e-22	-21.231	-21.528	-0.297
	Fe(SO4)2-	5.817e-24	5.391e-24	-23.235	-23.268	-0.033
	FeCl+2	5.049e-24	3.725e-24	-23.297	-23.429	-0.132
	FeCl2+	9.538e-27	8.840e-27	-26.021	-26.054	-0.033
	Fe2(OH)2+4	6.823e-27	2.021e-27	-26.166	-26.694	-0.528
	FeHSO4+2	5.996e-31	4.424e-31	-30.222	-30.354	-0.132
	FeCl3	4.152e-31	4.157e-31	-30.382	-30.381	0.001
	Fe3(OH)4+5	4.844e-32	7.237e-33	-31.315	-32.140	-0.826
H(0)	5.182e-31					
	H2	2.591e-31	2.594e-31	-30.587	-30.586	0.001
K	4.861e-04					
	K+	4.851e-04	4.492e-04	-3.314	-3.348	-0.033
	KSO4-	9.461e-07	8.768e-07	-6.024	-6.057	-0.033
Mg	4.526e-05					
	Mg+2	3.776e-05	2.816e-05	-4.423	-4.550	-0.127
	MgCO3	4.989e-06	4.995e-06	-5.302	-5.301	0.001
	MgSO4	1.729e-06	1.731e-06	-5.762	-5.762	0.001
	MgOH+	4.090e-07	3.790e-07	-6.388	-6.421	-0.033
	MgHCO3+	3.038e-07	2.816e-07	-6.517	-6.550	-0.033
	MgF+	7.275e-08	6.742e-08	-7.138	-7.171	-0.033
Mn(2)	1.639e-06					
	MnCO3	1.487e-06	1.489e-06	-5.828	-5.827	0.001
	Mn+2	1.289e-07	9.512e-08	-6.890	-7.022	-0.132
	MnOH+	1.012e-08	9.375e-09	-7.995	-8.028	-0.033
	MnHCO3+	7.937e-09	7.356e-09	-8.100	-8.133	-0.033
	MnSO4	4.546e-09	4.551e-09	-8.342	-8.342	0.001
	MnCl+	1.966e-10	1.822e-10	-9.706	-9.739	-0.033
	MnF+	2.759e-11	2.557e-11	-10.559	-10.592	-0.033
	Mn(OH)3-	2.350e-13	2.178e-13	-12.629	-12.662	-0.033
	MnCl2	3.737e-14	3.741e-14	-13.427	-13.427	0.001
	MnCl3-	5.229e-18	4.846e-18	-17.282	-17.315	-0.033
Mn(3)	3.322e-29					
	Mn+3	3.322e-29	1.676e-29	-28.479	-28.776	-0.297
Mn(6)	1.025e-33					
	MnO4-2	1.025e-33	7.559e-34	-32.989	-33.122	-0.132
Mn(7)	1.887e-39					
	MnO4-	1.887e-39	1.749e-39	-38.724	-38.757	-0.033
Na	4.438e-03					
	Na+	4.417e-03	4.096e-03	-2.355	-2.388	-0.033
	NaCO3-	1.335e-05	1.238e-05	-4.874	-4.907	-0.033
	NaSO4-	6.259e-06	5.801e-06	-5.203	-5.237	-0.033
	NaHCO3	1.996e-06	1.998e-06	-5.700	-5.699	0.001
	NaF	9.146e-08	9.157e-08	-7.039	-7.038	0.001
Ni	1.704e-07					
	NiCO3	1.161e-07	1.162e-07	-6.935	-6.935	0.001
	Ni(CO3)2-2	5.393e-08	3.978e-08	-7.268	-7.400	-0.132
	Ni(OH)2	2.188e-10	2.190e-10	-9.660	-9.659	0.001
	Ni+2	1.078e-10	7.955e-11	-9.967	-10.099	-0.132
	NiOH+	4.743e-11	4.396e-11	-10.324	-10.357	-0.033
	Ni(OH)3-	1.240e-11	1.149e-11	-10.906	-10.940	-0.033
	NiHCO3+	1.028e-11	9.528e-12	-10.988	-11.021	-0.033
	NiSO4	4.340e-12	4.345e-12	-11.363	-11.362	0.001
	NiCl+	1.014e-13	9.398e-14	-12.994	-13.027	-0.033
	NiF+	6.654e-14	6.166e-14	-13.177	-13.210	-0.033
	NiCl2	1.603e-16	1.605e-16	-15.795	-15.795	0.001
	Ni(SO4)2-2	9.467e-17	6.984e-17	-16.024	-16.156	-0.132
O(0)	6.682e-33					
	O2	3.341e-33	3.345e-33	-32.476	-32.476	0.001
Pb	1.110e-07					
	PbCO3	6.275e-08	6.283e-08	-7.202	-7.202	0.001
	Pb(CO3)2-2	4.215e-08	3.109e-08	-7.375	-7.507	-0.132
	Pb(OH)2	3.828e-09	3.833e-09	-8.417	-8.417	0.001
	PbOH+	2.026e-09	1.877e-09	-8.693	-8.726	-0.033
	Pb(OH)3-	2.491e-10	2.309e-10	-9.604	-9.637	-0.033
	Pb+2	2.487e-11	1.835e-11	-10.604	-10.736	-0.132
	PbHCO3+	1.364e-11	1.265e-11	-10.865	-10.898	-0.033
	Pb(OH)4-2	3.762e-12	2.776e-12	-11.425	-11.557	-0.132
	PbSO4	2.984e-12	2.988e-12	-11.525	-11.525	0.001
	PbCl+	3.369e-13	3.123e-13	-12.472	-12.505	-0.033
	PbF+	1.368e-14	1.268e-14	-13.864	-13.897	-0.033
	Pb(SO4)2-2	6.154e-15	4.540e-15	-14.211	-14.343	-0.132
	PbCl2	2.498e-16	2.501e-16	-15.602	-15.602	0.001
	PbF2	1.004e-17	1.005e-17	-16.998	-16.998	0.001
	Pb3(OH)4+2	4.698e-18	3.466e-18	-17.328	-17.460	-0.132
	Pb2OH+3	1.529e-18	7.712e-19	-17.816	-18.113	-0.297
	PbCl3-	9.845e-20	9.124e-20	-19.007	-19.040	-0.033
	PbF3-	3.053e-21	2.830e-21	-20.515	-20.548	-0.033
	PbCl4-2	2.703e-23	1.994e-23	-22.568	-22.700	-0.132
	PbF4-2	7.133e-26	5.262e-26	-25.147	-25.279	-0.132

S(6)	4.061e-04					
	SO4-2	3.905e-04	2.896e-04	-3.408	-3.538	-0.130
	CaSO4	6.622e-06	6.629e-06	-5.179	-5.179	0.001
	NaSO4-	6.259e-06	5.801e-06	-5.203	-5.237	-0.033
	MgSO4	1.729e-06	1.731e-06	-5.762	-5.762	0.001
	KSO4-	9.461e-07	8.768e-07	-6.024	-6.057	-0.033
	BaSO4	5.204e-08	5.210e-08	-7.284	-7.283	0.001
	MnSO4	4.546e-09	4.551e-09	-8.342	-8.342	0.001
	ZnSO4	6.958e-11	6.966e-11	-10.158	-10.157	0.001
	HSO4-	5.335e-12	4.944e-12	-11.273	-11.306	-0.033
	NiSO4	4.340e-12	4.345e-12	-11.363	-11.362	0.001
	PbSO4	2.984e-12	2.988e-12	-11.525	-11.525	0.001
	Zn(SO4)2-2	2.289e-13	1.689e-13	-12.640	-12.772	-0.132
	CuSO4	5.655e-14	5.661e-14	-13.248	-13.247	0.001
	FeSO4	1.836e-14	1.839e-14	-13.736	-13.736	0.001
	CaHSO4+	7.629e-15	7.070e-15	-14.118	-14.151	-0.033
	Pb(SO4)2-2	6.154e-15	4.540e-15	-14.211	-14.343	-0.132
	Ni(SO4)2-2	9.467e-17	6.984e-17	-16.024	-16.156	-0.132
	UO2SO4	1.976e-17	1.978e-17	-16.704	-16.704	0.001
	UO2(SO4)2-2	7.000e-20	5.164e-20	-19.155	-19.287	-0.132
	AlSO4+	1.790e-20	1.659e-20	-19.747	-19.780	-0.033
	FeSO4+	9.321e-22	8.639e-22	-21.031	-21.064	-0.033
	Al(SO4)2-	1.610e-22	1.492e-22	-21.793	-21.826	-0.033
	FeHSO4+	2.457e-23	2.277e-23	-22.610	-22.643	-0.033
	Fe(SO4)2-	5.817e-24	5.391e-24	-23.235	-23.268	-0.033
	FeHSO4+2	5.996e-31	4.424e-31	-30.222	-30.354	-0.132
	AlHSO4+2	3.680e-31	2.715e-31	-30.434	-30.566	-0.132
	U(SO4)2	0.000e+00	0.000e+00	-50.436	-50.435	0.001
	USO4+2	0.000e+00	0.000e+00	-50.629	-50.761	-0.132
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-66.515	-66.812	-0.297
U(4)	2.301e-24					
	U(OH)4	2.301e-24	2.304e-24	-23.638	-23.638	0.001
	U(OH)3+	1.813e-30	1.681e-30	-29.741	-29.775	-0.033
	U(CO3)4-4	6.630e-36	1.964e-36	-35.179	-35.707	-0.528
	U(OH)2+2	2.234e-37	1.648e-37	-36.651	-36.783	-0.132
	U(CO3)5-6	4.867e-38	3.150e-39	-37.313	-38.502	-1.189
	UOH+3	0.000e+00	0.000e+00	-44.414	-44.711	-0.297
	UF3+	0.000e+00	0.000e+00	-45.385	-45.418	-0.033
	UF4	0.000e+00	0.000e+00	-45.920	-45.919	0.001
	UF2+2	0.000e+00	0.000e+00	-46.247	-46.379	-0.132
	UF+3	0.000e+00	0.000e+00	-48.586	-48.883	-0.297
	UF5-	0.000e+00	0.000e+00	-48.841	-48.874	-0.033
	U(SO4)2	0.000e+00	0.000e+00	-50.436	-50.435	0.001
	USO4+2	0.000e+00	0.000e+00	-50.629	-50.761	-0.132
	UF6-2	0.000e+00	0.000e+00	-51.048	-51.180	-0.132
	U+4	0.000e+00	0.000e+00	-53.257	-53.785	-0.528
	UCl+3	0.000e+00	0.000e+00	-55.053	-55.350	-0.297
	U6(OH)15+9	0.000e+00	0.000e+00	-191.436	-194.111	-2.675
U(5)	1.922e-19					
	UO2+	1.920e-19	1.779e-19	-18.717	-18.750	-0.033
	UO2(CO3)3-5	2.280e-22	3.407e-23	-21.642	-22.468	-0.826
U(6)	7.985e-06					
	UO2(CO3)3-4	7.202e-06	2.133e-06	-5.143	-5.671	-0.528
	UO2(OH)3-	5.271e-07	4.885e-07	-6.278	-6.311	-0.033
	UO2(CO3)2-2	2.561e-07	1.889e-07	-6.592	-6.724	-0.132
	UO2(OH)4-2	5.507e-11	4.063e-11	-10.259	-10.391	-0.132
	UO2CO3	4.382e-11	4.387e-11	-10.358	-10.358	0.001
	(UO2)3(OH)7-	1.818e-12	1.685e-12	-11.740	-11.773	-0.033
	UO2OH+	1.506e-12	1.396e-12	-11.822	-11.855	-0.033
	UO2F+	2.739e-16	2.538e-16	-15.562	-15.595	-0.033
	(UO2)3(CO3)6-6	1.391e-16	9.001e-18	-15.857	-17.046	-1.189
	(UO2)3(OH)5+	1.078e-16	9.989e-17	-15.967	-16.000	-0.033
	UO2+2	7.263e-17	5.358e-17	-16.139	-16.271	-0.132
	UO2F2	3.331e-17	3.335e-17	-16.477	-16.477	0.001
	UO2SO4	1.976e-17	1.978e-17	-16.704	-16.704	0.001
	UO2F3-	2.660e-19	2.465e-19	-18.575	-18.608	-0.033
	(UO2)2(OH)2+2	2.057e-19	1.518e-19	-18.687	-18.819	-0.132
	(UO2)4(OH)7+	1.227e-19	1.137e-19	-18.911	-18.944	-0.033
	UO2(SO4)2-2	7.000e-20	5.164e-20	-19.155	-19.287	-0.132
	UO2Cl+	3.859e-20	3.576e-20	-19.414	-19.447	-0.033
	(UO2)3(OH)4+2	1.990e-22	1.468e-22	-21.701	-21.833	-0.132
	UO2F4-2	8.280e-23	6.108e-23	-22.082	-22.214	-0.132
	UO2Cl2	8.693e-25	8.704e-25	-24.061	-24.060	0.001
	(UO2)2OH+3	5.960e-26	3.006e-26	-25.225	-25.522	-0.297
Zn	6.580e-07					
	Zn(OH)2	3.660e-07	3.665e-07	-6.436	-6.436	0.001
	Zn(CO3)2-2	2.373e-07	1.751e-07	-6.625	-6.757	-0.132
	ZnCO3	4.151e-08	4.156e-08	-7.382	-7.381	0.001
	Zn(OH)3-	6.561e-09	6.081e-09	-8.183	-8.216	-0.033
	ZnOH+	4.901e-09	4.542e-09	-8.310	-8.343	-0.033
	Zn+2	1.433e-09	1.057e-09	-8.844	-8.976	-0.132
	ZnHCO3+	1.246e-10	1.155e-10	-9.904	-9.938	-0.033
	ZnOHCl	8.628e-11	8.639e-11	-10.064	-10.064	0.001
	ZnSO4	6.958e-11	6.966e-11	-10.158	-10.157	0.001
	Zn(OH)4-2	6.855e-12	5.057e-12	-11.164	-11.296	-0.132
	ZnCl+	1.218e-12	1.129e-12	-11.914	-11.947	-0.033
	ZnF+	5.964e-13	5.527e-13	-12.224	-12.257	-0.033
	Zn(SO4)2-2	2.289e-13	1.689e-13	-12.640	-12.772	-0.132
	ZnCl2	5.469e-16	5.476e-16	-15.262	-15.262	0.001
	ZnCl3-	3.046e-19	2.823e-19	-18.516	-18.549	-0.033
	ZnCl4-2	8.750e-23	6.455e-23	-22.058	-22.190	-0.132

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Reading data base.
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           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
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Reading input data for simulation 1.
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           TITLE   Schneckentein 16.5-17.5m
           SOLUTION        17
           units           mg/l
           temp            23
           pH              10.07
           F               0.6
           Cl              12
           S(6)            29          as SO4
           Na              100
           K               6.7
           Mg              2.3
           Ca              10.7
           Alkalinity      189.1       as HCO3
           Al              1.81
           As              1.24
           Ba              0.121
           Cu              0.083
           Fe              3.06
           Mn              0.34
           Ni              0.022
           Pb              0.051
           U               0.72
           Zn              0.24
           END
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TITLE
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   Schneckentein 16.5-17.5m

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Beginning of initial solution calculations.
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Initial solution 17.

----------------------------Solution composition------------
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           Elements           Molality       Moles

           Al                 6.711e-05   6.711e-05
           Alkalinity         3.100e-03   3.100e-03
           As                 1.656e-05   1.656e-05
           Ba                 8.813e-07   8.813e-07
           Ca                 2.671e-04   2.671e-04
           Cl                 3.386e-04   3.386e-04
           Cu                 1.307e-06   1.307e-06
           F                  3.159e-05   3.159e-05
           Fe                 5.481e-05   5.481e-05
           K                  1.714e-04   1.714e-04
           Mg                 9.464e-05   9.464e-05
           Mn                 6.191e-06   6.191e-06
           Na                 4.351e-03   4.351e-03
           Ni                 3.749e-07   3.749e-07
           Pb                 2.462e-07   2.462e-07
           S(6)               3.020e-04   3.020e-04
           U                  3.026e-06   3.026e-06
           Zn                 3.673e-06   3.673e-06
```

```
----------------------------Description of solution----------------------
-----

                                    pH  =  10.070
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   5.439e-03
                     Mass of water (kg)  =   1.000e+00
                  Total carbon (mol/kg)  =   1.781e-03
                     Total CO2 (mol/kg)  =   1.781e-03
                    Temperature (deg C)  =  23.000
                 Electrical balance (eq)  =   1.443e-03
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  17.03
                               Iterations  =  16
                                  Total H  = 1.110140e+02
                                  Total O  = 5.551344e+01
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	1.092e-04	1.009e-04	-3.962	-3.996	-0.034
H+	9.136e-11	8.511e-11	-10.039	-10.070	-0.031
H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al 6.711e-05					
Al(OH)4-	6.710e-05	6.205e-05	-4.173	-4.207	-0.034
Al(OH)3	2.873e-09	2.876e-09	-8.542	-8.541	0.001
Al(OH)2+	2.086e-12	1.929e-12	-11.681	-11.715	-0.034
AlOH+2	3.420e-17	2.500e-17	-16.466	-16.602	-0.136
AlF2+	1.090e-18	1.008e-18	-17.963	-17.997	-0.034
AlF3	3.671e-19	3.676e-19	-18.435	-18.435	0.001
AlF+2	9.579e-20	7.001e-20	-19.019	-19.155	-0.136
AlF4-	4.592e-21	4.246e-21	-20.338	-20.372	-0.034
Al+3	4.942e-22	2.441e-22	-21.306	-21.612	-0.306
AlSO4+	1.731e-22	1.601e-22	-21.762	-21.796	-0.034
Al(SO4)2-	1.155e-24	1.068e-24	-23.938	-23.972	-0.034
AlHSO4+2	1.625e-33	1.188e-33	-32.789	-32.925	-0.136
As(3) 5.403e-25					
H2AsO3-	4.682e-25	4.329e-25	-24.330	-24.364	-0.034
H3AsO3	6.704e-26	6.713e-26	-25.174	-25.173	0.001
HAsO3-2	5.044e-27	3.686e-27	-26.297	-26.433	-0.136
AsO3-3	3.155e-30	1.558e-30	-29.501	-29.807	-0.306
H4AsO3+	3.062e-36	2.831e-36	-35.514	-35.548	-0.034
As(5) 1.656e-05					
HAsO4-2	1.588e-05	1.161e-05	-4.799	-4.935	-0.136
AsO4-3	6.662e-07	3.291e-07	-6.176	-6.483	-0.306
H2AsO4-	6.176e-09	5.710e-09	-8.209	-8.243	-0.034
H3AsO4	8.332e-17	8.342e-17	-16.079	-16.079	0.001
Ba 8.813e-07					
Ba+2	7.017e-07	5.129e-07	-6.154	-6.290	-0.136
BaCO3	1.203e-07	1.205e-07	-6.920	-6.919	0.001
BaSO4	5.465e-08	5.471e-08	-7.262	-7.262	0.001
BaHCO3+	4.469e-09	4.132e-09	-8.350	-8.384	-0.034
BaOH+	2.208e-10	2.042e-10	-9.656	-9.690	-0.034
C(4) 1.781e-03					
HCO3-	9.661e-04	8.952e-04	-3.015	-3.048	-0.033
CO3-2	6.420e-04	4.732e-04	-3.192	-3.325	-0.132
CaCO3	9.353e-05	9.365e-05	-4.029	-4.028	0.001
NaCO3-	3.434e-05	3.175e-05	-4.464	-4.498	-0.034
MgCO3	2.192e-05	2.194e-05	-4.659	-4.659	0.001
MnCO3	5.912e-06	5.920e-06	-5.228	-5.228	0.001
UO2(CO3)3-4	2.803e-06	8.000e-07	-5.552	-6.097	-0.545
NaHCO3	2.005e-06	2.008e-06	-5.698	-5.697	0.001
Zn(CO3)2-2	1.491e-06	1.090e-06	-5.827	-5.963	-0.136
CaHCO3+	1.469e-06	1.358e-06	-5.833	-5.867	-0.034
MgHCO3+	5.628e-07	5.204e-07	-6.250	-6.284	-0.034
Ni(CO3)2-2	1.981e-07	1.448e-07	-6.703	-6.839	-0.136
NiCO3	1.758e-07	1.761e-07	-6.755	-6.754	0.001
CO2	1.756e-07	1.758e-07	-6.756	-6.755	0.001
Pb(CO3)2-2	1.429e-07	1.045e-07	-6.845	-6.981	-0.136
BaCO3	1.203e-07	1.205e-07	-6.920	-6.919	0.001
ZnCO3	1.076e-07	1.077e-07	-6.968	-6.968	0.001
PbCO3	8.777e-08	8.788e-08	-7.057	-7.056	0.001
UO2(CO3)2-2	4.646e-08	3.396e-08	-7.333	-7.469	-0.136
MnHCO3+	1.359e-08	1.256e-08	-7.867	-7.901	-0.034
BaHCO3+	4.469e-09	4.132e-09	-8.350	-8.384	-0.034
CuCO3	1.149e-09	1.150e-09	-8.940	-8.939	0.001
Cu(CO3)2-2	9.377e-10	6.853e-10	-9.028	-9.164	-0.136
ZnHCO3+	1.390e-10	1.285e-10	-9.857	-9.891	-0.034
PbHCO3+	8.218e-12	7.599e-12	-11.085	-11.119	-0.034
NiHCO3+	6.707e-12	6.201e-12	-11.173	-11.208	-0.034
UO2CO3	3.171e-12	3.175e-12	-11.499	-11.498	0.001
CuHCO3+	2.196e-13	2.031e-13	-12.658	-12.692	-0.034
FeCO3	1.848e-13	1.850e-13	-12.733	-12.733	0.001
FeHCO3+	1.578e-15	1.459e-15	-14.802	-14.836	-0.034
(UO2)3(CO3)6-6	7.650e-19	4.554e-20	-18.116	-19.342	-1.225
UO2(CO3)3-5	9.968e-23	1.405e-23	-22.001	-22.852	-0.851
U(CO3)4-4	1.897e-37	5.414e-38	-36.722	-37.267	-0.545
U(CO3)5-6	4.313e-39	2.568e-40	-38.365	-39.590	-1.225
Ca 2.671e-04					
Ca+2	1.667e-04	1.228e-04	-3.778	-3.911	-0.133
CaCO3	9.353e-05	9.365e-05	-4.029	-4.028	0.001
CaSO4	5.111e-06	5.118e-06	-5.291	-5.291	0.001
CaHCO3+	1.469e-06	1.358e-06	-5.833	-5.867	-0.034
CaOH+	2.589e-07	2.394e-07	-6.587	-6.621	-0.034
CaF+	3.203e-08	2.962e-08	-7.494	-7.528	-0.034
CaHSO4+	2.693e-15	2.490e-15	-14.570	-14.604	-0.034
Cl 3.386e-04					
Cl-	3.386e-04	3.128e-04	-3.470	-3.505	-0.034
MnCl+	2.170e-10	2.007e-10	-9.663	-9.698	-0.034
ZnOHCl	1.386e-10	1.388e-10	-9.858	-9.858	0.001
ZnCl+	9.503e-13	8.786e-13	-12.022	-12.056	-0.034
PbCl+	1.369e-13	1.266e-13	-12.864	-12.898	-0.034
NiCl+	4.264e-14	3.943e-14	-13.370	-13.404	-0.034
MnCl2	2.736e-14	2.740e-14	-13.563	-13.562	0.001
CuCl2-	7.838e-16	7.247e-16	-15.106	-15.140	-0.034
CuCl+	3.734e-16	3.453e-16	-15.428	-15.462	-0.034
ZnCl2	2.851e-16	2.855e-16	-15.545	-15.544	0.001
PbCl2	6.508e-17	6.516e-17	-16.187	-16.186	0.001
NiCl2	4.472e-17	4.478e-17	-16.349	-16.349	0.001
FeCl+	7.609e-18	7.036e-18	-17.119	-17.153	-0.034
MnCl3-	2.553e-18	2.360e-18	-17.593	-17.627	-0.034
CuCl3-2	4.877e-19	3.565e-19	-18.312	-18.448	-0.136
ZnCl3-	1.070e-19	9.898e-20	-18.970	-19.004	-0.034
CuCl2	5.668e-20	5.675e-20	-19.247	-19.246	0.001
PbCl3-	1.729e-20	1.599e-20	-19.762	-19.796	-0.034
UO2Cl+	7.808e-22	7.219e-22	-21.107	-21.142	-0.034
ZnCl4-2	2.089e-23	1.527e-23	-22.680	-22.816	-0.136
PbCl4-2	3.225e-24	2.357e-24	-23.491	-23.628	-0.136
FeCl+2	1.690e-25	1.235e-25	-24.772	-24.908	-0.136
CuCl3-	6.573e-26	6.078e-26	-25.182	-25.216	-0.034
UO2Cl2	1.188e-26	1.189e-26	-25.925	-25.925	0.001
FeCl2+	1.989e-28	1.839e-28	-27.701	-27.735	-0.034
CuCl4-2	1.244e-31	9.094e-32	-30.905	-31.041	-0.136
FeCl3	5.746e-33	5.753e-33	-32.241	-32.240	0.001
UCl+3	0.000e+00	0.000e+00	-58.323	-58.629	-0.306
Cu(1) 2.600e-14					
Cu+	2.521e-14	2.331e-14	-13.598	-13.632	-0.034
CuCl2-	7.838e-16	7.247e-16	-15.106	-15.140	-0.034
CuCl3-2	4.877e-19	3.565e-19	-18.312	-18.448	-0.136
Cu(2) 1.307e-06					
Cu(OH)2	1.303e-06	1.305e-06	-5.885	-5.884	0.001
CuCO3	1.149e-09	1.150e-09	-8.940	-8.939	0.001
Cu(OH)3-	9.991e-10	9.238e-10	-9.000	-9.034	-0.034
Cu(CO3)2-2	9.377e-10	6.853e-10	-9.028	-9.164	-0.136
CuOH+	5.751e-11	5.317e-11	-10.240	-10.274	-0.034
Cu(OH)4-2	2.963e-12	2.165e-12	-11.528	-11.664	-0.136
Cu+2	6.193e-13	4.526e-13	-12.208	-12.344	-0.136
CuHCO3+	2.196e-13	2.031e-13	-12.658	-12.692	-0.034
CuSO4	1.938e-14	1.940e-14	-13.713	-13.712	0.001
Cu2(OH)2+2	1.386e-15	1.013e-15	-14.858	-14.994	-0.136
CuCl+	3.734e-16	3.453e-16	-15.428	-15.462	-0.034
CuF+	2.539e-16	2.347e-16	-15.595	-15.629	-0.034
CuCl2	5.668e-20	5.675e-20	-19.247	-19.246	0.001
CuCl3-	6.573e-26	6.078e-26	-25.182	-25.216	-0.034
CuCl4-2	1.244e-31	9.094e-32	-30.905	-31.041	-0.136
F 3.159e-05					
F-	3.139e-05	2.903e-05	-4.503	-4.537	-0.034
MgF+	1.002e-07	9.266e-08	-6.999	-7.033	-0.034
NaF	6.654e-08	6.662e-08	-7.177	-7.176	0.001
CaF+	3.203e-08	2.962e-08	-7.494	-7.528	-0.034
MnF+	3.420e-11	3.163e-11	-10.466	-10.500	-0.034
HF	3.570e-12	3.575e-12	-11.447	-11.447	0.001
ZnF+	4.931e-13	4.560e-13	-12.307	-12.341	-0.034
NiF+	3.144e-14	2.907e-14	-13.503	-13.537	-0.034
PbF+	5.966e-15	5.516e-15	-14.224	-14.258	-0.034
HF2-	4.238e-16	3.918e-16	-15.373	-15.407	-0.034
CuF+	2.539e-16	2.347e-16	-15.595	-15.629	-0.034
UO2F+	6.130e-18	5.668e-18	-17.213	-17.247	-0.034
FeF+	5.116e-18	4.730e-18	-17.291	-17.325	-0.034
PbF2	3.265e-18	3.269e-18	-17.486	-17.486	0.001
AlF2+	1.090e-18	1.008e-18	-17.963	-17.997	-0.034
UO2F2	5.562e-19	5.569e-19	-18.255	-18.254	0.001
AlF3	3.671e-19	3.676e-19	-18.435	-18.435	0.001
AlF+2	9.579e-20	7.001e-20	-19.019	-19.155	-0.136
AlF4-	4.592e-21	4.246e-21	-20.338	-20.372	-0.034
UO2F3-	3.329e-21	3.078e-21	-20.478	-20.512	-0.034
FeF+2	8.506e-22	6.217e-22	-21.070	-21.206	-0.136
FeF2+	7.586e-22	7.015e-22	-21.120	-21.154	-0.034
PbF3-	7.436e-22	6.875e-22	-21.129	-21.163	-0.034
H2F2	3.573e-23	3.578e-23	-22.447	-22.446	0.001
FeF3	3.201e-23	3.205e-23	-22.495	-22.494	0.001
UO2F4-2	7.757e-25	5.670e-25	-24.110	-24.246	-0.136
PbF4-2	1.307e-26	9.552e-27	-25.884	-26.020	-0.136
UF3+	0.000e+00	0.000e+00	-48.845	-48.879	-0.034
UF4	0.000e+00	0.000e+00	-49.512	-49.511	0.001
UF2+2	0.000e+00	0.000e+00	-49.581	-49.717	-0.136
UF+3	0.000e+00	0.000e+00	-51.791	-52.098	-0.306
UF5-	0.000e+00	0.000e+00	-52.533	-52.567	-0.034
UF6-2	0.000e+00	0.000e+00	-54.870	-55.006	-0.136
Fe(2) 2.719e-13					
FeCO3	1.848e-13	1.850e-13	-12.733	-12.733	0.001
FeOH+	5.632e-14	5.208e-14	-13.249	-13.283	-0.034
Fe+2	2.229e-14	1.630e-14	-13.652	-13.788	-0.136
Fe(OH)2	4.365e-15	4.371e-15	-14.360	-14.359	0.001
Fe(OH)3-	2.023e-15	1.870e-15	-14.694	-14.728	-0.034
FeHCO3+	1.578e-15	1.459e-15	-14.802	-14.836	-0.034
FeSO4	5.937e-16	5.945e-16	-15.226	-15.226	0.001
FeCl+	7.609e-18	7.036e-18	-17.119	-17.153	-0.034
FeF+	5.116e-18	4.730e-18	-17.291	-17.325	-0.034
FeHSO4+	3.574e-25	3.305e-25	-24.447	-24.481	-0.034

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Reading data base.
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           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 16.5-17.5m
           SOLUTION        17
           units           mg/l
           temp            23
           pH              10.07
           F               0.6
           Cl              12
           S(6)            29          as SO4
           Na              100
           K               6.7
           Mg              2.3
           Ca              10.7
           Alkalinity      189.1       as HCO3
           Al              1.81
           As              1.24
           Ba              0.121
           Cu              0.083
           Fe              3.06
           Mn              0.34
           Ni              0.022
           Pb              0.051
           U               0.72
           Zn              0.24
           END
```

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-----
TITLE
-----

   Schneckentein 16.5-17.5m

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Beginning of initial solution calculations.
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Initial solution 17.

----------------------------Solution composition------------
-----------------

           Elements           Molality       Moles

           Al                 6.711e-05   6.711e-05
           Alkalinity         3.100e-03   3.100e-03
           As                 1.656e-05   1.656e-05
           Ba                 8.813e-07   8.813e-07
           Ca                 2.671e-04   2.671e-04
           Cl                 3.386e-04   3.386e-04
           Cu                 1.307e-06   1.307e-06
           F                  3.159e-05   3.159e-05
           Fe                 5.481e-05   5.481e-05
           K                  1.714e-04   1.714e-04
           Mg                 9.464e-05   9.464e-05
           Mn                 6.191e-06   6.191e-06
           Na                 4.351e-03   4.351e-03
           Ni                 3.749e-07   3.749e-07
           Pb                 2.462e-07   2.462e-07
           S(6)               3.020e-04   3.020e-04
           U                  3.026e-06   3.026e-06
           Zn                 3.673e-06   3.673e-06
```

```
----------------------------Description of solution----------------------
-----

                                    pH  =  10.070
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   5.439e-03
                     Mass of water (kg)  =   1.000e+00
                  Total carbon (mol/kg)  =   1.781e-03
                     Total CO2 (mol/kg)  =   1.781e-03
                    Temperature (deg C)  =  23.000
                 Electrical balance (eq)  =   1.443e-03
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  17.03
                               Iterations  =  16
                                  Total H  = 1.110140e+02
                                  Total O  = 5.551344e+01
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	1.092e-04	1.009e-04	-3.962	-3.996	-0.034
H+	9.136e-11	8.511e-11	-10.039	-10.070	-0.031
H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al 6.711e-05					
Al(OH)4-	6.710e-05	6.205e-05	-4.173	-4.207	-0.034
Al(OH)3	2.873e-09	2.876e-09	-8.542	-8.541	0.001
Al(OH)2+	2.086e-12	1.929e-12	-11.681	-11.715	-0.034
AlOH+2	3.420e-17	2.500e-17	-16.466	-16.602	-0.136
AlF2+	1.090e-18	1.008e-18	-17.963	-17.997	-0.034
AlF3	3.671e-19	3.676e-19	-18.435	-18.435	0.001
AlF+2	9.579e-20	7.001e-20	-19.019	-19.155	-0.136
AlF4-	4.592e-21	4.246e-21	-20.338	-20.372	-0.034
Al+3	4.942e-22	2.441e-22	-21.306	-21.612	-0.306
AlSO4+	1.731e-22	1.601e-22	-21.762	-21.796	-0.034
Al(SO4)2-	1.155e-24	1.068e-24	-23.938	-23.972	-0.034
AlHSO4+2	1.625e-33	1.188e-33	-32.789	-32.925	-0.136
As(3) 5.403e-25					
H2AsO3-	4.682e-25	4.329e-25	-24.330	-24.364	-0.034
H3AsO3	6.704e-26	6.713e-26	-25.174	-25.173	0.001
HAsO3-2	5.044e-27	3.686e-27	-26.297	-26.433	-0.136
AsO3-3	3.155e-30	1.558e-30	-29.501	-29.807	-0.306
H4AsO3+	3.062e-36	2.831e-36	-35.514	-35.548	-0.034
As(5) 1.656e-05					
HAsO4-2	1.588e-05	1.161e-05	-4.799	-4.935	-0.136
AsO4-3	6.662e-07	3.291e-07	-6.176	-6.483	-0.306
H2AsO4-	6.176e-09	5.710e-09	-8.209	-8.243	-0.034
H3AsO4	8.332e-17	8.342e-17	-16.079	-16.079	0.001
Ba 8.813e-07					
Ba+2	7.017e-07	5.129e-07	-6.154	-6.290	-0.136
BaCO3	1.203e-07	1.205e-07	-6.920	-6.919	0.001
BaSO4	5.465e-08	5.471e-08	-7.262	-7.262	0.001
BaHCO3+	4.469e-09	4.132e-09	-8.350	-8.384	-0.034
BaOH+	2.208e-10	2.042e-10	-9.656	-9.690	-0.034
C(4) 1.781e-03					
HCO3-	9.661e-04	8.952e-04	-3.015	-3.048	-0.033
CO3-2	6.420e-04	4.732e-04	-3.192	-3.325	-0.132
CaCO3	9.353e-05	9.365e-05	-4.029	-4.028	0.001
NaCO3-	3.434e-05	3.175e-05	-4.464	-4.498	-0.034
MgCO3	2.192e-05	2.194e-05	-4.659	-4.659	0.001
MnCO3	5.912e-06	5.920e-06	-5.228	-5.228	0.001
UO2(CO3)3-4	2.803e-06	8.000e-07	-5.552	-6.097	-0.545
NaHCO3	2.005e-06	2.008e-06	-5.698	-5.697	0.001
Zn(CO3)2-2	1.491e-06	1.090e-06	-5.827	-5.963	-0.136
CaHCO3+	1.469e-06	1.358e-06	-5.833	-5.867	-0.034
MgHCO3+	5.628e-07	5.204e-07	-6.250	-6.284	-0.034
Ni(CO3)2-2	1.981e-07	1.448e-07	-6.703	-6.839	-0.136
NiCO3	1.758e-07	1.761e-07	-6.755	-6.754	0.001
CO2	1.756e-07	1.758e-07	-6.756	-6.755	0.001
Pb(CO3)2-2	1.429e-07	1.045e-07	-6.845	-6.981	-0.136
BaCO3	1.203e-07	1.205e-07	-6.920	-6.919	0.001
ZnCO3	1.076e-07	1.077e-07	-6.968	-6.968	0.001
PbCO3	8.777e-08	8.788e-08	-7.057	-7.056	0.001
UO2(CO3)2-2	4.646e-08	3.396e-08	-7.333	-7.469	-0.136
MnHCO3+	1.359e-08	1.256e-08	-7.867	-7.901	-0.034
BaHCO3+	4.469e-09	4.132e-09	-8.350	-8.384	-0.034
CuCO3	1.149e-09	1.150e-09	-8.940	-8.939	0.001
Cu(CO3)2-2	9.377e-10	6.853e-10	-9.028	-9.164	-0.136
ZnHCO3+	1.390e-10	1.285e-10	-9.857	-9.891	-0.034
PbHCO3+	8.218e-12	7.599e-12	-11.085	-11.119	-0.034
NiHCO3+	6.707e-12	6.201e-12	-11.173	-11.208	-0.034
UO2CO3	3.171e-12	3.175e-12	-11.499	-11.498	0.001
CuHCO3+	2.196e-13	2.031e-13	-12.658	-12.692	-0.034
FeCO3	1.848e-13	1.850e-13	-12.733	-12.733	0.001
FeHCO3+	1.578e-15	1.459e-15	-14.802	-14.836	-0.034
(UO2)3(CO3)6-6	7.650e-19	4.554e-20	-18.116	-19.342	-1.225
UO2(CO3)3-5	9.968e-23	1.405e-23	-22.001	-22.852	-0.851
U(CO3)4-4	1.897e-37	5.414e-38	-36.722	-37.267	-0.545
U(CO3)5-6	4.313e-39	2.568e-40	-38.365	-39.590	-1.225
Ca 2.671e-04					
Ca+2	1.667e-04	1.228e-04	-3.778	-3.911	-0.133
CaCO3	9.353e-05	9.365e-05	-4.029	-4.028	0.001
CaSO4	5.111e-06	5.118e-06	-5.291	-5.291	0.001
CaHCO3+	1.469e-06	1.358e-06	-5.833	-5.867	-0.034
CaOH+	2.589e-07	2.394e-07	-6.587	-6.621	-0.034
CaF+	3.203e-08	2.962e-08	-7.494	-7.528	-0.034
CaHSO4+	2.693e-15	2.490e-15	-14.570	-14.604	-0.034
Cl 3.386e-04					
Cl-	3.386e-04	3.128e-04	-3.470	-3.505	-0.034
MnCl+	2.170e-10	2.007e-10	-9.663	-9.698	-0.034
ZnOHCl	1.386e-10	1.388e-10	-9.858	-9.858	0.001
ZnCl+	9.503e-13	8.786e-13	-12.022	-12.056	-0.034
PbCl+	1.369e-13	1.266e-13	-12.864	-12.898	-0.034
NiCl+	4.264e-14	3.943e-14	-13.370	-13.404	-0.034
MnCl2	2.736e-14	2.740e-14	-13.563	-13.562	0.001
CuCl2-	7.838e-16	7.247e-16	-15.106	-15.140	-0.034
CuCl+	3.734e-16	3.453e-16	-15.428	-15.462	-0.034
ZnCl2	2.851e-16	2.855e-16	-15.545	-15.544	0.001
PbCl2	6.508e-17	6.516e-17	-16.187	-16.186	0.001
NiCl2	4.472e-17	4.478e-17	-16.349	-16.349	0.001
FeCl+	7.609e-18	7.036e-18	-17.119	-17.153	-0.034
MnCl3-	2.553e-18	2.360e-18	-17.593	-17.627	-0.034
CuCl3-2	4.877e-19	3.565e-19	-18.312	-18.448	-0.136
ZnCl3-	1.070e-19	9.898e-20	-18.970	-19.004	-0.034
CuCl2	5.668e-20	5.675e-20	-19.247	-19.246	0.001
PbCl3-	1.729e-20	1.599e-20	-19.762	-19.796	-0.034
UO2Cl+	7.808e-22	7.219e-22	-21.107	-21.142	-0.034
ZnCl4-2	2.089e-23	1.527e-23	-22.680	-22.816	-0.136
PbCl4-2	3.225e-24	2.357e-24	-23.491	-23.628	-0.136
FeCl+2	1.690e-25	1.235e-25	-24.772	-24.908	-0.136
CuCl3-	6.573e-26	6.078e-26	-25.182	-25.216	-0.034
UO2Cl2	1.188e-26	1.189e-26	-25.925	-25.925	0.001
FeCl2+	1.989e-28	1.839e-28	-27.701	-27.735	-0.034
CuCl4-2	1.244e-31	9.094e-32	-30.905	-31.041	-0.136
FeCl3	5.746e-33	5.753e-33	-32.241	-32.240	0.001
UCl+3	0.000e+00	0.000e+00	-58.323	-58.629	-0.306
Cu(1) 2.600e-14					
Cu+	2.521e-14	2.331e-14	-13.598	-13.632	-0.034
CuCl2-	7.838e-16	7.247e-16	-15.106	-15.140	-0.034
CuCl3-2	4.877e-19	3.565e-19	-18.312	-18.448	-0.136
Cu(2) 1.307e-06					
Cu(OH)2	1.303e-06	1.305e-06	-5.885	-5.884	0.001
CuCO3	1.149e-09	1.150e-09	-8.940	-8.939	0.001
Cu(OH)3-	9.991e-10	9.238e-10	-9.000	-9.034	-0.034
Cu(CO3)2-2	9.377e-10	6.853e-10	-9.028	-9.164	-0.136
CuOH+	5.751e-11	5.317e-11	-10.240	-10.274	-0.034
Cu(OH)4-2	2.963e-12	2.165e-12	-11.528	-11.664	-0.136
Cu+2	6.193e-13	4.526e-13	-12.208	-12.344	-0.136
CuHCO3+	2.196e-13	2.031e-13	-12.658	-12.692	-0.034
CuSO4	1.938e-14	1.940e-14	-13.713	-13.712	0.001
Cu2(OH)2+2	1.386e-15	1.013e-15	-14.858	-14.994	-0.136
CuCl+	3.734e-16	3.453e-16	-15.428	-15.462	-0.034
CuF+	2.539e-16	2.347e-16	-15.595	-15.629	-0.034
CuCl2	5.668e-20	5.675e-20	-19.247	-19.246	0.001
CuCl3-	6.573e-26	6.078e-26	-25.182	-25.216	-0.034
CuCl4-2	1.244e-31	9.094e-32	-30.905	-31.041	-0.136
F 3.159e-05					
F-	3.139e-05	2.903e-05	-4.503	-4.537	-0.034
MgF+	1.002e-07	9.266e-08	-6.999	-7.033	-0.034
NaF	6.654e-08	6.662e-08	-7.177	-7.176	0.001
CaF+	3.203e-08	2.962e-08	-7.494	-7.528	-0.034
MnF+	3.420e-11	3.163e-11	-10.466	-10.500	-0.034
HF	3.570e-12	3.575e-12	-11.447	-11.447	0.001
ZnF+	4.931e-13	4.560e-13	-12.307	-12.341	-0.034
NiF+	3.144e-14	2.907e-14	-13.503	-13.537	-0.034
PbF+	5.966e-15	5.516e-15	-14.224	-14.258	-0.034
HF2-	4.238e-16	3.918e-16	-15.373	-15.407	-0.034
CuF+	2.539e-16	2.347e-16	-15.595	-15.629	-0.034
UO2F+	6.130e-18	5.668e-18	-17.213	-17.247	-0.034
FeF+	5.116e-18	4.730e-18	-17.291	-17.325	-0.034
PbF2	3.265e-18	3.269e-18	-17.486	-17.486	0.001
AlF2+	1.090e-18	1.008e-18	-17.963	-17.997	-0.034
UO2F2	5.562e-19	5.569e-19	-18.255	-18.254	0.001
AlF3	3.671e-19	3.676e-19	-18.435	-18.435	0.001
AlF+2	9.579e-20	7.001e-20	-19.019	-19.155	-0.136
AlF4-	4.592e-21	4.246e-21	-20.338	-20.372	-0.034
UO2F3-	3.329e-21	3.078e-21	-20.478	-20.512	-0.034
FeF+2	8.506e-22	6.217e-22	-21.070	-21.206	-0.136
FeF2+	7.586e-22	7.015e-22	-21.120	-21.154	-0.034
PbF3-	7.436e-22	6.875e-22	-21.129	-21.163	-0.034
H2F2	3.573e-23	3.578e-23	-22.447	-22.446	0.001
FeF3	3.201e-23	3.205e-23	-22.495	-22.494	0.001
UO2F4-2	7.757e-25	5.670e-25	-24.110	-24.246	-0.136
PbF4-2	1.307e-26	9.552e-27	-25.884	-26.020	-0.136
UF3+	0.000e+00	0.000e+00	-48.845	-48.879	-0.034
UF4	0.000e+00	0.000e+00	-49.512	-49.511	0.001
UF2+2	0.000e+00	0.000e+00	-49.581	-49.717	-0.136
UF+3	0.000e+00	0.000e+00	-51.791	-52.098	-0.306
UF5-	0.000e+00	0.000e+00	-52.533	-52.567	-0.034
UF6-2	0.000e+00	0.000e+00	-54.870	-55.006	-0.136
Fe(2) 2.719e-13					
FeCO3	1.848e-13	1.850e-13	-12.733	-12.733	0.001
FeOH+	5.632e-14	5.208e-14	-13.249	-13.283	-0.034
Fe+2	2.229e-14	1.630e-14	-13.652	-13.788	-0.136
Fe(OH)2	4.365e-15	4.371e-15	-14.360	-14.359	0.001
Fe(OH)3-	2.023e-15	1.870e-15	-14.694	-14.728	-0.034
FeHCO3+	1.578e-15	1.459e-15	-14.802	-14.836	-0.034
FeSO4	5.937e-16	5.945e-16	-15.226	-15.226	0.001
FeCl+	7.609e-18	7.036e-18	-17.119	-17.153	-0.034
FeF+	5.116e-18	4.730e-18	-17.291	-17.325	-0.034
FeHSO4+	3.574e-25	3.305e-25	-24.447	-24.481	-0.034

Fe(3)	5.481e-05					
	Fe(OH)4-	5.012e-05	4.635e-05	-4.300	-4.334	-0.034
	Fe(OH)3	4.685e-06	4.690e-06	-5.329	-5.329	0.001
	Fe(OH)2+	3.659e-09	3.384e-09	-8.437	-8.471	-0.034
	FeOH+2	1.285e-15	9.389e-16	-14.891	-15.027	-0.136
	FeF+2	8.506e-22	6.217e-22	-21.070	-21.206	-0.136
	FeF2+	7.586e-22	7.015e-22	-21.120	-21.154	-0.034
	FeSO4+	3.364e-23	3.111e-23	-22.473	-22.507	-0.034
	FeF3	3.201e-23	3.205e-23	-22.495	-22.494	0.001
	Fe+3	2.821e-23	1.394e-23	-22.550	-22.856	-0.306
	FeCl+2	1.690e-25	1.235e-25	-24.772	-24.908	-0.136
	Fe(SO4)2-	1.554e-25	1.437e-25	-24.808	-24.842	-0.034
	FeCl2+	1.989e-28	1.839e-28	-27.701	-27.735	-0.034
	Fe2(OH)2+4	9.034e-29	2.578e-29	-28.044	-28.589	-0.545
	FeHSO4+2	9.713e-33	7.099e-33	-32.013	-32.149	-0.136
	FeCl3	5.746e-33	5.753e-33	-32.241	-32.240	0.001
	Fe3(OH)4+5	1.557e-34	2.195e-35	-33.808	-34.659	-0.851
H(0)	1.029e-31					
	H2	5.147e-32	5.153e-32	-31.288	-31.288	0.001
K	1.714e-04					
	K+	1.712e-04	1.581e-04	-3.767	-3.801	-0.034
	KSO4-	2.512e-07	2.322e-07	-6.600	-6.634	-0.034
Mg	9.464e-05					
	Mg+2	6.776e-05	5.011e-05	-4.169	-4.300	-0.131
	MgCO3	2.192e-05	2.194e-05	-4.659	-4.659	0.001
	MgSO4	2.371e-06	2.374e-06	-5.625	-5.625	0.001
	MgOH+	1.927e-06	1.782e-06	-5.715	-5.749	-0.034
	MgHCO3+	5.628e-07	5.204e-07	-6.250	-6.284	-0.034
	MgF+	1.002e-07	9.266e-08	-6.999	-7.033	-0.034
Mn(2)	6.191e-06					
	MnCO3	5.912e-06	5.920e-06	-5.228	-5.228	0.001
	Mn+2	2.155e-07	1.575e-07	-6.667	-6.803	-0.136
	MnOH+	4.364e-08	4.035e-08	-7.360	-7.394	-0.034
	MnHCO3+	1.359e-08	1.256e-08	-7.867	-7.901	-0.034
	MnSO4	5.729e-09	5.736e-09	-8.242	-8.241	0.001
	MnCl+	2.170e-10	2.007e-10	-9.663	-9.698	-0.034
	MnF+	3.420e-11	3.163e-11	-10.466	-10.500	-0.034
	Mn(OH)3-	4.376e-12	4.046e-12	-11.359	-11.393	-0.034
	MnCl2	2.736e-14	2.740e-14	-13.563	-13.562	0.001
	MnCl3-	2.553e-18	2.360e-18	-17.593	-17.627	-0.034
Mn(3)	7.342e-29					
	Mn+3	7.342e-29	3.627e-29	-28.134	-28.440	-0.306
Mn(6)	5.135e-30					
	MnO4-2	5.135e-30	3.753e-30	-29.289	-29.426	-0.136
Mn(7)	1.238e-35					
	MnO4-	1.238e-35	1.145e-35	-34.907	-34.941	-0.034
Na	4.351e-03					
	Na+	4.310e-03	3.988e-03	-2.365	-2.399	-0.034
	NaCO3-	3.434e-05	3.175e-05	-4.464	-4.498	-0.034
	NaSO4-	4.543e-06	4.201e-06	-5.343	-5.377	-0.034
	NaHCO3	2.005e-06	2.008e-06	-5.698	-5.697	0.001
	NaF	6.654e-08	6.662e-08	-7.177	-7.176	0.001
Ni	3.749e-07					
	Ni(CO3)2-2	1.981e-07	1.448e-07	-6.703	-6.839	-0.136
	NiCO3	1.758e-07	1.761e-07	-6.755	-6.754	0.001
	Ni(OH)2	6.917e-10	6.926e-10	-9.160	-9.160	0.001
	Ni(OH)3-	8.799e-11	8.136e-11	-10.056	-10.090	-0.034
	NiOH+	7.640e-11	7.064e-11	-10.117	-10.151	-0.034
	Ni+2	6.866e-11	5.018e-11	-10.163	-10.299	-0.136
	NiHCO3+	6.707e-12	6.201e-12	-11.173	-11.208	-0.034
	NiSO4	2.044e-12	2.047e-12	-11.689	-11.689	0.001
	NiCl+	4.264e-14	3.943e-14	-13.370	-13.404	-0.034
	NiF+	3.144e-14	2.907e-14	-13.503	-13.537	-0.034
	NiCl2	4.472e-17	4.478e-17	-16.349	-16.349	0.001
	Ni(SO4)2-2	3.257e-17	2.381e-17	-16.487	-16.623	-0.136
O(0)	6.810e-31					
	O2	3.405e-31	3.409e-31	-30.468	-30.467	0.001
Pb	2.462e-07					
	Pb(CO3)2-2	1.429e-07	1.045e-07	-6.845	-6.981	-0.136
	PbCO3	8.777e-08	8.788e-08	-7.057	-7.056	0.001
	Pb(OH)2	1.117e-08	1.119e-08	-7.952	-7.951	0.001
	PbOH+	2.647e-09	2.448e-09	-8.577	-8.611	-0.034
	Pb(OH)3-	1.632e-09	1.509e-09	-8.787	-8.821	-0.034
	Pb(OH)4-2	5.556e-11	4.061e-11	-10.255	-10.391	-0.136
	Pb+2	1.462e-11	1.069e-11	-10.835	-10.971	-0.136
	PbHCO3+	8.218e-12	7.599e-12	-11.085	-11.119	-0.034
	PbSO4	1.278e-12	1.279e-12	-11.894	-11.893	0.001
	PbCl+	1.369e-13	1.266e-13	-12.864	-12.898	-0.034
	PbF+	5.966e-15	5.516e-15	-14.224	-14.258	-0.034
	Pb(SO4)2-2	1.955e-15	1.429e-15	-14.709	-14.845	-0.136
	PbCl2	6.508e-17	6.516e-17	-16.187	-16.186	0.001
	Pb3(OH)4+2	3.099e-17	2.265e-17	-16.509	-16.645	-0.136
	PbF2	3.265e-18	3.269e-18	-17.486	-17.486	0.001
	Pb2OH+3	1.186e-18	5.856e-19	-17.926	-18.232	-0.306
	PbCl3-	1.729e-20	1.599e-20	-19.762	-19.796	-0.034
	PbF3-	7.436e-22	6.875e-22	-21.129	-21.163	-0.034
	PbCl4-2	3.225e-24	2.357e-24	-23.491	-23.628	-0.136
	PbF4-2	1.307e-26	9.552e-27	-25.884	-26.020	-0.136
S(6)	3.020e-04					
	SO4-2	2.897e-04	2.129e-04	-3.538	-3.672	-0.134
	CaSO4	5.111e-06	5.118e-06	-5.291	-5.291	0.001
	NaSO4-	4.543e-06	4.201e-06	-5.343	-5.377	-0.034
	MgSO4	2.371e-06	2.374e-06	-5.625	-5.625	0.001
	KSO4-	2.512e-07	2.322e-07	-6.600	-6.634	-0.034
	BaSO4	5.465e-08	5.471e-08	-7.262	-7.262	0.001
	MnSO4	5.729e-09	5.736e-09	-8.242	-8.241	0.001
	ZnSO4	5.597e-11	5.604e-11	-10.252	-10.252	0.001
	NiSO4	2.044e-12	2.047e-12	-11.689	-11.689	0.001
	HSO4-	1.824e-12	1.687e-12	-11.739	-11.773	-0.034
	PbSO4	1.278e-12	1.279e-12	-11.894	-11.893	0.001
	Zn(SO4)2-2	1.347e-13	9.846e-14	-12.871	-13.007	-0.136
	CuSO4	1.938e-14	1.940e-14	-13.713	-13.712	0.001
	CaHSO4+	2.693e-15	2.490e-15	-14.570	-14.604	-0.034
	Pb(SO4)2-2	1.955e-15	1.429e-15	-14.709	-14.845	-0.136
	FeSO4	5.937e-16	5.945e-16	-15.226	-15.226	0.001
	Ni(SO4)2-2	3.257e-17	2.381e-17	-16.487	-16.623	-0.136
	UO2SO4	4.539e-19	4.544e-19	-18.343	-18.343	0.001
	UO2(SO4)2-2	1.240e-21	9.062e-22	-20.907	-21.043	-0.136
	AlSO4+	1.731e-22	1.601e-22	-21.762	-21.796	-0.034
	FeSO4+	3.364e-23	3.111e-23	-22.473	-22.507	-0.034
	Al(SO4)2-	1.155e-24	1.068e-24	-23.938	-23.972	-0.034
	FeHSO4+	3.574e-25	3.305e-25	-24.447	-24.481	-0.034
	Fe(SO4)2-	1.554e-25	1.437e-25	-24.808	-24.842	-0.034
	FeHSO4+2	9.713e-33	7.099e-33	-32.013	-32.149	-0.136
	AlHSO4+2	1.625e-33	1.188e-33	-32.789	-32.925	-0.136
	U(SO4)2	0.000e+00	0.000e+00	-53.750	-53.749	0.001
	USO4+2	0.000e+00	0.000e+00	-53.832	-53.968	-0.136
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-69.477	-69.784	-0.306
U(4)	6.192e-26					
	U(OH)4	6.192e-26	6.200e-26	-25.208	-25.208	0.001
	U(OH)3+	2.138e-32	1.977e-32	-31.670	-31.704	-0.034
	U(CO3)4-4	1.897e-37	5.414e-38	-36.722	-37.267	-0.545
	U(CO3)5-6	4.313e-39	2.568e-40	-38.365	-39.590	-1.225
	U(OH)2+2	1.126e-39	8.228e-40	-38.949	-39.085	-0.136
	UOH+3	0.000e+00	0.000e+00	-47.086	-47.392	-0.306
	UF3+	0.000e+00	0.000e+00	-48.845	-48.879	-0.034
	UF4	0.000e+00	0.000e+00	-49.512	-49.511	0.001
	UF2+2	0.000e+00	0.000e+00	-49.581	-49.717	-0.136
	UF+3	0.000e+00	0.000e+00	-51.791	-52.098	-0.306
	UF5-	0.000e+00	0.000e+00	-52.533	-52.567	-0.034
	U(SO4)2	0.000e+00	0.000e+00	-53.750	-53.749	0.001
	USO4+2	0.000e+00	0.000e+00	-53.832	-53.968	-0.136
	UF6-2	0.000e+00	0.000e+00	-54.870	-55.006	-0.136
	U+4	0.000e+00	0.000e+00	-56.322	-56.867	-0.545
	UCl+3	0.000e+00	0.000e+00	-58.323	-58.629	-0.306
	U6(OH)15+9	0.000e+00	0.000e+00	-204.595	-207.352	-2.757
U(5)	5.633e-21					
	UO2+	5.534e-21	5.117e-21	-20.257	-20.291	-0.034
	UO2(CO3)3-5	9.968e-23	1.405e-23	-22.001	-22.852	-0.851
U(6)	3.026e-06					
	UO2(CO3)3-4	2.803e-06	8.000e-07	-5.552	-6.097	-0.545
	UO2(OH)3-	1.764e-07	1.631e-07	-6.753	-6.788	-0.034
	UO2(CO3)2-2	4.646e-08	3.396e-08	-7.333	-7.469	-0.136
	UO2(OH)4-2	4.155e-11	3.037e-11	-10.381	-10.518	-0.136
	UO2CO3	3.171e-12	3.175e-12	-11.499	-11.498	0.001
	UO2OH+	1.127e-13	1.042e-13	-12.948	-12.982	-0.034
	(UO2)3(OH)7-	1.354e-14	1.252e-14	-13.868	-13.902	-0.034
	UO2F+	6.130e-18	5.668e-18	-17.213	-17.247	-0.034
	UO2+2	2.182e-18	1.595e-18	-17.661	-17.797	-0.136
	(UO2)3(CO3)6-6	7.650e-19	4.554e-20	-18.116	-19.342	-1.225
	UO2F2	5.562e-19	5.569e-19	-18.255	-18.254	0.001
	UO2SO4	4.539e-19	4.544e-19	-18.343	-18.343	0.001
	(UO2)3(OH)5+	2.078e-19	1.921e-19	-18.682	-18.716	-0.034
	UO2F3-	3.329e-21	3.078e-21	-20.478	-20.512	-0.034
	UO2(SO4)2-2	1.240e-21	9.062e-22	-20.907	-21.043	-0.136
	(UO2)2(OH)2+2	1.025e-21	7.491e-22	-20.989	-21.125	-0.136
	UO2Cl+	7.808e-22	7.219e-22	-21.107	-21.142	-0.034
	(UO2)4(OH)7+	2.718e-23	2.513e-23	-22.566	-22.600	-0.034
	UO2F4-2	7.757e-25	5.670e-25	-24.110	-24.246	-0.136
	(UO2)3(OH)4+2	1.330e-25	9.721e-26	-24.876	-25.012	-0.136
	UO2Cl2	1.188e-26	1.189e-26	-25.925	-25.925	0.001
	(UO2)2OH+3	1.207e-28	5.960e-29	-27.918	-28.225	-0.306
Zn	3.673e-06					
	Zn(OH)2	1.979e-06	1.982e-06	-5.704	-5.703	0.001
	Zn(CO3)2-2	1.491e-06	1.090e-06	-5.827	-5.963	-0.136
	ZnCO3	1.076e-07	1.077e-07	-6.968	-6.968	0.001
	Zn(OH)3-	7.961e-08	7.361e-08	-7.099	-7.133	-0.034
	ZnOH+	1.364e-08	1.261e-08	-7.865	-7.899	-0.034
	Zn+2	1.560e-09	1.141e-09	-8.807	-8.943	-0.136
	Zn(OH)4-2	1.875e-10	1.371e-10	-9.727	-9.863	-0.136
	ZnHCO3+	1.390e-10	1.285e-10	-9.857	-9.891	-0.034
	ZnOHCl	1.386e-10	1.388e-10	-9.858	-9.858	0.001
	ZnSO4	5.597e-11	5.604e-11	-10.252	-10.252	0.001
	ZnCl+	9.503e-13	8.786e-13	-12.022	-12.056	-0.034
	ZnF+	4.931e-13	4.560e-13	-12.307	-12.341	-0.034
	Zn(SO4)2-2	1.347e-13	9.846e-14	-12.871	-13.007	-0.136
	ZnCl2	2.851e-16	2.855e-16	-15.545	-15.544	0.001
	ZnCl3-	1.070e-19	9.898e-20	-18.970	-19.004	-0.034
	ZnCl4-2	2.089e-23	1.527e-23	-22.680	-22.816	-0.136

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-2.33	8.60	10.93	Al(OH)3
AlAsO4:2H2O	-12.26	-7.48	4.78	AlAsO4:2H2O
AlumK	-27.55	-32.76	-5.21	KAl(SO4)2:12H2O
Alunite	-14.41	-15.56	-1.15	KAl3(SO4)2(OH)6
Anglesite	-6.84	-14.64	-7.80	PbSO4
Anhydrite	-3.23	-7.58	-4.35	CaSO4
Antlerite	-8.71	-0.42	8.29	Cu3(OH)4SO4
Aragonite	1.09	-7.24	-8.32	CaCO3
Arsenolite	-97.82	-176.87	-79.05	As4O6
Artinite	-1.53	8.21	9.74	MgCO3:Mg(OH)2:3H2O
As2O5	-38.88	-32.16	6.73	As2O5
Atacamite	-5.42	2.02	7.43	Cu2(OH)3Cl
Azurite	-6.75	-23.54	-16.79	Cu3(OH)2(CO3)2
B-UO2(OH)2	-3.27	2.34	5.61	UO2(OH)2
Ba3(AsO4)2	18.32	9.39	-8.93	Ba3(AsO4)2
BaF2	-9.60	-15.36	-5.76	BaF2
Barite	0.04	-9.96	-10.00	BaSO4
Basaluminite	-12.12	10.58	22.70	Al4(OH)10SO4
Bianchite	-10.85	-12.62	-1.76	ZnSO4:6H2O
Birnessite	-2.12	41.48	43.60	MnO2
Bixbyite	4.07	54.81	50.74	Mn2O3
Boehmite	-0.13	8.60	8.72	AlOOH
Brochantite	-7.97	7.37	15.34	Cu4(OH)6SO4
Brucite	-1.13	15.84	16.97	Mg(OH)2
Bunsenite	-2.73	9.84	12.57	NiO
Ca3(AsO4)2:4w	-5.79	16.53	22.32	Ca3(AsO4)2:4H2O
Calcite	1.23	-7.24	-8.47	CaCO3
Cerrusite	-1.14	-14.30	-13.15	PbCO3
Chalcanthite	-13.37	-16.02	-2.65	CuSO4:5H2O
Claudetite	-97.56	-176.87	-79.31	As4O6
CO2(g)	-5.31	-23.46	-18.15	CO2
Cotunnite	-13.18	-17.98	-4.80	PbCl2
Cu(OH)2	-0.92	7.80	8.72	Cu(OH)2
Cu2SO4	-29.01	-36.36	-7.35	Cu2SO4
Cu3(AsO4)2:6w	-14.88	-8.77	6.10	Cu3(AsO4)2:6H2O
CuCO3	-6.04	-15.67	-9.63	CuCO3
CuF	-25.31	-20.88	4.43	CuF
CuF2	-20.86	-21.42	-0.55	CuF2
CuF2:2H2O	-16.89	-21.42	-4.53	CuF2:2H2O
CuMetal	-8.79	-20.34	-11.56	Cu
CuOCuSO4	-19.93	-8.22	11.71	CuO:CuSO4
CupricFerrite	16.43	48.64	32.21	CuFe2O4
Cuprite	-5.54	-12.55	-7.00	Cu2O
CuprousFerrite	12.69	14.15	1.45	CuFeO2
CuSO4	-19.12	-16.02	3.10	CuSO4
Diaspore	1.60	8.60	7.00	AlOOH
Dolomite	2.18	-14.86	-17.04	CaMg(CO3)2
Dolomite(d)	1.62	-14.86	-16.49	CaMg(CO3)2
Epsomite	-5.82	-7.97	-2.15	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.32	16.35	10.03	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.46	20.42	17.96	Fe(OH)3
Fe3(OH)8	0.84	47.20	46.36	Fe3(OH)8
Fluorite	-2.36	-12.99	-10.62	CaF2
Gibbsite	0.37	8.60	8.22	Al(OH)3
Goethite	8.35	20.42	12.07	FeOOH
Goslarite	-10.64	-12.62	-1.98	ZnSO4:7H2O
Gummite	-8.17	2.34	10.52	UO3
Gypsum	-3.00	-7.58	-4.58	CaSO4:2H2O
H2(g)	-28.10	-28.14	-0.04	H2
Halite	-7.48	-5.90	1.58	NaCl
Hausmannite	6.62	68.15	61.53	Mn3O4
Hematite	18.56	40.84	22.28	Fe2O3
Huntite	-0.27	-30.11	-29.84	CaMg3(CO3)4
Hydrocerrusite	-1.96	-19.42	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-6.16	-14.66	-8.50	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-12.50	18.70	31.20	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-10.24	19.91	30.15	KFe3(SO4)2(OH)6
Jarosite-Na	-12.79	21.31	34.10	NaFe3(SO4)2(OH)6
JarositeH	-20.44	13.64	34.09	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-11.98	-15.21	-3.23	AlOHSO4
Langite	-9.62	7.37	16.99	Cu4(OH)6SO4:H2O
Larnakite	-5.23	-5.47	-0.25	PbO:PbSO4
Laurionite	-5.03	-4.41	0.62	PbOHCl
Litharge	-3.63	9.17	12.80	PbO
Maghemite	8.32	40.84	32.52	Fe2O3
Magnesite	0.37	-7.63	-8.00	MgCO3
Magnetite	17.07	47.20	30.12	Fe3O4
Malachite	-2.77	-7.87	-5.10	Cu2(OH)2CO3
Manganite	2.07	27.41	25.34	MnOOH
Massicot	-3.82	9.17	12.99	PbO
Matlockite	-9.54	-19.01	-9.47	PbClF
Melanothallite	-23.14	-19.35	3.79	CuCl2
Melanterite	-15.23	-17.46	-2.23	FeSO4:7H2O
Minium	-18.55	55.65	74.20	Pb3O4
Mirabilite	-7.26	-8.47	-1.21	Na2SO4:10H2O
Mn2(SO4)3	-62.38	-16.62	45.76	Mn2(SO4)3
Mn3(AsO4):8H2O	-4.67	7.85	12.52	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-16.44	-13.81	2.62	MnCl2:4H2O
MnSO4	-13.22	-10.47	2.75	MnSO4
Morenosite	-11.60	-13.97	-2.37	NiSO4:7H2O
Na4UO2(CO3)3	-21.08	-37.37	-16.29	Na4UO2(CO3)3
Nahcolite	-4.88	-15.79	-10.91	NaHCO3
Nantokite	-10.33	-19.85	-9.52	CuCl
Natron	-6.73	-8.12	-1.39	Na2CO3:10H2O
Nesquehonite	-2.03	-7.63	-5.59	MgCO3:3H2O
Ni(OH)2	-0.81	9.84	10.65	Ni(OH)2
Ni3(AsO4)2:8H2O	-18.35	-2.64	15.72	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-16.45	15.55	32.00	Ni4(OH)6SO4
NiCO3	-6.83	-13.62	-6.79	NiCO3
Nsutite	-1.09	41.48	42.56	MnO2
O2(g)	-27.59	56.28	83.87	O2
Pb(OH)2	0.95	9.17	8.22	Pb(OH)2
Pb2(OH)3Cl	-4.03	4.76	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-7.86	18.34	26.20	PbO:Pb(OH)2
Pb2O3	-14.56	46.48	61.04	Pb2O3
Pb2OCO3	-4.68	-5.13	-0.44	PbO:PbCO3
Pb3(AsO4)2	-10.48	-4.65	5.82	Pb3(AsO4)2
Pb3O2CO3	-7.11	4.04	11.15	PbCO3:2PbO
Pb3O2SO4	-6.81	3.69	10.50	PbSO4:2PbO
Pb4(OH)6SO4	-8.24	12.86	21.10	Pb4(OH)6SO4
Pb4O3SO4	-9.41	12.86	22.27	PbSO4:3PbO
PbF2	-12.61	-20.05	-7.44	PbF2
PbMetal	-23.24	-18.97	4.27	Pb
PbO:0.3H2O	-3.81	9.17	12.98	PbO:0.33H2O
Phosgenite	-12.47	-32.28	-19.81	PbCl2:PbCO3
Plattnerite	-12.34	37.31	49.65	PbO2
Portlandite	-6.72	16.23	22.95	Ca(OH)2
Pyrochroite	-1.86	13.34	15.20	Mn(OH)2
Pyrolusite	-0.23	41.48	41.70	MnO2
Retgersite	-11.93	-13.97	-2.05	NiSO4:6H2O
Rhodochrosite	1.00	-10.13	-11.12	MnCO3
Rhodochrosite(d)	0.26	-10.13	-10.39	MnCO3
Rutherfordine	-6.68	-21.12	-14.44	UO2CO3
Schoepite	-3.12	2.34	5.46	UO2(OH)2:H2O
Scorodite	-9.09	4.34	13.43	FeAsO4:2H2O
Siderite	-6.24	-17.11	-10.88	FeCO3
Siderite(d)(3)	-6.66	-17.11	-10.45	FeCO3
Smithsonite	-2.29	-12.27	-9.98	ZnCO3
Tenorite	0.10	7.80	7.70	CuO
Thenardite	-8.29	-8.47	-0.18	Na2SO4
Thermonatrite	-8.26	-8.12	0.14	Na2CO3:H2O
Trona	-12.86	-23.92	-11.05	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-37.20	-49.61	-12.41	U(OH)2SO4
U3O8(c)	-14.59	-21.11	-6.53	U3O8
U4O9(c)	-35.32	-75.05	-39.72	U4O9
UF4(c)	-56.50	-84.23	-27.72	UF4
UF4:2.5H2O	-47.45	-84.23	-36.78	UF4:2.5H2O
UO2(a)	-16.69	-25.80	-9.11	UO2
UO3(gamma)	-5.47	2.34	7.81	UO3
Uraninite(c)	-11.88	-25.80	-13.92	UO2
Witherite	-1.05	-9.61	-8.57	BaCO3
Zincite(c)	-0.05	11.20	11.25	ZnO
Zincosite	-15.72	-12.61	3.11	ZnSO4
Zn(OH)2-a	-1.25	11.20	12.45	Zn(OH)2
Zn(OH)2-b	-0.55	11.20	11.75	Zn(OH)2
Zn(OH)2-c	-1.00	11.20	12.20	Zn(OH)2
Zn(OH)2-e	-0.30	11.20	11.50	Zn(OH)2
Zn(OH)2-g	-0.51	11.20	11.71	Zn(OH)2
Zn2(OH)2SO4	-8.92	-1.42	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.38	8.82	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-12.25	1.43	13.68	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-33.36	-14.03	19.33	ZnO:2ZnSO4
Zn4(OH)6SO4	-7.42	20.98	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-9.66	28.84	38.50	Zn5(OH)8Cl2
ZnCl2	-23.07	-15.95	7.12	ZnCl2
ZnCO3:H2O	-2.01	-12.27	-10.26	ZnCO3:H2O
ZnF2	-16.56	-18.02	-1.46	ZnF2
ZnMetal	-42.88	-16.94	25.94	Zn
ZnO(a)	-0.11	11.20	11.31	ZnO
ZnSO4:H2O	-12.10	-12.61	-0.52	ZnSO4:H2O

End of simulation.

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------------------
Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 17.5-18.5m
           SOLUTION        18
           units           mg/l
           temp            22.7
           pH              9.53
           F               0.7
           Cl              6.9
           S(6)            48          as SO4
           Na              130
           K               2
           Mg              1.4
           Ca              9.3
           Alkalinity      225.7       as HCO3
           Al              2.7
           As              1.47
           Ba              0.158
           Cu              0.190
           Fe              5.18
           Mn              0.62
           Ni              0.042
           Pb              0.085
           U               1.18
           Zn              0.52
           END
```

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TITLE
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   Schneckentein 17.5-18.5m

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Beginning of initial solution calculations.
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Initial solution 18.

----------------------------Solution composition--------------
---------------

           Elements           Molality       Moles

           Al                1.001e-04   1.001e-04
           Alkalinity        3.700e-03   3.700e-03
           As                1.963e-05   1.963e-05
           Ba                1.151e-06   1.151e-06
           Ca                2.321e-04   2.321e-04
           Cl                1.947e-04   1.947e-04
           Cu                2.991e-06   2.991e-06
           F                 3.686e-05   3.686e-05
           Fe                9.279e-05   9.279e-05
           K                 5.117e-05   5.117e-05
           Mg                5.761e-05   5.761e-05
           Mn                1.129e-05   1.129e-05
           Na                5.657e-03   5.657e-03
           Ni                7.157e-07   7.157e-07
           Pb                4.104e-07   4.104e-07
           S(6)              4.999e-04   4.999e-04
           U                 4.960e-06   4.960e-06
           Zn                7.958e-06   7.958e-06
```

```
----------------------------Description of solution----------------------
-----

                                    pH  =   9.530
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   6.344e-03
                     Mass of water (kg)  =   1.000e+00
                 Total carbon (mol/kg)  =   2.558e-03
                    Total CO2 (mol/kg)  =   2.558e-03
                   Temperature (deg C)  =  22.700
                Electrical balance (eq)  =   1.788e-03
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  17.18
                               Iterations  =  17
                                  Total H  = 1.110153e+02
                                  Total O  = 5.551677e+01
```

----------Distribution of species----------

	Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
	OH-	3.093e-05	2.844e-05	-4.510	-4.546	-0.036
	H+	3.182e-10	2.951e-10	-9.497	-9.530	-0.033
	H2O	5.551e+01	9.998e-01	-0.000	-0.000	0.000
Al	1.001e-04					
	Al(OH)4-	1.001e-04	9.204e-05	-4.000	-4.036	-0.036
	Al(OH)3	1.483e-08	1.485e-08	-7.829	-7.828	0.001
	Al(OH)2+	3.842e-11	3.532e-11	-10.415	-10.452	-0.036
	AlOH+2	2.281e-15	1.631e-15	-14.642	-14.788	-0.146
	AlF2+	3.396e-16	3.123e-16	-15.469	-15.505	-0.036
	AlF3	1.320e-16	1.322e-16	-15.880	-15.879	0.001
	AlF+2	2.618e-17	1.871e-17	-16.582	-16.728	-0.146
	AlF4-	1.927e-18	1.772e-18	-17.715	-17.752	-0.036
	Al+3	1.199e-19	5.631e-20	-18.921	-19.249	-0.328
	AlSO4+	6.480e-20	5.958e-20	-19.188	-19.225	-0.036
	Al(SO4)2-	6.990e-22	6.427e-22	-21.156	-21.192	-0.036
	AlHSO4+2	2.139e-30	1.529e-30	-29.670	-29.816	-0.146
As(3)	3.655e-23					
	H2AsO3-	2.433e-23	2.237e-23	-22.614	-22.650	-0.036
	H3AsO3	1.214e-23	1.216e-23	-22.916	-22.915	0.001
	HAsO3-2	7.585e-26	5.421e-26	-25.120	-25.266	-0.146
	AsO3-3	1.392e-29	6.541e-30	-28.856	-29.184	-0.328
	H4AsO3+	1.934e-33	1.778e-33	-32.714	-32.750	-0.036
As(5)	1.963e-05					
	HAsO4-2	1.936e-05	1.384e-05	-4.713	-4.859	-0.146
	AsO4-3	2.391e-07	1.123e-07	-6.621	-6.950	-0.328
	H2AsO4-	2.570e-08	2.363e-08	-7.590	-7.626	-0.036
	H3AsO4	1.192e-15	1.194e-15	-14.924	-14.923	0.001
Ba	1.151e-06					
	Ba+2	9.312e-07	6.655e-07	-6.031	-6.177	-0.146
	BaSO4	1.148e-07	1.150e-07	-6.940	-6.939	0.001
	BaCO3	9.279e-08	9.292e-08	-7.033	-7.032	0.001
	BaHCO3+	1.206e-08	1.109e-08	-7.919	-7.955	-0.036
	BaOH+	8.309e-11	7.640e-11	-10.080	-10.117	-0.036
C(4)	2.558e-03					
	HCO3-	2.027e-03	1.868e-03	-2.693	-2.729	-0.035
	CO3-2	3.922e-04	2.830e-04	-3.406	-3.548	-0.142
	CaCO3	5.441e-05	5.449e-05	-4.264	-4.264	0.001
	NaCO3-	2.635e-05	2.423e-05	-4.579	-4.616	-0.036
	MnCO3	1.049e-05	1.050e-05	-4.979	-4.979	0.001
	MgCO3	8.552e-06	8.565e-06	-5.068	-5.067	0.001
	Zn(CO3)2-2	5.550e-06	3.967e-06	-5.256	-5.402	-0.146
	NaHCO3	5.421e-06	5.429e-06	-5.266	-5.265	0.001
	UO2(CO3)3-4	4.807e-06	1.255e-06	-5.318	-5.902	-0.583
	CaHCO3+	3.000e-06	2.759e-06	-5.523	-5.559	-0.036
	CO2	1.276e-06	1.278e-06	-5.894	-5.894	0.001
	MgHCO3+	7.735e-07	7.112e-07	-6.112	-6.148	-0.036
	ZnCO3	6.545e-07	6.555e-07	-6.184	-6.183	0.001
	NiCO3	4.233e-07	4.239e-07	-6.373	-6.373	0.001
	Ni(CO3)2-2	2.917e-07	2.085e-07	-6.535	-6.681	-0.146
	PbCO3	2.022e-07	2.025e-07	-6.694	-6.694	0.001
	Pb(CO3)2-2	2.014e-07	1.440e-07	-6.696	-6.842	-0.146
	UO2(CO3)2-2	1.217e-07	8.698e-08	-6.915	-7.061	-0.146
	BaCO3	9.279e-08	9.292e-08	-7.033	-7.032	0.001
	MnHCO3+	8.460e-08	7.779e-08	-7.073	-7.109	-0.036
	CuCO3	1.877e-08	1.880e-08	-7.726	-7.726	0.001
	BaHCO3+	1.206e-08	1.109e-08	-7.919	-7.955	-0.036
	Cu(CO3)2-2	9.373e-09	6.699e-09	-8.028	-8.174	-0.146
	ZnHCO3+	2.969e-09	2.730e-09	-8.527	-8.564	-0.036
	PbHCO3+	6.645e-11	6.109e-11	-10.178	-10.214	-0.036
	NiHCO3+	5.667e-11	5.211e-11	-10.247	-10.283	-0.036
	FeCO3	2.380e-11	2.384e-11	-10.623	-10.623	0.001
	UO2CO3	1.366e-11	1.367e-11	-10.865	-10.864	0.001
	CuHCO3+	1.260e-11	1.158e-11	-10.900	-10.936	-0.036
	FeHCO3+	7.133e-13	6.559e-13	-12.147	-12.183	-0.036
	(UO2)3(CO3)6-6	1.609e-17	7.831e-19	-16.794	-18.106	-1.313
	UO2(CO3)3-5	1.770e-22	2.169e-23	-21.752	-22.664	-0.912
	U(CO3)4-4	2.938e-35	7.667e-36	-34.532	-35.115	-0.583
	U(CO3)5-6	4.317e-37	2.101e-38	-36.365	-37.678	-1.313
Ca	2.321e-04					
	Ca+2	1.665e-04	1.201e-04	-3.778	-3.920	-0.142
	CaCO3	5.441e-05	5.449e-05	-4.264	-4.264	0.001
	CaSO4	8.074e-06	8.086e-06	-5.093	-5.092	0.001
	CaHCO3+	3.000e-06	2.759e-06	-5.523	-5.559	-0.036
	CaOH+	7.345e-08	6.754e-08	-7.134	-7.170	-0.036
	CaF+	3.632e-08	3.340e-08	-7.440	-7.476	-0.036
	CaHSO4+	1.478e-14	1.359e-14	-13.830	-13.867	-0.036
Cl	1.947e-04					
	Cl-	1.947e-04	1.788e-04	-3.711	-3.748	-0.037
	MnCl+	3.702e-10	3.404e-10	-9.432	-9.468	-0.036
	ZnOHCl	2.325e-10	2.329e-10	-9.634	-9.633	0.001
	ZnCl+	5.486e-12	5.044e-12	-11.261	-11.297	-0.036
	PbCl+	3.010e-13	2.767e-13	-12.521	-12.558	-0.036
	NiCl+	9.871e-14	9.076e-14	-13.006	-13.042	-0.036
	MnCl2	2.653e-14	2.657e-14	-13.576	-13.576	0.001
	CuCl2-	7.026e-15	6.460e-15	-14.153	-14.190	-0.036
	CuCl+	5.781e-15	5.315e-15	-14.238	-14.274	-0.036
	FeCl+	9.425e-16	8.666e-16	-15.026	-15.062	-0.036
	ZnCl2	9.345e-16	9.358e-16	-15.029	-15.029	0.001
	PbCl2	8.179e-17	8.191e-17	-16.087	-16.087	0.001
	NiCl2	5.884e-17	5.893e-17	-16.230	-16.230	0.001
	CuCl3-2	2.539e-18	1.815e-18	-17.595	-17.741	-0.146
	MnCl3-	1.423e-18	1.309e-18	-17.847	-17.883	-0.036
	CuCl2	4.971e-19	4.978e-19	-18.304	-18.303	0.001
	ZnCl3-	2.014e-19	1.852e-19	-18.696	-18.732	-0.036
	PbCl3-	1.247e-20	1.147e-20	-19.904	-19.940	-0.036
	UO2Cl+	3.229e-21	2.969e-21	-20.491	-20.527	-0.036
	ZnCl4-2	2.280e-23	1.630e-23	-22.642	-22.788	-0.146
	FeCl+2	2.073e-23	1.482e-23	-22.683	-22.829	-0.146
	PbCl4-2	1.349e-24	9.644e-25	-23.870	-24.016	-0.146
	CuCl3-	3.297e-25	3.032e-25	-24.482	-24.518	-0.036
	UO2Cl2	2.784e-26	2.788e-26	-25.555	-25.555	0.001
	FeCl2+	1.385e-26	1.274e-26	-25.858	-25.895	-0.036
	CuCl4-2	3.603e-31	2.575e-31	-30.443	-30.589	-0.146
	FeCl3	2.275e-31	2.278e-31	-30.643	-30.642	0.001
	UCl+3	0.000e+00	0.000e+00	-55.496	-55.824	-0.328
Cu(1)	6.979e-13					
	Cu+	6.909e-13	6.353e-13	-12.161	-12.197	-0.036
	CuCl2-	7.026e-15	6.460e-15	-14.153	-14.190	-0.036
	CuCl3-2	2.539e-18	1.815e-18	-17.595	-17.741	-0.146
Cu(2)	2.991e-06					
	Cu(OH)2	2.962e-06	2.966e-06	-5.528	-5.528	0.001
	CuCO3	1.877e-08	1.880e-08	-7.726	-7.726	0.001
	Cu(CO3)2-2	9.373e-09	6.699e-09	-8.028	-8.174	-0.146
	Cu(OH)3-	6.586e-10	6.055e-10	-9.181	-9.218	-0.036
	CuOH+	4.558e-10	4.191e-10	-9.341	-9.378	-0.036
	Cu+2	1.731e-11	1.237e-11	-10.762	-10.908	-0.146
	CuHCO3+	1.260e-11	1.158e-11	-10.900	-10.936	-0.036
	CuSO4	8.557e-13	8.569e-13	-12.068	-12.067	0.001
	Cu(OH)4-2	5.727e-13	4.093e-13	-12.242	-12.388	-0.146
	Cu2(OH)2+2	8.541e-14	6.105e-14	-13.068	-13.214	-0.146
	CuF+	8.076e-15	7.425e-15	-14.093	-14.129	-0.036
	CuCl+	5.781e-15	5.315e-15	-14.238	-14.274	-0.036
	CuCl2	4.971e-19	4.978e-19	-18.304	-18.303	0.001
	CuCl3-	3.297e-25	3.032e-25	-24.482	-24.518	-0.036
	CuCl4-2	3.603e-31	2.575e-31	-30.443	-30.589	-0.146
F	3.686e-05					
	F-	3.665e-05	3.370e-05	-4.436	-4.472	-0.036
	NaF	1.001e-07	1.002e-07	-7.000	-6.999	0.001
	MgF+	7.627e-08	7.013e-08	-7.118	-7.154	-0.036
	CaF+	3.632e-08	3.340e-08	-7.440	-7.476	-0.036
	MnF+	1.184e-10	1.089e-10	-9.926	-9.963	-0.036
	HF	1.429e-11	1.431e-11	-10.845	-10.844	0.001
	ZnF+	5.836e-12	5.366e-12	-11.234	-11.270	-0.036
	NiF+	1.477e-13	1.358e-13	-12.831	-12.867	-0.036
	PbF+	2.683e-14	2.467e-14	-13.571	-13.608	-0.036
	CuF+	8.076e-15	7.425e-15	-14.093	-14.129	-0.036
	HF2-	1.976e-15	1.817e-15	-14.704	-14.741	-0.036
	FeF+	1.287e-15	1.183e-15	-14.891	-14.927	-0.036
	AlF2+	3.396e-16	3.123e-16	-15.469	-15.505	-0.036
	AlF3	1.320e-16	1.322e-16	-15.880	-15.879	0.001
	UO2F+	5.160e-17	4.744e-17	-16.287	-16.324	-0.036
	AlF+2	2.618e-17	1.871e-17	-16.582	-16.728	-0.146
	PbF2	1.695e-17	1.697e-17	-16.771	-16.770	0.001
	UO2F2	5.403e-18	5.411e-18	-17.267	-17.267	0.001
	AlF4-	1.927e-18	1.772e-18	-17.715	-17.752	-0.036
	FeF2+	2.160e-19	1.986e-19	-18.665	-18.702	-0.036
	FeF+2	2.130e-19	1.522e-19	-18.672	-18.818	-0.146
	UO2F3-	3.775e-20	3.471e-20	-19.423	-19.459	-0.036
	FeF3	1.051e-20	1.053e-20	-19.978	-19.978	0.001
	PbF3-	4.506e-21	4.143e-21	-20.346	-20.383	-0.036
	H2F2	5.788e-22	5.797e-22	-21.237	-21.237	0.001
	UO2F4-2	1.039e-23	7.428e-24	-22.983	-23.129	-0.146
	PbF4-2	9.349e-26	6.682e-26	-25.029	-25.175	-0.146
	UF3+	0.000e+00	0.000e+00	-45.604	-45.641	-0.036
	UF4	0.000e+00	0.000e+00	-46.208	-46.207	0.001
	UF2+2	0.000e+00	0.000e+00	-46.397	-46.543	-0.146
	UF+3	0.000e+00	0.000e+00	-48.660	-48.988	-0.328
	UF5-	0.000e+00	0.000e+00	-49.166	-49.202	-0.036
	UF6-2	0.000e+00	0.000e+00	-51.430	-51.576	-0.146
Fe(2)	3.316e-11					
	FeCO3	2.380e-11	2.384e-11	-10.623	-10.623	0.001
	Fe+2	4.912e-12	3.511e-12	-11.309	-11.455	-0.146
	FeOH+	3.440e-12	3.163e-12	-11.463	-11.500	-0.036
	FeHCO3+	7.133e-13	6.559e-13	-12.147	-12.183	-0.036
	FeSO4	2.060e-13	2.063e-13	-12.686	-12.685	0.001
	Fe(OH)2	7.444e-14	7.455e-14	-13.128	-13.128	0.001
	Fe(OH)3-	9.976e-15	9.173e-15	-14.001	-14.037	-0.036
	FeF+	1.287e-15	1.183e-15	-14.891	-14.927	-0.036
	FeCl+	9.425e-16	8.666e-16	-15.026	-15.062	-0.036
	FeHSO4+	4.321e-22	3.973e-22	-21.364	-21.401	-0.036

Fe(3)	9.279e-05					
	Fe(OH)4-	6.992e-05	6.429e-05	-4.155	-4.192	-0.036
	Fe(OH)3	2.281e-05	2.284e-05	-4.642	-4.641	0.001
	Fe(OH)2+	6.297e-08	5.789e-08	-7.201	-7.237	-0.036
	FeOH+2	7.884e-14	5.635e-14	-13.103	-13.249	-0.146
	FeF2+	2.160e-19	1.986e-19	-18.665	-18.702	-0.036
	FeF+2	2.130e-19	1.522e-19	-18.672	-18.818	-0.146
	FeSO4+	1.153e-20	1.060e-20	-19.938	-19.975	-0.036
	FeF3	1.051e-20	1.053e-20	-19.978	-19.978	0.001
	Fe+3	6.286e-21	2.953e-21	-20.202	-20.530	-0.328
	Fe(SO4)2-	8.621e-23	7.927e-23	-22.064	-22.101	-0.036
	FeCl+2	2.073e-23	1.482e-23	-22.683	-22.829	-0.146
	Fe2(OH)2+4	3.604e-25	9.405e-26	-24.443	-25.027	-0.583
	FeCl2+	1.385e-26	1.274e-26	-25.858	-25.895	-0.036
	FeHSO4+2	1.174e-29	8.394e-30	-28.930	-29.076	-0.146
	Fe3(OH)4+5	1.149e-29	1.409e-30	-28.940	-29.851	-0.912
	FeCl3	2.275e-31	2.278e-31	-30.643	-30.642	0.001
H(0)	1.238e-30					
	H2	6.191e-31	6.200e-31	-30.208	-30.208	0.001
K	5.117e-05					
	K+	5.105e-05	4.689e-05	-4.292	-4.329	-0.037
	KSO4-	1.209e-07	1.111e-07	-6.918	-6.954	-0.036
Mg	5.761e-05					
	Mg+2	4.535e-05	3.285e-05	-4.343	-4.483	-0.140
	MgCO3	8.552e-06	8.565e-06	-5.068	-5.067	0.001
	MgSO4	2.498e-06	2.501e-06	-5.602	-5.602	0.001
	MgHCO3+	7.735e-07	7.112e-07	-6.112	-6.148	-0.036
	MgOH+	3.565e-07	3.278e-07	-6.448	-6.484	-0.036
	MgF+	7.627e-08	7.013e-08	-7.118	-7.154	-0.036
Mn(2)	1.129e-05					
	MnCO3	1.049e-05	1.050e-05	-4.979	-4.979	0.001
	Mn+2	6.536e-07	4.672e-07	-6.185	-6.331	-0.146
	MnHCO3+	8.460e-08	7.779e-08	-7.073	-7.109	-0.036
	MnOH+	3.663e-08	3.368e-08	-7.436	-7.473	-0.036
	MnSO4	2.736e-08	2.740e-08	-7.563	-7.562	0.001
	MnCl+	3.702e-10	3.404e-10	-9.432	-9.468	-0.036
	MnF+	1.184e-10	1.089e-10	-9.926	-9.963	-0.036
	Mn(OH)3-	3.131e-13	2.879e-13	-12.504	-12.541	-0.036
	MnCl2	2.653e-14	2.657e-14	-13.576	-13.576	0.001
	MnCl3-	1.423e-18	1.309e-18	-17.847	-17.883	-0.036
Mn(3)	2.191e-28					
	Mn+3	2.191e-28	1.029e-28	-27.659	-27.988	-0.328
Mn(6)	5.757e-34					
	MnO4-2	5.757e-34	4.115e-34	-33.240	-33.386	-0.146
Mn(7)	1.304e-39					
	MnO4-	1.304e-39	1.199e-39	-38.885	-38.921	-0.036
Na	5.657e-03					
	Na+	5.616e-03	5.168e-03	-2.251	-2.287	-0.036
	NaCO3-	2.635e-05	2.423e-05	-4.579	-4.616	-0.036
	NaSO4-	9.570e-06	8.800e-06	-5.019	-5.056	-0.036
	NaHCO3	5.421e-06	5.429e-06	-5.266	-5.265	0.001
	NaF	1.001e-07	1.002e-07	-7.000	-6.999	0.001
Ni	7.157e-07					
	NiCO3	4.233e-07	4.239e-07	-6.373	-6.373	0.001
	Ni(CO3)2-2	2.917e-07	2.085e-07	-6.535	-6.681	-0.146
	Ni+2	2.827e-10	2.020e-10	-9.549	-9.695	-0.146
	Ni(OH)2	2.316e-10	2.319e-10	-9.635	-9.635	0.001
	NiOH+	8.731e-11	8.028e-11	-10.059	-10.095	-0.036
	NiHCO3+	5.667e-11	5.211e-11	-10.247	-10.283	-0.036
	NiSO4	1.329e-11	1.331e-11	-10.876	-10.876	0.001
	Ni(OH)3-	8.545e-12	7.856e-12	-11.068	-11.105	-0.036
	NiF+	1.477e-13	1.358e-13	-12.831	-12.867	-0.036
	NiCl+	9.871e-14	9.076e-14	-13.006	-13.042	-0.036
	Ni(SO4)2-2	3.519e-16	2.515e-16	-15.454	-15.599	-0.146
	NiCl2	5.884e-17	5.893e-17	-16.230	-16.230	0.001
O(0)	3.734e-33					
	O2	1.867e-33	1.870e-33	-32.729	-32.728	0.001
Pb	4.104e-07					
	PbCO3	2.022e-07	2.025e-07	-6.694	-6.694	0.001
	Pb(CO3)2-2	2.014e-07	1.440e-07	-6.696	-6.842	-0.146
	Pb(OH)2	3.579e-09	3.584e-09	-8.446	-8.446	0.001
	PbOH+	2.958e-09	2.719e-09	-8.529	-8.566	-0.036
	Pb(OH)3-	1.516e-10	1.394e-10	-9.819	-9.856	-0.036
	PbHCO3+	6.645e-11	6.109e-11	-10.178	-10.214	-0.036
	Pb+2	5.760e-11	4.117e-11	-10.240	-10.385	-0.146
	PbSO4	7.970e-12	7.982e-12	-11.099	-11.098	0.001
	Pb(OH)4-2	1.514e-12	1.082e-12	-11.820	-11.966	-0.146
	PbCl+	3.010e-13	2.767e-13	-12.521	-12.558	-0.036
	PbF+	2.683e-14	2.467e-14	-13.571	-13.608	-0.036
	Pb(SO4)2-2	2.021e-14	1.444e-14	-13.694	-13.840	-0.146
	PbCl2	8.179e-17	8.191e-17	-16.087	-16.087	0.001
	PbF2	1.695e-17	1.697e-17	-16.771	-16.770	0.001
	Pb3(OH)4+2	1.197e-17	8.558e-18	-16.922	-17.068	-0.146
	Pb2OH+3	5.336e-18	2.506e-18	-17.273	-17.601	-0.328
	PbCl3-	1.247e-20	1.147e-20	-19.904	-19.940	-0.036
	PbF3-	4.506e-21	4.143e-21	-20.346	-20.383	-0.036
	PbCl4-2	1.349e-24	9.644e-25	-23.870	-24.016	-0.146
	PbF4-2	9.349e-26	6.682e-26	-25.029	-25.175	-0.146
S(6)	4.999e-04					
	SO4-2	4.795e-04	3.448e-04	-3.319	-3.462	-0.143
	NaSO4-	9.570e-06	8.800e-06	-5.019	-5.056	-0.036
	CaSO4	8.074e-06	8.086e-06	-5.093	-5.092	0.001
	MgSO4	2.498e-06	2.501e-06	-5.602	-5.602	0.001
	KSO4-	1.209e-07	1.111e-07	-6.918	-6.954	-0.036
	BaSO4	1.148e-07	1.150e-07	-6.940	-6.939	0.001
	MnSO4	2.736e-08	2.740e-08	-7.563	-7.562	0.001
	ZnSO4	9.202e-10	9.216e-10	-9.036	-9.035	0.001
	NiSO4	1.329e-11	1.331e-11	-10.876	-10.876	0.001
	HSO4-	1.024e-11	9.413e-12	-10.990	-11.026	-0.036
	PbSO4	7.970e-12	7.982e-12	-11.099	-11.098	0.001
	Zn(SO4)2-2	3.679e-12	2.629e-12	-11.434	-11.580	-0.146
	CuSO4	8.557e-13	8.569e-13	-12.068	-12.067	0.001
	FeSO4	2.060e-13	2.063e-13	-12.686	-12.685	0.001
	Pb(SO4)2-2	2.021e-14	1.444e-14	-13.694	-13.840	-0.146
	CaHSO4+	1.478e-14	1.359e-14	-13.830	-13.867	-0.036
	Ni(SO4)2-2	3.519e-16	2.515e-16	-15.454	-15.599	-0.146
	UO2SO4	5.261e-18	5.269e-18	-17.279	-17.278	0.001
	AlSO4+	6.480e-20	5.958e-20	-19.188	-19.225	-0.036
	UO2(SO4)2-2	2.366e-20	1.691e-20	-19.626	-19.772	-0.146
	FeSO4+	1.153e-20	1.060e-20	-19.938	-19.975	-0.036
	Al(SO4)2-	6.990e-22	6.427e-22	-21.156	-21.192	-0.036
	FeHSO4+	4.321e-22	3.973e-22	-21.364	-21.401	-0.036
	Fe(SO4)2-	8.621e-23	7.927e-23	-22.064	-22.101	-0.036
	FeHSO4+2	1.174e-29	8.394e-30	-28.930	-29.076	-0.146
	AlHSO4+2	2.139e-30	1.529e-30	-29.670	-29.816	-0.146
	U(SO4)2	0.000e+00	0.000e+00	-50.293	-50.292	0.001
	USO4+2	0.000e+00	0.000e+00	-50.570	-50.716	-0.146
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-66.430	-66.758	-0.328
U(4)	4.542e-25					
	U(OH)4	4.542e-25	4.549e-25	-24.343	-24.342	0.001
	U(OH)3+	5.489e-31	5.047e-31	-30.261	-30.297	-0.036
	U(CO3)4-4	2.938e-35	7.667e-36	-34.532	-35.115	-0.583
	U(CO3)5-6	4.317e-37	2.101e-38	-36.365	-37.678	-1.313
	U(OH)2+2	1.028e-37	7.347e-38	-36.988	-37.134	-0.146
	UOH+3	0.000e+00	0.000e+00	-44.569	-44.897	-0.328
	UF3+	0.000e+00	0.000e+00	-45.604	-45.641	-0.036
	UF4	0.000e+00	0.000e+00	-46.208	-46.207	0.001
	UF2+2	0.000e+00	0.000e+00	-46.397	-46.543	-0.146
	UF+3	0.000e+00	0.000e+00	-48.660	-48.988	-0.328
	UF5-	0.000e+00	0.000e+00	-49.166	-49.202	-0.036
	U(SO4)2	0.000e+00	0.000e+00	-50.293	-50.292	0.001
	USO4+2	0.000e+00	0.000e+00	-50.570	-50.716	-0.146
	UF6-2	0.000e+00	0.000e+00	-51.430	-51.576	-0.146
	U+4	0.000e+00	0.000e+00	-53.239	-53.823	-0.583
	UCl+3	0.000e+00	0.000e+00	-55.496	-55.824	-0.328
	U6(OH)15+9	0.000e+00	0.000e+00	-194.234	-197.187	-2.954
U(5)	4.056e-20					
	UO2+	4.038e-20	3.713e-20	-19.394	-19.430	-0.036
	UO2(CO3)3-5	1.770e-22	2.169e-23	-21.752	-22.664	-0.912
U(6)	4.960e-06					
	UO2(CO3)3-4	4.807e-06	1.255e-06	-5.318	-5.902	-0.583
	UO2(CO3)2-2	1.217e-07	8.698e-08	-6.915	-7.061	-0.146
	UO2(OH)3-	3.070e-08	2.823e-08	-7.513	-7.549	-0.036
	UO2CO3	1.366e-11	1.367e-11	-10.865	-10.864	0.001
	UO2(OH)4-2	2.121e-12	1.516e-12	-11.674	-11.819	-0.146
	UO2OH+	2.315e-13	2.129e-13	-12.635	-12.672	-0.036
	(UO2)3(OH)7-	8.487e-16	7.803e-16	-15.071	-15.108	-0.036
	UO2F+	5.160e-17	4.744e-17	-16.287	-16.324	-0.036
	UO2+2	1.610e-17	1.151e-17	-16.793	-16.939	-0.146
	(UO2)3(CO3)6-6	1.609e-17	7.831e-19	-16.794	-18.106	-1.313
	UO2F2	5.403e-18	5.411e-18	-17.267	-17.267	0.001
	UO2SO4	5.261e-18	5.269e-18	-17.279	-17.278	0.001
	(UO2)3(OH)5+	1.500e-19	1.379e-19	-18.824	-18.860	-0.036
	UO2F3-	3.775e-20	3.471e-20	-19.423	-19.459	-0.036
	UO2(SO4)2-2	2.366e-20	1.691e-20	-19.626	-19.772	-0.146
	(UO2)2(OH)2+2	4.459e-21	3.187e-21	-20.351	-20.497	-0.146
	UO2Cl+	3.229e-21	2.969e-21	-20.491	-20.527	-0.036
	(UO2)4(OH)7+	1.229e-23	1.130e-23	-22.910	-22.947	-0.036
	UO2F4-2	1.039e-23	7.428e-24	-22.983	-23.129	-0.146
	(UO2)3(OH)4+2	3.535e-25	2.526e-25	-24.452	-24.598	-0.146
	UO2Cl2	2.784e-26	2.788e-26	-25.555	-25.555	0.001
	(UO2)2OH+3	1.905e-27	8.949e-28	-26.720	-27.048	-0.328
Zn	7.958e-06					
	Zn(CO3)2-2	5.550e-06	3.967e-06	-5.256	-5.402	-0.146
	Zn(OH)2	1.675e-06	1.677e-06	-5.776	-5.775	0.001
	ZnCO3	6.545e-07	6.555e-07	-6.184	-6.183	0.001
	ZnOH+	3.933e-08	3.617e-08	-7.405	-7.442	-0.036
	Zn(OH)3-	1.954e-08	1.797e-08	-7.709	-7.745	-0.036
	Zn+2	1.624e-08	1.161e-08	-7.789	-7.935	-0.146
	ZnHCO3+	2.969e-09	2.730e-09	-8.527	-8.564	-0.036
	ZnSO4	9.202e-10	9.216e-10	-9.036	-9.035	0.001
	ZnOHCl	2.325e-10	2.329e-10	-9.634	-9.633	0.001
	Zn(OH)4-2	1.350e-11	9.648e-12	-10.870	-11.016	-0.146
	ZnF+	5.836e-12	5.366e-12	-11.234	-11.270	-0.036
	ZnCl+	5.486e-12	5.044e-12	-11.261	-11.297	-0.036
	Zn(SO4)2-2	3.679e-12	2.629e-12	-11.434	-11.580	-0.146
	ZnCl2	9.345e-16	9.358e-16	-15.029	-15.029	0.001
	ZnCl3-	2.014e-19	1.852e-19	-18.696	-18.732	-0.036
	ZnCl4-2	2.280e-23	1.630e-23	-22.642	-22.788	-0.146

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-1.61	9.34	10.95	Al(OH)3
AlAsO4:2H2O	-10.36	-5.58	4.78	AlAsO4:2H2O
AlumK	-25.29	-30.50	-5.21	KAl(SO4)2:12H2O
Alunite	-10.71	-11.82	-1.11	KAl3(SO4)2(OH)6
Anglesite	-6.05	-13.85	-7.80	PbSO4
Anhydrite	-3.03	-7.38	-4.35	CaSO4
Antlerite	-6.36	1.93	8.29	Cu3(OH)4SO4
Aragonite	0.85	-7.47	-8.32	CaCO3
Arsenolite	-88.78	-167.93	-79.15	As4O6
Artinite	-3.22	6.54	9.76	MgCO3:Mg(OH)2:3H2O
As2O5	-36.58	-29.85	6.73	As2O5
Atacamite	-4.42	3.03	7.45	Cu2(OH)3Cl
Azurite	-3.99	-20.76	-16.77	Cu3(OH)2(CO3)2
B-UO2(OH)2	-3.50	2.12	5.62	UO2(OH)2
Ba3(AsO4)2	17.73	8.80	-8.93	Ba3(AsO4)2
BaF2	-9.36	-15.12	-5.77	BaF2
Barite	0.37	-9.64	-10.01	BaSO4
Basaluminite	-7.86	14.84	22.70	Al4(OH)10SO4
Bianchite	-9.63	-11.40	-1.76	ZnSO4:6H2O
Birnessite	-3.81	39.79	43.60	MnO2
Bixbyite	1.73	52.52	50.79	Mn2O3
Boehmite	0.60	9.34	8.74	AlOOH
Brochantite	-5.25	10.09	15.34	Cu4(OH)6SO4
Brucite	-2.42	14.58	16.99	Mg(OH)2
Bunsenite	-3.22	9.37	12.59	NiO
Ca3(AsO4)2:4w	-6.76	15.57	22.33	Ca3(AsO4)2:4H2O
Calcite	1.00	-7.47	-8.47	CaCO3
Cerrusite	-0.78	-13.93	-13.16	PbCO3
Chalcanthite	-11.72	-14.37	-2.65	CuSO4:5H2O
Claudetite	-88.52	-167.93	-79.41	As4O6
CO2(g)	-4.45	-22.61	-18.15	CO2
Cotunnite	-13.08	-17.88	-4.80	PbCl2
Cu(OH)2	-0.57	8.15	8.73	Cu(OH)2
Cu2SO4	-25.93	-33.28	-7.35	Cu2SO4
Cu3(AsO4)2:6w	-11.50	-5.39	6.11	Cu3(AsO4)2:6H2O
CuCO3	-4.83	-14.46	-9.63	CuCO3
CuF	-23.82	-19.38	4.44	CuF
CuF2	-19.31	-19.85	-0.54	CuF2
CuF2:2H2O	-15.32	-19.85	-4.53	CuF2:2H2O
CuMetal	-7.34	-18.91	-11.57	Cu
CuOCuSO4	-17.95	-6.22	11.73	CuO:CuSO4
CupricFerrite	18.17	50.42	32.25	CuFe2O4
Cuprite	-3.75	-10.76	-7.01	Cu2O
CuprousFerrite	14.29	15.76	1.47	CuFeO2
CuSO4	-17.48	-14.37	3.11	CuSO4
Diaspore	2.32	9.34	7.02	AlOOH
Dolomite	1.54	-15.50	-17.04	CaMg(CO3)2
Dolomite(d)	0.98	-15.50	-16.48	CaMg(CO3)2
Epsomite	-5.79	-7.95	-2.16	MgSO4:7H2O
Fe(OH)2.7Cl.3	7.12	17.15	10.04	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	3.17	21.14	17.97	Fe(OH)3
Fe3(OH)8	3.50	49.88	46.37	Fe3(OH)8
Fluorite	-2.24	-12.87	-10.63	CaF2
Gibbsite	1.10	9.34	8.24	Al(OH)3
Goethite	9.06	21.14	12.08	FeOOH
Goslarite	-9.42	-11.40	-1.98	ZnSO4:7H2O
Gummite	-8.41	2.12	10.53	UO3
Gypsum	-2.80	-7.38	-4.58	CaSO4:2H2O
H2(g)	-27.01	-27.06	-0.05	H2
Halite	-7.61	-6.03	1.58	NaCl
Hausmannite	3.64	65.25	61.60	Mn3O4
Hematite	19.95	42.27	22.32	Fe2O3
Huntite	-1.74	-31.56	-29.82	CaMg3(CO3)4
Hydrocerrusite	-1.73	-19.19	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-9.09	-17.55	-8.46	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-8.64	22.58	31.23	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-6.63	23.56	30.19	KFe3(SO4)2(OH)6
Jarosite-Na	-8.55	25.60	34.15	NaFe3(SO4)2(OH)6
JarositeH	-15.79	18.36	34.15	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-9.95	-13.18	-3.23	AlOHSO4
Langite	-6.93	10.09	17.02	Cu4(OH)6SO4:H2O
Larnakite	-4.93	-5.17	-0.24	PbO:PbSO4
Laurionite	-5.23	-4.60	0.62	PbOHCl
Litharge	-4.14	8.67	12.81	PbO
Maghemite	9.73	42.27	32.54	Fe2O3
Magnesite	-0.04	-8.03	-7.99	MgCO3
Magnetite	19.70	49.88	30.17	Fe3O4
Malachite	-1.22	-6.30	-5.09	Cu2(OH)2CO3
Manganite	0.92	26.26	25.34	MnOOH
Massicot	-4.33	8.67	13.01	PbO
Matlockite	-9.13	-18.61	-9.48	PbClF
Melanothallite	-22.20	-18.40	3.80	CuCl2
Melanterite	-12.68	-14.92	-2.24	FeSO4:7H2O
Minium	-21.19	53.08	74.28	Pb3O4
Mirabilite	-6.81	-8.04	-1.22	Na2SO4:10H2O
Mn2(SO4)3	-60.87	-15.05	45.83	Mn2(SO4)3
Mn3(AsO4):8H2O	-4.18	8.34	12.53	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-16.44	-13.83	2.61	MnCl2:4H2O
MnSO4	-12.55	-9.79	2.76	MnSO4
Morenosite	-10.78	-13.16	-2.38	NiSO4:7H2O
Na4UO2(CO3)3	-20.44	-36.73	-16.29	Na4UO2(CO3)3
Nahcolite	-4.45	-15.36	-10.92	NaHCO3
Nantokite	-9.13	-18.66	-9.53	CuCl
Natron	-6.72	-8.12	-1.40	Na2CO3:10H2O
Nesquehonite	-2.44	-8.03	-5.59	MgCO3:3H2O
Ni(OH)2	-1.26	9.37	10.63	Ni(OH)2
Ni3(AsO4)2:8H2O	-17.47	-1.75	15.72	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-17.06	14.94	32.00	Ni4(OH)6SO4
NiCO3	-6.46	-13.24	-6.78	NiCO3
Nsutite	-2.77	39.79	42.56	MnO2
O2(g)	-29.85	54.12	83.97	O2
Pb(OH)2	0.44	8.67	8.23	Pb(OH)2
Pb2(OH)3Cl	-4.72	4.07	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-8.85	17.35	26.20	PbO:Pb(OH)2
Pb2O3	-16.63	44.41	61.04	Pb2O3
Pb2OCO3	-4.82	-5.26	-0.43	PbO:PbCO3
Pb3(AsO4)2	-9.65	-3.82	5.83	Pb3(AsO4)2
Pb3O2CO3	-7.76	3.42	11.17	PbCO3:2PbO
Pb3O2SO4	-7.02	3.50	10.52	PbSO4:2PbO
Pb4(OH)6SO4	-8.92	12.18	21.10	Pb4(OH)6SO4
Pb4O3SO4	-10.12	12.18	22.30	PbSO4:3PbO
PbF2	-11.89	-19.33	-7.44	PbF2
PbMetal	-22.65	-18.39	4.27	Pb
PbO:0.3H2O	-4.31	8.67	12.98	PbO:0.33H2O
Phosgenite	-12.00	-31.81	-19.81	PbCl2:PbCO3
Plattnerite	-13.97	35.73	49.70	PbO2
Portlandite	-7.84	15.14	22.98	Ca(OH)2
Pyrochroite	-2.47	12.73	15.20	Mn(OH)2
Pyrolusite	-1.96	39.79	41.75	MnO2
Retgersite	-11.11	-13.16	-2.05	NiSO4:6H2O
Rhodochrosite	1.24	-9.88	-11.12	MnCO3
Rhodochrosite(d)	0.51	-9.88	-10.39	MnCO3
Rutherfordine	-6.05	-20.49	-14.44	UO2CO3
Schoepite	-3.35	2.12	5.47	UO2(OH)2:H2O
Scorodite	-7.23	6.21	13.44	FeAsO4:2H2O
Siderite	-4.13	-15.00	-10.88	FeCO3
Siderite(d)(3)	-4.55	-15.00	-10.45	FeCO3
Smithsonite	-1.51	-11.48	-9.98	ZnCO3
Tenorite	0.45	8.15	7.71	CuO
Thenardite	-7.86	-8.04	-0.18	Na2SO4
Thermonatrite	-8.26	-8.12	0.14	Na2CO3:H2O
Trona	-12.44	-23.49	-11.04	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-35.03	-47.46	-12.44	U(OH)2SO4
U3O8(c)	-14.18	-20.70	-6.52	U3O8
U4O9(c)	-32.94	-72.70	-39.75	U4O9
UF4(c)	-53.21	-80.95	-27.73	UF4
UF4:2.5H2O	-44.15	-80.95	-36.80	UF4:2.5H2O
UO2(a)	-15.80	-24.94	-9.14	UO2
UO3(gamma)	-5.71	2.12	7.83	UO3
Uraninite(c)	-11.01	-24.94	-13.93	UO2
Witherite	-1.16	-9.72	-8.57	BaCO3
Zincite(c)	-0.14	11.12	11.26	ZnO
Zincosite	-14.52	-11.40	3.12	ZnSO4
Zn(OH)2-a	-1.33	11.12	12.45	Zn(OH)2
Zn(OH)2-b	-0.63	11.12	11.75	Zn(OH)2
Zn(OH)2-c	-1.08	11.12	12.20	Zn(OH)2
Zn(OH)2-e	-0.38	11.12	11.50	Zn(OH)2
Zn(OH)2-g	-0.59	11.12	11.71	Zn(OH)2
Zn2(OH)2SO4	-7.77	-0.27	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.23	8.97	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-10.16	3.53	13.69	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-31.04	-11.67	19.37	ZnO:2ZnSO4
Zn4(OH)6SO4	-6.42	21.98	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-9.43	29.07	38.50	Zn5(OH)8Cl2
ZnCl2	-22.56	-15.43	7.13	ZnCl2
ZnCO3:H2O	-1.22	-11.48	-10.26	ZnCO3:H2O
ZnF2	-15.43	-16.88	-1.45	ZnF2
ZnMetal	-41.90	-15.94	25.97	Zn
ZnO(a)	-0.19	11.12	11.31	ZnO
ZnSO4:H2O	-10.89	-11.40	-0.51	ZnSO4:H2O

End of simulation.

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Reading data base.
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           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
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           TITLE   Schneckentein 18.5-19.5m
           SOLUTION        19
           units           mg/l
           temp            20.3
           pH              9.64
           F               1.6
           Cl              12.5
           S(6)            73          as SO4
           Na              140
           K               8.4
           Mg              1.4
           Ca              9.6
           Alkalinity      220         as HCO3
           Al              2.65
           As              3.76
           Ba              0.142
           Cu              0.042
           Fe              2.19
           Mn              0.07
           Ni              0.010
           Pb              0.033
           U               1.13
           Zn              0.026
           END
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TITLE
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   Schneckentein 18.5-19.5m

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Beginning of initial solution calculations.
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Initial solution 19.

-----------------------------Solution composition--------------
---------------

            Elements           Molality       Moles

            Al               9.826e-05   9.826e-05
            Alkalinity       3.607e-03   3.607e-03
            As               5.021e-05   5.021e-05
            Ba               1.034e-06   1.034e-06
            Ca               2.396e-04   2.396e-04
            Cl               3.527e-04   3.527e-04
            Cu               6.613e-07   6.613e-07
            F                8.426e-05   8.426e-05
            Fe               3.923e-05   3.923e-05
            K                2.149e-04   2.149e-04
            Mg               5.761e-05   5.761e-05
            Mn               1.275e-06   1.275e-06
            Na               6.093e-03   6.093e-03
            Ni               1.704e-07   1.704e-07
            Pb               1.594e-07   1.594e-07
            S(6)             7.603e-04   7.603e-04
            U                4.750e-06   4.750e-06
            Zn               3.979e-07   3.979e-07
```

```
----------------------------Description of solution-------------------------
---

                                    pH  =   9.640
                                    pe  =   4.000
                      Activity of water  =   1.000
                         Ionic strength  =   7.345e-03
                     Mass of water (kg)  =   1.000e+00
                 Total carbon (mol/kg)  =   2.488e-03
                    Total CO2 (mol/kg)  =   2.488e-03
                  Temperature (deg C)  =  20.300
                Electrical balance (eq)  =   1.638e-03
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  13.96
                               Iterations  =  18
                                  Total H  = 1.110150e+02
                                  Total O  = 5.551751e+01
```

----------Distribution of species----------

	Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
	OH-	3.318e-05	3.035e-05	-4.479	-4.518	-0.039
	H+	2.481e-10	2.291e-10	-9.605	-9.640	-0.035
	H2O	5.551e+01	9.998e-01	-0.000	-0.000	0.000
Al	9.826e-05					
	Al(OH)4-	9.825e-05	8.986e-05	-4.008	-4.046	-0.039
	Al(OH)3	1.155e-08	1.157e-08	-7.937	-7.937	0.001
	Al(OH)2+	2.812e-11	2.571e-11	-10.551	-10.590	-0.039
	AlOH+2	1.638e-15	1.146e-15	-14.786	-14.941	-0.155
	AlF2+	1.098e-15	1.004e-15	-14.959	-14.998	-0.039
	AlF3	9.625e-16	9.641e-16	-15.017	-15.016	0.001
	AlF+2	3.832e-17	2.681e-17	-16.417	-16.572	-0.155
	AlF4-	3.212e-17	2.938e-17	-16.493	-16.532	-0.039
	Al+3	8.043e-20	3.601e-20	-19.095	-19.444	-0.349
	AlSO4+	6.013e-20	5.499e-20	-19.221	-19.260	-0.039
	Al(SO4)2-	9.555e-22	8.739e-22	-21.020	-21.059	-0.039
	AlHSO4+2	1.536e-30	1.075e-30	-29.814	-29.969	-0.155
As(3)	5.573e-23					
	H2AsO3-	3.909e-23	3.575e-23	-22.408	-22.447	-0.039
	H3AsO3	1.650e-23	1.653e-23	-22.782	-22.782	0.001
	HAsO3-2	1.434e-25	1.004e-25	-24.843	-24.998	-0.155
	AsO3-3	3.203e-29	1.434e-29	-28.494	-28.843	-0.349
	H4AsO3+	2.051e-33	1.876e-33	-32.688	-32.727	-0.039
As(5)	5.021e-05					
	HAsO4-2	4.940e-05	3.456e-05	-4.306	-4.461	-0.155
	AsO4-3	7.595e-07	3.401e-07	-6.119	-6.468	-0.349
	H2AsO4-	5.063e-08	4.631e-08	-7.296	-7.334	-0.039
	H3AsO4	1.770e-15	1.773e-15	-14.752	-14.751	0.001
Ba	1.034e-06					
	Ba+2	7.973e-07	5.579e-07	-6.098	-6.253	-0.155
	BaSO4	1.434e-07	1.436e-07	-6.843	-6.843	0.001
	BaCO3	8.479e-08	8.494e-08	-7.072	-7.071	0.001
	BaHCO3+	8.824e-09	8.070e-09	-8.054	-8.093	-0.039
	BaOH+	9.020e-11	8.250e-11	-10.045	-10.084	-0.039
C(4)	2.488e-03					
	HCO3-	1.908e-03	1.750e-03	-2.719	-2.757	-0.038
	CO3-2	4.580e-04	3.239e-04	-3.339	-3.490	-0.150
	CaCO3	5.856e-05	5.866e-05	-4.232	-4.232	0.001
	NaCO3-	2.867e-05	2.622e-05	-4.543	-4.581	-0.039
	MgCO3	8.990e-06	9.005e-06	-5.046	-5.046	0.001
	NaHCO3	5.434e-06	5.443e-06	-5.265	-5.264	0.001
	UO2(CO3)3-4	4.636e-06	1.111e-06	-5.334	-5.954	-0.620
	CaHCO3+	2.656e-06	2.429e-06	-5.576	-5.615	-0.039
	MnCO3	1.193e-06	1.195e-06	-5.923	-5.923	0.001
	CO2	9.599e-07	9.615e-07	-6.018	-6.017	0.001
	MgHCO3+	6.882e-07	6.294e-07	-6.162	-6.201	-0.039
	Zn(CO3)2-2	2.672e-07	1.869e-07	-6.573	-6.728	-0.155
	NiCO3	9.427e-08	9.443e-08	-7.026	-7.025	0.001
	BaCO3	8.479e-08	8.494e-08	-7.072	-7.071	0.001
	Pb(CO3)2-2	8.402e-08	5.879e-08	-7.076	-7.231	-0.155
	UO2(CO3)2-2	7.967e-08	5.574e-08	-7.099	-7.254	-0.155
	Ni(CO3)2-2	7.597e-08	5.315e-08	-7.119	-7.274	-0.155
	PbCO3	7.214e-08	7.226e-08	-7.142	-7.141	0.001
	ZnCO3	2.695e-08	2.700e-08	-7.569	-7.569	0.001
	BaHCO3+	8.824e-09	8.070e-09	-8.054	-8.093	-0.039
	MnHCO3+	7.918e-09	7.242e-09	-8.101	-8.140	-0.039
	CuCO3	2.869e-09	2.874e-09	-8.542	-8.542	0.001
	Cu(CO3)2-2	1.675e-09	1.172e-09	-8.776	-8.931	-0.155
	ZnHCO3+	1.006e-10	9.202e-11	-9.997	-10.036	-0.039
	PbHCO3+	1.951e-11	1.784e-11	-10.710	-10.749	-0.039
	NiHCO3+	1.039e-11	9.500e-12	-10.983	-11.022	-0.039
	UO2CO3	7.996e-12	8.010e-12	-11.097	-11.096	0.001
	FeCO3	7.696e-12	7.709e-12	-11.114	-11.113	0.001
	CuHCO3+	1.584e-12	1.449e-12	-11.800	-11.839	-0.039
	FeHCO3+	1.898e-13	1.736e-13	-12.722	-12.760	-0.039
	(UO2)3(CO3)6-6	6.170e-18	2.479e-19	-17.210	-18.606	-1.396
	UO2(CO3)3-5	1.576e-22	1.691e-23	-21.802	-22.772	-0.969
	U(CO3)4-4	1.674e-35	4.011e-36	-34.776	-35.397	-0.620
	U(CO3)5-6	2.370e-37	9.524e-39	-36.625	-38.021	-1.396
Ca	2.396e-04					
	Ca+2	1.667e-04	1.178e-04	-3.778	-3.929	-0.151
	CaCO3	5.856e-05	5.866e-05	-4.232	-4.232	0.001
	CaSO4	1.153e-05	1.155e-05	-4.938	-4.937	0.001
	CaHCO3+	2.656e-06	2.429e-06	-5.576	-5.615	-0.039
	CaOH+	9.332e-08	8.535e-08	-7.030	-7.069	-0.039
	CaF+	7.692e-08	7.035e-08	-7.114	-7.153	-0.039
	CaHSO4+	1.603e-14	1.466e-14	-13.795	-13.834	-0.039
Cl	3.527e-04					
	Cl-	3.527e-04	3.222e-04	-3.453	-3.492	-0.039
	MnCl+	6.665e-11	6.095e-11	-10.176	-10.215	-0.039
	ZnOHCl	1.942e-11	1.945e-11	-10.712	-10.711	0.001
	ZnCl+	3.209e-13	2.935e-13	-12.494	-12.532	-0.039
	PbCl+	1.600e-13	1.463e-13	-12.796	-12.835	-0.039
	NiCl+	3.481e-14	3.183e-14	-13.458	-13.497	-0.039
	MnCl2	8.559e-15	8.573e-15	-14.068	-14.067	0.001
	CuCl2-	3.011e-15	2.754e-15	-14.521	-14.560	-0.039
	CuCl+	1.240e-15	1.134e-15	-14.907	-14.945	-0.039
	FeCl+	4.825e-16	4.413e-16	-15.316	-15.355	-0.039
	ZnCl2	9.697e-17	9.714e-17	-16.013	-16.013	0.001
	PbCl2	8.154e-17	8.168e-17	-16.089	-16.088	0.001
	NiCl2	3.718e-17	3.724e-17	-16.430	-16.429	0.001
	CuCl3-2	1.973e-18	1.381e-18	-17.705	-17.860	-0.155
	MnCl3-	8.319e-19	7.608e-19	-18.080	-18.119	-0.039
	CuCl2	1.861e-19	1.864e-19	-18.730	-18.730	0.001
	ZnCl3-	3.731e-20	3.413e-20	-19.428	-19.467	-0.039
	PbCl3-	2.219e-20	2.030e-20	-19.654	-19.693	-0.039
	UO2Cl+	2.964e-21	2.711e-21	-20.528	-20.567	-0.039
	FeCl+2	8.719e-24	6.100e-24	-23.060	-23.215	-0.155
	ZnCl4-2	7.584e-24	5.306e-24	-23.120	-23.275	-0.155
	PbCl4-2	4.312e-24	3.017e-24	-23.365	-23.520	-0.155
	CuCl3-	2.141e-25	1.958e-25	-24.669	-24.708	-0.039
	UO2Cl2	4.473e-26	4.480e-26	-25.349	-25.349	0.001
	FeCl2+	1.117e-26	1.021e-26	-25.952	-25.991	-0.039
	CuCl4-2	4.046e-31	2.831e-31	-30.393	-30.548	-0.155
	FeCl3	3.286e-31	3.291e-31	-30.483	-30.483	0.001
	UCl+3	0.000e+00	0.000e+00	-55.708	-56.057	-0.349
Cu(1)	9.369e-14					
	Cu+	9.067e-14	8.293e-14	-13.043	-13.081	-0.039
	CuCl2-	3.011e-15	2.754e-15	-14.521	-14.560	-0.039
	CuCl3-2	1.973e-18	1.381e-18	-17.705	-17.860	-0.155
Cu(2)	6.613e-07					
	Cu(OH)2	6.564e-07	6.575e-07	-6.183	-6.182	0.001
	CuCO3	2.869e-09	2.874e-09	-8.542	-8.542	0.001
	Cu(CO3)2-2	1.675e-09	1.172e-09	-8.776	-8.931	-0.155
	Cu(OH)3-	1.891e-10	1.729e-10	-9.723	-9.762	-0.039
	CuOH+	7.885e-11	7.211e-11	-10.103	-10.142	-0.039
	Cu+2	2.362e-12	1.652e-12	-11.627	-11.782	-0.155
	CuHCO3+	1.584e-12	1.449e-12	-11.800	-11.839	-0.039
	Cu(OH)4-2	2.152e-13	1.506e-13	-12.667	-12.822	-0.155
	CuSO4	1.674e-13	1.677e-13	-12.776	-12.775	0.001
	CuF+	2.411e-15	2.205e-15	-14.618	-14.657	-0.039
	Cu2(OH)2+2	2.024e-15	1.416e-15	-14.694	-14.849	-0.155
	CuCl+	1.240e-15	1.134e-15	-14.907	-14.945	-0.039
	CuCl2	1.861e-19	1.864e-19	-18.730	-18.730	0.001
	CuCl3-	2.141e-25	1.958e-25	-24.669	-24.708	-0.039
	CuCl4-2	4.046e-31	2.831e-31	-30.393	-30.548	-0.155
F	8.426e-05					
	F-	8.378e-05	7.662e-05	-4.077	-4.116	-0.039
	NaF	2.435e-07	2.439e-07	-6.614	-6.613	0.001
	MgF+	1.590e-07	1.454e-07	-6.799	-6.837	-0.039
	CaF+	7.692e-08	7.035e-08	-7.114	-7.153	-0.039
	MnF+	2.691e-11	2.462e-11	-10.570	-10.609	-0.039
	HF	2.417e-11	2.421e-11	-10.617	-10.616	0.001
	ZnF+	4.656e-13	4.258e-13	-12.332	-12.371	-0.039
	NiF+	6.575e-14	6.013e-14	-13.182	-13.221	-0.039
	PbF+	1.913e-14	1.749e-14	-13.718	-13.757	-0.039
	HF2-	7.483e-15	6.844e-15	-14.126	-14.165	-0.039
	CuF+	2.411e-15	2.205e-15	-14.618	-14.657	-0.039
	AlF2+	1.098e-15	1.004e-15	-14.959	-14.998	-0.039
	AlF3	9.625e-16	9.641e-16	-15.017	-15.016	0.001
	FeF+	8.312e-16	7.602e-16	-15.080	-15.119	-0.039
	UO2F+	6.104e-17	5.583e-17	-16.214	-16.253	-0.039
	AlF+2	3.832e-17	2.681e-17	-16.417	-16.572	-0.155
	AlF4-	3.212e-17	2.938e-17	-16.493	-16.532	-0.039
	PbF2	2.732e-17	2.737e-17	-16.564	-16.563	0.001
	UO2F2	1.443e-17	1.446e-17	-16.841	-16.840	0.001
	FeF2+	2.595e-19	2.373e-19	-18.586	-18.625	-0.039
	UO2F3-	2.304e-19	2.108e-19	-18.637	-18.676	-0.039
	FeF+2	1.177e-19	8.234e-20	-18.929	-19.084	-0.155
	FeF3	2.831e-20	2.835e-20	-19.548	-19.547	0.001
	PbF3-	1.661e-20	1.519e-20	-19.780	-19.818	-0.039
	H2F2	1.803e-21	1.806e-21	-20.744	-20.743	0.001
	UO2F4-2	1.476e-22	1.033e-22	-21.831	-21.986	-0.155
	PbF4-2	7.962e-25	5.571e-25	-24.099	-24.254	-0.155
	UF3+	0.000e+00	0.000e+00	-45.048	-45.086	-0.039
	UF4	0.000e+00	0.000e+00	-45.291	-45.291	0.001
	UF2+2	0.000e+00	0.000e+00	-46.185	-46.340	-0.155
	UF5-	0.000e+00	0.000e+00	-47.925	-47.964	-0.039
	UF+3	0.000e+00	0.000e+00	-48.790	-49.139	-0.349
	UF6-2	0.000e+00	0.000e+00	-49.816	-49.971	-0.155
Fe(2)	1.046e-11					
	FeCO3	7.696e-12	7.709e-12	-11.114	-11.113	0.001
	Fe+2	1.418e-12	9.922e-13	-11.848	-12.003	-0.155
	FeOH+	1.048e-12	9.584e-13	-11.980	-12.018	-0.039
	FeHCO3+	1.898e-13	1.736e-13	-12.722	-12.760	-0.039
	FeSO4	8.293e-14	8.307e-14	-13.081	-13.081	0.001
	Fe(OH)2	2.346e-14	2.350e-14	-13.630	-13.629	0.001
	Fe(OH)3-	3.976e-15	3.636e-15	-14.401	-14.439	-0.039
	FeF+	8.312e-16	7.602e-16	-15.080	-15.119	-0.039
	FeCl+	4.825e-16	4.413e-16	-15.316	-15.355	-0.039
	FeHSO4+	1.350e-22	1.234e-22	-21.870	-21.909	-0.039

Fe(3)	3.923e-05					
	Fe(OH)4-	3.068e-05	2.806e-05	-4.513	-4.552	-0.039
	Fe(OH)3	8.528e-06	8.542e-06	-5.069	-5.068	0.001
	Fe(OH)2+	2.046e-08	1.871e-08	-7.689	-7.728	-0.039
	FeOH+2	2.218e-14	1.552e-14	-13.654	-13.809	-0.155
	FeF2+	2.595e-19	2.373e-19	-18.586	-18.625	-0.039
	FeF+2	1.177e-19	8.234e-20	-18.929	-19.084	-0.155
	FeF3	2.831e-20	2.835e-20	-19.548	-19.547	0.001
	FeSO4+	4.042e-21	3.697e-21	-20.393	-20.432	-0.039
	Fe+3	1.629e-21	7.294e-22	-20.788	-21.137	-0.349
	Fe(SO4)2-	4.459e-23	4.078e-23	-22.351	-22.390	-0.039
	FeCl+2	8.719e-24	6.100e-24	-23.060	-23.215	-0.155
	Fe2(OH)2+4	3.294e-26	7.893e-27	-25.482	-26.103	-0.620
	FeCl2+	1.117e-26	1.021e-26	-25.952	-25.991	-0.039
	FeHSO4+2	3.258e-30	2.279e-30	-29.487	-29.642	-0.155
	Fe3(OH)4+5	4.468e-31	4.794e-32	-30.350	-31.319	-0.969
	FeCl3	3.286e-31	3.291e-31	-30.483	-30.483	0.001
H(0)	7.503e-31					
	H2	3.751e-31	3.758e-31	-30.426	-30.425	0.001
K	2.149e-04					
	K+	2.142e-04	1.957e-04	-3.669	-3.709	-0.039
	KSO4-	7.322e-07	6.696e-07	-6.135	-6.174	-0.039
Mg	5.761e-05					
	Mg+2	4.409e-05	3.132e-05	-4.356	-4.504	-0.149
	MgCO3	8.990e-06	9.005e-06	-5.046	-5.046	0.001
	MgSO4	3.330e-06	3.335e-06	-5.478	-5.477	0.001
	MgHCO3+	6.882e-07	6.294e-07	-6.162	-6.201	-0.039
	MgOH+	3.525e-07	3.224e-07	-6.453	-6.492	-0.039
	MgF+	1.590e-07	1.454e-07	-6.799	-6.837	-0.039
Mn(2)	1.275e-06					
	MnCO3	1.193e-06	1.195e-06	-5.923	-5.923	0.001
	Mn+2	6.637e-08	4.644e-08	-7.178	-7.333	-0.155
	MnHCO3+	7.918e-09	7.242e-09	-8.101	-8.140	-0.039
	MnSO4	3.867e-09	3.873e-09	-8.413	-8.412	0.001
	MnOH+	3.859e-09	3.530e-09	-8.413	-8.452	-0.039
	MnCl+	6.665e-11	6.095e-11	-10.176	-10.215	-0.039
	MnF+	2.691e-11	2.462e-11	-10.570	-10.609	-0.039
	Mn(OH)3-	6.690e-14	6.118e-14	-13.175	-13.213	-0.039
	MnCl2	8.559e-15	8.573e-15	-14.068	-14.067	0.001
	MnCl3-	8.319e-19	7.608e-19	-18.080	-18.119	-0.039
Mn(3)	1.596e-29					
	Mn+3	1.596e-29	7.145e-30	-28.797	-29.146	-0.349
Mn(6)	5.501e-35					
	MnO4-2	5.501e-35	3.849e-35	-34.260	-34.415	-0.155
Mn(7)	0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-40.072	-40.111	-0.039
Na	6.093e-03					
	Na+	6.043e-03	5.532e-03	-2.219	-2.257	-0.038
	NaCO3-	2.867e-05	2.622e-05	-4.543	-4.581	-0.039
	NaSO4-	1.511e-05	1.382e-05	-4.821	-4.860	-0.039
	NaHCO3	5.434e-06	5.443e-06	-5.265	-5.264	0.001
	NaF	2.435e-07	2.439e-07	-6.614	-6.613	0.001
Ni	1.704e-07					
	NiCO3	9.427e-08	9.443e-08	-7.026	-7.025	0.001
	Ni(CO3)2-2	7.597e-08	5.315e-08	-7.119	-7.274	-0.155
	Ni(OH)2	7.479e-11	7.492e-11	-10.126	-10.125	0.001
	Ni+2	5.621e-11	3.933e-11	-10.250	-10.405	-0.155
	NiOH+	1.852e-11	1.694e-11	-10.732	-10.771	-0.039
	NiHCO3+	1.039e-11	9.500e-12	-10.983	-11.022	-0.039
	NiSO4	3.775e-12	3.781e-12	-11.423	-11.422	0.001
	Ni(OH)3-	3.575e-12	3.270e-12	-11.447	-11.485	-0.039
	NiF+	6.575e-14	6.013e-14	-13.182	-13.221	-0.039
	NiCl+	3.481e-14	3.183e-14	-13.458	-13.497	-0.039
	Ni(SO4)2-2	1.554e-16	1.087e-16	-15.809	-15.964	-0.155
	NiCl2	3.718e-17	3.724e-17	-16.430	-16.429	0.001
O(0)	1.577e-33					
	O2	7.883e-34	7.897e-34	-33.103	-33.103	0.001
Pb	1.594e-07					
	Pb(CO3)2-2	8.402e-08	5.879e-08	-7.076	-7.231	-0.155
	PbCO3	7.214e-08	7.226e-08	-7.142	-7.141	0.001
	Pb(OH)2	1.852e-09	1.855e-09	-8.732	-8.732	0.001
	PbOH+	1.195e-09	1.093e-09	-8.923	-8.962	-0.039
	Pb(OH)3-	1.016e-10	9.295e-11	-9.993	-10.032	-0.039
	PbHCO3+	1.951e-11	1.784e-11	-10.710	-10.749	-0.039
	Pb+2	1.835e-11	1.284e-11	-10.736	-10.892	-0.155
	PbSO4	3.703e-12	3.709e-12	-11.431	-11.431	0.001
	Pb(OH)4-2	1.328e-12	9.294e-13	-11.877	-12.032	-0.155
	PbCl+	1.600e-13	1.463e-13	-12.796	-12.835	-0.039
	PbF+	1.913e-14	1.749e-14	-13.718	-13.757	-0.039
	Pb(SO4)2-2	1.429e-14	1.000e-14	-13.845	-14.000	-0.155
	PbCl2	8.154e-17	8.168e-17	-16.089	-16.088	0.001
	PbF2	2.732e-17	2.737e-17	-16.564	-16.563	0.001
	Pb3(OH)4+2	7.066e-19	4.944e-19	-18.151	-18.306	-0.155
	Pb2OH+3	7.013e-19	3.140e-19	-18.154	-18.503	-0.349
	PbCl3-	2.219e-20	2.030e-20	-19.654	-19.693	-0.039
	PbF3-	1.661e-20	1.519e-20	-19.780	-19.818	-0.039
	PbCl4-2	4.312e-24	3.017e-24	-23.365	-23.520	-0.155
	PbF4-2	7.962e-25	5.571e-25	-24.099	-24.254	-0.155
S(6)	7.603e-04					
	SO4-2	7.294e-04	5.138e-04	-3.137	-3.289	-0.152
	NaSO4-	1.511e-05	1.382e-05	-4.821	-4.860	-0.039
	CaSO4	1.153e-05	1.155e-05	-4.938	-4.937	0.001
	MgSO4	3.330e-06	3.335e-06	-5.478	-5.477	0.001
	KSO4-	7.322e-07	6.696e-07	-6.135	-6.174	-0.039
	BaSO4	1.434e-07	1.436e-07	-6.843	-6.843	0.001
	MnSO4	3.867e-09	3.873e-09	-8.413	-8.412	0.001
	ZnSO4	4.841e-11	4.850e-11	-10.315	-10.314	0.001
	HSO4-	1.131e-11	1.035e-11	-10.946	-10.985	-0.039
	NiSO4	3.775e-12	3.781e-12	-11.423	-11.422	0.001
	PbSO4	3.703e-12	3.709e-12	-11.431	-11.431	0.001
	Zn(SO4)2-2	3.003e-13	2.101e-13	-12.522	-12.678	-0.155
	CuSO4	1.674e-13	1.677e-13	-12.776	-12.775	0.001
	FeSO4	8.293e-14	8.307e-14	-13.081	-13.081	0.001
	CaHSO4+	1.603e-14	1.466e-14	-13.795	-13.834	-0.039
	Pb(SO4)2-2	1.429e-14	1.000e-14	-13.845	-14.000	-0.155
	Ni(SO4)2-2	1.554e-16	1.087e-16	-15.809	-15.964	-0.155
	UO2SO4	3.821e-18	3.827e-18	-17.418	-17.417	0.001
	AlSO4+	6.013e-20	5.499e-20	-19.221	-19.260	-0.039
	UO2(SO4)2-2	2.485e-20	1.739e-20	-19.605	-19.760	-0.155
	FeSO4+	4.042e-21	3.697e-21	-20.393	-20.432	-0.039
	Al(SO4)2-	9.555e-22	8.739e-22	-21.020	-21.059	-0.039
	FeHSO4+	1.350e-22	1.234e-22	-21.870	-21.909	-0.039
	Fe(SO4)2-	4.459e-23	4.078e-23	-22.351	-22.390	-0.039
	FeHSO4+2	3.258e-30	2.279e-30	-29.487	-29.642	-0.155
	AlHSO4+2	1.536e-30	1.075e-30	-29.814	-29.969	-0.155
	U(SO4)2	0.000e+00	0.000e+00	-50.509	-50.508	0.001
	USO4+2	0.000e+00	0.000e+00	-50.915	-51.070	-0.155
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-67.072	-67.421	-0.349
U(4)	2.704e-25					
	U(OH)4	2.704e-25	2.708e-25	-24.568	-24.567	0.001
	U(OH)3+	2.626e-31	2.402e-31	-30.581	-30.619	-0.039
	U(CO3)4-4	1.674e-35	4.011e-36	-34.776	-35.397	-0.620
	U(CO3)5-6	2.370e-37	9.524e-39	-36.625	-38.021	-1.396
	U(OH)2+2	4.154e-38	2.906e-38	-37.382	-37.537	-0.155
	UOH+3	0.000e+00	0.000e+00	-45.021	-45.370	-0.349
	UF3+	0.000e+00	0.000e+00	-45.048	-45.086	-0.039
	UF4	0.000e+00	0.000e+00	-45.291	-45.291	0.001
	UF2+2	0.000e+00	0.000e+00	-46.185	-46.340	-0.155
	UF5-	0.000e+00	0.000e+00	-47.925	-47.964	-0.039
	UF+3	0.000e+00	0.000e+00	-48.790	-49.139	-0.349
	UF6-2	0.000e+00	0.000e+00	-49.816	-49.971	-0.155
	U(SO4)2	0.000e+00	0.000e+00	-50.509	-50.508	0.001
	USO4+2	0.000e+00	0.000e+00	-50.915	-51.070	-0.155
	U+4	0.000e+00	0.000e+00	-53.718	-54.338	-0.620
	UCl+3	0.000e+00	0.000e+00	-55.708	-56.057	-0.349
	U6(OH)15+9	0.000e+00	0.000e+00	-195.490	-198.631	-3.141
U(5)	2.228e-20					
	UO2+	2.212e-20	2.023e-20	-19.655	-19.694	-0.039
	UO2(CO3)3-5	1.576e-22	1.691e-23	-21.802	-22.772	-0.969
U(6)	4.750e-06					
	UO2(CO3)3-4	4.636e-06	1.111e-06	-5.334	-5.954	-0.620
	UO2(CO3)2-2	7.967e-08	5.574e-08	-7.099	-7.254	-0.155
	UO2(OH)3-	3.434e-08	3.141e-08	-7.464	-7.503	-0.039
	UO2CO3	7.996e-12	8.010e-12	-11.097	-11.096	0.001
	UO2(OH)4-2	3.105e-12	2.173e-12	-11.508	-11.663	-0.155
	UO2OH+	1.339e-13	1.224e-13	-12.873	-12.912	-0.039
	(UO2)3(OH)7-	7.082e-16	6.477e-16	-15.150	-15.189	-0.039
	UO2F+	6.104e-17	5.583e-17	-16.214	-16.253	-0.039
	UO2F2	1.443e-17	1.446e-17	-16.841	-16.840	0.001
	UO2+2	8.559e-18	5.988e-18	-17.068	-17.223	-0.155
	(UO2)3(CO3)6-6	6.170e-18	2.479e-19	-17.210	-18.606	-1.396
	UO2SO4	3.821e-18	3.827e-18	-17.418	-17.417	0.001
	UO2F3-	2.304e-19	2.108e-19	-18.637	-18.676	-0.039
	(UO2)3(OH)5+	5.320e-20	4.866e-20	-19.274	-19.313	-0.039
	UO2(SO4)2-2	2.485e-20	1.739e-20	-19.605	-19.760	-0.155
	UO2Cl+	2.964e-21	2.711e-21	-20.528	-20.567	-0.039
	(UO2)2(OH)2+2	1.776e-21	1.243e-21	-20.751	-20.906	-0.155
	UO2F4-2	1.476e-22	1.033e-22	-21.831	-21.986	-0.155
	(UO2)4(OH)7+	5.339e-24	4.883e-24	-23.273	-23.311	-0.039
	(UO2)3(OH)4+2	1.402e-25	9.809e-26	-24.853	-25.008	-0.155
	UO2Cl2	4.473e-26	4.480e-26	-25.349	-25.349	0.001
	(UO2)2OH+3	6.975e-28	3.123e-28	-27.156	-27.505	-0.349
Zn	3.979e-07					
	Zn(CO3)2-2	2.672e-07	1.869e-07	-6.573	-6.728	-0.155
	Zn(OH)2	1.000e-07	1.002e-07	-7.000	-6.999	0.001
	ZnCO3	2.695e-08	2.700e-08	-7.569	-7.569	0.001
	ZnOH+	1.522e-09	1.392e-09	-8.818	-8.856	-0.039
	Zn(OH)3-	1.512e-09	1.383e-09	-8.821	-8.859	-0.039
	Zn+2	5.970e-10	4.177e-10	-9.224	-9.379	-0.155
	ZnHCO3+	1.006e-10	9.202e-11	-9.997	-10.036	-0.039
	ZnSO4	4.841e-11	4.850e-11	-10.315	-10.314	0.001
	ZnOHCl	1.942e-11	1.945e-11	-10.712	-10.711	0.001
	Zn(OH)4-2	1.367e-12	9.563e-13	-11.864	-12.019	-0.155
	ZnF+	4.656e-13	4.258e-13	-12.332	-12.371	-0.039
	ZnCl+	3.209e-13	2.935e-13	-12.494	-12.532	-0.039
	Zn(SO4)2-2	3.003e-13	2.101e-13	-12.522	-12.678	-0.155
	ZnCl2	9.697e-17	9.714e-17	-16.013	-16.013	0.001
	ZnCl3-	3.731e-20	3.413e-20	-19.428	-19.467	-0.039
	ZnCl4-2	7.584e-24	5.306e-24	-23.120	-23.275	-0.155

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-1.63	9.48	11.11	Al(OH)3
AlAsO4:2H2O	-10.08	-5.27	4.80	AlAsO4:2H2O
AlumK	-24.48	-29.73	-5.25	KAl(SO4)2:12H2O
Alunite	-9.97	-10.78	-0.81	KAl3(SO4)2(OH)6
Anglesite	-6.37	-14.18	-7.82	PbSO4
Anhydrite	-2.87	-7.22	-4.34	CaSO4
Antlerite	-8.37	-0.08	8.29	Cu3(OH)4SO4
Aragonite	0.89	-7.42	-8.31	CaCO3
Arsenolite	-88.16	-168.12	-79.97	As4O6
Artinite	-3.16	6.78	9.94	MgCO3:Mg(OH)2:3H2O
As2O5	-36.26	-29.50	6.76	As2O5
Atacamite	-5.70	1.86	7.56	Cu2(OH)3Cl
Azurite	-6.41	-23.05	-16.63	Cu3(OH)2(CO3)2
B-UO2(OH)2	-3.65	2.06	5.71	UO2(OH)2
Ba3(AsO4)2	18.52	9.58	-8.95	Ba3(AsO4)2
BaF2	-8.71	-14.48	-5.77	BaF2
Barite	0.50	-9.54	-10.05	BaSO4
Basaluminite	-7.36	15.34	22.70	Al4(OH)10SO4
Bianchite	-10.91	-12.67	-1.76	ZnSO4:6H2O
Birnessite	-4.37	39.23	43.60	MnO2
Bixbyite	-0.02	51.17	51.19	Mn2O3
Boehmite	0.56	9.48	8.91	AlOOH
Brochantite	-7.92	7.42	15.34	Cu4(OH)6SO4
Brucite	-2.38	14.78	17.16	Mg(OH)2
Bunsenite	-3.86	8.87	12.73	NiO
Ca3(AsO4)2:4w	-5.82	16.55	22.37	Ca3(AsO4)2:4H2O
Calcite	1.04	-7.42	-8.45	CaCO3
Cerrusite	-1.19	-14.38	-13.19	PbCO3
Chalcanthite	-12.41	-15.07	-2.66	CuSO4:5H2O
Claudetite	-87.91	-168.12	-80.22	As4O6
CO2(g)	-4.61	-22.77	-18.16	CO2
Cotunnite	-13.04	-17.88	-4.84	PbCl2
Cu(OH)2	-1.32	7.50	8.82	Cu(OH)2
Cu2SO4	-27.56	-34.85	-7.30	Cu2SO4
Cu3(AsO4)2:6w	-13.16	-7.01	6.15	Cu3(AsO4)2:6H2O
CuCO3	-5.64	-15.27	-9.63	CuCO3
CuF	-24.42	-19.90	4.52	CuF
CuF2	-19.55	-20.01	-0.46	CuF2
CuF2:2H2O	-15.51	-20.01	-4.51	CuF2:2H2O
CuMetal	-8.12	-19.78	-11.66	Cu
CuOCuSO4	-19.52	-7.57	11.95	CuO:CuSO4
CupricFerrite	16.73	49.33	32.60	CuFe2O4
Cuprite	-5.26	-12.28	-7.02	Cu2O
CuprousFerrite	13.22	14.77	1.56	CuFeO2
CuSO4	-18.29	-15.07	3.22	CuSO4
Diaspore	2.31	9.48	7.17	AlOOH
Dolomite	1.57	-15.41	-16.98	CaMg(CO3)2
Dolomite(d)	1.00	-15.41	-16.41	CaMg(CO3)2
Epsomite	-5.62	-7.79	-2.17	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.88	16.98	10.09	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.89	20.92	18.02	Fe(OH)3
Fe3(OH)8	2.62	49.11	46.49	Fe3(OH)8
Fluorite	-1.50	-12.16	-10.66	CaF2
Gibbsite	1.10	9.48	8.38	Al(OH)3
Goethite	8.78	20.92	12.13	FeOOH
Goslarite	-10.67	-12.67	-2.00	ZnSO4:7H2O
Gummite	-8.62	2.06	10.67	UO3
Gypsum	-2.64	-7.22	-4.58	CaSO4:2H2O
H2(g)	-27.23	-27.28	-0.05	H2
Halite	-7.32	-5.75	1.57	NaCl
Hausmannite	0.91	63.12	62.21	Mn3O4
Hematite	19.21	41.83	22.62	Fe2O3
Huntite	-1.73	-31.40	-29.67	CaMg3(CO3)4
Hydrocerrusite	-2.91	-20.37	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-9.05	-17.20	-8.15	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-9.00	22.40	31.40	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-7.02	23.54	30.56	KFe3(SO4)2(OH)6
Jarosite-Na	-9.55	24.99	34.55	NaFe3(SO4)2(OH)6
JarositeH	-17.05	17.61	34.66	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-9.86	-13.09	-3.23	AlOHSO4
Langite	-9.83	7.42	17.26	Cu4(OH)6SO4:H2O
Larnakite	-5.59	-5.79	-0.20	PbO:PbSO4
Laurionite	-5.37	-4.74	0.62	PbOHCl
Litharge	-4.52	8.39	12.91	PbO
Maghemite	9.18	41.83	32.65	Fe2O3
Magnesite	-0.04	-7.99	-7.96	MgCO3
Magnetite	18.51	49.11	30.60	Fe3O4
Malachite	-2.78	-7.77	-4.99	Cu2(OH)2CO3
Manganite	0.25	25.59	25.34	MnOOH
Massicot	-4.72	8.39	13.11	PbO
Matlockite	-8.98	-18.50	-9.52	PbClF
Melanothallite	-22.64	-18.77	3.87	CuCl2
Melanterite	-13.03	-15.29	-2.27	FeSO4:7H2O
Minium	-22.45	52.45	74.90	Pb3O4
Mirabilite	-6.47	-7.80	-1.34	Na2SO4:10H2O
Mn2(SO4)3	-62.91	-16.53	46.37	Mn2(SO4)3
Mn3(AsO4):8H2O	-6.23	6.34	12.57	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-16.82	-14.32	2.51	MnCl2:4H2O
MnSO4	-13.47	-10.62	2.85	MnSO4
Morenosite	-11.30	-13.70	-2.39	NiSO4:7H2O
Na4UO2(CO3)3	-20.43	-36.72	-16.29	Na4UO2(CO3)3
Nahcolite	-4.42	-15.39	-10.96	NaHCO3
Nantokite	-9.70	-19.27	-9.58	CuCl
Natron	-6.51	-8.00	-1.50	Na2CO3:10H2O
Nesquehonite	-2.44	-7.99	-5.55	MgCO3:3H2O
Ni(OH)2	-1.57	8.87	10.44	Ni(OH)2
Ni3(AsO4)2:8H2O	-18.64	-2.88	15.76	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.07	12.93	32.00	Ni4(OH)6SO4
NiCO3	-7.17	-13.89	-6.72	NiCO3
Nsutite	-3.34	39.23	42.56	MnO2
O2(g)	-30.25	54.56	84.81	O2
Pb(OH)2	0.07	8.39	8.31	Pb(OH)2
Pb2(OH)3Cl	-5.15	3.64	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-9.42	16.78	26.20	PbO:Pb(OH)2
Pb2O3	-16.98	44.06	61.04	Pb2O3
Pb2OCO3	-5.63	-5.99	-0.37	PbO:PbCO3
Pb3(AsO4)2	-10.21	-4.34	5.87	Pb3(AsO4)2
Pb3O2CO3	-8.93	2.40	11.33	PbCO3:2PbO
Pb3O2SO4	-8.05	2.60	10.64	PbSO4:2PbO
Pb4(OH)6SO4	-10.12	10.98	21.10	Pb4(OH)6SO4
Pb4O3SO4	-11.53	10.98	22.51	PbSO4:3PbO
PbF2	-11.69	-19.12	-7.43	PbF2
PbMetal	-23.16	-18.89	4.27	Pb
PbO:0.3H2O	-4.59	8.39	12.98	PbO:0.33H2O
Phosgenite	-12.45	-32.26	-19.81	PbCl2:PbCO3
Plattnerite	-14.46	35.67	50.13	PbO2
Portlandite	-7.81	15.35	23.16	Ca(OH)2
Pyrochroite	-3.25	11.95	15.20	Mn(OH)2
Pyrolusite	-2.92	39.23	42.14	MnO2
Retgersite	-11.64	-13.69	-2.05	NiSO4:6H2O
Rhodochrosite	0.29	-10.82	-11.11	MnCO3
Rhodochrosite(d)	-0.43	-10.82	-10.39	MnCO3
Rutherfordine	-6.28	-20.71	-14.43	UO2CO3
Schoepite	-3.49	2.06	5.55	UO2(OH)2:H2O
Scorodite	-7.36	6.17	13.52	FeAsO4:2H2O
Siderite	-4.63	-15.49	-10.86	FeCO3
Siderite(d)(3)	-5.04	-15.49	-10.45	FeCO3
Smithsonite	-2.92	-12.87	-9.95	ZnCO3
Tenorite	-0.30	7.50	7.80	CuO
Thenardite	-7.63	-7.80	-0.17	Na2SO4
Thermonatrite	-8.16	-8.00	0.16	Na2CO3:H2O
Trona	-12.43	-23.39	-10.96	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-35.15	-47.79	-12.64	U(OH)2SO4
U3O8(c)	-14.67	-21.11	-6.44	U3O8
U4O9(c)	-33.64	-73.61	-39.97	U4O9
UF4(c)	-52.42	-80.25	-27.83	UF4
UF4:2.5H2O	-43.24	-80.25	-37.01	UF4:2.5H2O
UO2(a)	-15.88	-25.22	-9.34	UO2
UO3(gamma)	-5.89	2.06	7.95	UO3
Uraninite(c)	-11.20	-25.22	-14.03	UO2
Witherite	-1.17	-9.74	-8.57	BaCO3
Zincite(c)	-1.50	9.90	11.40	ZnO
Zincosite	-15.90	-12.67	3.24	ZnSO4
Zn(OH)2-a	-2.55	9.90	12.45	Zn(OH)2
Zn(OH)2-b	-1.85	9.90	11.75	Zn(OH)2
Zn(OH)2-c	-2.30	9.90	12.20	Zn(OH)2
Zn(OH)2-e	-1.60	9.90	11.50	Zn(OH)2
Zn(OH)2-g	-1.81	9.90	11.71	Zn(OH)2
Zn2(OH)2SO4	-10.27	-2.77	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-8.53	6.67	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-13.53	0.20	13.73	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-35.18	-15.44	19.75	ZnO:2ZnSO4
Zn4(OH)6SO4	-11.37	17.03	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-15.26	23.24	38.50	Zn5(OH)8Cl2
ZnCl2	-23.60	-16.36	7.24	ZnCl2
ZnCO3:H2O	-2.61	-12.87	-10.26	ZnCO3:H2O
ZnF2	-16.24	-17.61	-1.37	ZnF2
ZnMetal	-43.57	-17.38	26.19	Zn
ZnO(a)	-1.41	9.90	11.31	ZnO
ZnSO4:H2O	-12.22	-12.67	-0.45	ZnSO4:H2O

End of simulation.

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-0.50	10.65	11.15	Al(OH)3
AlAsO4:2H2O	-7.39	-2.58	4.81	AlAsO4:2H2O
AlumK	-19.91	-25.18	-5.27	KAl(SO4)2:12H2O
Alunite	-3.13	-3.87	-0.73	KAl3(SO4)2(OH)6
Anglesite	-5.80	-13.61	-7.82	PbSO4
Anhydrite	-3.81	-8.15	-4.34	CaSO4
Antlerite	-7.43	0.86	8.29	Cu3(OH)4SO4
Aragonite	-1.64	-9.95	-8.30	CaCO3
Arsenolite	-23.26	-26.25	-2.99	As4O6
Artinite	-9.72	0.26	9.98	MgCO3:Mg(OH)2:3H2O
As2O5	-33.24	-26.47	6.77	As2O5
Atacamite	-5.35	2.24	7.59	Cu2(OH)3Cl
Azurite	-5.73	-22.33	-16.60	Cu3(OH)2(CO3)2
B-UO2(OH)2	-2.26	3.47	5.73	UO2(OH)2
Ba3(AsO4)2	10.51	1.56	-8.95	Ba3(AsO4)2
BaF2	-9.78	-15.56	-5.77	BaF2
Barite	-0.19	-10.25	-10.06	BaSO4
Basaluminite	0.32	23.02	22.70	Al4(OH)10SO4
Bianchite	-9.63	-11.39	-1.76	ZnSO4:6H2O
Birnessite	-10.98	32.62	43.60	MnO2
Bixbyite	-9.50	41.80	51.30	Mn2O3
Boehmite	1.70	10.65	8.96	AlOOH
Brochantite	-7.66	7.68	15.34	Cu4(OH)6SO4
Brucite	-6.37	10.83	17.20	Mg(OH)2
Bunsenite	-5.64	7.12	12.77	NiO
Ca3(AsO4)2:4w	-14.51	7.87	22.38	Ca3(AsO4)2:4H2O
Calcite	-1.49	-9.95	-8.45	CaCO3
Cerrusite	-2.22	-15.41	-13.19	PbCO3
Chalcanthite	-10.12	-12.78	-2.66	CuSO4:5H2O
Claudetite	-23.01	-26.25	-3.24	As4O6
CO2(g)	-3.23	-21.39	-18.17	CO2
Cotunnite	-11.98	-16.82	-4.84	PbCl2
Cu(OH)2	-2.02	6.82	8.84	Cu(OH)2
Cu2SO4	-22.11	-29.40	-7.29	Cu2SO4
Cu3(AsO4)2:6w	-12.17	-6.01	6.16	Cu3(AsO4)2:6H2O
CuCO3	-4.94	-14.57	-9.63	CuCO3
CuF	-21.90	-17.35	4.55	CuF
CuF2	-17.64	-18.08	-0.44	CuF2
CuF2:2H2O	-13.58	-18.08	-4.50	CuF2:2H2O
CuMetal	-4.93	-16.62	-11.69	Cu
CuOCuSO4	-17.96	-5.96	12.00	CuO:CuSO4
CupricFerrite	15.73	48.42	32.69	CuFe2O4
Cuprite	-2.77	-9.80	-7.03	Cu2O
CuprousFerrite	14.32	15.90	1.58	CuFeO2
CuSO4	-16.03	-12.78	3.25	CuSO4
Diaspore	3.45	10.65	7.21	AlOOH
Dolomite	-3.55	-20.51	-16.96	CaMg(CO3)2
Dolomite(d)	-4.12	-20.51	-16.39	CaMg(CO3)2
Epsomite	-6.59	-8.77	-2.18	MgSO4:7H2O
Fe(OH)2.7Cl.3	7.27	17.38	10.11	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.76	20.80	18.04	Fe(OH)3
Fe3(OH)8	4.16	50.68	46.52	Fe3(OH)8
Fluorite	-2.79	-13.45	-10.66	CaF2
Gibbsite	2.24	10.65	8.41	Al(OH)3
Goethite	8.65	20.80	12.15	FeOOH
Goslarite	-9.39	-11.39	-2.00	ZnSO4:7H2O
Gummite	-7.24	3.47	10.71	UO3
Gypsum	-3.57	-8.15	-4.58	CaSO4:2H2O
H2(g)	-23.39	-23.44	-0.05	H2
Halite	-8.22	-6.65	1.57	NaCl
Hausmannite	-11.39	50.97	62.37	Mn3O4
Hematite	18.90	41.60	22.70	Fe2O3
Huntite	-12.02	-41.65	-29.63	CaMg3(CO3)4
Hydrocerrusite	-7.38	-24.84	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-23.38	-31.45	-8.07	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-5.51	25.94	31.45	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-4.08	26.57	30.65	KFe3(SO4)2(OH)6
Jarosite-Na	-6.69	27.96	34.65	NaFe3(SO4)2(OH)6
JarositeH	-11.58	23.20	34.79	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-5.71	-8.94	-3.23	AlOHSO4
Langite	-9.63	7.68	17.32	Cu4(OH)6SO4:H2O
Larnakite	-7.44	-7.63	-0.19	PbO:PbSO4
Laurionite	-6.04	-5.42	0.62	PbOHCl
Litharge	-6.95	5.98	12.94	PbO
Maghemite	8.92	41.60	32.68	Fe2O3
Magnesite	-2.62	-10.57	-7.95	MgCO3
Magnetite	19.98	50.68	30.70	Fe3O4
Malachite	-2.79	-7.75	-4.97	Cu2(OH)2CO3
Manganite	-4.44	20.90	25.34	MnOOH
Massicot	-7.15	5.98	13.13	PbO
Matlockite	-8.33	-17.87	-9.54	PbClF
Melanothallite	-19.88	-15.98	3.89	CuCl2
Melanterite	-8.24	-10.52	-2.28	FeSO4:7H2O
Minium	-33.67	41.39	75.05	Pb3O4
Mirabilite	-8.72	-10.09	-1.37	Na2SO4:10H2O
Mn2(SO4)3	-63.51	-17.00	46.51	Mn2(SO4)3
Mn3(AsO4):8H2O	-11.52	1.06	12.58	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-16.10	-13.63	2.48	MnCl2:4H2O
MnSO4	-13.29	-10.42	2.87	MnSO4
Morenosite	-10.08	-12.47	-2.40	NiSO4:7H2O
Na4UO2(CO3)3	-25.40	-41.69	-16.29	Na4UO2(CO3)3
Nahcolite	-5.66	-16.64	-10.98	NaHCO3
Nantokite	-6.71	-16.30	-9.59	CuCl
Natron	-10.36	-11.88	-1.52	Na2CO3:10H2O
Nesquehonite	-5.02	-10.57	-5.54	MgCO3:3H2O
Ni(OH)2	-3.27	7.12	10.40	Ni(OH)2
Ni3(AsO4)2:8H2O	-20.88	-5.10	15.77	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-23.11	8.89	32.00	Ni4(OH)6SO4
NiCO3	-7.56	-14.27	-6.71	NiCO3
Nsutite	-9.95	32.62	42.56	MnO2
O2(g)	-38.14	46.88	85.02	O2
Pb(OH)2	-2.35	5.98	8.34	Pb(OH)2
Pb2(OH)3Cl	-8.23	0.56	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.23	11.97	26.20	PbO:Pb(OH)2
Pb2O3	-25.63	35.41	61.04	Pb2O3
Pb2OCO3	-9.08	-9.43	-0.35	PbO:PbCO3
Pb3(AsO4)2	-14.41	-8.52	5.88	Pb3(AsO4)2
Pb3O2CO3	-14.82	-3.45	11.37	PbCO3:2PbO
Pb3O2SO4	-12.32	-1.65	10.68	PbSO4:2PbO
Pb4(OH)6SO4	-16.77	4.33	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.23	4.33	22.57	PbSO4:3PbO
PbF2	-11.49	-18.92	-7.43	PbF2
PbMetal	-21.72	-17.46	4.26	Pb
PbO:0.3H2O	-7.00	5.98	12.98	PbO:0.33H2O
Phosgenite	-12.42	-32.23	-19.81	PbCl2:PbCO3
Plattnerite	-20.82	29.42	50.24	PbO2
Portlandite	-11.76	11.45	23.21	Ca(OH)2
Pyrochroite	-6.02	9.18	15.20	Mn(OH)2
Pyrolusite	-9.63	32.62	42.24	MnO2
Retgersite	-10.42	-12.47	-2.05	NiSO4:6H2O
Rhodochrosite	-1.10	-12.22	-11.11	MnCO3
Rhodochrosite(d)	-1.83	-12.22	-10.39	MnCO3
Rutherfordine	-3.49	-17.93	-14.43	UO2CO3
Schoepite	-2.10	3.47	5.56	UO2(OH)2:H2O
Scorodite	-5.98	7.56	13.54	FeAsO4:2H2O
Siderite	-1.46	-12.31	-10.86	FeCO3
Siderite(d)(3)	-1.86	-12.31	-10.45	FeCO3
Smithsonite	-3.24	-13.19	-9.94	ZnCO3
Tenorite	-1.00	6.82	7.82	CuO
Thenardite	-9.92	-10.09	-0.17	Na2SO4
Thermonatrite	-12.05	-11.88	0.16	Na2CO3:H2O
Trona	-17.59	-28.52	-10.93	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-26.87	-39.57	-12.70	U(OH)2SO4
U3O8(c)	-6.62	-13.04	-6.42	U3O8
U4O9(c)	-16.42	-56.45	-40.03	U4O9
UF4(c)	-41.92	-69.77	-27.85	UF4
UF4:2.5H2O	-32.71	-69.77	-37.06	UF4:2.5H2O
UO2(a)	-10.58	-19.97	-9.40	UO2
UO3(gamma)	-4.51	3.47	7.98	UO3
Uraninite(c)	-5.92	-19.97	-14.05	UO2
Witherite	-3.47	-12.05	-8.58	BaCO3
Zincite(c)	-3.22	8.21	11.43	ZnO
Zincosite	-14.66	-11.39	3.26	ZnSO4
Zn(OH)2-a	-4.24	8.21	12.45	Zn(OH)2
Zn(OH)2-b	-3.54	8.21	11.75	Zn(OH)2
Zn(OH)2-c	-3.99	8.21	12.20	Zn(OH)2
Zn(OH)2-e	-3.29	8.21	11.50	Zn(OH)2
Zn(OH)2-g	-3.50	8.21	11.71	Zn(OH)2
Zn2(OH)2SO4	-10.68	-3.18	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-10.19	5.01	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-15.59	-1.85	13.74	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-34.42	-14.57	19.84	ZnO:2ZnSO4
Zn4(OH)6SO4	-15.17	13.23	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-20.27	18.23	38.50	Zn5(OH)8Cl2
ZnCl2	-21.86	-14.60	7.26	ZnCl2
ZnCO3:H2O	-2.93	-13.19	-10.26	ZnCO3:H2O
ZnF2	-15.35	-16.69	-1.35	ZnF2
ZnMetal	-41.48	-15.23	26.24	Zn
ZnO(a)	-3.10	8.21	11.31	ZnO
ZnSO4:H2O	-10.96	-11.39	-0.43	ZnSO4:H2O

End of simulation.

```
------------------
Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE Schneckenstein 2.5-3.5m
           SOLUTION  1
           units                   mg/l
           temp                    19.7
           pH                       7.4
           pe                       7.29
           F                        1.4
           Cl                       3.2
           N(5)                     1.0       as NO3
           S(6)                   250         as SO4
           Na                       8.9
           K                        6.2
           Mg                      30
           Ca                      69
           Alkalinity              30.5       as HCO3
           Al                       0.275
           As                       0.049
           Ba                       0.181
           Cd                       0.019
           Cu                       0.139
           Fe(+2)                   0.030
           Fe(+3)                   0.120
           Mn                       1.319
           Ni                       0.149
           Pb                       0.006
           U                        0.055    Fe(+2)/Fe(+3)
           Zn                       1.220
           END
```

```
TITLE
-----

 Schneckenstein 2.5-3.5m

-------------------------------------------
Beginning of initial solution calculations.
-------------------------------------------

Initial solution 1.

-----------------------------Solution composition--------------
---------------

           Elements           Molality       Moles

           Al                1.020e-05   1.020e-05
           Alkalinity        5.000e-04   5.000e-04
           As                6.543e-07   6.543e-07
           Ba                1.318e-06   1.318e-06
           Ca                1.722e-03   1.722e-03
           Cd                1.691e-07   1.691e-07
           Cl                9.030e-05   9.030e-05
           Cu                2.188e-06   2.188e-06
           F                 7.372e-05   7.372e-05
           Fe(2)             5.374e-07   5.374e-07
           Fe(3)             2.150e-06   2.150e-06
           K                 1.586e-04   1.586e-04
           Mg                1.234e-03   1.234e-03
           Mn                2.402e-05   2.402e-05
           N(5)              1.613e-05   1.613e-05
           Na                3.873e-04   3.873e-04
           Ni                2.539e-06   2.539e-06
           Pb                2.897e-08   2.897e-08
           S(6)              2.603e-03   2.603e-03
           U                 2.312e-07   2.312e-07
           Zn                1.867e-05   1.867e-05
```

```
---------------------------Description of solution----------------------------

                                    pH  =   7.400
                                    pe  =   7.290
                      Activity of water  =   1.000
                         Ionic strength  =   9.872e-03
                     Mass of water (kg)  =   1.000e+00
                Total carbon (mol/kg)    =   4.871e-04
                   Total CO2 (mol/kg)    =   4.871e-04
                  Temperature (deg C)    =  19.700
               Electrical balance (eq)   =   7.037e-04
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =   6.73
                              Iterations  =  11
                                 Total H  = 1.110129e+02
                                 Total O  = 5.551816e+01

--------------------------------Redox couples--------------------------------

           Redox couple             pe  Eh (volts)

           Fe(2)/Fe(3)          4.5310      0.2633
```

```
------------------
Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE    Schneckenstein 2.5-3.5m
           SOLUTION  1
           units     mg/l
           temp      19.7
           pH        7.4
           pe        7.29
           F          1.4
           Cl         3.2
           N(5)       1.0       as NO3
           S(6)       250       as SO4
           Na         8.9
           K          6.2
           Mg         30
           Ca         69
           Alkalinity  30.5     as HCO3
           Al          0.275
           As          0.049
           Ba          0.181
           Cd          0.019
           Cu          0.139
           Fe(+2)      0.030
           Fe(+3)      0.120
           Mn          1.319
           Ni          0.149
           Pb          0.006
           U           0.055
           Zn          1.220
           END
```

```
-----
TITLE
-----

    Schneckenstein 2.5-3.5m

-----------------------------------------
Beginning of initial solution calculations.
-----------------------------------------

Initial solution 1.

----------------------------Solution composition--------------------
----------

           Elements           Molality       Moles

           Al                1.020e-05   1.020e-05
           Alkalinity        5.000e-04   5.000e-04
           As                6.543e-07   6.543e-07
           Ba                1.318e-06   1.318e-06
           Ca                1.722e-03   1.722e-03
           Cd                1.691e-07   1.691e-07
           Cl                9.030e-05   9.030e-05
           Cu                2.188e-06   2.188e-06
           F                 7.372e-05   7.372e-05
           Fe(2)             5.374e-07   5.374e-07
           Fe(3)             2.150e-06   2.150e-06
           K                 1.586e-04   1.586e-04
           Mg                1.234e-03   1.234e-03
           Mn                2.402e-05   2.402e-05
           N(5)              1.613e-05   1.613e-05
           Na                3.873e-04   3.873e-04
           Ni                2.539e-06   2.539e-06
           Pb                2.897e-08   2.897e-08
           S(6)              2.603e-03   2.603e-03
           U                 2.312e-07   2.312e-07
           Zn                1.867e-05   1.867e-05
```

```
----------------------------Description of solution-------------------------
---

                                    pH  =   7.400
                                    pe  =   7.290
                      Activity of water  =   1.000
                         Ionic strength  =   9.872e-03
                     Mass of water (kg)  =   1.000e+00
                  Total carbon (mol/kg)  =   4.871e-04
                     Total CO2 (mol/kg)  =   4.871e-04
                    Temperature (deg C)  =  19.700
                 Electrical balance (eq)  =   7.037e-04
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =   6.73
                                Iterations  =  11
                                   Total H  = 1.110129e+02
                                   Total O  = 5.551816e+01

---------------------------------Redox couples-----------------------------
---

           Redox couple             pe  Eh (volts)

           Fe(2)/Fe(3)          4.5310      0.2633
```

```
------------------
Reading data base.
------------------

          SOLUTION_MASTER_SPECIES
          SOLUTION_SPECIES
          PHASES
          EXCHANGE_MASTER_SPECIES
          EXCHANGE_SPECIES
          SURFACE_MASTER_SPECIES
          SURFACE_SPECIES
          END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

          TITLE    Schneckenstein 2.5-3.5m
          SOLUTION  1
          units     mg/l
          temp      19.7
          pH        7.4
          pe        7.29
          F          1.4
          Cl         3.2
          N(5)       1.0       as NO3
          S(6)       250       as SO4
          Na         8.9
          K          6.2
          Mg         30
          Ca         69
          Alkalinity  30.5     as HCO3
          Al          0.275
          As          0.049
          Ba          0.181
          Cd          0.019
          Cu          0.139
          Fe          0.150
          Mn          1.319
          Ni          0.149
          Pb          0.006
          U           0.055
          Zn          1.220
          END
-----
```

```
TITLE
-----

    Schneckenstein 2.5-3.5m

-------------------------------------------
Beginning of initial solution calculations.
-------------------------------------------

Initial solution 1.

-----------------------------Solution composition----------------
-------------

            Elements           Molality       Moles

            Al                1.020e-05   1.020e-05
            Alkalinity        5.000e-04   5.000e-04
            As                6.543e-07   6.543e-07
            Ba                1.318e-06   1.318e-06
            Ca                1.722e-03   1.722e-03
            Cd                1.691e-07   1.691e-07
            Cl                9.030e-05   9.030e-05
            Cu                2.188e-06   2.188e-06
            F                 7.372e-05   7.372e-05
            Fe                2.687e-06   2.687e-06
            K                 1.586e-04   1.586e-04
            Mg                1.234e-03   1.234e-03
            Mn                2.402e-05   2.402e-05
            N(5)              1.613e-05   1.613e-05
            Na                3.873e-04   3.873e-04
            Ni                2.539e-06   2.539e-06
            Pb                2.897e-08   2.897e-08
            S(6)              2.603e-03   2.603e-03
            U                 2.312e-07   2.312e-07
            Zn                1.867e-05   1.867e-05
```

```
----------------------------Description of solution----------------------
-----

                                    pH  =   7.400
                                    pe  =   7.290
                        Activity of water  =   1.000
                           Ionic strength  =   9.871e-03
                       Mass of water (kg)  =   1.000e+00
                     Total carbon (mol/kg)  =   4.867e-04
                        Total CO2 (mol/kg)  =   4.867e-04
                       Temperature (deg C)  =  19.700
                    Electrical balance (eq)  =   7.031e-04
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =   6.72
                                Iterations  =  11
                                   Total H  = 1.110129e+02
                                   Total O  = 5.551816e+01
```

----------Distribution of species----------

	Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
	OH-	1.843e-07	1.665e-07	-6.735	-6.779	-0.044
	H+	4.353e-08	3.981e-08	-7.361	-7.400	-0.039
	H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	1.020e-05					
	Al(OH)4-	9.769e-06	8.825e-06	-5.010	-5.054	-0.044
	Al(OH)3	1.983e-07	1.988e-07	-6.703	-6.702	0.001
	Al(OH)2+	8.907e-08	8.046e-08	-7.050	-7.094	-0.044
	AlF2+	7.798e-08	7.044e-08	-7.108	-7.152	-0.044
	AlF3	5.558e-08	5.570e-08	-7.255	-7.254	0.001
	AlF+2	3.437e-09	2.289e-09	-8.464	-8.640	-0.177
	AlF4-	1.548e-09	1.399e-09	-8.810	-8.854	-0.044
	AlOH+2	9.894e-10	6.589e-10	-9.005	-9.181	-0.177
	AlSO4+	1.744e-11	1.575e-11	-10.758	-10.803	-0.044
	Al+3	9.342e-12	3.743e-12	-11.030	-11.427	-0.397
	Al(SO4)2-	7.677e-13	6.935e-13	-12.115	-12.159	-0.044
	AlHSO4+2	7.998e-20	5.326e-20	-19.097	-19.274	-0.177
As(3)	4.776e-23					
	H3AsO3	4.712e-23	4.723e-23	-22.327	-22.326	0.001
	H2AsO3-	6.358e-25	5.744e-25	-24.197	-24.241	-0.044
	HAsO3-2	1.356e-29	9.034e-30	-28.868	-29.044	-0.177
	H4AsO3+	1.031e-30	9.316e-31	-29.987	-30.031	-0.044
	AsO3-3	1.815e-35	7.271e-36	-34.741	-35.138	-0.397
As(5)	6.543e-07					
	HAsO4-2	5.582e-07	3.717e-07	-6.253	-6.430	-0.177
	H2AsO4-	9.607e-08	8.678e-08	-7.017	-7.062	-0.044
	AsO4-3	5.173e-11	2.073e-11	-10.286	-10.683	-0.397
	H3AsO4	5.728e-13	5.741e-13	-12.242	-12.241	0.001
Ba	1.318e-06					
	Ba+2	8.921e-07	5.942e-07	-6.050	-6.226	-0.177
	BaSO4	4.241e-07	4.250e-07	-6.373	-6.372	0.001
	BaHCO3+	2.102e-09	1.898e-09	-8.677	-8.722	-0.044
	BaCO3	1.139e-10	1.142e-10	-9.943	-9.942	0.001
	BaOH+	5.597e-13	5.057e-13	-12.252	-12.296	-0.044
C(4)	4.871e-04					
	HCO3-	4.345e-04	3.939e-04	-3.362	-3.405	-0.043
	CO2	3.787e-05	3.796e-05	-4.422	-4.421	0.001
	CaHCO3+	4.974e-06	4.493e-06	-5.303	-5.347	-0.044
	MgHCO3+	3.479e-06	3.143e-06	-5.459	-5.503	-0.044
	NiCO3	1.587e-06	1.591e-06	-5.799	-5.798	0.001
	ZnCO3	7.708e-07	7.725e-07	-6.113	-6.112	0.001
	CaCO3	6.154e-07	6.168e-07	-6.211	-6.210	0.001
	CO3-2	6.130e-07	4.138e-07	-6.213	-6.383	-0.171
	MnHCO3+	5.177e-07	4.676e-07	-6.286	-6.330	-0.044
	ZnHCO3+	5.136e-07	4.640e-07	-6.289	-6.334	-0.044
	MnCO3	4.369e-07	4.379e-07	-6.360	-6.359	0.001
	CuCO3	2.748e-07	2.754e-07	-6.561	-6.560	0.001
	MgCO3	2.528e-07	2.534e-07	-6.597	-6.596	0.001
	UO2(CO3)2-2	1.893e-07	1.260e-07	-6.723	-6.899	-0.177
	NaHCO3	7.685e-08	7.702e-08	-7.114	-7.113	0.001
	NiHCO3+	3.122e-08	2.820e-08	-7.506	-7.550	-0.044
	CuHCO3+	2.708e-08	2.447e-08	-7.567	-7.611	-0.044
	PbCO3	2.000e-08	2.004e-08	-7.699	-7.698	0.001
	UO2(CO3)3-4	1.711e-08	3.365e-09	-7.767	-8.473	-0.706
	UO2CO3	1.430e-08	1.434e-08	-7.845	-7.844	0.001
	FeHCO3+	1.308e-08	1.182e-08	-7.883	-7.927	-0.044
	Zn(CO3)2-2	1.026e-08	6.834e-09	-7.989	-8.165	-0.177
	FeCO3	2.971e-09	2.978e-09	-8.527	-8.526	0.001
	NaCO3-	2.259e-09	2.041e-09	-8.646	-8.690	-0.044
	BaHCO3+	2.102e-09	1.898e-09	-8.677	-8.722	-0.044
	Ni(CO3)2-2	1.718e-09	1.144e-09	-8.765	-8.942	-0.177
	CdHCO3+	1.206e-09	1.089e-09	-8.919	-8.963	-0.044
	PbHCO3+	9.652e-10	8.719e-10	-9.015	-9.060	-0.044
	Cu(CO3)2-2	2.154e-10	1.435e-10	-9.667	-9.843	-0.177
	BaCO3	1.139e-10	1.142e-10	-9.943	-9.942	0.001
	Pb(CO3)2-2	3.128e-11	2.083e-11	-10.505	-10.681	-0.177
	CdCO3	2.868e-11	2.874e-11	-10.542	-10.541	0.001
	Cd(CO3)2-2	5.648e-14	3.761e-14	-13.248	-13.425	-0.177
	(UO2)3(CO3)6-6	1.165e-16	3.002e-18	-15.934	-17.523	-1.589
	UO2(CO3)3-5	1.853e-25	1.460e-26	-24.732	-25.836	-1.103
	U(CO3)4-4	6.816e-33	1.341e-33	-32.166	-32.873	-0.706
	U(CO3)5-6	1.471e-37	3.792e-39	-36.832	-38.421	-1.589
Ca	1.722e-03					
	Ca+2	1.452e-03	9.792e-04	-2.838	-3.009	-0.171
	CaSO4	2.646e-04	2.652e-04	-3.577	-3.576	0.001
	CaHCO3+	4.974e-06	4.493e-06	-5.303	-5.347	-0.044
	CaCO3	6.154e-07	6.168e-07	-6.211	-6.210	0.001
	CaF+	5.258e-07	4.750e-07	-6.279	-6.323	-0.044
	CaOH+	4.518e-09	4.082e-09	-8.345	-8.389	-0.044
	CaHSO4+	6.430e-11	5.809e-11	-10.192	-10.236	-0.044
Cd	1.691e-07					
	Cd+2	1.313e-07	8.745e-08	-6.882	-7.058	-0.177
	CdSO4	3.475e-08	3.483e-08	-7.459	-7.458	0.001
	CdHCO3+	1.206e-09	1.089e-09	-8.919	-8.963	-0.044
	Cd(SO4)2-2	8.460e-10	5.634e-10	-9.073	-9.249	-0.177
	CdCl+	7.393e-10	6.679e-10	-9.131	-9.175	-0.044
	CdOH+	1.355e-10	1.224e-10	-9.868	-9.912	-0.044
	CdF+	7.697e-11	6.953e-11	-10.114	-10.158	-0.044
	CdCO3	2.868e-11	2.874e-11	-10.542	-10.541	0.001
	CdOHCl	6.162e-12	6.176e-12	-11.210	-11.209	0.001
	CdNO3+	4.154e-12	3.753e-12	-11.382	-11.426	-0.044
	Cd(OH)2	2.459e-13	2.464e-13	-12.609	-12.608	0.001
	CdCl2	2.217e-13	2.222e-13	-12.654	-12.653	0.001
	Cd(CO3)2-2	5.648e-14	3.761e-14	-13.248	-13.425	-0.177
	CdF2	1.101e-14	1.103e-14	-13.958	-13.957	0.001
	Cd2OH+3	1.400e-16	5.609e-17	-15.854	-16.251	-0.397
	CdCl3-	1.165e-17	1.053e-17	-16.934	-16.978	-0.044
	Cd(OH)3-	7.687e-19	6.944e-19	-18.114	-18.158	-0.044
	Cd(OH)4-2	2.334e-25	1.554e-25	-24.632	-24.808	-0.177
Cl	9.030e-05					
	Cl-	9.029e-05	8.142e-05	-4.044	-4.089	-0.045
	MnCl+	4.892e-09	4.419e-09	-8.311	-8.355	-0.044
	ZnCl+	1.789e-09	1.616e-09	-8.747	-8.791	-0.044
	CdCl+	7.393e-10	6.679e-10	-9.131	-9.175	-0.044
	ZnOHCl	6.322e-10	6.336e-10	-9.199	-9.198	0.001
	NiCl+	1.174e-10	1.061e-10	-9.930	-9.974	-0.044
	FeCl+	3.733e-11	3.372e-11	-10.428	-10.472	-0.044
	CuCl+	2.309e-11	2.086e-11	-10.637	-10.681	-0.044
	PbCl+	8.748e-12	7.903e-12	-11.058	-11.102	-0.044
	CdOHCl	6.162e-12	6.176e-12	-11.210	-11.209	0.001
	CdCl2	2.217e-13	2.222e-13	-12.654	-12.653	0.001
	MnCl2	1.567e-13	1.571e-13	-12.805	-12.804	0.001
	ZnCl2	1.346e-13	1.349e-13	-12.871	-12.870	0.001
	NiCl2	3.129e-14	3.136e-14	-13.505	-13.504	0.001
	CuCl2-	7.457e-15	6.736e-15	-14.127	-14.172	-0.044
	PbCl2	1.125e-15	1.128e-15	-14.949	-14.948	0.001
	UO2Cl+	1.060e-15	9.575e-16	-14.975	-15.019	-0.044
	CuCl2	8.584e-16	8.603e-16	-15.066	-15.065	0.001
	ZnCl3-	1.320e-17	1.193e-17	-16.879	-16.923	-0.044
	CdCl3-	1.165e-17	1.053e-17	-16.934	-16.978	-0.044
	MnCl3-	3.899e-18	3.522e-18	-17.409	-17.453	-0.044
	FeCl+2	2.253e-18	1.501e-18	-17.647	-17.824	-0.177
	CuCl3-2	1.278e-18	8.514e-19	-17.893	-18.070	-0.177
	PbCl3-	7.811e-20	7.057e-20	-19.107	-19.151	-0.044
	UO2Cl2	3.966e-21	3.975e-21	-20.402	-20.401	0.001
	FeCl2+	7.168e-22	6.476e-22	-21.145	-21.189	-0.044
	ZnCl4-2	7.003e-22	4.664e-22	-21.155	-21.331	-0.177
	CuCl3-	2.500e-22	2.259e-22	-21.602	-21.646	-0.044
	PbCl4-2	3.961e-24	2.638e-24	-23.402	-23.579	-0.177
	FeCl3	5.261e-27	5.273e-27	-26.279	-26.278	0.001
	CuCl4-2	1.222e-28	8.135e-29	-27.913	-28.090	-0.177
	UCl+3	0.000e+00	0.000e+00	-42.152	-42.549	-0.397
Cu(1)	3.519e-12					
	Cu+	3.512e-12	3.172e-12	-11.455	-11.499	-0.044
	CuCl2-	7.457e-15	6.736e-15	-14.127	-14.172	-0.044
	CuCl3-2	1.278e-18	8.514e-19	-17.893	-18.070	-0.177
Cu(2)	2.188e-06					
	Cu(OH)2	1.630e-06	1.634e-06	-5.788	-5.787	0.001
	CuCO3	2.748e-07	2.754e-07	-6.561	-6.560	0.001
	Cu+2	1.861e-07	1.240e-07	-6.730	-6.907	-0.177
	CuSO4	3.472e-08	3.480e-08	-7.459	-7.458	0.001
	CuOH+	3.446e-08	3.113e-08	-7.463	-7.507	-0.044
	CuHCO3+	2.708e-08	2.447e-08	-7.567	-7.611	-0.044
	Cu2(OH)2+2	3.727e-10	2.482e-10	-9.429	-9.605	-0.177
	Cu(CO3)2-2	2.154e-10	1.435e-10	-9.667	-9.843	-0.177
	CuF+	1.501e-10	1.356e-10	-9.824	-9.868	-0.044
	CuCl+	2.309e-11	2.086e-11	-10.637	-10.681	-0.044
	Cu(OH)3-	2.737e-12	2.472e-12	-11.563	-11.607	-0.044
	CuCl2	8.584e-16	8.603e-16	-15.066	-15.065	0.001
	Cu(OH)4-2	1.860e-17	1.239e-17	-16.730	-16.907	-0.177
	CuCl3-	2.500e-22	2.259e-22	-21.602	-21.646	-0.044
	CuCl4-2	1.222e-28	8.135e-29	-27.913	-28.090	-0.177
F	7.372e-05					
	F-	6.991e-05	6.316e-05	-4.155	-4.200	-0.044
	MgF+	2.916e-06	2.635e-06	-5.535	-5.579	-0.044
	CaF+	5.258e-07	4.750e-07	-6.279	-6.323	-0.044
	AlF2+	7.798e-08	7.044e-08	-7.108	-7.152	-0.044
	AlF3	5.558e-08	5.570e-08	-7.255	-7.254	0.001
	NaF	1.261e-08	1.264e-08	-7.899	-7.898	0.001
	ZnF+	8.635e-09	7.801e-09	-8.064	-8.108	-0.044
	MnF+	6.444e-09	5.821e-09	-8.191	-8.235	-0.044
	AlF+2	3.437e-09	2.289e-09	-8.464	-8.640	-0.177
	HF	3.424e-09	3.431e-09	-8.466	-8.465	0.001
	AlF4-	1.548e-09	1.399e-09	-8.810	-8.854	-0.044
	NiF+	7.235e-10	6.536e-10	-9.141	-9.185	-0.044
	FeF+	2.098e-10	1.895e-10	-9.678	-9.722	-0.044
	CuF+	1.501e-10	1.356e-10	-9.824	-9.868	-0.044
	CdF+	7.697e-11	6.953e-11	-10.114	-10.158	-0.044
	UO2F+	7.156e-11	6.465e-11	-10.145	-10.189	-0.044
	UO2F2	1.377e-11	1.380e-11	-10.861	-10.860	0.001
	PbF+	3.465e-12	3.130e-12	-11.460	-11.504	-0.044
	HF2-	8.803e-13	7.952e-13	-12.055	-12.100	-0.044
	UO2F3-	1.835e-13	1.657e-13	-12.736	-12.781	-0.044
	FeF2+	1.742e-13	1.574e-13	-12.759	-12.803	-0.044
	FeF+2	1.002e-13	6.674e-14	-12.999	-13.176	-0.177
	FeF3	1.543e-14	1.547e-14	-13.812	-13.811	0.001
	CdF2	1.101e-14	1.103e-14	-13.958	-13.957	0.001
	PbF2	4.027e-15	4.036e-15	-14.395	-14.394	0.001
	UO2F4-2	1.007e-16	6.704e-17	-15.997	-16.174	-0.177
	H2F2	3.697e-17	3.706e-17	-16.432	-16.431	0.001
	PbF3-	2.044e-18	1.847e-18	-17.689	-17.734	-0.044
	PbF4-2	8.383e-23	5.583e-23	-22.077	-22.253	-0.177
	UF3+	6.374e-32	5.758e-32	-31.196	-31.240	-0.044
	UF4	2.969e-32	2.976e-32	-31.527	-31.526	0.001
	UF2+2	5.866e-33	3.906e-33	-32.232	-32.408	-0.177
	UF5-	5.653e-35	5.106e-35	-34.248	-34.292	-0.044
	UF+3	1.884e-35	7.551e-36	-34.725	-35.122	-0.397
	UF6-2	6.246e-37	4.160e-37	-36.204	-36.381	-0.177
Fe(2)	5.374e-07					
	Fe+2	4.505e-07	3.000e-07	-6.346	-6.523	-0.177
	FeSO4	6.884e-08	6.900e-08	-7.162	-7.161	0.001
	FeHCO3+	1.308e-08	1.182e-08	-7.883	-7.927	-0.044
	FeCO3	2.971e-09	2.978e-09	-8.527	-8.526	0.001
	FeOH+	1.763e-09	1.592e-09	-8.754	-8.798	-0.044
	FeF+	2.098e-10	1.895e-10	-9.678	-9.722	-0.044
	FeCl+	3.733e-11	3.372e-11	-10.428	-10.472	-0.044
	Fe(OH)2	2.124e-13	2.129e-13	-12.673	-12.672	0.001
	FeHSO4+	1.970e-14	1.780e-14	-13.706	-13.750	-0.044
	Fe(OH)3-	2.085e-16	1.884e-16	-15.681	-15.725	-0.044

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	1.843e-07	1.665e-07	-6.735	-6.779	-0.044
H+	4.353e-08	3.981e-08	-7.361	-7.400	-0.039
H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	**1.020e-05**				
Al(OH)4-	9.769e-06	8.825e-06	-5.010	-5.054	-0.044
Al(OH)3	1.983e-07	1.988e-07	-6.703	-6.702	0.001
Al(OH)2+	8.907e-08	8.046e-08	-7.050	-7.094	-0.044
AlF2+	7.798e-08	7.044e-08	-7.108	-7.152	-0.044
AlF3	5.558e-08	5.570e-08	-7.255	-7.254	0.001
AlF+2	3.437e-09	2.289e-09	-8.464	-8.640	-0.177
AlF4-	1.548e-09	1.399e-09	-8.810	-8.854	-0.044
AlOH+2	9.894e-10	6.589e-10	-9.005	-9.181	-0.177
AlSO4+	1.744e-11	1.575e-11	-10.758	-10.803	-0.044
Al+3	9.342e-12	3.743e-12	-11.030	-11.427	-0.397
Al(SO4)2-	7.677e-13	6.935e-13	-12.115	-12.159	-0.044
AlHSO4+2	7.998e-20	5.326e-20	-19.097	-19.274	-0.177
As(3)	**4.776e-23**				
H3AsO3	4.712e-23	4.723e-23	-22.327	-22.326	0.001
H2AsO3-	6.358e-25	5.744e-25	-24.197	-24.241	-0.044
HAsO3-2	1.356e-29	9.034e-30	-28.868	-29.044	-0.177
H4AsO3+	1.031e-30	9.316e-31	-29.987	-30.031	-0.044
AsO3-3	1.815e-35	7.271e-36	-34.741	-35.138	-0.397
As(5)	**6.543e-07**				
HAsO4-2	5.582e-07	3.717e-07	-6.253	-6.430	-0.177
H2AsO4-	9.607e-08	8.678e-08	-7.017	-7.062	-0.044
AsO4-3	5.173e-11	2.073e-11	-10.286	-10.683	-0.397
H3AsO4	5.728e-13	5.741e-13	-12.242	-12.241	0.001
Ba	**1.318e-06**				
Ba+2	8.921e-07	5.942e-07	-6.050	-6.226	-0.177
BaSO4	4.241e-07	4.250e-07	-6.373	-6.372	0.001
BaHCO3+	2.102e-09	1.898e-09	-8.677	-8.722	-0.044
BaCO3	1.139e-10	1.142e-10	-9.943	-9.942	0.001
BaOH+	5.597e-13	5.057e-13	-12.252	-12.296	-0.044
C(4)	**4.871e-04**				
HCO3-	4.345e-04	3.939e-04	-3.362	-3.405	-0.043
CO2	3.787e-05	3.796e-05	-4.422	-4.421	0.001
CaHCO3+	4.974e-06	4.493e-06	-5.303	-5.347	-0.044
MgHCO3+	3.479e-06	3.143e-06	-5.459	-5.503	-0.044
NiCO3	1.587e-06	1.591e-06	-5.799	-5.798	0.001
ZnCO3	7.708e-07	7.725e-07	-6.113	-6.112	0.001
CaCO3	6.154e-07	6.168e-07	-6.211	-6.210	0.001
CO3-2	6.130e-07	4.138e-07	-6.213	-6.383	-0.171
MnHCO3+	5.177e-07	4.676e-07	-6.286	-6.330	-0.044
ZnHCO3+	5.136e-07	4.640e-07	-6.289	-6.334	-0.044
MnCO3	4.369e-07	4.379e-07	-6.360	-6.359	0.001
CuCO3	2.748e-07	2.754e-07	-6.561	-6.560	0.001
MgCO3	2.528e-07	2.534e-07	-6.597	-6.596	0.001
UO2(CO3)2-2	1.893e-07	1.260e-07	-6.723	-6.899	-0.177
NaHCO3	7.685e-08	7.702e-08	-7.114	-7.113	0.001
NiHCO3+	3.122e-08	2.820e-08	-7.506	-7.550	-0.044
CuHCO3+	2.708e-08	2.447e-08	-7.567	-7.611	-0.044
PbCO3	2.000e-08	2.004e-08	-7.699	-7.698	0.001
UO2(CO3)3-4	1.711e-08	3.365e-09	-7.767	-8.473	-0.706
UO2CO3	1.430e-08	1.434e-08	-7.845	-7.844	0.001
FeHCO3+	1.308e-08	1.182e-08	-7.883	-7.927	-0.044
Zn(CO3)2-2	1.026e-08	6.834e-09	-7.989	-8.165	-0.177
FeCO3	2.971e-09	2.978e-09	-8.527	-8.526	0.001
NaCO3-	2.259e-09	2.041e-09	-8.646	-8.690	-0.044
BaHCO3+	2.102e-09	1.898e-09	-8.677	-8.722	-0.044
Ni(CO3)2-2	1.718e-09	1.144e-09	-8.765	-8.942	-0.177
CdHCO3+	1.206e-09	1.089e-09	-8.919	-8.963	-0.044
PbHCO3+	9.652e-10	8.719e-10	-9.015	-9.060	-0.044
Cu(CO3)2-2	2.154e-10	1.435e-10	-9.667	-9.843	-0.177
BaCO3	1.139e-10	1.142e-10	-9.943	-9.942	0.001
Pb(CO3)2-2	3.128e-11	2.083e-11	-10.505	-10.681	-0.177
CdCO3	2.868e-11	2.874e-11	-10.542	-10.541	0.001
Cd(CO3)2-2	5.648e-14	3.761e-14	-13.248	-13.425	-0.177
(UO2)3(CO3)6-6	1.165e-16	3.002e-18	-15.934	-17.523	-1.589
UO2(CO3)3-5	3.227e-28	2.544e-29	-27.491	-28.594	-1.103
U(CO3)4-4	2.068e-38	4.069e-39	-37.684	-38.390	-0.706
U(CO3)5-6	0.000e+00	0.000e+00	-42.350	-43.939	-1.589
Ca	**1.722e-03**				
Ca+2	1.452e-03	9.792e-04	-2.838	-3.009	-0.171
CaSO4	2.646e-04	2.652e-04	-3.577	-3.576	0.001
CaHCO3+	4.974e-06	4.493e-06	-5.303	-5.347	-0.044
CaCO3	6.154e-07	6.168e-07	-6.211	-6.210	0.001
CaF+	5.258e-07	4.750e-07	-6.279	-6.323	-0.044
CaOH+	4.518e-09	4.082e-09	-8.345	-8.389	-0.044
CaHSO4+	6.430e-11	5.809e-11	-10.192	-10.236	-0.044
Cd	**1.691e-07**				
Cd+2	1.313e-07	8.745e-08	-6.882	-7.058	-0.177
CdSO4	3.475e-08	3.483e-08	-7.459	-7.458	0.001
CdHCO3+	1.206e-09	1.089e-09	-8.919	-8.963	-0.044
Cd(SO4)2-2	8.460e-10	5.634e-10	-9.073	-9.249	-0.177
CdCl+	7.393e-10	6.679e-10	-9.131	-9.175	-0.044
CdOH+	1.355e-10	1.224e-10	-9.868	-9.912	-0.044
CdF+	7.697e-11	6.953e-11	-10.114	-10.158	-0.044
CdCO3	2.868e-11	2.874e-11	-10.542	-10.541	0.001
CdOHCl	6.162e-12	6.176e-12	-11.210	-11.209	0.001
CdNO3+	4.154e-12	3.753e-12	-11.382	-11.426	-0.044
Cd(OH)2	2.459e-13	2.464e-13	-12.609	-12.608	0.001
CdCl2	2.217e-13	2.222e-13	-12.654	-12.653	0.001
Cd(CO3)2-2	5.648e-14	3.761e-14	-13.248	-13.425	-0.177
CdF2	1.101e-14	1.103e-14	-13.958	-13.957	0.001
Cd2OH+3	1.400e-16	5.609e-17	-15.854	-16.251	-0.397
CdCl3-	1.165e-17	1.053e-17	-16.934	-16.978	-0.044
Cd(OH)3-	7.687e-19	6.944e-19	-18.114	-18.158	-0.044
Cd(OH)4-2	2.334e-25	1.554e-25	-24.632	-24.808	-0.177
Cl	**9.030e-05**				
Cl-	9.029e-05	8.142e-05	-4.044	-4.089	-0.045
MnCl+	4.892e-09	4.419e-09	-8.311	-8.355	-0.044
ZnCl+	1.789e-09	1.616e-09	-8.747	-8.791	-0.044
CdCl+	7.393e-10	6.679e-10	-9.131	-9.175	-0.044
ZnOHCl	6.322e-10	6.336e-10	-9.199	-9.198	0.001
NiCl+	1.174e-10	1.061e-10	-9.930	-9.974	-0.044
FeCl+	3.733e-11	3.372e-11	-10.428	-10.472	-0.044
CuCl+	2.309e-11	2.086e-11	-10.637	-10.681	-0.044
PbCl+	8.748e-12	7.903e-12	-11.058	-11.102	-0.044
CdOHCl	6.162e-12	6.176e-12	-11.210	-11.209	0.001
CdCl2	2.217e-13	2.222e-13	-12.654	-12.653	0.001
MnCl2	1.567e-13	1.571e-13	-12.805	-12.804	0.001
ZnCl2	1.346e-13	1.349e-13	-12.871	-12.870	0.001
NiCl2	3.129e-14	3.136e-14	-13.505	-13.504	0.001
CuCl2-	7.457e-15	6.736e-15	-14.127	-14.172	-0.044
PbCl2	1.125e-15	1.128e-15	-14.949	-14.948	0.001
UO2Cl+	1.060e-15	9.575e-16	-14.975	-15.019	-0.044
CuCl2	8.584e-16	8.603e-16	-15.066	-15.065	0.001
ZnCl3-	1.320e-17	1.193e-17	-16.879	-16.923	-0.044
CdCl3-	1.165e-17	1.053e-17	-16.934	-16.978	-0.044
MnCl3-	3.899e-18	3.522e-18	-17.409	-17.453	-0.044
FeCl+2	2.253e-18	1.501e-18	-17.647	-17.824	-0.177
CuCl3-2	1.278e-18	8.514e-19	-17.893	-18.070	-0.177
PbCl3-	7.811e-20	7.057e-20	-19.107	-19.151	-0.044
UO2Cl2	3.966e-21	3.975e-21	-20.402	-20.401	0.001
FeCl2+	7.168e-22	6.476e-22	-21.145	-21.189	-0.044
ZnCl4-2	7.003e-22	4.664e-22	-21.155	-21.331	-0.177
CuCl3-	2.500e-22	2.259e-22	-21.602	-21.646	-0.044
PbCl4-2	3.961e-24	2.638e-24	-23.402	-23.579	-0.177
FeCl3	5.261e-27	5.273e-27	-26.279	-26.278	0.001
CuCl4-2	1.222e-28	8.135e-29	-27.913	-28.090	-0.177
UCl+3	0.000e+00	0.000e+00	-47.669	-48.067	-0.397
Cu(1)	**3.519e-12**				
Cu+	3.512e-12	3.172e-12	-11.455	-11.499	-0.044
CuCl2-	7.457e-15	6.736e-15	-14.127	-14.172	-0.044
CuCl3-2	1.278e-18	8.514e-19	-17.893	-18.070	-0.177
Cu(2)	**2.188e-06**				
Cu(OH)2	1.630e-06	1.634e-06	-5.788	-5.787	0.001
CuCO3	2.748e-07	2.754e-07	-6.561	-6.560	0.001
Cu+2	1.861e-07	1.240e-07	-6.730	-6.907	-0.177
CuSO4	3.472e-08	3.480e-08	-7.459	-7.458	0.001
CuOH+	3.446e-08	3.113e-08	-7.463	-7.507	-0.044
CuHCO3+	2.708e-08	2.447e-08	-7.567	-7.611	-0.044
Cu2(OH)2+2	3.727e-10	2.482e-10	-9.429	-9.605	-0.177
Cu(CO3)2-2	2.154e-10	1.435e-10	-9.667	-9.843	-0.177
CuF+	1.501e-10	1.356e-10	-9.824	-9.868	-0.044
CuCl+	2.309e-11	2.086e-11	-10.637	-10.681	-0.044
Cu(OH)3-	2.737e-12	2.472e-12	-11.563	-11.607	-0.044
CuCl2	8.584e-16	8.603e-16	-15.066	-15.065	0.001
Cu(OH)4-2	1.860e-17	1.239e-17	-16.730	-16.907	-0.177
CuCl3-	2.500e-22	2.259e-22	-21.602	-21.646	-0.044
CuCl4-2	1.222e-28	8.135e-29	-27.913	-28.090	-0.177
F	**7.372e-05**				
F-	6.991e-05	6.316e-05	-4.155	-4.200	-0.044
MgF+	2.916e-06	2.635e-06	-5.535	-5.579	-0.044
CaF+	5.258e-07	4.750e-07	-6.279	-6.323	-0.044
AlF2+	7.798e-08	7.044e-08	-7.108	-7.152	-0.044
AlF3	5.558e-08	5.570e-08	-7.255	-7.254	0.001
NaF	1.261e-08	1.264e-08	-7.899	-7.898	0.001
ZnF+	8.635e-09	7.801e-09	-8.064	-8.108	-0.044
MnF+	6.444e-09	5.821e-09	-8.191	-8.235	-0.044
AlF+2	3.437e-09	2.289e-09	-8.464	-8.640	-0.177
HF	3.424e-09	3.431e-09	-8.466	-8.465	0.001
AlF4-	1.548e-09	1.399e-09	-8.810	-8.854	-0.044
NiF+	7.235e-10	6.536e-10	-9.141	-9.185	-0.044
FeF+	2.098e-10	1.895e-10	-9.678	-9.722	-0.044
CuF+	1.501e-10	1.356e-10	-9.824	-9.868	-0.044
CdF+	7.697e-11	6.953e-11	-10.114	-10.158	-0.044
UO2F+	7.156e-11	6.465e-11	-10.145	-10.189	-0.044
UO2F2	1.377e-11	1.380e-11	-10.861	-10.860	0.001
PbF+	3.465e-12	3.130e-12	-11.460	-11.504	-0.044
HF2-	8.803e-13	7.952e-13	-12.055	-12.100	-0.044
UO2F3-	1.835e-13	1.657e-13	-12.736	-12.781	-0.044
FeF2+	1.742e-13	1.574e-13	-12.759	-12.803	-0.044
FeF+2	1.002e-13	6.674e-14	-12.999	-13.176	-0.177
FeF3	1.543e-14	1.547e-14	-13.812	-13.811	0.001
CdF2	1.101e-14	1.103e-14	-13.958	-13.957	0.001
PbF2	4.027e-15	4.036e-15	-14.395	-14.394	0.001
UO2F4-2	1.007e-16	6.704e-17	-15.997	-16.174	-0.177
H2F2	3.697e-17	3.706e-17	-16.432	-16.431	0.001
PbF3-	2.044e-18	1.847e-18	-17.689	-17.734	-0.044
PbF4-2	8.383e-23	5.583e-23	-22.077	-22.253	-0.177
UF3+	1.934e-37	1.747e-37	-36.714	-36.758	-0.044
UF4	9.009e-38	9.029e-38	-37.045	-37.044	0.001
UF2+2	1.780e-38	1.185e-38	-37.750	-37.926	-0.177
UF5-	1.715e-40	1.550e-40	-39.766	-39.810	-0.044
UF+3	0.000e+00	0.000e+00	-40.243	-40.640	-0.397
UF6-2	0.000e+00	0.000e+00	-41.722	-41.899	-0.177
Fe(2)	**5.374e-07**				
Fe+2	4.505e-07	3.000e-07	-6.346	-6.523	-0.177
FeSO4	6.884e-08	6.900e-08	-7.162	-7.161	0.001
FeHCO3+	1.308e-08	1.182e-08	-7.883	-7.927	-0.044
FeCO3	2.971e-09	2.978e-09	-8.527	-8.526	0.001
FeOH+	1.763e-09	1.592e-09	-8.754	-8.798	-0.044
FeF+	2.098e-10	1.895e-10	-9.678	-9.722	-0.044
FeCl+	3.733e-11	3.372e-11	-10.428	-10.472	-0.044
Fe(OH)2	2.124e-13	2.129e-13	-12.673	-12.672	0.001
FeHSO4+	1.970e-14	1.780e-14	-13.706	-13.750	-0.044
Fe(OH)3-	2.085e-16	1.884e-16	-15.681	-15.725	-0.044

----------Distribution of species----------

	Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
	OH-	1.843e-07	1.665e-07	-6.735	-6.779	-0.044
	H+	4.353e-08	3.981e-08	-7.361	-7.400	-0.039
	H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	1.020e-05					
	Al(OH)4-	9.769e-06	8.825e-06	-5.010	-5.054	-0.044
	Al(OH)3	1.983e-07	1.988e-07	-6.703	-6.702	0.001
	Al(OH)2+	8.907e-08	8.046e-08	-7.050	-7.094	-0.044
	AlF2+	7.798e-08	7.044e-08	-7.108	-7.152	-0.044
	AlF3	5.558e-08	5.570e-08	-7.255	-7.254	0.001
	AlF+2	3.437e-09	2.289e-09	-8.464	-8.640	-0.177
	AlF4-	1.548e-09	1.399e-09	-8.810	-8.854	-0.044
	AlOH+2	9.894e-10	6.589e-10	-9.005	-9.181	-0.177
	AlSO4+	1.744e-11	1.575e-11	-10.758	-10.803	-0.044
	Al+3	9.342e-12	3.743e-12	-11.030	-11.427	-0.397
	Al(SO4)2-	7.677e-13	6.935e-13	-12.115	-12.159	-0.044
	AlHSO4+2	7.998e-20	5.326e-20	-19.097	-19.274	-0.177
As(3)	4.776e-23					
	H3AsO3	4.713e-23	4.723e-23	-22.327	-22.326	0.001
	H2AsO3-	6.358e-25	5.744e-25	-24.197	-24.241	-0.044
	HAsO3-2	1.356e-29	9.034e-30	-28.868	-29.044	-0.177
	H4AsO3+	1.031e-30	9.316e-31	-29.987	-30.031	-0.044
	AsO3-3	1.815e-35	7.271e-36	-34.741	-35.138	-0.397
As(5)	6.543e-07					
	HAsO4-2	5.582e-07	3.717e-07	-6.253	-6.430	-0.177
	H2AsO4-	9.607e-08	8.679e-08	-7.017	-7.062	-0.044
	AsO4-3	5.173e-11	2.073e-11	-10.286	-10.683	-0.397
	H3AsO4	5.729e-13	5.742e-13	-12.242	-12.241	0.001
Ba	1.318e-06					
	Ba+2	8.921e-07	5.942e-07	-6.050	-6.226	-0.177
	BaSO4	4.241e-07	4.251e-07	-6.373	-6.372	0.001
	BaHCO3+	2.100e-09	1.897e-09	-8.678	-8.722	-0.044
	BaCO3	1.138e-10	1.141e-10	-9.944	-9.943	0.001
	BaOH+	5.597e-13	5.057e-13	-12.252	-12.296	-0.044
C(4)	4.867e-04					
	HCO3-	4.342e-04	3.935e-04	-3.362	-3.405	-0.043
	CO2	3.784e-05	3.792e-05	-4.422	-4.421	0.001
	CaHCO3+	4.970e-06	4.490e-06	-5.304	-5.348	-0.044
	MgHCO3+	3.476e-06	3.140e-06	-5.459	-5.503	-0.044
	NiCO3	1.587e-06	1.591e-06	-5.799	-5.798	0.001
	ZnCO3	7.702e-07	7.720e-07	-6.113	-6.112	0.001
	CaCO3	6.149e-07	6.163e-07	-6.211	-6.210	0.001
	CO3-2	6.125e-07	4.135e-07	-6.213	-6.384	-0.171
	MnHCO3+	5.173e-07	4.673e-07	-6.286	-6.330	-0.044
	ZnHCO3+	5.132e-07	4.636e-07	-6.290	-6.334	-0.044
	MnCO3	4.365e-07	4.375e-07	-6.360	-6.359	0.001
	CuCO3	2.746e-07	2.753e-07	-6.561	-6.560	0.001
	MgCO3	2.526e-07	2.532e-07	-6.598	-6.597	0.001
	UO2(CO3)2-2	1.892e-07	1.260e-07	-6.723	-6.900	-0.177
	NaHCO3	7.679e-08	7.696e-08	-7.115	-7.114	0.001
	NiHCO3+	3.121e-08	2.819e-08	-7.506	-7.550	-0.044
	CuHCO3+	2.707e-08	2.445e-08	-7.568	-7.612	-0.044
	PbCO3	1.999e-08	2.004e-08	-7.699	-7.698	0.001
	UO2(CO3)3-4	1.709e-08	3.363e-09	-7.767	-8.473	-0.706
	UO2CO3	1.431e-08	1.435e-08	-7.844	-7.843	0.001
	Zn(CO3)2-2	1.025e-08	6.824e-09	-7.989	-8.166	-0.177
	NaCO3-	2.258e-09	2.040e-09	-8.646	-8.690	-0.044
	BaHCO3+	2.100e-09	1.897e-09	-8.678	-8.722	-0.044
	Ni(CO3)2-2	1.716e-09	1.143e-09	-8.765	-8.942	-0.177
	CdHCO3+	1.205e-09	1.088e-09	-8.919	-8.963	-0.044
	PbHCO3+	9.650e-10	8.717e-10	-9.015	-9.060	-0.044
	Cu(CO3)2-2	2.151e-10	1.433e-10	-9.667	-9.844	-0.177
	BaCO3	1.138e-10	1.141e-10	-9.944	-9.943	0.001
	Pb(CO3)2-2	3.124e-11	2.081e-11	-10.505	-10.682	-0.177
	CdCO3	2.866e-11	2.872e-11	-10.543	-10.542	0.001
	FeHCO3+	2.845e-11	2.570e-11	-10.546	-10.590	-0.044
	FeCO3	6.462e-12	6.477e-12	-11.190	-11.189	0.001
	Cd(CO3)2-2	5.639e-14	3.755e-14	-13.249	-13.425	-0.177
	(UO2)3(CO3)6-6	1.164e-16	3.002e-18	-15.934	-17.523	-1.589
	UO2(CO3)3-5	3.224e-28	2.542e-29	-27.492	-28.595	-1.103
	U(CO3)4-4	2.065e-38	4.063e-39	-37.685	-38.391	-0.706
	U(CO3)5-6	0.000e+00	0.000e+00	-42.351	-43.940	-1.589
Ca	1.722e-03					
	Ca+2	1.452e-03	9.793e-04	-2.838	-3.009	-0.171
	CaSO4	2.646e-04	2.652e-04	-3.577	-3.576	0.001
	CaHCO3+	4.970e-06	4.490e-06	-5.304	-5.348	-0.044
	CaCO3	6.149e-07	6.163e-07	-6.211	-6.210	0.001
	CaF+	5.258e-07	4.750e-07	-6.279	-6.323	-0.044
	CaOH+	4.518e-09	4.082e-09	-8.345	-8.389	-0.044
	CaHSO4+	6.430e-11	5.809e-11	-10.192	-10.236	-0.044
Cd	1.691e-07					
	Cd+2	1.313e-07	8.745e-08	-6.882	-7.058	-0.177
	CdSO4	3.475e-08	3.483e-08	-7.459	-7.458	0.001
	CdHCO3+	1.205e-09	1.088e-09	-8.919	-8.963	-0.044
	Cd(SO4)2-2	8.460e-10	5.635e-10	-9.073	-9.249	-0.177
	CdCl+	7.393e-10	6.679e-10	-9.131	-9.175	-0.044
	CdOH+	1.355e-10	1.224e-10	-9.868	-9.912	-0.044
	CdF+	7.697e-11	6.954e-11	-10.114	-10.158	-0.044
	CdCO3	2.866e-11	2.872e-11	-10.543	-10.542	0.001
	CdOHCl	6.162e-12	6.176e-12	-11.210	-11.209	0.001
	CdNO3+	4.154e-12	3.753e-12	-11.382	-11.426	-0.044
	Cd(OH)2	2.459e-13	2.464e-13	-12.609	-12.608	0.001
	CdCl2	2.217e-13	2.222e-13	-12.654	-12.653	0.001
	Cd(CO3)2-2	5.639e-14	3.755e-14	-13.249	-13.425	-0.177
	CdF2	1.101e-14	1.103e-14	-13.958	-13.957	0.001
	Cd2OH+3	1.400e-16	5.609e-17	-15.854	-16.251	-0.397
	CdCl3-	1.165e-17	1.053e-17	-16.934	-16.978	-0.044
	Cd(OH)3-	7.687e-19	6.944e-19	-18.114	-18.158	-0.044
	Cd(OH)4-2	2.334e-25	1.554e-25	-24.632	-24.808	-0.177
Cl	9.030e-05					
	Cl-	9.029e-05	8.142e-05	-4.044	-4.089	-0.045
	MnCl+	4.892e-09	4.419e-09	-8.311	-8.355	-0.044
	ZnCl+	1.789e-09	1.617e-09	-8.747	-8.791	-0.044
	CdCl+	7.393e-10	6.679e-10	-9.131	-9.175	-0.044
	ZnOHCl	6.322e-10	6.337e-10	-9.199	-9.198	0.001
	NiCl+	1.175e-10	1.061e-10	-9.930	-9.974	-0.044
	CuCl+	2.309e-11	2.086e-11	-10.637	-10.681	-0.044
	PbCl+	8.753e-12	7.907e-12	-11.058	-11.102	-0.044
	CdOHCl	6.162e-12	6.176e-12	-11.210	-11.209	0.001
	CdCl2	2.217e-13	2.222e-13	-12.654	-12.653	0.001
	MnCl2	1.567e-13	1.571e-13	-12.805	-12.804	0.001
	ZnCl2	1.346e-13	1.349e-13	-12.871	-12.870	0.001
	FeCl+	8.125e-14	7.340e-14	-13.090	-13.134	-0.044
	NiCl2	3.131e-14	3.138e-14	-13.504	-13.503	0.001
	CuCl2-	7.458e-15	6.737e-15	-14.127	-14.172	-0.044
	PbCl2	1.126e-15	1.129e-15	-14.948	-14.947	0.001
	UO2Cl+	1.062e-15	9.590e-16	-14.974	-15.018	-0.044
	CuCl2	8.585e-16	8.604e-16	-15.066	-15.065	0.001
	ZnCl3-	1.320e-17	1.193e-17	-16.879	-16.923	-0.044
	CdCl3-	1.165e-17	1.053e-17	-16.934	-16.978	-0.044
	MnCl3-	3.899e-18	3.522e-18	-17.409	-17.453	-0.044
	FeCl+2	2.815e-18	1.875e-18	-17.550	-17.727	-0.177
	CuCl3-2	1.279e-18	8.516e-19	-17.893	-18.070	-0.177
	PbCl3-	7.816e-20	7.061e-20	-19.107	-19.151	-0.044
	UO2Cl2	3.972e-21	3.981e-21	-20.401	-20.400	0.001
	FeCl2+	8.957e-22	8.091e-22	-21.048	-21.092	-0.044
	ZnCl4-2	7.003e-22	4.664e-22	-21.155	-21.331	-0.177
	CuCl3-	2.501e-22	2.259e-22	-21.602	-21.646	-0.044
	PbCl4-2	3.964e-24	2.640e-24	-23.402	-23.578	-0.177
	FeCl3	6.573e-27	6.588e-27	-26.182	-26.181	0.001
	CuCl4-2	1.222e-28	8.136e-29	-27.913	-28.090	-0.177
	UCl+3	0.000e+00	0.000e+00	-47.669	-48.066	-0.397
Cu(1)	3.519e-12					
	Cu+	3.512e-12	3.173e-12	-11.454	-11.499	-0.044
	CuCl2-	7.458e-15	6.737e-15	-14.127	-14.172	-0.044
	CuCl3-2	1.279e-18	8.516e-19	-17.893	-18.070	-0.177
Cu(2)	2.188e-06					
	Cu(OH)2	1.630e-06	1.634e-06	-5.788	-5.787	0.001
	CuCO3	2.746e-07	2.753e-07	-6.561	-6.560	0.001
	Cu+2	1.861e-07	1.240e-07	-6.730	-6.907	-0.177
	CuSO4	3.473e-08	3.481e-08	-7.459	-7.458	0.001
	CuOH+	3.447e-08	3.114e-08	-7.463	-7.507	-0.044
	CuHCO3+	2.707e-08	2.445e-08	-7.568	-7.612	-0.044
	Cu2(OH)2+2	3.727e-10	2.483e-10	-9.429	-9.605	-0.177
	Cu(CO3)2-2	2.151e-10	1.433e-10	-9.667	-9.844	-0.177
	CuF+	1.501e-10	1.356e-10	-9.824	-9.868	-0.044
	CuCl+	2.309e-11	2.086e-11	-10.637	-10.681	-0.044
	Cu(OH)3-	2.737e-12	2.473e-12	-11.563	-11.607	-0.044
	CuCl2	8.585e-16	8.604e-16	-15.066	-15.065	0.001
	Cu(OH)4-2	1.861e-17	1.239e-17	-16.730	-16.907	-0.177
	CuCl3-	2.501e-22	2.259e-22	-21.602	-21.646	-0.044
	CuCl4-2	1.222e-28	8.136e-29	-27.913	-28.090	-0.177
F	7.372e-05					
	F-	6.991e-05	6.316e-05	-4.155	-4.200	-0.044
	MgF+	2.916e-06	2.635e-06	-5.535	-5.579	-0.044
	CaF+	5.258e-07	4.750e-07	-6.279	-6.323	-0.044
	AlF2+	7.798e-08	7.044e-08	-7.108	-7.152	-0.044
	AlF3	5.558e-08	5.570e-08	-7.255	-7.254	0.001
	NaF	1.261e-08	1.264e-08	-7.899	-7.898	0.001
	ZnF+	8.635e-09	7.801e-09	-8.064	-8.108	-0.044
	MnF+	6.444e-09	5.821e-09	-8.191	-8.235	-0.044
	AlF+2	3.437e-09	2.289e-09	-8.464	-8.640	-0.177
	HF	3.424e-09	3.431e-09	-8.466	-8.465	0.001
	AlF4-	1.548e-09	1.399e-09	-8.810	-8.854	-0.044
	NiF+	7.239e-10	6.540e-10	-9.140	-9.184	-0.044
	CuF+	1.501e-10	1.356e-10	-9.824	-9.868	-0.044
	CdF+	7.697e-11	6.954e-11	-10.114	-10.158	-0.044
	UO2F+	7.168e-11	6.475e-11	-10.145	-10.189	-0.044
	UO2F2	1.379e-11	1.382e-11	-10.861	-10.860	0.001
	PbF+	3.467e-12	3.132e-12	-11.460	-11.504	-0.044
	HF2-	8.803e-13	7.952e-13	-12.055	-12.099	-0.044
	FeF+	4.566e-13	4.124e-13	-12.341	-12.385	-0.044
	FeF2+	2.177e-13	1.967e-13	-12.662	-12.706	-0.044
	UO2F3-	1.838e-13	1.660e-13	-12.736	-12.780	-0.044
	FeF+2	1.252e-13	8.339e-14	-12.902	-13.079	-0.177
	FeF3	1.928e-14	1.933e-14	-13.715	-13.714	0.001
	CdF2	1.101e-14	1.103e-14	-13.958	-13.957	0.001
	PbF2	4.030e-15	4.039e-15	-14.395	-14.394	0.001
	UO2F4-2	1.008e-16	6.715e-17	-15.996	-16.173	-0.177
	H2F2	3.697e-17	3.706e-17	-16.432	-16.431	0.001
	PbF3-	2.046e-18	1.848e-18	-17.689	-17.733	-0.044
	PbF4-2	8.388e-23	5.586e-23	-22.076	-22.253	-0.177
	UF3+	1.937e-37	1.750e-37	-36.713	-36.757	-0.044
	UF4	9.023e-38	9.044e-38	-37.045	-37.044	0.001
	UF2+2	1.783e-38	1.187e-38	-37.749	-37.925	-0.177
	UF5-	1.718e-40	1.552e-40	-39.765	-39.809	-0.044
	UF+3	0.000e+00	0.000e+00	-40.242	-40.639	-0.397
	UF6-2	0.000e+00	0.000e+00	-41.722	-41.898	-0.177
Fe(2)	1.170e-09					
	Fe+2	9.805e-10	6.530e-10	-9.009	-9.185	-0.177
	FeSO4	1.498e-10	1.502e-10	-9.824	-9.823	0.001
	FeHCO3+	2.845e-11	2.570e-11	-10.546	-10.590	-0.044
	FeCO3	6.462e-12	6.477e-12	-11.190	-11.189	0.001
	FeOH+	3.836e-12	3.466e-12	-11.416	-11.460	-0.044
	FeF+	4.566e-13	4.124e-13	-12.341	-12.385	-0.044
	FeCl+	8.125e-14	7.340e-14	-13.090	-13.134	-0.044
	Fe(OH)2	4.623e-16	4.633e-16	-15.335	-15.334	0.001
	FeHSO4+	4.288e-17	3.874e-17	-16.368	-16.412	-0.044
	Fe(OH)3-	4.539e-19	4.101e-19	-18.343	-18.387	-0.044

Fe(3)	2.150e-06					
	Fe(OH)3	1.478e-06	1.481e-06	-5.830	-5.829	0.001
	Fe(OH)2+	6.412e-07	5.792e-07	-6.193	-6.237	-0.044
	Fe(OH)4-	3.024e-08	2.732e-08	-7.519	-7.564	-0.044
	FeOH+2	1.283e-10	8.546e-11	-9.892	-10.068	-0.177
	FeF2+	1.742e-13	1.574e-13	-12.759	-12.803	-0.044
	FeF+2	1.002e-13	6.674e-14	-12.999	-13.176	-0.177
	FeF3	1.543e-14	1.547e-14	-13.812	-13.811	0.001
	FeSO4+	1.113e-14	1.006e-14	-13.953	-13.998	-0.044
	Fe+3	1.807e-15	7.241e-16	-14.743	-15.140	-0.397
	Fe(SO4)2-	3.404e-16	3.075e-16	-15.468	-15.512	-0.044
	FeCl+2	2.253e-18	1.501e-18	-17.647	-17.824	-0.177
	Fe2(OH)2+4	1.249e-18	2.457e-19	-17.903	-18.610	-0.706
	FeHSO4+2	1.620e-21	1.079e-21	-20.790	-20.967	-0.177
	FeCl2+	7.168e-22	6.476e-22	-21.145	-21.189	-0.044
	Fe3(OH)4+5	6.206e-22	4.892e-23	-21.207	-22.310	-1.103
	FeCl3	5.261e-27	5.273e-27	-26.279	-26.278	0.001
H(0)	5.965e-33					
	H2	2.983e-33	2.989e-33	-32.525	-32.524	0.001
K	1.586e-04					
	K+	1.571e-04	1.417e-04	-3.804	-3.849	-0.045
	KSO4-	1.480e-06	1.337e-06	-5.830	-5.874	-0.044
Mg	1.234e-03					
	Mg+2	1.026e-03	6.962e-04	-2.989	-3.157	-0.168
	MgSO4	2.023e-04	2.027e-04	-3.694	-3.693	0.001
	MgHCO3+	3.479e-06	3.143e-06	-5.459	-5.503	-0.044
	MgF+	2.916e-06	2.635e-06	-5.535	-5.579	-0.044
	MgCO3	2.528e-07	2.534e-07	-6.597	-6.596	0.001
	MgOH+	4.317e-08	3.900e-08	-7.365	-7.409	-0.044
Mn(2)	2.402e-05					
	Mn+2	2.000e-05	1.332e-05	-4.699	-4.875	-0.177
	MnSO4	3.044e-06	3.051e-06	-5.517	-5.516	0.001
	MnHCO3+	5.177e-07	4.676e-07	-6.286	-6.330	-0.044
	MnCO3	4.369e-07	4.379e-07	-6.360	-6.359	0.001
	MnF+	6.444e-09	5.821e-09	-8.191	-8.235	-0.044
	MnOH+	6.132e-09	5.540e-09	-8.212	-8.257	-0.044
	MnCl+	4.892e-09	4.419e-09	-8.311	-8.355	-0.044
	MnCl2	1.567e-13	1.571e-13	-12.805	-12.804	0.001
	Mn(NO3)2	1.138e-14	1.140e-14	-13.944	-13.943	0.001
	MnCl3-	3.899e-18	3.522e-18	-17.409	-17.453	-0.044
	Mn(OH)3-	3.703e-18	3.345e-18	-17.431	-17.476	-0.044
Mn(3)	9.110e-24					
	Mn+3	9.110e-24	3.650e-24	-23.040	-23.438	-0.397
Mn(6)	1.701e-37					
	MnO4-2	1.701e-37	1.133e-37	-36.769	-36.946	-0.177
Mn(7)	4.483e-40					
	MnO4-	4.483e-40	4.050e-40	-39.348	-39.393	-0.044
N(5)	1.613e-05					
	NO3-	1.613e-05	1.457e-05	-4.792	-4.836	-0.044
	CdNO3+	4.154e-12	3.753e-12	-11.382	-11.426	-0.044
	PbNO3+	6.651e-13	6.008e-13	-12.177	-12.221	-0.044
	Mn(NO3)2	1.138e-14	1.140e-14	-13.944	-13.943	0.001
	UO2NO3+	2.712e-16	2.450e-16	-15.567	-15.611	-0.044
	UNO3+3	0.000e+00	0.000e+00	-43.209	-43.606	-0.397
	U(NO3)2+2	0.000e+00	0.000e+00	-47.436	-47.612	-0.177
Na	3.873e-04					
	Na+	3.845e-04	3.478e-04	-3.415	-3.459	-0.044
	NaSO4-	2.661e-06	2.404e-06	-5.575	-5.619	-0.044
	NaHCO3	7.685e-08	7.702e-08	-7.114	-7.113	0.001
	NaF	1.261e-08	1.264e-08	-7.899	-7.898	0.001
	NaCO3-	2.259e-09	2.041e-09	-8.646	-8.690	-0.044
Ni	2.539e-06					
	NiCO3	1.587e-06	1.591e-06	-5.799	-5.798	0.001
	Ni+2	7.788e-07	5.187e-07	-6.109	-6.285	-0.177
	NiSO4	1.375e-07	1.378e-07	-6.862	-6.861	0.001
	NiHCO3+	3.122e-08	2.820e-08	-7.506	-7.550	-0.044
	Ni(CO3)2-2	1.718e-09	1.144e-09	-8.765	-8.942	-0.177
	NiOH+	1.362e-09	1.231e-09	-8.866	-8.910	-0.044
	NiF+	7.235e-10	6.536e-10	-9.141	-9.185	-0.044
	NiCl+	1.174e-10	1.061e-10	-9.930	-9.974	-0.044
	Ni(OH)2	3.265e-11	3.272e-11	-10.486	-10.485	0.001
	Ni(SO4)2-2	1.661e-11	1.107e-11	-10.780	-10.956	-0.177
	NiCl2	3.129e-14	3.136e-14	-13.505	-13.504	0.001
	Ni(OH)3-	9.097e-15	8.218e-15	-14.041	-14.085	-0.044
O(0)	1.556e-29					
	O2	7.778e-30	7.795e-30	-29.109	-29.108	0.001
Pb	2.897e-08					
	PbCO3	2.000e-08	2.004e-08	-7.699	-7.698	0.001
	Pb+2	4.185e-09	2.787e-09	-8.378	-8.555	-0.177
	PbSO4	2.232e-09	2.237e-09	-8.651	-8.650	0.001
	PbOH+	1.511e-09	1.365e-09	-8.821	-8.865	-0.044
	PbHCO3+	9.652e-10	8.719e-10	-9.015	-9.060	-0.044
	Pb(CO3)2-2	3.128e-11	2.083e-11	-10.505	-10.681	-0.177
	Pb(SO4)2-2	2.516e-11	1.676e-11	-10.599	-10.776	-0.177
	Pb(OH)2	1.331e-11	1.334e-11	-10.876	-10.875	0.001
	PbCl+	8.748e-12	7.903e-12	-11.058	-11.102	-0.044
	PbF+	3.465e-12	3.130e-12	-11.460	-11.504	-0.044
	PbNO3+	6.651e-13	6.008e-13	-12.177	-12.221	-0.044
	Pb(OH)3-	4.257e-15	3.846e-15	-14.371	-14.415	-0.044
	PbF2	4.027e-15	4.036e-15	-14.395	-14.394	0.001
	PbCl2	1.125e-15	1.128e-15	-14.949	-14.948	0.001
	Pb2OH+3	2.125e-16	8.516e-17	-15.673	-16.070	-0.397
	PbF3-	2.044e-18	1.847e-18	-17.689	-17.734	-0.044
	Pb(OH)4-2	3.323e-19	2.213e-19	-18.479	-18.655	-0.177
	PbCl3-	7.811e-20	7.057e-20	-19.107	-19.151	-0.044
	Pb3(OH)4+2	7.590e-21	5.055e-21	-20.120	-20.296	-0.177
	PbF4-2	8.383e-23	5.583e-23	-22.077	-22.253	-0.177
	PbCl4-2	3.961e-24	2.638e-24	-23.402	-23.579	-0.177
S(6)	2.603e-03					
	SO4-2	2.126e-03	1.427e-03	-2.673	-2.845	-0.173
	CaSO4	2.646e-04	2.652e-04	-3.577	-3.576	0.001
	MgSO4	2.023e-04	2.027e-04	-3.694	-3.693	0.001
	MnSO4	3.044e-06	3.051e-06	-5.517	-5.516	0.001
	ZnSO4	2.997e-06	3.004e-06	-5.523	-5.522	0.001
	NaSO4-	2.661e-06	2.404e-06	-5.575	-5.619	-0.044
	KSO4-	1.480e-06	1.337e-06	-5.830	-5.874	-0.044
	BaSO4	4.241e-07	4.250e-07	-6.373	-6.372	0.001
	NiSO4	1.375e-07	1.378e-07	-6.862	-6.861	0.001
	FeSO4	6.884e-08	6.900e-08	-7.162	-7.161	0.001
	Zn(SO4)2-2	5.454e-08	3.632e-08	-7.263	-7.440	-0.177
	CdSO4	3.475e-08	3.483e-08	-7.459	-7.458	0.001
	CuSO4	3.472e-08	3.480e-08	-7.459	-7.458	0.001
	HSO4-	5.462e-09	4.934e-09	-8.263	-8.307	-0.044
	PbSO4	2.232e-09	2.237e-09	-8.651	-8.650	0.001
	Cd(SO4)2-2	8.460e-10	5.634e-10	-9.073	-9.249	-0.177
	CaHSO4+	6.430e-11	5.809e-11	-10.192	-10.236	-0.044
	Pb(SO4)2-2	2.516e-11	1.676e-11	-10.599	-10.776	-0.177
	AlSO4+	1.744e-11	1.575e-11	-10.758	-10.803	-0.044
	Ni(SO4)2-2	1.661e-11	1.107e-11	-10.780	-10.956	-0.177
	UO2SO4	1.468e-11	1.471e-11	-10.833	-10.832	0.001
	Al(SO4)2-	7.677e-13	6.935e-13	-12.115	-12.159	-0.044
	UO2(SO4)2-2	2.753e-13	1.833e-13	-12.560	-12.737	-0.177
	FeHSO4+	1.970e-14	1.780e-14	-13.706	-13.750	-0.044
	FeSO4+	1.113e-14	1.006e-14	-13.953	-13.998	-0.044
	Fe(SO4)2-	3.404e-16	3.075e-16	-15.468	-15.512	-0.044
	AlHSO4+2	7.998e-20	5.326e-20	-19.097	-19.274	-0.177
	FeHSO4+2	1.620e-21	1.079e-21	-20.790	-20.967	-0.177
	U(SO4)2	2.917e-36	2.923e-36	-35.535	-35.534	0.001
	USO4+2	4.428e-37	2.949e-37	-36.354	-36.530	-0.177
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-53.493	-53.890	-0.397
U(4)	3.410e-20					
	U(OH)4	3.409e-20	3.417e-20	-19.467	-19.466	0.001
	U(OH)3+	5.874e-24	5.306e-24	-23.231	-23.275	-0.044
	U(OH)2+2	1.704e-28	1.135e-28	-27.768	-27.945	-0.177
	UF3+	6.374e-32	5.758e-32	-31.196	-31.240	-0.044
	UF4	2.969e-32	2.976e-32	-31.527	-31.526	0.001
	U(CO3)4-4	6.816e-33	1.341e-33	-32.166	-32.873	-0.706
	UF2+2	5.866e-33	3.906e-33	-32.232	-32.408	-0.177
	UOH+3	7.392e-34	2.962e-34	-33.131	-33.528	-0.397
	UF5-	5.653e-35	5.106e-35	-34.248	-34.292	-0.044
	UF+3	1.884e-35	7.551e-36	-34.725	-35.122	-0.397
	U(SO4)2	2.917e-36	2.923e-36	-35.535	-35.534	0.001
	UF6-2	6.246e-37	4.160e-37	-36.204	-36.381	-0.177
	USO4+2	4.428e-37	2.949e-37	-36.354	-36.530	-0.177
	U(CO3)5-6	1.471e-37	3.792e-39	-36.832	-38.421	-1.589
	U+4	2.927e-40	0.000e+00	-39.534	-40.240	-0.706
	UCl+3	0.000e+00	0.000e+00	-42.152	-42.549	-0.397
	UNO3+3	0.000e+00	0.000e+00	-43.209	-43.606	-0.397
	U(NO3)2+2	0.000e+00	0.000e+00	-47.436	-47.612	-0.177
	U6(OH)15+9	0.000e+00	0.000e+00	-144.064	-147.639	-3.575
U(5)	9.385e-15					
	UO2+	9.385e-15	8.478e-15	-14.028	-14.072	-0.044
	UO2(CO3)3-5	1.853e-25	1.460e-26	-24.732	-25.836	-1.103
U(6)	2.312e-07					
	UO2(CO3)2-2	1.893e-07	1.260e-07	-6.723	-6.899	-0.177
	UO2(CO3)3-4	1.711e-08	3.365e-09	-7.767	-8.473	-0.706
	UO2CO3	1.430e-08	1.434e-08	-7.845	-7.844	0.001
	UO2(OH)3-	9.323e-09	8.422e-09	-8.030	-8.075	-0.044
	UO2OH+	1.056e-09	9.537e-10	-8.976	-9.021	-0.044
	UO2F+	7.156e-11	6.465e-11	-10.145	-10.189	-0.044
	UO2SO4	1.468e-11	1.471e-11	-10.833	-10.832	0.001
	UO2F2	1.377e-11	1.380e-11	-10.861	-10.860	0.001
	UO2+2	1.265e-11	8.425e-12	-10.898	-11.074	-0.177
	(UO2)3(OH)5+	8.670e-13	7.832e-13	-12.062	-12.106	-0.044
	(UO2)3(OH)7-	4.174e-13	3.771e-13	-12.379	-12.424	-0.044
	UO2(SO4)2-2	2.753e-13	1.833e-13	-12.560	-12.737	-0.177
	UO2F3-	1.835e-13	1.657e-13	-12.736	-12.781	-0.044
	(UO2)2(OH)2+2	1.180e-13	7.859e-14	-12.928	-13.105	-0.177
	UO2(OH)4-2	5.034e-15	3.353e-15	-14.298	-14.475	-0.177
	(UO2)4(OH)7+	4.427e-15	3.999e-15	-14.354	-14.398	-0.044
	UO2Cl+	1.060e-15	9.575e-16	-14.975	-15.019	-0.044
	(UO2)3(OH)4+2	4.499e-16	2.996e-16	-15.347	-15.523	-0.177
	UO2NO3+	2.712e-16	2.450e-16	-15.567	-15.611	-0.044
	(UO2)3(CO3)6-6	1.165e-16	3.002e-18	-15.934	-17.523	-1.589
	UO2F4-2	1.007e-16	6.704e-17	-15.997	-16.174	-0.177
	(UO2)2OH+3	8.878e-18	3.557e-18	-17.052	-17.449	-0.397
	UO2Cl2	3.966e-21	3.975e-21	-20.402	-20.401	0.001
Zn	1.867e-05					
	Zn+2	1.405e-05	9.357e-06	-4.852	-5.029	-0.177
	ZnSO4	2.997e-06	3.004e-06	-5.523	-5.522	0.001
	ZnCO3	7.708e-07	7.725e-07	-6.113	-6.112	0.001
	ZnHCO3+	5.136e-07	4.640e-07	-6.289	-6.334	-0.044
	ZnOH+	1.894e-07	1.711e-07	-6.723	-6.767	-0.044
	Zn(OH)2	7.414e-08	7.431e-08	-7.130	-7.129	0.001
	Zn(SO4)2-2	5.454e-08	3.632e-08	-7.263	-7.440	-0.177
	Zn(CO3)2-2	1.026e-08	6.834e-09	-7.989	-8.165	-0.177
	ZnF+	8.635e-09	7.801e-09	-8.064	-8.108	-0.044
	ZnCl+	1.789e-09	1.616e-09	-8.747	-8.791	-0.044
	ZnOHCl	6.322e-10	6.336e-10	-9.199	-9.198	0.001
	Zn(OH)3-	6.533e-12	5.902e-12	-11.185	-11.229	-0.044
	ZnCl2	1.346e-13	1.349e-13	-12.871	-12.870	0.001
	Zn(OH)4-2	3.528e-17	2.349e-17	-16.453	-16.629	-0.177
	ZnCl3-	1.320e-17	1.193e-17	-16.879	-16.923	-0.044
	ZnCl4-2	7.003e-22	4.664e-22	-21.155	-21.331	-0.177

Fe(3)	2.150e-06					
	Fe(OH)3	1.478e-06	1.481e-06	-5.830	-5.829	0.001
	Fe(OH)2+	6.412e-07	5.792e-07	-6.193	-6.237	-0.044
	Fe(OH)4-	3.024e-08	2.732e-08	-7.519	-7.564	-0.044
	FeOH+2	1.283e-10	8.546e-11	-9.892	-10.068	-0.177
	FeF2+	1.742e-13	1.574e-13	-12.759	-12.803	-0.044
	FeF+2	1.002e-13	6.674e-14	-12.999	-13.176	-0.177
	FeF3	1.543e-14	1.547e-14	-13.812	-13.811	0.001
	FeSO4+	1.113e-14	1.006e-14	-13.953	-13.998	-0.044
	Fe+3	1.807e-15	7.241e-16	-14.743	-15.140	-0.397
	Fe(SO4)2-	3.404e-16	3.075e-16	-15.468	-15.512	-0.044
	FeCl+2	2.253e-18	1.501e-18	-17.647	-17.824	-0.177
	Fe2(OH)2+4	1.249e-18	2.457e-19	-17.903	-18.610	-0.706
	FeHSO4+2	1.620e-21	1.079e-21	-20.790	-20.967	-0.177
	FeCl2+	7.168e-22	6.476e-22	-21.145	-21.189	-0.044
	Fe3(OH)4+5	6.206e-22	4.892e-23	-21.207	-22.310	-1.103
	FeCl3	5.261e-27	5.273e-27	-26.279	-26.278	0.001
H(0)	5.965e-33					
	H2	2.983e-33	2.989e-33	-32.525	-32.524	0.001
K	1.586e-04					
	K+	1.571e-04	1.417e-04	-3.804	-3.849	-0.045
	KSO4-	1.480e-06	1.337e-06	-5.830	-5.874	-0.044
Mg	1.234e-03					
	Mg+2	1.026e-03	6.962e-04	-2.989	-3.157	-0.168
	MgSO4	2.023e-04	2.027e-04	-3.694	-3.693	0.001
	MgHCO3+	3.479e-06	3.143e-06	-5.459	-5.503	-0.044
	MgF+	2.916e-06	2.635e-06	-5.535	-5.579	-0.044
	MgCO3	2.528e-07	2.534e-07	-6.597	-6.596	0.001
	MgOH+	4.317e-08	3.900e-08	-7.365	-7.409	-0.044
Mn(2)	2.402e-05					
	Mn+2	2.000e-05	1.332e-05	-4.699	-4.875	-0.177
	MnSO4	3.044e-06	3.051e-06	-5.517	-5.516	0.001
	MnHCO3+	5.177e-07	4.676e-07	-6.286	-6.330	-0.044
	MnCO3	4.369e-07	4.379e-07	-6.360	-6.359	0.001
	MnF+	6.444e-09	5.821e-09	-8.191	-8.235	-0.044
	MnOH+	6.132e-09	5.540e-09	-8.212	-8.257	-0.044
	MnCl+	4.892e-09	4.419e-09	-8.311	-8.355	-0.044
	MnCl2	1.567e-13	1.571e-13	-12.805	-12.804	0.001
	Mn(NO3)2	1.138e-14	1.140e-14	-13.944	-13.943	0.001
	MnCl3-	3.899e-18	3.522e-18	-17.409	-17.453	-0.044
	Mn(OH)3-	3.703e-18	3.345e-18	-17.431	-17.476	-0.044
Mn(3)	9.110e-24					
	Mn+3	9.110e-24	3.650e-24	-23.040	-23.438	-0.397
Mn(6)	1.701e-37					
	MnO4-2	1.701e-37	1.133e-37	-36.769	-36.946	-0.177
Mn(7)	4.483e-40					
	MnO4-	4.483e-40	4.050e-40	-39.348	-39.393	-0.044
N(5)	1.613e-05					
	NO3-	1.613e-05	1.457e-05	-4.792	-4.836	-0.044
	CdNO3+	4.154e-12	3.753e-12	-11.382	-11.426	-0.044
	PbNO3+	6.651e-13	6.008e-13	-12.177	-12.221	-0.044
	Mn(NO3)2	1.138e-14	1.140e-14	-13.944	-13.943	0.001
	UO2NO3+	2.712e-16	2.450e-16	-15.567	-15.611	-0.044
	UNO3+3	0.000e+00	0.000e+00	-48.727	-49.124	-0.397
	U(NO3)2+2	0.000e+00	0.000e+00	-52.954	-53.130	-0.177
Na	3.873e-04					
	Na+	3.845e-04	3.478e-04	-3.415	-3.459	-0.044
	NaSO4-	2.661e-06	2.404e-06	-5.575	-5.619	-0.044
	NaHCO3	7.685e-08	7.702e-08	-7.114	-7.113	0.001
	NaF	1.261e-08	1.264e-08	-7.899	-7.898	0.001
	NaCO3-	2.259e-09	2.041e-09	-8.646	-8.690	-0.044
Ni	2.539e-06					
	NiCO3	1.587e-06	1.591e-06	-5.799	-5.798	0.001
	Ni+2	7.788e-07	5.187e-07	-6.109	-6.285	-0.177
	NiSO4	1.375e-07	1.378e-07	-6.862	-6.861	0.001
	NiHCO3+	3.122e-08	2.820e-08	-7.506	-7.550	-0.044
	Ni(CO3)2-2	1.718e-09	1.144e-09	-8.765	-8.942	-0.177
	NiOH+	1.362e-09	1.231e-09	-8.866	-8.910	-0.044
	NiF+	7.235e-10	6.536e-10	-9.141	-9.185	-0.044
	NiCl+	1.174e-10	1.061e-10	-9.930	-9.974	-0.044
	Ni(OH)2	3.265e-11	3.272e-11	-10.486	-10.485	0.001
	Ni(SO4)2-2	1.661e-11	1.107e-11	-10.780	-10.956	-0.177
	NiCl2	3.129e-14	3.136e-14	-13.505	-13.504	0.001
	Ni(OH)3-	9.097e-15	8.218e-15	-14.041	-14.085	-0.044
O(0)	1.556e-29					
	O2	7.778e-30	7.795e-30	-29.109	-29.108	0.001
Pb	2.897e-08					
	PbCO3	2.000e-08	2.004e-08	-7.699	-7.698	0.001
	Pb+2	4.185e-09	2.787e-09	-8.378	-8.555	-0.177
	PbSO4	2.232e-09	2.237e-09	-8.651	-8.650	0.001
	PbOH+	1.511e-09	1.365e-09	-8.821	-8.865	-0.044
	PbHCO3+	9.652e-10	8.719e-10	-9.015	-9.060	-0.044
	Pb(CO3)2-2	3.128e-11	2.083e-11	-10.505	-10.681	-0.177
	Pb(SO4)2-2	2.516e-11	1.676e-11	-10.599	-10.776	-0.177
	Pb(OH)2	1.331e-11	1.334e-11	-10.876	-10.875	0.001
	PbCl+	8.748e-12	7.903e-12	-11.058	-11.102	-0.044
	PbF+	3.465e-12	3.130e-12	-11.460	-11.504	-0.044
	PbNO3+	6.651e-13	6.008e-13	-12.177	-12.221	-0.044
	Pb(OH)3-	4.257e-15	3.846e-15	-14.371	-14.415	-0.044
	PbF2	4.027e-15	4.036e-15	-14.395	-14.394	0.001
	PbCl2	1.125e-15	1.128e-15	-14.949	-14.948	0.001
	Pb2OH+3	2.125e-16	8.516e-17	-15.673	-16.070	-0.397
	PbF3-	2.044e-18	1.847e-18	-17.689	-17.734	-0.044
	Pb(OH)4-2	3.323e-19	2.213e-19	-18.479	-18.655	-0.177
	PbCl3-	7.811e-20	7.057e-20	-19.107	-19.151	-0.044
	Pb3(OH)4+2	7.590e-21	5.055e-21	-20.120	-20.296	-0.177
	PbF4-2	8.383e-23	5.583e-23	-22.077	-22.253	-0.177
	PbCl4-2	3.961e-24	2.638e-24	-23.402	-23.579	-0.177
S(6)	2.603e-03					
	SO4-2	2.126e-03	1.427e-03	-2.673	-2.845	-0.173
	CaSO4	2.646e-04	2.652e-04	-3.577	-3.576	0.001
	MgSO4	2.023e-04	2.027e-04	-3.694	-3.693	0.001
	MnSO4	3.044e-06	3.051e-06	-5.517	-5.516	0.001
	ZnSO4	2.997e-06	3.004e-06	-5.523	-5.522	0.001
	NaSO4-	2.661e-06	2.404e-06	-5.575	-5.619	-0.044
	KSO4-	1.480e-06	1.337e-06	-5.830	-5.874	-0.044
	BaSO4	4.241e-07	4.250e-07	-6.373	-6.372	0.001
	NiSO4	1.375e-07	1.378e-07	-6.862	-6.861	0.001
	FeSO4	6.884e-08	6.900e-08	-7.162	-7.161	0.001
	Zn(SO4)2-2	5.454e-08	3.632e-08	-7.263	-7.440	-0.177
	CdSO4	3.475e-08	3.483e-08	-7.459	-7.458	0.001
	CuSO4	3.472e-08	3.480e-08	-7.459	-7.458	0.001
	HSO4-	5.462e-09	4.934e-09	-8.263	-8.307	-0.044
	PbSO4	2.232e-09	2.237e-09	-8.651	-8.650	0.001
	Cd(SO4)2-2	8.460e-10	5.634e-10	-9.073	-9.249	-0.177
	CaHSO4+	6.430e-11	5.809e-11	-10.192	-10.236	-0.044
	Pb(SO4)2-2	2.516e-11	1.676e-11	-10.599	-10.776	-0.177
	AlSO4+	1.744e-11	1.575e-11	-10.758	-10.803	-0.044
	Ni(SO4)2-2	1.661e-11	1.107e-11	-10.780	-10.956	-0.177
	UO2SO4	1.468e-11	1.471e-11	-10.833	-10.832	0.001
	Al(SO4)2-	7.677e-13	6.935e-13	-12.115	-12.159	-0.044
	UO2(SO4)2-2	2.753e-13	1.833e-13	-12.560	-12.737	-0.177
	FeHSO4+	1.970e-14	1.780e-14	-13.706	-13.750	-0.044
	FeSO4+	1.113e-14	1.006e-14	-13.953	-13.998	-0.044
	Fe(SO4)2-	3.404e-16	3.075e-16	-15.468	-15.512	-0.044
	AlHSO4+2	7.998e-20	5.326e-20	-19.097	-19.274	-0.177
	FeHSO4+2	1.620e-21	1.079e-21	-20.790	-20.967	-0.177
	U(SO4)2	0.000e+00	0.000e+00	-41.053	-41.052	0.001
	USO4+2	0.000e+00	0.000e+00	-41.872	-42.048	-0.177
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-61.770	-62.167	-0.397
U(4)	1.035e-25					
	U(OH)4	1.035e-25	1.037e-25	-24.985	-24.984	0.001
	U(OH)3+	1.782e-29	1.610e-29	-28.749	-28.793	-0.044
	U(OH)2+2	5.172e-34	3.444e-34	-33.286	-33.463	-0.177
	UF3+	1.934e-37	1.747e-37	-36.714	-36.758	-0.044
	UF4	9.009e-38	9.029e-38	-37.045	-37.044	0.001
	U(CO3)4-4	2.068e-38	4.069e-39	-37.684	-38.390	-0.706
	UF2+2	1.780e-38	1.185e-38	-37.750	-37.926	-0.177
	UOH+3	2.243e-39	8.988e-40	-38.649	-39.046	-0.397
	UF5-	1.715e-40	1.550e-40	-39.766	-39.810	-0.044
	UF+3	0.000e+00	0.000e+00	-40.243	-40.640	-0.397
	U(SO4)2	0.000e+00	0.000e+00	-41.053	-41.052	0.001
	UF6-2	0.000e+00	0.000e+00	-41.722	-41.899	-0.177
	USO4+2	0.000e+00	0.000e+00	-41.872	-42.048	-0.177
	U(CO3)5-6	0.000e+00	0.000e+00	-42.350	-43.939	-1.589
	U+4	0.000e+00	0.000e+00	-45.051	-45.758	-0.706
	UCl+3	0.000e+00	0.000e+00	-47.669	-48.067	-0.397
	UNO3+3	0.000e+00	0.000e+00	-48.727	-49.124	-0.397
	U(NO3)2+2	0.000e+00	0.000e+00	-52.954	-53.130	-0.177
	U6(OH)15+9	0.000e+00	0.000e+00	-177.172	-180.746	-3.575
U(5)	1.635e-17					
	UO2+	1.635e-17	1.477e-17	-16.787	-16.831	-0.044
	UO2(CO3)3-5	3.227e-28	2.544e-29	-27.491	-28.594	-1.103
U(6)	2.312e-07					
	UO2(CO3)2-2	1.893e-07	1.260e-07	-6.723	-6.899	-0.177
	UO2(CO3)3-4	1.711e-08	3.365e-09	-7.767	-8.473	-0.706
	UO2CO3	1.430e-08	1.434e-08	-7.845	-7.844	0.001
	UO2(OH)3-	9.323e-09	8.422e-09	-8.030	-8.075	-0.044
	UO2OH+	1.056e-09	9.537e-10	-8.976	-9.021	-0.044
	UO2F+	7.156e-11	6.465e-11	-10.145	-10.189	-0.044
	UO2SO4	1.468e-11	1.471e-11	-10.833	-10.832	0.001
	UO2F2	1.377e-11	1.380e-11	-10.861	-10.860	0.001
	UO2+2	1.265e-11	8.425e-12	-10.898	-11.074	-0.177
	(UO2)3(OH)5+	8.670e-13	7.832e-13	-12.062	-12.106	-0.044
	(UO2)3(OH)7-	4.174e-13	3.771e-13	-12.379	-12.424	-0.044
	UO2(SO4)2-2	2.753e-13	1.833e-13	-12.560	-12.737	-0.177
	UO2F3-	1.835e-13	1.657e-13	-12.736	-12.781	-0.044
	(UO2)2(OH)2+2	1.180e-13	7.859e-14	-12.928	-13.105	-0.177
	UO2(OH)4-2	5.034e-15	3.353e-15	-14.298	-14.475	-0.177
	(UO2)4(OH)7+	4.427e-15	3.999e-15	-14.354	-14.398	-0.044
	UO2Cl+	1.060e-15	9.575e-16	-14.975	-15.019	-0.044
	(UO2)3(OH)4+2	4.499e-16	2.996e-16	-15.347	-15.523	-0.177
	UO2NO3+	2.712e-16	2.450e-16	-15.567	-15.611	-0.044
	(UO2)3(CO3)6-6	1.165e-16	3.002e-18	-15.934	-17.523	-1.589
	UO2F4-2	1.007e-16	6.704e-17	-15.997	-16.174	-0.177
	(UO2)2OH+3	8.878e-18	3.557e-18	-17.052	-17.449	-0.397
	UO2Cl2	3.966e-21	3.975e-21	-20.402	-20.401	0.001
Zn	1.867e-05					
	Zn+2	1.405e-05	9.357e-06	-4.852	-5.029	-0.177
	ZnSO4	2.997e-06	3.004e-06	-5.523	-5.522	0.001
	ZnCO3	7.708e-07	7.725e-07	-6.113	-6.112	0.001
	ZnHCO3+	5.136e-07	4.640e-07	-6.289	-6.334	-0.044
	ZnOH+	1.894e-07	1.711e-07	-6.723	-6.767	-0.044
	Zn(OH)2	7.414e-08	7.431e-08	-7.130	-7.129	0.001
	Zn(SO4)2-2	5.454e-08	3.632e-08	-7.263	-7.440	-0.177
	Zn(CO3)2-2	1.026e-08	6.834e-09	-7.989	-8.165	-0.177
	ZnF+	8.635e-09	7.801e-09	-8.064	-8.108	-0.044
	ZnCl+	1.789e-09	1.616e-09	-8.747	-8.791	-0.044
	ZnOHCl	6.322e-10	6.336e-10	-9.199	-9.198	0.001
	Zn(OH)3-	6.533e-12	5.902e-12	-11.185	-11.229	-0.044
	ZnCl2	1.346e-13	1.349e-13	-12.871	-12.870	0.001
	Zn(OH)4-2	3.528e-17	2.349e-17	-16.453	-16.629	-0.177
	ZnCl3-	1.320e-17	1.193e-17	-16.879	-16.923	-0.044
	ZnCl4-2	7.003e-22	4.664e-22	-21.155	-21.331	-0.177

Fe(3)	2.686e-06					
	Fe(OH)3	1.847e-06	1.851e-06	-5.734	-5.733	0.001
	Fe(OH)2+	8.011e-07	7.237e-07	-6.096	-6.140	-0.044
	Fe(OH)4-	3.778e-08	3.413e-08	-7.423	-7.467	-0.044
	FeOH+2	1.603e-10	1.068e-10	-9.795	-9.971	-0.177
	FeF2+	2.177e-13	1.967e-13	-12.662	-12.706	-0.044
	FeF+2	1.252e-13	8.339e-14	-12.902	-13.079	-0.177
	FeF3	1.928e-14	1.933e-14	-13.715	-13.714	0.001
	FeSO4+	1.391e-14	1.257e-14	-13.857	-13.901	-0.044
	Fe+3	2.258e-15	9.047e-16	-14.646	-15.043	-0.397
	Fe(SO4)2-	4.253e-16	3.842e-16	-15.371	-15.415	-0.044
	FeCl+2	2.815e-18	1.875e-18	-17.550	-17.727	-0.177
	Fe2(OH)2+4	1.950e-18	3.836e-19	-17.710	-18.416	-0.706
	FeHSO4+2	2.024e-21	1.348e-21	-20.694	-20.870	-0.177
	Fe3(OH)4+5	1.210e-21	9.543e-23	-20.917	-22.020	-1.103
	FeCl2+	8.957e-22	8.091e-22	-21.048	-21.092	-0.044
	FeCl3	6.573e-27	6.588e-27	-26.182	-26.181	0.001
H(0)	5.965e-33					
	H2	2.983e-33	2.989e-33	-32.525	-32.524	0.001
K	1.586e-04					
	K+	1.571e-04	1.417e-04	-3.804	-3.849	-0.045
	KSO4-	1.480e-06	1.337e-06	-5.830	-5.874	-0.044
Mg	1.234e-03					
	Mg+2	1.026e-03	6.962e-04	-2.989	-3.157	-0.168
	MgSO4	2.023e-04	2.027e-04	-3.694	-3.693	0.001
	MgHCO3+	3.476e-06	3.140e-06	-5.459	-5.503	-0.044
	MgF+	2.916e-06	2.635e-06	-5.535	-5.579	-0.044
	MgCO3	2.526e-07	2.532e-07	-6.598	-6.597	0.001
	MgOH+	4.317e-08	3.900e-08	-7.365	-7.409	-0.044
Mn(2)	2.402e-05					
	Mn+2	2.000e-05	1.332e-05	-4.699	-4.875	-0.177
	MnSO4	3.044e-06	3.051e-06	-5.517	-5.516	0.001
	MnHCO3+	5.173e-07	4.673e-07	-6.286	-6.330	-0.044
	MnCO3	4.365e-07	4.375e-07	-6.360	-6.359	0.001
	MnF+	6.444e-09	5.821e-09	-8.191	-8.235	-0.044
	MnOH+	6.133e-09	5.540e-09	-8.212	-8.256	-0.044
	MnCl+	4.892e-09	4.419e-09	-8.311	-8.355	-0.044
	MnCl2	1.567e-13	1.571e-13	-12.805	-12.804	0.001
	Mn(NO3)2	1.138e-14	1.140e-14	-13.944	-13.943	0.001
	MnCl3-	3.899e-18	3.522e-18	-17.409	-17.453	-0.044
	Mn(OH)3-	3.703e-18	3.345e-18	-17.431	-17.476	-0.044
Mn(3)	9.110e-24					
	Mn+3	9.110e-24	3.650e-24	-23.040	-23.438	-0.397
Mn(6)	1.701e-37					
	MnO4-2	1.701e-37	1.133e-37	-36.769	-36.946	-0.177
Mn(7)	4.483e-40					
	MnO4-	4.483e-40	4.050e-40	-39.348	-39.393	-0.044
N(5)	1.613e-05					
	NO3-	1.613e-05	1.457e-05	-4.792	-4.836	-0.044
	CdNO3+	4.154e-12	3.753e-12	-11.382	-11.426	-0.044
	PbNO3+	6.655e-13	6.012e-13	-12.177	-12.221	-0.044
	Mn(NO3)2	1.138e-14	1.140e-14	-13.944	-13.943	0.001
	UO2NO3+	2.716e-16	2.454e-16	-15.566	-15.610	-0.044
	UNO3+3	0.000e+00	0.000e+00	-48.726	-49.123	-0.397
	U(NO3)2+2	0.000e+00	0.000e+00	-52.953	-53.130	-0.177
Na	3.873e-04					
	Na+	3.845e-04	3.478e-04	-3.415	-3.459	-0.044
	NaSO4-	2.661e-06	2.404e-06	-5.575	-5.619	-0.044
	NaHCO3	7.679e-08	7.696e-08	-7.115	-7.114	0.001
	NaF	1.261e-08	1.264e-08	-7.899	-7.898	0.001
	NaCO3-	2.258e-09	2.040e-09	-8.646	-8.690	-0.044
Ni	2.539e-06					
	NiCO3	1.587e-06	1.591e-06	-5.799	-5.798	0.001
	Ni+2	7.792e-07	5.190e-07	-6.108	-6.285	-0.177
	NiSO4	1.376e-07	1.379e-07	-6.861	-6.860	0.001
	NiHCO3+	3.121e-08	2.819e-08	-7.506	-7.550	-0.044
	Ni(CO3)2-2	1.716e-09	1.143e-09	-8.765	-8.942	-0.177
	NiOH+	1.363e-09	1.231e-09	-8.866	-8.910	-0.044
	NiF+	7.239e-10	6.540e-10	-9.140	-9.184	-0.044
	NiCl+	1.175e-10	1.061e-10	-9.930	-9.974	-0.044
	Ni(OH)2	3.266e-11	3.274e-11	-10.486	-10.485	0.001
	Ni(SO4)2-2	1.662e-11	1.107e-11	-10.779	-10.956	-0.177
	NiCl2	3.131e-14	3.138e-14	-13.504	-13.503	0.001
	Ni(OH)3-	9.102e-15	8.222e-15	-14.041	-14.085	-0.044
O(0)	1.556e-29					
	O2	7.778e-30	7.795e-30	-29.109	-29.108	0.001
Pb	2.897e-08					
	PbCO3	1.999e-08	2.004e-08	-7.699	-7.698	0.001
	Pb+2	4.187e-09	2.789e-09	-8.378	-8.555	-0.177
	PbSO4	2.233e-09	2.238e-09	-8.651	-8.650	0.001
	PbOH+	1.512e-09	1.366e-09	-8.821	-8.865	-0.044
	PbHCO3+	9.650e-10	8.717e-10	-9.015	-9.060	-0.044
	Pb(CO3)2-2	3.124e-11	2.081e-11	-10.505	-10.682	-0.177
	Pb(SO4)2-2	2.518e-11	1.677e-11	-10.599	-10.776	-0.177
	Pb(OH)2	1.331e-11	1.334e-11	-10.876	-10.875	0.001
	PbCl+	8.753e-12	7.907e-12	-11.058	-11.102	-0.044
	PbF+	3.467e-12	3.132e-12	-11.460	-11.504	-0.044
	PbNO3+	6.655e-13	6.012e-13	-12.177	-12.221	-0.044
	Pb(OH)3-	4.260e-15	3.848e-15	-14.371	-14.415	-0.044
	PbF2	4.030e-15	4.039e-15	-14.395	-14.394	0.001
	PbCl2	1.126e-15	1.129e-15	-14.948	-14.947	0.001
	Pb2OH+3	2.128e-16	8.526e-17	-15.672	-16.069	-0.397
	PbF3-	2.046e-18	1.848e-18	-17.689	-17.733	-0.044
	Pb(OH)4-2	3.324e-19	2.214e-19	-18.478	-18.655	-0.177
	PbCl3-	7.816e-20	7.061e-20	-19.107	-19.151	-0.044
	Pb3(OH)4+2	7.603e-21	5.063e-21	-20.119	-20.296	-0.177
	PbF4-2	8.388e-23	5.586e-23	-22.076	-22.253	-0.177
	PbCl4-2	3.964e-24	2.640e-24	-23.402	-23.578	-0.177

S(6)	2.603e-03					
	SO4-2	2.126e-03	1.427e-03	-2.672	-2.845	-0.173
	CaSO4	2.646e-04	2.652e-04	-3.577	-3.576	0.001
	MgSO4	2.023e-04	2.027e-04	-3.694	-3.693	0.001
	MnSO4	3.044e-06	3.051e-06	-5.517	-5.516	0.001
	ZnSO4	2.997e-06	3.004e-06	-5.523	-5.522	0.001
	NaSO4-	2.661e-06	2.404e-06	-5.575	-5.619	-0.044
	KSO4-	1.480e-06	1.337e-06	-5.830	-5.874	-0.044
	BaSO4	4.241e-07	4.251e-07	-6.373	-6.372	0.001
	NiSO4	1.376e-07	1.379e-07	-6.861	-6.860	0.001
	Zn(SO4)2-2	5.455e-08	3.633e-08	-7.263	-7.440	-0.177
	CdSO4	3.475e-08	3.483e-08	-7.459	-7.458	0.001
	CuSO4	3.473e-08	3.481e-08	-7.459	-7.458	0.001
	HSO4-	5.462e-09	4.934e-09	-8.263	-8.307	-0.044
	PbSO4	2.233e-09	2.238e-09	-8.651	-8.650	0.001
	Cd(SO4)2-2	8.460e-10	5.635e-10	-9.073	-9.249	-0.177
	FeSO4	1.498e-10	1.502e-10	-9.824	-9.823	0.001
	CaHSO4+	6.430e-11	5.809e-11	-10.192	-10.236	-0.044
	Pb(SO4)2-2	2.518e-11	1.677e-11	-10.599	-10.776	-0.177
	AlSO4+	1.744e-11	1.575e-11	-10.758	-10.803	-0.044
	Ni(SO4)2-2	1.662e-11	1.107e-11	-10.779	-10.956	-0.177
	UO2SO4	1.470e-11	1.474e-11	-10.833	-10.832	0.001
	Al(SO4)2-	7.677e-13	6.935e-13	-12.115	-12.159	-0.044
	UO2(SO4)2-2	2.757e-13	1.836e-13	-12.560	-12.736	-0.177
	FeSO4+	1.391e-14	1.257e-14	-13.857	-13.901	-0.044
	Fe(SO4)2-	4.253e-16	3.842e-16	-15.371	-15.415	-0.044
	FeHSO4+	4.288e-17	3.874e-17	-16.368	-16.412	-0.044
	AlHSO4+2	7.998e-20	5.326e-20	-19.097	-19.274	-0.177
	FeHSO4+2	2.024e-21	1.348e-21	-20.694	-20.870	-0.177
	U(SO4)2	0.000e+00	0.000e+00	-41.052	-41.051	0.001
	USO4+2	0.000e+00	0.000e+00	-41.871	-42.048	-0.177
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-61.769	-62.167	-0.397
U(4)	1.036e-25					
	U(OH)4	1.036e-25	1.039e-25	-24.985	-24.984	0.001
	U(OH)3+	1.785e-29	1.613e-29	-28.748	-28.792	-0.044
	U(OH)2+2	5.180e-34	3.450e-34	-33.286	-33.462	-0.177
	UF3+	1.937e-37	1.750e-37	-36.713	-36.757	-0.044
	UF4	9.023e-38	9.044e-38	-37.045	-37.044	0.001
	U(CO3)4-4	2.065e-38	4.063e-39	-37.685	-38.391	-0.706
	UF2+2	1.783e-38	1.187e-38	-37.749	-37.925	-0.177
	UOH+3	2.247e-39	9.002e-40	-38.648	-39.046	-0.397
	UF5-	1.718e-40	1.552e-40	-39.765	-39.809	-0.044
	UF+3	0.000e+00	0.000e+00	-40.242	-40.639	-0.397
	U(SO4)2	0.000e+00	0.000e+00	-41.052	-41.051	0.001
	UF6-2	0.000e+00	0.000e+00	-41.722	-41.898	-0.177
	USO4+2	0.000e+00	0.000e+00	-41.871	-42.048	-0.177
	U(CO3)5-6	0.000e+00	0.000e+00	-42.351	-43.940	-1.589
	U+4	0.000e+00	0.000e+00	-45.051	-45.757	-0.706
	UCl+3	0.000e+00	0.000e+00	-47.669	-48.066	-0.397
	UNO3+3	0.000e+00	0.000e+00	-48.726	-49.123	-0.397
	U(NO3)2+2	0.000e+00	0.000e+00	-52.953	-53.130	-0.177
	U6(OH)15+9	0.000e+00	0.000e+00	-177.168	-180.742	-3.575
U(5)	1.637e-17					
	UO2+	1.637e-17	1.479e-17	-16.786	-16.830	-0.044
	UO2(CO3)3-5	3.224e-28	2.542e-29	-27.492	-28.595	-1.103
U(6)	2.312e-07					
	UO2(CO3)2-2	1.892e-07	1.260e-07	-6.723	-6.900	-0.177
	UO2(CO3)3-4	1.709e-08	3.363e-09	-7.767	-8.473	-0.706
	UO2CO3	1.431e-08	1.435e-08	-7.844	-7.843	0.001
	UO2(OH)3-	9.338e-09	8.436e-09	-8.030	-8.074	-0.044
	UO2OH+	1.057e-09	9.552e-10	-8.976	-9.020	-0.044
	UO2F+	7.168e-11	6.475e-11	-10.145	-10.189	-0.044
	UO2SO4	1.470e-11	1.474e-11	-10.833	-10.832	0.001
	UO2F2	1.379e-11	1.382e-11	-10.861	-10.860	0.001
	UO2+2	1.267e-11	8.438e-12	-10.897	-11.074	-0.177
	(UO2)3(OH)5+	8.710e-13	7.869e-13	-12.060	-12.104	-0.044
	(UO2)3(OH)7-	4.193e-13	3.788e-13	-12.377	-12.422	-0.044
	UO2(SO4)2-2	2.757e-13	1.836e-13	-12.560	-12.736	-0.177
	UO2F3-	1.838e-13	1.660e-13	-12.736	-12.780	-0.044
	(UO2)2(OH)2+2	1.184e-13	7.883e-14	-12.927	-13.103	-0.177
	UO2(OH)4-2	5.042e-15	3.358e-15	-14.297	-14.474	-0.177
	(UO2)4(OH)7+	4.455e-15	4.024e-15	-14.351	-14.395	-0.044
	UO2Cl+	1.062e-15	9.590e-16	-14.974	-15.018	-0.044
	(UO2)3(OH)4+2	4.520e-16	3.010e-16	-15.345	-15.521	-0.177
	UO2NO3+	2.716e-16	2.454e-16	-15.566	-15.610	-0.044
	(UO2)3(CO3)6-6	1.164e-16	3.002e-18	-15.934	-17.523	-1.589
	UO2F4-2	1.008e-16	6.715e-17	-15.996	-16.173	-0.177
	(UO2)2OH+3	8.905e-18	3.568e-18	-17.050	-17.448	-0.397
	UO2Cl2	3.972e-21	3.981e-21	-20.401	-20.400	0.001
Zn	1.867e-05					
	Zn+2	1.405e-05	9.358e-06	-4.852	-5.029	-0.177
	ZnSO4	2.997e-06	3.004e-06	-5.523	-5.522	0.001
	ZnCO3	7.702e-07	7.720e-07	-6.113	-6.112	0.001
	ZnHCO3+	5.132e-07	4.636e-07	-6.290	-6.334	-0.044
	ZnOH+	1.895e-07	1.711e-07	-6.723	-6.767	-0.044
	Zn(OH)2	7.415e-08	7.432e-08	-7.130	-7.129	0.001
	Zn(SO4)2-2	5.455e-08	3.633e-08	-7.263	-7.440	-0.177
	Zn(CO3)2-2	1.025e-08	6.824e-09	-7.989	-8.166	-0.177
	ZnF+	8.635e-09	7.801e-09	-8.064	-8.108	-0.044
	ZnCl+	1.789e-09	1.617e-09	-8.747	-8.791	-0.044
	ZnOHCl	6.322e-10	6.337e-10	-9.199	-9.198	0.001
	Zn(OH)3-	6.534e-12	5.902e-12	-11.185	-11.229	-0.044
	ZnCl2	1.346e-13	1.349e-13	-12.871	-12.870	0.001
	Zn(OH)4-2	3.528e-17	2.350e-17	-16.452	-16.629	-0.177
	ZnCl3-	1.320e-17	1.193e-17	-16.879	-16.923	-0.044
	ZnCl4-2	7.003e-22	4.664e-22	-21.155	-21.331	-0.177

----------Saturation Indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-0.38	10.77	11.15	Al(OH)3
AlAsO4:2H2O	-6.27	-1.47	4.81	AlAsO4:2H2O
AlumK	-15.70	-20.97	-5.27	KAl(SO4)2:12H2O
Alunite	1.31	0.58	-0.73	KAl3(SO4)2(OH)6
Anglesite	-3.58	-11.40	-7.82	PbSO4
Anhydrite	-1.51	-5.85	-4.34	CaSO4
Antlerite	-2.26	6.03	8.29	Cu3(OH)4SO4
Aragonite	-1.09	-9.39	-8.30	CaCO3
Arsenolite	-86.31	-166.48	-80.17	As4O6
Artinite	-7.88	2.10	9.98	MgCO3:Mg(OH)2:3H2O
As2O5	-31.25	-24.48	6.77	As2O5
Atacamite	-3.29	4.30	7.59	Cu2(OH)3Cl
Azurite	-2.09	-18.69	-16.60	Cu3(OH)2(CO3)2
B-UO2(OH)2	-2.00	3.73	5.73	UO2(OH)2
Ba3(AsO4)2	10.19	1.24	-8.95	Ba3(AsO4)2
BaF2	-8.85	-14.63	-5.77	BaF2
Barite	0.99	-9.07	-10.06	BaSO4
Basaluminite	2.75	25.45	22.70	Al4(OH)10SO4
Bianchite	-6.11	-7.87	-1.76	ZnSO4:6H2O
Birnessite	-4.30	39.30	43.60	MnO2
Bixbyite	-2.07	49.23	51.30	Mn2O3
Boehmite	1.82	10.77	8.96	AlOOH
Brochantite	-1.41	13.93	15.34	Cu4(OH)6SO4
Brucite	-5.56	11.64	17.20	Mg(OH)2
Bunsenite	-4.25	8.51	12.77	NiO
Ca3(AsO4)2:4w	-11.49	10.89	22.38	Ca3(AsO4)2:4H2O
Calcite	-0.94	-9.39	-8.45	CaCO3
Cd(gamma)	-35.47	-21.64	13.83	Cd
Cd(OH)2	-5.91	7.74	13.65	Cd(OH)2
Cd(OH)2(a)	-6.26	7.74	14.01	Cd(OH)2
Cd3(OH)2(SO4)2	-18.78	-12.07	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-16.98	5.58	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-15.08	13.32	28.40	Cd4(OH)6SO4
CdCl2	-14.62	-15.24	-0.62	CdCl2
CdCl2:2.5H2O	-13.27	-15.24	-1.96	CdCl2:2.5H2O
CdCl2:H2O	-13.55	-15.24	-1.69	CdCl2:H2O
CdF2	-12.61	-15.46	-2.85	CdF2
CdMetal	-35.37	-21.64	13.73	Cd
CdOHCl	-7.37	-3.75	3.62	CdOHCl
CdSO4	-10.00	-9.90	0.10	CdSO4
CdSO4:2.7H2O	-8.09	-9.90	-1.82	CdSO4:2.67H2O
CdSO4:H2O	-8.35	-9.90	-1.56	CdSO4:H2O
Cerrusite	-1.74	-14.94	-13.19	PbCO3
Chalcanthite	-7.09	-9.75	-2.66	CuSO4:5H2O
Claudetite	-86.06	-166.48	-80.42	As4O6
CO2(g)	-3.02	-21.18	-18.17	CO2
Cotunnite	-11.89	-16.73	-4.84	PbCl2
Cu(OH)2	-0.95	7.89	8.84	Cu(OH)2
Cu2(OH)3NO3	-5.92	3.55	9.47	Cu2(OH)3NO3
Cu2SO4	-23.95	-31.24	-7.29	Cu2SO4
Cu3(AsO4)2:6w	-6.96	-0.80	6.16	Cu3(AsO4)2:6H2O
CuCO3	-3.66	-13.29	-9.63	CuCO3
CuF	-22.94	-18.40	4.55	CuF
CuF2	-14.86	-15.31	-0.44	CuF2
CuF2:2H2O	-10.80	-15.31	-4.50	CuF2:2H2O
CuMetal	-9.80	-21.49	-11.69	Cu
CuOCuSO4	-13.86	-1.86	12.00	CuO:CuSO4
CupricFerrite	15.62	22.01	6.39	CuFe2O4
Cuprite	-6.56	-13.59	-7.03	Cu2O
CuprousFerrite	11.83	0.26	-11.57	CuFeO2
CuSO4	-13.00	-9.75	3.25	CuSO4
Diaspore	3.57	10.77	7.21	AlOOH
Dolomite	-1.97	-18.93	-16.96	CaMg(CO3)2
Dolomite(d)	-2.54	-18.93	-16.39	CaMg(CO3)2
Epsomite	-3.83	-6.00	-2.18	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.65	3.61	-3.04	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.17	7.06	4.89	Fe(OH)3
Fe3(OH)8	2.17	22.40	20.22	Fe3(OH)8
Fluorite	-0.74	-11.41	-10.66	CaF2
Gibbsite	2.36	10.77	8.41	Al(OH)3
Goethite	8.06	7.06	-1.00	FeOOH
Goslarite	-5.87	-7.87	-2.00	ZnSO4:7H2O
Gummite	-6.98	3.73	10.71	UO3
Gypsum	-1.27	-5.85	-4.58	CaSO4:2H2O
H2(g)	-29.33	-29.38	-0.05	H2
Halite	-9.12	-7.55	1.57	NaCl
Hausmannite	-3.21	59.15	62.37	Mn3O4
Hematite	17.72	14.12	-3.60	Fe2O3
Huntite	-8.39	-38.01	-29.63	CaMg3(CO3)4
Hydrocerrusite	-6.17	-23.63	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-18.45	-26.52	-8.07	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-3.26	-11.26	-8.00	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-1.77	-10.56	-8.80	KFe3(SO4)2(OH)6
Jarosite-Na	-5.37	-10.17	-4.80	NaFe3(SO4)2(OH)6
JarositeH	-9.45	-14.11	-4.66	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-3.64	-6.87	-3.23	AlOHSO4
Langite	-3.39	13.93	17.32	Cu4(OH)6SO4:H2O
Larnakite	-4.96	-5.16	-0.19	PbO:PbSO4
Laurionite	-5.87	-5.24	0.62	PbOHCl
Litharge	-6.69	6.25	12.94	PbO
Maghemite	7.73	14.12	6.39	Fe2O3
Magnesite	-1.59	-9.54	-7.95	MgCO3
Magnetite	17.99	22.40	4.41	Fe3O4
Malachite	-0.43	-5.40	-4.97	Cu2(OH)2CO3
Manganite	-0.73	24.61	25.34	MnOOH
Massicot	-6.89	6.25	13.13	PbO
Matlockite	-7.31	-16.84	-9.54	PbClF
Melanothallite	-18.98	-15.09	3.89	CuCl2
Melanterite	-7.09	-9.37	-2.28	FeSO4:7H2O
Minium	-26.94	48.12	75.05	Pb3O4
Mirabilite	-8.40	-9.76	-1.37	Na2SO4:10H2O
Mn2(SO4)3	-50.22	-3.71	46.51	Mn2(SO4)3
Mn3(AsO4):8H2O	-7.29	5.29	12.58	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-15.53	-13.05	2.48	MnCl2:4H2O
MnSO4	-10.60	-7.72	2.87	MnSO4
Monteponite	-6.36	7.74	14.10	CdO
Morenosite	-6.73	-9.13	-2.40	NiSO4:7H2O
Na4UO2(CO3)3	-27.77	-44.06	-16.29	Na4UO2(CO3)3
Nahcolite	-6.27	-17.24	-10.98	NaHCO3
Nantokite	-8.70	-18.29	-9.59	CuCl
Natron	-11.78	-13.30	-1.52	Na2CO3:10H2O
Nesquehonite	-4.00	-9.54	-5.54	MgCO3:3H2O
Ni(OH)2	-1.88	8.51	10.40	Ni(OH)2
Ni3(AsO4)2:8H2O	-14.71	1.06	15.77	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-15.59	16.41	32.00	Ni4(OH)6SO4
NiCO3	-5.96	-12.67	-6.71	NiCO3
Nsutite	-3.26	39.30	42.56	MnO2
O2(g)	-26.26	58.76	85.02	O2
Otavite	-1.34	-13.44	-12.10	CdCO3
Pb(OH)2	-2.09	6.25	8.34	Pb(OH)2
Pb2(OH)3Cl	-7.79	1.00	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.71	12.49	26.20	PbO:Pb(OH)2
Pb2O3	-19.17	41.87	61.04	Pb2O3
Pb2OCO3	-8.35	-8.69	-0.35	PbO:PbCO3
Pb3(AsO4)2	-11.63	-5.75	5.88	Pb3(AsO4)2
Pb3O2CO3	-13.82	-2.45	11.37	PbCO3:2PbO
Pb3O2SO4	-9.59	1.09	10.68	PbSO4:2PbO
Pb4(OH)6SO4	-13.77	7.33	21.10	Pb4(OH)6SO4
Pb4O3SO4	-15.23	7.33	22.57	PbSO4:3PbO
PbF2	-9.52	-16.95	-7.43	PbF2
PbMetal	-27.40	-23.13	4.26	Pb
PbO:0.3H2O	-6.73	6.25	12.98	PbO:0.33H2O
Phosgenite	-11.86	-31.67	-19.81	PbCl2:PbCO3
Plattnerite	-14.61	35.63	50.24	PbO2
Portlandite	-11.42	11.79	23.21	Ca(OH)2
Pyrochroite	-5.28	9.92	15.20	Mn(OH)2
Pyrolusite	-2.94	39.30	42.24	MnO2
Retgersite	-7.08	-9.13	-2.05	NiSO4:6H2O
Rhodochrosite	-0.15	-11.26	-11.11	MnCO3
Rhodochrosite(d)	-0.87	-11.26	-10.39	MnCO3
Rutherfordine	-3.03	-17.46	-14.43	UO2CO3
Schoepite	-1.84	3.73	5.56	UO2(OH)2:H2O
Scorodite	-5.57	-5.18	0.39	FeAsO4:2H2O
Siderite	-2.05	-12.91	-10.86	FeCO3
Siderite(d)(3)	-2.46	-12.91	-10.45	FeCO3
Smithsonite	-1.47	-11.41	-9.94	ZnCO3
Tenorite	0.07	7.89	7.82	CuO
Thenardite	-9.59	-9.76	-0.17	Na2SO4
Thermonatrite	-13.46	-13.30	0.16	Na2CO3:H2O
Trona	-19.61	-30.54	-10.93	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-25.09	-11.49	13.60	U(OH)2SO4
U3O8(c)	4.77	77.24	72.47	U3O8
U4O9(c)	-11.14	54.02	65.16	U4O9
UF4(c)	-38.68	-40.24	-1.56	UF4
UF4:2.5H2O	-29.48	-40.24	-10.76	UF4:2.5H2O
UO2(a)	-10.74	6.16	16.90	UO2
UO3(gamma)	-4.25	3.73	7.98	UO3
Uraninite(c)	-6.09	6.16	12.25	UO2
Witherite	-4.03	-12.61	-8.58	BaCO3
Zincite(c)	-1.66	9.77	11.43	ZnO
Zincosite	-11.14	-7.87	3.26	ZnSO4
Zn(NO3)2:6H2O	-18.07	-14.70	3.37	Zn(NO3)2:6H2O
Zn(OH)2-a	-2.68	9.77	12.45	Zn(OH)2
Zn(OH)2-b	-1.98	9.77	11.75	Zn(OH)2
Zn(OH)2-c	-2.43	9.77	12.20	Zn(OH)2
Zn(OH)2-e	-1.73	9.77	11.50	Zn(OH)2
Zn(OH)2-g	-1.94	9.77	11.71	Zn(OH)2
Zn2(OH)2SO4	-5.60	1.90	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.15	8.05	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-8.91	4.83	13.74	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-25.82	-5.98	19.84	ZnO:2ZnSO4
Zn4(OH)6SO4	-6.96	21.44	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-12.62	25.88	38.50	Zn5(OH)8Cl2
ZnCl2	-20.47	-13.21	7.26	ZnCl2
ZnCO3:H2O	-1.15	-11.41	-10.26	ZnCO3:H2O
ZnF2	-12.08	-13.43	-1.35	ZnF2
ZnMetal	-45.85	-19.61	26.24	Zn
ZnO(a)	-1.54	9.77	11.31	ZnO
ZnSO4:H2O	-7.45	-7.87	-0.43	ZnSO4:H2O

End of simulation.

----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-0.38	10.77	11.15	Al(OH)3
AlAsO4:2H2O	-6.27	-1.47	4.81	AlAsO4:2H2O
AlumK	-15.70	-20.97	-5.27	KAl(SO4)2:12H2O
Alunite	1.31	0.58	-0.73	KAl3(SO4)2(OH)6
Anglesite	-3.58	-11.40	-7.82	PbSO4
Anhydrite	-1.51	-5.85	-4.34	CaSO4
Antlerite	-2.26	6.03	8.29	Cu3(OH)4SO4
Aragonite	-1.09	-9.39	-8.30	CaCO3
Arsenolite	-86.31	-166.48	-80.17	As4O6
Artinite	-7.88	2.10	9.98	MgCO3:Mg(OH)2:3H2O
As2O5	-31.25	-24.48	6.77	As2O5
Atacamite	-3.29	4.30	7.59	Cu2(OH)3Cl
Azurite	-2.09	-18.69	-16.60	Cu3(OH)2(CO3)2
B-UO2(OH)2	-2.00	3.73	5.73	UO2(OH)2
Ba3(AsO4)2	10.19	1.24	-8.95	Ba3(AsO4)2
BaF2	-8.85	-14.63	-5.77	BaF2
Barite	0.99	-9.07	-10.06	BaSO4
Basaluminite	2.75	25.45	22.70	Al4(OH)10SO4
Bianchite	-6.11	-7.87	-1.76	ZnSO4:6H2O
Birnessite	-4.30	39.30	43.60	MnO2
Bixbyite	-2.07	49.23	51.30	Mn2O3
Boehmite	1.82	10.77	8.96	AlOOH
Brochantite	-1.41	13.93	15.34	Cu4(OH)6SO4
Brucite	-5.56	11.64	17.20	Mg(OH)2
Bunsenite	-4.25	8.51	12.77	NiO
Ca3(AsO4)2:4w	-11.49	10.89	22.38	Ca3(AsO4)2:4H2O
Calcite	-0.94	-9.39	-8.45	CaCO3
Cd(gamma)	-35.47	-21.64	13.83	Cd
Cd(OH)2	-5.91	7.74	13.65	Cd(OH)2
Cd(OH)2(a)	-6.26	7.74	14.01	Cd(OH)2
Cd3(OH)2(SO4)2	-18.78	-12.07	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-16.98	5.58	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-15.08	13.32	28.40	Cd4(OH)6SO4
CdCl2	-14.62	-15.24	-0.62	CdCl2
CdCl2:2.5H2O	-13.27	-15.24	-1.96	CdCl2:2.5H2O
CdCl2:H2O	-13.55	-15.24	-1.69	CdCl2:H2O
CdF2	-12.61	-15.46	-2.85	CdF2
CdMetal	-35.37	-21.64	13.73	Cd
CdOHCl	-7.37	-3.75	3.62	CdOHCl
CdSO4	-10.00	-9.90	0.10	CdSO4
CdSO4:2.7H2O	-8.09	-9.90	-1.82	CdSO4:2.67H2O
CdSO4:H2O	-8.35	-9.90	-1.56	CdSO4:H2O
Cerrusite	-1.74	-14.94	-13.19	PbCO3
Chalcanthite	-7.09	-9.75	-2.66	CuSO4:5H2O
Claudetite	-86.06	-166.48	-80.42	As4O6
CO2(g)	-3.02	-21.18	-18.17	CO2
Cotunnite	-11.89	-16.73	-4.84	PbCl2
Cu(OH)2	-0.95	7.89	8.84	Cu(OH)2
Cu2(OH)3NO3	-5.92	3.55	9.47	Cu2(OH)3NO3
Cu2SO4	-23.95	-31.24	-7.29	Cu2SO4
Cu3(AsO4)2:6w	-6.96	-0.80	6.16	Cu3(AsO4)2:6H2O
CuCO3	-3.66	-13.29	-9.63	CuCO3
CuF	-22.94	-18.40	4.55	CuF
CuF2	-14.86	-15.31	-0.44	CuF2
CuF2:2H2O	-10.80	-15.31	-4.50	CuF2:2H2O
CuMetal	-9.80	-21.49	-11.69	Cu
CuOCuSO4	-13.86	-1.86	12.00	CuO:CuSO4
CupricFerrite	15.62	22.01	6.39	CuFe2O4
Cuprite	-6.56	-13.59	-7.03	Cu2O
CuprousFerrite	11.83	0.26	-11.57	CuFeO2
CuSO4	-13.00	-9.75	3.25	CuSO4
Diaspore	3.57	10.77	7.21	AlOOH
Dolomite	-1.97	-18.93	-16.96	CaMg(CO3)2
Dolomite(d)	-2.54	-18.93	-16.39	CaMg(CO3)2
Epsomite	-3.83	-6.00	-2.18	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.65	3.61	-3.04	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.17	7.06	4.89	Fe(OH)3
Fe3(OH)8	2.17	22.40	20.22	Fe3(OH)8
Fluorite	-0.74	-11.41	-10.66	CaF2
Gibbsite	2.36	10.77	8.41	Al(OH)3
Goethite	8.06	7.06	-1.00	FeOOH
Goslarite	-5.87	-7.87	-2.00	ZnSO4:7H2O
Gummite	-6.98	3.73	10.71	UO3
Gypsum	-1.27	-5.85	-4.58	CaSO4:2H2O
H2(g)	-29.33	-29.38	-0.05	H2
Halite	-9.12	-7.55	1.57	NaCl
Hausmannite	-3.21	59.15	62.37	Mn3O4
Hematite	17.72	14.12	-3.60	Fe2O3
Huntite	-8.39	-38.01	-29.63	CaMg3(CO3)4
Hydrocerrusite	-6.17	-23.63	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-18.45	-26.52	-8.07	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-3.26	-11.26	-8.00	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-1.77	-10.56	-8.80	KFe3(SO4)2(OH)6
Jarosite-Na	-5.37	-10.17	-4.80	NaFe3(SO4)2(OH)6
JarositeH	-9.45	-14.11	-4.66	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-3.64	-6.87	-3.23	AlOHSO4
Langite	-3.39	13.93	17.32	Cu4(OH)6SO4:H2O
Larnakite	-4.96	-5.16	-0.19	PbO:PbSO4
Laurionite	-5.87	-5.24	0.62	PbOHCl
Litharge	-6.69	6.25	12.94	PbO
Maghemite	7.73	14.12	6.39	Fe2O3
Magnesite	-1.59	-9.54	-7.95	MgCO3
Magnetite	17.99	22.40	4.41	Fe3O4
Malachite	-0.43	-5.40	-4.97	Cu2(OH)2CO3
Manganite	-0.73	24.61	25.34	MnOOH
Massicot	-6.89	6.25	13.13	PbO
Matlockite	-7.31	-16.84	-9.54	PbClF
Melanothallite	-18.98	-15.09	3.89	CuCl2
Melanterite	-7.09	-9.37	-2.28	FeSO4:7H2O
Minium	-26.94	48.12	75.05	Pb3O4
Mirabilite	-8.40	-9.76	-1.37	Na2SO4:10H2O
Mn2(SO4)3	-50.22	-3.71	46.51	Mn2(SO4)3
Mn3(AsO4):8H2O	-7.29	5.29	12.58	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-15.53	-13.05	2.48	MnCl2:4H2O
MnSO4	-10.60	-7.72	2.87	MnSO4
Monteponite	-6.36	7.74	14.10	CdO
Morenosite	-6.73	-9.13	-2.40	NiSO4:7H2O
Na4UO2(CO3)3	-27.77	-44.06	-16.29	Na4UO2(CO3)3
Nahcolite	-6.27	-17.24	-10.98	NaHCO3
Nantokite	-8.70	-18.29	-9.59	CuCl
Natron	-11.78	-13.30	-1.52	Na2CO3:10H2O
Nesquehonite	-4.00	-9.54	-5.54	MgCO3:3H2O
Ni(OH)2	-1.88	8.51	10.40	Ni(OH)2
Ni3(AsO4)2:8H2O	-14.71	1.06	15.77	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-15.59	16.41	32.00	Ni4(OH)6SO4
NiCO3	-5.96	-12.67	-6.71	NiCO3
Nsutite	-3.26	39.30	42.56	MnO2
O2(g)	-26.26	58.76	85.02	O2
Otavite	-1.34	-13.44	-12.10	CdCO3
Pb(OH)2	-2.09	6.25	8.34	Pb(OH)2
Pb2(OH)3Cl	-7.79	1.00	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.71	12.49	26.20	PbO:Pb(OH)2
Pb2O3	-19.17	41.87	61.04	Pb2O3
Pb2OCO3	-8.35	-8.69	-0.35	PbO:PbCO3
Pb3(AsO4)2	-11.63	-5.75	5.88	Pb3(AsO4)2
Pb3O2CO3	-13.82	-2.45	11.37	PbCO3:2PbO
Pb3O2SO4	-9.59	1.09	10.68	PbSO4:2PbO
Pb4(OH)6SO4	-13.77	7.33	21.10	Pb4(OH)6SO4
Pb4O3SO4	-15.23	7.33	22.57	PbSO4:3PbO
PbF2	-9.52	-16.95	-7.43	PbF2
PbMetal	-27.40	-23.13	4.26	Pb
PbO:0.3H2O	-6.73	6.25	12.98	PbO:0.33H2O
Phosgenite	-11.86	-31.67	-19.81	PbCl2:PbCO3
Plattnerite	-14.61	35.63	50.24	PbO2
Portlandite	-11.42	11.79	23.21	Ca(OH)2
Pyrochroite	-5.28	9.92	15.20	Mn(OH)2
Pyrolusite	-2.94	39.30	42.24	MnO2
Retgersite	-7.08	-9.13	-2.05	NiSO4:6H2O
Rhodochrosite	-0.15	-11.26	-11.11	MnCO3
Rhodochrosite(d)	-0.87	-11.26	-10.39	MnCO3
Rutherfordine	-3.03	-17.46	-14.43	UO2CO3
Schoepite	-1.84	3.73	5.56	UO2(OH)2:H2O
Scorodite	-5.57	-5.18	0.39	FeAsO4:2H2O
Siderite	-2.05	-12.91	-10.86	FeCO3
Siderite(d)(3)	-2.46	-12.91	-10.45	FeCO3
Smithsonite	-1.47	-11.41	-9.94	ZnCO3
Tenorite	0.07	7.89	7.82	CuO
Thenardite	-9.59	-9.76	-0.17	Na2SO4
Thermonatrite	-13.46	-13.30	0.16	Na2CO3:H2O
Trona	-19.61	-30.54	-10.93	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-30.60	-43.30	-12.70	U(OH)2SO4
U3O8(c)	-11.78	-18.20	-6.42	U3O8
U4O9(c)	-33.21	-73.24	-40.03	U4O9
UF4(c)	-44.20	-72.05	-27.85	UF4
UF4:2.5H2O	-34.99	-72.05	-37.06	UF4:2.5H2O
UO2(a)	-16.26	-25.65	-9.40	UO2
UO3(gamma)	-4.25	3.73	7.98	UO3
Uraninite(c)	-11.60	-25.65	-14.05	UO2
Witherite	-4.03	-12.61	-8.58	BaCO3
Zincite(c)	-1.66	9.77	11.43	ZnO
Zincosite	-11.14	-7.87	3.26	ZnSO4
Zn(NO3)2:6H2O	-18.07	-14.70	3.37	Zn(NO3)2:6H2O
Zn(OH)2-a	-2.68	9.77	12.45	Zn(OH)2
Zn(OH)2-b	-1.98	9.77	11.75	Zn(OH)2
Zn(OH)2-c	-2.43	9.77	12.20	Zn(OH)2
Zn(OH)2-e	-1.73	9.77	11.50	Zn(OH)2
Zn(OH)2-g	-1.94	9.77	11.71	Zn(OH)2
Zn2(OH)2SO4	-5.60	1.90	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.15	8.05	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-8.91	4.83	13.74	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-25.82	-5.98	19.84	ZnO:2ZnSO4
Zn4(OH)6SO4	-6.96	21.44	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-12.62	25.88	38.50	Zn5(OH)8Cl2
ZnCl2	-20.47	-13.21	7.26	ZnCl2
ZnCO3:H2O	-1.15	-11.41	-10.26	ZnCO3:H2O
ZnF2	-12.08	-13.43	-1.35	ZnF2
ZnMetal	-45.85	-19.61	26.24	Zn
ZnO(a)	-1.54	9.77	11.31	ZnO
ZnSO4:H2O	-7.45	-7.87	-0.43	ZnSO4:H2O

End of simulation.

-------------------Saturation indices-------------------------------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-0.38	10.77	11.15	Al(OH)3
AlAsO4:2H2O	-6.27	-1.47	4.81	AlAsO4:2H2O
AlumK	-15.70	-20.97	-5.27	KAl(SO4)2:12H2O
Alunite	1.31	0.58	-0.73	KAl3(SO4)2(OH)6
Anglesite	-3.58	-11.40	-7.82	PbSO4
Anhydrite	-1.51	-5.85	-4.34	CaSO4
Antlerite	-2.26	6.03	8.29	Cu3(OH)4SO4
Aragonite	-1.09	-9.39	-8.30	CaCO3
Arsenolite	-86.31	-166.48	-80.17	As4O6
Artinite	-7.88	2.10	9.98	MgCO3:Mg(OH)2:3H2O
As2O5	-31.25	-24.48	6.77	As2O5
Atacamite	-3.29	4.30	7.59	Cu2(OH)3Cl
Azurite	-2.09	-18.69	-16.60	Cu3(OH)2(CO3)2
B-UO2(OH)2	-2.00	3.73	5.73	UO2(OH)2
Ba3(AsO4)2	10.19	1.24	-8.95	Ba3(AsO4)2
BaF2	-8.85	-14.63	-5.77	BaF2
Barite	0.99	-9.07	-10.06	BaSO4
Basaluminite	2.75	25.45	22.70	Al4(OH)10SO4
Bianchite	-6.11	-7.87	-1.76	ZnSO4:6H2O
Birnessite	-4.30	39.30	43.60	MnO2
Bixbyite	-2.07	49.23	51.30	Mn2O3
Boehmite	1.82	10.77	8.96	AlOOH
Brochantite	-1.41	13.93	15.34	Cu4(OH)6SO4
Brucite	-5.56	11.64	17.20	Mg(OH)2
Bunsenite	-4.25	8.52	12.77	NiO
Ca3(AsO4)2:4w	-11.49	10.89	22.38	Ca3(AsO4)2:4H2O
Calcite	-0.94	-9.39	-8.45	CaCO3
Cd(gamma)	-35.47	-21.64	13.83	Cd
Cd(OH)2	-5.91	7.74	13.65	Cd(OH)2
Cd(OH)2(a)	-6.26	7.74	14.01	Cd(OH)2
Cd3(OH)2(SO4)2	-18.78	-12.07	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-16.98	5.58	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-15.08	13.32	28.40	Cd4(OH)6SO4
CdCl2	-14.62	-15.24	-0.62	CdCl2
CdCl2:2.5H2O	-13.27	-15.24	-1.96	CdCl2:2.5H2O
CdCl2:H2O	-13.55	-15.24	-1.69	CdCl2:H2O
CdF2	-12.61	-15.46	-2.85	CdF2
CdMetal	-35.37	-21.64	13.73	Cd
CdOHCl	-7.37	-3.75	3.62	CdOHCl
CdSO4	-10.00	-9.90	0.10	CdSO4
CdSO4:2.7H2O	-8.09	-9.90	-1.82	CdSO4:2.67H2O
CdSO4:H2O	-8.35	-9.90	-1.56	CdSO4:H2O
Cerrusite	-1.74	-14.94	-13.19	PbCO3
Chalcanthite	-7.09	-9.75	-2.66	CuSO4:5H2O
Claudetite	-86.06	-166.48	-80.42	As4O6
CO2(g)	-3.02	-21.18	-18.17	CO2
Cotunnite	-11.89	-16.73	-4.84	PbCl2
Cu(OH)2	-0.95	7.89	8.84	Cu(OH)2
Cu2(OH)3NO3	-5.92	3.55	9.47	Cu2(OH)3NO3
Cu2SO4	-23.95	-31.24	-7.29	Cu2SO4
Cu3(AsO4)2:6w	-6.96	-0.80	6.16	Cu3(AsO4)2:6H2O
CuCO3	-3.66	-13.29	-9.63	CuCO3
CuF	-22.94	-18.40	4.55	CuF
CuF2	-14.86	-15.31	-0.44	CuF2
CuF2:2H2O	-10.80	-15.31	-4.50	CuF2:2H2O
CuMetal	-9.80	-21.49	-11.69	Cu
CuOCuSO4	-13.86	-1.86	12.00	CuO:CuSO4
CupricFerrite	15.81	48.50	32.69	CuFe2O4
Cuprite	-6.56	-13.59	-7.03	Cu2O
CuprousFerrite	11.93	13.51	1.58	CuFeO2
CuSO4	-13.00	-9.75	3.25	CuSO4
Diaspore	3.57	10.77	7.21	AlOOH
Dolomite	-1.97	-18.93	-16.96	CaMg(CO3)2
Dolomite(d)	-2.54	-18.93	-16.39	CaMg(CO3)2
Epsomite	-3.83	-6.00	-2.18	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.75	16.86	10.11	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	2.27	20.30	18.04	Fe(OH)3
Fe3(OH)8	-0.29	46.22	46.52	Fe3(OH)8
Fluorite	-0.74	-11.41	-10.66	CaF2
Gibbsite	2.36	10.77	8.41	Al(OH)3
Goethite	8.16	20.30	12.15	FeOOH
Goslarite	-5.87	-7.87	-2.00	ZnSO4:7H2O
Gummite	-6.98	3.73	10.71	UO3
Gypsum	-1.27	-5.85	-4.58	CaSO4:2H2O
H2(g)	-29.33	-29.38	-0.05	H2
Halite	-9.12	-7.55	1.57	NaCl
Hausmannite	-3.21	59.15	62.37	Mn3O4
Hematite	17.91	40.61	22.70	Fe2O3
Huntite	-8.39	-38.02	-29.63	CaMg3(CO3)4
Hydrocerrusite	-6.17	-23.63	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-18.45	-26.52	-8.07	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-2.97	28.48	31.45	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-1.48	29.18	30.65	KFe3(SO4)2(OH)6
Jarosite-Na	-5.08	29.56	34.65	NaFe3(SO4)2(OH)6
JarositeH	-9.16	25.62	34.79	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-3.64	-6.87	-3.23	AlOHSO4
Langite	-3.39	13.93	17.32	Cu4(OH)6SO4:H2O
Larnakite	-4.96	-5.15	-0.19	PbO:PbSO4
Laurionite	-5.87	-5.24	0.62	PbOHCl
Litharge	-6.69	6.25	12.94	PbO
Maghemite	7.93	40.61	32.68	Fe2O3
Magnesite	-1.59	-9.54	-7.95	MgCO3
Magnetite	15.52	46.22	30.70	Fe3O4
Malachite	-0.43	-5.40	-4.97	Cu2(OH)2CO3
Manganite	-0.73	24.61	25.34	MnOOH
Massicot	-6.89	6.25	13.13	PbO
Matlockite	-7.31	-16.84	-9.54	PbClF
Melanothallite	-18.98	-15.09	3.89	CuCl2
Melanterite	-9.76	-12.03	-2.28	FeSO4:7H2O
Minium	-26.94	48.12	75.05	Pb3O4
Mirabilite	-8.40	-9.76	-1.37	Na2SO4:10H2O
Mn2(SO4)3	-50.22	-3.71	46.51	Mn2(SO4)3
Mn3(AsO4):8H2O	-7.29	5.29	12.58	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-15.53	-13.05	2.48	MnCl2:4H2O
MnSO4	-10.60	-7.72	2.87	MnSO4
Monteponite	-6.36	7.74	14.10	CdO
Morenosite	-6.73	-9.13	-2.40	NiSO4:7H2O
Na4UO2(CO3)3	-27.77	-44.06	-16.29	Na4UO2(CO3)3
Nahcolite	-6.27	-17.24	-10.98	NaHCO3
Nantokite	-8.70	-18.29	-9.59	CuCl
Natron	-11.78	-13.30	-1.52	Na2CO3:10H2O
Nesquehonite	-4.00	-9.54	-5.54	MgCO3:3H2O
Ni(OH)2	-1.88	8.52	10.40	Ni(OH)2
Ni3(AsO4)2:8H2O	-14.71	1.06	15.77	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-15.59	16.41	32.00	Ni4(OH)6SO4
NiCO3	-5.96	-12.67	-6.71	NiCO3
Nsutite	-3.26	39.30	42.56	MnO2
O2(g)	-26.26	58.76	85.02	O2
Otavite	-1.34	-13.44	-12.10	CdCO3
Pb(OH)2	-2.09	6.25	8.34	Pb(OH)2
Pb2(OH)3Cl	-7.79	1.00	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.71	12.49	26.20	PbO:Pb(OH)2
Pb2O3	-19.17	41.87	61.04	Pb2O3
Pb2OCO3	-8.34	-8.69	-0.35	PbO:PbCO3
Pb3(AsO4)2	-11.63	-5.75	5.88	Pb3(AsO4)2
Pb3O2CO3	-13.82	-2.45	11.37	PbCO3:2PbO
Pb3O2SO4	-9.58	1.09	10.68	PbSO4:2PbO
Pb4(OH)6SO4	-13.76	7.34	21.10	Pb4(OH)6SO4
Pb4O3SO4	-15.23	7.34	22.57	PbSO4:3PbO
PbF2	-9.52	-16.95	-7.43	PbF2
PbMetal	-27.40	-23.13	4.26	Pb
PbO:0.3H2O	-6.73	6.25	12.98	PbO:0.33H2O
Phosgenite	-11.86	-31.67	-19.81	PbCl2:PbCO3
Plattnerite	-14.61	35.63	50.24	PbO2
Portlandite	-11.42	11.79	23.21	Ca(OH)2
Pyrochroite	-5.28	9.92	15.20	Mn(OH)2
Pyrolusite	-2.94	39.30	42.24	MnO2
Retgersite	-7.08	-9.13	-2.05	NiSO4:6H2O
Rhodochrosite	-0.15	-11.26	-11.11	MnCO3
Rhodochrosite(d)	-0.87	-11.26	-10.39	MnCO3
Rutherfordine	-3.03	-17.46	-14.43	UO2CO3
Schoepite	-1.84	3.73	5.56	UO2(OH)2:H2O
Scorodite	-5.48	8.06	13.54	FeAsO4:2H2O
Siderite	-4.71	-15.57	-10.86	FeCO3
Siderite(d)(3)	-5.12	-15.57	-10.45	FeCO3
Smithsonite	-1.47	-11.41	-9.94	ZnCO3
Tenorite	0.07	7.89	7.82	CuO
Thenardite	-9.59	-9.76	-0.17	Na2SO4
Thermonatrite	-13.46	-13.30	0.16	Na2CO3:H2O
Trona	-19.61	-30.54	-10.93	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-30.60	-43.30	-12.70	U(OH)2SO4
U3O8(c)	-11.78	-18.20	-6.42	U3O8
U4O9(c)	-33.21	-73.24	-40.03	U4O9
UF4(c)	-44.20	-72.05	-27.85	UF4
UF4:2.5H2O	-34.99	-72.05	-37.06	UF4:2.5H2O
UO2(a)	-16.26	-25.65	-9.40	UO2
UO3(gamma)	-4.25	3.73	7.98	UO3
Uraninite(c)	-11.60	-25.65	-14.05	UO2
Witherite	-4.03	-12.61	-8.58	BaCO3
Zincite(c)	-1.66	9.77	11.43	ZnO
Zincosite	-11.14	-7.87	3.26	ZnSO4
Zn(NO3)2:6H2O	-18.07	-14.70	3.37	Zn(NO3)2:6H2O
Zn(OH)2-a	-2.68	9.77	12.45	Zn(OH)2
Zn(OH)2-b	-1.98	9.77	11.75	Zn(OH)2
Zn(OH)2-c	-2.43	9.77	12.20	Zn(OH)2
Zn(OH)2-e	-1.73	9.77	11.50	Zn(OH)2
Zn(OH)2-g	-1.94	9.77	11.71	Zn(OH)2
Zn2(OH)2SO4	-5.60	1.90	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.15	8.05	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-8.91	4.83	13.74	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-25.82	-5.98	19.84	ZnO:2ZnSO4
Zn4(OH)6SO4	-6.96	21.44	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-12.62	25.88	38.50	Zn5(OH)8Cl2
ZnCl2	-20.47	-13.21	7.26	ZnCl2
ZnCO3:H2O	-1.15	-11.41	-10.26	ZnCO3:H2O
ZnF2	-12.08	-13.43	-1.35	ZnF2
ZnMetal	-45.85	-19.61	26.24	Zn
ZnO(a)	-1.54	9.77	11.31	ZnO
ZnSO4:H2O	-7.45	-7.87	-0.43	ZnSO4:H2O

End of simulation.

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Reading data base.
------------------

          SOLUTION_MASTER_SPECIES
          SOLUTION_SPECIES
          PHASES
          EXCHANGE_MASTER_SPECIES
          EXCHANGE_SPECIES
          SURFACE_MASTER_SPECIES
          SURFACE_SPECIES
          END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

          TITLE       Schneckenstein 3.5-4.5m
          SOLUTION    2
          units       mg/l
          temp        21
          pH           7.9
          pe           6.88
          F            1.7
          Cl           7.7
          N(5)         1.3       as NO3
          S(6)       190         as SO4
          Na          19
          K           13
          Mg          24
          Ca          61
          Alkalinity  24.4       as HCO3
          Al           1.030
          As           0.105
          Ba           0.153
          Cd           0.007
          Cu           0.186
          Fe           0.060
          Mn           3.1
          Ni           0.089
          Pb           0.21
          U            0.265
          Zn           1.37
          END
```

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TITLE
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       Schneckenstein 3.5-4.5m

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Beginning of initial solution calculations.
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Initial solution 2.

----------------------------Solution composition------------
-----------------

           Elements           Molality       Moles

           Al                3.819e-05   3.819e-05
           Alkalinity        4.000e-04   4.000e-04
           As                1.402e-06   1.402e-06
           Ba                1.114e-06   1.114e-06
           Ca                1.522e-03   1.522e-03
           Cd                6.230e-08   6.230e-08
           Cl                2.173e-04   2.173e-04
           Cu                2.928e-06   2.928e-06
           F                 8.951e-05   8.951e-05
           Fe                1.075e-06   1.075e-06
           K                 3.326e-04   3.326e-04
           Mg                9.875e-04   9.875e-04
           Mn                5.645e-05   5.645e-05
           N(5)              2.097e-05   2.097e-05
           Na                8.267e-04   8.267e-04
           Ni                1.516e-06   1.516e-06
           Pb                1.014e-06   1.014e-06
           S(6)              1.979e-03   1.979e-03
           U                 1.114e-06   1.114e-06
           Zn                2.096e-05   2.096e-05
```

```
----------------------------Description of solution----------------------
-----

                                     pH  =   7.900
                                     pe  =   6.880
                        Activity of water  =   1.000
                           Ionic strength  =   8.600e-03
                       Mass of water (kg)  =   1.000e+00
                    Total carbon (mol/kg)  =   2.321e-04
                       Total CO2 (mol/kg)  =   2.321e-04
                      Temperature (deg C)  =  21.000
                  Electrical balance (eq)  =   1.779e-03
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  18.78
                                Iterations  =  12
                                   Total H  = 1.110128e+02
                                   Total O  = 5.551506e+01
```

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Reading data base.
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           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE       Schneckenstein 3.5-4.5m
           SOLUTION    2
           units       mg/l
           temp        21
           pH           7.9
           pe           6.88
           F            1.7
           Cl           7.7
           N(5)         1.3       as NO3
           S(6)       190         as SO4
           Na          19
           K           13
           Mg          24
           Ca          61
           Alkalinity  24.4       as HCO3
           Al           1.030
           As           0.105
           Ba           0.153
           Cd           0.007
           Cu           0.186
           Fe(+2)       0.010
           Fe(+3)       0.050
           Mn           3.1
           Ni           0.089
           Pb           0.21
           U            0.265
           Zn           1.37
           END
```

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TITLE
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       Schneckenstein 3.5-4.5m

-------------------------------------------
Beginning of initial solution calculations.
-------------------------------------------

Initial solution 2.

----------------------------Solution composition--------------
---------------

           Elements           Molality       Moles

           Al                 3.819e-05   3.819e-05
           Alkalinity         4.000e-04   4.000e-04
           As                 1.402e-06   1.402e-06
           Ba                 1.114e-06   1.114e-06
           Ca                 1.522e-03   1.522e-03
           Cd                 6.230e-08   6.230e-08
           Cl                 2.173e-04   2.173e-04
           Cu                 2.928e-06   2.928e-06
           F                  8.951e-05   8.951e-05
           Fe(2)              1.791e-07   1.791e-07
           Fe(3)              8.956e-07   8.956e-07
           K                  3.326e-04   3.326e-04
           Mg                 9.875e-04   9.875e-04
           Mn                 5.645e-05   5.645e-05
           N(5)               2.097e-05   2.097e-05
           Na                 8.267e-04   8.267e-04
           Ni                 1.516e-06   1.516e-06
           Pb                 1.014e-06   1.014e-06
           S(6)               1.979e-03   1.979e-03
           U                  1.114e-06   1.114e-06
           Zn                 2.096e-05   2.096e-05
```

```
----------------------------Description of solution-------------------------
---

                                    pH  =   7.900
                                    pe  =   6.880
                      Activity of water  =   1.000
                         Ionic strength  =   8.601e-03
                     Mass of water (kg)  =   1.000e+00
                  Total carbon (mol/kg)  =   2.323e-04
                     Total CO2 (mol/kg)  =   2.323e-04
                    Temperature (deg C)  =  21.000
                 Electrical balance (eq)  =   1.779e-03
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  18.78
                               Iterations  =  12
                                  Total H  = 1.110128e+02
                                  Total O  = 5.551506e+01

---------------------------------Redox couples-----------------------------
---

           Redox couple             pe  Eh (volts)

           Fe(2)/Fe(3)          3.0788      0.1797
```

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Reading data base.
------------------

          SOLUTION_MASTER_SPECIES
          SOLUTION_SPECIES
          PHASES
          EXCHANGE_MASTER_SPECIES
          EXCHANGE_SPECIES
          SURFACE_MASTER_SPECIES
          SURFACE_SPECIES
          END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

          TITLE       Schneckenstein 3.5-4.5m
          SOLUTION    2
          units       mg/l
          temp        21
          pH           7.9
          pe           6.88
          F            1.7
          Cl           7.7
          N(5)         1.3       as NO3
          S(6)       190         as SO4
          Na          19
          K           13
          Mg          24
          Ca          61
          Alkalinity  24.4       as HCO3
          Al           1.030
          As           0.105
          Ba           0.153
          Cd           0.007
          Cu           0.186
          Fe(+2)       0.010
          Fe(+3)       0.050
          Mn           3.1
          Ni           0.089
          Pb           0.21
          U            0.265    Fe(+2)/Fe(+3)
          Zn           1.37
          END



----------------------------Description of solution---------------
-------------

                                    pH  =   7.900
                                    pe  =   6.880
                      Activity of water  =   1.000
                         Ionic strength  =   8.601e-03
                     Mass of water (kg)  =   1.000e+00
                Total carbon (mol/kg)    =   2.323e-04
                   Total CO2 (mol/kg)    =   2.323e-04
                  Temperature (deg C)    =  21.000
               Electrical balance (eq)   =   1.779e-03
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  18.78
                              Iterations  =  12
                                 Total H  = 1.110128e+02
                                 Total O  = 5.551506e+01

---------------------------------Redox couples--------------------
-------------

          Redox couple             pe  Eh (volts)

          Fe(2)/Fe(3)          3.0788      0.1797
```

```
-----
TITLE
-----

       Schneckenstein 3.5-4.5m

-------------------------------------------
Beginning of initial solution calculations.
-------------------------------------------

Initial solution 2.

-----------------------------Solution composition-----
------------------------

          Elements           Molality       Moles

          Al               3.819e-05   3.819e-05
          Alkalinity       4.000e-04   4.000e-04
          As               1.402e-06   1.402e-06
          Ba               1.114e-06   1.114e-06
          Ca               1.522e-03   1.522e-03
          Cd               6.230e-08   6.230e-08
          Cl               2.173e-04   2.173e-04
          Cu               2.928e-06   2.928e-06
          F                8.951e-05   8.951e-05
          Fe(2)            1.791e-07   1.791e-07
          Fe(3)            8.956e-07   8.956e-07
          K                3.326e-04   3.326e-04
          Mg               9.875e-04   9.875e-04
          Mn               5.645e-05   5.645e-05
          N(5)             2.097e-05   2.097e-05
          Na               8.267e-04   8.267e-04
          Ni               1.516e-06   1.516e-06
          Pb               1.014e-06   1.014e-06
          S(6)             1.979e-03   1.979e-03
          U                1.114e-06   1.114e-06
          Zn               2.096e-05   2.096e-05
```

----------Distribution of species----------

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
OH-	6.425e-07	5.837e-07	-6.192	-6.234	-0.042
H+	1.370e-08	1.259e-08	-7.863	-7.900	-0.037
H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al 3.819e-05					
Al(OH)4-	3.791e-05	3.444e-05	-4.421	-4.463	-0.042
Al(OH)3	2.414e-07	2.419e-07	-6.617	-6.616	0.001
Al(OH)2+	3.078e-08	2.796e-08	-7.512	-7.553	-0.042
AlF2+	3.385e-09	3.075e-09	-8.470	-8.512	-0.042
AlF3	2.997e-09	3.003e-09	-8.523	-8.522	0.001
AlF+2	1.181e-10	8.046e-11	-9.928	-10.094	-0.167
AlF4-	1.024e-10	9.304e-11	-9.990	-10.031	-0.042
AlOH+2	9.424e-11	6.423e-11	-10.026	-10.192	-0.167
AlSO4+	3.909e-13	3.552e-13	-12.408	-12.450	-0.042
Al+3	2.508e-13	1.058e-13	-12.601	-12.975	-0.375
Al(SO4)2-	1.357e-14	1.233e-14	-13.867	-13.909	-0.042
AlHSO4+2	5.627e-22	3.835e-22	-21.250	-21.416	-0.167
As(3) 6.352e-24					
H3AsO3	6.081e-24	6.093e-24	-23.216	-23.215	0.001
H2AsO3-	2.711e-25	2.463e-25	-24.567	-24.609	-0.042
HAsO3-2	1.905e-29	1.298e-29	-28.720	-28.887	-0.167
H4AsO3+	4.183e-32	3.801e-32	-31.379	-31.420	-0.042
AsO3-3	8.198e-35	3.460e-35	-34.086	-34.461	-0.375
As(5) 1.402e-06					
HAsO4-2	1.328e-06	9.053e-07	-5.877	-6.043	-0.167
H2AsO4-	7.313e-08	6.645e-08	-7.136	-7.178	-0.042
AsO4-3	3.910e-10	1.650e-10	-9.408	-9.783	-0.375
H3AsO4	1.405e-13	1.408e-13	-12.852	-12.851	0.001
Ba 1.114e-06					
Ba+2	8.060e-07	5.493e-07	-6.094	-6.260	-0.167
BaSO4	3.073e-07	3.079e-07	-6.512	-6.512	0.001
BaHCO3+	9.906e-10	9.000e-10	-9.004	-9.046	-0.042
BaCO3	1.734e-10	1.737e-10	-9.761	-9.760	0.001
BaOH+	1.627e-12	1.478e-12	-11.789	-11.830	-0.042
C(4) 2.321e-04					
HCO3-	2.127e-04	1.939e-04	-3.672	-3.712	-0.040
CO2	5.782e-06	5.793e-06	-5.238	-5.237	0.001
CaHCO3+	2.323e-06	2.110e-06	-5.634	-5.676	-0.042
MnCO3	1.720e-06	1.724e-06	-5.764	-5.764	0.001
MgHCO3+	1.438e-06	1.307e-06	-5.842	-5.884	-0.042
ZnCO3	1.359e-06	1.362e-06	-5.867	-5.866	0.001
NiCO3	1.122e-06	1.124e-06	-5.950	-5.949	0.001
CO3-2	9.616e-07	6.634e-07	-6.017	-6.178	-0.161
CaCO3	9.392e-07	9.411e-07	-6.027	-6.026	0.001
PbCO3	7.495e-07	7.509e-07	-6.125	-6.124	0.001
UO2(CO3)2-2	6.224e-07	4.242e-07	-6.206	-6.372	-0.167
MnHCO3+	6.220e-07	5.652e-07	-6.206	-6.248	-0.042
MgCO3	3.479e-07	3.486e-07	-6.459	-6.458	0.001
ZnHCO3+	2.763e-07	2.511e-07	-6.559	-6.600	-0.042
NaHCO3	8.136e-08	8.152e-08	-7.090	-7.089	0.001
UO2(CO3)3-4	7.594e-08	1.638e-08	-7.120	-7.786	-0.666
CuCO3	7.556e-08	7.571e-08	-7.122	-7.121	0.001
UO2CO3	2.931e-08	2.937e-08	-7.533	-7.532	0.001
Zn(CO3)2-2	2.834e-08	1.931e-08	-7.548	-7.714	-0.167
PbHCO3+	1.104e-08	1.003e-08	-7.957	-7.999	-0.042
NaCO3-	8.286e-09	7.529e-09	-8.082	-8.123	-0.042
NiHCO3+	6.732e-09	6.116e-09	-8.172	-8.214	-0.042
CuHCO3+	2.273e-09	2.065e-09	-8.643	-8.685	-0.042
Ni(CO3)2-2	1.901e-09	1.296e-09	-8.721	-8.887	-0.167
Pb(CO3)2-2	1.836e-09	1.251e-09	-8.736	-8.903	-0.167
BaHCO3+	9.906e-10	9.000e-10	-9.004	-9.046	-0.042
CdHCO3+	2.307e-10	2.096e-10	-9.637	-9.679	-0.042
BaCO3	1.734e-10	1.737e-10	-9.761	-9.760	0.001
Cu(CO3)2-2	9.278e-11	6.323e-11	-10.033	-10.199	-0.167
CdCO3	1.798e-11	1.802e-11	-10.745	-10.744	0.001
FeHCO3+	4.238e-13	3.851e-13	-12.373	-12.414	-0.042
FeCO3	3.155e-13	3.161e-13	-12.501	-12.500	0.001
Cd(CO3)2-2	5.546e-14	3.780e-14	-13.256	-13.423	-0.167
(UO2)3(CO3)6-6	3.262e-15	1.035e-16	-14.486	-15.985	-1.499
UO2(CO3)3-5	3.749e-27	3.413e-28	-26.426	-27.467	-1.041
U(CO3)4-4	8.027e-39	1.732e-39	-38.095	-38.762	-0.666
U(CO3)5-6	0.000e+00	0.000e+00	-42.540	-44.039	-1.499
Ca 1.522e-03					
Ca+2	1.323e-03	9.121e-04	-2.878	-3.040	-0.161
CaSO4	1.956e-04	1.960e-04	-3.709	-3.708	0.001
CaHCO3+	2.323e-06	2.110e-06	-5.634	-5.676	-0.042
CaCO3	9.392e-07	9.411e-07	-6.027	-6.026	0.001
CaF+	6.196e-07	5.630e-07	-6.208	-6.250	-0.042
CaOH+	1.323e-08	1.202e-08	-7.878	-7.920	-0.042
CaHSO4+	1.516e-11	1.378e-11	-10.819	-10.861	-0.042
Cd 6.230e-08					
Cd+2	5.017e-08	3.419e-08	-7.300	-7.466	-0.167
CdSO4	1.074e-08	1.076e-08	-7.969	-7.968	0.001
CdCl+	6.987e-10	6.349e-10	-9.156	-9.197	-0.042
CdHCO3+	2.307e-10	2.096e-10	-9.637	-9.679	-0.042
Cd(SO4)2-2	1.985e-10	1.353e-10	-9.702	-9.869	-0.167
CdOH+	1.841e-10	1.672e-10	-9.735	-9.777	-0.042
CdF+	3.690e-11	3.353e-11	-10.433	-10.475	-0.042
CdOHCl	1.907e-11	1.910e-11	-10.720	-10.719	0.001
CdCO3	1.798e-11	1.802e-11	-10.745	-10.744	0.001
CdNO3+	2.030e-12	1.844e-12	-11.693	-11.734	-0.042
Cd(OH)2	9.616e-13	9.635e-13	-12.017	-12.016	0.001
CdCl2	5.128e-13	5.138e-13	-12.290	-12.289	0.001
Cd(CO3)2-2	5.546e-14	3.780e-14	-13.256	-13.423	-0.167
CdF2	6.547e-15	6.560e-15	-14.184	-14.183	0.001
Cd2OH+3	6.980e-17	2.946e-17	-16.156	-16.531	-0.375
CdCl3-	6.616e-17	6.011e-17	-16.179	-16.221	-0.042
Cd(OH)3-	9.450e-18	8.586e-18	-17.025	-17.066	-0.042
Cd(OH)4-2	8.918e-24	6.078e-24	-23.050	-23.216	-0.167
Cl 2.173e-04					
Cl-	2.172e-04	1.971e-04	-3.663	-3.705	-0.042
MnCl+	2.890e-08	2.626e-08	-7.539	-7.581	-0.042
ZnOHCl	5.321e-09	5.332e-09	-8.274	-8.273	0.001
ZnCl+	5.022e-09	4.563e-09	-8.299	-8.341	-0.042
CdCl+	6.987e-10	6.349e-10	-9.156	-9.197	-0.042
PbCl+	5.087e-10	4.622e-10	-9.294	-9.335	-0.042
NiCl+	1.245e-10	1.131e-10	-9.905	-9.946	-0.042
CdOHCl	1.907e-11	1.910e-11	-10.720	-10.719	0.001
CuCl+	1.017e-11	9.243e-12	-10.993	-11.034	-0.042
MnCl2	2.255e-12	2.259e-12	-11.647	-11.646	0.001
ZnCl2	9.246e-13	9.264e-13	-12.034	-12.033	0.001
CdCl2	5.128e-13	5.138e-13	-12.290	-12.289	0.001
PbCl2	1.554e-13	1.557e-13	-12.809	-12.808	0.001
NiCl2	8.079e-14	8.095e-14	-13.093	-13.092	0.001
CuCl2-	1.932e-14	1.755e-14	-13.714	-13.756	-0.042
FeCl+	5.947e-15	5.404e-15	-14.226	-14.267	-0.042
UO2Cl+	3.276e-15	2.977e-15	-14.485	-14.526	-0.042
CuCl2	9.344e-16	9.362e-16	-15.029	-15.029	0.001
ZnCl3-	2.200e-16	1.999e-16	-15.657	-15.699	-0.042
MnCl3-	1.350e-16	1.226e-16	-15.870	-15.911	-0.042
CdCl3-	6.616e-17	6.011e-17	-16.179	-16.221	-0.042
PbCl3-	2.616e-17	2.377e-17	-16.582	-16.624	-0.042
CuCl3-2	7.921e-18	5.398e-18	-17.101	-17.268	-0.167
FeCl+2	8.849e-20	6.031e-20	-19.053	-19.220	-0.167
UO2Cl2	3.024e-20	3.030e-20	-19.519	-19.519	0.001
ZnCl4-2	2.806e-20	1.912e-20	-19.552	-19.718	-0.167
PbCl4-2	3.189e-21	2.173e-21	-20.496	-20.663	-0.167
CuCl3-	6.706e-22	6.093e-22	-21.174	-21.215	-0.042
FeCl2+	6.644e-23	6.037e-23	-22.178	-22.219	-0.042
FeCl3	1.187e-27	1.190e-27	-26.925	-26.925	0.001
CuCl4-2	8.039e-28	5.479e-28	-27.095	-27.261	-0.167
UCl+3	0.000e+00	0.000e+00	-48.514	-48.889	-0.375
Cu(1) 1.577e-12					
Cu+	1.558e-12	1.416e-12	-11.807	-11.849	-0.042
CuCl2-	1.932e-14	1.755e-14	-13.714	-13.756	-0.042
CuCl3-2	7.921e-18	5.398e-18	-17.101	-17.268	-0.167
Cu(2) 2.928e-06					
Cu(OH)2	2.795e-06	2.801e-06	-5.554	-5.553	0.001
CuCO3	7.556e-08	7.571e-08	-7.122	-7.121	0.001
Cu+2	3.118e-08	2.125e-08	-7.506	-7.673	-0.167
CuOH+	1.858e-08	1.688e-08	-7.731	-7.773	-0.042
CuSO4	4.710e-09	4.719e-09	-8.327	-8.326	0.001
CuHCO3+	2.273e-09	2.065e-09	-8.643	-8.685	-0.042
Cu2(OH)2+2	1.223e-10	8.335e-11	-9.913	-10.079	-0.167
Cu(CO3)2-2	9.278e-11	6.323e-11	-10.033	-10.199	-0.167
CuF+	3.194e-11	2.902e-11	-10.496	-10.537	-0.042
Cu(OH)3-	1.475e-11	1.340e-11	-10.831	-10.873	-0.042
CuCl+	1.017e-11	9.243e-12	-10.993	-11.034	-0.042
CuCl2	9.344e-16	9.362e-16	-15.029	-15.029	0.001
Cu(OH)4-2	3.117e-16	2.124e-16	-15.506	-15.673	-0.167
CuCl3-	6.706e-22	6.093e-22	-21.174	-21.215	-0.042
CuCl4-2	8.039e-28	5.479e-28	-27.095	-27.261	-0.167
F 8.951e-05					
F-	8.573e-05	7.789e-05	-4.067	-4.109	-0.042
MgF+	3.081e-06	2.800e-06	-5.511	-5.553	-0.042
CaF+	6.196e-07	5.630e-07	-6.208	-6.250	-0.042
NaF	3.345e-08	3.352e-08	-7.476	-7.475	0.001
MnF+	1.940e-08	1.763e-08	-7.712	-7.754	-0.042
ZnF+	1.184e-08	1.076e-08	-7.927	-7.968	-0.042
AlF2+	3.385e-09	3.075e-09	-8.470	-8.512	-0.042
AlF3	2.997e-09	3.003e-09	-8.523	-8.522	0.001
HF	1.367e-09	1.369e-09	-8.864	-8.864	0.001
NiF+	3.909e-10	3.552e-10	-9.408	-9.450	-0.042
AlF+2	1.181e-10	8.046e-11	-9.928	-10.094	-0.167
UO2F+	1.115e-10	1.013e-10	-9.953	-9.995	-0.042
AlF4-	1.024e-10	9.304e-11	-9.990	-10.031	-0.042
PbF+	9.930e-11	9.022e-11	-10.003	-10.045	-0.042
CdF+	3.690e-11	3.353e-11	-10.433	-10.475	-0.042
CuF+	3.194e-11	2.902e-11	-10.496	-10.537	-0.042
UO2F2	2.662e-11	2.667e-11	-10.575	-10.574	0.001
HF2-	4.358e-13	3.959e-13	-12.361	-12.402	-0.042
UO2F3-	4.351e-13	3.953e-13	-12.361	-12.403	-0.042
PbF2	1.432e-13	1.435e-13	-12.844	-12.843	0.001
FeF+	1.703e-14	1.547e-14	-13.769	-13.810	-0.042
CdF2	6.547e-15	6.560e-15	-14.184	-14.183	0.001
FeF2+	4.349e-15	3.951e-15	-14.362	-14.403	-0.042
FeF+2	1.962e-15	1.337e-15	-14.707	-14.874	-0.167
FeF3	4.801e-16	4.811e-16	-15.319	-15.318	0.001
UO2F4-2	2.883e-16	1.965e-16	-15.540	-15.707	-0.167
PbF3-	8.911e-17	8.097e-17	-16.050	-16.092	-0.042
H2F2	5.625e-18	5.636e-18	-17.250	-17.249	0.001
PbF4-2	4.429e-21	3.019e-21	-20.354	-20.520	-0.167
UF3+	2.325e-38	2.113e-38	-37.634	-37.675	-0.042
UF4	1.334e-38	1.336e-38	-37.875	-37.874	0.001
UF2+2	1.694e-39	1.154e-39	-38.771	-38.938	-0.167
UF5-	0.000e+00	0.000e+00	-40.488	-40.530	-0.042
UF+3	0.000e+00	0.000e+00	-41.370	-41.744	-0.375
UF6-2	0.000e+00	0.000e+00	-42.366	-42.533	-0.167
Fe(2) 3.397e-11					
Fe+2	2.915e-11	1.986e-11	-10.535	-10.702	-0.167
FeSO4	3.661e-12	3.668e-12	-11.436	-11.436	0.001
FeHCO3+	4.238e-13	3.851e-13	-12.373	-12.414	-0.042
FeOH+	4.056e-13	3.685e-13	-12.392	-12.434	-0.042
FeCO3	3.155e-13	3.161e-13	-12.501	-12.500	0.001
FeF+	1.703e-14	1.547e-14	-13.769	-13.810	-0.042
FeCl+	5.947e-15	5.404e-15	-14.226	-14.267	-0.042
Fe(OH)2	1.747e-16	1.751e-16	-15.758	-15.757	0.001
Fe(OH)3-	5.464e-19	4.965e-19	-18.262	-18.304	-0.042
FeHSO4+	3.302e-19	3.000e-19	-18.481	-18.523	-0.042

----------Distribution of species----------

	Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
	OH-	6.425e-07	5.837e-07	-6.192	-6.234	-0.042
	H+	1.370e-08	1.259e-08	-7.863	-7.900	-0.037
	H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	3.819e-05					
	Al(OH)4-	3.791e-05	3.444e-05	-4.421	-4.463	-0.042
	Al(OH)3	2.414e-07	2.419e-07	-6.617	-6.616	0.001
	Al(OH)2+	3.078e-08	2.796e-08	-7.512	-7.553	-0.042
	AlF2+	3.385e-09	3.075e-09	-8.470	-8.512	-0.042
	AlF3	2.997e-09	3.003e-09	-8.523	-8.522	0.001
	AlF+2	1.181e-10	8.046e-11	-9.928	-10.094	-0.167
	AlF4-	1.024e-10	9.304e-11	-9.990	-10.031	-0.042
	AlOH+2	9.424e-11	6.423e-11	-10.026	-10.192	-0.167
	AlSO4+	3.909e-13	3.552e-13	-12.408	-12.450	-0.042
	Al+3	2.508e-13	1.058e-13	-12.601	-12.975	-0.375
	Al(SO4)2-	1.357e-14	1.233e-14	-13.868	-13.909	-0.042
	AlHSO4+2	5.627e-22	3.835e-22	-21.250	-21.416	-0.167
As(3)	6.352e-24					
	H3AsO3	6.081e-24	6.093e-24	-23.216	-23.215	0.001
	H2AsO3-	2.711e-25	2.463e-25	-24.567	-24.609	-0.042
	HAsO3-2	1.905e-29	1.298e-29	-28.720	-28.887	-0.167
	H4AsO3+	4.183e-32	3.801e-32	-31.379	-31.420	-0.042
	AsO3-3	8.198e-35	3.460e-35	-34.086	-34.461	-0.375
As(5)	1.402e-06					
	HAsO4-2	1.328e-06	9.053e-07	-5.877	-6.043	-0.167
	H2AsO4-	7.313e-08	6.645e-08	-7.136	-7.178	-0.042
	AsO4-3	3.910e-10	1.650e-10	-9.408	-9.783	-0.375
	H3AsO4	1.405e-13	1.408e-13	-12.852	-12.851	0.001
Ba	1.114e-06					
	Ba+2	8.060e-07	5.493e-07	-6.094	-6.260	-0.167
	BaSO4	3.073e-07	3.079e-07	-6.512	-6.512	0.001
	BaHCO3+	9.913e-10	9.007e-10	-9.004	-9.045	-0.042
	BaCO3	1.735e-10	1.738e-10	-9.761	-9.760	0.001
	BaOH+	1.627e-12	1.478e-12	-11.789	-11.830	-0.042
C(4)	2.323e-04					
	HCO3-	2.129e-04	1.940e-04	-3.672	-3.712	-0.040
	CO2	5.786e-06	5.797e-06	-5.238	-5.237	0.001
	CaHCO3+	2.324e-06	2.112e-06	-5.634	-5.675	-0.042
	MnCO3	1.721e-06	1.725e-06	-5.764	-5.763	0.001
	MgHCO3+	1.439e-06	1.308e-06	-5.842	-5.883	-0.042
	ZnCO3	1.360e-06	1.362e-06	-5.867	-5.866	0.001
	NiCO3	1.122e-06	1.124e-06	-5.950	-5.949	0.001
	CO3-2	9.623e-07	6.639e-07	-6.017	-6.178	-0.161
	CaCO3	9.399e-07	9.418e-07	-6.027	-6.026	0.001
	PbCO3	7.496e-07	7.511e-07	-6.125	-6.124	0.001
	UO2(CO3)2-2	6.227e-07	4.244e-07	-6.206	-6.372	-0.167
	MnHCO3+	6.225e-07	5.656e-07	-6.206	-6.248	-0.042
	MgCO3	3.481e-07	3.488e-07	-6.458	-6.457	0.001
	ZnHCO3+	2.765e-07	2.512e-07	-6.558	-6.600	-0.042
	NaHCO3	8.142e-08	8.158e-08	-7.089	-7.088	0.001
	UO2(CO3)3-4	7.603e-08	1.640e-08	-7.119	-7.785	-0.666
	CuCO3	7.561e-08	7.576e-08	-7.121	-7.121	0.001
	UO2CO3	2.930e-08	2.936e-08	-7.533	-7.532	0.001
	Zn(CO3)2-2	2.838e-08	1.934e-08	-7.547	-7.714	-0.167
	PbHCO3+	1.104e-08	1.003e-08	-7.957	-7.999	-0.042
	NaCO3-	8.292e-09	7.534e-09	-8.081	-8.123	-0.042
	NiHCO3+	6.733e-09	6.117e-09	-8.172	-8.213	-0.042
	CuHCO3+	2.274e-09	2.066e-09	-8.643	-8.685	-0.042
	FeHCO3+	2.236e-09	2.032e-09	-8.650	-8.692	-0.042
	Ni(CO3)2-2	1.903e-09	1.297e-09	-8.721	-8.887	-0.167
	Pb(CO3)2-2	1.838e-09	1.252e-09	-8.736	-8.902	-0.167
	FeCO3	1.664e-09	1.668e-09	-8.779	-8.778	0.001
	BaHCO3+	9.913e-10	9.007e-10	-9.004	-9.045	-0.042
	CdHCO3+	2.309e-10	2.098e-10	-9.637	-9.678	-0.042
	BaCO3	1.735e-10	1.738e-10	-9.761	-9.760	0.001
	Cu(CO3)2-2	9.291e-11	6.332e-11	-10.032	-10.198	-0.167
	CdCO3	1.800e-11	1.803e-11	-10.745	-10.744	0.001
	Cd(CO3)2-2	5.554e-14	3.785e-14	-13.255	-13.422	-0.167
	(UO2)3(CO3)6-6	3.267e-15	1.036e-16	-14.486	-15.985	-1.499
	UO2(CO3)3-5	3.753e-27	3.417e-28	-26.426	-27.466	-1.041
	U(CO3)4-4	8.042e-39	1.735e-39	-38.095	-38.761	-0.666
	U(CO3)5-6	0.000e+00	0.000e+00	-42.539	-44.038	-1.499
Ca	1.522e-03					
	Ca+2	1.323e-03	9.121e-04	-2.878	-3.040	-0.162
	CaSO4	1.956e-04	1.960e-04	-3.709	-3.708	0.001
	CaHCO3+	2.324e-06	2.112e-06	-5.634	-5.675	-0.042
	CaCO3	9.399e-07	9.418e-07	-6.027	-6.026	0.001
	CaF+	6.196e-07	5.630e-07	-6.208	-6.250	-0.042
	CaOH+	1.323e-08	1.202e-08	-7.878	-7.920	-0.042
	CaHSO4+	1.516e-11	1.378e-11	-10.819	-10.861	-0.042
Cd	6.230e-08					
	Cd+2	5.017e-08	3.419e-08	-7.300	-7.466	-0.167
	CdSO4	1.074e-08	1.076e-08	-7.969	-7.968	0.001
	CdCl+	6.987e-10	6.349e-10	-9.156	-9.197	-0.042
	CdHCO3+	2.309e-10	2.098e-10	-9.637	-9.678	-0.042
	Cd(SO4)2-2	1.985e-10	1.353e-10	-9.702	-9.869	-0.167
	CdOH+	1.841e-10	1.672e-10	-9.735	-9.777	-0.042
	CdF+	3.690e-11	3.353e-11	-10.433	-10.475	-0.042
	CdOHCl	1.907e-11	1.910e-11	-10.720	-10.719	0.001
	CdCO3	1.800e-11	1.803e-11	-10.745	-10.744	0.001
	CdNO3+	2.030e-12	1.844e-12	-11.693	-11.734	-0.042
	Cd(OH)2	9.616e-13	9.635e-13	-12.017	-12.016	0.001
	CdCl2	5.128e-13	5.138e-13	-12.290	-12.289	0.001
	Cd(CO3)2-2	5.554e-14	3.785e-14	-13.255	-13.422	-0.167
	CdF2	6.547e-15	6.560e-15	-14.184	-14.183	0.001
	Cd2OH+3	6.980e-17	2.946e-17	-16.156	-16.531	-0.375
	CdCl3-	6.616e-17	6.011e-17	-16.179	-16.221	-0.042
	Cd(OH)3-	9.450e-18	8.586e-18	-17.025	-17.066	-0.042
	Cd(OH)4-2	8.918e-24	6.078e-24	-23.050	-23.216	-0.167
Cl	2.173e-04					
	Cl-	2.172e-04	1.971e-04	-3.663	-3.705	-0.042
	MnCl+	2.890e-08	2.626e-08	-7.539	-7.581	-0.042
	ZnOHCl	5.321e-09	5.331e-09	-8.274	-8.273	0.001
	ZnCl+	5.022e-09	4.563e-09	-8.299	-8.341	-0.042
	CdCl+	6.987e-10	6.349e-10	-9.156	-9.197	-0.042
	PbCl+	5.084e-10	4.619e-10	-9.294	-9.335	-0.042
	NiCl+	1.244e-10	1.131e-10	-9.905	-9.947	-0.042
	FeCl+	3.135e-11	2.849e-11	-10.504	-10.545	-0.042
	CdOHCl	1.907e-11	1.910e-11	-10.720	-10.719	0.001
	CuCl+	1.017e-11	9.242e-12	-10.993	-11.034	-0.042
	MnCl2	2.254e-12	2.259e-12	-11.647	-11.646	0.001
	ZnCl2	9.245e-13	9.264e-13	-12.034	-12.033	0.001
	CdCl2	5.128e-13	5.138e-13	-12.290	-12.289	0.001
	PbCl2	1.553e-13	1.556e-13	-12.809	-12.808	0.001
	NiCl2	8.075e-14	8.091e-14	-13.093	-13.092	0.001
	CuCl2-	1.932e-14	1.755e-14	-13.714	-13.756	-0.042
	UO2Cl+	3.273e-15	2.974e-15	-14.485	-14.527	-0.042
	CuCl2	9.344e-16	9.362e-16	-15.029	-15.029	0.001
	ZnCl3-	2.200e-16	1.999e-16	-15.658	-15.699	-0.042
	MnCl3-	1.349e-16	1.226e-16	-15.870	-15.911	-0.042
	CdCl3-	6.616e-17	6.011e-17	-16.179	-16.221	-0.042
	PbCl3-	2.615e-17	2.376e-17	-16.583	-16.624	-0.042
	CuCl3-2	7.920e-18	5.398e-18	-17.101	-17.268	-0.167
	FeCl+2	7.375e-20	5.026e-20	-19.132	-19.299	-0.167
	UO2Cl2	3.021e-20	3.027e-20	-19.520	-19.519	0.001
	ZnCl4-2	2.806e-20	1.912e-20	-19.552	-19.718	-0.167
	PbCl4-2	3.188e-21	2.172e-21	-20.497	-20.663	-0.167
	CuCl3-	6.706e-22	6.093e-22	-21.174	-21.215	-0.042
	FeCl2+	5.537e-23	5.031e-23	-22.257	-22.298	-0.042
	FeCl3	9.895e-28	9.915e-28	-27.005	-27.004	0.001
	CuCl4-2	8.039e-28	5.479e-28	-27.095	-27.261	-0.167
	UCl+3	0.000e+00	0.000e+00	-48.515	-48.889	-0.375
Cu(1)	1.577e-12					
	Cu+	1.558e-12	1.416e-12	-11.807	-11.849	-0.042
	CuCl2-	1.932e-14	1.755e-14	-13.714	-13.756	-0.042
	CuCl3-2	7.920e-18	5.398e-18	-17.101	-17.268	-0.167
Cu(2)	2.928e-06					
	Cu(OH)2	2.795e-06	2.801e-06	-5.554	-5.553	0.001
	CuCO3	7.561e-08	7.576e-08	-7.121	-7.121	0.001
	Cu+2	3.118e-08	2.125e-08	-7.506	-7.673	-0.167
	CuOH+	1.858e-08	1.688e-08	-7.731	-7.773	-0.042
	CuSO4	4.709e-09	4.719e-09	-8.327	-8.326	0.001
	CuHCO3+	2.274e-09	2.066e-09	-8.643	-8.685	-0.042
	Cu2(OH)2+2	1.223e-10	8.335e-11	-9.913	-10.079	-0.167
	Cu(CO3)2-2	9.291e-11	6.332e-11	-10.032	-10.198	-0.167
	CuF+	3.194e-11	2.902e-11	-10.496	-10.537	-0.042
	Cu(OH)3-	1.475e-11	1.340e-11	-10.831	-10.873	-0.042
	CuCl+	1.017e-11	9.242e-12	-10.993	-11.034	-0.042
	CuCl2	9.344e-16	9.362e-16	-15.029	-15.029	0.001
	Cu(OH)4-2	3.117e-16	2.124e-16	-15.506	-15.673	-0.167
	CuCl3-	6.706e-22	6.093e-22	-21.174	-21.215	-0.042
	CuCl4-2	8.039e-28	5.479e-28	-27.095	-27.261	-0.167
F	8.951e-05					
	F-	8.573e-05	7.789e-05	-4.067	-4.109	-0.042
	MgF+	3.081e-06	2.800e-06	-5.511	-5.553	-0.042
	CaF+	6.196e-07	5.630e-07	-6.208	-6.250	-0.042
	NaF	3.345e-08	3.352e-08	-7.476	-7.475	0.001
	MnF+	1.940e-08	1.763e-08	-7.712	-7.754	-0.042
	ZnF+	1.184e-08	1.076e-08	-7.927	-7.968	-0.042
	AlF2+	3.385e-09	3.075e-09	-8.470	-8.512	-0.042
	AlF3	2.997e-09	3.003e-09	-8.523	-8.522	0.001
	HF	1.367e-09	1.369e-09	-8.864	-8.864	0.001
	NiF+	3.907e-10	3.550e-10	-9.408	-9.450	-0.042
	AlF+2	1.181e-10	8.046e-11	-9.928	-10.094	-0.167
	UO2F+	1.113e-10	1.012e-10	-9.953	-9.995	-0.042
	AlF4-	1.024e-10	9.304e-11	-9.990	-10.031	-0.042
	PbF+	9.925e-11	9.018e-11	-10.003	-10.045	-0.042
	FeF+	8.978e-11	8.157e-11	-10.047	-10.088	-0.042
	CdF+	3.690e-11	3.353e-11	-10.433	-10.475	-0.042
	CuF+	3.194e-11	2.902e-11	-10.496	-10.537	-0.042
	UO2F2	2.659e-11	2.665e-11	-10.575	-10.574	0.001
	HF2-	4.358e-13	3.959e-13	-12.361	-12.402	-0.042
	UO2F3-	4.347e-13	3.949e-13	-12.362	-12.403	-0.042
	PbF2	1.431e-13	1.434e-13	-12.844	-12.843	0.001
	CdF2	6.547e-15	6.560e-15	-14.184	-14.183	0.001
	FeF2+	3.624e-15	3.293e-15	-14.441	-14.482	-0.042
	FeF+2	1.635e-15	1.114e-15	-14.786	-14.953	-0.167
	FeF3	4.001e-16	4.009e-16	-15.398	-15.397	0.001
	UO2F4-2	2.880e-16	1.963e-16	-15.541	-15.707	-0.167
	PbF3-	8.906e-17	8.092e-17	-16.050	-16.092	-0.042
	H2F2	5.625e-18	5.636e-18	-17.250	-17.249	0.001
	PbF4-2	4.427e-21	3.017e-21	-20.354	-20.520	-0.167
	UF3+	2.323e-38	2.111e-38	-37.634	-37.676	-0.042
	UF4	1.333e-38	1.335e-38	-37.875	-37.874	0.001
	UF2+2	1.692e-39	1.153e-39	-38.772	-38.938	-0.167
	UF5-	0.000e+00	0.000e+00	-40.488	-40.530	-0.042
	UF+3	0.000e+00	0.000e+00	-41.370	-41.745	-0.375
	UF6-2	0.000e+00	0.000e+00	-42.367	-42.533	-0.167
Fe(2)	1.791e-07					
	Fe+2	1.537e-07	1.047e-07	-6.813	-6.980	-0.167
	FeSO4	1.930e-08	1.934e-08	-7.714	-7.714	0.001
	FeHCO3+	2.236e-09	2.032e-09	-8.650	-8.692	-0.042
	FeOH+	2.138e-09	1.943e-09	-8.670	-8.712	-0.042
	FeCO3	1.664e-09	1.668e-09	-8.779	-8.778	0.001
	FeF+	8.978e-11	8.157e-11	-10.047	-10.088	-0.042
	FeCl+	3.135e-11	2.849e-11	-10.504	-10.545	-0.042
	Fe(OH)2	9.212e-13	9.231e-13	-12.036	-12.035	0.001
	Fe(OH)3-	2.881e-15	2.618e-15	-14.540	-14.582	-0.042
	FeHSO4+	1.741e-15	1.582e-15	-14.759	-14.801	-0.042

----------Distribution of species----------

	Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
	OH-	6.425e-07	5.837e-07	-6.192	-6.234	-0.042
	H+	1.370e-08	1.259e-08	-7.863	-7.900	-0.037
	H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	3.819e-05					
	Al(OH)4-	3.791e-05	3.444e-05	-4.421	-4.463	-0.042
	Al(OH)3	2.414e-07	2.419e-07	-6.617	-6.616	0.001
	Al(OH)2+	3.078e-08	2.796e-08	-7.512	-7.553	-0.042
	AlF2+	3.385e-09	3.075e-09	-8.470	-8.512	-0.042
	AlF3	2.997e-09	3.003e-09	-8.523	-8.522	0.001
	AlF+2	1.181e-10	8.046e-11	-9.928	-10.094	-0.167
	AlF4-	1.024e-10	9.304e-11	-9.990	-10.031	-0.042
	AlOH+2	9.424e-11	6.423e-11	-10.026	-10.192	-0.167
	AlSO4+	3.909e-13	3.552e-13	-12.408	-12.450	-0.042
	Al+3	2.508e-13	1.058e-13	-12.601	-12.975	-0.375
	Al(SO4)2-	1.357e-14	1.233e-14	-13.868	-13.909	-0.042
	AlHSO4+2	5.627e-22	3.835e-22	-21.250	-21.416	-0.167
As(3)	6.352e-24					
	H3AsO3	6.081e-24	6.093e-24	-23.216	-23.215	0.001
	H2AsO3-	2.711e-25	2.463e-25	-24.567	-24.609	-0.042
	HAsO3-2	1.905e-29	1.298e-29	-28.720	-28.887	-0.167
	H4AsO3+	4.183e-32	3.801e-32	-31.379	-31.420	-0.042
	AsO3-3	8.198e-35	3.460e-35	-34.086	-34.461	-0.375
As(5)	1.402e-06					
	HAsO4-2	1.328e-06	9.053e-07	-5.877	-6.043	-0.167
	H2AsO4-	7.313e-08	6.645e-08	-7.136	-7.178	-0.042
	AsO4-3	3.910e-10	1.650e-10	-9.408	-9.783	-0.375
	H3AsO4	1.405e-13	1.408e-13	-12.852	-12.851	0.001
Ba	1.114e-06					
	Ba+2	8.060e-07	5.493e-07	-6.094	-6.260	-0.167
	BaSO4	3.073e-07	3.079e-07	-6.512	-6.512	0.001
	BaHCO3+	9.913e-10	9.007e-10	-9.004	-9.045	-0.042
	BaCO3	1.735e-10	1.738e-10	-9.761	-9.760	0.001
	BaOH+	1.627e-12	1.478e-12	-11.789	-11.830	-0.042
C(4)	2.323e-04					
	HCO3-	2.129e-04	1.940e-04	-3.672	-3.712	-0.040
	CO2	5.786e-06	5.797e-06	-5.238	-5.237	0.001
	CaHCO3+	2.324e-06	2.112e-06	-5.634	-5.675	-0.042
	MnCO3	1.721e-06	1.725e-06	-5.764	-5.763	0.001
	MgHCO3+	1.439e-06	1.308e-06	-5.842	-5.883	-0.042
	ZnCO3	1.360e-06	1.362e-06	-5.867	-5.866	0.001
	NiCO3	1.122e-06	1.124e-06	-5.950	-5.949	0.001
	CO3-2	9.623e-07	6.639e-07	-6.017	-6.178	-0.161
	CaCO3	9.399e-07	9.418e-07	-6.027	-6.026	0.001
	PbCO3	7.496e-07	7.511e-07	-6.125	-6.124	0.001
	UO2(CO3)2-2	6.227e-07	4.244e-07	-6.206	-6.372	-0.167
	MnHCO3+	6.225e-07	5.656e-07	-6.206	-6.248	-0.042
	MgCO3	3.481e-07	3.488e-07	-6.458	-6.457	0.001
	ZnHCO3+	2.765e-07	2.512e-07	-6.558	-6.600	-0.042
	NaHCO3	8.142e-08	8.158e-08	-7.089	-7.088	0.001
	UO2(CO3)3-4	7.603e-08	1.640e-08	-7.119	-7.785	-0.666
	CuCO3	7.561e-08	7.576e-08	-7.121	-7.121	0.001
	UO2CO3	2.930e-08	2.936e-08	-7.533	-7.532	0.001
	Zn(CO3)2-2	2.838e-08	1.934e-08	-7.547	-7.714	-0.167
	PbHCO3+	1.104e-08	1.003e-08	-7.957	-7.999	-0.042
	NaCO3-	8.292e-09	7.534e-09	-8.081	-8.123	-0.042
	NiHCO3+	6.733e-09	6.117e-09	-8.172	-8.213	-0.042
	CuHCO3+	2.274e-09	2.066e-09	-8.643	-8.685	-0.042
	FeHCO3+	2.236e-09	2.032e-09	-8.650	-8.692	-0.042
	Ni(CO3)2-2	1.903e-09	1.297e-09	-8.721	-8.887	-0.167
	Pb(CO3)2-2	1.838e-09	1.252e-09	-8.736	-8.902	-0.167
	FeCO3	1.664e-09	1.668e-09	-8.779	-8.778	0.001
	BaHCO3+	9.913e-10	9.007e-10	-9.004	-9.045	-0.042
	CdHCO3+	2.309e-10	2.098e-10	-9.637	-9.678	-0.042
	BaCO3	1.735e-10	1.738e-10	-9.761	-9.760	0.001
	Cu(CO3)2-2	9.291e-11	6.332e-11	-10.032	-10.198	-0.167
	CdCO3	1.800e-11	1.803e-11	-10.745	-10.744	0.001
	Cd(CO3)2-2	5.554e-14	3.785e-14	-13.255	-13.422	-0.167
	(UO2)3(CO3)6-6	3.267e-15	1.036e-16	-14.486	-15.985	-1.499
	UO2(CO3)3-5	2.374e-23	2.161e-24	-22.624	-23.665	-1.041
	U(CO3)4-4	3.219e-31	6.943e-32	-30.492	-31.158	-0.666
	U(CO3)5-6	1.156e-35	3.667e-37	-34.937	-36.436	-1.499
Ca	1.522e-03					
	Ca+2	1.323e-03	9.121e-04	-2.878	-3.040	-0.162
	CaSO4	1.956e-04	1.960e-04	-3.709	-3.708	0.001
	CaHCO3+	2.324e-06	2.112e-06	-5.634	-5.675	-0.042
	CaCO3	9.399e-07	9.418e-07	-6.027	-6.026	0.001
	CaF+	6.196e-07	5.630e-07	-6.208	-6.250	-0.042
	CaOH+	1.323e-08	1.202e-08	-7.878	-7.920	-0.042
	CaHSO4+	1.516e-11	1.378e-11	-10.819	-10.861	-0.042
Cd	6.230e-08					
	Cd+2	5.017e-08	3.419e-08	-7.300	-7.466	-0.167
	CdSO4	1.074e-08	1.076e-08	-7.969	-7.968	0.001
	CdCl+	6.987e-10	6.349e-10	-9.156	-9.197	-0.042
	CdHCO3+	2.309e-10	2.098e-10	-9.637	-9.678	-0.042
	Cd(SO4)2-2	1.985e-10	1.353e-10	-9.702	-9.869	-0.167
	CdOH+	1.841e-10	1.672e-10	-9.735	-9.777	-0.042
	CdF+	3.690e-11	3.353e-11	-10.433	-10.475	-0.042
	CdOHCl	1.907e-11	1.910e-11	-10.720	-10.719	0.001
	CdCO3	1.800e-11	1.803e-11	-10.745	-10.744	0.001
	CdNO3+	2.030e-12	1.844e-12	-11.693	-11.734	-0.042
	Cd(OH)2	9.616e-13	9.635e-13	-12.017	-12.016	0.001
	CdCl2	5.128e-13	5.138e-13	-12.290	-12.289	0.001
	Cd(CO3)2-2	5.554e-14	3.785e-14	-13.255	-13.422	-0.167
	CdF2	6.547e-15	6.560e-15	-14.184	-14.183	0.001
	Cd2OH+3	6.980e-17	2.946e-17	-16.156	-16.531	-0.375
	CdCl3-	6.616e-17	6.011e-17	-16.179	-16.221	-0.042
	Cd(OH)3-	9.450e-18	8.586e-18	-17.025	-17.066	-0.042
	Cd(OH)4-2	8.918e-24	6.078e-24	-23.050	-23.216	-0.167
Cl	2.173e-04					
	Cl-	2.172e-04	1.971e-04	-3.663	-3.705	-0.042
	MnCl+	2.890e-08	2.626e-08	-7.539	-7.581	-0.042
	ZnOHCl	5.321e-09	5.331e-09	-8.274	-8.273	0.001
	ZnCl+	5.022e-09	4.563e-09	-8.299	-8.341	-0.042
	CdCl+	6.987e-10	6.349e-10	-9.156	-9.197	-0.042
	PbCl+	5.084e-10	4.619e-10	-9.294	-9.335	-0.042
	NiCl+	1.244e-10	1.131e-10	-9.905	-9.947	-0.042
	FeCl+	3.135e-11	2.849e-11	-10.504	-10.545	-0.042
	CdOHCl	1.907e-11	1.910e-11	-10.720	-10.719	0.001
	CuCl+	1.017e-11	9.242e-12	-10.993	-11.034	-0.042
	MnCl2	2.254e-12	2.259e-12	-11.647	-11.646	0.001
	ZnCl2	9.245e-13	9.264e-13	-12.034	-12.033	0.001
	CdCl2	5.128e-13	5.138e-13	-12.290	-12.289	0.001
	PbCl2	1.553e-13	1.556e-13	-12.809	-12.808	0.001
	NiCl2	8.075e-14	8.091e-14	-13.093	-13.092	0.001
	CuCl2-	1.932e-14	1.755e-14	-13.714	-13.756	-0.042
	UO2Cl+	3.273e-15	2.974e-15	-14.485	-14.527	-0.042
	CuCl2	9.344e-16	9.362e-16	-15.029	-15.029	0.001
	ZnCl3-	2.200e-16	1.999e-16	-15.658	-15.699	-0.042
	MnCl3-	1.349e-16	1.226e-16	-15.870	-15.911	-0.042
	CdCl3-	6.616e-17	6.011e-17	-16.179	-16.221	-0.042
	PbCl3-	2.615e-17	2.376e-17	-16.583	-16.624	-0.042
	CuCl3-2	7.920e-18	5.398e-18	-17.101	-17.268	-0.167
	FeCl+2	7.375e-20	5.026e-20	-19.132	-19.299	-0.167
	UO2Cl2	3.021e-20	3.027e-20	-19.520	-19.519	0.001
	ZnCl4-2	2.806e-20	1.912e-20	-19.552	-19.718	-0.167
	PbCl4-2	3.188e-21	2.172e-21	-20.497	-20.663	-0.167
	CuCl3-	6.706e-22	6.093e-22	-21.174	-21.215	-0.042
	FeCl2+	5.537e-23	5.031e-23	-22.257	-22.298	-0.042
	FeCl3	9.895e-28	9.915e-28	-27.005	-27.004	0.001
	CuCl4-2	8.039e-28	5.479e-28	-27.095	-27.261	-0.167
	UCl+3	0.000e+00	0.000e+00	-40.912	-41.287	-0.375
Cu(1)	1.577e-12					
	Cu+	1.558e-12	1.416e-12	-11.807	-11.849	-0.042
	CuCl2-	1.932e-14	1.755e-14	-13.714	-13.756	-0.042
	CuCl3-2	7.920e-18	5.398e-18	-17.101	-17.268	-0.167
Cu(2)	2.928e-06					
	Cu(OH)2	2.795e-06	2.801e-06	-5.554	-5.553	0.001
	CuCO3	7.561e-08	7.576e-08	-7.121	-7.121	0.001
	Cu+2	3.118e-08	2.125e-08	-7.506	-7.673	-0.167
	CuOH+	1.858e-08	1.688e-08	-7.731	-7.773	-0.042
	CuSO4	4.709e-09	4.719e-09	-8.327	-8.326	0.001
	CuHCO3+	2.274e-09	2.066e-09	-8.643	-8.685	-0.042
	Cu2(OH)2+2	1.223e-10	8.335e-11	-9.913	-10.079	-0.167
	Cu(CO3)2-2	9.291e-11	6.332e-11	-10.032	-10.198	-0.167
	CuF+	3.194e-11	2.902e-11	-10.496	-10.537	-0.042
	Cu(OH)3-	1.475e-11	1.340e-11	-10.831	-10.873	-0.042
	CuCl+	1.017e-11	9.242e-12	-10.993	-11.034	-0.042
	CuCl2	9.344e-16	9.362e-16	-15.029	-15.029	0.001
	Cu(OH)4-2	3.117e-16	2.124e-16	-15.506	-15.673	-0.167
	CuCl3-	6.706e-22	6.093e-22	-21.174	-21.215	-0.042
	CuCl4-2	8.039e-28	5.479e-28	-27.095	-27.261	-0.167
F	8.951e-05					
	F-	8.573e-05	7.789e-05	-4.067	-4.109	-0.042
	MgF+	3.081e-06	2.800e-06	-5.511	-5.553	-0.042
	CaF+	6.196e-07	5.630e-07	-6.208	-6.250	-0.042
	NaF	3.345e-08	3.352e-08	-7.476	-7.475	0.001
	MnF+	1.940e-08	1.763e-08	-7.712	-7.754	-0.042
	ZnF+	1.184e-08	1.076e-08	-7.927	-7.968	-0.042
	AlF2+	3.385e-09	3.075e-09	-8.470	-8.512	-0.042
	AlF3	2.997e-09	3.003e-09	-8.523	-8.522	0.001
	HF	1.367e-09	1.369e-09	-8.864	-8.864	0.001
	NiF+	3.907e-10	3.550e-10	-9.408	-9.450	-0.042
	AlF+2	1.181e-10	8.046e-11	-9.928	-10.094	-0.167
	UO2F+	1.113e-10	1.012e-10	-9.953	-9.995	-0.042
	AlF4-	1.024e-10	9.304e-11	-9.990	-10.031	-0.042
	PbF+	9.925e-11	9.018e-11	-10.003	-10.045	-0.042
	FeF+	8.978e-11	8.157e-11	-10.047	-10.088	-0.042
	CdF+	3.690e-11	3.353e-11	-10.433	-10.475	-0.042
	CuF+	3.194e-11	2.902e-11	-10.496	-10.537	-0.042
	UO2F2	2.659e-11	2.665e-11	-10.575	-10.574	0.001
	HF2-	4.358e-13	3.959e-13	-12.361	-12.402	-0.042
	UO2F3-	4.347e-13	3.949e-13	-12.362	-12.403	-0.042
	PbF2	1.431e-13	1.434e-13	-12.844	-12.843	0.001
	CdF2	6.547e-15	6.560e-15	-14.184	-14.183	0.001
	FeF2+	3.624e-15	3.293e-15	-14.441	-14.482	-0.042
	FeF+2	1.635e-15	1.114e-15	-14.786	-14.953	-0.167
	FeF3	4.001e-16	4.009e-16	-15.398	-15.397	0.001
	UO2F4-2	2.880e-16	1.963e-16	-15.541	-15.707	-0.167
	PbF3-	8.906e-17	8.092e-17	-16.050	-16.092	-0.042
	H2F2	5.625e-18	5.636e-18	-17.250	-17.249	0.001
	PbF4-2	4.427e-21	3.017e-21	-20.354	-20.520	-0.167
	UF3+	9.297e-31	8.447e-31	-30.032	-30.073	-0.042
	UF4	5.333e-31	5.344e-31	-30.273	-30.272	0.001
	UF2+2	6.772e-32	4.615e-32	-31.169	-31.336	-0.167
	UF5-	1.300e-33	1.181e-33	-32.886	-32.928	-0.042
	UF+3	1.707e-34	7.206e-35	-33.768	-34.142	-0.375
	UF6-2	1.721e-35	1.173e-35	-34.764	-34.931	-0.167
Fe(2)	1.791e-07					
	Fe+2	1.537e-07	1.047e-07	-6.813	-6.980	-0.167
	FeSO4	1.930e-08	1.934e-08	-7.714	-7.714	0.001
	FeHCO3+	2.236e-09	2.032e-09	-8.650	-8.692	-0.042
	FeOH+	2.138e-09	1.943e-09	-8.670	-8.712	-0.042
	FeCO3	1.664e-09	1.668e-09	-8.779	-8.778	0.001
	FeF+	8.978e-11	8.157e-11	-10.047	-10.088	-0.042
	FeCl+	3.135e-11	2.849e-11	-10.504	-10.545	-0.042
	Fe(OH)2	9.212e-13	9.231e-13	-12.036	-12.035	0.001
	Fe(OH)3-	2.881e-15	2.618e-15	-14.540	-14.582	-0.042
	FeHSO4+	1.741e-15	1.582e-15	-14.759	-14.801	-0.042

Fe(3)	1.075e-06					
	Fe(OH)3	8.982e-07	9.000e-07	-6.047	-6.046	0.001
	Fe(OH)2+	1.155e-07	1.050e-07	-6.937	-6.979	-0.042
	Fe(OH)4-	6.096e-08	5.539e-08	-7.215	-7.257	-0.042
	FeOH+2	6.829e-12	4.654e-12	-11.166	-11.332	-0.167
	FeF2+	4.349e-15	3.951e-15	-14.362	-14.403	-0.042
	FeF+2	1.962e-15	1.337e-15	-14.707	-14.874	-0.167
	FeF3	4.801e-16	4.811e-16	-15.319	-15.318	0.001
	FeSO4+	1.422e-16	1.292e-16	-15.847	-15.889	-0.042
	Fe+3	2.731e-17	1.152e-17	-16.564	-16.938	-0.375
	Fe(SO4)2-	3.424e-18	3.111e-18	-17.465	-17.507	-0.042
	FeCl+2	8.849e-20	6.031e-20	-19.053	-19.220	-0.167
	Fe2(OH)2+4	3.196e-21	6.894e-22	-20.495	-21.162	-0.666
	FeCl2+	6.644e-23	6.037e-23	-22.178	-22.219	-0.042
	FeHSO4+2	6.415e-24	4.372e-24	-23.193	-23.359	-0.167
	Fe3(OH)4+5	2.414e-25	2.198e-26	-24.617	-25.658	-1.041
	FeCl3	1.187e-27	1.190e-27	-26.925	-26.925	0.001
H(0)	3.930e-33					
	H2	1.965e-33	1.969e-33	-32.707	-32.706	0.001
K	3.326e-04					
	K+	3.301e-04	2.995e-04	-3.481	-3.524	-0.042
	KSO4-	2.479e-06	2.252e-06	-5.606	-5.647	-0.042
Mg	9.875e-04					
	Mg+2	8.445e-04	5.855e-04	-3.073	-3.232	-0.159
	MgSO4	1.380e-04	1.383e-04	-3.860	-3.859	0.001
	MgF+	3.081e-06	2.800e-06	-5.511	-5.553	-0.042
	MgHCO3+	1.438e-06	1.307e-06	-5.842	-5.884	-0.042
	MgCO3	3.479e-07	3.486e-07	-6.459	-6.458	0.001
	MgOH+	1.289e-07	1.171e-07	-6.890	-6.932	-0.042
Mn(2)	5.645e-05					
	Mn+2	4.799e-05	3.271e-05	-4.319	-4.485	-0.167
	MnSO4	6.009e-06	6.021e-06	-5.221	-5.220	0.001
	MnCO3	1.720e-06	1.724e-06	-5.764	-5.764	0.001
	MnHCO3+	6.220e-07	5.652e-07	-6.206	-6.248	-0.042
	MnOH+	5.281e-08	4.798e-08	-7.277	-7.319	-0.042
	MnCl+	2.890e-08	2.626e-08	-7.539	-7.581	-0.042
	MnF+	1.940e-08	1.763e-08	-7.712	-7.754	-0.042
	MnCl2	2.255e-12	2.259e-12	-11.647	-11.646	0.001
	Mn(NO3)2	4.762e-14	4.772e-14	-13.322	-13.321	0.001
	Mn(OH)3-	2.859e-16	2.597e-16	-15.544	-15.585	-0.042
	MnCl3-	1.350e-16	1.226e-16	-15.870	-15.911	-0.042
Mn(3)	1.005e-23					
	Mn+3	1.005e-23	4.241e-24	-22.998	-23.372	-0.375
Mn(6)	2.922e-34					
	MnO4-2	2.922e-34	1.991e-34	-33.534	-33.701	-0.167
Mn(7)	3.730e-37					
	MnO4-	3.730e-37	3.389e-37	-36.428	-36.470	-0.042
N(5)	2.097e-05					
	NO3-	2.097e-05	1.906e-05	-4.678	-4.720	-0.042
	PbNO3+	2.021e-11	1.836e-11	-10.695	-10.736	-0.042
	CdNO3+	2.030e-12	1.844e-12	-11.693	-11.734	-0.042
	Mn(NO3)2	4.762e-14	4.772e-14	-13.322	-13.321	0.001
	UO2NO3+	4.464e-16	4.056e-16	-15.350	-15.392	-0.042
	UNO3+3	0.000e+00	0.000e+00	-49.824	-50.199	-0.375
	U(NO3)2+2	0.000e+00	0.000e+00	-53.922	-54.089	-0.167
Na	8.267e-04					
	Na+	8.221e-04	7.477e-04	-3.085	-3.126	-0.041
	NaSO4-	4.496e-06	4.085e-06	-5.347	-5.389	-0.042
	NaHCO3	8.136e-08	8.152e-08	-7.090	-7.089	0.001
	NaF	3.345e-08	3.352e-08	-7.476	-7.475	0.001
	NaCO3-	8.286e-09	7.529e-09	-8.082	-8.123	-0.042
Ni	1.516e-06					
	NiCO3	1.122e-06	1.124e-06	-5.950	-5.949	0.001
	Ni+2	3.353e-07	2.285e-07	-6.475	-6.641	-0.167
	NiSO4	4.804e-08	4.813e-08	-7.318	-7.318	0.001
	NiHCO3+	6.732e-09	6.116e-09	-8.172	-8.214	-0.042
	NiOH+	2.074e-09	1.884e-09	-8.683	-8.725	-0.042
	Ni(CO3)2-2	1.901e-09	1.296e-09	-8.721	-8.887	-0.167
	NiF+	3.909e-10	3.552e-10	-9.408	-9.450	-0.042
	Ni(OH)2	1.439e-10	1.442e-10	-9.842	-9.841	0.001
	NiCl+	1.245e-10	1.131e-10	-9.905	-9.946	-0.042
	Ni(SO4)2-2	4.393e-12	2.994e-12	-11.357	-11.524	-0.167
	Ni(OH)3-	1.260e-13	1.145e-13	-12.900	-12.941	-0.042
	NiCl2	8.079e-14	8.095e-14	-13.093	-13.092	0.001
O(0)	9.921e-29					
	O2	4.961e-29	4.970e-29	-28.304	-28.304	0.001
Pb	1.014e-06					
	PbCO3	7.495e-07	7.509e-07	-6.125	-6.124	0.001
	PbOH+	1.110e-07	1.009e-07	-6.955	-6.996	-0.042
	Pb+2	9.558e-08	6.514e-08	-7.020	-7.186	-0.167
	PbSO4	4.089e-08	4.097e-08	-7.388	-7.388	0.001
	PbHCO3+	1.104e-08	1.003e-08	-7.957	-7.999	-0.042
	Pb(OH)2	3.111e-09	3.117e-09	-8.507	-8.506	0.001
	Pb(CO3)2-2	1.836e-09	1.251e-09	-8.736	-8.903	-0.167
	PbCl+	5.087e-10	4.622e-10	-9.294	-9.335	-0.042
	Pb(SO4)2-2	3.528e-10	2.405e-10	-9.452	-9.619	-0.167
	PbF+	9.930e-11	9.022e-11	-10.003	-10.045	-0.042
	PbNO3+	2.021e-11	1.836e-11	-10.695	-10.736	-0.042
	Pb(OH)3-	3.128e-12	2.842e-12	-11.505	-11.546	-0.042
	Pb2OH+3	3.486e-13	1.471e-13	-12.458	-12.832	-0.375
	PbCl2	1.554e-13	1.557e-13	-12.809	-12.808	0.001
	PbF2	1.432e-13	1.435e-13	-12.844	-12.843	0.001
	Pb3(OH)4+2	1.158e-14	7.892e-15	-13.936	-14.103	-0.167
	Pb(OH)4-2	7.589e-16	5.172e-16	-15.120	-15.286	-0.167
	PbF3-	8.911e-17	8.097e-17	-16.050	-16.092	-0.042
	PbCl3-	2.616e-17	2.377e-17	-16.582	-16.624	-0.042
	PbF4-2	4.429e-21	3.019e-21	-20.354	-20.520	-0.167
	PbCl4-2	3.189e-21	2.173e-21	-20.496	-20.663	-0.167
S(6)	1.979e-03					
	SO4-2	1.629e-03	1.118e-03	-2.788	-2.951	-0.163
	CaSO4	1.956e-04	1.960e-04	-3.709	-3.708	0.001
	MgSO4	1.380e-04	1.383e-04	-3.860	-3.859	0.001
	MnSO4	6.009e-06	6.021e-06	-5.221	-5.220	0.001
	NaSO4-	4.496e-06	4.085e-06	-5.347	-5.389	-0.042
	ZnSO4	2.609e-06	2.614e-06	-5.584	-5.583	0.001
	KSO4-	2.479e-06	2.252e-06	-5.606	-5.647	-0.042
	BaSO4	3.073e-07	3.079e-07	-6.512	-6.512	0.001
	NiSO4	4.804e-08	4.813e-08	-7.318	-7.318	0.001
	PbSO4	4.089e-08	4.097e-08	-7.388	-7.388	0.001
	Zn(SO4)2-2	3.598e-08	2.452e-08	-7.444	-7.610	-0.167
	CdSO4	1.074e-08	1.076e-08	-7.969	-7.968	0.001
	CuSO4	4.710e-09	4.719e-09	-8.327	-8.326	0.001
	HSO4-	1.383e-09	1.256e-09	-8.859	-8.901	-0.042
	Pb(SO4)2-2	3.528e-10	2.405e-10	-9.452	-9.619	-0.167
	Cd(SO4)2-2	1.985e-10	1.353e-10	-9.702	-9.869	-0.167
	CaHSO4+	1.516e-11	1.378e-11	-10.819	-10.861	-0.042
	UO2SO4	1.510e-11	1.513e-11	-10.821	-10.820	0.001
	Ni(SO4)2-2	4.393e-12	2.994e-12	-11.357	-11.524	-0.167
	FeSO4	3.661e-12	3.668e-12	-11.436	-11.436	0.001
	AlSO4+	3.909e-13	3.552e-13	-12.408	-12.450	-0.042
	UO2(SO4)2-2	2.229e-13	1.519e-13	-12.652	-12.818	-0.167
	Al(SO4)2-	1.357e-14	1.233e-14	-13.867	-13.909	-0.042
	FeSO4+	1.422e-16	1.292e-16	-15.847	-15.889	-0.042
	Fe(SO4)2-	3.424e-18	3.111e-18	-17.465	-17.507	-0.042
	FeHSO4+	3.302e-19	3.000e-19	-18.481	-18.523	-0.042
	AlHSO4+2	5.627e-22	3.835e-22	-21.250	-21.416	-0.167
	FeHSO4+2	6.415e-24	4.372e-24	-23.193	-23.359	-0.167
	U(SO4)2	0.000e+00	0.000e+00	-42.430	-42.429	0.001
	USO4+2	0.000e+00	0.000e+00	-43.172	-43.339	-0.167
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-62.493	-62.868	-0.375
U(4)	8.045e-25					
	U(OH)4	8.044e-25	8.060e-25	-24.095	-24.094	0.001
	U(OH)3+	4.287e-29	3.895e-29	-28.368	-28.410	-0.042
	U(OH)2+2	3.724e-34	2.538e-34	-33.429	-33.595	-0.167
	UF3+	2.325e-38	2.113e-38	-37.634	-37.675	-0.042
	UF4	1.334e-38	1.336e-38	-37.875	-37.874	0.001
	U(CO3)4-4	8.027e-39	1.732e-39	-38.095	-38.762	-0.666
	UF2+2	1.694e-39	1.154e-39	-38.771	-38.938	-0.167
	UOH+3	4.723e-40	1.993e-40	-39.326	-39.700	-0.375
	UF5-	0.000e+00	0.000e+00	-40.488	-40.530	-0.042
	UF+3	0.000e+00	0.000e+00	-41.370	-41.744	-0.375
	UF6-2	0.000e+00	0.000e+00	-42.366	-42.533	-0.167
	U(SO4)2	0.000e+00	0.000e+00	-42.430	-42.429	0.001
	U(CO3)5-6	0.000e+00	0.000e+00	-42.540	-44.039	-1.499
	USO4+2	0.000e+00	0.000e+00	-43.172	-43.339	-0.167
	U+4	0.000e+00	0.000e+00	-46.283	-46.949	-0.666
	UCl+3	0.000e+00	0.000e+00	-48.514	-48.889	-0.375
	UNO3+3	0.000e+00	0.000e+00	-49.824	-50.199	-0.375
	U(NO3)2+2	0.000e+00	0.000e+00	-53.922	-54.089	-0.167
	U6(OH)15+9	0.000e+00	0.000e+00	-177.021	-180.393	-3.372
U(5)	5.159e-17					
	UO2+	5.159e-17	4.688e-17	-16.287	-16.329	-0.042
	UO2(CO3)3-5	3.749e-27	3.413e-28	-26.426	-27.467	-1.041
U(6)	1.114e-06					
	UO2(CO3)2-2	6.224e-07	4.242e-07	-6.206	-6.372	-0.167
	UO2(OH)3-	3.711e-07	3.372e-07	-6.430	-6.472	-0.042
	UO2(CO3)3-4	7.594e-08	1.638e-08	-7.120	-7.786	-0.666
	UO2CO3	2.931e-08	2.937e-08	-7.533	-7.532	0.001
	UO2OH+	4.569e-09	4.152e-09	-8.340	-8.382	-0.042
	(UO2)3(OH)7-	2.664e-09	2.420e-09	-8.575	-8.616	-0.042
	(UO2)3(OH)5+	6.693e-10	6.081e-10	-9.174	-9.216	-0.042
	UO2F+	1.115e-10	1.013e-10	-9.953	-9.995	-0.042
	(UO2)4(OH)7+	3.577e-11	3.250e-11	-10.446	-10.488	-0.042
	UO2F2	2.662e-11	2.667e-11	-10.575	-10.574	0.001
	UO2+2	1.565e-11	1.067e-11	-10.805	-10.972	-0.167
	UO2SO4	1.510e-11	1.513e-11	-10.821	-10.820	0.001
	(UO2)2(OH)2+2	1.998e-12	1.362e-12	-11.699	-11.866	-0.167
	UO2(OH)4-2	6.229e-13	4.245e-13	-12.206	-12.372	-0.167
	UO2F3-	4.351e-13	3.953e-13	-12.361	-12.403	-0.042
	UO2(SO4)2-2	2.229e-13	1.519e-13	-12.652	-12.818	-0.167
	(UO2)3(OH)4+2	8.923e-14	6.081e-14	-13.050	-13.216	-0.167
	UO2Cl+	3.276e-15	2.977e-15	-14.485	-14.526	-0.042
	(UO2)3(CO3)6-6	3.262e-15	1.035e-16	-14.486	-15.985	-1.499
	UO2NO3+	4.464e-16	4.056e-16	-15.350	-15.392	-0.042
	UO2F4-2	2.883e-16	1.965e-16	-15.540	-15.707	-0.167
	(UO2)2OH+3	4.273e-17	1.803e-17	-16.369	-16.744	-0.375
	UO2Cl2	3.024e-20	3.030e-20	-19.519	-19.519	0.001
Zn	2.096e-05					
	Zn+2	1.509e-05	1.029e-05	-4.821	-4.988	-0.167
	ZnSO4	2.609e-06	2.614e-06	-5.584	-5.583	0.001
	ZnCO3	1.359e-06	1.362e-06	-5.867	-5.866	0.001
	Zn(OH)2	8.153e-07	8.169e-07	-6.089	-6.088	0.001
	ZnOH+	7.249e-07	6.587e-07	-6.140	-6.181	-0.042
	ZnHCO3+	2.763e-07	2.511e-07	-6.559	-6.600	-0.042
	Zn(SO4)2-2	3.598e-08	2.452e-08	-7.444	-7.610	-0.167
	Zn(CO3)2-2	2.834e-08	1.931e-08	-7.548	-7.714	-0.167
	ZnF+	1.184e-08	1.076e-08	-7.927	-7.968	-0.042
	ZnOHCl	5.321e-09	5.332e-09	-8.274	-8.273	0.001
	ZnCl+	5.022e-09	4.563e-09	-8.299	-8.341	-0.042
	Zn(OH)3-	2.258e-10	2.052e-10	-9.646	-9.688	-0.042
	ZnCl2	9.246e-13	9.264e-13	-12.034	-12.033	0.001
	Zn(OH)4-2	3.790e-15	2.583e-15	-14.421	-14.588	-0.167
	ZnCl3-	2.200e-16	1.999e-16	-15.657	-15.699	-0.042
	ZnCl4-2	2.806e-20	1.912e-20	-19.552	-19.718	-0.167

Fe(3)	8.956e-07					
	Fe(OH)3	7.485e-07	7.500e-07	-6.126	-6.125	0.001
	Fe(OH)2+	9.627e-08	8.747e-08	-7.017	-7.058	-0.042
	Fe(OH)4-	5.080e-08	4.616e-08	-7.294	-7.336	-0.042
	FeOH+2	5.691e-12	3.879e-12	-11.245	-11.411	-0.167
	FeF2+	3.624e-15	3.293e-15	-14.441	-14.482	-0.042
	FeF+2	1.635e-15	1.114e-15	-14.786	-14.953	-0.167
	FeF3	4.001e-16	4.009e-16	-15.398	-15.397	0.001
	FeSO4+	1.185e-16	1.077e-16	-15.926	-15.968	-0.042
	Fe+3	2.276e-17	9.603e-18	-16.643	-17.018	-0.375
	Fe(SO4)2-	2.854e-18	2.593e-18	-17.545	-17.586	-0.042
	FeCl+2	7.375e-20	5.026e-20	-19.132	-19.299	-0.167
	Fe2(OH)2+4	2.220e-21	4.788e-22	-20.654	-21.320	-0.666
	FeCl2+	5.537e-23	5.031e-23	-22.257	-22.298	-0.042
	FeHSO4+2	5.346e-24	3.643e-24	-23.272	-23.438	-0.167
	Fe3(OH)4+5	1.397e-25	1.272e-26	-24.855	-25.896	-1.041
	FeCl3	9.895e-28	9.915e-28	-27.005	-27.004	0.001
H(0)	3.930e-33					
	H2	1.965e-33	1.969e-33	-32.707	-32.706	0.001
K	3.326e-04					
	K+	3.301e-04	2.995e-04	-3.481	-3.524	-0.042
	KSO4-	2.478e-06	2.252e-06	-5.606	-5.647	-0.042
Mg	9.875e-04					
	Mg+2	8.445e-04	5.855e-04	-3.073	-3.232	-0.159
	MgSO4	1.380e-04	1.383e-04	-3.860	-3.859	0.001
	MgF+	3.081e-06	2.800e-06	-5.511	-5.553	-0.042
	MgHCO3+	1.439e-06	1.308e-06	-5.842	-5.883	-0.042
	MgCO3	3.481e-07	3.488e-07	-6.458	-6.457	0.001
	MgOH+	1.289e-07	1.171e-07	-6.890	-6.932	-0.042
Mn(2)	5.645e-05					
	Mn+2	4.799e-05	3.271e-05	-4.319	-4.485	-0.167
	MnSO4	6.009e-06	6.021e-06	-5.221	-5.220	0.001
	MnCO3	1.721e-06	1.725e-06	-5.764	-5.763	0.001
	MnHCO3+	6.225e-07	5.656e-07	-6.206	-6.248	-0.042
	MnOH+	5.281e-08	4.798e-08	-7.277	-7.319	-0.042
	MnCl+	2.890e-08	2.626e-08	-7.539	-7.581	-0.042
	MnF+	1.940e-08	1.763e-08	-7.712	-7.754	-0.042
	MnCl2	2.254e-12	2.259e-12	-11.647	-11.646	0.001
	Mn(NO3)2	4.762e-14	4.771e-14	-13.322	-13.321	0.001
	Mn(OH)3-	2.859e-16	2.597e-16	-15.544	-15.585	-0.042
	MnCl3-	1.349e-16	1.226e-16	-15.870	-15.911	-0.042
Mn(3)	1.005e-23					
	Mn+3	1.005e-23	4.241e-24	-22.998	-23.373	-0.375
Mn(6)	2.922e-34					
	MnO4-2	2.922e-34	1.991e-34	-33.534	-33.701	-0.167
Mn(7)	3.729e-37					
	MnO4-	3.729e-37	3.389e-37	-36.428	-36.470	-0.042
N(5)	2.097e-05					
	NO3-	2.097e-05	1.906e-05	-4.678	-4.720	-0.042
	PbNO3+	2.020e-11	1.835e-11	-10.695	-10.736	-0.042
	CdNO3+	2.030e-12	1.844e-12	-11.693	-11.734	-0.042
	Mn(NO3)2	4.762e-14	4.771e-14	-13.322	-13.321	0.001
	UO2NO3+	4.460e-16	4.052e-16	-15.351	-15.392	-0.042
	UNO3+3	0.000e+00	0.000e+00	-49.824	-50.199	-0.375
	U(NO3)2+2	0.000e+00	0.000e+00	-53.923	-54.089	-0.167
Na	8.267e-04					
	Na+	8.221e-04	7.477e-04	-3.085	-3.126	-0.041
	NaSO4-	4.496e-06	4.085e-06	-5.347	-5.389	-0.042
	NaHCO3	8.142e-08	8.158e-08	-7.089	-7.088	0.001
	NaF	3.345e-08	3.352e-08	-7.476	-7.475	0.001
	NaCO3-	8.292e-09	7.534e-09	-8.081	-8.123	-0.042
Ni	1.516e-06					
	NiCO3	1.122e-06	1.124e-06	-5.950	-5.949	0.001
	Ni+2	3.352e-07	2.284e-07	-6.475	-6.641	-0.167
	NiSO4	4.801e-08	4.811e-08	-7.319	-7.318	0.001
	NiHCO3+	6.733e-09	6.117e-09	-8.172	-8.213	-0.042
	NiOH+	2.073e-09	1.883e-09	-8.683	-8.725	-0.042
	Ni(CO3)2-2	1.903e-09	1.297e-09	-8.721	-8.887	-0.167
	NiF+	3.907e-10	3.550e-10	-9.408	-9.450	-0.042
	Ni(OH)2	1.438e-10	1.441e-10	-9.842	-9.841	0.001
	NiCl+	1.244e-10	1.131e-10	-9.905	-9.947	-0.042
	Ni(SO4)2-2	4.390e-12	2.992e-12	-11.358	-11.524	-0.167
	Ni(OH)3-	1.260e-13	1.144e-13	-12.900	-12.941	-0.042
	NiCl2	8.075e-14	8.091e-14	-13.093	-13.092	0.001
O(0)	9.921e-29					
	O2	4.961e-29	4.970e-29	-28.304	-28.304	0.001
Pb	1.014e-06					
	PbCO3	7.496e-07	7.511e-07	-6.125	-6.124	0.001
	PbOH+	1.110e-07	1.008e-07	-6.955	-6.996	-0.042
	Pb+2	9.553e-08	6.510e-08	-7.020	-7.186	-0.167
	PbSO4	4.086e-08	4.095e-08	-7.389	-7.388	0.001
	PbHCO3+	1.104e-08	1.003e-08	-7.957	-7.999	-0.042
	Pb(OH)2	3.109e-09	3.115e-09	-8.507	-8.506	0.001
	Pb(CO3)2-2	1.838e-09	1.252e-09	-8.736	-8.902	-0.167
	PbCl+	5.084e-10	4.619e-10	-9.294	-9.335	-0.042
	Pb(SO4)2-2	3.527e-10	2.403e-10	-9.453	-9.619	-0.167
	PbF+	9.925e-11	9.018e-11	-10.003	-10.045	-0.042
	PbNO3+	2.020e-11	1.835e-11	-10.695	-10.736	-0.042
	Pb(OH)3-	3.127e-12	2.841e-12	-11.505	-11.547	-0.042
	Pb2OH+3	3.482e-13	1.469e-13	-12.458	-12.833	-0.375
	PbCl2	1.553e-13	1.556e-13	-12.809	-12.808	0.001
	PbF2	1.431e-13	1.434e-13	-12.844	-12.843	0.001
	Pb3(OH)4+2	1.156e-14	7.879e-15	-13.937	-14.104	-0.167
	Pb(OH)4-2	7.585e-16	5.169e-16	-15.120	-15.287	-0.167
	PbF3-	8.906e-17	8.092e-17	-16.050	-16.092	-0.042
	PbCl3-	2.615e-17	2.376e-17	-16.583	-16.624	-0.042
	PbF4-2	4.427e-21	3.017e-21	-20.354	-20.520	-0.167
	PbCl4-2	3.188e-21	2.172e-21	-20.497	-20.663	-0.167
S(6)	1.979e-03					
	SO4-2	1.629e-03	1.118e-03	-2.788	-2.951	-0.163
	CaSO4	1.956e-04	1.960e-04	-3.709	-3.708	0.001
	MgSO4	1.380e-04	1.383e-04	-3.860	-3.859	0.001
	MnSO4	6.009e-06	6.021e-06	-5.221	-5.220	0.001
	NaSO4-	4.496e-06	4.085e-06	-5.347	-5.389	-0.042
	ZnSO4	2.609e-06	2.614e-06	-5.584	-5.583	0.001
	KSO4-	2.478e-06	2.252e-06	-5.606	-5.647	-0.042
	BaSO4	3.073e-07	3.079e-07	-6.512	-6.512	0.001
	NiSO4	4.801e-08	4.811e-08	-7.319	-7.318	0.001
	PbSO4	4.086e-08	4.095e-08	-7.389	-7.388	0.001
	Zn(SO4)2-2	3.597e-08	2.452e-08	-7.444	-7.611	-0.167
	FeSO4	1.930e-08	1.934e-08	-7.714	-7.714	0.001
	CdSO4	1.074e-08	1.076e-08	-7.969	-7.968	0.001
	CuSO4	4.709e-09	4.719e-09	-8.327	-8.326	0.001
	HSO4-	1.383e-09	1.256e-09	-8.859	-8.901	-0.042
	Pb(SO4)2-2	3.527e-10	2.403e-10	-9.453	-9.619	-0.167
	Cd(SO4)2-2	1.985e-10	1.353e-10	-9.702	-9.869	-0.167
	CaHSO4+	1.516e-11	1.378e-11	-10.819	-10.861	-0.042
	UO2SO4	1.508e-11	1.511e-11	-10.821	-10.821	0.001
	Ni(SO4)2-2	4.390e-12	2.992e-12	-11.358	-11.524	-0.167
	AlSO4+	3.909e-13	3.552e-13	-12.408	-12.450	-0.042
	UO2(SO4)2-2	2.227e-13	1.518e-13	-12.652	-12.819	-0.167
	Al(SO4)2-	1.357e-14	1.233e-14	-13.868	-13.909	-0.042
	FeHSO4+	1.741e-15	1.582e-15	-14.759	-14.801	-0.042
	FeSO4+	1.185e-16	1.077e-16	-15.926	-15.968	-0.042
	Fe(SO4)2-	2.854e-18	2.593e-18	-17.545	-17.586	-0.042
	AlHSO4+2	5.627e-22	3.835e-22	-21.250	-21.416	-0.167
	FeHSO4+2	5.346e-24	3.643e-24	-23.272	-23.438	-0.167
	U(SO4)2	0.000e+00	0.000e+00	-42.430	-42.430	0.001
	USO4+2	0.000e+00	0.000e+00	-43.173	-43.339	-0.167
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-62.494	-62.868	-0.375
U(4)	8.037e-25					
	U(OH)4	8.037e-25	8.053e-25	-24.095	-24.094	0.001
	U(OH)3+	4.282e-29	3.891e-29	-28.368	-28.410	-0.042
	U(OH)2+2	3.721e-34	2.536e-34	-33.429	-33.596	-0.167
	UF3+	2.323e-38	2.111e-38	-37.634	-37.676	-0.042
	UF4	1.333e-38	1.335e-38	-37.875	-37.874	0.001
	U(CO3)4-4	8.042e-39	1.735e-39	-38.095	-38.761	-0.666
	UF2+2	1.692e-39	1.153e-39	-38.772	-38.938	-0.167
	UOH+3	4.719e-40	1.991e-40	-39.326	-39.701	-0.375
	UF5-	0.000e+00	0.000e+00	-40.488	-40.530	-0.042
	UF+3	0.000e+00	0.000e+00	-41.370	-41.745	-0.375
	UF6-2	0.000e+00	0.000e+00	-42.367	-42.533	-0.167
	U(SO4)2	0.000e+00	0.000e+00	-42.430	-42.430	0.001
	U(CO3)5-6	0.000e+00	0.000e+00	-42.539	-44.038	-1.499
	USO4+2	0.000e+00	0.000e+00	-43.173	-43.339	-0.167
	U+4	0.000e+00	0.000e+00	-46.283	-46.949	-0.666
	UCl+3	0.000e+00	0.000e+00	-48.515	-48.889	-0.375
	UNO3+3	0.000e+00	0.000e+00	-49.824	-50.199	-0.375
	U(NO3)2+2	0.000e+00	0.000e+00	-53.923	-54.089	-0.167
	U6(OH)15+9	0.000e+00	0.000e+00	-177.023	-180.395	-3.372
U(5)	5.154e-17					
	UO2+	5.154e-17	4.683e-17	-16.288	-16.329	-0.042
	UO2(CO3)3-5	3.753e-27	3.417e-28	-26.426	-27.466	-1.041
U(6)	1.114e-06					
	UO2(CO3)2-2	6.227e-07	4.244e-07	-6.206	-6.372	-0.167
	UO2(OH)3-	3.708e-07	3.369e-07	-6.431	-6.472	-0.042
	UO2(CO3)3-4	7.603e-08	1.640e-08	-7.119	-7.785	-0.666
	UO2CO3	2.930e-08	2.936e-08	-7.533	-7.532	0.001
	UO2OH+	4.565e-09	4.148e-09	-8.341	-8.382	-0.042
	(UO2)3(OH)7-	2.656e-09	2.413e-09	-8.576	-8.617	-0.042
	(UO2)3(OH)5+	6.674e-10	6.064e-10	-9.176	-9.217	-0.042
	UO2F+	1.113e-10	1.012e-10	-9.953	-9.995	-0.042
	(UO2)4(OH)7+	3.564e-11	3.238e-11	-10.448	-10.490	-0.042
	UO2F2	2.659e-11	2.665e-11	-10.575	-10.574	0.001
	UO2+2	1.564e-11	1.066e-11	-10.806	-10.972	-0.167
	UO2SO4	1.508e-11	1.511e-11	-10.821	-10.821	0.001
	(UO2)2(OH)2+2	1.994e-12	1.359e-12	-11.700	-11.867	-0.167
	UO2(OH)4-2	6.223e-13	4.241e-13	-12.206	-12.373	-0.167
	UO2F3-	4.347e-13	3.949e-13	-12.362	-12.403	-0.042
	UO2(SO4)2-2	2.227e-13	1.518e-13	-12.652	-12.819	-0.167
	(UO2)3(OH)4+2	8.898e-14	6.064e-14	-13.051	-13.217	-0.167
	UO2Cl+	3.273e-15	2.974e-15	-14.485	-14.527	-0.042
	(UO2)3(CO3)6-6	3.267e-15	1.036e-16	-14.486	-15.985	-1.499
	UO2NO3+	4.460e-16	4.052e-16	-15.351	-15.392	-0.042
	UO2F4-2	2.880e-16	1.963e-16	-15.541	-15.707	-0.167
	(UO2)2OH+3	4.265e-17	1.800e-17	-16.370	-16.745	-0.375
	UO2Cl2	3.021e-20	3.027e-20	-19.520	-19.519	0.001
Zn	2.096e-05					
	Zn+2	1.509e-05	1.029e-05	-4.821	-4.988	-0.167
	ZnSO4	2.609e-06	2.614e-06	-5.584	-5.583	0.001
	ZnCO3	1.360e-06	1.362e-06	-5.867	-5.866	0.001
	Zn(OH)2	8.153e-07	8.169e-07	-6.089	-6.088	0.001
	ZnOH+	7.249e-07	6.586e-07	-6.140	-6.181	-0.042
	ZnHCO3+	2.765e-07	2.512e-07	-6.558	-6.600	-0.042
	Zn(SO4)2-2	3.597e-08	2.452e-08	-7.444	-7.611	-0.167
	Zn(CO3)2-2	2.838e-08	1.934e-08	-7.547	-7.714	-0.167
	ZnF+	1.184e-08	1.076e-08	-7.927	-7.968	-0.042
	ZnOHCl	5.321e-09	5.331e-09	-8.274	-8.273	0.001
	ZnCl+	5.022e-09	4.563e-09	-8.299	-8.341	-0.042
	Zn(OH)3-	2.258e-10	2.052e-10	-9.646	-9.688	-0.042
	ZnCl2	9.245e-13	9.264e-13	-12.034	-12.033	0.001
	Zn(OH)4-2	3.790e-15	2.583e-15	-14.421	-14.588	-0.167
	ZnCl3-	2.200e-16	1.999e-16	-15.658	-15.699	-0.042
	ZnCl4-2	2.806e-20	1.912e-20	-19.552	-19.718	-0.167

Fe(3)	8.956e-07					
	Fe(OH)3	7.485e-07	7.500e-07	-6.126	-6.125	0.001
	Fe(OH)2+	9.627e-08	8.747e-08	-7.017	-7.058	-0.042
	Fe(OH)4-	5.080e-08	4.616e-08	-7.294	-7.336	-0.042
	FeOH+2	5.691e-12	3.879e-12	-11.245	-11.411	-0.167
	FeF2+	3.624e-15	3.293e-15	-14.441	-14.482	-0.042
	FeF+2	1.635e-15	1.114e-15	-14.786	-14.953	-0.167
	FeF3	4.001e-16	4.009e-16	-15.398	-15.397	0.001
	FeSO4+	1.185e-16	1.077e-16	-15.926	-15.968	-0.042
	Fe+3	2.276e-17	9.603e-18	-16.643	-17.018	-0.375
	Fe(SO4)2-	2.854e-18	2.593e-18	-17.545	-17.586	-0.042
	FeCl+2	7.375e-20	5.026e-20	-19.132	-19.299	-0.167
	Fe2(OH)2+4	2.220e-21	4.788e-22	-20.654	-21.320	-0.666
	FeCl2+	5.537e-23	5.031e-23	-22.257	-22.298	-0.042
	FeHSO4+2	5.346e-24	3.643e-24	-23.272	-23.438	-0.167
	Fe3(OH)4+5	1.397e-25	1.272e-26	-24.855	-25.896	-1.041
	FeCl3	9.895e-28	9.915e-28	-27.005	-27.004	0.001
H(0)	3.930e-33					
	H2	1.965e-33	1.969e-33	-32.707	-32.706	0.001
K	3.326e-04					
	K+	3.301e-04	2.995e-04	-3.481	-3.524	-0.042
	KSO4-	2.478e-06	2.252e-06	-5.606	-5.647	-0.042
Mg	9.875e-04					
	Mg+2	8.445e-04	5.855e-04	-3.073	-3.232	-0.159
	MgSO4	1.380e-04	1.383e-04	-3.860	-3.859	0.001
	MgF+	3.081e-06	2.800e-06	-5.511	-5.553	-0.042
	MgHCO3+	1.439e-06	1.308e-06	-5.842	-5.883	-0.042
	MgCO3	3.481e-07	3.488e-07	-6.458	-6.457	0.001
	MgOH+	1.289e-07	1.171e-07	-6.890	-6.932	-0.042
Mn(2)	5.645e-05					
	Mn+2	4.799e-05	3.271e-05	-4.319	-4.485	-0.167
	MnSO4	6.009e-06	6.021e-06	-5.221	-5.220	0.001
	MnCO3	1.721e-06	1.725e-06	-5.764	-5.763	0.001
	MnHCO3+	6.225e-07	5.656e-07	-6.206	-6.248	-0.042
	MnOH+	5.281e-08	4.798e-08	-7.277	-7.319	-0.042
	MnCl+	2.890e-08	2.626e-08	-7.539	-7.581	-0.042
	MnF+	1.940e-08	1.763e-08	-7.712	-7.754	-0.042
	MnCl2	2.254e-12	2.259e-12	-11.647	-11.646	0.001
	Mn(NO3)2	4.762e-14	4.771e-14	-13.322	-13.321	0.001
	Mn(OH)3-	2.859e-16	2.597e-16	-15.544	-15.585	-0.042
	MnCl3-	1.349e-16	1.226e-16	-15.870	-15.911	-0.042
Mn(3)	1.005e-23					
	Mn+3	1.005e-23	4.241e-24	-22.998	-23.373	-0.375
Mn(6)	2.922e-34					
	MnO4-2	2.922e-34	1.991e-34	-33.534	-33.701	-0.167
Mn(7)	3.729e-37					
	MnO4-	3.729e-37	3.389e-37	-36.428	-36.470	-0.042
N(5)	2.097e-05					
	NO3-	2.097e-05	1.906e-05	-4.678	-4.720	-0.042
	PbNO3+	2.020e-11	1.835e-11	-10.695	-10.736	-0.042
	CdNO3+	2.030e-12	1.844e-12	-11.693	-11.734	-0.042
	Mn(NO3)2	4.762e-14	4.771e-14	-13.322	-13.321	0.001
	UO2NO3+	4.460e-16	4.052e-16	-15.351	-15.392	-0.042
	UNO3+3	0.000e+00	0.000e+00	-42.222	-42.597	-0.375
	U(NO3)2+2	0.000e+00	0.000e+00	-46.320	-46.487	-0.167
Na	8.267e-04					
	Na+	8.221e-04	7.477e-04	-3.085	-3.126	-0.041
	NaSO4-	4.496e-06	4.085e-06	-5.347	-5.389	-0.042
	NaHCO3	8.142e-08	8.158e-08	-7.089	-7.088	0.001
	NaF	3.345e-08	3.352e-08	-7.476	-7.475	0.001
	NaCO3-	8.292e-09	7.534e-09	-8.081	-8.123	-0.042
Ni	1.516e-06					
	NiCO3	1.122e-06	1.124e-06	-5.950	-5.949	0.001
	Ni+2	3.352e-07	2.284e-07	-6.475	-6.641	-0.167
	NiSO4	4.801e-08	4.811e-08	-7.319	-7.318	0.001
	NiHCO3+	6.733e-09	6.117e-09	-8.172	-8.213	-0.042
	NiOH+	2.073e-09	1.883e-09	-8.683	-8.725	-0.042
	Ni(CO3)2-2	1.903e-09	1.297e-09	-8.721	-8.887	-0.167
	NiF+	3.907e-10	3.550e-10	-9.408	-9.450	-0.042
	Ni(OH)2	1.438e-10	1.441e-10	-9.842	-9.841	0.001
	NiCl+	1.244e-10	1.131e-10	-9.905	-9.947	-0.042
	Ni(SO4)2-2	4.390e-12	2.992e-12	-11.358	-11.524	-0.167
	Ni(OH)3-	1.260e-13	1.144e-13	-12.900	-12.941	-0.042
	NiCl2	8.075e-14	8.091e-14	-13.093	-13.092	0.001
O(0)	9.921e-29					
	O2	4.961e-29	4.970e-29	-28.304	-28.304	0.001
Pb	1.014e-06					
	PbCO3	7.496e-07	7.511e-07	-6.125	-6.124	0.001
	PbOH+	1.110e-07	1.008e-07	-6.955	-6.996	-0.042
	Pb+2	9.553e-08	6.510e-08	-7.020	-7.186	-0.167
	PbSO4	4.086e-08	4.095e-08	-7.389	-7.388	0.001
	PbHCO3+	1.104e-08	1.003e-08	-7.957	-7.999	-0.042
	Pb(OH)2	3.109e-09	3.115e-09	-8.507	-8.506	0.001
	Pb(CO3)2-2	1.838e-09	1.252e-09	-8.736	-8.902	-0.167
	PbCl+	5.084e-10	4.619e-10	-9.294	-9.335	-0.042
	Pb(SO4)2-2	3.527e-10	2.403e-10	-9.453	-9.619	-0.167
	PbF+	9.925e-11	9.018e-11	-10.003	-10.045	-0.042
	PbNO3+	2.020e-11	1.835e-11	-10.695	-10.736	-0.042
	Pb(OH)3-	3.127e-12	2.841e-12	-11.505	-11.547	-0.042
	Pb2OH+3	3.482e-13	1.469e-13	-12.458	-12.833	-0.375
	PbCl2	1.553e-13	1.556e-13	-12.809	-12.808	0.001
	PbF2	1.431e-13	1.434e-13	-12.844	-12.843	0.001
	Pb3(OH)4+2	1.156e-14	7.879e-15	-13.937	-14.104	-0.167
	Pb(OH)4-2	7.585e-16	5.169e-16	-15.120	-15.287	-0.167
	PbF3-	8.906e-17	8.092e-17	-16.050	-16.092	-0.042
	PbCl3-	2.615e-17	2.376e-17	-16.583	-16.624	-0.042
	PbF4-2	4.427e-21	3.017e-21	-20.354	-20.520	-0.167
	PbCl4-2	3.188e-21	2.172e-21	-20.497	-20.663	-0.167
S(6)	1.979e-03					
	SO4-2	1.629e-03	1.118e-03	-2.788	-2.951	-0.163
	CaSO4	1.956e-04	1.960e-04	-3.709	-3.708	0.001
	MgSO4	1.380e-04	1.383e-04	-3.860	-3.859	0.001
	MnSO4	6.009e-06	6.021e-06	-5.221	-5.220	0.001
	NaSO4-	4.496e-06	4.085e-06	-5.347	-5.389	-0.042
	ZnSO4	2.609e-06	2.614e-06	-5.584	-5.583	0.001
	KSO4-	2.478e-06	2.252e-06	-5.606	-5.647	-0.042
	BaSO4	3.073e-07	3.079e-07	-6.512	-6.512	0.001
	NiSO4	4.801e-08	4.811e-08	-7.319	-7.318	0.001
	PbSO4	4.086e-08	4.095e-08	-7.389	-7.388	0.001
	Zn(SO4)2-2	3.597e-08	2.452e-08	-7.444	-7.611	-0.167
	FeSO4	1.930e-08	1.934e-08	-7.714	-7.714	0.001
	CdSO4	1.074e-08	1.076e-08	-7.969	-7.968	0.001
	CuSO4	4.709e-09	4.719e-09	-8.327	-8.326	0.001
	HSO4-	1.383e-09	1.256e-09	-8.859	-8.901	-0.042
	Pb(SO4)2-2	3.527e-10	2.403e-10	-9.453	-9.619	-0.167
	Cd(SO4)2-2	1.985e-10	1.353e-10	-9.702	-9.869	-0.167
	CaHSO4+	1.516e-11	1.378e-11	-10.819	-10.861	-0.042
	UO2SO4	1.508e-11	1.511e-11	-10.821	-10.821	0.001
	Ni(SO4)2-2	4.390e-12	2.992e-12	-11.358	-11.524	-0.167
	AlSO4+	3.909e-13	3.552e-13	-12.408	-12.450	-0.042
	UO2(SO4)2-2	2.227e-13	1.518e-13	-12.652	-12.819	-0.167
	Al(SO4)2-	1.357e-14	1.233e-14	-13.868	-13.909	-0.042
	FeHSO4+	1.741e-15	1.582e-15	-14.759	-14.801	-0.042
	FeSO4+	1.185e-16	1.077e-16	-15.926	-15.968	-0.042
	Fe(SO4)2-	2.854e-18	2.593e-18	-17.545	-17.586	-0.042
	AlHSO4+2	5.627e-22	3.835e-22	-21.250	-21.416	-0.167
	FeHSO4+2	5.346e-24	3.643e-24	-23.272	-23.438	-0.167
	U(SO4)2	1.485e-35	1.488e-35	-34.828	-34.827	0.001
	USO4+2	2.688e-36	1.832e-36	-35.571	-35.737	-0.167
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-51.090	-51.465	-0.375
U(4)	3.217e-17					
	U(OH)4	3.216e-17	3.223e-17	-16.493	-16.492	0.001
	U(OH)3+	1.714e-21	1.557e-21	-20.766	-20.808	-0.042
	U(OH)2+2	1.489e-26	1.015e-26	-25.827	-25.994	-0.167
	UF3+	9.297e-31	8.447e-31	-30.032	-30.073	-0.042
	UF4	5.333e-31	5.344e-31	-30.273	-30.272	0.001
	U(CO3)4-4	3.219e-31	6.943e-32	-30.492	-31.158	-0.666
	UF2+2	6.772e-32	4.615e-32	-31.169	-31.336	-0.167
	UOH+3	1.889e-32	7.970e-33	-31.724	-32.099	-0.375
	UF5-	1.300e-33	1.181e-33	-32.886	-32.928	-0.042
	UF+3	1.707e-34	7.206e-35	-33.768	-34.142	-0.375
	UF6-2	1.721e-35	1.173e-35	-34.764	-34.931	-0.167
	U(SO4)2	1.485e-35	1.488e-35	-34.828	-34.827	0.001
	U(CO3)5-6	1.156e-35	3.667e-37	-34.937	-36.436	-1.499
	USO4+2	2.688e-36	1.832e-36	-35.571	-35.737	-0.167
	U+4	2.086e-39	4.500e-40	-38.681	-39.347	-0.666
	UCl+3	0.000e+00	0.000e+00	-40.912	-41.287	-0.375
	UNO3+3	0.000e+00	0.000e+00	-42.222	-42.597	-0.375
	U(NO3)2+2	0.000e+00	0.000e+00	-46.320	-46.487	-0.167
	U6(OH)15+9	0.000e+00	0.000e+00	-131.409	-134.781	-3.372
U(5)	3.261e-13					
	UO2+	3.261e-13	2.963e-13	-12.487	-12.528	-0.042
	UO2(CO3)3-5	2.374e-23	2.161e-24	-22.624	-23.665	-1.041
U(6)	1.114e-06					
	UO2(CO3)2-2	6.227e-07	4.244e-07	-6.206	-6.372	-0.167
	UO2(OH)3-	3.708e-07	3.369e-07	-6.431	-6.472	-0.042
	UO2(CO3)3-4	7.603e-08	1.640e-08	-7.119	-7.785	-0.666
	UO2CO3	2.930e-08	2.936e-08	-7.533	-7.532	0.001
	UO2OH+	4.565e-09	4.148e-09	-8.341	-8.382	-0.042
	(UO2)3(OH)7-	2.656e-09	2.413e-09	-8.576	-8.617	-0.042
	(UO2)3(OH)5+	6.674e-10	6.064e-10	-9.176	-9.217	-0.042
	UO2F+	1.113e-10	1.012e-10	-9.953	-9.995	-0.042
	(UO2)4(OH)7+	3.564e-11	3.238e-11	-10.448	-10.490	-0.042
	UO2F2	2.659e-11	2.665e-11	-10.575	-10.574	0.001
	UO2+2	1.564e-11	1.066e-11	-10.806	-10.972	-0.167
	UO2SO4	1.508e-11	1.511e-11	-10.821	-10.821	0.001
	(UO2)2(OH)2+2	1.994e-12	1.359e-12	-11.700	-11.867	-0.167
	UO2(OH)4-2	6.223e-13	4.241e-13	-12.206	-12.373	-0.167
	UO2F3-	4.347e-13	3.949e-13	-12.362	-12.403	-0.042
	UO2(SO4)2-2	2.227e-13	1.518e-13	-12.652	-12.819	-0.167
	(UO2)3(OH)4+2	8.898e-14	6.064e-14	-13.051	-13.217	-0.167
	UO2Cl+	3.273e-15	2.974e-15	-14.485	-14.527	-0.042
	(UO2)3(CO3)6-6	3.267e-15	1.036e-16	-14.486	-15.985	-1.499
	UO2NO3+	4.460e-16	4.052e-16	-15.351	-15.392	-0.042
	UO2F4-2	2.880e-16	1.963e-16	-15.541	-15.707	-0.167
	(UO2)2OH+3	4.265e-17	1.800e-17	-16.370	-16.745	-0.375
	UO2Cl2	3.021e-20	3.027e-20	-19.520	-19.519	0.001
Zn	2.096e-05					
	Zn+2	1.509e-05	1.029e-05	-4.821	-4.988	-0.167
	ZnSO4	2.609e-06	2.614e-06	-5.584	-5.583	0.001
	ZnCO3	1.360e-06	1.362e-06	-5.867	-5.866	0.001
	Zn(OH)2	8.153e-07	8.169e-07	-6.089	-6.088	0.001
	ZnOH+	7.249e-07	6.586e-07	-6.140	-6.181	-0.042
	ZnHCO3+	2.765e-07	2.512e-07	-6.558	-6.600	-0.042
	Zn(SO4)2-2	3.597e-08	2.452e-08	-7.444	-7.611	-0.167
	Zn(CO3)2-2	2.838e-08	1.934e-08	-7.547	-7.714	-0.167
	ZnF+	1.184e-08	1.076e-08	-7.927	-7.968	-0.042
	ZnOHCl	5.321e-09	5.331e-09	-8.274	-8.273	0.001
	ZnCl+	5.022e-09	4.563e-09	-8.299	-8.341	-0.042
	Zn(OH)3-	2.258e-10	2.052e-10	-9.646	-9.688	-0.042
	ZnCl2	9.245e-13	9.264e-13	-12.034	-12.033	0.001
	Zn(OH)4-2	3.790e-15	2.583e-15	-14.421	-14.588	-0.167
	ZnCl3-	2.200e-16	1.999e-16	-15.658	-15.699	-0.042
	ZnCl4-2	2.806e-20	1.912e-20	-19.552	-19.718	-0.167

-------------------Saturation indices-----------------------------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-0.34	10.72	11.06	Al(OH)3
AlAsO4:2H2O	-6.92	-2.13	4.79	AlAsO4:2H2O
AlumK	-17.16	-22.40	-5.24	KAl(SO4)2:12H2O
Alunite	-0.05	-0.95	-0.90	KAl3(SO4)2(OH)6
Anglesite	-2.33	-10.14	-7.81	PbSO4
Anhydrite	-1.64	-5.99	-4.35	CaSO4
Antlerite	-2.66	5.63	8.29	Cu3(OH)4SO4
Aragonite	-0.91	-9.22	-8.31	CaCO3
Arsenolite	-89.92	-169.64	-79.73	As4O6
Artinite	-6.73	3.16	9.89	MgCO3:Mg(OH)2:3H2O
As2O5	-32.46	-25.70	6.75	As2O5
Atacamite	-2.88	4.65	7.53	Cu2(OH)3Cl
Azurite	-2.90	-19.57	-16.67	Cu3(OH)2(CO3)2
B-UO2(OH)2	-0.85	4.83	5.68	UO2(OH)2
Ba3(AsO4)2	11.86	2.92	-8.94	Ba3(AsO4)2
BaF2	-8.71	-14.48	-5.77	BaF2
Barite	0.82	-9.21	-10.04	BaSO4
Basaluminite	1.45	24.15	22.70	Al4(OH)10SO4
Bianchite	-6.18	-7.94	-1.76	ZnSO4:6H2O
Birnessite	-2.73	40.87	43.60	MnO2
Bixbyite	1.11	52.19	51.08	Mn2O3
Boehmite	1.86	10.72	8.86	AlOOH
Brochantite	-1.58	13.76	15.34	Cu4(OH)6SO4
Brucite	-4.54	12.57	17.11	Mg(OH)2
Bunsenite	-3.53	9.16	12.69	NiO
Ca3(AsO4)2:4w	-9.78	12.58	22.36	Ca3(AsO4)2:4H2O
Calcite	-0.76	-9.22	-8.46	CaCO3
Cd(gamma)	-35.00	-21.23	13.77	Cd
Cd(OH)2	-5.32	8.33	13.65	Cd(OH)2
Cd(OH)2(a)	-5.60	8.33	13.94	Cd(OH)2
Cd3(OH)2(SO4)2	-19.21	-12.50	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-16.31	6.25	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-13.82	14.58	28.40	Cd4(OH)6SO4
CdCl2	-14.24	-14.88	-0.64	CdCl2
CdCl2:2.5H2O	-12.92	-14.88	-1.96	CdCl2:2.5H2O
CdCl2:H2O	-13.18	-14.88	-1.69	CdCl2:H2O
CdF2	-12.80	-15.68	-2.88	CdF2
CdMetal	-34.90	-21.23	13.67	Cd
CdOHCl	-6.87	-3.27	3.59	CdOHCl
CdSO4	-10.46	-10.42	0.05	CdSO4
CdSO4:2.7H2O	-8.59	-10.42	-1.83	CdSO4:2.67H2O
CdSO4:H2O	-8.84	-10.42	-1.58	CdSO4:H2O
Cerrusite	-0.19	-13.36	-13.18	PbCO3
Chalcanthite	-7.97	-10.62	-2.65	CuSO4:5H2O
Claudetite	-89.66	-169.64	-79.98	As4O6
CO2(g)	-3.82	-21.98	-18.16	CO2
Cotunnite	-9.77	-14.60	-4.83	PbCl2
Cu(OH)2	-0.66	8.13	8.79	Cu(OH)2
Cu2(OH)3NO3	-5.78	3.63	9.41	Cu2(OH)3NO3
Cu2SO4	-24.74	-32.06	-7.31	Cu2SO4
Cu3(AsO4)2:6w	-7.46	-1.32	6.14	Cu3(AsO4)2:6H2O
CuCO3	-4.22	-13.85	-9.63	CuCO3
CuF	-23.16	-18.66	4.50	CuF
CuF2	-15.40	-15.89	-0.49	CuF2
CuF2:2H2O	-11.38	-15.89	-4.51	CuF2:2H2O
CuMetal	-9.80	-21.43	-11.63	Cu
CuOCuSO4	-14.38	-2.50	11.88	CuO:CuSO4
CupricFerrite	15.38	47.88	32.50	CuFe2O4
Cuprite	-6.29	-13.31	-7.02	Cu2O
CuprousFerrite	11.69	13.23	1.53	CuFeO2
CuSO4	-13.81	-10.62	3.19	CuSO4
Diaspore	3.60	10.72	7.13	AlOOH
Dolomite	-1.63	-18.63	-17.00	CaMg(CO3)2
Dolomite(d)	-2.20	-18.63	-16.43	CaMg(CO3)2
Epsomite	-4.02	-6.18	-2.17	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.32	16.40	10.08	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	1.87	19.88	18.01	Fe(OH)3
Fe3(OH)8	-1.60	44.85	46.45	Fe3(OH)8
Fluorite	-0.61	-11.26	-10.65	CaF2
Gibbsite	2.39	10.72	8.34	Al(OH)3
Goethite	7.76	19.88	12.12	FeOOH
Goslarite	-5.95	-7.94	-1.99	ZnSO4:7H2O
Gummite	-5.80	4.83	10.63	UO3
Gypsum	-1.41	-5.99	-4.58	CaSO4:2H2O
H2(g)	-29.51	-29.56	-0.05	H2
Halite	-8.40	-6.83	1.57	NaCl
Hausmannite	1.47	63.50	62.03	Mn3O4
Hematite	17.22	39.76	22.53	Fe2O3
Huntite	-7.74	-37.45	-29.71	CaMg3(CO3)4
Hydrocerrusite	-0.66	-18.12	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-16.83	-25.08	-8.24	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-5.71	25.64	31.35	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-3.94	26.51	30.45	KFe3(SO4)2(OH)6
Jarosite-Na	-7.53	26.90	34.43	NaFe3(SO4)2(OH)6
JarositeH	-12.38	22.13	34.51	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-4.80	-8.03	-3.23	AlOHSO4
Langite	-3.43	13.76	17.18	Cu4(OH)6SO4:H2O
Larnakite	-1.31	-1.52	-0.22	PbO:PbSO4
Laurionite	-3.61	-2.99	0.62	PbOHCl
Litharge	-4.27	8.61	12.88	PbO
Maghemite	7.14	39.76	32.62	Fe2O3
Magnesite	-1.44	-9.41	-7.97	MgCO3
Magnetite	14.38	44.85	30.47	Fe3O4
Malachite	-0.70	-5.72	-5.02	Cu2(OH)2CO3
Manganite	0.75	26.09	25.34	MnOOH
Massicot	-4.46	8.61	13.08	PbO
Matlockite	-5.49	-15.00	-9.51	PbClF
Melanothallite	-18.94	-15.08	3.85	CuCl2
Melanterite	-11.39	-13.65	-2.26	FeSO4:7H2O
Minium	-19.31	55.40	74.71	Pb3O4
Mirabilite	-7.90	-9.20	-1.30	Na2SO4:10H2O
Mn2(SO4)3	-50.28	-4.06	46.21	Mn2(SO4)3
Mn3(AsO4):8H2O	-4.31	8.24	12.56	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-14.43	-11.90	2.54	MnCl2:4H2O
MnSO4	-10.26	-7.44	2.82	MnSO4
Monteponite	-5.68	8.33	14.02	CdO
Morenosite	-7.20	-9.59	-2.39	NiSO4:7H2O
Na4UO2(CO3)3	-25.72	-42.01	-16.29	Na4UO2(CO3)3
Nahcolite	-6.25	-17.20	-10.95	NaHCO3
Nantokite	-8.69	-18.26	-9.56	CuCl
Natron	-10.96	-12.43	-1.47	Na2CO3:10H2O
Nesquehonite	-3.85	-9.41	-5.56	MgCO3:3H2O
Ni(OH)2	-1.34	9.16	10.50	Ni(OH)2
Ni3(AsO4)2:8H2O	-13.98	1.77	15.75	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-14.12	17.88	32.00	Ni4(OH)6SO4
NiCO3	-6.08	-12.82	-6.74	NiCO3
Nsutite	-1.69	40.87	42.56	MnO2
O2(g)	-25.44	59.12	84.56	O2
Otavite	-1.54	-13.64	-12.10	CdCO3
Pb(OH)2	0.32	8.61	8.29	Pb(OH)2
Pb2(OH)3Cl	-3.17	5.62	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-8.97	17.23	26.20	PbO:Pb(OH)2
Pb2O3	-14.25	46.79	61.04	Pb2O3
Pb2OCO3	-4.36	-4.75	-0.39	PbO:PbCO3
Pb3(AsO4)2	-5.72	0.14	5.86	Pb3(AsO4)2
Pb3O2CO3	-7.42	3.86	11.28	PbCO3:2PbO
Pb3O2SO4	-3.52	7.09	10.61	PbSO4:2PbO
Pb4(OH)6SO4	-5.40	15.70	21.10	Pb4(OH)6SO4
Pb4O3SO4	-6.75	15.70	22.45	PbSO4:3PbO
PbF2	-7.97	-15.40	-7.43	PbF2
PbMetal	-25.21	-20.95	4.27	Pb
PbO:0.3H2O	-4.37	8.61	12.98	PbO:0.33H2O
Phosgenite	-8.15	-27.96	-19.81	PbCl2:PbCO3
Plattnerite	-11.83	38.17	50.01	PbO2
Portlandite	-10.35	12.76	23.11	Ca(OH)2
Pyrochroite	-3.89	11.31	15.20	Mn(OH)2
Pyrolusite	-1.15	40.87	42.03	MnO2
Retgersite	-7.54	-9.59	-2.05	NiSO4:6H2O
Rhodochrosite	0.45	-10.66	-11.12	MnCO3
Rhodochrosite(d)	-0.27	-10.66	-10.39	MnCO3
Rutherfordine	-2.71	-17.15	-14.44	UO2CO3
Schoepite	-0.70	4.83	5.52	UO2(OH)2:H2O
Scorodite	-6.47	7.03	13.50	FeAsO4:2H2O
Siderite	-6.01	-16.88	-10.87	FeCO3
Siderite(d)(3)	-6.43	-16.88	-10.45	FeCO3
Smithsonite	-1.21	-11.17	-9.96	ZnCO3
Tenorite	0.36	8.13	7.77	CuO
Thenardite	-9.03	-9.20	-0.17	Na2SO4
Thermonatrite	-12.58	-12.43	0.15	Na2CO3:H2O
Trona	-18.65	-29.64	-10.98	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-30.90	-43.48	-12.58	U(OH)2SO4
U3O8(c)	-8.61	-15.08	-6.46	U3O8
U4O9(c)	-29.46	-69.37	-39.91	U4O9
UF4(c)	-44.97	-72.77	-27.80	UF4
UF4:2.5H2O	-35.82	-72.77	-36.95	UF4:2.5H2O
UO2(a)	-15.45	-24.73	-9.28	UO2
UO3(gamma)	-3.08	4.83	7.91	UO3
Uraninite(c)	-10.73	-24.73	-14.00	UO2
Witherite	-3.87	-12.44	-8.57	BaCO3
Zincite(c)	-0.55	10.81	11.36	ZnO
Zincosite	-11.14	-7.94	3.20	ZnSO4
Zn(NO3)2:6H2O	-17.81	-14.43	3.39	Zn(NO3)2:6H2O
Zn(OH)2-a	-1.64	10.81	12.45	Zn(OH)2
Zn(OH)2-b	-0.94	10.81	11.75	Zn(OH)2
Zn(OH)2-c	-1.39	10.81	12.20	Zn(OH)2
Zn(OH)2-e	-0.69	10.81	11.50	Zn(OH)2
Zn(OH)2-g	-0.90	10.81	11.71	Zn(OH)2
Zn2(OH)2SO4	-4.63	2.87	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.18	10.02	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-6.98	6.73	13.72	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-24.70	-5.07	19.64	ZnO:2ZnSO4
Zn4(OH)6SO4	-3.90	24.50	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-7.65	30.85	38.50	Zn5(OH)8Cl2
ZnCl2	-19.60	-12.40	7.20	ZnCl2
ZnCO3:H2O	-0.91	-11.17	-10.26	ZnCO3:H2O
ZnF2	-11.82	-13.20	-1.39	ZnF2
ZnMetal	-44.87	-18.75	26.12	Zn
ZnO(a)	-0.50	10.81	11.31	ZnO
ZnSO4:H2O	-7.48	-7.94	-0.46	ZnSO4:H2O

End of simulation.

-------------------Saturation indices-----------------------------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-0.34	10.72	11.06	Al(OH)3
AlAsO4:2H2O	-6.92	-2.13	4.79	AlAsO4:2H2O
AlumK	-17.16	-22.40	-5.24	KAl(SO4)2:12H2O
Alunite	-0.05	-0.95	-0.90	KAl3(SO4)2(OH)6
Anglesite	-2.33	-10.14	-7.81	PbSO4
Anhydrite	-1.64	-5.99	-4.35	CaSO4
Antlerite	-2.66	5.63	8.29	Cu3(OH)4SO4
Aragonite	-0.91	-9.22	-8.31	CaCO3
Arsenolite	-89.92	-169.64	-79.73	As4O6
Artinite	-6.73	3.16	9.89	MgCO3:Mg(OH)2:3H2O
As2O5	-32.46	-25.70	6.75	As2O5
Atacamite	-2.88	4.65	7.53	Cu2(OH)3Cl
Azurite	-2.90	-19.57	-16.67	Cu3(OH)2(CO3)2
B-UO2(OH)2	-0.85	4.83	5.68	UO2(OH)2
Ba3(AsO4)2	11.86	2.92	-8.94	Ba3(AsO4)2
BaF2	-8.71	-14.48	-5.77	BaF2
Barite	0.82	-9.21	-10.04	BaSO4
Basaluminite	1.45	24.15	22.70	Al4(OH)10SO4
Bianchite	-6.18	-7.94	-1.76	ZnSO4:6H2O
Birnessite	-2.73	40.87	43.60	MnO2
Bixbyite	1.11	52.19	51.08	Mn2O3
Boehmite	1.86	10.72	8.86	AlOOH
Brochantite	-1.58	13.76	15.34	Cu4(OH)6SO4
Brucite	-4.54	12.57	17.11	Mg(OH)2
Bunsenite	-3.53	9.16	12.69	NiO
Ca3(AsO4)2:4w	-9.78	12.58	22.36	Ca3(AsO4)2:4H2O
Calcite	-0.76	-9.22	-8.46	CaCO3
Cd(gamma)	-35.00	-21.23	13.77	Cd
Cd(OH)2	-5.32	8.33	13.65	Cd(OH)2
Cd(OH)2(a)	-5.60	8.33	13.94	Cd(OH)2
Cd3(OH)2(SO4)2	-19.21	-12.50	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-16.31	6.25	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-13.82	14.58	28.40	Cd4(OH)6SO4
CdCl2	-14.24	-14.88	-0.64	CdCl2
CdCl2:2.5H2O	-12.92	-14.88	-1.96	CdCl2:2.5H2O
CdCl2:H2O	-13.18	-14.88	-1.69	CdCl2:H2O
CdF2	-12.80	-15.68	-2.88	CdF2
CdMetal	-34.90	-21.23	13.67	Cd
CdOHCl	-6.87	-3.27	3.59	CdOHCl
CdSO4	-10.46	-10.42	0.05	CdSO4
CdSO4:2.7H2O	-8.59	-10.42	-1.83	CdSO4:2.67H2O
CdSO4:H2O	-8.84	-10.42	-1.58	CdSO4:H2O
Cerrusite	-0.19	-13.36	-13.18	PbCO3
Chalcanthite	-7.97	-10.62	-2.65	CuSO4:5H2O
Claudetite	-89.66	-169.64	-79.98	As4O6
CO2(g)	-3.82	-21.98	-18.16	CO2
Cotunnite	-9.77	-14.60	-4.83	PbCl2
Cu(OH)2	-0.66	8.13	8.79	Cu(OH)2
Cu2(OH)3NO3	-5.78	3.63	9.41	Cu2(OH)3NO3
Cu2SO4	-24.74	-32.06	-7.31	Cu2SO4
Cu3(AsO4)2:6w	-7.46	-1.32	6.14	Cu3(AsO4)2:6H2O
CuCO3	-4.22	-13.85	-9.63	CuCO3
CuF	-23.16	-18.66	4.50	CuF
CuF2	-15.40	-15.89	-0.49	CuF2
CuF2:2H2O	-11.38	-15.89	-4.51	CuF2:2H2O
CuMetal	-9.80	-21.43	-11.63	Cu
CuOCuSO4	-14.38	-2.50	11.88	CuO:CuSO4
CupricFerrite	15.23	21.49	6.27	CuFe2O4
Cuprite	-6.29	-13.31	-7.02	Cu2O
CuprousFerrite	11.62	0.03	-11.59	CuFeO2
CuSO4	-13.81	-10.62	3.19	CuSO4
Diaspore	3.60	10.72	7.13	AlOOH
Dolomite	-1.63	-18.63	-17.00	CaMg(CO3)2
Dolomite(d)	-2.20	-18.63	-16.43	CaMg(CO3)2
Epsomite	-4.02	-6.18	-2.17	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.24	3.20	-3.04	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	1.79	6.68	4.89	Fe(OH)3
Fe3(OH)8	1.96	22.18	20.22	Fe3(OH)8
Fluorite	-0.61	-11.26	-10.65	CaF2
Gibbsite	2.39	10.72	8.34	Al(OH)3
Goethite	7.68	6.68	-1.00	FeOOH
Goslarite	-5.95	-7.94	-1.99	ZnSO4:7H2O
Gummite	-5.80	4.83	10.63	UO3
Gypsum	-1.41	-5.99	-4.58	CaSO4:2H2O
H2(g)	-29.51	-29.56	-0.05	H2
Halite	-8.40	-6.83	1.57	NaCl
Hausmannite	1.47	63.50	62.03	Mn3O4
Hematite	17.07	13.36	-3.70	Fe2O3
Huntite	-7.74	-37.45	-29.71	CaMg3(CO3)4
Hydrocerrusite	-0.66	-18.12	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-16.83	-25.07	-8.24	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-5.94	-13.94	-8.00	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-4.18	-13.08	-8.90	KFe3(SO4)2(OH)6
Jarosite-Na	-7.76	-12.68	-4.92	NaFe3(SO4)2(OH)6
JarositeH	-12.62	-17.46	-4.84	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-4.80	-8.03	-3.23	AlOHSO4
Langite	-3.43	13.76	17.18	Cu4(OH)6SO4:H2O
Larnakite	-1.31	-1.52	-0.22	PbO:PbSO4
Laurionite	-3.61	-2.99	0.62	PbOHCl
Litharge	-4.27	8.61	12.88	PbO
Maghemite	6.98	13.36	6.39	Fe2O3
Magnesite	-1.44	-9.41	-7.97	MgCO3
Magnetite	17.94	22.18	4.24	Fe3O4
Malachite	-0.70	-5.72	-5.02	Cu2(OH)2CO3
Manganite	0.75	26.09	25.34	MnOOH
Massicot	-4.46	8.61	13.08	PbO
Matlockite	-5.49	-15.00	-9.51	PbClF
Melanothallite	-18.94	-15.08	3.85	CuCl2
Melanterite	-7.67	-9.93	-2.26	FeSO4:7H2O
Minium	-19.31	55.40	74.71	Pb3O4
Mirabilite	-7.90	-9.20	-1.30	Na2SO4:10H2O
Mn2(SO4)3	-50.28	-4.06	46.21	Mn2(SO4)3
Mn3(AsO4):8H2O	-4.31	8.24	12.56	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-14.43	-11.90	2.54	MnCl2:4H2O
MnSO4	-10.26	-7.44	2.82	MnSO4
Monteponite	-5.68	8.33	14.02	CdO
Morenosite	-7.20	-9.59	-2.39	NiSO4:7H2O
Na4UO2(CO3)3	-25.72	-42.01	-16.29	Na4UO2(CO3)3
Nahcolite	-6.25	-17.20	-10.95	NaHCO3
Nantokite	-8.69	-18.26	-9.56	CuCl
Natron	-10.96	-12.43	-1.47	Na2CO3:10H2O
Nesquehonite	-3.85	-9.41	-5.56	MgCO3:3H2O
Ni(OH)2	-1.34	9.16	10.50	Ni(OH)2
Ni3(AsO4)2:8H2O	-13.98	1.77	15.75	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-14.12	17.88	32.00	Ni4(OH)6SO4
NiCO3	-6.08	-12.82	-6.74	NiCO3
Nsutite	-1.69	40.87	42.56	MnO2
O2(g)	-25.44	59.12	84.56	O2
Otavite	-1.54	-13.64	-12.10	CdCO3
Pb(OH)2	0.32	8.61	8.29	Pb(OH)2
Pb2(OH)3Cl	-3.17	5.62	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-8.97	17.23	26.20	PbO:Pb(OH)2
Pb2O3	-14.25	46.79	61.04	Pb2O3
Pb2OCO3	-4.36	-4.75	-0.39	PbO:PbCO3
Pb3(AsO4)2	-5.72	0.14	5.86	Pb3(AsO4)2
Pb3O2CO3	-7.42	3.86	11.28	PbCO3:2PbO
Pb3O2SO4	-3.52	7.09	10.61	PbSO4:2PbO
Pb4(OH)6SO4	-5.40	15.70	21.10	Pb4(OH)6SO4
Pb4O3SO4	-6.75	15.70	22.45	PbSO4:3PbO
PbF2	-7.97	-15.40	-7.43	PbF2
PbMetal	-25.21	-20.95	4.27	Pb
PbO:0.3H2O	-4.37	8.61	12.98	PbO:0.33H2O
Phosgenite	-8.15	-27.96	-19.81	PbCl2:PbCO3
Plattnerite	-11.83	38.17	50.01	PbO2
Portlandite	-10.35	12.76	23.11	Ca(OH)2
Pyrochroite	-3.89	11.31	15.20	Mn(OH)2
Pyrolusite	-1.15	40.87	42.03	MnO2
Retgersite	-7.54	-9.59	-2.05	NiSO4:6H2O
Rhodochrosite	0.45	-10.66	-11.12	MnCO3
Rhodochrosite(d)	-0.27	-10.66	-10.39	MnCO3
Rutherfordine	-2.71	-17.15	-14.44	UO2CO3
Schoepite	-0.70	4.83	5.52	UO2(OH)2:H2O
Scorodite	-6.55	-6.17	0.38	FeAsO4:2H2O
Siderite	-2.29	-13.16	-10.87	FeCO3
Siderite(d)(3)	-2.71	-13.16	-10.45	FeCO3
Smithsonite	-1.21	-11.17	-9.96	ZnCO3
Tenorite	0.36	8.13	7.77	CuO
Thenardite	-9.03	-9.20	-0.17	Na2SO4
Thermonatrite	-12.58	-12.43	0.15	Na2CO3:H2O
Trona	-18.65	-29.63	-10.98	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-30.90	-43.48	-12.58	U(OH)2SO4
U3O8(c)	-8.61	-15.08	-6.46	U3O8
U4O9(c)	-29.46	-69.37	-39.91	U4O9
UF4(c)	-44.97	-72.77	-27.80	UF4
UF4:2.5H2O	-35.82	-72.77	-36.95	UF4:2.5H2O
UO2(a)	-15.45	-24.73	-9.28	UO2
UO3(gamma)	-3.08	4.83	7.91	UO3
Uraninite(c)	-10.73	-24.73	-14.00	UO2
Witherite	-3.87	-12.44	-8.57	BaCO3
Zincite(c)	-0.55	10.81	11.36	ZnO
Zincosite	-11.14	-7.94	3.20	ZnSO4
Zn(NO3)2:6H2O	-17.81	-14.43	3.39	Zn(NO3)2:6H2O
Zn(OH)2-a	-1.64	10.81	12.45	Zn(OH)2
Zn(OH)2-b	-0.94	10.81	11.75	Zn(OH)2
Zn(OH)2-c	-1.39	10.81	12.20	Zn(OH)2
Zn(OH)2-e	-0.69	10.81	11.50	Zn(OH)2
Zn(OH)2-g	-0.90	10.81	11.71	Zn(OH)2
Zn2(OH)2SO4	-4.63	2.87	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.18	10.02	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-6.98	6.73	13.72	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-24.70	-5.07	19.64	ZnO:2ZnSO4
Zn4(OH)6SO4	-3.90	24.50	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-7.65	30.85	38.50	Zn5(OH)8Cl2
ZnCl2	-19.60	-12.40	7.20	ZnCl2
ZnCO3:H2O	-0.91	-11.17	-10.26	ZnCO3:H2O
ZnF2	-11.82	-13.20	-1.39	ZnF2
ZnMetal	-44.87	-18.75	26.12	Zn
ZnO(a)	-0.50	10.81	11.31	ZnO
ZnSO4:H2O	-7.48	-7.94	-0.46	ZnSO4:H2O

End of simulation.

-------------------Saturation indices-----------------------------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-0.34	10.72	11.06	Al(OH)3
AlAsO4:2H2O	-6.92	-2.13	4.79	AlAsO4:2H2O
AlumK	-17.16	-22.40	-5.24	KAl(SO4)2:12H2O
Alunite	-0.05	-0.95	-0.90	KAl3(SO4)2(OH)6
Anglesite	-2.33	-10.14	-7.81	PbSO4
Anhydrite	-1.64	-5.99	-4.35	CaSO4
Antlerite	-2.66	5.63	8.29	Cu3(OH)4SO4
Aragonite	-0.91	-9.22	-8.31	CaCO3
Arsenolite	-89.92	-169.64	-79.73	As4O6
Artinite	-6.73	3.16	9.89	MgCO3:Mg(OH)2:3H2O
As2O5	-32.46	-25.70	6.75	As2O5
Atacamite	-2.88	4.65	7.53	Cu2(OH)3Cl
Azurite	-2.90	-19.57	-16.67	Cu3(OH)2(CO3)2
B-UO2(OH)2	-0.85	4.83	5.68	UO2(OH)2
Ba3(AsO4)2	11.86	2.92	-8.94	Ba3(AsO4)2
BaF2	-8.71	-14.48	-5.77	BaF2
Barite	0.82	-9.21	-10.04	BaSO4
Basaluminite	1.45	24.15	22.70	Al4(OH)10SO4
Bianchite	-6.18	-7.94	-1.76	ZnSO4:6H2O
Birnessite	-2.73	40.87	43.60	MnO2
Bixbyite	1.11	52.19	51.08	Mn2O3
Boehmite	1.86	10.72	8.86	AlOOH
Brochantite	-1.58	13.76	15.34	Cu4(OH)6SO4
Brucite	-4.54	12.57	17.11	Mg(OH)2
Bunsenite	-3.53	9.16	12.69	NiO
Ca3(AsO4)2:4w	-9.78	12.58	22.36	Ca3(AsO4)2:4H2O
Calcite	-0.76	-9.22	-8.46	CaCO3
Cd(gamma)	-35.00	-21.23	13.77	Cd
Cd(OH)2	-5.32	8.33	13.65	Cd(OH)2
Cd(OH)2(a)	-5.60	8.33	13.94	Cd(OH)2
Cd3(OH)2(SO4)2	-19.21	-12.50	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-16.31	6.25	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-13.82	14.58	28.40	Cd4(OH)6SO4
CdCl2	-14.24	-14.88	-0.64	CdCl2
CdCl2:2.5H2O	-12.92	-14.88	-1.96	CdCl2:2.5H2O
CdCl2:H2O	-13.18	-14.88	-1.69	CdCl2:H2O
CdF2	-12.80	-15.68	-2.88	CdF2
CdMetal	-34.90	-21.23	13.67	Cd
CdOHCl	-6.87	-3.27	3.59	CdOHCl
CdSO4	-10.46	-10.42	0.05	CdSO4
CdSO4:2.7H2O	-8.59	-10.42	-1.83	CdSO4:2.67H2O
CdSO4:H2O	-8.84	-10.42	-1.58	CdSO4:H2O
Cerrusite	-0.19	-13.36	-13.18	PbCO3
Chalcanthite	-7.97	-10.62	-2.65	CuSO4:5H2O
Claudetite	-89.66	-169.64	-79.98	As4O6
CO2(g)	-3.82	-21.98	-18.16	CO2
Cotunnite	-9.77	-14.60	-4.83	PbCl2
Cu(OH)2	-0.66	8.13	8.79	Cu(OH)2
Cu2(OH)3NO3	-5.78	3.63	9.41	Cu2(OH)3NO3
Cu2SO4	-24.74	-32.06	-7.31	Cu2SO4
Cu3(AsO4)2:6w	-7.46	-1.32	6.14	Cu3(AsO4)2:6H2O
CuCO3	-4.22	-13.85	-9.63	CuCO3
CuF	-23.16	-18.66	4.50	CuF
CuF2	-15.40	-15.89	-0.49	CuF2
CuF2:2H2O	-11.38	-15.89	-4.51	CuF2:2H2O
CuMetal	-9.80	-21.43	-11.63	Cu
CuOCuSO4	-14.38	-2.50	11.88	CuO:CuSO4
CupricFerrite	15.23	21.49	6.27	CuFe2O4
Cuprite	-6.29	-13.31	-7.02	Cu2O
CuprousFerrite	11.62	0.03	-11.59	CuFeO2
CuSO4	-13.81	-10.62	3.19	CuSO4
Diaspore	3.60	10.72	7.13	AlOOH
Dolomite	-1.63	-18.63	-17.00	CaMg(CO3)2
Dolomite(d)	-2.20	-18.63	-16.43	CaMg(CO3)2
Epsomite	-4.02	-6.18	-2.17	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.24	3.20	-3.04	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	1.79	6.68	4.89	Fe(OH)3
Fe3(OH)8	1.96	22.18	20.22	Fe3(OH)8
Fluorite	-0.61	-11.26	-10.65	CaF2
Gibbsite	2.39	10.72	8.34	Al(OH)3
Goethite	7.68	6.68	-1.00	FeOOH
Goslarite	-5.95	-7.94	-1.99	ZnSO4:7H2O
Gummite	-5.80	4.83	10.63	UO3
Gypsum	-1.41	-5.99	-4.58	CaSO4:2H2O
H2(g)	-29.51	-29.56	-0.05	H2
Halite	-8.40	-6.83	1.57	NaCl
Hausmannite	1.47	63.50	62.03	Mn3O4
Hematite	17.07	13.36	-3.70	Fe2O3
Huntite	-7.74	-37.45	-29.71	CaMg3(CO3)4
Hydrocerrusite	-0.66	-18.12	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-16.83	-25.07	-8.24	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-5.94	-13.94	-8.00	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-4.18	-13.08	-8.90	KFe3(SO4)2(OH)6
Jarosite-Na	-7.76	-12.68	-4.92	NaFe3(SO4)2(OH)6
JarositeH	-12.62	-17.46	-4.84	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-4.80	-8.03	-3.23	AlOHSO4
Langite	-3.43	13.76	17.18	Cu4(OH)6SO4:H2O
Larnakite	-1.31	-1.52	-0.22	PbO:PbSO4
Laurionite	-3.61	-2.99	0.62	PbOHCl
Litharge	-4.27	8.61	12.88	PbO
Maghemite	6.98	13.36	6.39	Fe2O3
Magnesite	-1.44	-9.41	-7.97	MgCO3
Magnetite	17.94	22.18	4.24	Fe3O4
Malachite	-0.70	-5.72	-5.02	Cu2(OH)2CO3
Manganite	0.75	26.09	25.34	MnOOH
Massicot	-4.46	8.61	13.08	PbO
Matlockite	-5.49	-15.00	-9.51	PbClF
Melanothallite	-18.94	-15.08	3.85	CuCl2
Melanterite	-7.67	-9.93	-2.26	FeSO4:7H2O
Minium	-19.31	55.40	74.71	Pb3O4
Mirabilite	-7.90	-9.20	-1.30	Na2SO4:10H2O
Mn2(SO4)3	-50.28	-4.06	46.21	Mn2(SO4)3
Mn3(AsO4):8H2O	-4.31	8.24	12.56	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-14.43	-11.90	2.54	MnCl2:4H2O
MnSO4	-10.26	-7.44	2.82	MnSO4
Monteponite	-5.68	8.33	14.02	CdO
Morenosite	-7.20	-9.59	-2.39	NiSO4:7H2O
Na4UO2(CO3)3	-25.72	-42.01	-16.29	Na4UO2(CO3)3
Nahcolite	-6.25	-17.20	-10.95	NaHCO3
Nantokite	-8.69	-18.26	-9.56	CuCl
Natron	-10.96	-12.43	-1.47	Na2CO3:10H2O
Nesquehonite	-3.85	-9.41	-5.56	MgCO3:3H2O
Ni(OH)2	-1.34	9.16	10.50	Ni(OH)2
Ni3(AsO4)2:8H2O	-13.98	1.77	15.75	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-14.12	17.88	32.00	Ni4(OH)6SO4
NiCO3	-6.08	-12.82	-6.74	NiCO3
Nsutite	-1.69	40.87	42.56	MnO2
O2(g)	-25.44	59.12	84.56	O2
Otavite	-1.54	-13.64	-12.10	CdCO3
Pb(OH)2	0.32	8.61	8.29	Pb(OH)2
Pb2(OH)3Cl	-3.17	5.62	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-8.97	17.23	26.20	PbO:Pb(OH)2
Pb2O3	-14.25	46.79	61.04	Pb2O3
Pb2OCO3	-4.36	-4.75	-0.39	PbO:PbCO3
Pb3(AsO4)2	-5.72	0.14	5.86	Pb3(AsO4)2
Pb3O2CO3	-7.42	3.86	11.28	PbCO3:2PbO
Pb3O2SO4	-3.52	7.09	10.61	PbSO4:2PbO
Pb4(OH)6SO4	-5.40	15.70	21.10	Pb4(OH)6SO4
Pb4O3SO4	-6.75	15.70	22.45	PbSO4:3PbO
PbF2	-7.97	-15.40	-7.43	PbF2
PbMetal	-25.21	-20.95	4.27	Pb
PbO:0.3H2O	-4.37	8.61	12.98	PbO:0.33H2O
Phosgenite	-8.15	-27.96	-19.81	PbCl2:PbCO3
Plattnerite	-11.83	38.17	50.01	PbO2
Portlandite	-10.35	12.76	23.11	Ca(OH)2
Pyrochroite	-3.89	11.31	15.20	Mn(OH)2
Pyrolusite	-1.15	40.87	42.03	MnO2
Retgersite	-7.54	-9.59	-2.05	NiSO4:6H2O
Rhodochrosite	0.45	-10.66	-11.12	MnCO3
Rhodochrosite(d)	-0.27	-10.66	-10.39	MnCO3
Rutherfordine	-2.71	-17.15	-14.44	UO2CO3
Schoepite	-0.70	4.83	5.52	UO2(OH)2:H2O
Scorodite	-6.55	-6.17	0.38	FeAsO4:2H2O
Siderite	-2.29	-13.16	-10.87	FeCO3
Siderite(d)(3)	-2.71	-13.16	-10.45	FeCO3
Smithsonite	-1.21	-11.17	-9.96	ZnCO3
Tenorite	0.36	8.13	7.77	CuO
Thenardite	-9.03	-9.20	-0.17	Na2SO4
Thermonatrite	-12.58	-12.43	0.15	Na2CO3:H2O
Trona	-18.65	-29.63	-10.98	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-30.90	-43.48	-12.58	U(OH)2SO4
U3O8(c)	-8.61	-15.08	-6.46	U3O8
U4O9(c)	-29.46	-69.37	-39.91	U4O9
UF4(c)	-44.97	-72.77	-27.80	UF4
UF4:2.5H2O	-35.82	-72.77	-36.95	UF4:2.5H2O
UO2(a)	-15.45	-24.73	-9.28	UO2
UO3(gamma)	-3.08	4.83	7.91	UO3
Uraninite(c)	-10.73	-24.73	-14.00	UO2
Witherite	-3.87	-12.44	-8.57	BaCO3
Zincite(c)	-0.55	10.81	11.36	ZnO
Zincosite	-11.14	-7.94	3.20	ZnSO4
Zn(NO3)2:6H2O	-17.81	-14.43	3.39	Zn(NO3)2:6H2O
Zn(OH)2-a	-1.64	10.81	12.45	Zn(OH)2
Zn(OH)2-b	-0.94	10.81	11.75	Zn(OH)2
Zn(OH)2-c	-1.39	10.81	12.20	Zn(OH)2
Zn(OH)2-e	-0.69	10.81	11.50	Zn(OH)2
Zn(OH)2-g	-0.90	10.81	11.71	Zn(OH)2
Zn2(OH)2SO4	-4.63	2.87	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.18	10.02	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-6.98	6.73	13.72	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-24.70	-5.07	19.64	ZnO:2ZnSO4
Zn4(OH)6SO4	-3.90	24.50	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-7.65	30.85	38.50	Zn5(OH)8Cl2
ZnCl2	-19.60	-12.40	7.20	ZnCl2
ZnCO3:H2O	-0.91	-11.17	-10.26	ZnCO3:H2O
ZnF2	-11.82	-13.20	-1.39	ZnF2
ZnMetal	-44.87	-18.75	26.12	Zn
ZnO(a)	-0.50	10.81	11.31	ZnO
ZnSO4:H2O	-7.48	-7.94	-0.46	ZnSO4:H2O

End of simulation.

```
------------------
Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 4.5-5.5m
           SOLUTION        3
           units           mg/l
           temp            21.5
           pH              8.4
           pe              7.17
           F               1.8
           Cl              5
           S(6)            150       as SO4
           Na              16
           K               2.7
           Mg              13
           Ca              40
           Alkalinity      42.7      as HCO3
           Al              0.409
           As              0.091
           Ba              0.186
           Cd              0.006
           Cu              0.108
           Fe(+2)          0.010
           Fe(+3)          0.050
           Mn              4.0
           Ni              0.083
           Pb              0.007
           U               0.949      Fe(+2)/Fe(+3)
           Zn              0.199
           END
```

```
-----
TITLE
-----

   Schneckentein 4.5-5.5m

-----------------------------------------
Beginning of initial solution calculations.
-----------------------------------------

Initial solution 3.

----------------------------Solution composition----------
--------------------

           Elements           Molality       Moles

           Al                1.516e-05   1.516e-05
           Alkalinity        7.000e-04   7.000e-04
           As                1.215e-06   1.215e-06
           Ba                1.355e-06   1.355e-06
           Ca                9.983e-04   9.983e-04
           Cd                5.340e-08   5.340e-08
           Cl                1.411e-04   1.411e-04
           Cu                1.700e-06   1.700e-06
           F                 9.477e-05   9.477e-05
           Fe(2)             1.791e-07   1.791e-07
           Fe(3)             8.956e-07   8.956e-07
           K                 6.907e-05   6.907e-05
           Mg                5.349e-04   5.349e-04
           Mn                7.283e-05   7.283e-05
           Na                6.962e-04   6.962e-04
           Ni                1.414e-06   1.414e-06
           Pb                3.379e-08   3.379e-08
           S(6)              1.562e-03   1.562e-03
           U                 3.988e-06   3.988e-06
           Zn                3.045e-06   3.045e-06
```

```
----------------------------Description of solution----------------------
-------

                                    pH  =   8.400
                                    pe  =   7.170
                      Activity of water  =   1.000
                         Ionic strength  =   6.304e-03
                     Mass of water (kg)  =   1.000e+00
                  Total carbon (mol/kg)  =   5.920e-04
                     Total CO2 (mol/kg)  =   5.920e-04
                    Temperature (deg C)  =  21.500
                Electrical balance (eq)  =  -1.372e-05
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  -0.19
                               Iterations  =  15
                                  Total H  = 1.110131e+02
                                  Total O  = 5.551432e+01

--------------------------------Redox couples-------------------------
--------

           Redox couple             pe  Eh (volts)

           Fe(2)/Fe(3)          1.5392      0.0900
```

```
------------------
Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 4.5-5.5m
           SOLUTION        3
           units           mg/l
           temp            21.5
           pH              8.4
           pe              7.17
           F               1.8
           Cl              5
           S(6)            150       as SO4
           Na              16
           K               2.7
           Mg              13
           Ca              40
           Alkalinity      42.7      as HCO3
           Al              0.409
           As              0.091
           Ba              0.186
           Cd              0.006
           Cu              0.108
           Fe(+2)          0.010
           Fe(+3)          0.050
           Mn              4.0
           Ni              0.083
           Pb              0.007
           U               0.949
           Zn              0.199
           END
```

```
TITLE
-----

   Schneckentein 4.5-5.5m

-------------------------------------------
Beginning of initial solution calculations.
-------------------------------------------

Initial solution 3.

-----------------------------Solution composition--------------
---------------

            Elements           Molality       Moles

            Al                1.516e-05   1.516e-05
            Alkalinity        7.000e-04   7.000e-04
            As                1.215e-06   1.215e-06
            Ba                1.355e-06   1.355e-06
            Ca                9.983e-04   9.983e-04
            Cd                5.340e-08   5.340e-08
            Cl                1.411e-04   1.411e-04
            Cu                1.700e-06   1.700e-06
            F                 9.477e-05   9.477e-05
            Fe(2)             1.791e-07   1.791e-07
            Fe(3)             8.956e-07   8.956e-07
            K                 6.907e-05   6.907e-05
            Mg                5.349e-04   5.349e-04
            Mn                7.283e-05   7.283e-05
            Na                6.962e-04   6.962e-04
            Ni                1.414e-06   1.414e-06
            Pb                3.379e-08   3.379e-08
            S(6)              1.562e-03   1.562e-03
            U                 3.988e-06   3.988e-06
            Zn                3.045e-06   3.045e-06
```

```
----------------------------Description of solution----------------------
-----

                                    pH  =   8.400
                                    pe  =   7.170
                      Activity of water  =   1.000
                         Ionic strength  =   6.304e-03
                     Mass of water (kg)  =   1.000e+00
                 Total carbon (mol/kg)  =   5.920e-04
                    Total CO2 (mol/kg)  =   5.920e-04
                   Temperature (deg C)  =  21.500
                Electrical balance (eq)  =  -1.372e-05
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  -0.19
                              Iterations  =  15
                                 Total H  = 1.110131e+02
                                 Total O  = 5.551432e+01

--------------------------------Redox couples---------------------------
-----

           Redox couple             pe  Eh (volts)

           Fe(2)/Fe(3)          1.5392      0.0900
```

```
------------------
Reading data base.
------------------

           SOLUTION_MASTER_SPECIES
           SOLUTION_SPECIES
           PHASES
           EXCHANGE_MASTER_SPECIES
           EXCHANGE_SPECIES
           SURFACE_MASTER_SPECIES
           SURFACE_SPECIES
           END
-----------------------------------
Reading input data for simulation 1.
-----------------------------------

           TITLE   Schneckentein 4.5-5.5m
           SOLUTION        3
           units           mg/l
           temp            21.5
           pH              8.4
           pe              7.17
           F               1.8
           Cl              5
           S(6)            150       as SO4
           Na              16
           K               2.7
           Mg              13
           Ca              40
           Alkalinity      42.7      as HCO3
           Al              0.409
           As              0.091
           Ba              0.186
           Cd              0.006
           Cu              0.108
           Fe              0.060
           Mn              4.0
           Ni              0.083
           Pb              0.007
           U               0.949
           Zn              0.199
           END
```

```
-----
TITLE
-----

   Schneckentein 4.5-5.5m

-------------------------------------------
Beginning of initial solution calculations.
-------------------------------------------

Initial solution 3.

-----------------------------Solution composition------------
-----------------

           Elements           Molality       Moles

           Al                1.516e-05   1.516e-05
           Alkalinity        7.000e-04   7.000e-04
           As                1.215e-06   1.215e-06
           Ba                1.355e-06   1.355e-06
           Ca                9.983e-04   9.983e-04
           Cd                5.340e-08   5.340e-08
           Cl                1.411e-04   1.411e-04
           Cu                1.700e-06   1.700e-06
           F                 9.477e-05   9.477e-05
           Fe                1.075e-06   1.075e-06
           K                 6.907e-05   6.907e-05
           Mg                5.349e-04   5.349e-04
           Mn                7.283e-05   7.283e-05
           Na                6.962e-04   6.962e-04
           Ni                1.414e-06   1.414e-06
           Pb                3.379e-08   3.379e-08
           S(6)              1.562e-03   1.562e-03
           U                 3.988e-06   3.988e-06
           Zn                3.045e-06   3.045e-06
```

```
----------------------------Description of solution------------------
----------

                                    pH  =   8.400
                                    pe  =   7.170
                      Activity of water  =   1.000
                         Ionic strength  =   6.304e-03
                     Mass of water (kg)  =   1.000e+00
                  Total carbon (mol/kg)  =   5.918e-04
                     Total CO2 (mol/kg)  =   5.918e-04
                    Temperature (deg C)  =  21.500
                 Electrical balance (eq)  =  -1.390e-05
 Percent error, 100*(Cat-|An|)/(Cat+|An|)  =  -0.20
                               Iterations  =  15
                                  Total H  = 1.110131e+02
                                  Total O  = 5.551432e+01
```

----------Distribution of species----------

	Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
	OH-	2.087e-06	1.920e-06	-5.680	-5.717	-0.036
	H+	4.291e-09	3.981e-09	-8.367	-8.400	-0.033
	H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	1.516e-05					
	Al(OH)4-	1.513e-05	1.392e-05	-4.820	-4.856	-0.036
	Al(OH)3	3.068e-08	3.073e-08	-7.513	-7.512	0.001
	Al(OH)2+	1.175e-09	1.081e-09	-8.930	-8.966	-0.036
	AlF2+	1.429e-11	1.314e-11	-10.845	-10.881	-0.036
	AlF3	1.398e-11	1.400e-11	-10.854	-10.854	0.001
	AlOH+2	1.048e-12	7.500e-13	-11.980	-12.125	-0.145
	AlF4-	5.143e-13	4.731e-13	-12.289	-12.325	-0.036
	AlF+2	4.392e-13	3.144e-13	-12.357	-12.503	-0.145
	AlSO4+	1.219e-15	1.121e-15	-14.914	-14.950	-0.036
	Al+3	8.020e-16	3.781e-16	-15.096	-15.422	-0.327
	Al(SO4)2-	3.722e-17	3.423e-17	-16.429	-16.466	-0.036
	AlHSO4+2	5.368e-25	3.843e-25	-24.270	-24.415	-0.145
As(3)	1.583e-26					
	H3AsO3	1.387e-26	1.389e-26	-25.858	-25.857	0.001
	H2AsO3-	1.967e-27	1.809e-27	-26.706	-26.742	-0.036
	HAsO3-2	4.307e-31	3.083e-31	-30.366	-30.511	-0.145
	H4AsO3+	2.978e-35	2.739e-35	-34.526	-34.562	-0.036
	AsO3-3	5.609e-36	2.644e-36	-35.251	-35.578	-0.327
As(5)	1.215e-06					
	HAsO4-2	1.192e-06	8.536e-07	-5.924	-6.069	-0.145
	H2AsO4-	2.149e-08	1.977e-08	-7.668	-7.704	-0.036
	AsO4-3	1.057e-09	4.982e-10	-8.976	-9.303	-0.327
	H3AsO4	1.329e-14	1.331e-14	-13.876	-13.876	0.001
Ba	1.355e-06					
	Ba+2	9.984e-07	7.147e-07	-6.001	-6.146	-0.145
	BaSO4	3.511e-07	3.516e-07	-6.455	-6.454	0.001
	BaHCO3+	3.312e-09	3.046e-09	-8.480	-8.516	-0.036
	BaCO3	1.867e-09	1.869e-09	-8.729	-8.728	0.001
	BaOH+	6.613e-12	6.083e-12	-11.180	-11.216	-0.036
C(4)	5.920e-04					
	HCO3-	5.384e-04	4.964e-04	-3.269	-3.304	-0.035
	MnCO3	1.534e-05	1.536e-05	-4.814	-4.814	0.001
	CO3-2	7.515e-06	5.431e-06	-5.124	-5.265	-0.141
	CaCO3	5.344e-06	5.352e-06	-5.272	-5.272	0.001
	CO2	4.650e-06	4.656e-06	-5.333	-5.332	0.001
	CaHCO3+	4.082e-06	3.754e-06	-5.389	-5.425	-0.036
	MgHCO3+	2.073e-06	1.907e-06	-5.683	-5.720	-0.036
	UO2(CO3)2-2	1.877e-06	1.344e-06	-5.727	-5.872	-0.145
	MnHCO3+	1.713e-06	1.576e-06	-5.766	-5.803	-0.036
	MgCO3	1.634e-06	1.636e-06	-5.787	-5.786	0.001
	UO2(CO3)3-4	1.555e-06	4.085e-07	-5.808	-6.389	-0.581
	NiCO3	1.340e-06	1.342e-06	-5.873	-5.872	0.001
	ZnCO3	8.292e-07	8.304e-07	-6.081	-6.081	0.001
	NaHCO3	1.777e-07	1.780e-07	-6.750	-6.750	0.001
	Zn(CO3)2-2	1.347e-07	9.642e-08	-6.871	-7.016	-0.145
	NaCO3-	5.863e-08	5.393e-08	-7.232	-7.268	-0.036
	ZnHCO3+	5.206e-08	4.788e-08	-7.284	-7.320	-0.036
	CuCO3	3.667e-08	3.673e-08	-7.436	-7.435	0.001
	PbCO3	3.056e-08	3.060e-08	-7.515	-7.514	0.001
	Ni(CO3)2-2	1.769e-08	1.267e-08	-7.752	-7.897	-0.145
	FeCO3	1.286e-08	1.288e-08	-7.891	-7.890	0.001
	UO2CO3	1.124e-08	1.126e-08	-7.949	-7.949	0.001
	FeHCO3+	5.335e-09	4.907e-09	-8.273	-8.309	-0.036
	BaHCO3+	3.312e-09	3.046e-09	-8.480	-8.516	-0.036
	NiHCO3+	2.483e-09	2.284e-09	-8.605	-8.641	-0.036
	BaCO3	1.867e-09	1.869e-09	-8.729	-8.728	0.001
	Pb(CO3)2-2	5.832e-10	4.175e-10	-9.234	-9.379	-0.145
	CdHCO3+	5.259e-10	4.838e-10	-9.279	-9.315	-0.036
	Cu(CO3)2-2	3.508e-10	2.511e-10	-9.455	-9.600	-0.145
	CuHCO3+	3.406e-10	3.133e-10	-9.468	-9.504	-0.036
	PbHCO3+	1.390e-10	1.278e-10	-9.857	-9.893	-0.036
	CdCO3	1.328e-10	1.330e-10	-9.877	-9.876	0.001
	Cd(CO3)2-2	3.190e-12	2.284e-12	-11.496	-11.641	-0.145
	(UO2)3(CO3)6-6	6.410e-14	3.166e-15	-13.193	-14.500	-1.306
	UO2(CO3)3-5	1.547e-20	1.916e-21	-19.811	-20.718	-0.907
	U(CO3)4-4	6.008e-28	1.578e-28	-27.221	-27.802	-0.581
	U(CO3)5-6	1.463e-31	7.226e-33	-30.835	-32.141	-1.306
Ca	9.983e-04					
	Ca+2	8.695e-04	6.281e-04	-3.061	-3.202	-0.141
	CaSO4	1.188e-04	1.190e-04	-3.925	-3.924	0.001
	CaCO3	5.344e-06	5.352e-06	-5.272	-5.272	0.001
	CaHCO3+	4.082e-06	3.754e-06	-5.389	-5.425	-0.036
	CaF+	4.651e-07	4.278e-07	-6.332	-6.369	-0.036
	CaOH+	2.846e-08	2.618e-08	-7.546	-7.582	-0.036
	CaHSO4+	2.893e-12	2.661e-12	-11.539	-11.575	-0.036
Cd	5.340e-08					
	Cd+2	4.305e-08	3.082e-08	-7.366	-7.511	-0.145
	CdSO4	8.526e-09	8.538e-09	-8.069	-8.069	0.001
	CdOH+	5.383e-10	4.951e-10	-9.269	-9.305	-0.036
	CdHCO3+	5.259e-10	4.838e-10	-9.279	-9.315	-0.036
	CdCl+	4.098e-10	3.769e-10	-9.387	-9.424	-0.036
	CdCO3	1.328e-10	1.330e-10	-9.877	-9.876	0.001
	Cd(SO4)2-2	1.312e-10	9.391e-11	-9.882	-10.027	-0.145
	CdOHCl	3.621e-11	3.626e-11	-10.441	-10.441	0.001
	CdF+	3.583e-11	3.296e-11	-10.446	-10.482	-0.036
	Cd(OH)2	8.672e-12	8.684e-12	-11.062	-11.061	0.001
	Cd(CO3)2-2	3.190e-12	2.284e-12	-11.496	-11.641	-0.145
	CdCl2	2.007e-13	2.010e-13	-12.697	-12.697	0.001
	CdF2	7.021e-15	7.032e-15	-14.154	-14.153	0.001
	Cd(OH)3-	2.661e-16	2.447e-16	-15.575	-15.611	-0.036
	Cd2OH+3	1.657e-16	7.810e-17	-15.781	-16.107	-0.327
	CdCl3-	1.694e-17	1.558e-17	-16.771	-16.807	-0.036
	Cd(OH)4-2	7.653e-22	5.479e-22	-21.116	-21.261	-0.145
Cl	1.411e-04					
	Cl-	1.410e-04	1.296e-04	-3.851	-3.887	-0.037
	MnCl+	2.044e-08	1.880e-08	-7.690	-7.726	-0.036
	ZnOHCl	8.247e-10	8.259e-10	-9.084	-9.083	0.001
	CdCl+	4.098e-10	3.769e-10	-9.387	-9.424	-0.036
	ZnCl+	2.486e-10	2.286e-10	-9.605	-9.641	-0.036
	CdOHCl	3.621e-11	3.626e-11	-10.441	-10.441	0.001
	FeCl+	1.923e-11	1.769e-11	-10.716	-10.752	-0.036
	NiCl+	1.180e-11	1.085e-11	-10.928	-10.965	-0.036
	PbCl+	1.666e-12	1.532e-12	-11.778	-11.815	-0.036
	MnCl2	1.062e-12	1.064e-12	-11.974	-11.973	0.001
	CuCl+	4.015e-13	3.693e-13	-12.396	-12.433	-0.036
	CdCl2	2.007e-13	2.010e-13	-12.697	-12.697	0.001
	ZnCl2	3.055e-14	3.059e-14	-13.515	-13.514	0.001
	NiCl2	5.098e-15	5.106e-15	-14.293	-14.292	0.001
	PbCl2	3.358e-16	3.362e-16	-15.474	-15.473	0.001
	CuCl2-	2.517e-16	2.315e-16	-15.599	-15.635	-0.036
	UO2Cl+	9.985e-17	9.185e-17	-16.001	-16.037	-0.036
	MnCl3-	4.128e-17	3.797e-17	-16.384	-16.421	-0.036
	CuCl2	2.470e-17	2.474e-17	-16.607	-16.607	0.001
	CdCl3-	1.694e-17	1.558e-17	-16.771	-16.807	-0.036
	ZnCl3-	4.734e-18	4.355e-18	-17.325	-17.361	-0.036
	CuCl3-2	6.553e-20	4.691e-20	-19.184	-19.329	-0.145
	PbCl3-	3.682e-20	3.387e-20	-19.434	-19.470	-0.036
	FeCl+2	1.315e-21	9.414e-22	-20.881	-21.026	-0.145
	UO2Cl2	6.170e-22	6.179e-22	-21.210	-21.209	0.001
	ZnCl4-2	3.842e-22	2.750e-22	-21.415	-21.561	-0.145
	CuCl3-	1.161e-23	1.068e-23	-22.935	-22.971	-0.036
	PbCl4-2	2.856e-24	2.044e-24	-23.544	-23.689	-0.145
	FeCl2+	6.629e-25	6.097e-25	-24.179	-24.215	-0.036
	CuCl4-2	8.931e-30	6.393e-30	-29.049	-29.194	-0.145
	FeCl3	7.891e-30	7.902e-30	-29.103	-29.102	0.001
	UCl+3	0.000e+00	0.000e+00	-41.443	-41.769	-0.327
Cu(1)	4.724e-14					
	Cu+	4.699e-14	4.322e-14	-13.328	-13.364	-0.036
	CuCl2-	2.517e-16	2.315e-16	-15.599	-15.635	-0.036
	CuCl3-2	6.553e-20	4.691e-20	-19.184	-19.329	-0.145
Cu(2)	1.700e-06					
	Cu(OH)2	1.657e-06	1.660e-06	-5.781	-5.780	0.001
	CuCO3	3.667e-08	3.673e-08	-7.436	-7.435	0.001
	CuOH+	3.438e-09	3.163e-09	-8.464	-8.500	-0.036
	Cu+2	1.759e-09	1.259e-09	-8.755	-8.900	-0.145
	Cu(CO3)2-2	3.508e-10	2.511e-10	-9.455	-9.600	-0.145
	CuHCO3+	3.406e-10	3.133e-10	-9.468	-9.504	-0.036
	CuSO4	2.459e-10	2.463e-10	-9.609	-9.609	0.001
	Cu(OH)3-	2.731e-11	2.512e-11	-10.564	-10.600	-0.036
	Cu2(OH)2+2	4.301e-12	3.079e-12	-11.366	-11.512	-0.145
	CuF+	2.048e-12	1.884e-12	-11.689	-11.725	-0.036
	CuCl+	4.015e-13	3.693e-13	-12.396	-12.433	-0.036
	Cu(OH)4-2	1.758e-15	1.259e-15	-14.755	-14.900	-0.145
	CuCl2	2.470e-17	2.474e-17	-16.607	-16.607	0.001
	CuCl3-	1.161e-23	1.068e-23	-22.935	-22.971	-0.036
	CuCl4-2	8.931e-30	6.393e-30	-29.049	-29.194	-0.145
F	9.477e-05					
	F-	9.234e-05	8.494e-05	-4.035	-4.071	-0.036
	MgF+	1.906e-06	1.753e-06	-5.720	-5.756	-0.036
	CaF+	4.651e-07	4.278e-07	-6.332	-6.369	-0.036
	NaF	3.112e-08	3.116e-08	-7.507	-7.506	0.001
	MnF+	2.275e-08	2.093e-08	-7.643	-7.679	-0.036
	ZnF+	9.559e-10	8.793e-10	-9.020	-9.056	-0.036
	HF	4.757e-10	4.764e-10	-9.323	-9.322	0.001
	FeF+	9.129e-11	8.397e-11	-10.040	-10.076	-0.036
	NiF+	6.141e-11	5.648e-11	-10.212	-10.248	-0.036
	CdF+	3.583e-11	3.296e-11	-10.446	-10.482	-0.036
	AlF2+	1.429e-11	1.314e-11	-10.845	-10.881	-0.036
	AlF3	1.398e-11	1.400e-11	-10.854	-10.854	0.001
	UO2F+	5.608e-12	5.159e-12	-11.251	-11.287	-0.036
	CuF+	2.048e-12	1.884e-12	-11.689	-11.725	-0.036
	UO2F2	1.480e-12	1.482e-12	-11.830	-11.829	0.001
	PbF+	5.324e-13	4.897e-13	-12.274	-12.310	-0.036
	AlF4-	5.143e-13	4.731e-13	-12.289	-12.325	-0.036
	AlF+2	4.392e-13	3.144e-13	-12.357	-12.503	-0.145
	HF2-	1.640e-13	1.509e-13	-12.785	-12.821	-0.036
	UO2F3-	2.605e-14	2.396e-14	-13.584	-13.621	-0.036
	CdF2	7.021e-15	7.032e-15	-14.154	-14.153	0.001
	PbF2	8.481e-16	8.493e-16	-15.072	-15.071	0.001
	FeF2+	1.210e-16	1.113e-16	-15.917	-15.954	-0.036
	FeF+2	4.794e-17	3.432e-17	-16.319	-16.464	-0.145
	UO2F4-2	1.811e-17	1.297e-17	-16.742	-16.887	-0.145
	FeF3	1.478e-17	1.480e-17	-16.830	-16.830	0.001
	H2F2	6.693e-19	6.703e-19	-18.174	-18.174	0.001
	PbF3-	5.682e-19	5.226e-19	-18.246	-18.282	-0.036
	PbF4-2	2.968e-23	2.125e-23	-22.528	-22.673	-0.145
	UF3+	6.043e-31	5.559e-31	-30.219	-30.255	-0.036
	UF4	3.819e-31	3.824e-31	-30.418	-30.417	0.001
	UF2+2	3.880e-32	2.778e-32	-31.411	-31.556	-0.145
	UF5-	1.019e-33	9.373e-34	-32.992	-33.028	-0.036
	UF+3	8.424e-35	3.971e-35	-34.074	-34.401	-0.327
	UF6-2	1.411e-35	1.010e-35	-34.850	-34.996	-0.145
Fe(2)	1.791e-07					
	Fe+2	1.381e-07	9.886e-08	-6.860	-7.005	-0.145
	FeSO4	1.615e-08	1.618e-08	-7.792	-7.791	0.001
	FeCO3	1.286e-08	1.288e-08	-7.891	-7.890	0.001
	FeOH+	6.551e-09	6.026e-09	-8.184	-8.220	-0.036
	FeHCO3+	5.335e-09	4.907e-09	-8.273	-8.309	-0.036
	FeF+	9.129e-11	8.397e-11	-10.040	-10.076	-0.036
	FeCl+	1.923e-11	1.769e-11	-10.716	-10.752	-0.036
	Fe(OH)2	9.454e-12	9.468e-12	-11.024	-11.024	0.001
	Fe(OH)3-	9.277e-14	8.533e-14	-13.033	-13.069	-0.036
	FeHSO4+	4.553e-16	4.188e-16	-15.342	-15.378	-0.036

----------Distribution of species----------

	Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
	OH-	2.087e-06	1.920e-06	-5.680	-5.717	-0.036
	H+	4.291e-09	3.981e-09	-8.367	-8.400	-0.033
	H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	1.516e-05					
	Al(OH)4-	1.513e-05	1.392e-05	-4.820	-4.856	-0.036
	Al(OH)3	3.068e-08	3.073e-08	-7.513	-7.512	0.001
	Al(OH)2+	1.175e-09	1.081e-09	-8.930	-8.966	-0.036
	AlF2+	1.429e-11	1.314e-11	-10.845	-10.881	-0.036
	AlF3	1.398e-11	1.400e-11	-10.854	-10.854	0.001
	AlOH+2	1.048e-12	7.500e-13	-11.980	-12.125	-0.145
	AlF4-	5.143e-13	4.731e-13	-12.289	-12.325	-0.036
	AlF+2	4.392e-13	3.144e-13	-12.357	-12.503	-0.145
	AlSO4+	1.219e-15	1.121e-15	-14.914	-14.950	-0.036
	Al+3	8.020e-16	3.781e-16	-15.096	-15.422	-0.327
	Al(SO4)2-	3.722e-17	3.423e-17	-16.429	-16.466	-0.036
	AlHSO4+2	5.368e-25	3.843e-25	-24.270	-24.415	-0.145
As(3)	1.583e-26					
	H3AsO3	1.387e-26	1.389e-26	-25.858	-25.857	0.001
	H2AsO3-	1.967e-27	1.809e-27	-26.706	-26.742	-0.036
	HAsO3-2	4.307e-31	3.083e-31	-30.366	-30.511	-0.145
	H4AsO3+	2.978e-35	2.739e-35	-34.526	-34.562	-0.036
	AsO3-3	5.609e-36	2.644e-36	-35.251	-35.578	-0.327
As(5)	1.215e-06					
	HAsO4-2	1.192e-06	8.536e-07	-5.924	-6.069	-0.145
	H2AsO4-	2.149e-08	1.977e-08	-7.668	-7.704	-0.036
	AsO4-3	1.057e-09	4.982e-10	-8.976	-9.303	-0.327
	H3AsO4	1.329e-14	1.331e-14	-13.876	-13.876	0.001
Ba	1.355e-06					
	Ba+2	9.984e-07	7.147e-07	-6.001	-6.146	-0.145
	BaSO4	3.511e-07	3.516e-07	-6.455	-6.454	0.001
	BaHCO3+	3.312e-09	3.046e-09	-8.480	-8.516	-0.036
	BaCO3	1.867e-09	1.869e-09	-8.729	-8.728	0.001
	BaOH+	6.613e-12	6.083e-12	-11.180	-11.216	-0.036
C(4)	5.920e-04					
	HCO3-	5.384e-04	4.964e-04	-3.269	-3.304	-0.035
	MnCO3	1.534e-05	1.536e-05	-4.814	-4.814	0.001
	CO3-2	7.515e-06	5.431e-06	-5.124	-5.265	-0.141
	CaCO3	5.344e-06	5.352e-06	-5.272	-5.272	0.001
	CO2	4.650e-06	4.656e-06	-5.333	-5.332	0.001
	CaHCO3+	4.082e-06	3.754e-06	-5.389	-5.425	-0.036
	MgHCO3+	2.073e-06	1.907e-06	-5.683	-5.720	-0.036
	UO2(CO3)2-2	1.877e-06	1.344e-06	-5.727	-5.872	-0.145
	MnHCO3+	1.713e-06	1.576e-06	-5.766	-5.803	-0.036
	MgCO3	1.634e-06	1.636e-06	-5.787	-5.786	0.001
	UO2(CO3)3-4	1.555e-06	4.085e-07	-5.808	-6.389	-0.581
	NiCO3	1.340e-06	1.342e-06	-5.873	-5.872	0.001
	ZnCO3	8.292e-07	8.304e-07	-6.081	-6.081	0.001
	NaHCO3	1.777e-07	1.780e-07	-6.750	-6.750	0.001
	Zn(CO3)2-2	1.347e-07	9.642e-08	-6.871	-7.016	-0.145
	NaCO3-	5.863e-08	5.393e-08	-7.232	-7.268	-0.036
	ZnHCO3+	5.206e-08	4.788e-08	-7.284	-7.320	-0.036
	CuCO3	3.667e-08	3.673e-08	-7.436	-7.435	0.001
	PbCO3	3.056e-08	3.060e-08	-7.515	-7.514	0.001
	Ni(CO3)2-2	1.769e-08	1.267e-08	-7.752	-7.897	-0.145
	FeCO3	1.286e-08	1.288e-08	-7.891	-7.890	0.001
	UO2CO3	1.124e-08	1.126e-08	-7.949	-7.949	0.001
	FeHCO3+	5.335e-09	4.907e-09	-8.273	-8.309	-0.036
	BaHCO3+	3.312e-09	3.046e-09	-8.480	-8.516	-0.036
	NiHCO3+	2.483e-09	2.284e-09	-8.605	-8.641	-0.036
	BaCO3	1.867e-09	1.869e-09	-8.729	-8.728	0.001
	Pb(CO3)2-2	5.832e-10	4.175e-10	-9.234	-9.379	-0.145
	CdHCO3+	5.259e-10	4.838e-10	-9.279	-9.315	-0.036
	Cu(CO3)2-2	3.508e-10	2.511e-10	-9.455	-9.600	-0.145
	CuHCO3+	3.406e-10	3.133e-10	-9.468	-9.504	-0.036
	PbHCO3+	1.390e-10	1.278e-10	-9.857	-9.893	-0.036
	CdCO3	1.328e-10	1.330e-10	-9.877	-9.876	0.001
	Cd(CO3)2-2	3.190e-12	2.284e-12	-11.496	-11.641	-0.145
	(UO2)3(CO3)6-6	6.410e-14	3.166e-15	-13.193	-14.500	-1.306
	UO2(CO3)3-5	3.620e-26	4.482e-27	-25.441	-26.349	-0.907
	U(CO3)4-4	3.289e-39	8.639e-40	-38.483	-39.064	-0.581
	U(CO3)5-6	0.000e+00	0.000e+00	-42.096	-43.403	-1.306
Ca	9.983e-04					
	Ca+2	8.695e-04	6.281e-04	-3.061	-3.202	-0.141
	CaSO4	1.188e-04	1.190e-04	-3.925	-3.924	0.001
	CaCO3	5.344e-06	5.352e-06	-5.272	-5.272	0.001
	CaHCO3+	4.082e-06	3.754e-06	-5.389	-5.425	-0.036
	CaF+	4.651e-07	4.278e-07	-6.332	-6.369	-0.036
	CaOH+	2.846e-08	2.618e-08	-7.546	-7.582	-0.036
	CaHSO4+	2.893e-12	2.661e-12	-11.539	-11.575	-0.036
Cd	5.340e-08					
	Cd+2	4.305e-08	3.082e-08	-7.366	-7.511	-0.145
	CdSO4	8.526e-09	8.538e-09	-8.069	-8.069	0.001
	CdOH+	5.383e-10	4.951e-10	-9.269	-9.305	-0.036
	CdHCO3+	5.259e-10	4.838e-10	-9.279	-9.315	-0.036
	CdCl+	4.098e-10	3.769e-10	-9.387	-9.424	-0.036
	CdCO3	1.328e-10	1.330e-10	-9.877	-9.876	0.001
	Cd(SO4)2-2	1.312e-10	9.391e-11	-9.882	-10.027	-0.145
	CdOHCl	3.621e-11	3.626e-11	-10.441	-10.441	0.001
	CdF+	3.583e-11	3.296e-11	-10.446	-10.482	-0.036
	Cd(OH)2	8.672e-12	8.684e-12	-11.062	-11.061	0.001
	Cd(CO3)2-2	3.190e-12	2.284e-12	-11.496	-11.641	-0.145
	CdCl2	2.007e-13	2.010e-13	-12.697	-12.697	0.001
	CdF2	7.021e-15	7.032e-15	-14.154	-14.153	0.001
	Cd(OH)3-	2.661e-16	2.447e-16	-15.575	-15.611	-0.036
	Cd2OH+3	1.657e-16	7.810e-17	-15.781	-16.107	-0.327
	CdCl3-	1.694e-17	1.558e-17	-16.771	-16.807	-0.036
	Cd(OH)4-2	7.653e-22	5.479e-22	-21.116	-21.261	-0.145
Cl	1.411e-04					
	Cl-	1.410e-04	1.296e-04	-3.851	-3.887	-0.037
	MnCl+	2.044e-08	1.880e-08	-7.690	-7.726	-0.036
	ZnOHCl	8.247e-10	8.259e-10	-9.084	-9.083	0.001
	CdCl+	4.098e-10	3.769e-10	-9.387	-9.424	-0.036
	ZnCl+	2.486e-10	2.286e-10	-9.605	-9.641	-0.036
	CdOHCl	3.621e-11	3.626e-11	-10.441	-10.441	0.001
	FeCl+	1.923e-11	1.769e-11	-10.716	-10.752	-0.036
	NiCl+	1.180e-11	1.085e-11	-10.928	-10.965	-0.036
	PbCl+	1.666e-12	1.532e-12	-11.778	-11.815	-0.036
	MnCl2	1.062e-12	1.064e-12	-11.974	-11.973	0.001
	CuCl+	4.015e-13	3.693e-13	-12.396	-12.433	-0.036
	CdCl2	2.007e-13	2.010e-13	-12.697	-12.697	0.001
	ZnCl2	3.055e-14	3.059e-14	-13.515	-13.514	0.001
	NiCl2	5.098e-15	5.106e-15	-14.293	-14.292	0.001
	PbCl2	3.358e-16	3.362e-16	-15.474	-15.473	0.001
	CuCl2-	2.517e-16	2.315e-16	-15.599	-15.635	-0.036
	UO2Cl+	9.985e-17	9.185e-17	-16.001	-16.037	-0.036
	MnCl3-	4.128e-17	3.797e-17	-16.384	-16.421	-0.036
	CuCl2	2.470e-17	2.474e-17	-16.607	-16.607	0.001
	CdCl3-	1.694e-17	1.558e-17	-16.771	-16.807	-0.036
	ZnCl3-	4.734e-18	4.355e-18	-17.325	-17.361	-0.036
	CuCl3-2	6.553e-20	4.691e-20	-19.184	-19.329	-0.145
	PbCl3-	3.682e-20	3.387e-20	-19.434	-19.470	-0.036
	FeCl+2	1.315e-21	9.414e-22	-20.881	-21.026	-0.145
	UO2Cl2	6.170e-22	6.179e-22	-21.210	-21.209	0.001
	ZnCl4-2	3.842e-22	2.750e-22	-21.415	-21.561	-0.145
	CuCl3-	1.161e-23	1.068e-23	-22.935	-22.971	-0.036
	PbCl4-2	2.856e-24	2.044e-24	-23.544	-23.689	-0.145
	FeCl2+	6.629e-25	6.097e-25	-24.179	-24.215	-0.036
	CuCl4-2	8.931e-30	6.393e-30	-29.049	-29.194	-0.145
	FeCl3	7.891e-30	7.902e-30	-29.103	-29.102	0.001
	UCl+3	0.000e+00	0.000e+00	-52.704	-53.031	-0.327
Cu(1)	4.724e-14					
	Cu+	4.699e-14	4.322e-14	-13.328	-13.364	-0.036
	CuCl2-	2.517e-16	2.315e-16	-15.599	-15.635	-0.036
	CuCl3-2	6.553e-20	4.691e-20	-19.184	-19.329	-0.145
Cu(2)	1.700e-06					
	Cu(OH)2	1.657e-06	1.660e-06	-5.781	-5.780	0.001
	CuCO3	3.667e-08	3.673e-08	-7.436	-7.435	0.001
	CuOH+	3.438e-09	3.163e-09	-8.464	-8.500	-0.036
	Cu+2	1.759e-09	1.259e-09	-8.755	-8.900	-0.145
	Cu(CO3)2-2	3.508e-10	2.511e-10	-9.455	-9.600	-0.145
	CuHCO3+	3.406e-10	3.133e-10	-9.468	-9.504	-0.036
	CuSO4	2.459e-10	2.463e-10	-9.609	-9.609	0.001
	Cu(OH)3-	2.731e-11	2.512e-11	-10.564	-10.600	-0.036
	Cu2(OH)2+2	4.301e-12	3.079e-12	-11.366	-11.512	-0.145
	CuF+	2.048e-12	1.884e-12	-11.689	-11.725	-0.036
	CuCl+	4.015e-13	3.693e-13	-12.396	-12.433	-0.036
	Cu(OH)4-2	1.758e-15	1.259e-15	-14.755	-14.900	-0.145
	CuCl2	2.470e-17	2.474e-17	-16.607	-16.607	0.001
	CuCl3-	1.161e-23	1.068e-23	-22.935	-22.971	-0.036
	CuCl4-2	8.931e-30	6.393e-30	-29.049	-29.194	-0.145
F	9.477e-05					
	F-	9.234e-05	8.494e-05	-4.035	-4.071	-0.036
	MgF+	1.906e-06	1.753e-06	-5.720	-5.756	-0.036
	CaF+	4.651e-07	4.278e-07	-6.332	-6.369	-0.036
	NaF	3.112e-08	3.116e-08	-7.507	-7.506	0.001
	MnF+	2.275e-08	2.093e-08	-7.643	-7.679	-0.036
	ZnF+	9.559e-10	8.793e-10	-9.020	-9.056	-0.036
	HF	4.757e-10	4.764e-10	-9.323	-9.322	0.001
	FeF+	9.129e-11	8.397e-11	-10.040	-10.076	-0.036
	NiF+	6.141e-11	5.648e-11	-10.212	-10.248	-0.036
	CdF+	3.583e-11	3.296e-11	-10.446	-10.482	-0.036
	AlF2+	1.429e-11	1.314e-11	-10.845	-10.881	-0.036
	AlF3	1.398e-11	1.400e-11	-10.854	-10.854	0.001
	UO2F+	5.608e-12	5.159e-12	-11.251	-11.287	-0.036
	CuF+	2.048e-12	1.884e-12	-11.689	-11.725	-0.036
	UO2F2	1.480e-12	1.482e-12	-11.830	-11.829	0.001
	PbF+	5.324e-13	4.897e-13	-12.274	-12.310	-0.036
	AlF4-	5.143e-13	4.731e-13	-12.289	-12.325	-0.036
	AlF+2	4.392e-13	3.144e-13	-12.357	-12.503	-0.145
	HF2-	1.640e-13	1.509e-13	-12.785	-12.821	-0.036
	UO2F3-	2.605e-14	2.396e-14	-13.584	-13.621	-0.036
	CdF2	7.021e-15	7.032e-15	-14.154	-14.153	0.001
	PbF2	8.481e-16	8.493e-16	-15.072	-15.071	0.001
	FeF2+	1.210e-16	1.113e-16	-15.917	-15.954	-0.036
	FeF+2	4.794e-17	3.432e-17	-16.319	-16.464	-0.145
	UO2F4-2	1.811e-17	1.297e-17	-16.742	-16.887	-0.145
	FeF3	1.478e-17	1.480e-17	-16.830	-16.830	0.001
	H2F2	6.693e-19	6.703e-19	-18.174	-18.174	0.001
	PbF3-	5.682e-19	5.226e-19	-18.246	-18.282	-0.036
	PbF4-2	2.968e-23	2.125e-23	-22.528	-22.673	-0.145
	UF3+	0.000e+00	0.000e+00	-41.480	-41.517	-0.036
	UF4	0.000e+00	0.000e+00	-41.680	-41.679	0.001
	UF2+2	0.000e+00	0.000e+00	-42.673	-42.818	-0.145
	UF5-	0.000e+00	0.000e+00	-44.253	-44.290	-0.036
	UF+3	0.000e+00	0.000e+00	-45.336	-45.663	-0.327
	UF6-2	0.000e+00	0.000e+00	-46.112	-46.257	-0.145
Fe(2)	1.791e-07					
	Fe+2	1.381e-07	9.886e-08	-6.860	-7.005	-0.145
	FeSO4	1.615e-08	1.618e-08	-7.792	-7.791	0.001
	FeCO3	1.286e-08	1.288e-08	-7.891	-7.890	0.001
	FeOH+	6.551e-09	6.026e-09	-8.184	-8.220	-0.036
	FeHCO3+	5.335e-09	4.907e-09	-8.273	-8.309	-0.036
	FeF+	9.129e-11	8.397e-11	-10.040	-10.076	-0.036
	FeCl+	1.923e-11	1.769e-11	-10.716	-10.752	-0.036
	Fe(OH)2	9.454e-12	9.468e-12	-11.024	-11.024	0.001
	Fe(OH)3-	9.277e-14	8.533e-14	-13.033	-13.069	-0.036
	FeHSO4+	4.553e-16	4.188e-16	-15.342	-15.378	-0.036

----------Distribution of species----------

	Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
	OH-	2.087e-06	1.920e-06	-5.680	-5.717	-0.036
	H+	4.291e-09	3.981e-09	-8.367	-8.400	-0.033
	H2O	5.551e+01	9.999e-01	-0.000	-0.000	0.000
Al	1.516e-05					
	Al(OH)4-	1.513e-05	1.392e-05	-4.820	-4.856	-0.036
	Al(OH)3	3.068e-08	3.073e-08	-7.513	-7.512	0.001
	Al(OH)2+	1.175e-09	1.081e-09	-8.930	-8.966	-0.036
	AlF2+	1.429e-11	1.314e-11	-10.845	-10.881	-0.036
	AlF3	1.398e-11	1.400e-11	-10.854	-10.854	0.001
	AlOH+2	1.048e-12	7.500e-13	-11.980	-12.125	-0.145
	AlF4-	5.143e-13	4.731e-13	-12.289	-12.325	-0.036
	AlF+2	4.392e-13	3.144e-13	-12.357	-12.503	-0.145
	AlSO4+	1.219e-15	1.121e-15	-14.914	-14.950	-0.036
	Al+3	8.020e-16	3.781e-16	-15.096	-15.422	-0.327
	Al(SO4)2-	3.722e-17	3.423e-17	-16.429	-16.466	-0.036
	AlHSO4+2	5.368e-25	3.843e-25	-24.270	-24.415	-0.145
As(3)	1.583e-26					
	H3AsO3	1.387e-26	1.389e-26	-25.858	-25.857	0.001
	H2AsO3-	1.967e-27	1.809e-27	-26.706	-26.742	-0.036
	HAsO3-2	4.307e-31	3.083e-31	-30.366	-30.511	-0.145
	H4AsO3+	2.978e-35	2.739e-35	-34.526	-34.562	-0.036
	AsO3-3	5.609e-36	2.644e-36	-35.251	-35.578	-0.327
As(5)	1.215e-06					
	HAsO4-2	1.192e-06	8.536e-07	-5.924	-6.069	-0.145
	H2AsO4-	2.149e-08	1.977e-08	-7.668	-7.704	-0.036
	AsO4-3	1.057e-09	4.982e-10	-8.976	-9.303	-0.327
	H3AsO4	1.329e-14	1.331e-14	-13.876	-13.876	0.001
Ba	1.355e-06					
	Ba+2	9.984e-07	7.147e-07	-6.001	-6.146	-0.145
	BaSO4	3.511e-07	3.516e-07	-6.455	-6.454	0.001
	BaHCO3+	3.311e-09	3.045e-09	-8.480	-8.516	-0.036
	BaCO3	1.866e-09	1.869e-09	-8.729	-8.728	0.001
	BaOH+	6.613e-12	6.083e-12	-11.180	-11.216	-0.036
C(4)	5.918e-04					
	HCO3-	5.382e-04	4.963e-04	-3.269	-3.304	-0.035
	MnCO3	1.534e-05	1.536e-05	-4.814	-4.814	0.001
	CO3-2	7.513e-06	5.430e-06	-5.124	-5.265	-0.141
	CaCO3	5.342e-06	5.350e-06	-5.272	-5.272	0.001
	CO2	4.648e-06	4.655e-06	-5.333	-5.332	0.001
	CaHCO3+	4.080e-06	3.753e-06	-5.389	-5.426	-0.036
	MgHCO3+	2.073e-06	1.907e-06	-5.683	-5.720	-0.036
	UO2(CO3)2-2	1.877e-06	1.344e-06	-5.726	-5.872	-0.145
	MnHCO3+	1.712e-06	1.575e-06	-5.766	-5.803	-0.036
	MgCO3	1.633e-06	1.635e-06	-5.787	-5.786	0.001
	UO2(CO3)3-4	1.555e-06	4.084e-07	-5.808	-6.389	-0.581
	NiCO3	1.340e-06	1.342e-06	-5.873	-5.872	0.001
	ZnCO3	8.290e-07	8.302e-07	-6.081	-6.081	0.001
	NaHCO3	1.777e-07	1.779e-07	-6.750	-6.750	0.001
	Zn(CO3)2-2	1.346e-07	9.638e-08	-6.871	-7.016	-0.145
	NaCO3-	5.862e-08	5.392e-08	-7.232	-7.268	-0.036
	ZnHCO3+	5.205e-08	4.788e-08	-7.284	-7.320	-0.036
	CuCO3	3.666e-08	3.672e-08	-7.436	-7.435	0.001
	PbCO3	3.056e-08	3.060e-08	-7.515	-7.514	0.001
	Ni(CO3)2-2	1.769e-08	1.266e-08	-7.752	-7.897	-0.145
	UO2CO3	1.125e-08	1.126e-08	-7.949	-7.948	0.001
	BaHCO3+	3.311e-09	3.045e-09	-8.480	-8.516	-0.036
	NiHCO3+	2.483e-09	2.284e-09	-8.605	-8.641	-0.036
	BaCO3	1.866e-09	1.869e-09	-8.729	-8.728	0.001
	Pb(CO3)2-2	5.830e-10	4.174e-10	-9.234	-9.379	-0.145
	CdHCO3+	5.258e-10	4.836e-10	-9.279	-9.315	-0.036
	Cu(CO3)2-2	3.506e-10	2.510e-10	-9.455	-9.600	-0.145
	CuHCO3+	3.405e-10	3.132e-10	-9.468	-9.504	-0.036
	PbHCO3+	1.390e-10	1.278e-10	-9.857	-9.893	-0.036
	CdCO3	1.327e-10	1.329e-10	-9.877	-9.876	0.001
	Cd(CO3)2-2	3.188e-12	2.282e-12	-11.496	-11.642	-0.145
	(UO2)3(CO3)6-6	6.410e-14	3.166e-15	-13.193	-14.499	-1.306
	FeCO3	3.610e-14	3.615e-14	-13.442	-13.442	0.001
	FeHCO3+	1.498e-14	1.377e-14	-13.825	-13.861	-0.036
	UO2(CO3)3-5	3.619e-26	4.481e-27	-25.441	-26.349	-0.907
	U(CO3)4-4	3.287e-39	8.635e-40	-38.483	-39.064	-0.581
	U(CO3)5-6	0.000e+00	0.000e+00	-42.097	-43.403	-1.306
Ca	9.983e-04					
	Ca+2	8.695e-04	6.281e-04	-3.061	-3.202	-0.141
	CaSO4	1.188e-04	1.190e-04	-3.925	-3.924	0.001
	CaCO3	5.342e-06	5.350e-06	-5.272	-5.272	0.001
	CaHCO3+	4.080e-06	3.753e-06	-5.389	-5.426	-0.036
	CaF+	4.651e-07	4.278e-07	-6.332	-6.369	-0.036
	CaOH+	2.846e-08	2.618e-08	-7.546	-7.582	-0.036
	CaHSO4+	2.893e-12	2.661e-12	-11.539	-11.575	-0.036
Cd	5.340e-08					
	Cd+2	4.305e-08	3.082e-08	-7.366	-7.511	-0.145
	CdSO4	8.526e-09	8.538e-09	-8.069	-8.069	0.001
	CdOH+	5.383e-10	4.951e-10	-9.269	-9.305	-0.036
	CdHCO3+	5.258e-10	4.836e-10	-9.279	-9.315	-0.036
	CdCl+	4.098e-10	3.770e-10	-9.387	-9.424	-0.036
	CdCO3	1.327e-10	1.329e-10	-9.877	-9.876	0.001
	Cd(SO4)2-2	1.312e-10	9.391e-11	-9.882	-10.027	-0.145
	CdOHCl	3.621e-11	3.626e-11	-10.441	-10.441	0.001
	CdF+	3.583e-11	3.296e-11	-10.446	-10.482	-0.036
	Cd(OH)2	8.672e-12	8.684e-12	-11.062	-11.061	0.001
	Cd(CO3)2-2	3.188e-12	2.282e-12	-11.496	-11.642	-0.145
	CdCl2	2.007e-13	2.010e-13	-12.697	-12.697	0.001
	CdF2	7.021e-15	7.032e-15	-14.154	-14.153	0.001
	Cd(OH)3-	2.661e-16	2.447e-16	-15.575	-15.611	-0.036
	Cd2OH+3	1.657e-16	7.810e-17	-15.781	-16.107	-0.327
	CdCl3-	1.694e-17	1.558e-17	-16.771	-16.807	-0.036
	Cd(OH)4-2	7.653e-22	5.479e-22	-21.116	-21.261	-0.145
Cl	1.411e-04					
	Cl-	1.410e-04	1.296e-04	-3.851	-3.887	-0.037
	MnCl+	2.044e-08	1.880e-08	-7.689	-7.726	-0.036
	ZnOHCl	8.248e-10	8.260e-10	-9.084	-9.083	0.001
	CdCl+	4.098e-10	3.770e-10	-9.387	-9.424	-0.036
	ZnCl+	2.486e-10	2.287e-10	-9.605	-9.641	-0.036
	CdOHCl	3.621e-11	3.626e-11	-10.441	-10.441	0.001
	NiCl+	1.180e-11	1.085e-11	-10.928	-10.964	-0.036
	PbCl+	1.666e-12	1.533e-12	-11.778	-11.815	-0.036
	MnCl2	1.062e-12	1.064e-12	-11.974	-11.973	0.001
	CuCl+	4.015e-13	3.693e-13	-12.396	-12.433	-0.036
	CdCl2	2.007e-13	2.010e-13	-12.697	-12.697	0.001
	ZnCl2	3.055e-14	3.059e-14	-13.515	-13.514	0.001
	NiCl2	5.100e-15	5.107e-15	-14.292	-14.292	0.001
	PbCl2	3.358e-16	3.363e-16	-15.474	-15.473	0.001
	CuCl2-	2.517e-16	2.315e-16	-15.599	-15.635	-0.036
	UO2Cl+	9.991e-17	9.190e-17	-16.000	-16.037	-0.036
	FeCl+	5.399e-17	4.966e-17	-16.268	-16.304	-0.036
	MnCl3-	4.128e-17	3.797e-17	-16.384	-16.421	-0.036
	CuCl2	2.470e-17	2.474e-17	-16.607	-16.607	0.001
	CdCl3-	1.694e-17	1.558e-17	-16.771	-16.807	-0.036
	ZnCl3-	4.735e-18	4.355e-18	-17.325	-17.361	-0.036
	CuCl3-2	6.553e-20	4.691e-20	-19.184	-19.329	-0.145
	PbCl3-	3.683e-20	3.388e-20	-19.434	-19.470	-0.036
	FeCl+2	1.578e-21	1.130e-21	-20.802	-20.947	-0.145
	UO2Cl2	6.173e-22	6.182e-22	-21.209	-21.209	0.001
	ZnCl4-2	3.842e-22	2.751e-22	-21.415	-21.561	-0.145
	CuCl3-	1.161e-23	1.068e-23	-22.935	-22.971	-0.036
	PbCl4-2	2.856e-24	2.045e-24	-23.544	-23.689	-0.145
	FeCl2+	7.955e-25	7.317e-25	-24.099	-24.136	-0.036
	FeCl3	9.469e-30	9.483e-30	-29.024	-29.023	0.001
	CuCl4-2	8.931e-30	6.394e-30	-29.049	-29.194	-0.145
	UCl+3	0.000e+00	0.000e+00	-52.704	-53.031	-0.327
Cu(1)	4.724e-14					
	Cu+	4.699e-14	4.322e-14	-13.328	-13.364	-0.036
	CuCl2-	2.517e-16	2.315e-16	-15.599	-15.635	-0.036
	CuCl3-2	6.553e-20	4.691e-20	-19.184	-19.329	-0.145
Cu(2)	1.700e-06					
	Cu(OH)2	1.657e-06	1.660e-06	-5.781	-5.780	0.001
	CuCO3	3.666e-08	3.672e-08	-7.436	-7.435	0.001
	CuOH+	3.438e-09	3.163e-09	-8.464	-8.500	-0.036
	Cu+2	1.759e-09	1.259e-09	-8.755	-8.900	-0.145
	Cu(CO3)2-2	3.506e-10	2.510e-10	-9.455	-9.600	-0.145
	CuHCO3+	3.405e-10	3.132e-10	-9.468	-9.504	-0.036
	CuSO4	2.459e-10	2.463e-10	-9.609	-9.609	0.001
	Cu(OH)3-	2.731e-11	2.512e-11	-10.564	-10.600	-0.036
	Cu2(OH)2+2	4.301e-12	3.079e-12	-11.366	-11.512	-0.145
	CuF+	2.048e-12	1.884e-12	-11.689	-11.725	-0.036
	CuCl+	4.015e-13	3.693e-13	-12.396	-12.433	-0.036
	Cu(OH)4-2	1.758e-15	1.259e-15	-14.755	-14.900	-0.145
	CuCl2	2.470e-17	2.474e-17	-16.607	-16.607	0.001
	CuCl3-	1.161e-23	1.068e-23	-22.935	-22.971	-0.036
	CuCl4-2	8.931e-30	6.394e-30	-29.049	-29.194	-0.145
F	9.477e-05					
	F-	9.234e-05	8.494e-05	-4.035	-4.071	-0.036
	MgF+	1.906e-06	1.753e-06	-5.720	-5.756	-0.036
	CaF+	4.651e-07	4.278e-07	-6.332	-6.369	-0.036
	NaF	3.112e-08	3.116e-08	-7.507	-7.506	0.001
	MnF+	2.275e-08	2.093e-08	-7.643	-7.679	-0.036
	ZnF+	9.561e-10	8.794e-10	-9.020	-9.056	-0.036
	HF	4.757e-10	4.764e-10	-9.323	-9.322	0.001
	NiF+	6.142e-11	5.650e-11	-10.212	-10.248	-0.036
	CdF+	3.583e-11	3.296e-11	-10.446	-10.482	-0.036
	AlF2+	1.429e-11	1.314e-11	-10.845	-10.881	-0.036
	AlF3	1.398e-11	1.400e-11	-10.854	-10.854	0.001
	UO2F+	5.612e-12	5.162e-12	-11.251	-11.287	-0.036
	CuF+	2.048e-12	1.884e-12	-11.689	-11.725	-0.036
	UO2F2	1.481e-12	1.483e-12	-11.829	-11.829	0.001
	PbF+	5.325e-13	4.898e-13	-12.274	-12.310	-0.036
	AlF4-	5.143e-13	4.731e-13	-12.289	-12.325	-0.036
	AlF+2	4.392e-13	3.144e-13	-12.357	-12.503	-0.145
	HF2-	1.640e-13	1.509e-13	-12.785	-12.821	-0.036
	UO2F3-	2.606e-14	2.397e-14	-13.584	-13.620	-0.036
	CdF2	7.021e-15	7.032e-15	-14.154	-14.153	0.001
	PbF2	8.483e-16	8.495e-16	-15.071	-15.071	0.001
	FeF+	2.563e-16	2.358e-16	-15.591	-15.628	-0.036
	FeF2+	1.452e-16	1.335e-16	-15.838	-15.874	-0.036
	FeF+2	5.752e-17	4.118e-17	-16.240	-16.385	-0.145
	UO2F4-2	1.813e-17	1.298e-17	-16.742	-16.887	-0.145
	FeF3	1.773e-17	1.776e-17	-16.751	-16.751	0.001
	H2F2	6.693e-19	6.703e-19	-18.174	-18.174	0.001
	PbF3-	5.683e-19	5.228e-19	-18.245	-18.282	-0.036
	PbF4-2	2.969e-23	2.125e-23	-22.527	-22.673	-0.145
	UF3+	0.000e+00	0.000e+00	-41.480	-41.516	-0.036
	UF4	0.000e+00	0.000e+00	-41.679	-41.679	0.001
	UF2+2	0.000e+00	0.000e+00	-42.673	-42.818	-0.145
	UF5-	0.000e+00	0.000e+00	-44.253	-44.290	-0.036
	UF+3	0.000e+00	0.000e+00	-45.336	-45.662	-0.327
	UF6-2	0.000e+00	0.000e+00	-46.112	-46.257	-0.145
Fe(2)	5.029e-13					
	Fe+2	3.877e-13	2.776e-13	-12.411	-12.557	-0.145
	FeSO4	4.535e-14	4.542e-14	-13.343	-13.343	0.001
	FeCO3	3.610e-14	3.615e-14	-13.442	-13.442	0.001
	FeOH+	1.839e-14	1.692e-14	-13.735	-13.772	-0.036
	FeHCO3+	1.498e-14	1.377e-14	-13.825	-13.861	-0.036
	FeF+	2.563e-16	2.358e-16	-15.591	-15.628	-0.036
	FeCl+	5.399e-17	4.966e-17	-16.268	-16.304	-0.036
	Fe(OH)2	2.654e-17	2.658e-17	-16.576	-16.575	0.001
	Fe(OH)3-	2.605e-19	2.396e-19	-18.584	-18.621	-0.036
	FeHSO4+	1.279e-21	1.176e-21	-20.893	-20.930	-0.036

Fe(3)	8.956e-07					
	Fe(OH)3	7.133e-07	7.143e-07	-6.147	-6.146	0.001
	Fe(OH)4-	1.543e-07	1.419e-07	-6.812	-6.848	-0.036
	Fe(OH)2+	2.801e-08	2.576e-08	-7.553	-7.589	-0.036
	FeOH+2	4.949e-13	3.543e-13	-12.306	-12.451	-0.145
	FeF2+	1.210e-16	1.113e-16	-15.917	-15.954	-0.036
	FeF+2	4.794e-17	3.432e-17	-16.319	-16.464	-0.145
	FeF3	1.478e-17	1.480e-17	-16.830	-16.830	0.001
	FeSO4+	2.911e-18	2.678e-18	-17.536	-17.572	-0.036
	Fe+3	5.708e-19	2.691e-19	-18.244	-18.570	-0.327
	Fe(SO4)2-	6.167e-20	5.673e-20	-19.210	-19.246	-0.036
	FeCl+2	1.315e-21	9.414e-22	-20.881	-21.026	-0.145
	Fe2(OH)2+4	1.489e-23	3.910e-24	-22.827	-23.408	-0.581
	FeCl2+	6.629e-25	6.097e-25	-24.179	-24.215	-0.036
	FeHSO4+2	4.000e-26	2.864e-26	-25.398	-25.543	-0.145
	Fe3(OH)4+5	2.357e-28	2.918e-29	-27.628	-28.535	-0.907
	FeCl3	7.891e-30	7.902e-30	-29.103	-29.102	0.001
H(0)	1.033e-34					
	H2	5.165e-35	5.172e-35	-34.287	-34.286	0.001
K	6.907e-05					
	K+	6.861e-05	6.305e-05	-4.164	-4.200	-0.037
	KSO4-	4.553e-07	4.188e-07	-6.342	-6.378	-0.036
Mg	5.349e-04					
	Mg+2	4.591e-04	3.331e-04	-3.338	-3.477	-0.139
	MgSO4	6.986e-05	6.996e-05	-4.156	-4.155	0.001
	MgHCO3+	2.073e-06	1.907e-06	-5.683	-5.720	-0.036
	MgF+	1.906e-06	1.753e-06	-5.720	-5.756	-0.036
	MgCO3	1.634e-06	1.636e-06	-5.787	-5.786	0.001
	MgOH+	2.398e-07	2.206e-07	-6.620	-6.656	-0.036
Mn(2)	7.283e-05					
	Mn+2	4.974e-05	3.561e-05	-4.303	-4.448	-0.145
	MnCO3	1.534e-05	1.536e-05	-4.814	-4.814	0.001
	MnSO4	5.802e-06	5.810e-06	-5.236	-5.236	0.001
	MnHCO3+	1.713e-06	1.576e-06	-5.766	-5.803	-0.036
	MnOH+	1.873e-07	1.723e-07	-6.728	-6.764	-0.036
	MnF+	2.275e-08	2.093e-08	-7.643	-7.679	-0.036
	MnCl+	2.044e-08	1.880e-08	-7.690	-7.726	-0.036
	MnCl2	1.062e-12	1.064e-12	-11.974	-11.973	0.001
	Mn(OH)3-	9.722e-15	8.943e-15	-14.012	-14.049	-0.036
	MnCl3-	4.128e-17	3.797e-17	-16.384	-16.421	-0.036
Mn(3)	2.058e-23					
	Mn+3	2.058e-23	9.704e-24	-22.686	-23.013	-0.327
Mn(6)	6.767e-29					
	MnO4-2	6.767e-29	4.845e-29	-28.170	-28.315	-0.145
Mn(7)	1.888e-31					
	MnO4-	1.888e-31	1.736e-31	-30.724	-30.760	-0.036
Na	6.962e-04					
	Na+	6.926e-04	6.375e-04	-3.160	-3.195	-0.036
	NaSO4-	3.334e-06	3.067e-06	-5.477	-5.513	-0.036
	NaHCO3	1.777e-07	1.780e-07	-6.750	-6.750	0.001
	NaCO3-	5.863e-08	5.393e-08	-7.232	-7.268	-0.036
	NaF	3.112e-08	3.116e-08	-7.507	-7.506	0.001
Ni	1.414e-06					
	NiCO3	1.340e-06	1.342e-06	-5.873	-5.872	0.001
	Ni+2	4.655e-08	3.333e-08	-7.332	-7.477	-0.145
	Ni(CO3)2-2	1.769e-08	1.267e-08	-7.752	-7.897	-0.145
	NiSO4	6.179e-09	6.188e-09	-8.209	-8.208	0.001
	NiHCO3+	2.483e-09	2.284e-09	-8.605	-8.641	-0.036
	NiOH+	9.793e-10	9.008e-10	-9.009	-9.045	-0.036
	Ni(OH)2	2.099e-10	2.103e-10	-9.678	-9.677	0.001
	NiF+	6.141e-11	5.648e-11	-10.212	-10.248	-0.036
	NiCl+	1.180e-11	1.085e-11	-10.928	-10.965	-0.036
	Ni(OH)3-	5.741e-13	5.281e-13	-12.241	-12.277	-0.036
	Ni(SO4)2-2	4.698e-13	3.363e-13	-12.328	-12.473	-0.145
	NiCl2	5.098e-15	5.106e-15	-14.293	-14.292	0.001
O(0)	2.122e-25					
	O2	1.061e-25	1.063e-25	-24.974	-24.974	0.001
Pb	3.379e-08					
	PbCO3	3.056e-08	3.060e-08	-7.515	-7.514	0.001
	PbOH+	1.726e-09	1.588e-09	-8.763	-8.799	-0.036
	Pb(CO3)2-2	5.832e-10	4.175e-10	-9.234	-9.379	-0.145
	Pb+2	4.529e-10	3.242e-10	-9.344	-9.489	-0.145
	PbSO4	1.787e-10	1.790e-10	-9.748	-9.747	0.001
	Pb(OH)2	1.549e-10	1.551e-10	-9.810	-9.809	0.001
	PbHCO3+	1.390e-10	1.278e-10	-9.857	-9.893	-0.036
	PbCl+	1.666e-12	1.532e-12	-11.778	-11.815	-0.036
	Pb(SO4)2-2	1.288e-12	9.220e-13	-11.890	-12.035	-0.145
	PbF+	5.324e-13	4.897e-13	-12.274	-12.310	-0.036
	Pb(OH)3-	4.864e-13	4.474e-13	-12.313	-12.349	-0.036
	PbF2	8.481e-16	8.493e-16	-15.072	-15.071	0.001
	Pb(OH)4-2	3.596e-16	2.574e-16	-15.444	-15.589	-0.145
	PbCl2	3.358e-16	3.362e-16	-15.474	-15.473	0.001
	Pb2OH+3	2.444e-17	1.152e-17	-16.612	-16.938	-0.327
	PbF3-	5.682e-19	5.226e-19	-18.246	-18.282	-0.036
	Pb3(OH)4+2	1.468e-19	1.051e-19	-18.833	-18.978	-0.145
	PbCl3-	3.682e-20	3.387e-20	-19.434	-19.470	-0.036
	PbF4-2	2.968e-23	2.125e-23	-22.528	-22.673	-0.145
	PbCl4-2	2.856e-24	2.044e-24	-23.544	-23.689	-0.145
S(6)	1.562e-03					
	SO4-2	1.363e-03	9.817e-04	-2.865	-3.008	-0.143
	CaSO4	1.188e-04	1.190e-04	-3.925	-3.924	0.001
	MgSO4	6.986e-05	6.996e-05	-4.156	-4.155	0.001
	MnSO4	5.802e-06	5.810e-06	-5.236	-5.236	0.001
	NaSO4-	3.334e-06	3.067e-06	-5.477	-5.513	-0.036
	KSO4-	4.553e-07	4.188e-07	-6.342	-6.378	-0.036
	BaSO4	3.511e-07	3.516e-07	-6.455	-6.454	0.001
	ZnSO4	1.713e-07	1.716e-07	-6.766	-6.766	0.001
	FeSO4	1.615e-08	1.618e-08	-7.792	-7.791	0.001
	CdSO4	8.526e-09	8.538e-09	-8.069	-8.069	0.001
	NiSO4	6.179e-09	6.188e-09	-8.209	-8.208	0.001
	Zn(SO4)2-2	1.965e-09	1.407e-09	-8.707	-8.852	-0.145
	HSO4-	3.831e-10	3.524e-10	-9.417	-9.453	-0.036
	CuSO4	2.459e-10	2.463e-10	-9.609	-9.609	0.001
	PbSO4	1.787e-10	1.790e-10	-9.748	-9.747	0.001
	Cd(SO4)2-2	1.312e-10	9.391e-11	-9.882	-10.027	-0.145
	CaHSO4+	2.893e-12	2.661e-12	-11.539	-11.575	-0.036
	Pb(SO4)2-2	1.288e-12	9.220e-13	-11.890	-12.035	-0.145
	UO2SO4	6.272e-13	6.281e-13	-12.203	-12.202	0.001
	Ni(SO4)2-2	4.698e-13	3.363e-13	-12.328	-12.473	-0.145
	UO2(SO4)2-2	7.815e-15	5.595e-15	-14.107	-14.252	-0.145
	AlSO4+	1.219e-15	1.121e-15	-14.914	-14.950	-0.036
	FeHSO4+	4.553e-16	4.188e-16	-15.342	-15.378	-0.036
	Al(SO4)2-	3.722e-17	3.423e-17	-16.429	-16.466	-0.036
	FeSO4+	2.911e-18	2.678e-18	-17.536	-17.572	-0.036
	Fe(SO4)2-	6.167e-20	5.673e-20	-19.210	-19.246	-0.036
	AlHSO4+2	5.368e-25	3.843e-25	-24.270	-24.415	-0.145
	FeHSO4+2	4.000e-26	2.864e-26	-25.398	-25.543	-0.145
	U(SO4)2	5.941e-36	5.950e-36	-35.226	-35.226	0.001
	USO4+2	1.146e-36	8.202e-37	-35.941	-36.086	-0.145
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-49.863	-50.189	-0.327
U(4)	1.754e-15					
	U(OH)4	1.754e-15	1.757e-15	-14.756	-14.755	0.001
	U(OH)3+	2.901e-20	2.668e-20	-19.537	-19.574	-0.036
	U(OH)2+2	7.572e-26	5.421e-26	-25.121	-25.266	-0.145
	U(CO3)4-4	6.008e-28	1.578e-28	-27.221	-27.802	-0.581
	UF3+	6.043e-31	5.559e-31	-30.219	-30.255	-0.036
	UF4	3.819e-31	3.824e-31	-30.418	-30.417	0.001
	U(CO3)5-6	1.463e-31	7.226e-33	-30.835	-32.141	-1.306
	UF2+2	3.880e-32	2.778e-32	-31.411	-31.556	-0.145
	UOH+3	2.802e-32	1.321e-32	-31.553	-31.879	-0.327
	UF5-	1.019e-33	9.373e-34	-32.992	-33.028	-0.036
	UF+3	8.424e-35	3.971e-35	-34.074	-34.401	-0.327
	UF6-2	1.411e-35	1.010e-35	-34.850	-34.996	-0.145
	U(SO4)2	5.941e-36	5.950e-36	-35.226	-35.226	0.001
	USO4+2	1.146e-36	8.202e-37	-35.941	-36.086	-0.145
	U+4	8.691e-40	2.283e-40	-39.061	-39.642	-0.581
	UCl+3	0.000e+00	0.000e+00	-41.443	-41.769	-0.327
	U6(OH)15+9	0.000e+00	0.000e+00	-126.110	-129.050	-2.939
U(5)	5.162e-13					
	UO2+	5.162e-13	4.748e-13	-12.287	-12.323	-0.036
	UO2(CO3)3-5	1.547e-20	1.916e-21	-19.811	-20.718	-0.907
U(6)	3.988e-06					
	UO2(CO3)2-2	1.877e-06	1.344e-06	-5.727	-5.872	-0.145
	UO2(CO3)3-4	1.555e-06	4.085e-07	-5.808	-6.389	-0.581
	UO2(OH)3-	5.410e-07	4.976e-07	-6.267	-6.303	-0.036
	UO2CO3	1.124e-08	1.126e-08	-7.949	-7.949	0.001
	(UO2)3(OH)7-	8.454e-10	7.776e-10	-9.073	-9.109	-0.036
	UO2OH+	6.876e-10	6.325e-10	-9.163	-9.199	-0.036
	(UO2)3(OH)5+	2.285e-11	2.101e-11	-10.641	-10.677	-0.036
	UO2F+	5.608e-12	5.159e-12	-11.251	-11.287	-0.036
	UO2(OH)4-2	2.767e-12	1.981e-12	-11.558	-11.703	-0.145
	UO2F2	1.480e-12	1.482e-12	-11.830	-11.829	0.001
	UO2+2	6.953e-13	4.977e-13	-12.158	-12.303	-0.145
	UO2SO4	6.272e-13	6.281e-13	-12.203	-12.202	0.001
	(UO2)4(OH)7+	5.297e-13	4.873e-13	-12.276	-12.312	-0.036
	(UO2)3(CO3)6-6	6.410e-14	3.166e-15	-13.193	-14.500	-1.306
	(UO2)2(OH)2+2	4.266e-14	3.054e-14	-13.370	-13.515	-0.145
	UO2F3-	2.605e-14	2.396e-14	-13.584	-13.621	-0.036
	UO2(SO4)2-2	7.815e-15	5.595e-15	-14.107	-14.252	-0.145
	(UO2)3(OH)4+2	8.630e-16	6.178e-16	-15.064	-15.209	-0.145
	UO2Cl+	9.985e-17	9.185e-17	-16.001	-16.037	-0.036
	UO2F4-2	1.811e-17	1.297e-17	-16.742	-16.887	-0.145
	(UO2)2OH+3	2.634e-19	1.242e-19	-18.579	-18.906	-0.327
	UO2Cl2	6.170e-22	6.179e-22	-21.210	-21.209	0.001
Zn	3.045e-06					
	Zn+2	1.070e-06	7.662e-07	-5.970	-6.116	-0.145
	ZnCO3	8.292e-07	8.304e-07	-6.081	-6.081	0.001
	Zn(OH)2	6.077e-07	6.085e-07	-6.216	-6.216	0.001
	ZnOH+	1.754e-07	1.613e-07	-6.756	-6.792	-0.036
	ZnSO4	1.713e-07	1.716e-07	-6.766	-6.766	0.001
	Zn(CO3)2-2	1.347e-07	9.642e-08	-6.871	-7.016	-0.145
	ZnHCO3+	5.206e-08	4.788e-08	-7.284	-7.320	-0.036
	Zn(SO4)2-2	1.965e-09	1.407e-09	-8.707	-8.852	-0.145
	ZnF+	9.559e-10	8.793e-10	-9.020	-9.056	-0.036
	ZnOHCl	8.247e-10	8.259e-10	-9.084	-9.083	0.001
	Zn(OH)3-	5.255e-10	4.833e-10	-9.279	-9.316	-0.036
	ZnCl+	2.486e-10	2.286e-10	-9.605	-9.641	-0.036
	ZnCl2	3.055e-14	3.059e-14	-13.515	-13.514	0.001
	Zn(OH)4-2	2.688e-14	1.924e-14	-13.571	-13.716	-0.145
	ZnCl3-	4.734e-18	4.355e-18	-17.325	-17.361	-0.036
	ZnCl4-2	3.842e-22	2.750e-22	-21.415	-21.561	-0.145

Fe(3)	8.956e-07					
	Fe(OH)3	7.133e-07	7.143e-07	-6.147	-6.146	0.001
	Fe(OH)4-	1.543e-07	1.419e-07	-6.812	-6.848	-0.036
	Fe(OH)2+	2.801e-08	2.576e-08	-7.553	-7.589	-0.036
	FeOH+2	4.949e-13	3.543e-13	-12.306	-12.451	-0.145
	FeF2+	1.210e-16	1.113e-16	-15.917	-15.954	-0.036
	FeF+2	4.794e-17	3.432e-17	-16.319	-16.464	-0.145
	FeF3	1.478e-17	1.480e-17	-16.830	-16.830	0.001
	FeSO4+	2.911e-18	2.678e-18	-17.536	-17.572	-0.036
	Fe+3	5.708e-19	2.691e-19	-18.244	-18.570	-0.327
	Fe(SO4)2-	6.167e-20	5.673e-20	-19.210	-19.246	-0.036
	FeCl+2	1.315e-21	9.414e-22	-20.881	-21.026	-0.145
	Fe2(OH)2+4	1.489e-23	3.910e-24	-22.827	-23.408	-0.581
	FeCl2+	6.629e-25	6.097e-25	-24.179	-24.215	-0.036
	FeHSO4+2	4.000e-26	2.864e-26	-25.398	-25.543	-0.145
	Fe3(OH)4+5	2.357e-28	2.918e-29	-27.628	-28.535	-0.907
	FeCl3	7.891e-30	7.902e-30	-29.103	-29.102	0.001
H(0)	1.033e-34					
	H2	5.165e-35	5.172e-35	-34.287	-34.286	0.001
K	6.907e-05					
	K+	6.861e-05	6.305e-05	-4.164	-4.200	-0.037
	KSO4-	4.553e-07	4.188e-07	-6.342	-6.378	-0.036
Mg	5.349e-04					
	Mg+2	4.591e-04	3.331e-04	-3.338	-3.477	-0.139
	MgSO4	6.986e-05	6.996e-05	-4.156	-4.155	0.001
	MgHCO3+	2.073e-06	1.907e-06	-5.683	-5.720	-0.036
	MgF+	1.906e-06	1.753e-06	-5.720	-5.756	-0.036
	MgCO3	1.634e-06	1.636e-06	-5.787	-5.786	0.001
	MgOH+	2.398e-07	2.206e-07	-6.620	-6.656	-0.036
Mn(2)	7.283e-05					
	Mn+2	4.974e-05	3.561e-05	-4.303	-4.448	-0.145
	MnCO3	1.534e-05	1.536e-05	-4.814	-4.814	0.001
	MnSO4	5.802e-06	5.810e-06	-5.236	-5.236	0.001
	MnHCO3+	1.713e-06	1.576e-06	-5.766	-5.803	-0.036
	MnOH+	1.873e-07	1.723e-07	-6.728	-6.764	-0.036
	MnF+	2.275e-08	2.093e-08	-7.643	-7.679	-0.036
	MnCl+	2.044e-08	1.880e-08	-7.690	-7.726	-0.036
	MnCl2	1.062e-12	1.064e-12	-11.974	-11.973	0.001
	Mn(OH)3-	9.722e-15	8.943e-15	-14.012	-14.049	-0.036
	MnCl3-	4.128e-17	3.797e-17	-16.384	-16.421	-0.036
Mn(3)	2.058e-23					
	Mn+3	2.058e-23	9.704e-24	-22.686	-23.013	-0.327
Mn(6)	6.767e-29					
	MnO4-2	6.767e-29	4.845e-29	-28.170	-28.315	-0.145
Mn(7)	1.888e-31					
	MnO4-	1.888e-31	1.736e-31	-30.724	-30.760	-0.036
Na	6.962e-04					
	Na+	6.926e-04	6.375e-04	-3.160	-3.195	-0.036
	NaSO4-	3.334e-06	3.067e-06	-5.477	-5.513	-0.036
	NaHCO3	1.777e-07	1.780e-07	-6.750	-6.750	0.001
	NaCO3-	5.863e-08	5.393e-08	-7.232	-7.268	-0.036
	NaF	3.112e-08	3.116e-08	-7.507	-7.506	0.001
Ni	1.414e-06					
	NiCO3	1.340e-06	1.342e-06	-5.873	-5.872	0.001
	Ni+2	4.655e-08	3.333e-08	-7.332	-7.477	-0.145
	Ni(CO3)2-2	1.769e-08	1.267e-08	-7.752	-7.897	-0.145
	NiSO4	6.179e-09	6.188e-09	-8.209	-8.208	0.001
	NiHCO3+	2.483e-09	2.284e-09	-8.605	-8.641	-0.036
	NiOH+	9.793e-10	9.008e-10	-9.009	-9.045	-0.036
	Ni(OH)2	2.099e-10	2.103e-10	-9.678	-9.677	0.001
	NiF+	6.141e-11	5.648e-11	-10.212	-10.248	-0.036
	NiCl+	1.180e-11	1.085e-11	-10.928	-10.965	-0.036
	Ni(OH)3-	5.741e-13	5.281e-13	-12.241	-12.277	-0.036
	Ni(SO4)2-2	4.698e-13	3.363e-13	-12.328	-12.473	-0.145
	NiCl2	5.098e-15	5.106e-15	-14.293	-14.292	0.001
O(0)	2.122e-25					
	O2	1.061e-25	1.063e-25	-24.974	-24.974	0.001
Pb	3.379e-08					
	PbCO3	3.056e-08	3.060e-08	-7.515	-7.514	0.001
	PbOH+	1.726e-09	1.588e-09	-8.763	-8.799	-0.036
	Pb(CO3)2-2	5.832e-10	4.175e-10	-9.234	-9.379	-0.145
	Pb+2	4.529e-10	3.242e-10	-9.344	-9.489	-0.145
	PbSO4	1.787e-10	1.790e-10	-9.748	-9.747	0.001
	Pb(OH)2	1.549e-10	1.551e-10	-9.810	-9.809	0.001
	PbHCO3+	1.390e-10	1.278e-10	-9.857	-9.893	-0.036
	PbCl+	1.666e-12	1.532e-12	-11.778	-11.815	-0.036
	Pb(SO4)2-2	1.288e-12	9.220e-13	-11.890	-12.035	-0.145
	PbF+	5.324e-13	4.897e-13	-12.274	-12.310	-0.036
	Pb(OH)3-	4.864e-13	4.474e-13	-12.313	-12.349	-0.036
	PbF2	8.481e-16	8.493e-16	-15.072	-15.071	0.001
	Pb(OH)4-2	3.596e-16	2.574e-16	-15.444	-15.589	-0.145
	PbCl2	3.358e-16	3.362e-16	-15.474	-15.473	0.001
	Pb2OH+3	2.444e-17	1.152e-17	-16.612	-16.938	-0.327
	PbF3-	5.682e-19	5.226e-19	-18.246	-18.282	-0.036
	Pb3(OH)4+2	1.468e-19	1.051e-19	-18.833	-18.978	-0.145
	PbCl3-	3.682e-20	3.387e-20	-19.434	-19.470	-0.036
	PbF4-2	2.968e-23	2.125e-23	-22.528	-22.673	-0.145
	PbCl4-2	2.856e-24	2.044e-24	-23.544	-23.689	-0.145
S(6)	1.562e-03					
	SO4-2	1.363e-03	9.817e-04	-2.865	-3.008	-0.143
	CaSO4	1.188e-04	1.190e-04	-3.925	-3.924	0.001
	MgSO4	6.986e-05	6.996e-05	-4.156	-4.155	0.001
	MnSO4	5.802e-06	5.810e-06	-5.236	-5.236	0.001
	NaSO4-	3.334e-06	3.067e-06	-5.477	-5.513	-0.036
	KSO4-	4.553e-07	4.188e-07	-6.342	-6.378	-0.036
	BaSO4	3.511e-07	3.516e-07	-6.455	-6.454	0.001
	ZnSO4	1.713e-07	1.716e-07	-6.766	-6.766	0.001
	FeSO4	1.615e-08	1.618e-08	-7.792	-7.791	0.001
	CdSO4	8.526e-09	8.538e-09	-8.069	-8.069	0.001
	NiSO4	6.179e-09	6.188e-09	-8.209	-8.208	0.001
	Zn(SO4)2-2	1.965e-09	1.407e-09	-8.707	-8.852	-0.145
	HSO4-	3.831e-10	3.524e-10	-9.417	-9.453	-0.036
	CuSO4	2.459e-10	2.463e-10	-9.609	-9.609	0.001
	PbSO4	1.787e-10	1.790e-10	-9.748	-9.747	0.001
	Cd(SO4)2-2	1.312e-10	9.391e-11	-9.882	-10.027	-0.145
	CaHSO4+	2.893e-12	2.661e-12	-11.539	-11.575	-0.036
	Pb(SO4)2-2	1.288e-12	9.220e-13	-11.890	-12.035	-0.145
	UO2SO4	6.272e-13	6.281e-13	-12.203	-12.202	0.001
	Ni(SO4)2-2	4.698e-13	3.363e-13	-12.328	-12.473	-0.145
	UO2(SO4)2-2	7.815e-15	5.595e-15	-14.107	-14.252	-0.145
	AlSO4+	1.219e-15	1.121e-15	-14.914	-14.950	-0.036
	FeHSO4+	4.553e-16	4.188e-16	-15.342	-15.378	-0.036
	Al(SO4)2-	3.722e-17	3.423e-17	-16.429	-16.466	-0.036
	FeSO4+	2.911e-18	2.678e-18	-17.536	-17.572	-0.036
	Fe(SO4)2-	6.167e-20	5.673e-20	-19.210	-19.246	-0.036
	AlHSO4+2	5.368e-25	3.843e-25	-24.270	-24.415	-0.145
	FeHSO4+2	4.000e-26	2.864e-26	-25.398	-25.543	-0.145
	U(SO4)2	0.000e+00	0.000e+00	-46.488	-46.487	0.001
	USO4+2	0.000e+00	0.000e+00	-47.203	-47.348	-0.145
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-66.755	-67.082	-0.327
U(4)	9.605e-27					
	U(OH)4	9.605e-27	9.619e-27	-26.018	-26.017	0.001
	U(OH)3+	1.588e-31	1.461e-31	-30.799	-30.835	-0.036
	U(OH)2+2	4.145e-37	2.968e-37	-36.382	-36.528	-0.145
	U(CO3)4-4	3.289e-39	8.639e-40	-38.483	-39.064	-0.581
	UF3+	0.000e+00	0.000e+00	-41.480	-41.517	-0.036
	UF4	0.000e+00	0.000e+00	-41.680	-41.679	0.001
	U(CO3)5-6	0.000e+00	0.000e+00	-42.096	-43.403	-1.306
	UF2+2	0.000e+00	0.000e+00	-42.673	-42.818	-0.145
	UOH+3	0.000e+00	0.000e+00	-42.814	-43.141	-0.327
	UF5-	0.000e+00	0.000e+00	-44.253	-44.290	-0.036
	UF+3	0.000e+00	0.000e+00	-45.336	-45.663	-0.327
	UF6-2	0.000e+00	0.000e+00	-46.112	-46.257	-0.145
	U(SO4)2	0.000e+00	0.000e+00	-46.488	-46.487	0.001
	USO4+2	0.000e+00	0.000e+00	-47.203	-47.348	-0.145
	U+4	0.000e+00	0.000e+00	-50.323	-50.903	-0.581
	UCl+3	0.000e+00	0.000e+00	-52.704	-53.031	-0.327
	U6(OH)15+9	0.000e+00	0.000e+00	-193.680	-196.619	-2.939
U(5)	1.208e-18					
	UO2+	1.208e-18	1.111e-18	-17.918	-17.954	-0.036
	UO2(CO3)3-5	3.620e-26	4.482e-27	-25.441	-26.349	-0.907
U(6)	3.988e-06					
	UO2(CO3)2-2	1.877e-06	1.344e-06	-5.727	-5.872	-0.145
	UO2(CO3)3-4	1.555e-06	4.085e-07	-5.808	-6.389	-0.581
	UO2(OH)3-	5.410e-07	4.976e-07	-6.267	-6.303	-0.036
	UO2CO3	1.124e-08	1.126e-08	-7.949	-7.949	0.001
	(UO2)3(OH)7-	8.454e-10	7.776e-10	-9.073	-9.109	-0.036
	UO2OH+	6.876e-10	6.325e-10	-9.163	-9.199	-0.036
	(UO2)3(OH)5+	2.285e-11	2.101e-11	-10.641	-10.677	-0.036
	UO2F+	5.608e-12	5.159e-12	-11.251	-11.287	-0.036
	UO2(OH)4-2	2.767e-12	1.981e-12	-11.558	-11.703	-0.145
	UO2F2	1.480e-12	1.482e-12	-11.830	-11.829	0.001
	UO2+2	6.953e-13	4.977e-13	-12.158	-12.303	-0.145
	UO2SO4	6.272e-13	6.281e-13	-12.203	-12.202	0.001
	(UO2)4(OH)7+	5.297e-13	4.873e-13	-12.276	-12.312	-0.036
	(UO2)3(CO3)6-6	6.410e-14	3.166e-15	-13.193	-14.500	-1.306
	(UO2)2(OH)2+2	4.266e-14	3.054e-14	-13.370	-13.515	-0.145
	UO2F3-	2.605e-14	2.396e-14	-13.584	-13.621	-0.036
	UO2(SO4)2-2	7.815e-15	5.595e-15	-14.107	-14.252	-0.145
	(UO2)3(OH)4+2	8.630e-16	6.178e-16	-15.064	-15.209	-0.145
	UO2Cl+	9.985e-17	9.185e-17	-16.001	-16.037	-0.036
	UO2F4-2	1.811e-17	1.297e-17	-16.742	-16.887	-0.145
	(UO2)2OH+3	2.634e-19	1.242e-19	-18.579	-18.906	-0.327
	UO2Cl2	6.170e-22	6.179e-22	-21.210	-21.209	0.001
Zn	3.045e-06					
	Zn+2	1.070e-06	7.662e-07	-5.970	-6.116	-0.145
	ZnCO3	8.292e-07	8.304e-07	-6.081	-6.081	0.001
	Zn(OH)2	6.077e-07	6.085e-07	-6.216	-6.216	0.001
	ZnOH+	1.754e-07	1.613e-07	-6.756	-6.792	-0.036
	ZnSO4	1.713e-07	1.716e-07	-6.766	-6.766	0.001
	Zn(CO3)2-2	1.347e-07	9.642e-08	-6.871	-7.016	-0.145
	ZnHCO3+	5.206e-08	4.788e-08	-7.284	-7.320	-0.036
	Zn(SO4)2-2	1.965e-09	1.407e-09	-8.707	-8.852	-0.145
	ZnF+	9.559e-10	8.793e-10	-9.020	-9.056	-0.036
	ZnOHCl	8.247e-10	8.259e-10	-9.084	-9.083	0.001
	Zn(OH)3-	5.255e-10	4.833e-10	-9.279	-9.316	-0.036
	ZnCl+	2.486e-10	2.286e-10	-9.605	-9.641	-0.036
	ZnCl2	3.055e-14	3.059e-14	-13.515	-13.514	0.001
	Zn(OH)4-2	2.688e-14	1.924e-14	-13.571	-13.716	-0.145
	ZnCl3-	4.734e-18	4.355e-18	-17.325	-17.361	-0.036
	ZnCl4-2	3.842e-22	2.750e-22	-21.415	-21.561	-0.145

Fe(3)	1.075e-06					
	Fe(OH)3	8.559e-07	8.572e-07	-6.068	-6.067	0.001
	Fe(OH)4-	1.851e-07	1.703e-07	-6.733	-6.769	-0.036
	Fe(OH)2+	3.361e-08	3.091e-08	-7.474	-7.510	-0.036
	FeOH+2	5.938e-13	4.251e-13	-12.226	-12.371	-0.145
	FeF2+	1.452e-16	1.335e-16	-15.838	-15.874	-0.036
	FeF+2	5.752e-17	4.118e-17	-16.240	-16.385	-0.145
	FeF3	1.773e-17	1.776e-17	-16.751	-16.751	0.001
	FeSO4+	3.494e-18	3.214e-18	-17.457	-17.493	-0.036
	Fe+3	6.850e-19	3.229e-19	-18.164	-18.491	-0.327
	Fe(SO4)2-	7.400e-20	6.807e-20	-19.131	-19.167	-0.036
	FeCl+2	1.578e-21	1.130e-21	-20.802	-20.947	-0.145
	Fe2(OH)2+4	2.144e-23	5.631e-24	-22.669	-23.249	-0.581
	FeCl2+	7.955e-25	7.317e-25	-24.099	-24.136	-0.036
	FeHSO4+2	4.801e-26	3.437e-26	-25.319	-25.464	-0.145
	Fe3(OH)4+5	4.072e-28	5.042e-29	-27.390	-28.297	-0.907
	FeCl3	9.469e-30	9.483e-30	-29.024	-29.023	0.001
H(0)	1.033e-34					
	H2	5.165e-35	5.172e-35	-34.287	-34.286	0.001
K	6.907e-05					
	K+	6.861e-05	6.305e-05	-4.164	-4.200	-0.037
	KSO4-	4.553e-07	4.188e-07	-6.342	-6.378	-0.036
Mg	5.349e-04					
	Mg+2	4.591e-04	3.331e-04	-3.338	-3.477	-0.139
	MgSO4	6.986e-05	6.997e-05	-4.156	-4.155	0.001
	MgHCO3+	2.073e-06	1.907e-06	-5.683	-5.720	-0.036
	MgF+	1.906e-06	1.753e-06	-5.720	-5.756	-0.036
	MgCO3	1.633e-06	1.635e-06	-5.787	-5.786	0.001
	MgOH+	2.398e-07	2.206e-07	-6.620	-6.656	-0.036
Mn(2)	7.283e-05					
	Mn+2	4.975e-05	3.561e-05	-4.303	-4.448	-0.145
	MnCO3	1.534e-05	1.536e-05	-4.814	-4.814	0.001
	MnSO4	5.802e-06	5.811e-06	-5.236	-5.236	0.001
	MnHCO3+	1.712e-06	1.575e-06	-5.766	-5.803	-0.036
	MnOH+	1.873e-07	1.723e-07	-6.728	-6.764	-0.036
	MnF+	2.275e-08	2.093e-08	-7.643	-7.679	-0.036
	MnCl+	2.044e-08	1.880e-08	-7.689	-7.726	-0.036
	MnCl2	1.062e-12	1.064e-12	-11.974	-11.973	0.001
	Mn(OH)3-	9.723e-15	8.944e-15	-14.012	-14.048	-0.036
	MnCl3-	4.128e-17	3.797e-17	-16.384	-16.421	-0.036
Mn(3)	2.059e-23					
	Mn+3	2.059e-23	9.705e-24	-22.686	-23.013	-0.327
Mn(6)	6.768e-29					
	MnO4-2	6.768e-29	4.845e-29	-28.170	-28.315	-0.145
Mn(7)	1.888e-31					
	MnO4-	1.888e-31	1.737e-31	-30.724	-30.760	-0.036
Na	6.962e-04					
	Na+	6.926e-04	6.375e-04	-3.160	-3.195	-0.036
	NaSO4-	3.334e-06	3.067e-06	-5.477	-5.513	-0.036
	NaHCO3	1.777e-07	1.779e-07	-6.750	-6.750	0.001
	NaCO3-	5.862e-08	5.392e-08	-7.232	-7.268	-0.036
	NaF	3.112e-08	3.116e-08	-7.507	-7.506	0.001
Ni	1.414e-06					
	NiCO3	1.340e-06	1.342e-06	-5.873	-5.872	0.001
	Ni+2	4.657e-08	3.334e-08	-7.332	-7.477	-0.145
	Ni(CO3)2-2	1.769e-08	1.266e-08	-7.752	-7.897	-0.145
	NiSO4	6.181e-09	6.189e-09	-8.209	-8.208	0.001
	NiHCO3+	2.483e-09	2.284e-09	-8.605	-8.641	-0.036
	NiOH+	9.796e-10	9.011e-10	-9.009	-9.045	-0.036
	Ni(OH)2	2.100e-10	2.103e-10	-9.678	-9.677	0.001
	NiF+	6.142e-11	5.650e-11	-10.212	-10.248	-0.036
	NiCl+	1.180e-11	1.085e-11	-10.928	-10.964	-0.036
	Ni(OH)3-	5.743e-13	5.282e-13	-12.241	-12.277	-0.036
	Ni(SO4)2-2	4.699e-13	3.364e-13	-12.328	-12.473	-0.145
	NiCl2	5.100e-15	5.107e-15	-14.292	-14.292	0.001
O(0)	2.122e-25					
	O2	1.061e-25	1.063e-25	-24.974	-24.974	0.001
Pb	3.379e-08					
	PbCO3	3.056e-08	3.060e-08	-7.515	-7.514	0.001
	PbOH+	1.727e-09	1.588e-09	-8.763	-8.799	-0.036
	Pb(CO3)2-2	5.830e-10	4.174e-10	-9.234	-9.379	-0.145
	Pb+2	4.530e-10	3.243e-10	-9.344	-9.489	-0.145
	PbSO4	1.788e-10	1.790e-10	-9.748	-9.747	0.001
	Pb(OH)2	1.550e-10	1.552e-10	-9.810	-9.809	0.001
	PbHCO3+	1.390e-10	1.278e-10	-9.857	-9.893	-0.036
	PbCl+	1.666e-12	1.533e-12	-11.778	-11.815	-0.036
	Pb(SO4)2-2	1.288e-12	9.223e-13	-11.890	-12.035	-0.145
	PbF+	5.325e-13	4.898e-13	-12.274	-12.310	-0.036
	Pb(OH)3-	4.865e-13	4.475e-13	-12.313	-12.349	-0.036
	PbF2	8.483e-16	8.495e-16	-15.071	-15.071	0.001
	Pb(OH)4-2	3.597e-16	2.575e-16	-15.444	-15.589	-0.145
	PbCl2	3.358e-16	3.363e-16	-15.474	-15.473	0.001
	Pb2OH+3	2.446e-17	1.153e-17	-16.612	-16.938	-0.327
	PbF3-	5.683e-19	5.228e-19	-18.245	-18.282	-0.036
	Pb3(OH)4+2	1.469e-19	1.052e-19	-18.833	-18.978	-0.145
	PbCl3-	3.683e-20	3.388e-20	-19.434	-19.470	-0.036
	PbF4-2	2.969e-23	2.125e-23	-22.527	-22.673	-0.145
	PbCl4-2	2.856e-24	2.045e-24	-23.544	-23.689	-0.145
S(6)	1.562e-03					
	SO4-2	1.363e-03	9.817e-04	-2.865	-3.008	-0.143
	CaSO4	1.188e-04	1.190e-04	-3.925	-3.924	0.001
	MgSO4	6.986e-05	6.997e-05	-4.156	-4.155	0.001
	MnSO4	5.802e-06	5.811e-06	-5.236	-5.236	0.001
	NaSO4-	3.334e-06	3.067e-06	-5.477	-5.513	-0.036
	KSO4-	4.553e-07	4.188e-07	-6.342	-6.378	-0.036
	BaSO4	3.511e-07	3.516e-07	-6.455	-6.454	0.001
	ZnSO4	1.714e-07	1.716e-07	-6.766	-6.765	0.001
	CdSO4	8.526e-09	8.538e-09	-8.069	-8.069	0.001
	NiSO4	6.181e-09	6.189e-09	-8.209	-8.208	0.001
	Zn(SO4)2-2	1.966e-09	1.407e-09	-8.707	-8.852	-0.145
	HSO4-	3.831e-10	3.524e-10	-9.417	-9.453	-0.036
	CuSO4	2.459e-10	2.463e-10	-9.609	-9.609	0.001
	PbSO4	1.788e-10	1.790e-10	-9.748	-9.747	0.001
	Cd(SO4)2-2	1.312e-10	9.391e-11	-9.882	-10.027	-0.145
	CaHSO4+	2.893e-12	2.661e-12	-11.539	-11.575	-0.036
	Pb(SO4)2-2	1.288e-12	9.223e-13	-11.890	-12.035	-0.145
	UO2SO4	6.276e-13	6.285e-13	-12.202	-12.202	0.001
	Ni(SO4)2-2	4.699e-13	3.364e-13	-12.328	-12.473	-0.145
	FeSO4	4.535e-14	4.542e-14	-13.343	-13.343	0.001
	UO2(SO4)2-2	7.820e-15	5.598e-15	-14.107	-14.252	-0.145
	AlSO4+	1.219e-15	1.121e-15	-14.914	-14.950	-0.036
	Al(SO4)2-	3.722e-17	3.423e-17	-16.429	-16.466	-0.036
	FeSO4+	3.494e-18	3.214e-18	-17.457	-17.493	-0.036
	Fe(SO4)2-	7.400e-20	6.807e-20	-19.131	-19.167	-0.036
	FeHSO4+	1.279e-21	1.176e-21	-20.893	-20.930	-0.036
	AlHSO4+2	5.368e-25	3.843e-25	-24.270	-24.415	-0.145
	FeHSO4+2	4.801e-26	3.437e-26	-25.319	-25.464	-0.145
	U(SO4)2	0.000e+00	0.000e+00	-46.488	-46.487	0.001
	USO4+2	0.000e+00	0.000e+00	-47.202	-47.347	-0.145
U(3)	0.000e+00					
	U+3	0.000e+00	0.000e+00	-66.755	-67.081	-0.327
U(4)	9.611e-27					
	U(OH)4	9.611e-27	9.625e-27	-26.017	-26.017	0.001
	U(OH)3+	1.589e-31	1.462e-31	-30.799	-30.835	-0.036
	U(OH)2+2	4.148e-37	2.969e-37	-36.382	-36.527	-0.145
	U(CO3)4-4	3.287e-39	8.635e-40	-38.483	-39.064	-0.581
	UF3+	0.000e+00	0.000e+00	-41.480	-41.516	-0.036
	UF4	0.000e+00	0.000e+00	-41.679	-41.679	0.001
	U(CO3)5-6	0.000e+00	0.000e+00	-42.097	-43.403	-1.306
	UF2+2	0.000e+00	0.000e+00	-42.673	-42.818	-0.145
	UOH+3	0.000e+00	0.000e+00	-42.814	-43.141	-0.327
	UF5-	0.000e+00	0.000e+00	-44.253	-44.290	-0.036
	UF+3	0.000e+00	0.000e+00	-45.336	-45.662	-0.327
	UF6-2	0.000e+00	0.000e+00	-46.112	-46.257	-0.145
	U(SO4)2	0.000e+00	0.000e+00	-46.488	-46.487	0.001
	USO4+2	0.000e+00	0.000e+00	-47.202	-47.347	-0.145
	U+4	0.000e+00	0.000e+00	-50.322	-50.903	-0.581
	UCl+3	0.000e+00	0.000e+00	-52.704	-53.031	-0.327
	U6(OH)15+9	0.000e+00	0.000e+00	-193.679	-196.618	-2.939
U(5)	1.209e-18					
	UO2+	1.209e-18	1.112e-18	-17.918	-17.954	-0.036
	UO2(CO3)3-5	3.619e-26	4.481e-27	-25.441	-26.349	-0.907
U(6)	3.988e-06					
	UO2(CO3)2-2	1.877e-06	1.344e-06	-5.726	-5.872	-0.145
	UO2(CO3)3-4	1.555e-06	4.084e-07	-5.808	-6.389	-0.581
	UO2(OH)3-	5.413e-07	4.979e-07	-6.267	-6.303	-0.036
	UO2CO3	1.125e-08	1.126e-08	-7.949	-7.948	0.001
	(UO2)3(OH)7-	8.469e-10	7.790e-10	-9.072	-9.108	-0.036
	UO2OH+	6.880e-10	6.329e-10	-9.162	-9.199	-0.036
	(UO2)3(OH)5+	2.289e-11	2.105e-11	-10.640	-10.677	-0.036
	UO2F+	5.612e-12	5.162e-12	-11.251	-11.287	-0.036
	UO2(OH)4-2	2.769e-12	1.982e-12	-11.558	-11.703	-0.145
	UO2F2	1.481e-12	1.483e-12	-11.829	-11.829	0.001
	UO2+2	6.957e-13	4.980e-13	-12.158	-12.303	-0.145
	UO2SO4	6.276e-13	6.285e-13	-12.202	-12.202	0.001
	(UO2)4(OH)7+	5.310e-13	4.884e-13	-12.275	-12.311	-0.036
	(UO2)3(CO3)6-6	6.410e-14	3.166e-15	-13.193	-14.499	-1.306
	(UO2)2(OH)2+2	4.271e-14	3.058e-14	-13.369	-13.515	-0.145
	UO2F3-	2.606e-14	2.397e-14	-13.584	-13.620	-0.036
	UO2(SO4)2-2	7.820e-15	5.598e-15	-14.107	-14.252	-0.145
	(UO2)3(OH)4+2	8.645e-16	6.189e-16	-15.063	-15.208	-0.145
	UO2Cl+	9.991e-17	9.190e-17	-16.000	-16.037	-0.036
	UO2F4-2	1.813e-17	1.298e-17	-16.742	-16.887	-0.145
	(UO2)2OH+3	2.637e-19	1.243e-19	-18.579	-18.906	-0.327
	UO2Cl2	6.173e-22	6.182e-22	-21.209	-21.209	0.001
Zn	3.045e-06					
	Zn+2	1.070e-06	7.663e-07	-5.970	-6.116	-0.145
	ZnCO3	8.290e-07	8.302e-07	-6.081	-6.081	0.001
	Zn(OH)2	6.077e-07	6.086e-07	-6.216	-6.216	0.001
	ZnOH+	1.754e-07	1.613e-07	-6.756	-6.792	-0.036
	ZnSO4	1.714e-07	1.716e-07	-6.766	-6.765	0.001
	Zn(CO3)2-2	1.346e-07	9.638e-08	-6.871	-7.016	-0.145
	ZnHCO3+	5.205e-08	4.788e-08	-7.284	-7.320	-0.036
	Zn(SO4)2-2	1.966e-09	1.407e-09	-8.707	-8.852	-0.145
	ZnF+	9.561e-10	8.794e-10	-9.020	-9.056	-0.036
	ZnOHCl	8.248e-10	8.260e-10	-9.084	-9.083	0.001
	Zn(OH)3-	5.255e-10	4.834e-10	-9.279	-9.316	-0.036
	ZnCl+	2.486e-10	2.287e-10	-9.605	-9.641	-0.036
	ZnCl2	3.055e-14	3.059e-14	-13.515	-13.514	0.001
	Zn(OH)4-2	2.688e-14	1.924e-14	-13.571	-13.716	-0.145
	ZnCl3-	4.735e-18	4.355e-18	-17.325	-17.361	-0.036
	ZnCl4-2	3.842e-22	2.751e-22	-21.415	-21.561	-0.145

----------Saturation Indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-1.25	9.78	11.03	Al(OH)3
AlAsO4:2H2O	-8.89	-4.10	4.79	AlAsO4:2H2O
AlumK	-20.41	-25.64	-5.23	KAl(SO4)2:12H2O
Alunite	-5.12	-6.08	-0.96	KAl3(SO4)2(OH)6
Anglesite	-4.69	-12.50	-7.81	PbSO4
Anhydrite	-1.86	-6.21	-4.35	CaSO4
Antlerite	-4.40	3.89	8.29	Cu3(OH)4SO4
Aragonite	-0.15	-8.47	-8.31	CaCO3
Arsenolite	-100.50	-180.06	-79.56	As4O6
Artinite	-5.27	4.58	9.85	MgCO3:Mg(OH)2:3H2O
As2O5	-34.50	-27.75	6.75	As2O5
Atacamite	-3.99	3.51	7.50	Cu2(OH)3Cl
Azurite	-3.73	-20.43	-16.70	Cu3(OH)2(CO3)2
B-UO2(OH)2	-1.17	4.50	5.66	UO2(OH)2
Ba3(AsO4)2	13.15	4.21	-8.94	Ba3(AsO4)2
BaF2	-8.52	-14.29	-5.77	BaF2
Barite	0.87	-9.15	-10.03	BaSO4
Basaluminite	-3.40	19.30	22.70	Al4(OH)10SO4
Bianchite	-7.36	-9.12	-1.76	ZnSO4:6H2O
Birnessite	-0.11	43.49	43.60	MnO2
Bixbyite	4.85	55.84	50.99	Mn2O3
Boehmite	0.95	9.78	8.83	AlOOH
Brochantite	-3.55	11.79	15.34	Cu4(OH)6SO4
Brucite	-3.75	13.32	17.08	Mg(OH)2
Bunsenite	-3.34	9.32	12.66	NiO
Ca3(AsO4)2:4w	-9.31	13.04	22.35	Ca3(AsO4)2:4H2O
Calcite	-0.01	-8.47	-8.46	CaCO3
Cd(gamma)	-35.60	-21.85	13.75	Cd
Cd(OH)2	-4.36	9.29	13.65	Cd(OH)2
Cd(OH)2(a)	-4.62	9.29	13.91	Cd(OH)2
Cd3(OH)2(SO4)2	-18.46	-11.75	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-14.50	8.06	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-11.05	17.35	28.40	Cd4(OH)6SO4
CdCl2	-14.64	-15.29	-0.64	CdCl2
CdCl2:2.5H2O	-13.33	-15.29	-1.95	CdCl2:2.5H2O
CdCl2:H2O	-13.59	-15.29	-1.69	CdCl2:H2O
CdF2	-12.76	-15.65	-2.90	CdF2
CdMetal	-35.50	-21.85	13.65	Cd
CdOHCl	-6.58	-3.00	3.58	CdOHCl
CdSO4	-10.55	-10.52	0.03	CdSO4
CdSO4:2.7H2O	-8.68	-10.52	-1.84	CdSO4:2.67H2O
CdSO4:H2O	-8.93	-10.52	-1.59	CdSO4:H2O
Cerrusite	-1.58	-14.75	-13.17	PbCO3
Chalcanthite	-9.26	-11.91	-2.65	CuSO4:5H2O
Claudetite	-100.25	-180.06	-79.81	As4O6
CO2(g)	-3.91	-22.07	-18.16	CO2
Cotunnite	-12.45	-17.26	-4.82	PbCl2
Cu(OH)2	-0.87	7.90	8.77	Cu(OH)2
Cu2SO4	-27.83	-35.15	-7.32	Cu2SO4
Cu3(AsO4)2:6w	-10.18	-4.05	6.13	Cu3(AsO4)2:6H2O
CuCO3	-4.54	-14.17	-9.63	CuCO3
CuF	-24.62	-20.14	4.48	CuF
CuF2	-16.54	-17.04	-0.50	CuF2
CuF2:2H2O	-12.52	-17.04	-4.52	CuF2:2H2O
CuMetal	-11.63	-23.24	-11.61	Cu
CuOCuSO4	-15.85	-4.01	11.84	CuO:CuSO4
CupricFerrite	14.94	21.16	6.22	CuFe2O4
Cuprite	-8.32	-15.34	-7.02	Cu2O
CuprousFerrite	10.55	-1.04	-11.59	CuFeO2
CuSO4	-15.08	-11.91	3.17	CuSO4
Diaspore	2.68	9.78	7.09	AlOOH
Dolomite	-0.20	-17.21	-17.01	CaMg(CO3)2
Dolomite(d)	-0.77	-17.21	-16.44	CaMg(CO3)2
Epsomite	-4.32	-6.49	-2.16	MgSO4:7H2O
Fe(OH)2.7Cl.3	5.98	2.94	-3.04	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	1.74	6.63	4.89	Fe(OH)3
Fe3(OH)8	2.83	23.05	20.22	Fe3(OH)8
Fluorite	-0.70	-11.34	-10.64	CaF2
Gibbsite	1.47	9.78	8.31	Al(OH)3
Goethite	7.63	6.63	-1.00	FeOOH
Goslarite	-7.14	-9.12	-1.99	ZnSO4:7H2O
Gummite	-6.11	4.50	10.60	UO3
Gypsum	-1.63	-6.21	-4.58	CaSO4:2H2O
H2(g)	-31.09	-31.14	-0.05	H2
Halite	-8.66	-7.08	1.57	NaCl
Hausmannite	6.29	68.19	61.91	Mn3O4
Hematite	17.00	13.26	-3.74	Fe2O3
Huntite	-4.95	-34.69	-29.74	CaMg3(CO3)4
Hydrocerrusite	-4.74	-22.20	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-13.34	-21.65	-8.31	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-8.34	-16.34	-8.00	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-6.59	-15.53	-8.94	KFe3(SO4)2(OH)6
Jarosite-Na	-9.56	-14.52	-4.96	NaFe3(SO4)2(OH)6
JarositeH	-14.82	-19.73	-4.91	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-6.80	-10.03	-3.23	AlOHSO4
Langite	-5.34	11.79	17.13	Cu4(OH)6SO4:H2O
Larnakite	-4.96	-5.19	-0.22	PbO:PbSO4
Laurionite	-5.60	-4.98	0.62	PbOHCl
Litharge	-5.55	7.31	12.86	PbO
Magnemite	6.87	13.26	6.39	Fe2O3
Magnesite	-0.77	-8.74	-7.98	MgCO3
Magnetite	18.88	23.05	4.18	Fe3O4
Malachite	-1.23	-6.27	-5.04	Cu2(OH)2CO3
Manganite	2.58	27.92	25.34	MnOOH
Massicot	-5.75	7.31	13.06	PbO
Matlockite	-7.95	-17.45	-9.50	PbClF
Melanothallite	-20.51	-16.67	3.84	CuCl2
Melanterite	-7.76	-10.01	-2.25	FeSO4:7H2O
Minium	-21.51	53.07	74.58	Pb3O4
Mirabilite	-8.12	-9.40	-1.28	Na2SO4:10H2O
Mn2(SO4)3	-49.68	-3.58	46.10	Mn2(SO4)3
Mn3(AsO4):8H2O	-3.24	9.30	12.55	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-14.78	-12.22	2.56	MnCl2:4H2O
MnSO4	-10.26	-7.46	2.80	MnSO4
Monteponite	-4.70	9.29	13.99	CdO
Morenosite	-8.10	-10.49	-2.39	NiSO4:7H2O
Na4UO2(CO3)3	-24.59	-40.88	-16.29	Na4UO2(CO3)3
Nahcolite	-5.92	-16.86	-10.94	NaHCO3
Nantokite	-10.40	-19.96	-9.55	CuCl
Natron	-10.21	-11.66	-1.45	Na2CO3:10H2O
Nesquehonite	-3.17	-8.74	-5.57	MgCO3:3H2O
Ni(OH)2	-1.21	9.32	10.53	Ni(OH)2
Ni3(AsO4)2:8H2O	-15.53	0.22	15.74	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-14.52	17.48	32.00	Ni4(OH)6SO4
NiCO3	-5.99	-12.74	-6.75	NiCO3
Nsutite	0.93	43.49	42.56	MnO2
O2(g)	-22.11	62.28	84.39	O2
Otavite	-0.68	-12.78	-12.10	CdCO3
Pb(OH)2	-0.96	7.31	8.27	Pb(OH)2
Pb2(OH)3Cl	-6.46	2.33	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-11.58	14.62	26.20	PbO:Pb(OH)2
Pb2O3	-15.28	45.76	61.04	Pb2O3
Pb2OCO3	-7.04	-7.44	-0.40	PbO:PbCO3
Pb3(AsO4)2	-11.67	-5.82	5.85	Pb3(AsO4)2
Pb3O2CO3	-11.38	-0.13	11.25	PbCO3:2PbO
Pb3O2SO4	-8.46	2.12	10.58	PbSO4:2PbO
Pb4(OH)6SO4	-11.66	9.44	21.10	Pb4(OH)6SO4
Pb4O3SO4	-12.97	9.44	22.41	PbSO4:3PbO
PbF2	-10.20	-17.63	-7.43	PbF2
PbMetal	-28.10	-23.83	4.27	Pb
PbO:0.3H2O	-5.67	7.31	12.98	PbO:0.33H2O
Phosgenite	-12.21	-32.02	-19.81	PbCl2:PbCO3
Plattnerite	-11.47	38.45	49.92	PbO2
Portlandite	-9.47	13.60	23.07	Ca(OH)2
Pyrochroite	-2.85	12.35	15.20	Mn(OH)2
Pyrolusite	1.54	43.49	41.95	MnO2
Retgersite	-8.44	-10.49	-2.05	NiSO4:6H2O
Rhodochrosite	1.40	-9.71	-11.12	MnCO3
Rhodochrosite(d)	0.68	-9.71	-10.39	MnCO3
Rutherfordine	-3.13	-17.57	-14.44	UO2CO3
Schoepite	-1.01	4.50	5.51	UO2(OH)2:H2O
Scorodite	-7.62	-7.25	0.38	FeAsO4:2H2O
Siderite	-1.40	-12.27	-10.87	FeCO3
Siderite(d)(3)	-1.82	-12.27	-10.45	FeCO3
Smithsonite	-1.42	-11.38	-9.96	ZnCO3
Tenorite	0.15	7.90	7.75	CuO
Thenardite	-9.22	-9.40	-0.17	Na2SO4
Thermonatrite	-11.81	-11.66	0.15	Na2CO3:H2O
Trona	-17.52	-28.52	-11.00	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-22.65	-8.98	13.67	U(OH)2SO4
U3O8(c)	22.62	94.76	72.15	U3O8
U4O9(c)	9.48	74.45	64.97	U4O9
UF4(c)	-37.48	-39.06	-1.57	UF4
UF4:2.5H2O	-28.36	-39.06	-10.70	UF4:2.5H2O
UO2(a)	-6.14	10.83	16.97	UO2
UO3(gamma)	-3.39	4.50	7.89	UO3
Uraninite(c)	-1.40	10.83	12.23	UO2
Witherite	-2.84	-11.41	-8.57	BaCO3
Zincite(c)	-0.65	10.68	11.33	ZnO
Zincosite	-12.30	-9.12	3.18	ZnSO4
Zn(OH)2-a	-1.77	10.68	12.45	Zn(OH)2
Zn(OH)2-b	-1.07	10.68	11.75	Zn(OH)2
Zn(OH)2-c	-1.52	10.68	12.20	Zn(OH)2
Zn(OH)2-e	-0.82	10.68	11.50	Zn(OH)2
Zn(OH)2-g	-1.03	10.68	11.71	Zn(OH)2
Zn2(OH)2SO4	-5.94	1.56	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.12	9.08	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-9.41	4.30	13.71	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.12	-7.56	19.56	ZnO:2ZnSO4
Zn4(OH)6SO4	-5.47	22.93	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-9.65	28.85	38.50	Zn5(OH)8Cl2
ZnCl2	-21.07	-13.89	7.18	ZnCl2
ZnCO3:H2O	-1.12	-11.38	-10.26	ZnCO3:H2O
ZnF2	-12.85	-14.26	-1.41	ZnF2
ZnMetal	-46.53	-20.46	26.08	Zn
ZnO(a)	-0.63	10.68	11.31	ZnO
ZnSO4:H2O	-8.65	-9.12	-0.48	ZnSO4:H2O

End of simulation.

----------Saturation indices----------

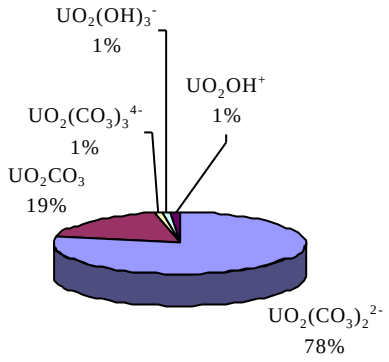
Phase	SI	log IAP	log KT	
Al(OH)3(a)	-1.25	9.78	11.03	Al(OH)3
AlAsO4:2H2O	-8.89	-4.10	4.79	AlAsO4:2H2O
AlumK	-20.41	-25.64	-5.23	KAl(SO4)2:12H2O
Alunite	-5.12	-6.08	-0.96	KAl3(SO4)2(OH)6
Anglesite	-4.69	-12.50	-7.81	PbSO4
Anhydrite	-1.86	-6.21	-4.35	CaSO4
Antlerite	-4.40	3.89	8.29	Cu3(OH)4SO4
Aragonite	-0.15	-8.47	-8.31	CaCO3
Arsenolite	-100.50	-180.06	-79.56	As4O6
Artinite	-5.27	4.58	9.85	MgCO3:Mg(OH)2:3H2O
As2O5	-34.50	-27.75	6.75	As2O5
Atacamite	-3.99	3.51	7.50	Cu2(OH)3Cl
Azurite	-3.73	-20.43	-16.70	Cu3(OH)2(CO3)2
B-UO2(OH)2	-1.17	4.50	5.66	UO2(OH)2
Ba3(AsO4)2	13.15	4.21	-8.94	Ba3(AsO4)2
BaF2	-8.52	-14.29	-5.77	BaF2
Barite	0.87	-9.15	-10.03	BaSO4
Basaluminite	-3.40	19.30	22.70	Al4(OH)10SO4
Bianchite	-7.36	-9.12	-1.76	ZnSO4:6H2O
Birnessite	-0.11	43.49	43.60	MnO2
Bixbyite	4.85	55.84	50.99	Mn2O3
Boehmite	0.95	9.78	8.83	AlOOH
Brochantite	-3.55	11.79	15.34	Cu4(OH)6SO4
Brucite	-3.75	13.32	17.08	Mg(OH)2
Bunsenite	-3.34	9.32	12.66	NiO
Ca3(AsO4)2:4w	-9.31	13.04	22.35	Ca3(AsO4)2:4H2O
Calcite	-0.01	-8.47	-8.46	CaCO3
Cd(gamma)	-35.60	-21.85	13.75	Cd
Cd(OH)2	-4.36	9.29	13.65	Cd(OH)2
Cd(OH)2(a)	-4.62	9.29	13.91	Cd(OH)2
Cd3(OH)2(SO4)2	-18.46	-11.75	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-14.50	8.06	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-11.05	17.35	28.40	Cd4(OH)6SO4
CdCl2	-14.64	-15.29	-0.64	CdCl2
CdCl2:2.5H2O	-13.33	-15.29	-1.95	CdCl2:2.5H2O
CdCl2:H2O	-13.59	-15.29	-1.69	CdCl2:H2O
CdF2	-12.76	-15.65	-2.90	CdF2
CdMetal	-35.50	-21.85	13.65	Cd
CdOHCl	-6.58	-3.00	3.58	CdOHCl
CdSO4	-10.55	-10.52	0.03	CdSO4
CdSO4:2.7H2O	-8.68	-10.52	-1.84	CdSO4:2.67H2O
CdSO4:H2O	-8.93	-10.52	-1.59	CdSO4:H2O
Cerrusite	-1.58	-14.75	-13.17	PbCO3
Chalcanthite	-9.26	-11.91	-2.65	CuSO4:5H2O
Claudetite	-100.25	-180.06	-79.81	As4O6
CO2(g)	-3.91	-22.07	-18.16	CO2
Cotunnite	-12.45	-17.26	-4.82	PbCl2
Cu(OH)2	-0.87	7.90	8.77	Cu(OH)2
Cu2SO4	-27.83	-35.15	-7.32	Cu2SO4
Cu3(AsO4)2:6w	-10.18	-4.05	6.13	Cu3(AsO4)2:6H2O
CuCO3	-4.54	-14.17	-9.63	CuCO3
CuF	-24.62	-20.14	4.48	CuF
CuF2	-16.54	-17.04	-0.50	CuF2
CuF2:2H2O	-12.52	-17.04	-4.52	CuF2:2H2O
CuMetal	-11.63	-23.24	-11.61	Cu
CuOCuSO4	-15.85	-4.01	11.84	CuO:CuSO4
CupricFerrite	14.94	21.16	6.22	CuFe2O4
Cuprite	-8.32	-15.34	-7.02	Cu2O
CuprousFerrite	10.55	-1.04	-11.59	CuFeO2
CuSO4	-15.08	-11.91	3.17	CuSO4
Diaspore	2.68	9.78	7.09	AlOOH
Dolomite	-0.20	-17.21	-17.01	CaMg(CO3)2
Dolomite(d)	-0.77	-17.21	-16.44	CaMg(CO3)2
Epsomite	-4.32	-6.49	-2.16	MgSO4:7H2O
Fe(OH)2.7Cl.3	5.98	2.94	-3.04	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	1.74	6.63	4.89	Fe(OH)3
Fe3(OH)8	2.83	23.05	20.22	Fe3(OH)8
Fluorite	-0.70	-11.34	-10.64	CaF2
Gibbsite	1.47	9.78	8.31	Al(OH)3
Goethite	7.63	6.63	-1.00	FeOOH
Goslarite	-7.14	-9.12	-1.99	ZnSO4:7H2O
Gummite	-6.11	4.50	10.60	UO3
Gypsum	-1.63	-6.21	-4.58	CaSO4:2H2O
H2(g)	-31.09	-31.14	-0.05	H2
Halite	-8.66	-7.08	1.57	NaCl
Hausmannite	6.29	68.19	61.91	Mn3O4
Hematite	17.00	13.26	-3.74	Fe2O3
Huntite	-4.95	-34.69	-29.74	CaMg3(CO3)4
Hydrocerrusite	-4.74	-22.20	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-13.34	-21.65	-8.31	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-8.34	-16.34	-8.00	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-6.59	-15.53	-8.94	KFe3(SO4)2(OH)6
Jarosite-Na	-9.56	-14.52	-4.96	NaFe3(SO4)2(OH)6
JarositeH	-14.82	-19.73	-4.91	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-6.80	-10.03	-3.23	AlOHSO4
Langite	-5.34	11.79	17.13	Cu4(OH)6SO4:H2O
Larnakite	-4.96	-5.19	-0.22	PbO:PbSO4
Laurionite	-5.60	-4.98	0.62	PbOHCl
Litharge	-5.55	7.31	12.86	PbO
Maghemite	6.87	13.26	6.39	Fe2O3
Magnesite	-0.77	-8.74	-7.98	MgCO3
Magnetite	18.88	23.05	4.18	Fe3O4
Malachite	-1.23	-6.27	-5.04	Cu2(OH)2CO3
Manganite	2.58	27.92	25.34	MnOOH
Massicot	-5.75	7.31	13.06	PbO
Matlockite	-7.95	-17.45	-9.50	PbClF
Melanothallite	-20.51	-16.67	3.84	CuCl2
Melanterite	-7.76	-10.01	-2.25	FeSO4:7H2O
Minium	-21.51	53.07	74.58	Pb3O4
Mirabilite	-8.12	-9.40	-1.28	Na2SO4:10H2O
Mn2(SO4)3	-49.68	-3.58	46.10	Mn2(SO4)3
Mn3(AsO4):8H2O	-3.24	9.30	12.55	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-14.78	-12.22	2.56	MnCl2:4H2O
MnSO4	-10.26	-7.46	2.80	MnSO4
Monteponite	-4.70	9.29	13.99	CdO
Morenosite	-8.10	-10.49	-2.39	NiSO4:7H2O
Na4UO2(CO3)3	-24.59	-40.88	-16.29	Na4UO2(CO3)3
Nahcolite	-5.92	-16.86	-10.94	NaHCO3
Nantokite	-10.40	-19.96	-9.55	CuCl
Natron	-10.21	-11.66	-1.45	Na2CO3:10H2O
Nesquehonite	-3.17	-8.74	-5.57	MgCO3:3H2O
Ni(OH)2	-1.21	9.32	10.53	Ni(OH)2
Ni3(AsO4)2:8H2O	-15.53	0.22	15.74	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-14.52	17.48	32.00	Ni4(OH)6SO4
NiCO3	-5.99	-12.74	-6.75	NiCO3
Nsutite	0.93	43.49	42.56	MnO2
O2(g)	-22.11	62.28	84.39	O2
Otavite	-0.68	-12.78	-12.10	CdCO3
Pb(OH)2	-0.96	7.31	8.27	Pb(OH)2
Pb2(OH)3Cl	-6.46	2.33	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-11.58	14.62	26.20	PbO:Pb(OH)2
Pb2O3	-15.28	45.76	61.04	Pb2O3
Pb2OCO3	-7.04	-7.44	-0.40	PbO:PbCO3
Pb3(AsO4)2	-11.67	-5.82	5.85	Pb3(AsO4)2
Pb3O2CO3	-11.38	-0.13	11.25	PbCO3:2PbO
Pb3O2SO4	-8.46	2.12	10.58	PbSO4:2PbO
Pb4(OH)6SO4	-11.66	9.44	21.10	Pb4(OH)6SO4
Pb4O3SO4	-12.97	9.44	22.41	PbSO4:3PbO
PbF2	-10.20	-17.63	-7.43	PbF2
PbMetal	-28.10	-23.83	4.27	Pb
PbO:0.3H2O	-5.67	7.31	12.98	PbO:0.33H2O
Phosgenite	-12.21	-32.02	-19.81	PbCl2:PbCO3
Plattnerite	-11.47	38.45	49.92	PbO2
Portlandite	-9.47	13.60	23.07	Ca(OH)2
Pyrochroite	-2.85	12.35	15.20	Mn(OH)2
Pyrolusite	1.54	43.49	41.95	MnO2
Retgersite	-8.44	-10.49	-2.05	NiSO4:6H2O
Rhodochrosite	1.40	-9.71	-11.12	MnCO3
Rhodochrosite(d)	0.68	-9.71	-10.39	MnCO3
Rutherfordine	-3.13	-17.57	-14.44	UO2CO3
Schoepite	-1.01	4.50	5.51	UO2(OH)2:H2O
Scorodite	-7.62	-7.25	0.38	FeAsO4:2H2O
Siderite	-1.40	-12.27	-10.87	FeCO3
Siderite(d)(3)	-1.82	-12.27	-10.45	FeCO3
Smithsonite	-1.42	-11.38	-9.96	ZnCO3
Tenorite	0.15	7.90	7.75	CuO
Thenardite	-9.22	-9.40	-0.17	Na2SO4
Thermonatrite	-11.81	-11.66	0.15	Na2CO3:H2O
Trona	-17.52	-28.52	-11.00	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-33.91	-46.45	-12.54	U(OH)2SO4
U3O8(c)	-11.17	-17.65	-6.48	U3O8
U4O9(c)	-35.57	-75.43	-39.86	U4O9
UF4(c)	-48.75	-76.53	-27.78	UF4
UF4:2.5H2O	-39.62	-76.53	-36.90	UF4:2.5H2O
UO2(a)	-17.40	-26.64	-9.24	UO2
UO3(gamma)	-3.39	4.50	7.89	UO3
Uraninite(c)	-12.67	-26.64	-13.98	UO2
Witherite	-2.84	-11.41	-8.57	BaCO3
Zincite(c)	-0.65	10.68	11.33	ZnO
Zincosite	-12.30	-9.12	3.18	ZnSO4
Zn(OH)2-a	-1.77	10.68	12.45	Zn(OH)2
Zn(OH)2-b	-1.07	10.68	11.75	Zn(OH)2
Zn(OH)2-c	-1.52	10.68	12.20	Zn(OH)2
Zn(OH)2-e	-0.82	10.68	11.50	Zn(OH)2
Zn(OH)2-g	-1.03	10.68	11.71	Zn(OH)2
Zn2(OH)2SO4	-5.94	1.56	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.12	9.08	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-9.41	4.30	13.71	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.12	-7.56	19.56	ZnO:2ZnSO4
Zn4(OH)6SO4	-5.47	22.93	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-9.65	28.85	38.50	Zn5(OH)8Cl2
ZnCl2	-21.07	-13.89	7.18	ZnCl2
ZnCO3:H2O	-1.12	-11.38	-10.26	ZnCO3:H2O
ZnF2	-12.85	-14.26	-1.41	ZnF2
ZnMetal	-46.53	-20.46	26.08	Zn
ZnO(a)	-0.63	10.68	11.31	ZnO
ZnSO4:H2O	-8.65	-9.12	-0.48	ZnSO4:H2O

End of simulation.

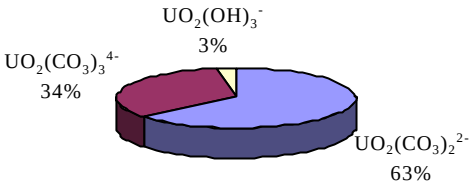
----------Saturation indices----------

Phase	SI	log IAP	log KT	
Al(OH)3(a)	-1.25	9.78	11.03	Al(OH)3
AlAsO4:2H2O	-8.89	-4.10	4.79	AlAsO4:2H2O
AlumK	-20.41	-25.64	-5.23	KAl(SO4)2:12H2O
Alunite	-5.12	-6.08	-0.96	KAl3(SO4)2(OH)6
Anglesite	-4.69	-12.50	-7.81	PbSO4
Anhydrite	-1.86	-6.21	-4.35	CaSO4
Antlerite	-4.40	3.89	8.29	Cu3(OH)4SO4
Aragonite	-0.15	-8.47	-8.31	CaCO3
Arsenolite	-100.50	-180.06	-79.56	As4O6
Artinite	-5.27	4.58	9.85	MgCO3:Mg(OH)2:3H2O
As2O5	-34.50	-27.75	6.75	As2O5
Atacamite	-3.99	3.51	7.50	Cu2(OH)3Cl
Azurite	-3.73	-20.43	-16.70	Cu3(OH)2(CO3)2
B-UO2(OH)2	-1.17	4.50	5.66	UO2(OH)2
Ba3(AsO4)2	13.15	4.21	-8.94	Ba3(AsO4)2
BaF2	-8.52	-14.29	-5.77	BaF2
Barite	0.87	-9.15	-10.03	BaSO4
Basaluminite	-3.40	19.30	22.70	Al4(OH)10SO4
Bianchite	-7.36	-9.12	-1.76	ZnSO4:6H2O
Birnessite	-0.11	43.49	43.60	MnO2
Bixbyite	4.85	55.84	50.99	Mn2O3
Boehmite	0.95	9.78	8.83	AlOOH
Brochantite	-3.55	11.79	15.34	Cu4(OH)6SO4
Brucite	-3.75	13.32	17.08	Mg(OH)2
Bunsenite	-3.34	9.32	12.66	NiO
Ca3(AsO4)2:4w	-9.31	13.04	22.35	Ca3(AsO4)2:4H2O
Calcite	-0.01	-8.47	-8.46	CaCO3
Cd(gamma)	-35.60	-21.85	13.75	Cd
Cd(OH)2	-4.36	9.29	13.65	Cd(OH)2
Cd(OH)2(a)	-4.62	9.29	13.91	Cd(OH)2
Cd3(OH)2(SO4)2	-18.46	-11.75	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-14.50	8.06	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-11.05	17.35	28.40	Cd4(OH)6SO4
CdCl2	-14.64	-15.29	-0.64	CdCl2
CdCl2:2.5H2O	-13.33	-15.29	-1.95	CdCl2:2.5H2O
CdCl2:H2O	-13.59	-15.29	-1.69	CdCl2:H2O
CdF2	-12.76	-15.65	-2.90	CdF2
CdMetal	-35.50	-21.85	13.65	Cd
CdOHCl	-6.58	-3.00	3.58	CdOHCl
CdSO4	-10.55	-10.52	0.03	CdSO4
CdSO4:2.7H2O	-8.68	-10.52	-1.84	CdSO4:2.67H2O
CdSO4:H2O	-8.93	-10.52	-1.59	CdSO4:H2O
Cerrusite	-1.58	-14.75	-13.17	PbCO3
Chalcanthite	-9.26	-11.91	-2.65	CuSO4:5H2O
Claudetite	-100.25	-180.06	-79.81	As4O6
CO2(g)	-3.91	-22.07	-18.16	CO2
Cotunnite	-12.45	-17.26	-4.82	PbCl2
Cu(OH)2	-0.87	7.90	8.77	Cu(OH)2
Cu2SO4	-27.83	-35.15	-7.32	Cu2SO4
Cu3(AsO4)2:6w	-10.18	-4.05	6.13	Cu3(AsO4)2:6H2O
CuCO3	-4.54	-14.17	-9.63	CuCO3
CuF	-24.62	-20.14	4.48	CuF
CuF2	-16.54	-17.04	-0.50	CuF2
CuF2:2H2O	-12.52	-17.04	-4.52	CuF2:2H2O
CuMetal	-11.63	-23.24	-11.61	Cu
CuOCuSO4	-15.85	-4.01	11.84	CuO:CuSO4
CupricFerrite	15.10	47.53	32.43	CuFe2O4
Cuprite	-8.32	-15.34	-7.02	Cu2O
CuprousFerrite	10.63	12.14	1.51	CuFeO2
CuSO4	-15.08	-11.91	3.17	CuSO4
Diaspore	2.68	9.78	7.09	AlOOH
Dolomite	-0.20	-17.21	-17.01	CaMg(CO3)2
Dolomite(d)	-0.77	-17.21	-16.44	CaMg(CO3)2
Epsomite	-4.32	-6.49	-2.16	MgSO4:7H2O
Fe(OH)2.7Cl.3	6.06	16.13	10.06	Fe(OH)2.7Cl0.3
Fe(OH)3(a)	1.82	19.81	18.00	Fe(OH)3
Fe3(OH)8	-2.56	43.87	46.43	Fe3(OH)8
Fluorite	-0.70	-11.34	-10.64	CaF2
Gibbsite	1.47	9.78	8.31	Al(OH)3
Goethite	7.71	19.81	12.10	FeOOH
Goslarite	-7.14	-9.12	-1.99	ZnSO4:7H2O
Gummite	-6.11	4.50	10.60	UO3
Gypsum	-1.63	-6.21	-4.58	CaSO4:2H2O
H2(g)	-31.09	-31.14	-0.05	H2
Halite	-8.66	-7.08	1.57	NaCl
Hausmannite	6.29	68.19	61.91	Mn3O4
Hematite	17.16	39.63	22.47	Fe2O3
Huntite	-4.95	-34.70	-29.74	CaMg3(CO3)4
Hydrocerrusite	-4.74	-22.20	-17.46	Pb(OH)2:2PbCO3
Hydromagnesite	-13.34	-21.65	-8.31	Mg5(CO3)4(OH)2:4H2O
Jarosite(ss)	-8.10	23.21	31.31	(K0.77Na0.03H0.2)Fe3(SO4)2(OH)6
Jarosite-K	-6.35	24.02	30.38	KFe3(SO4)2(OH)6
Jarosite-Na	-9.32	25.03	34.35	NaFe3(SO4)2(OH)6
JarositeH	-14.58	19.82	34.40	(H3O)Fe3(SO4)2(OH)6
Jurbanite	-6.80	-10.03	-3.23	AlOHSO4
Langite	-5.34	11.79	17.13	Cu4(OH)6SO4:H2O
Larnakite	-4.96	-5.19	-0.22	PbO:PbSO4
Laurionite	-5.60	-4.98	0.62	PbOHCl
Litharge	-5.55	7.31	12.86	PbO
Maghemite	7.03	39.63	32.59	Fe2O3
Magnesite	-0.77	-8.74	-7.98	MgCO3
Magnetite	13.49	43.87	30.38	Fe3O4
Malachite	-1.23	-6.27	-5.04	Cu2(OH)2CO3
Manganite	2.58	27.92	25.34	MnOOH
Massicot	-5.75	7.31	13.06	PbO
Matlockite	-7.95	-17.45	-9.50	PbClF
Melanothallite	-20.51	-16.67	3.84	CuCl2
Melanterite	-13.31	-15.56	-2.25	FeSO4:7H2O
Minium	-21.51	53.07	74.58	Pb3O4
Mirabilite	-8.12	-9.40	-1.28	Na2SO4:10H2O
Mn2(SO4)3	-49.68	-3.58	46.10	Mn2(SO4)3
Mn3(AsO4):8H2O	-3.24	9.30	12.55	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-14.78	-12.22	2.56	MnCl2:4H2O
MnSO4	-10.26	-7.46	2.80	MnSO4
Monteponite	-4.70	9.29	13.99	CdO
Morenosite	-8.10	-10.49	-2.39	NiSO4:7H2O
Na4UO2(CO3)3	-24.59	-40.88	-16.29	Na4UO2(CO3)3
Nahcolite	-5.92	-16.86	-10.94	NaHCO3
Nantokite	-10.40	-19.96	-9.55	CuCl
Natron	-10.21	-11.66	-1.45	Na2CO3:10H2O
Nesquehonite	-3.17	-8.74	-5.57	MgCO3:3H2O
Ni(OH)2	-1.21	9.32	10.53	Ni(OH)2
Ni3(AsO4)2:8H2O	-15.53	0.22	15.74	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-14.52	17.48	32.00	Ni4(OH)6SO4
NiCO3	-5.99	-12.74	-6.75	NiCO3
Nsutite	0.93	43.49	42.56	MnO2
O2(g)	-22.11	62.28	84.39	O2
Otavite	-0.68	-12.78	-12.10	CdCO3
Pb(OH)2	-0.96	7.31	8.27	Pb(OH)2
Pb2(OH)3Cl	-6.46	2.33	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-11.58	14.62	26.20	PbO:Pb(OH)2
Pb2O3	-15.28	45.76	61.04	Pb2O3
Pb2OCO3	-7.04	-7.44	-0.40	PbO:PbCO3
Pb3(AsO4)2	-11.67	-5.82	5.85	Pb3(AsO4)2
Pb3O2CO3	-11.38	-0.13	11.25	PbCO3:2PbO
Pb3O2SO4	-8.46	2.12	10.58	PbSO4:2PbO
Pb4(OH)6SO4	-11.66	9.44	21.10	Pb4(OH)6SO4
Pb4O3SO4	-12.97	9.44	22.41	PbSO4:3PbO
PbF2	-10.20	-17.63	-7.43	PbF2
PbMetal	-28.10	-23.83	4.27	Pb
PbO:0.3H2O	-5.67	7.31	12.98	PbO:0.33H2O
Phosgenite	-12.21	-32.02	-19.81	PbCl2:PbCO3
Plattnerite	-11.46	38.45	49.92	PbO2
Portlandite	-9.47	13.60	23.07	Ca(OH)2
Pyrochroite	-2.85	12.35	15.20	Mn(OH)2
Pyrolusite	1.54	43.49	41.95	MnO2
Retgersite	-8.44	-10.49	-2.05	NiSO4:6H2O
Rhodochrosite	1.40	-9.71	-11.12	MnCO3
Rhodochrosite(d)	0.68	-9.71	-10.39	MnCO3
Rutherfordine	-3.13	-17.57	-14.44	UO2CO3
Schoepite	-1.01	4.50	5.51	UO2(OH)2:H2O
Scorodite	-7.54	5.94	13.48	FeAsO4:2H2O
Siderite	-6.95	-17.82	-10.87	FeCO3
Siderite(d)(3)	-7.37	-17.82	-10.45	FeCO3
Smithsonite	-1.42	-11.38	-9.96	ZnCO3
Tenorite	0.15	7.90	7.75	CuO
Thenardite	-9.22	-9.40	-0.17	Na2SO4
Thermonatrite	-11.81	-11.66	0.15	Na2CO3:H2O
Trona	-17.52	-28.52	-11.00	NaHCO3:Na2CO3:2H2O
U(OH)2SO4	-33.91	-46.45	-12.54	U(OH)2SO4
U3O8(c)	-11.17	-17.65	-6.48	U3O8
U4O9(c)	-35.57	-75.43	-39.86	U4O9
UF4(c)	-48.74	-76.53	-27.78	UF4
UF4:2.5H2O	-39.62	-76.53	-36.90	UF4:2.5H2O
UO2(a)	-17.40	-26.64	-9.24	UO2
UO3(gamma)	-3.39	4.50	7.89	UO3
Uraninite(c)	-12.67	-26.64	-13.98	UO2
Witherite	-2.84	-11.41	-8.57	BaCO3
Zincite(c)	-0.65	10.68	11.33	ZnO
Zincosite	-12.30	-9.12	3.18	ZnSO4
Zn(OH)2-a	-1.77	10.68	12.45	Zn(OH)2
Zn(OH)2-b	-1.07	10.68	11.75	Zn(OH)2
Zn(OH)2-c	-1.52	10.68	12.20	Zn(OH)2
Zn(OH)2-e	-0.82	10.68	11.50	Zn(OH)2
Zn(OH)2-g	-1.03	10.68	11.71	Zn(OH)2
Zn2(OH)2SO4	-5.94	1.56	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.12	9.08	15.20	Zn2(OH)3Cl
Zn3(AsO4)2:2.5w	-9.41	4.30	13.71	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.12	-7.56	19.56	ZnO:2ZnSO4
Zn4(OH)6SO4	-5.47	22.93	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-9.65	28.85	38.50	Zn5(OH)8Cl2
ZnCl2	-21.07	-13.89	7.18	ZnCl2
ZnCO3:H2O	-1.12	-11.38	-10.26	ZnCO3:H2O
ZnF2	-12.85	-14.26	-1.41	ZnF2
ZnMetal	-46.53	-20.46	26.08	Zn
ZnO(a)	-0.63	10.68	11.31	ZnO
ZnSO4:H2O	-8.65	-9.12	-0.48	ZnSO4:H2O

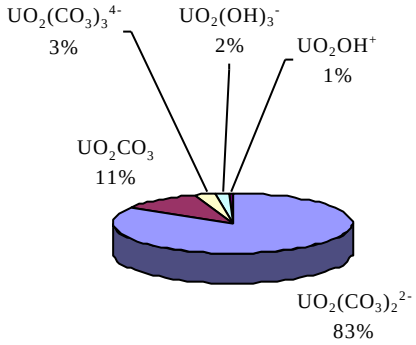
End of simulation.



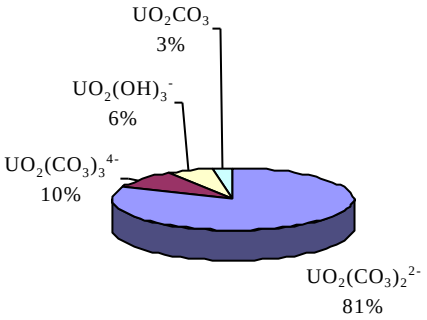
I. 0-1 m



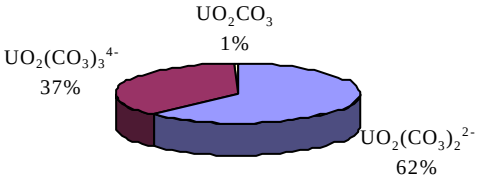
I. 1-1.5 m



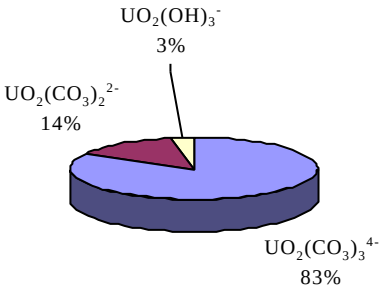
I. 1.5-2.5 m



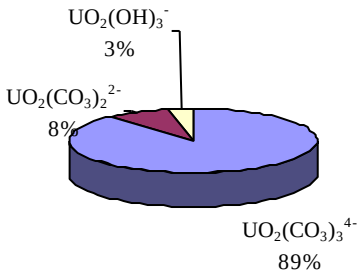
I. 2.5-3.5 m



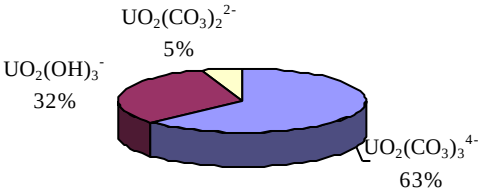
I. 3.5-4.5 m



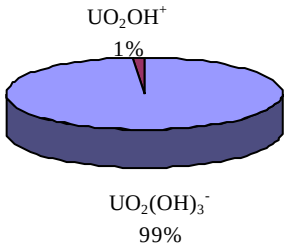
I. 5.5-6.5 m



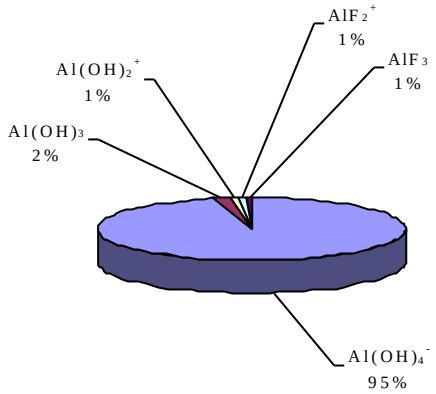
I. 6.5-7.5 m



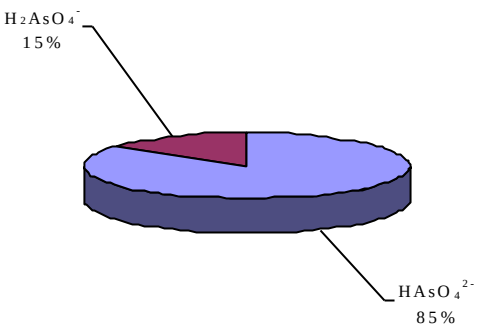
I. 7.5-8.5 m



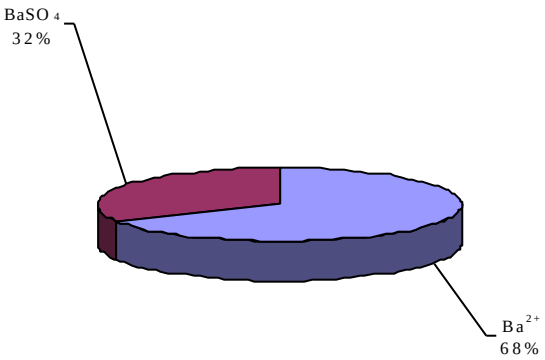
I. 8.5-9.5 m



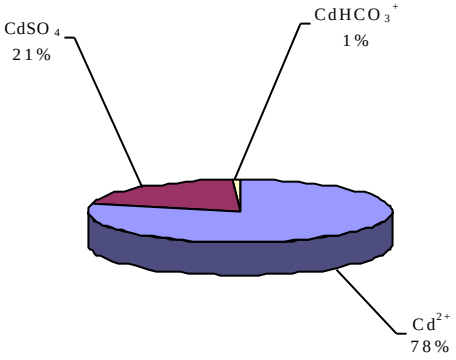
II. 2.5-3.5 m



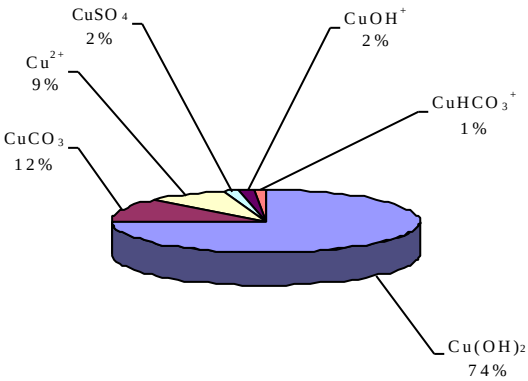
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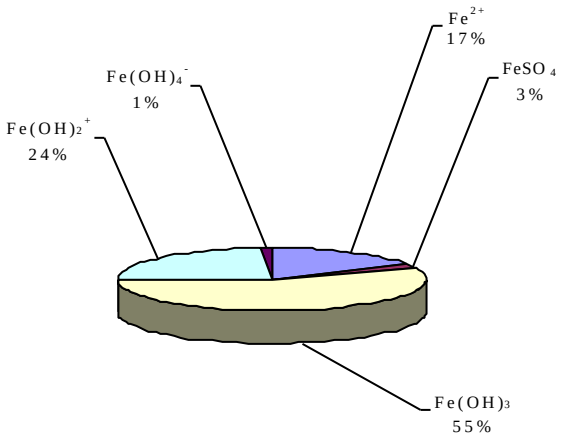
II. 2.5-3.5 m



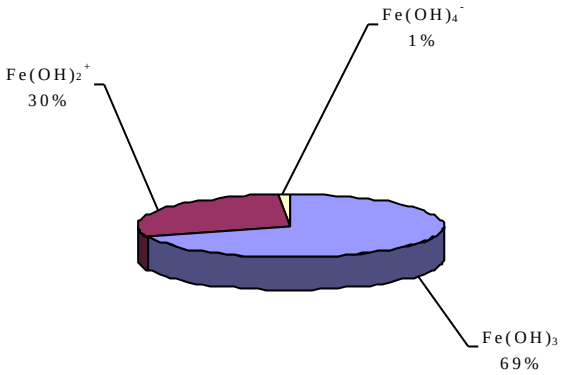
II. 2.5-3.5 m



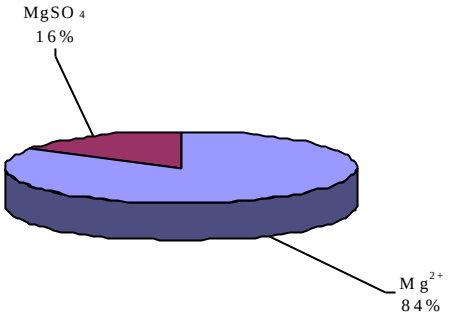
II. 2.5-3.5 m



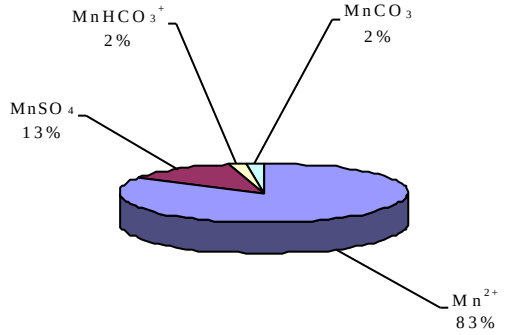
II. 2.5-3.5 m



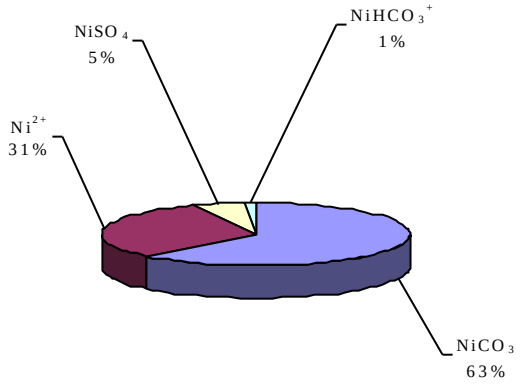
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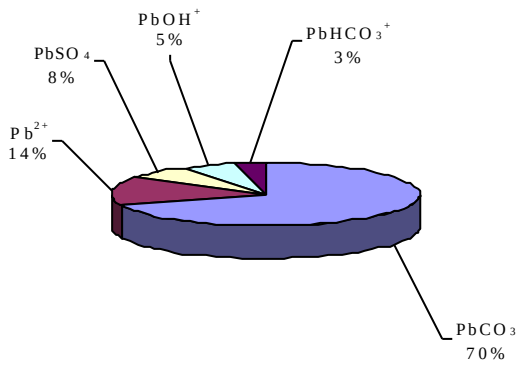
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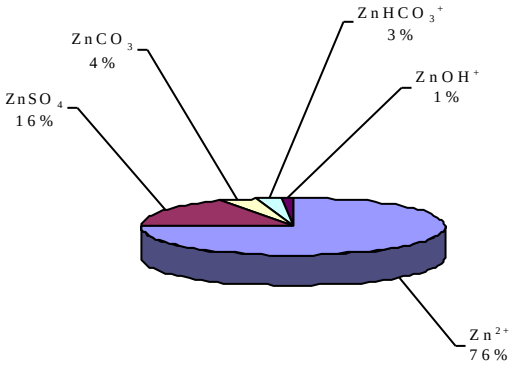
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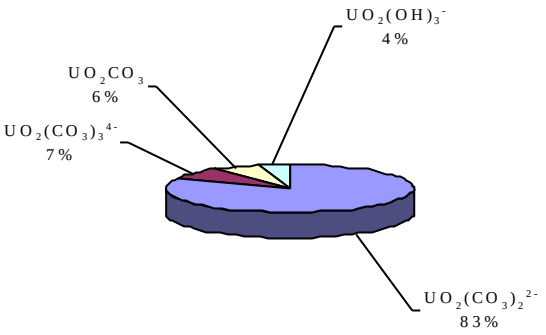
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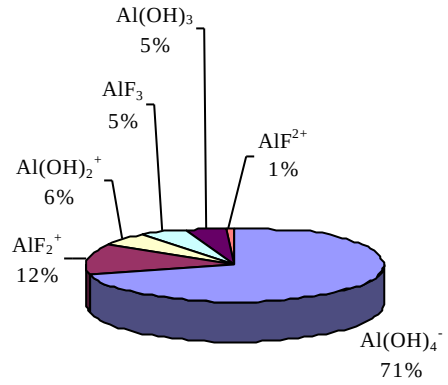
II. 2.5-3.5 m



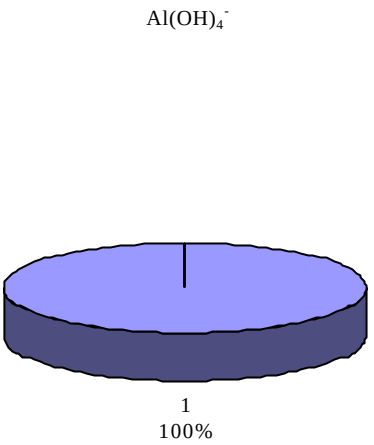
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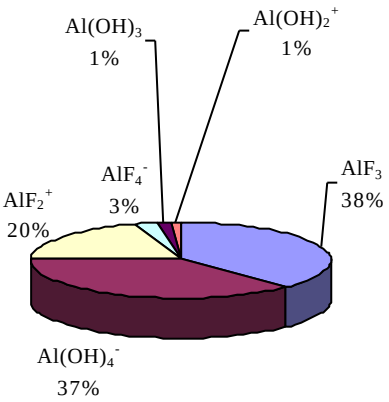
II. 2.5-3.5 m



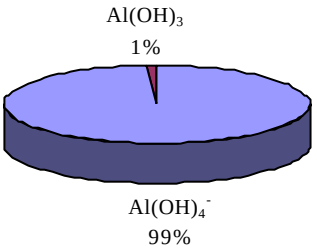
I. 0-1 m



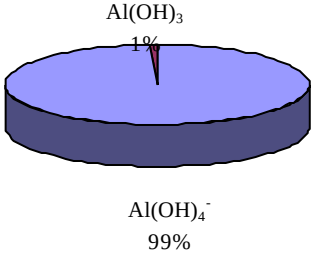
I. 1-1.5 m



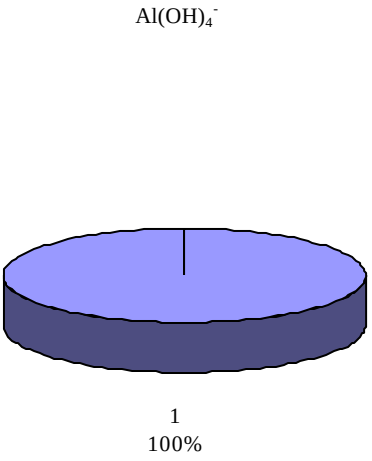
I. 1.5-2.5 m



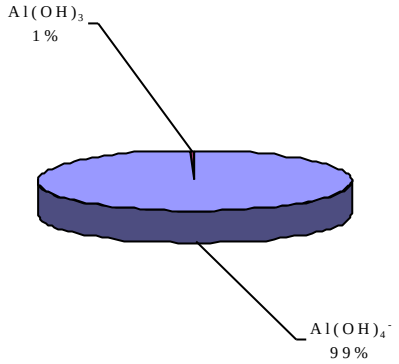
I. 2.5-3.5 m



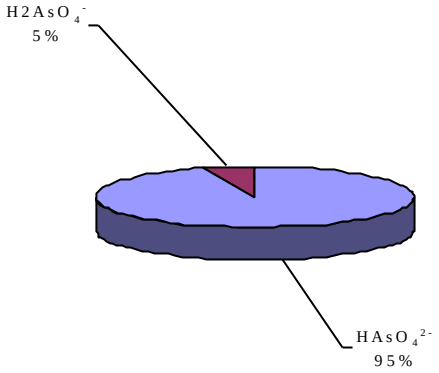
I. 3.5-4.5 m



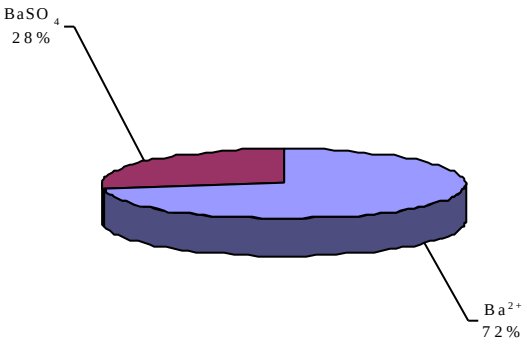
I. 5.5-6.5 m



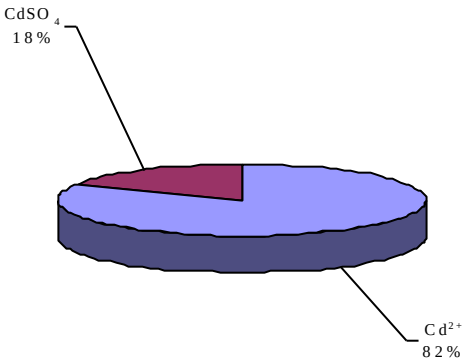
II. 3.5-4.5 m



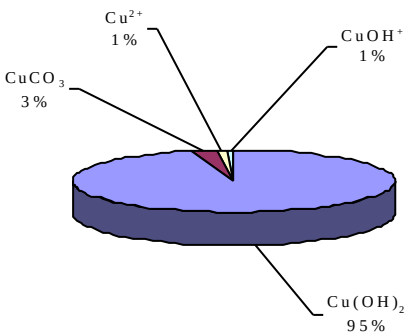
II. 3.5-4.5 m



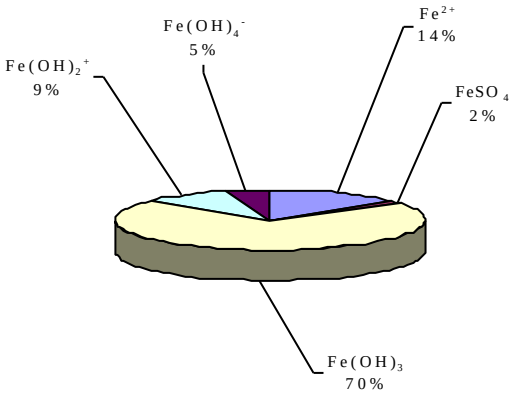
II. 3.5-4.5 m



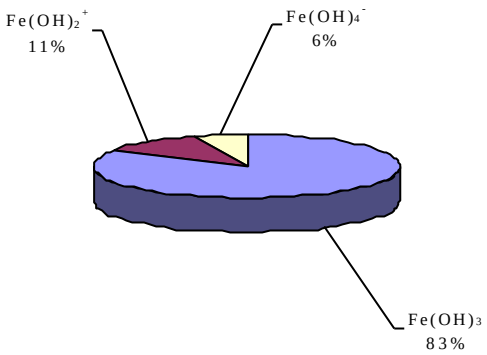
II. 3.5-4.5 m



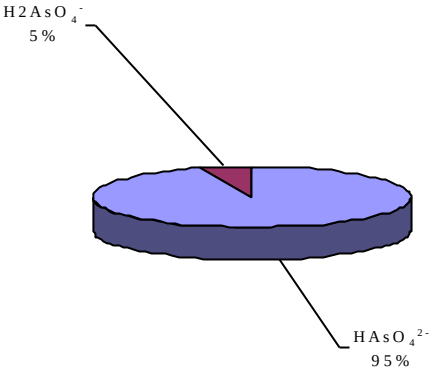
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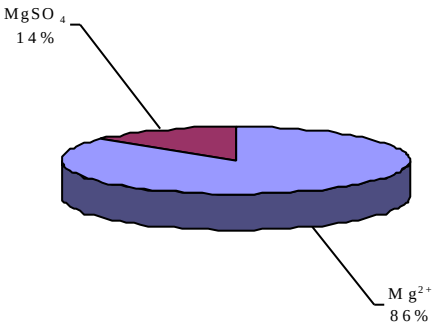
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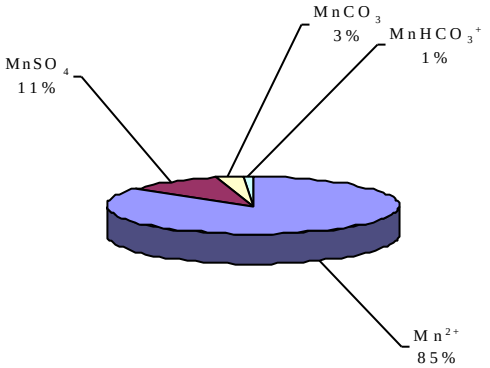
II. 3.5-4.5 m



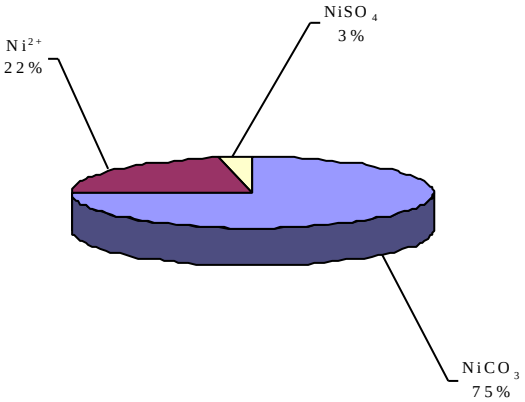
II. 3.5-4.5 m



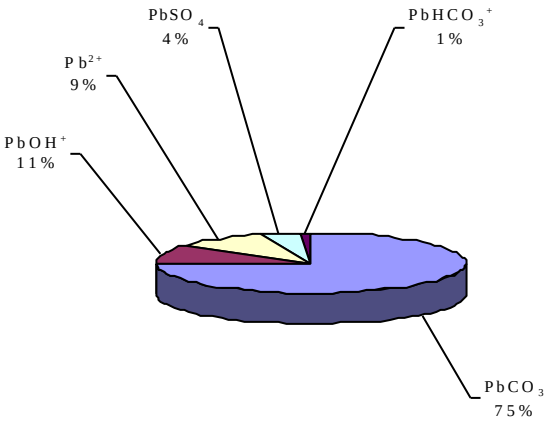
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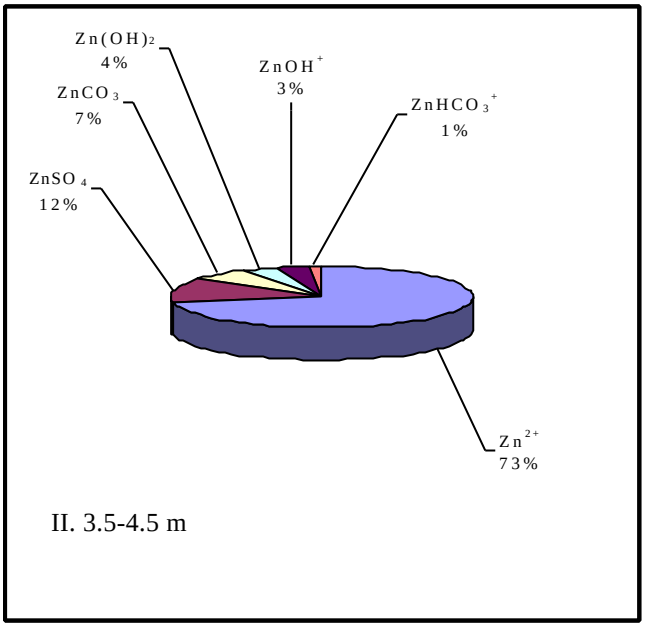
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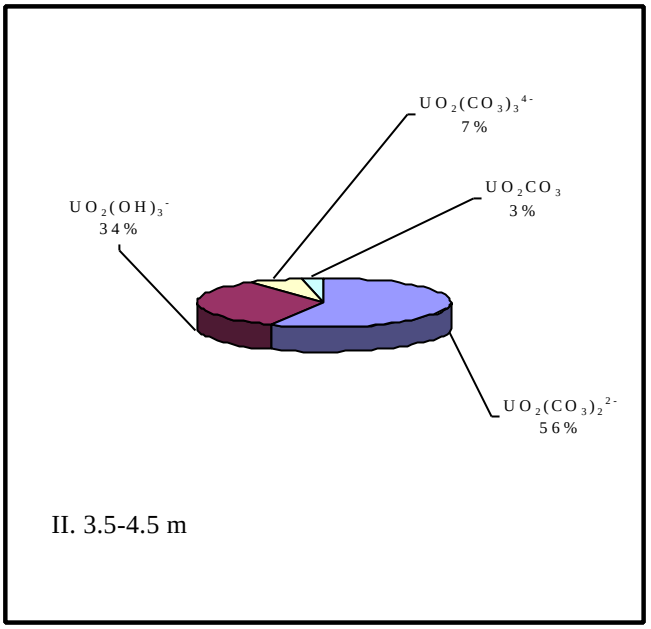
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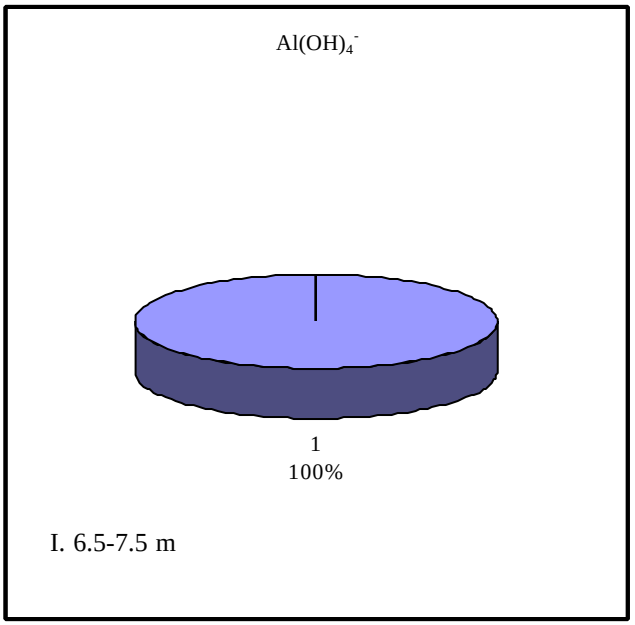
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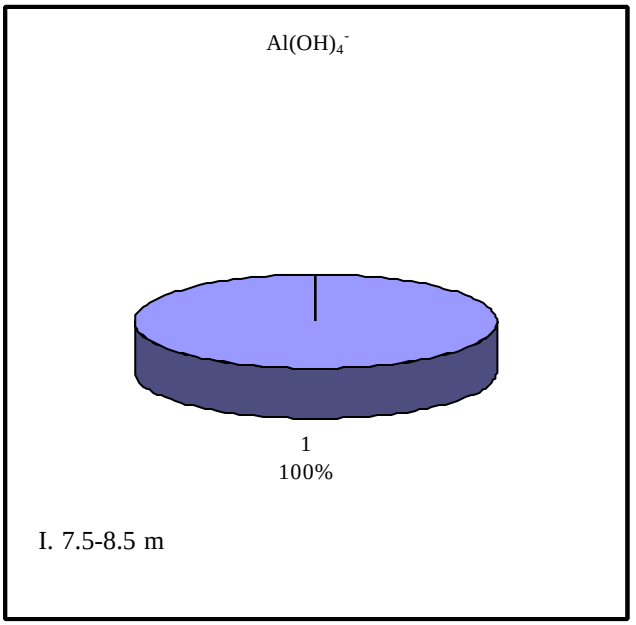
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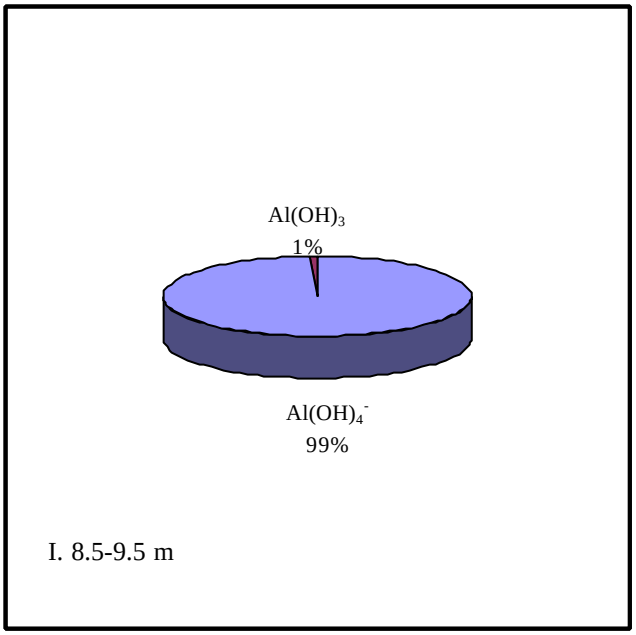
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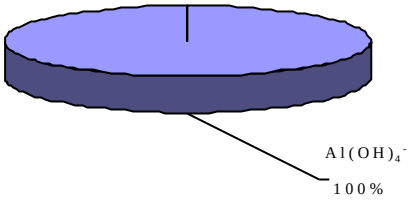
I. 6.5-7.5 m



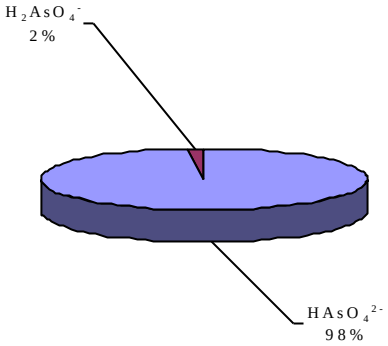
I. 7.5-8.5 m



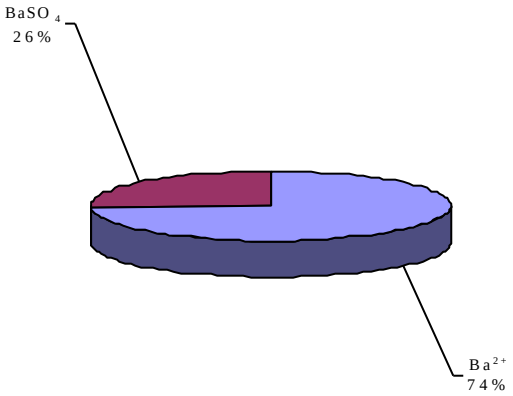
I. 8.5-9.5 m



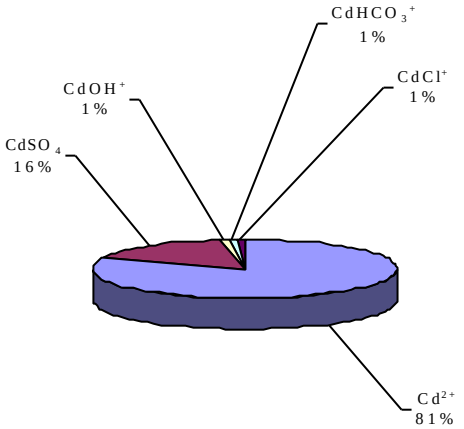
II. 4.5-5.5 m



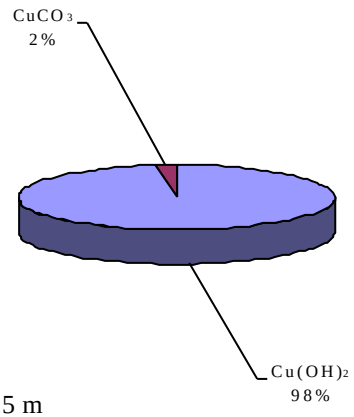
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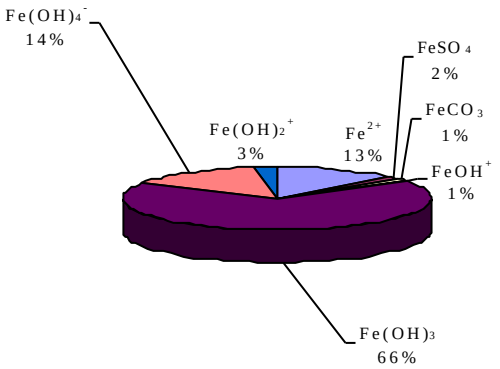
II. 4.5-5.5 m



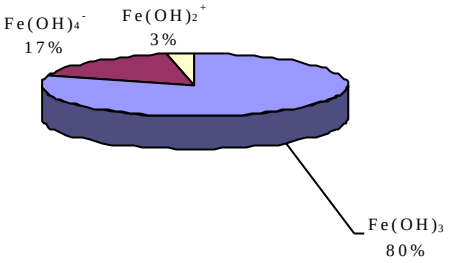
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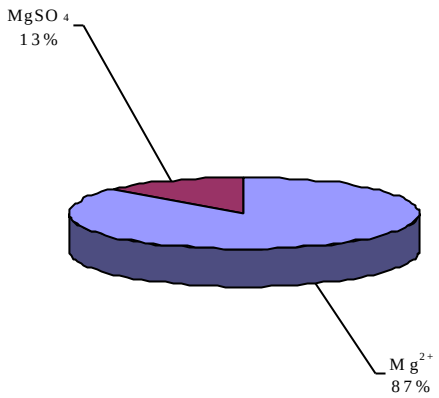
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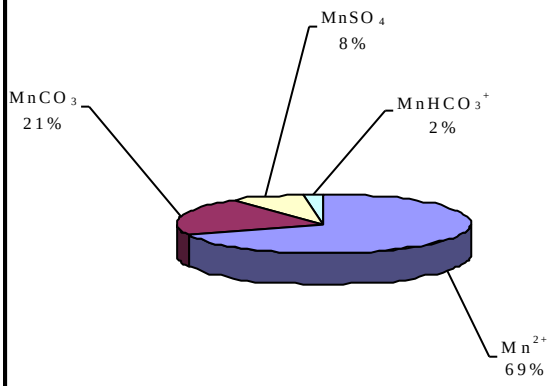
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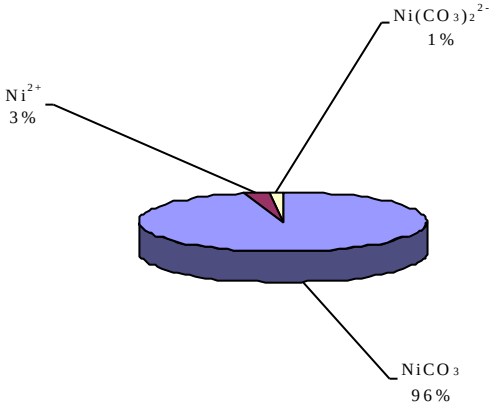
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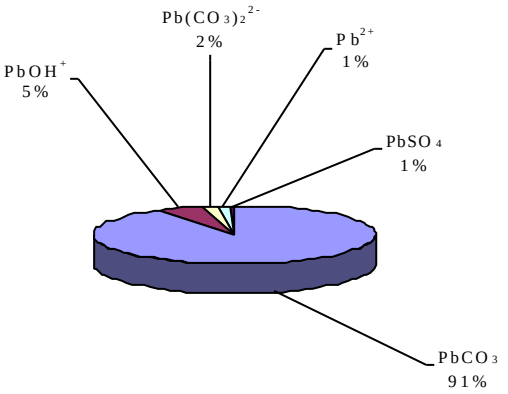
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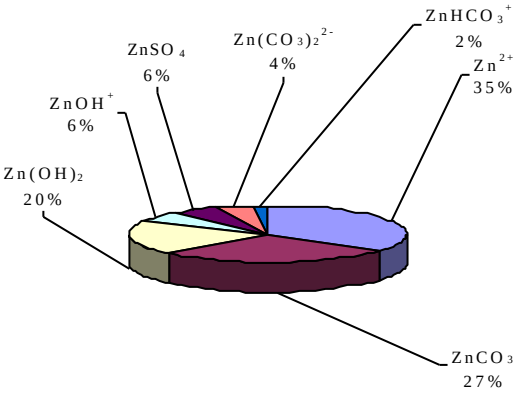
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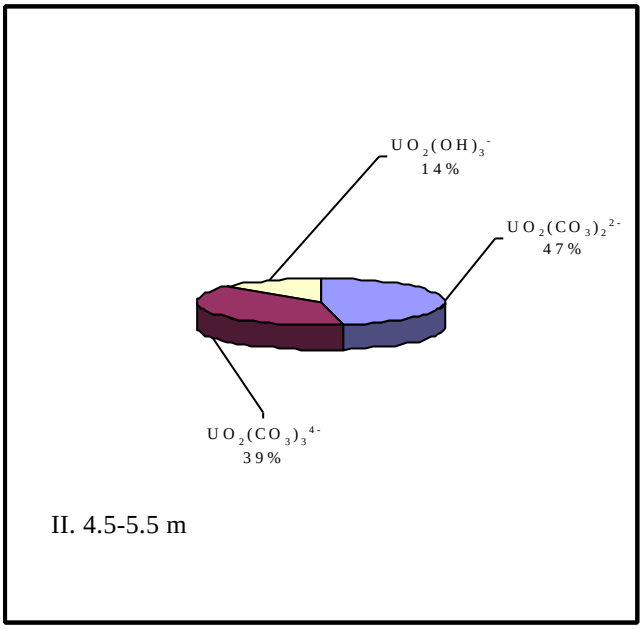
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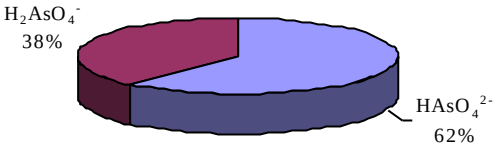
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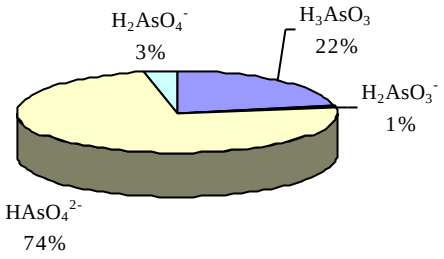
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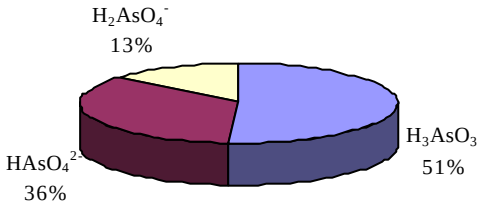
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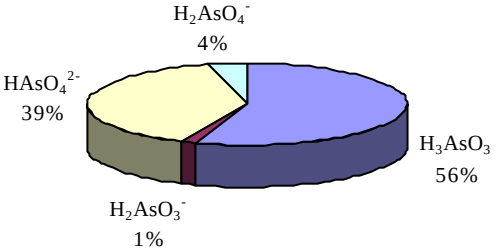
I. 0-1 m



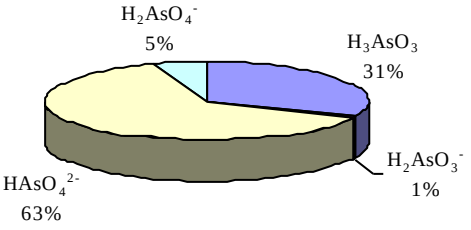
I. 1-1.5 m



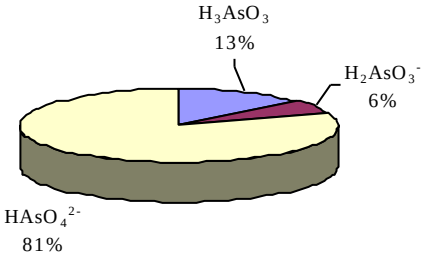
I. 1.5-2.5 m



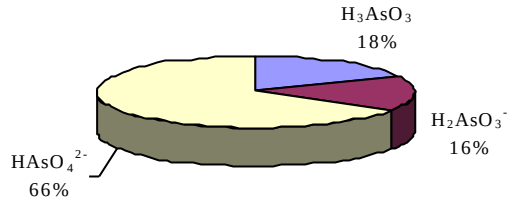
I. 2.5-3.5 m



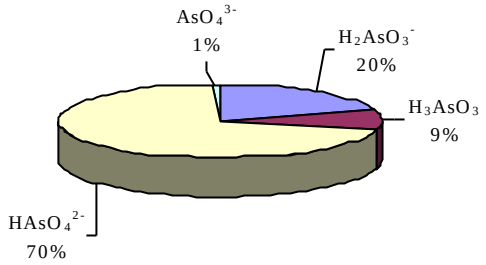
I. 3.5-4.5 m



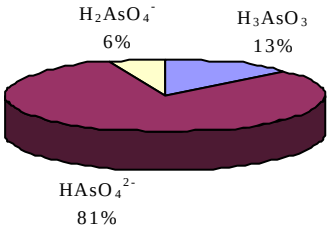
I. 5.5-6.5 m



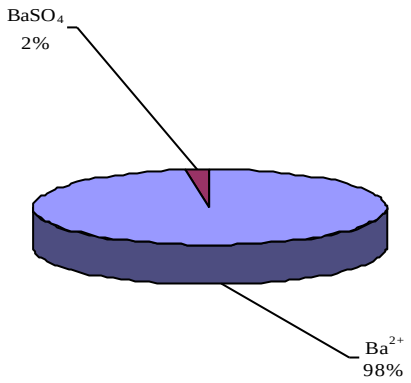
I. 6.5-7.5 m



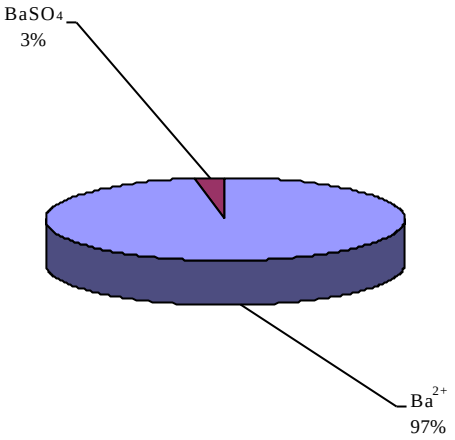
I. 7.5-8.5 m



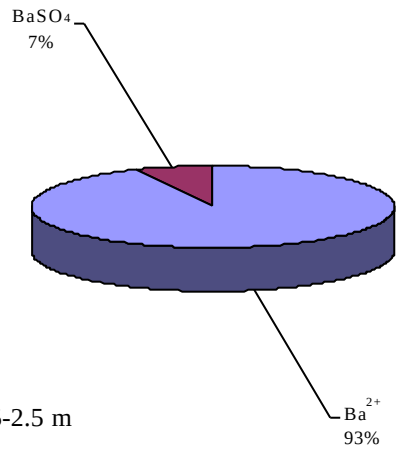
I. 8.5-9.5 m



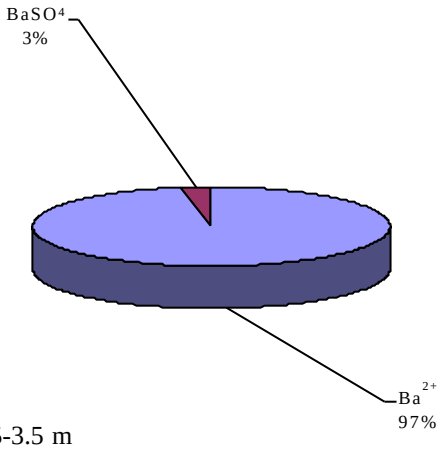
I. 0-1 m



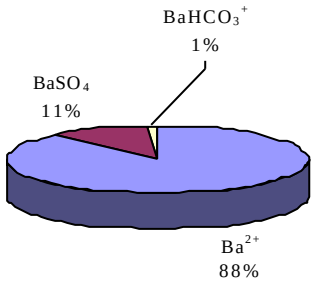
I. 1-1.5 m



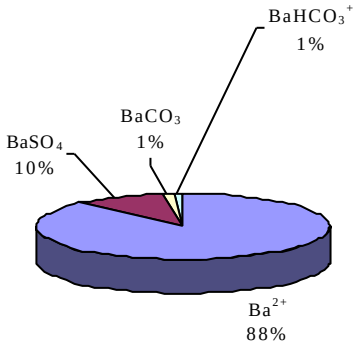
I. 1.5-2.5 m



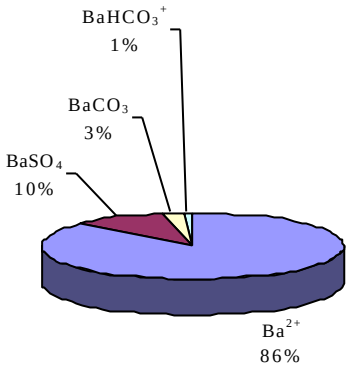
I. 2.5-3.5 m



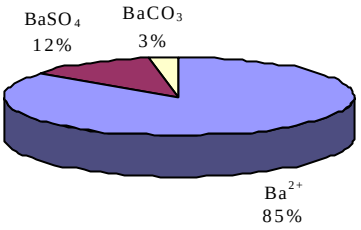
I. 3.5-4.5 m



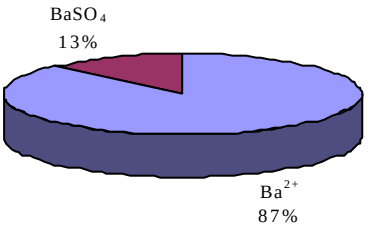
I. 5.5-6.5 m



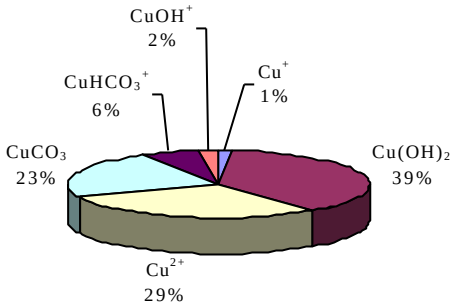
I. 6.5-7.5 m



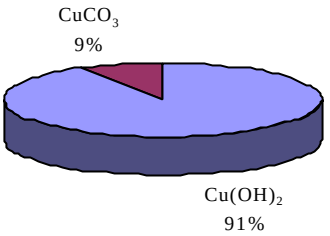
I. 7.5-8.5 m



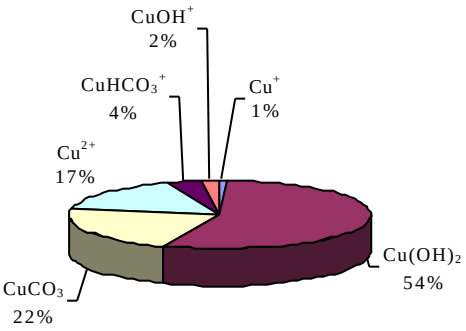
I. 8.5-9.5 m



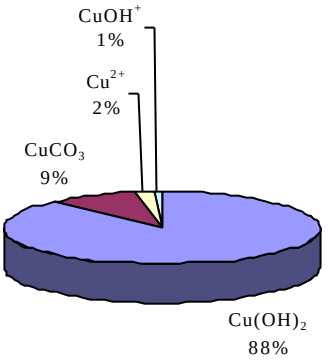
I. 0-1 m



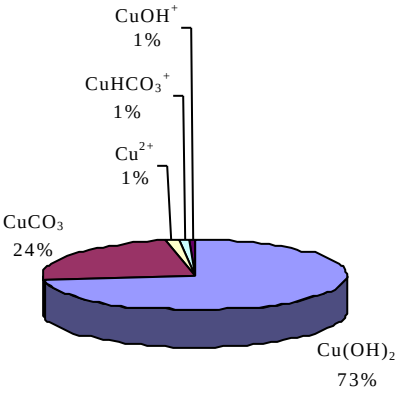
I. 1-1.5 m



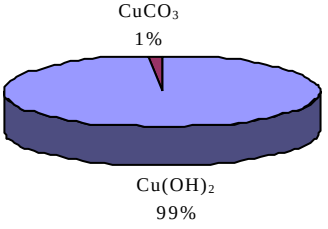
I. 1.5-2.5 m



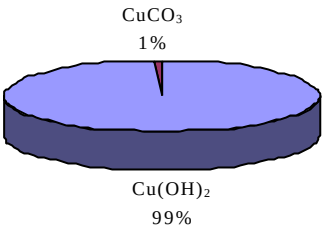
I. 2.5-3.5 m



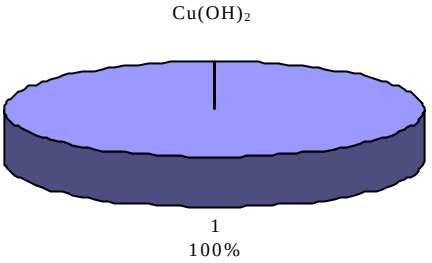
I. 3.5-4.5 m



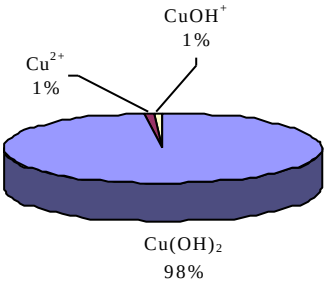
I. 5.5-6.5 m



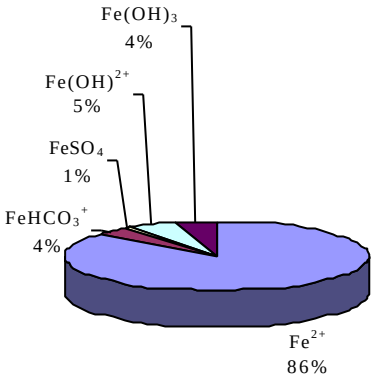
I. 6.5-7.5 m



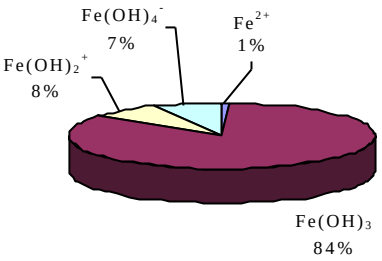
I. 7.5-8.5 m



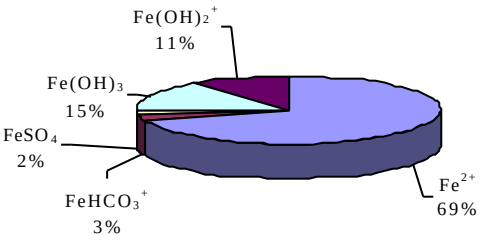
I. 8.5-9.5 m



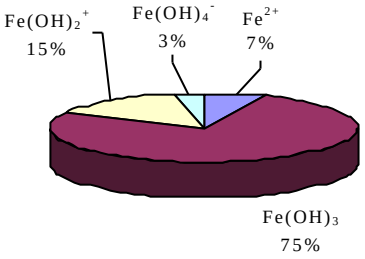
I. 0-1 m



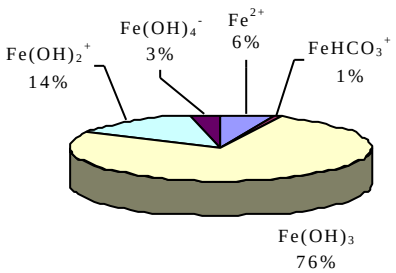
I. 1-1.5 m



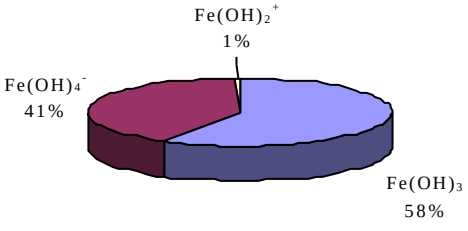
I. 1.5-2.5 m



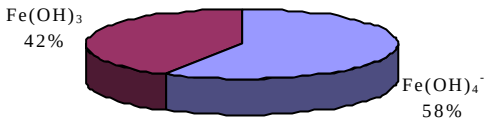
I. 2.5-3.5 m



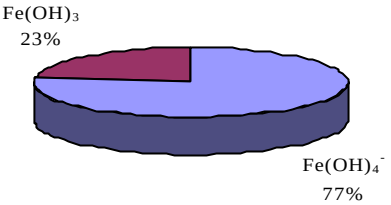
I. 3.5-4.5 m



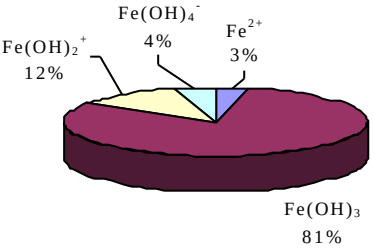
I. 5.5-6.5 m



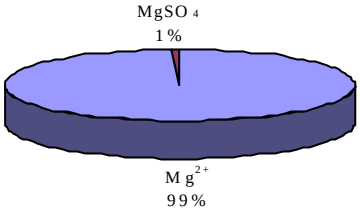
I. 6.5-7.5 m



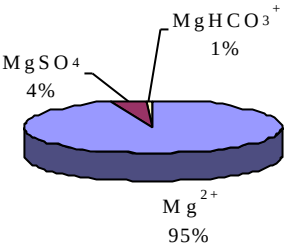
I. 7.5-8.5 m



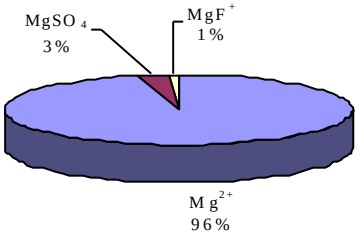
I. 8.5-9.5 m



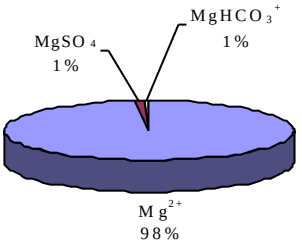
I. 0-1 m



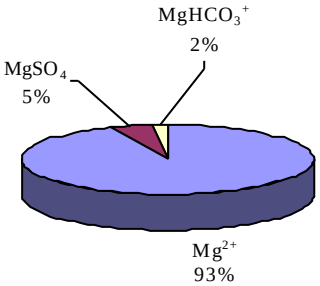
I. 1-1.5 m



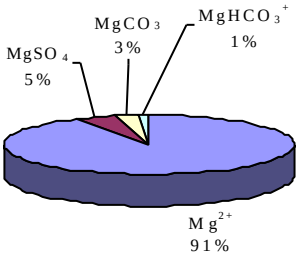
I. 1.5-2.5 m



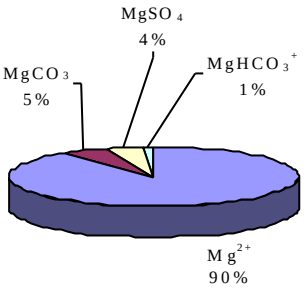
I. 2.5-3.5 m



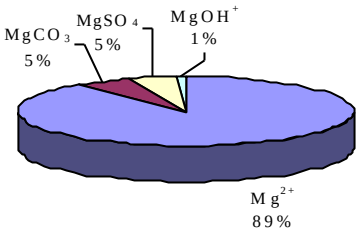
I. 3.5-4.5 m



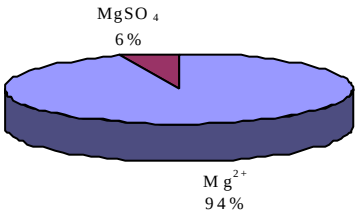
I. 5.5-6.5 m



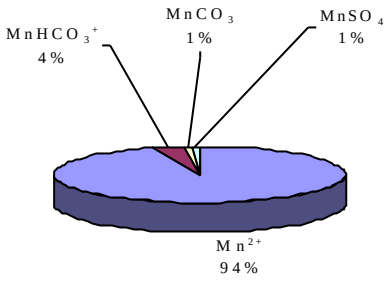
I. 6.5-7.5 m



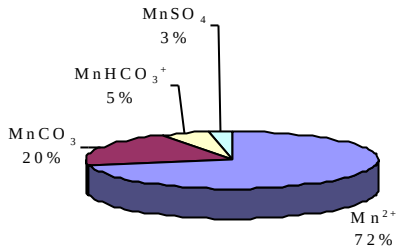
I. 7.5-8.5 m



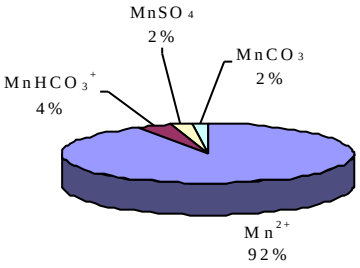
I. 8.5-9.5 m



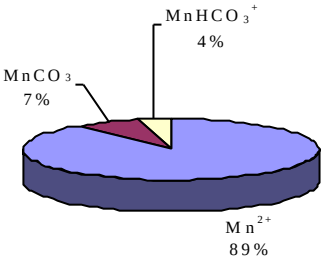
I. 0-1 m



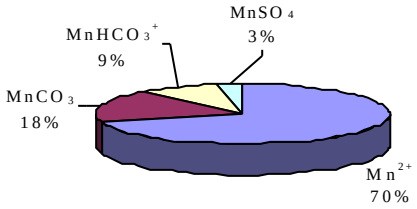
I. 1-1.5 m



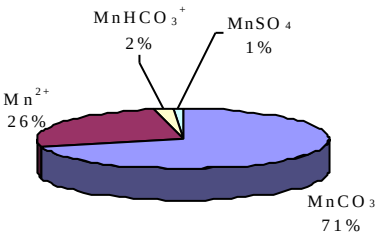
I. 1.5-2.5 m



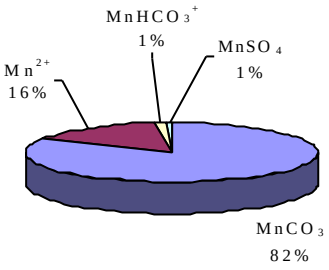
I. 2.5-3.5 m



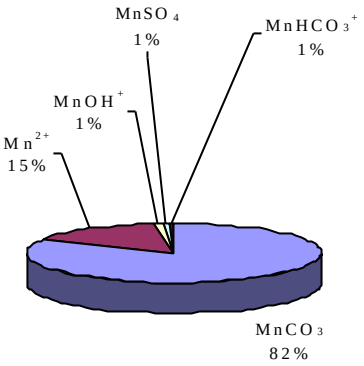
I. 3.5-4.5 m



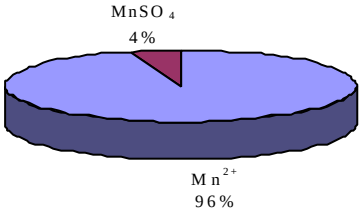
I. 5.5-6.5 m



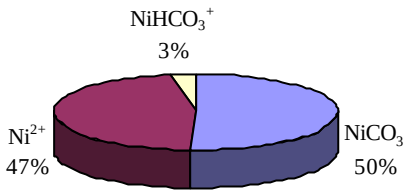
I. 6.5-7.5 m



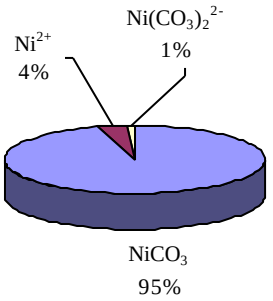
I. 7.5-8.5 m



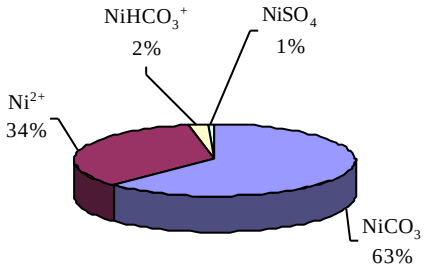
I. 8.5-9.5 m



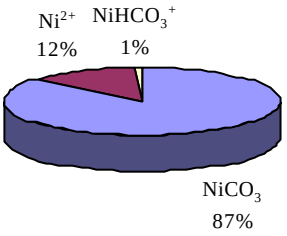
I. 0-1 m



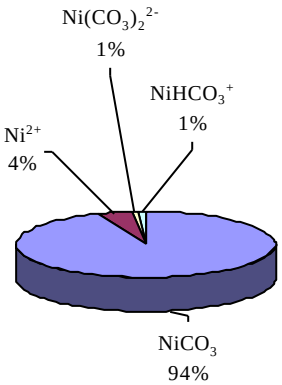
I. 1-1.5 m



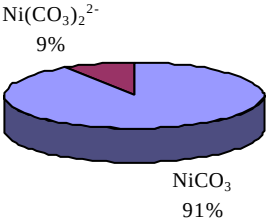
I. 1.5-2.5 m



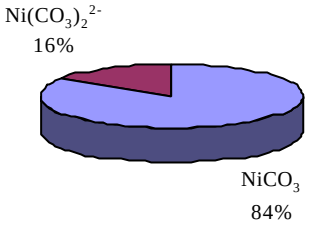
I. 2.5-3.5 m



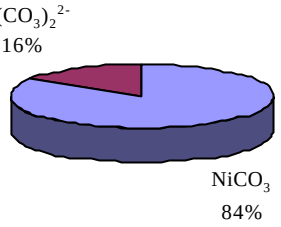
I. 3.5-4.5 m



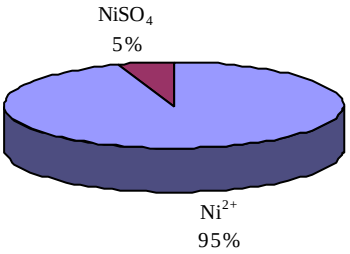
I. 5.5-6.5 m



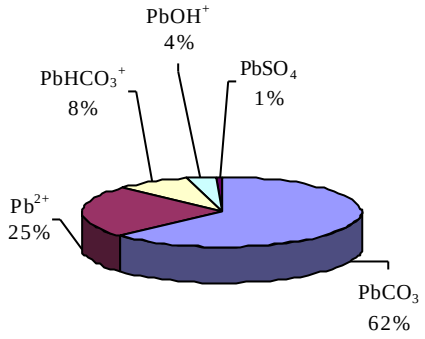
I. 6.5-7.5 m



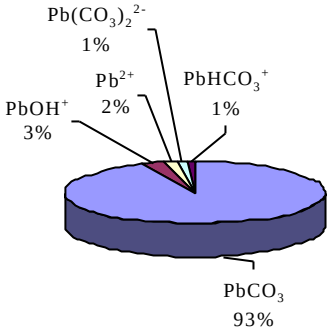
I. 7.5-8.5 m



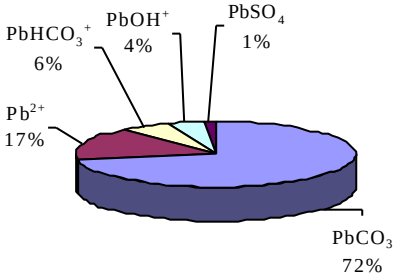
I. 8.5-9.5 m



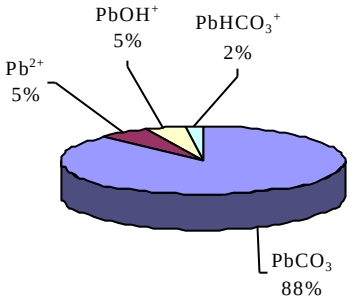
I. 0-1 m



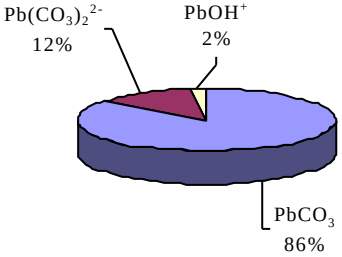
I. 1-1.5 m



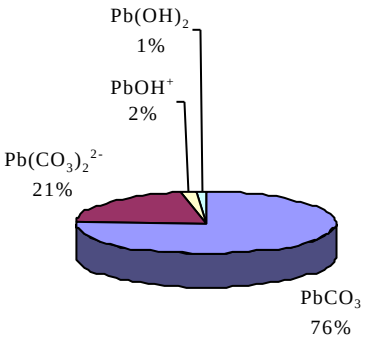
I. 1.5-2.5 m



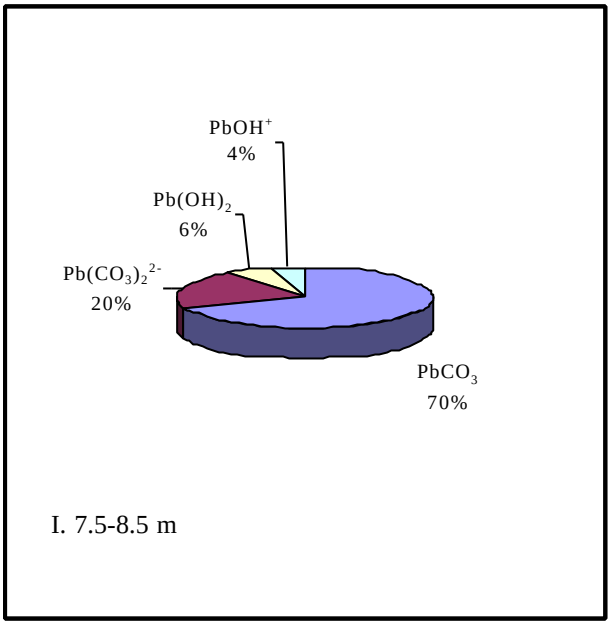
I. 2.5-3.5 m



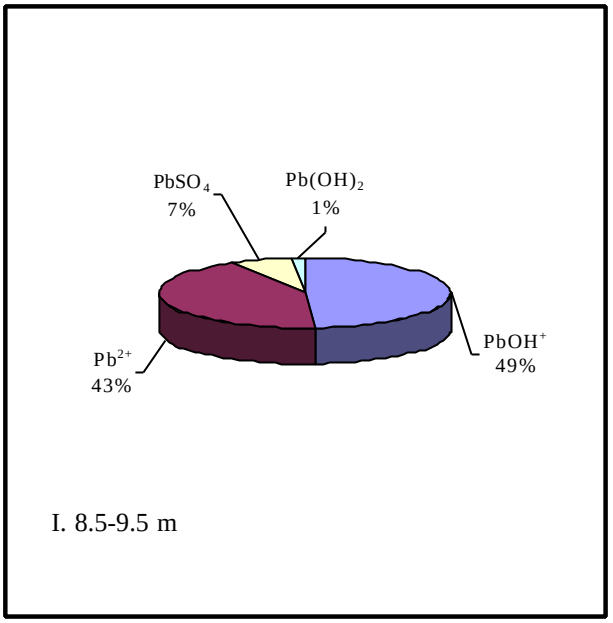
I. 5.5-6.5 m



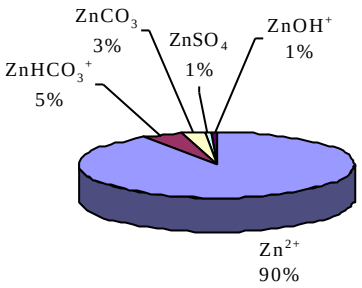
I. 6.5-7.5 m



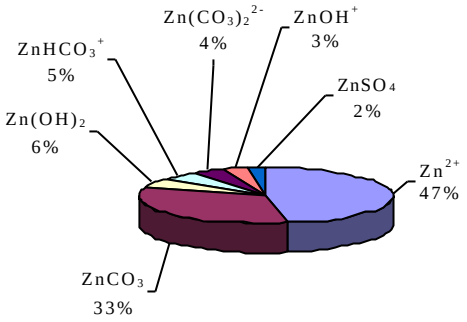
I. 7.5-8.5 m



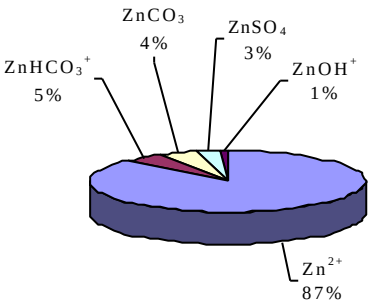
I. 8.5-9.5 m



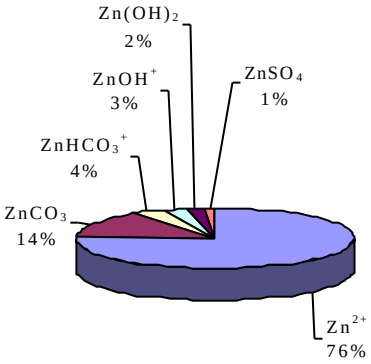
I. 0-1 m



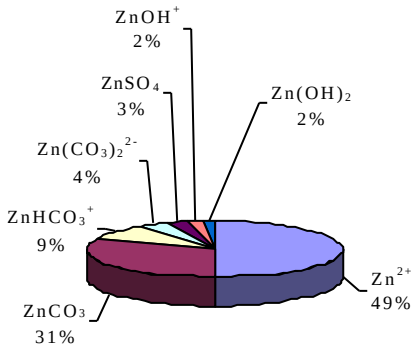
I. 1-1.5 m



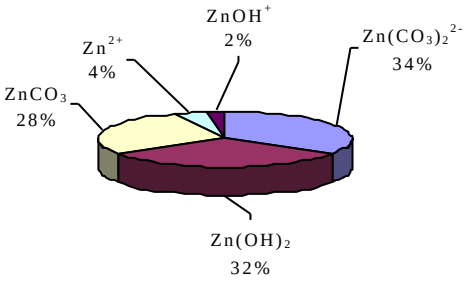
I. 1.5-2.5 m



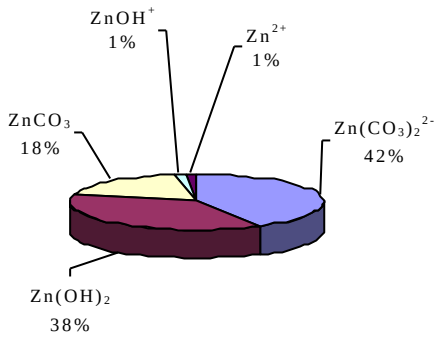
I. 2.5-3.5 m



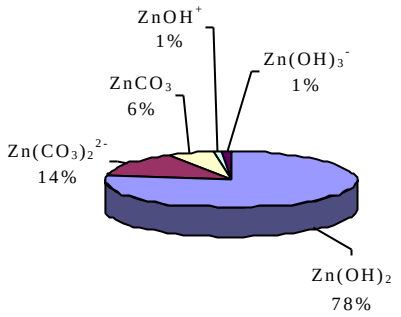
I. 3.5-4.5 m



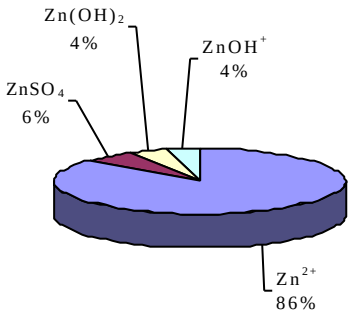
I. 5.5-6.5 m



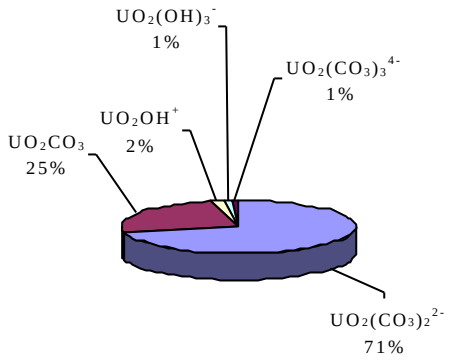
I. 6.5-7.5 m



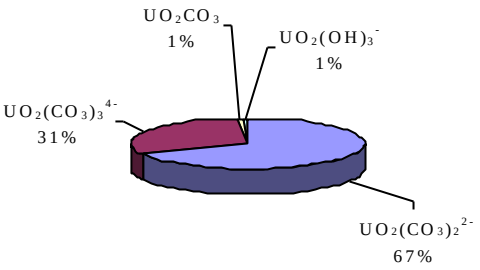
I. 7.5-8.5 m



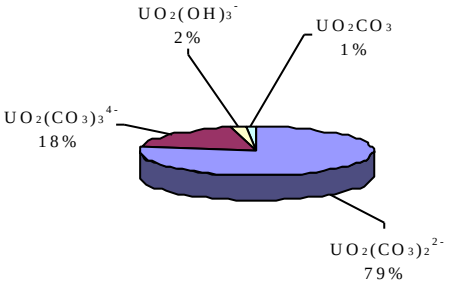
I. 8.5-9.5 m



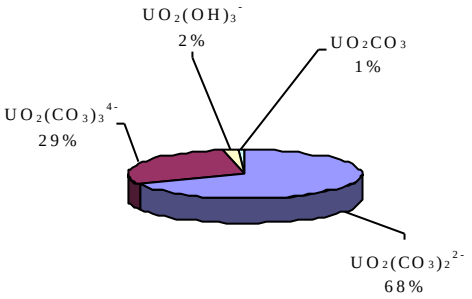
III. 0-1 m



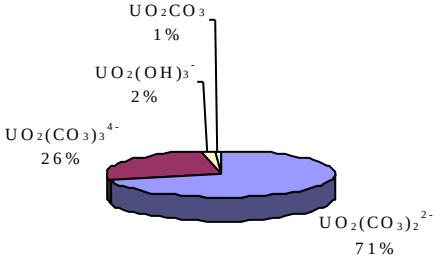
III. 3-4 m



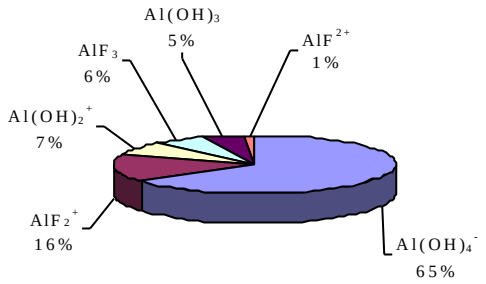
III. 5-6 m



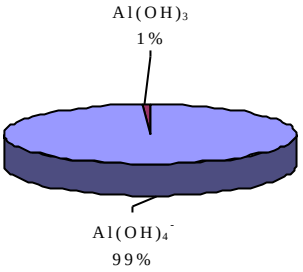
III. 6-7 m



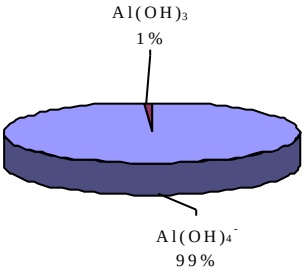
III. 7-8 m



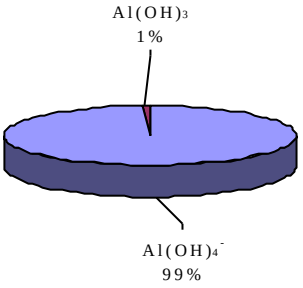
III. 0-1 m



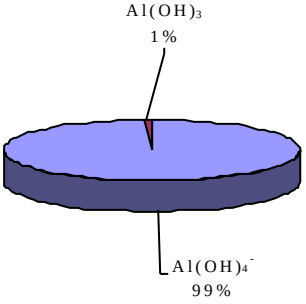
III. 2-3 m



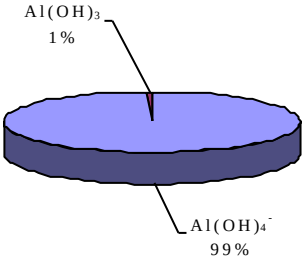
III. 3-4 m



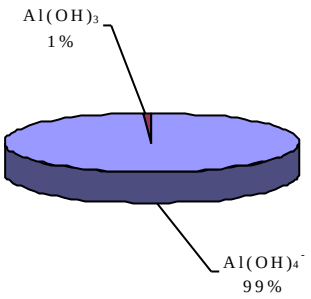
III. 4-5 m



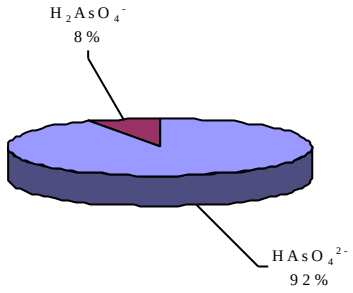
III. 5-6 m



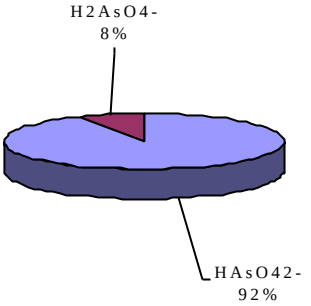
III. 6-7 m



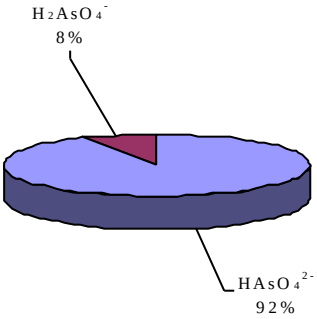
III. 7-8 m



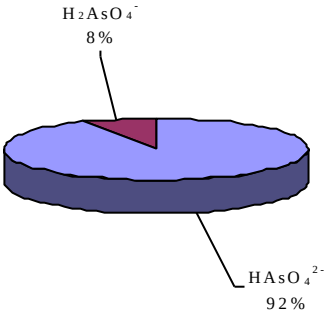
III. 2-3 m



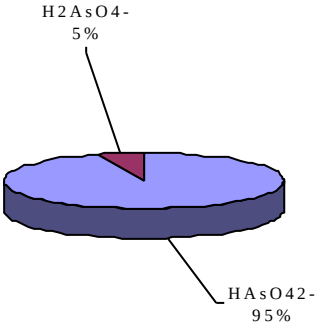
III. 3-4 m



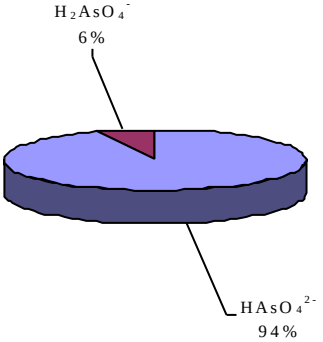
III. 4-5 m



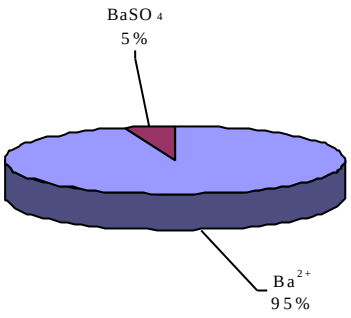
III. 5-6 m



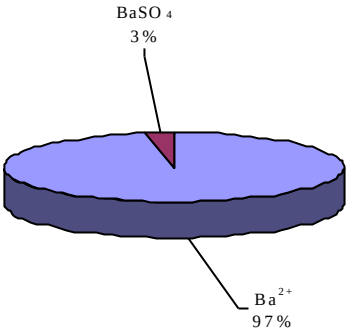
III. 6-7 m



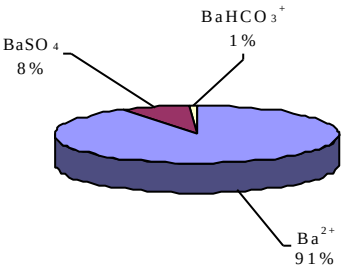
III. 7-8 m



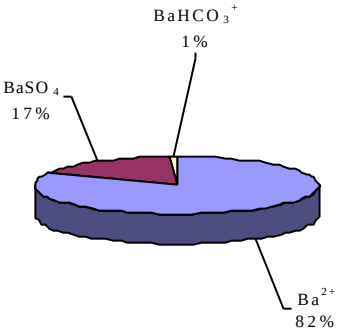
III. 0-1 m



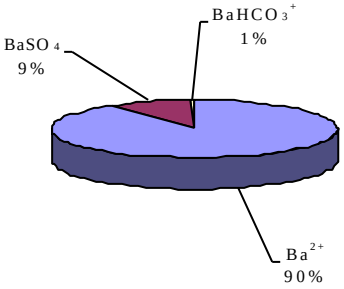
III. 2-3 m



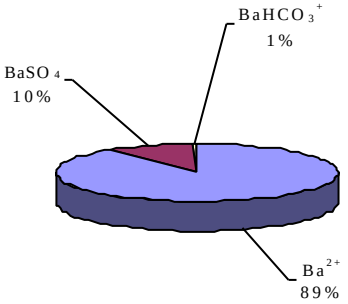
III. 3-4 m



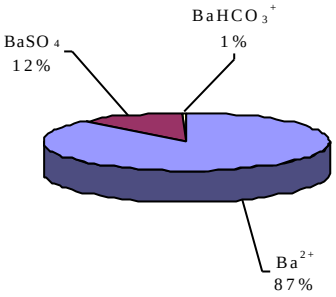
III. 4-5 m



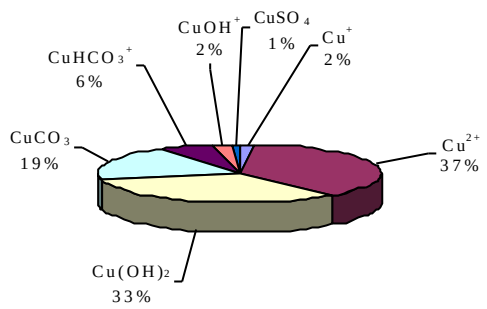
III. 5-6 m



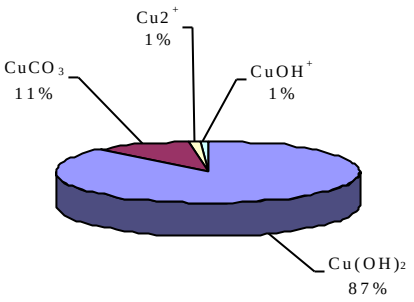
III. 6-7 m



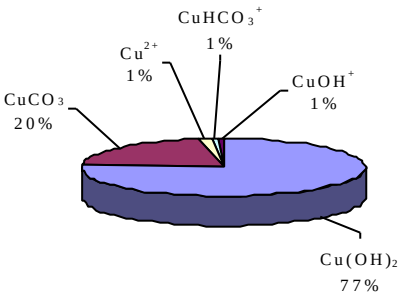
III. 7-8 m



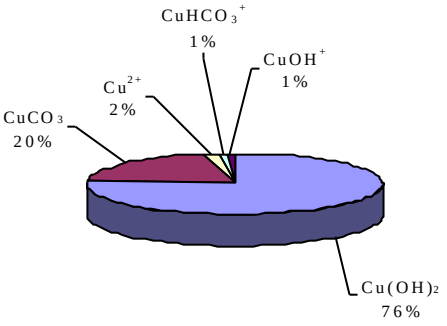
III. 0-1 m



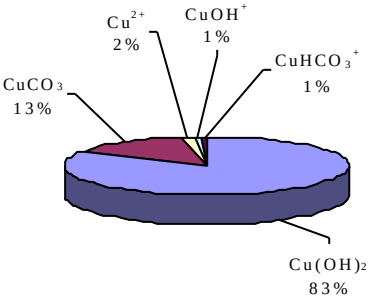
III. 2-3 m



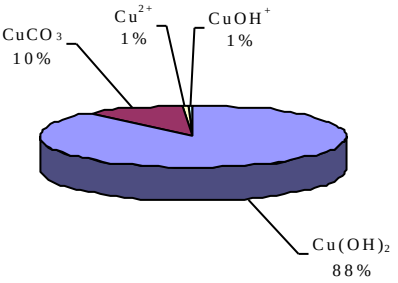
III. 3-4 m



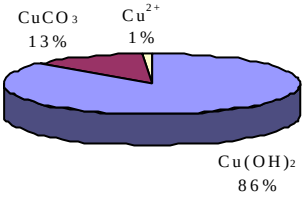
III. 4-5 m



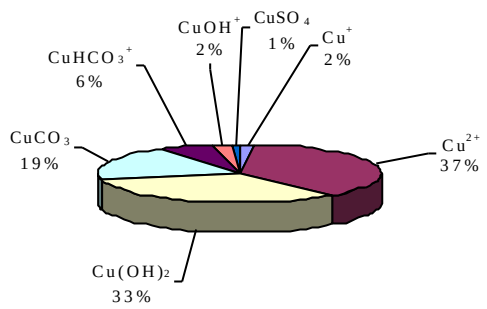
III. 5-6 m



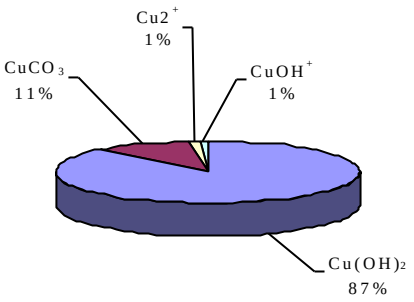
III. 6-7 m



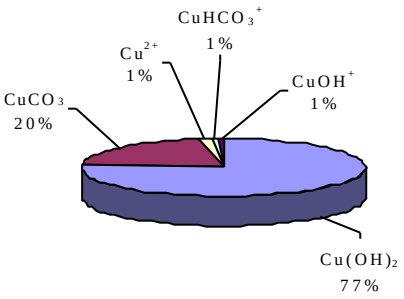
III. 7-8 m



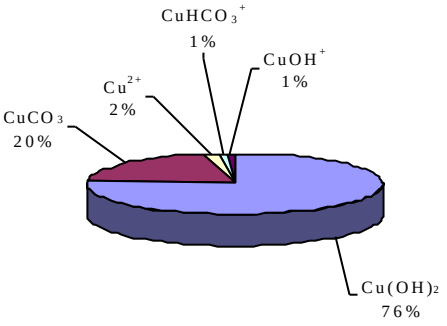
III. 0-1 m



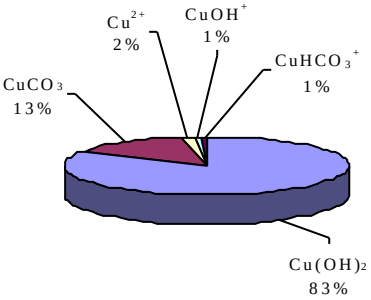
III. 2-3 m



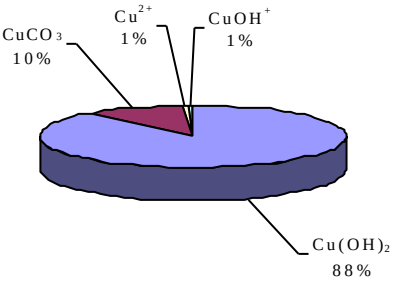
III. 3-4 m



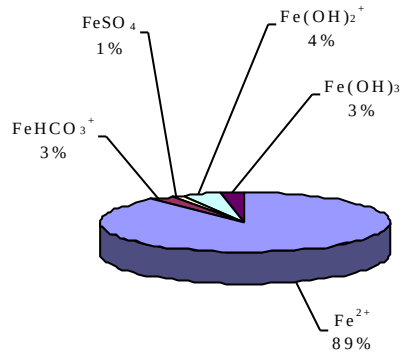
III. 4-5 m



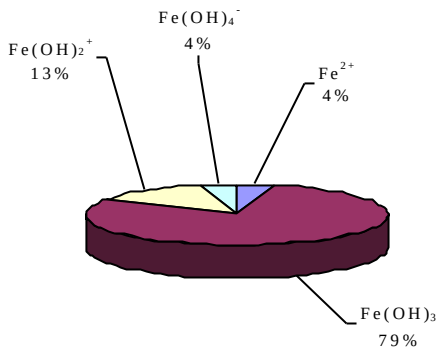
III. 5-6 m



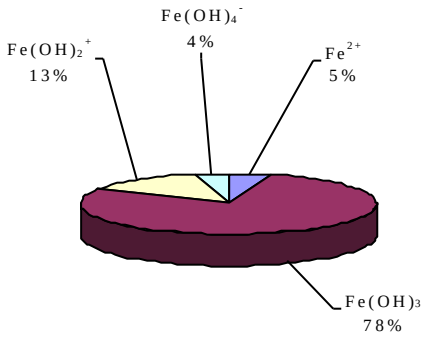
III. 6-7 m



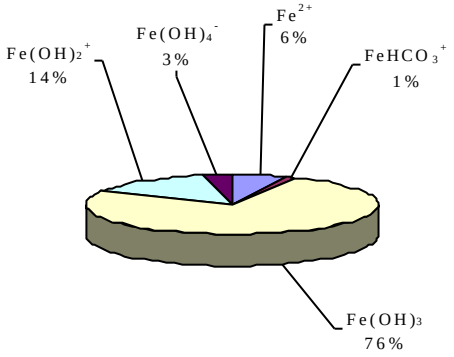
III. 0-1 m



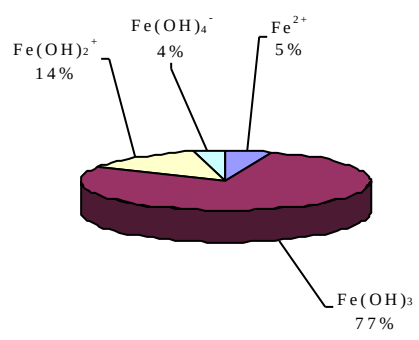
III. 2-3 m



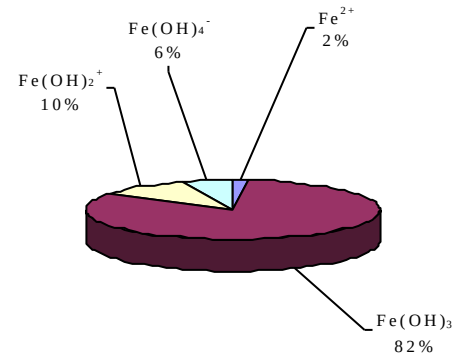
III. 3-4 m



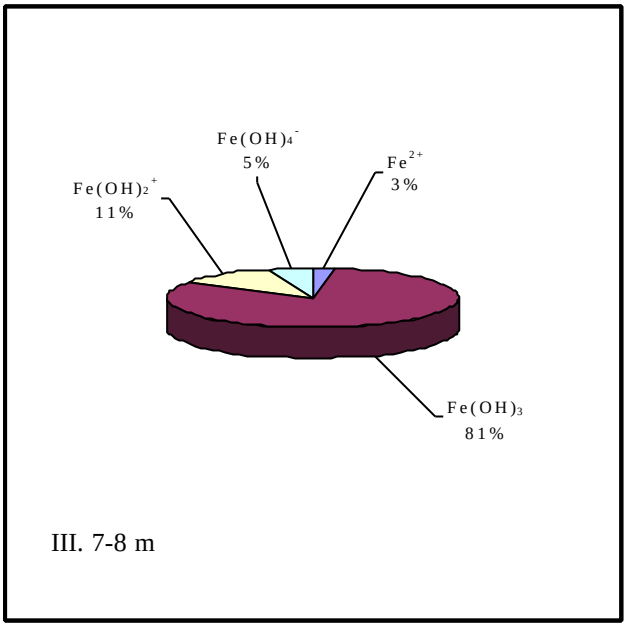
III. 4-5 m



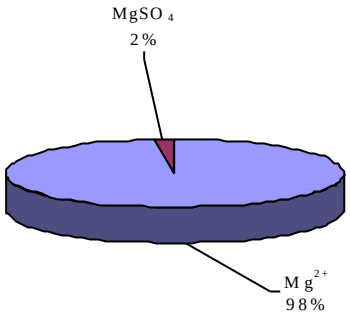
III. 5-6 m



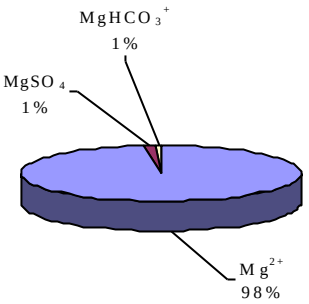
III. 6-7 m



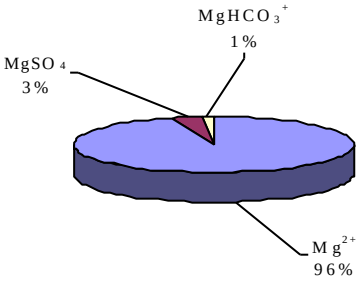
III. 7-8 m



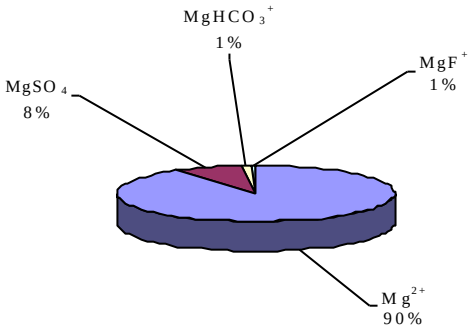
III. 0-1 m



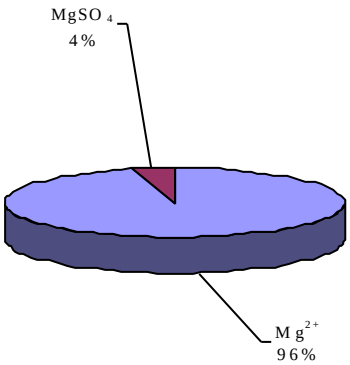
III. 2-3 m



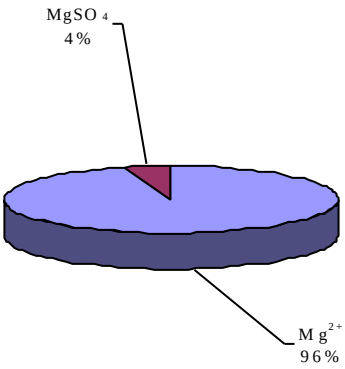
III. 3-4 m



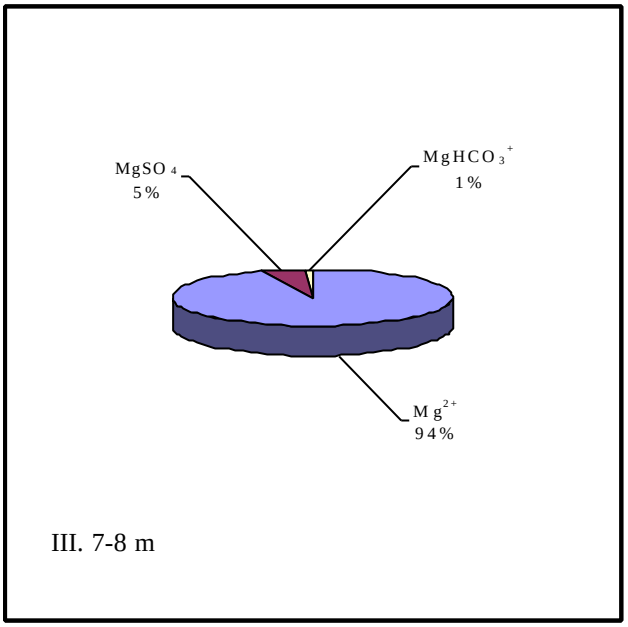
III. 4-5 m



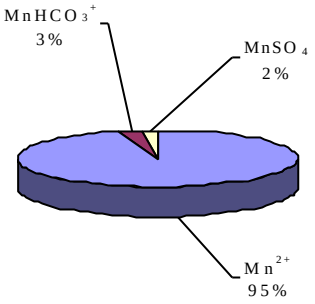
III. 5-6 m



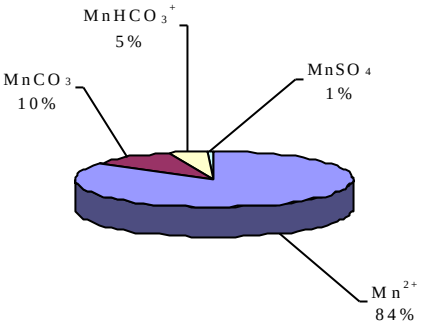
III. 6-7 m



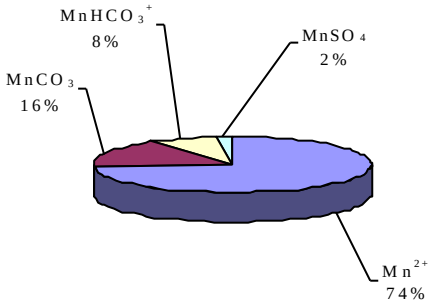
III. 7-8 m



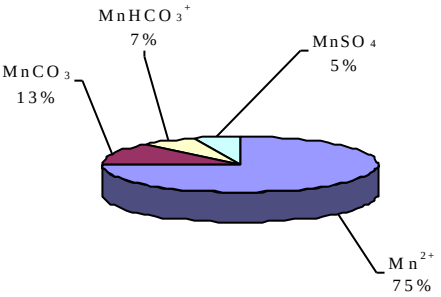
III. 0-1 m



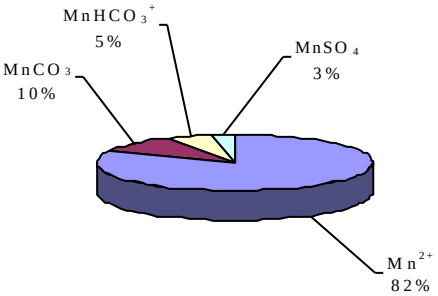
III. 2-3 m



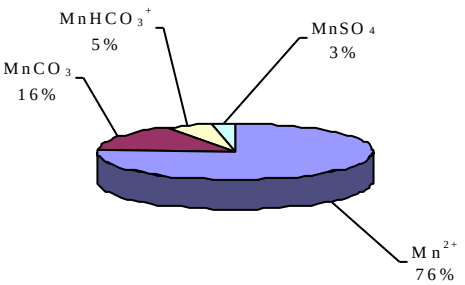
III. 3-4 m



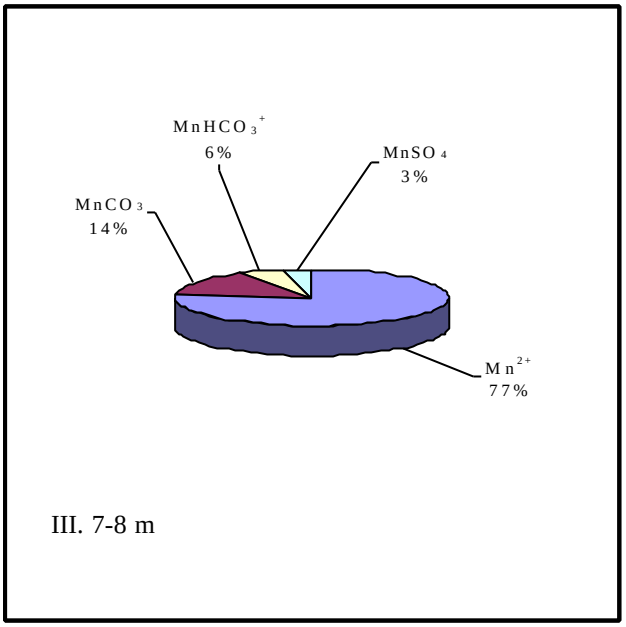
III. 4-5 m



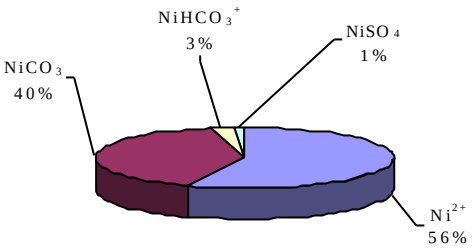
III. 5-6 m



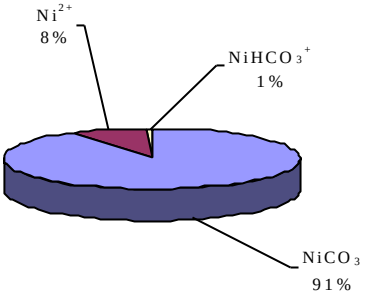
III. 6-7 m



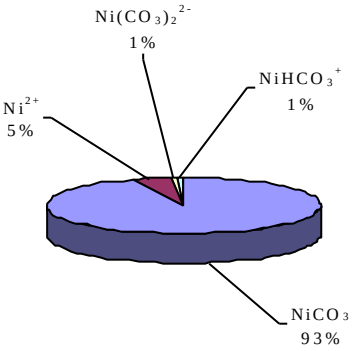
III. 7-8 m



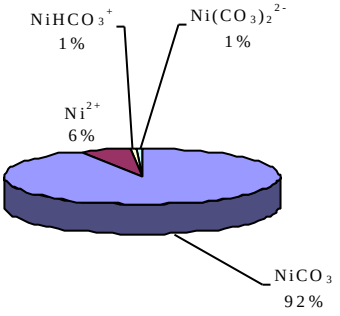
III. 0-1 m



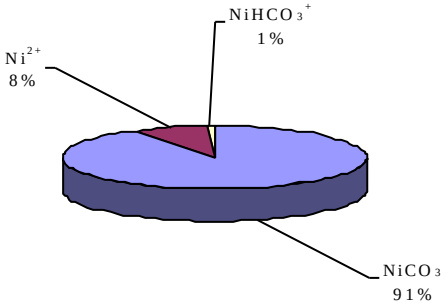
III. 2-3 m



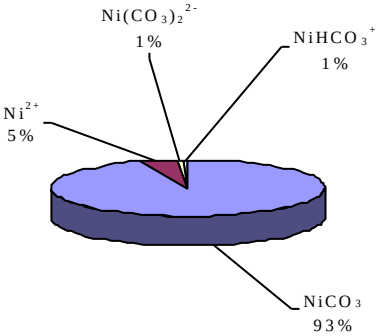
III. 3-4 m



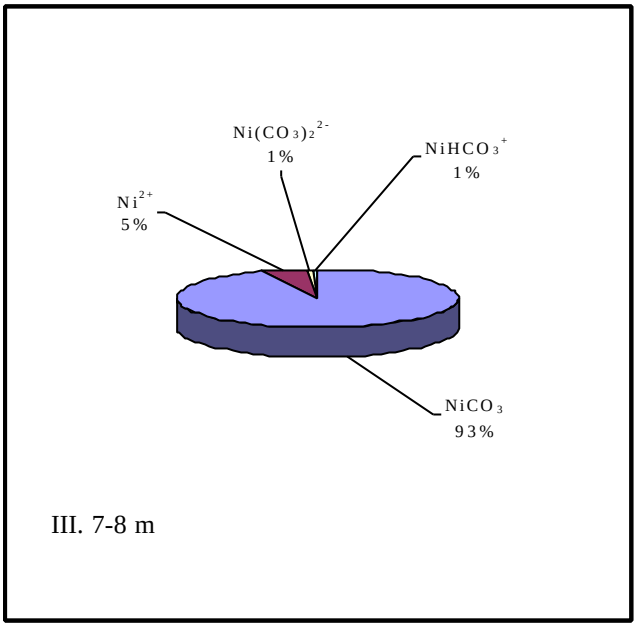
III. 4-5 m



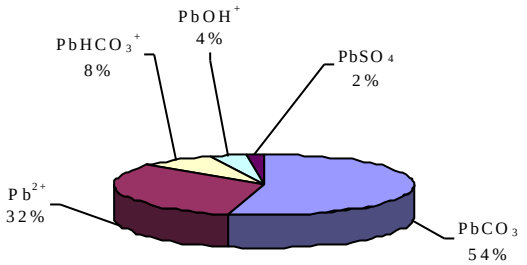
III. 5-6 m



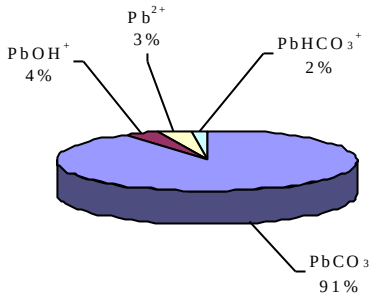
III. 6-7 m



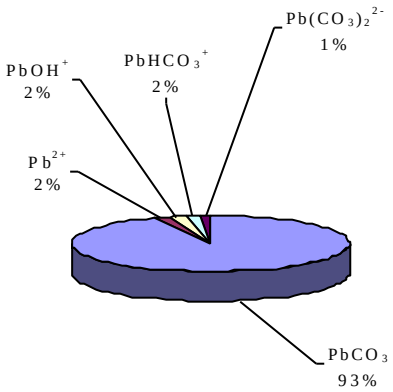
III. 7-8 m



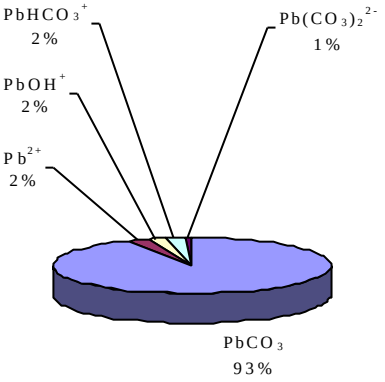
III. 0-1 m



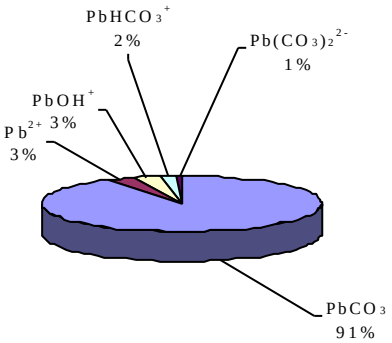
III. 2-3 m



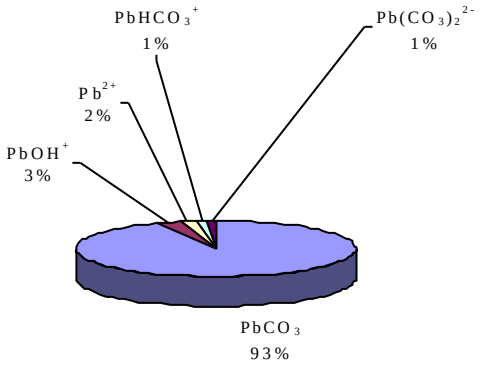
III. 3-4 m



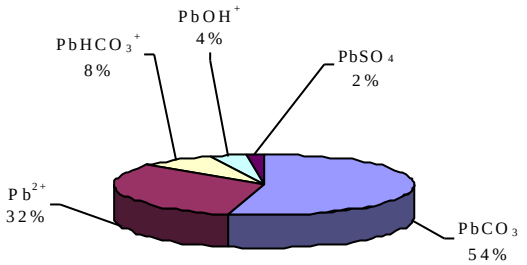
III. 4-5 m



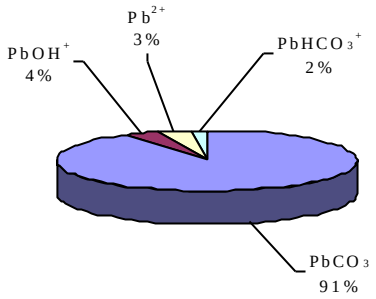
III. 5-6 m



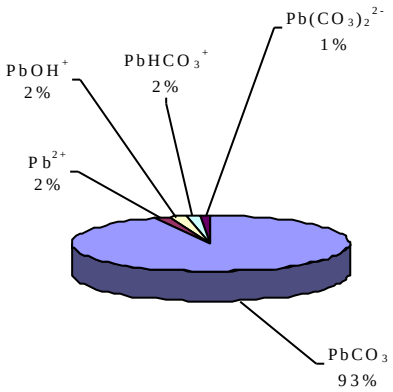
III. 6-7 m



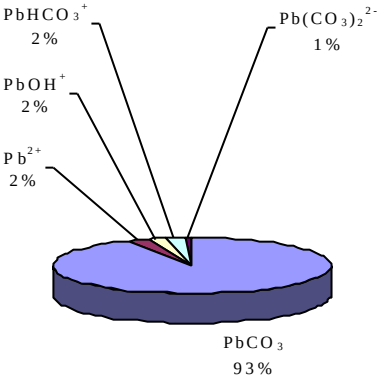
III. 0-1 m



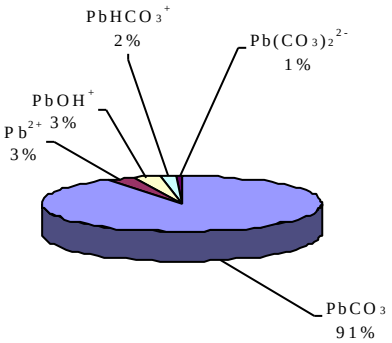
III. 2-3 m



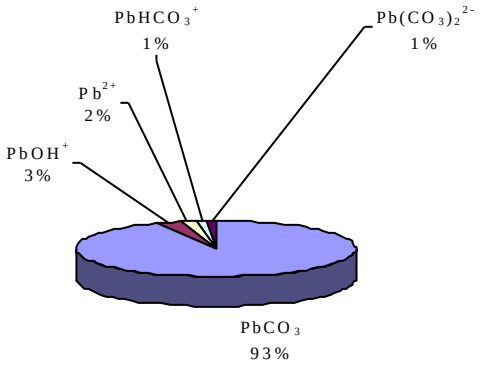
III. 3-4 m



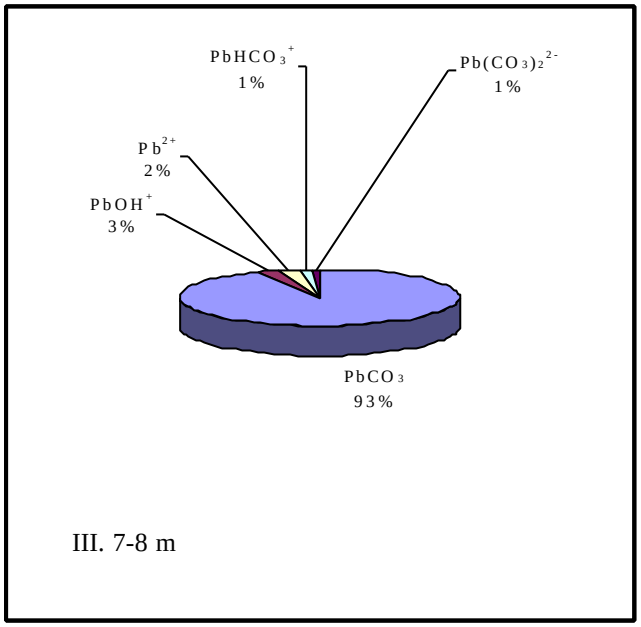
III. 4-5 m



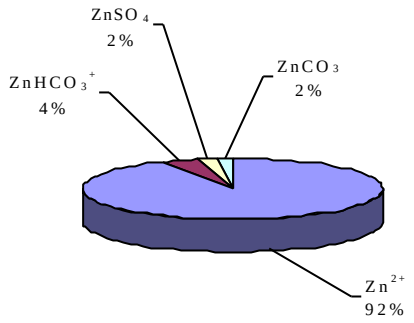
III. 5-6 m



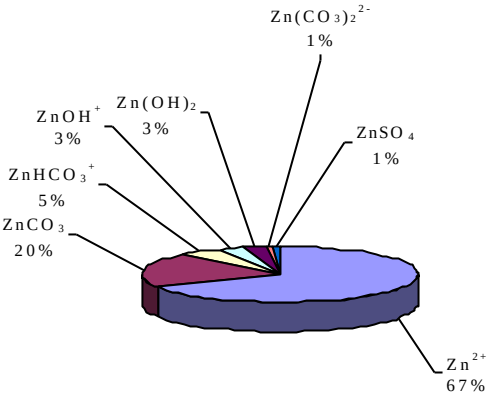
III. 6-7 m



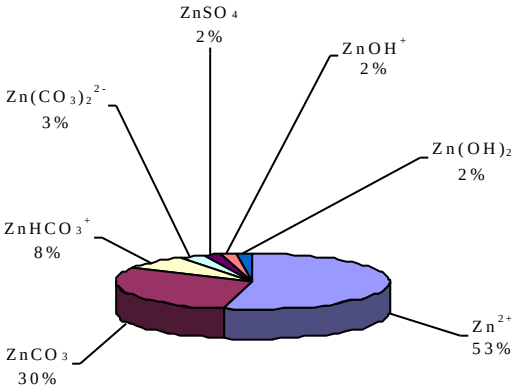
III. 7-8 m



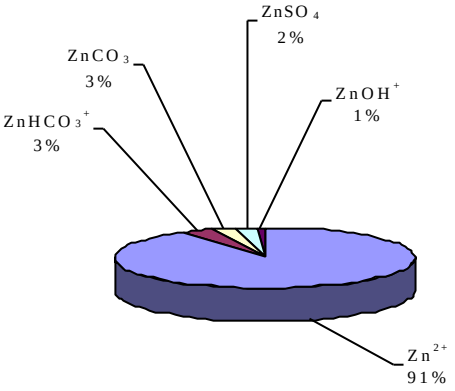
III. 0-1 m



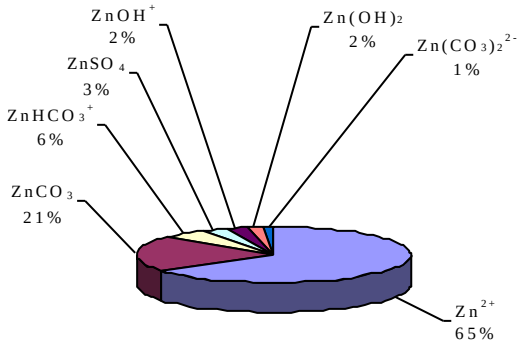
III. 2-3 m



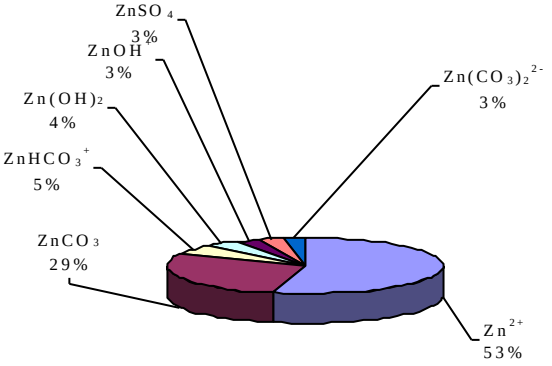
III. 3-4 m



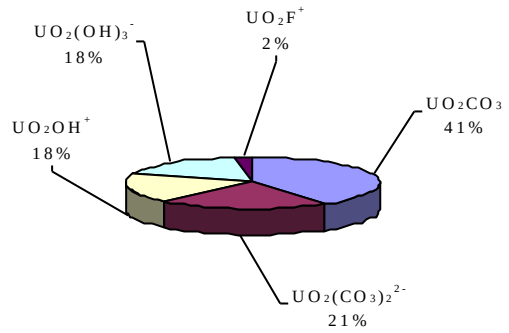
III. 4-5 m



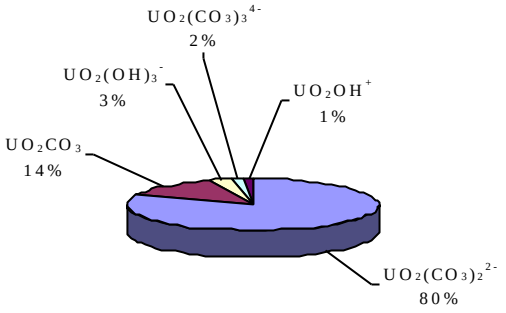
III. 5-6 m



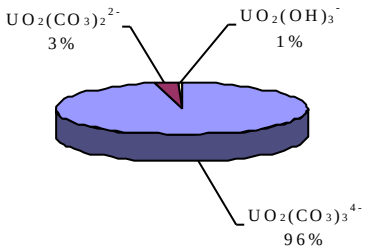
III. 6-7 m



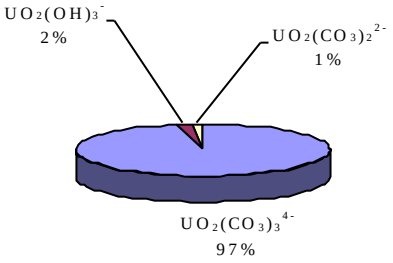
II. 0-0.5 m



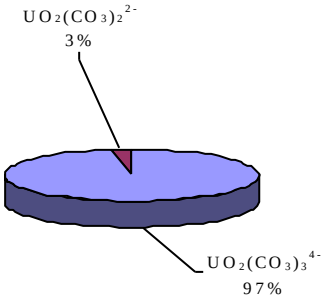
II. 3.5-4.5 m



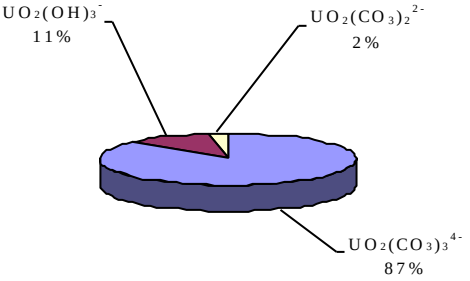
II. 5.5 –6.5 m



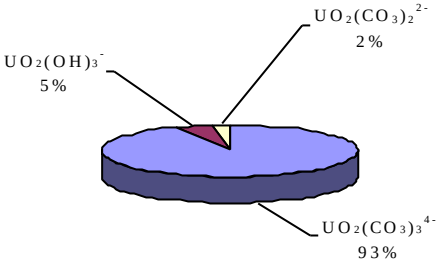
II. 6.5-7.5 m



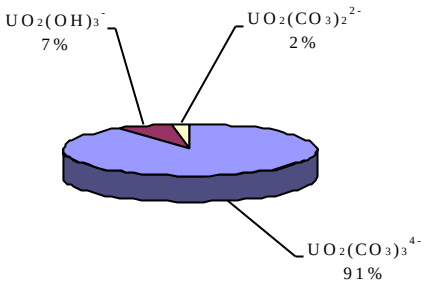
II. 7.5-8.5 m



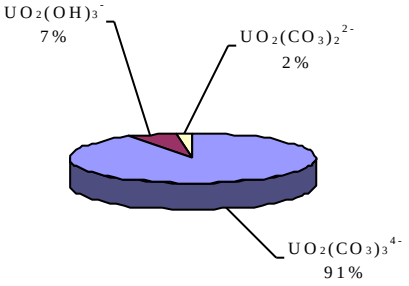
II. 8.5-9.5 m



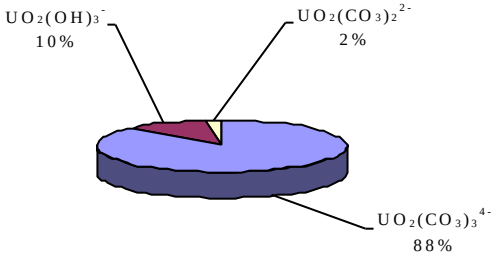
II. 9.5-10.5 m



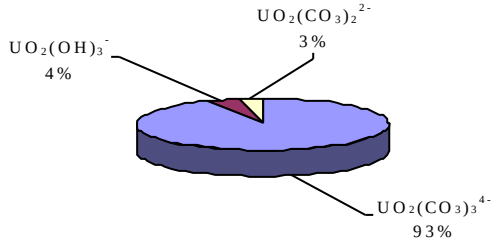
II. 10.5-11.5 m



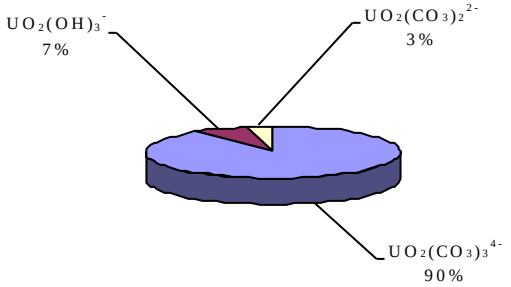
II. 11.5-12.5 m



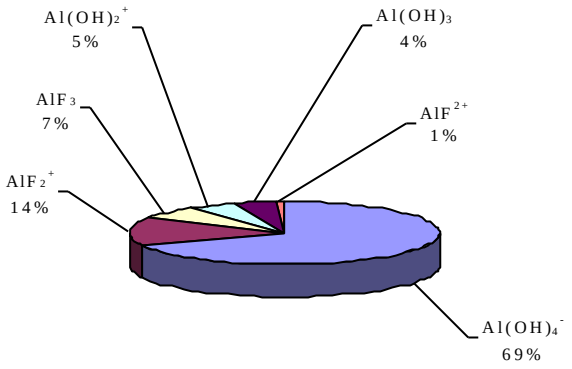
II. 12.5-13.5 m



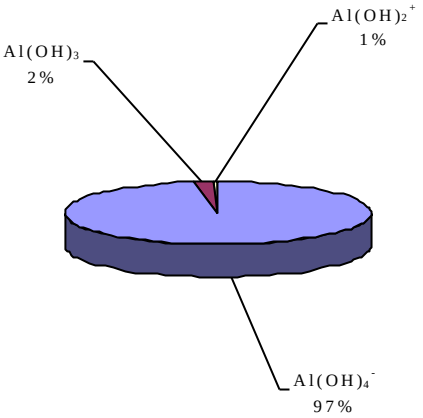
II. 13.5-14.5 m



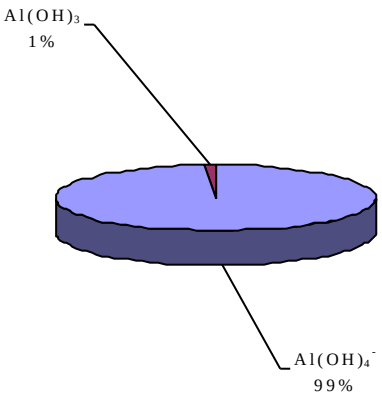
II. 14.5-15.5 m



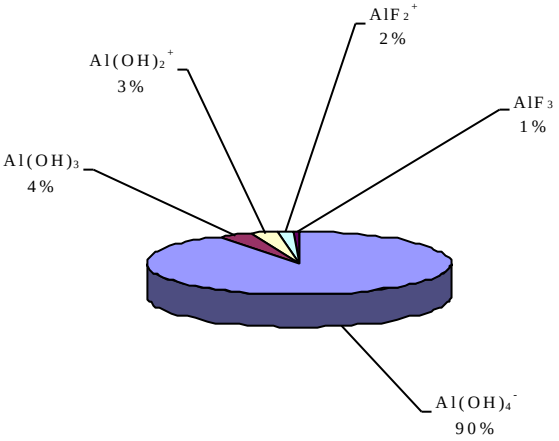
II. 0-0.5 m



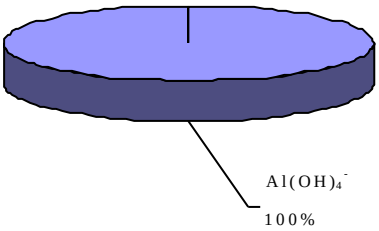
II. 0.5-1.5 m



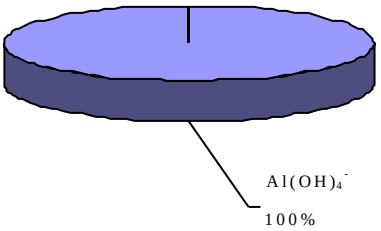
II. 2.5-3.5 m



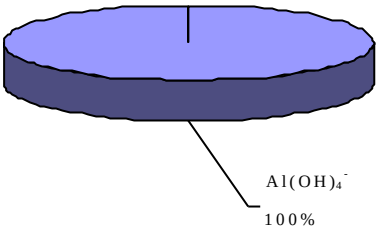
II. 4.5-5.5 m



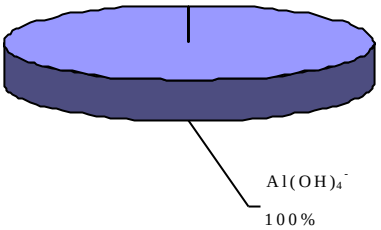
II. 5.5-6.5 m



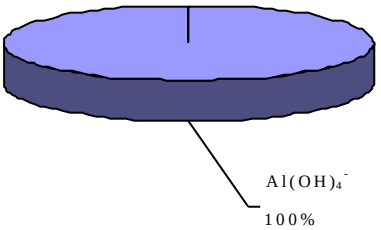
II. 6.5-7.5 m



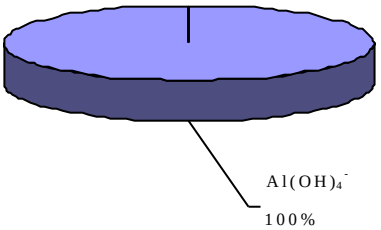
II. 7.5-8.5 m



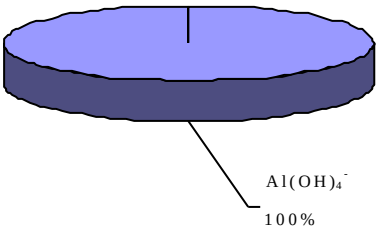
II. 8.5-9.5 m



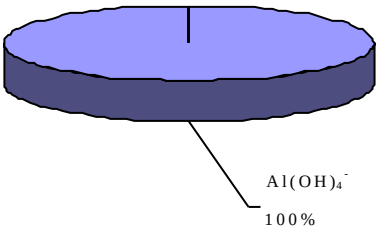
II. 9.5-10.5 m



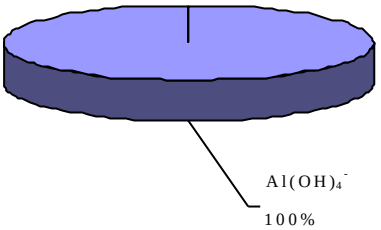
II. 10.5-11.5 m



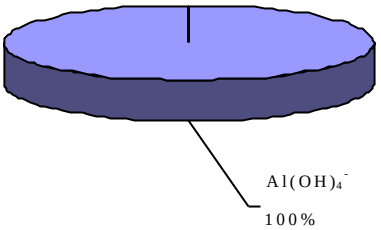
II. 11.5-12.5 m



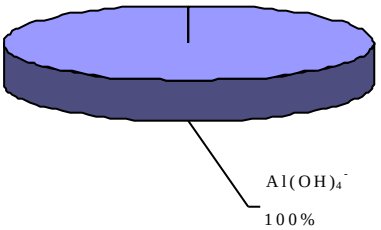
II. 12.5-13.5 m



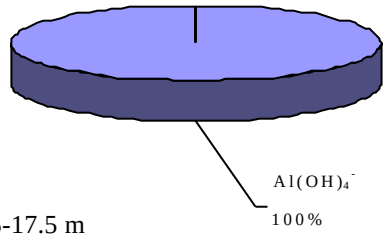
II. 13.5-14.5 m



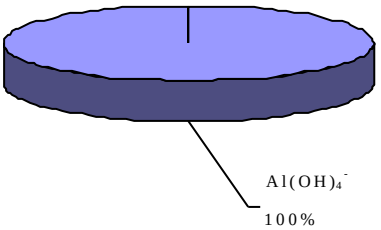
II. 14.5-15.5 m



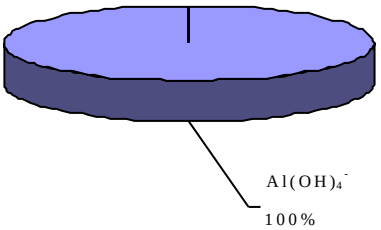
II. 15.5-16.5 m



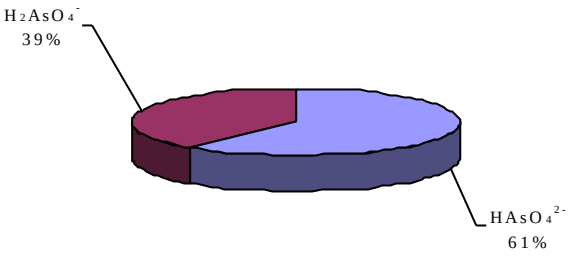
II. 16.5-17.5 m



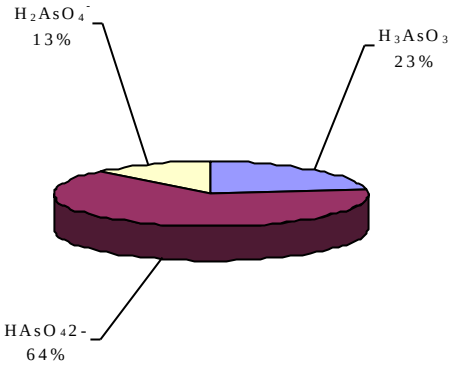
II. 17.5-18.5 m



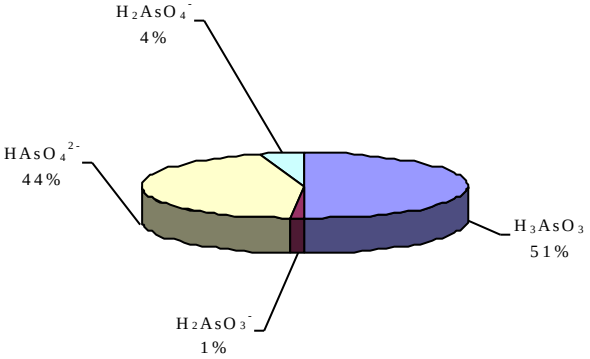
II. 18.5-19.5 m



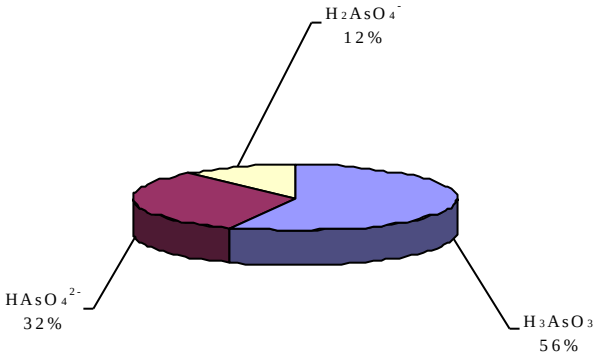
II. 0-0.5 m



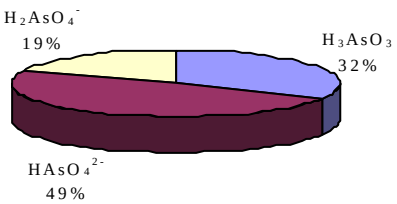
II. 0.5-1.5 m



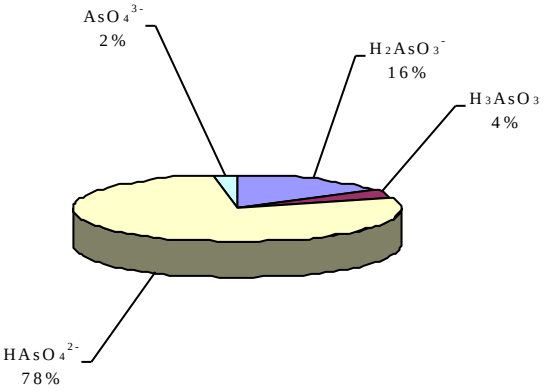
II. 2.5-3.5 m



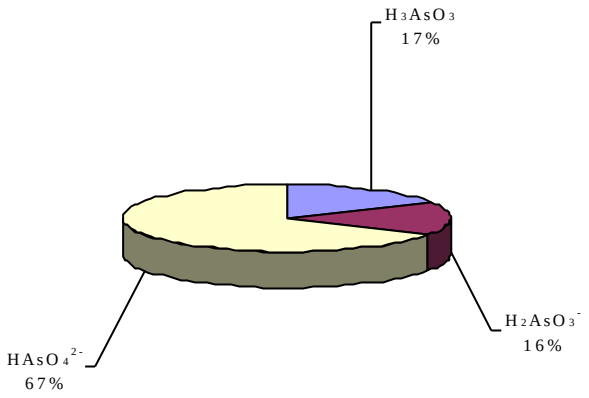
II. 3.5-4.5 m



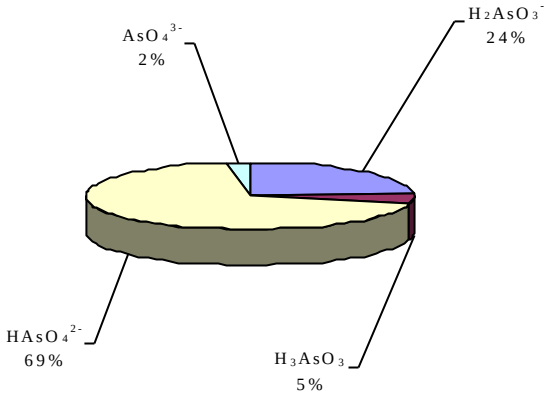
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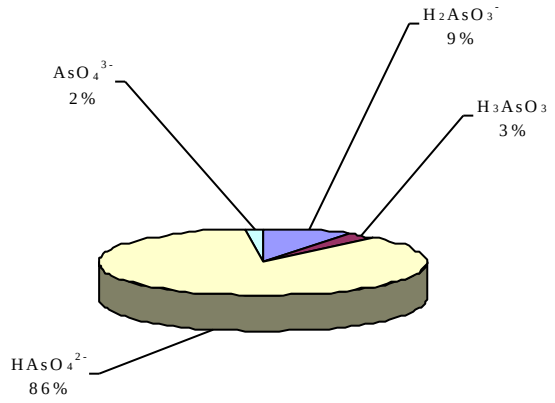
II. 6.5-7.5 m



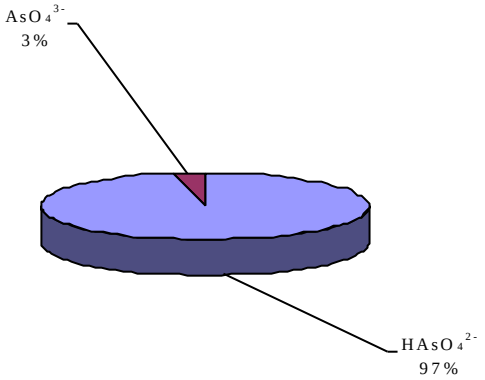
II. 7.5-8.5 m



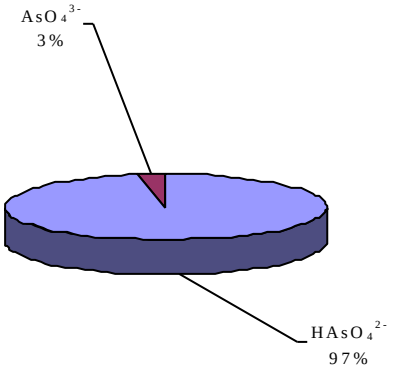
II. 8.5-9.5 m



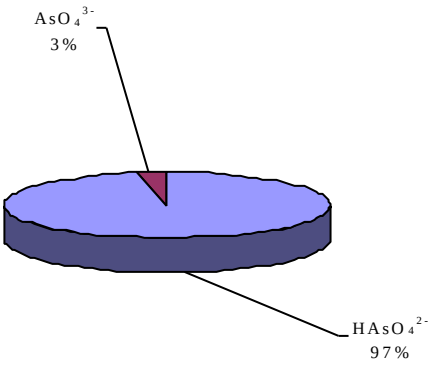
II. 9.5-10.5 m



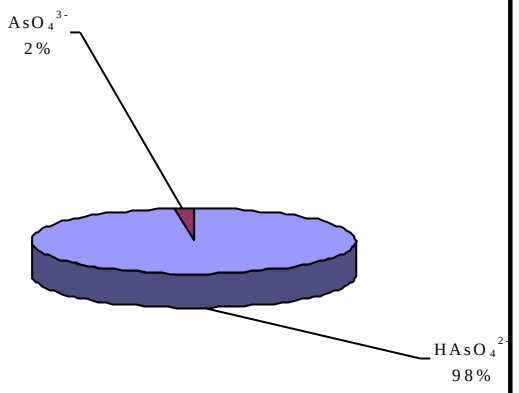
II. 10.5-11.5 m



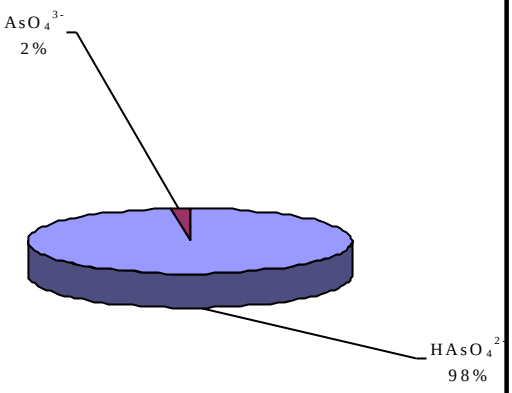
II. 11.5-12.5 m



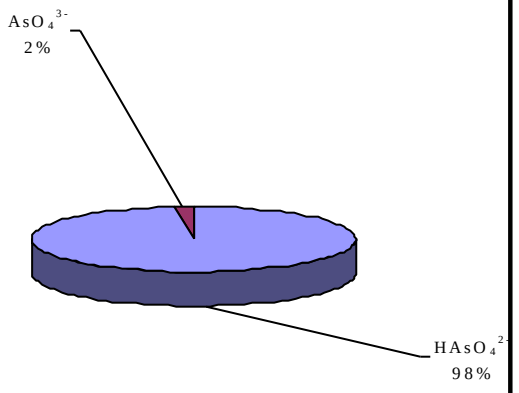
II. 12.5-13.5 m



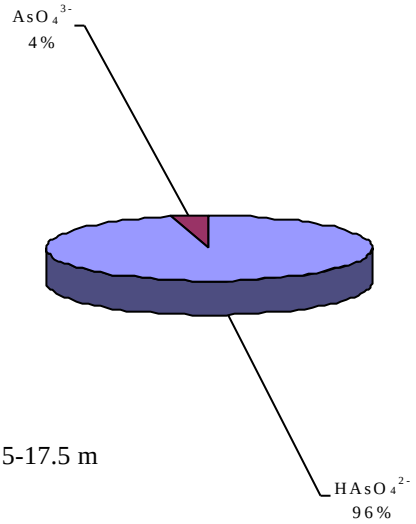
II. 13.5-14.5 m



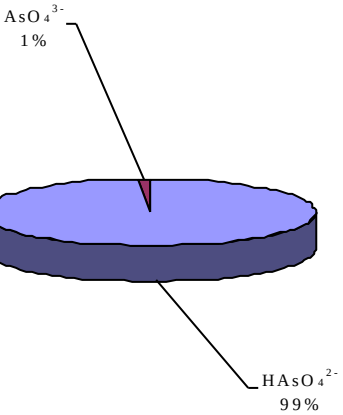
II. 14.5-15.5 m



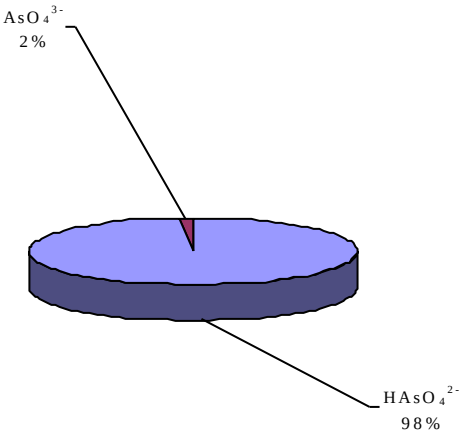
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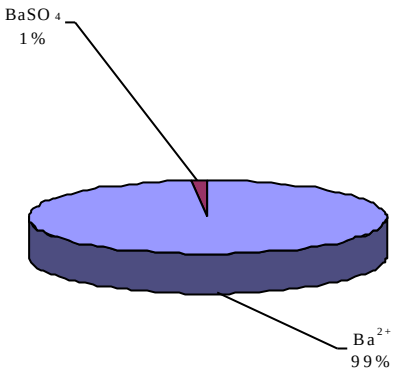
II. 16.5-17.5 m



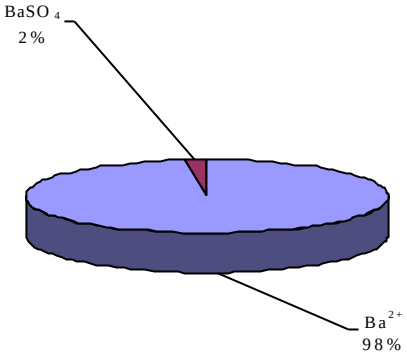
II. 17.5-18.5 m



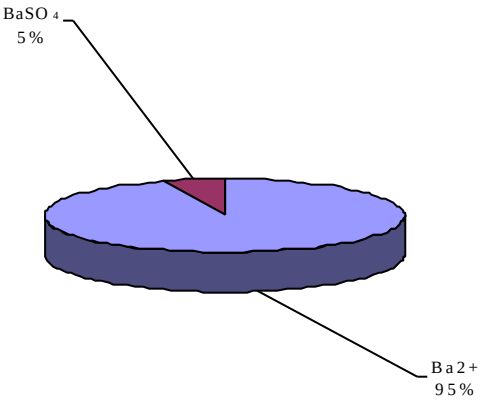
II. 18.5-19.5 m



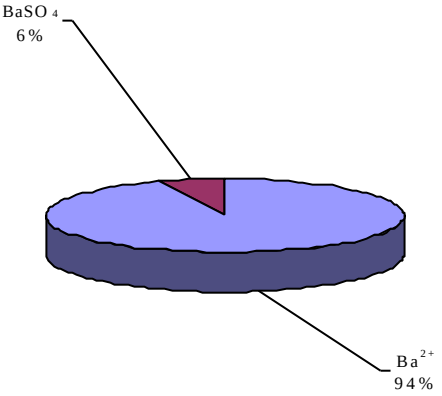
II. 0-0.5 m



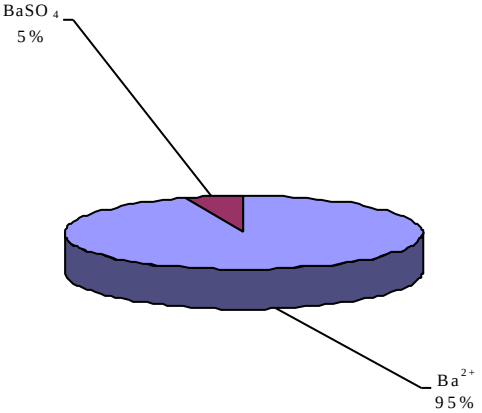
II. 0.5-1.5 m



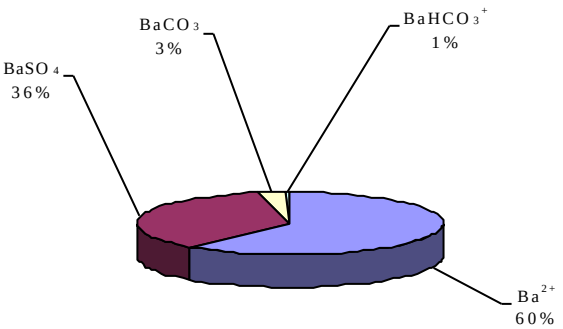
II. 2.5-3.5 m



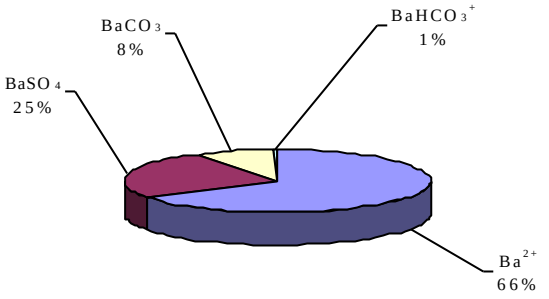
II. 3.5-4.5 m



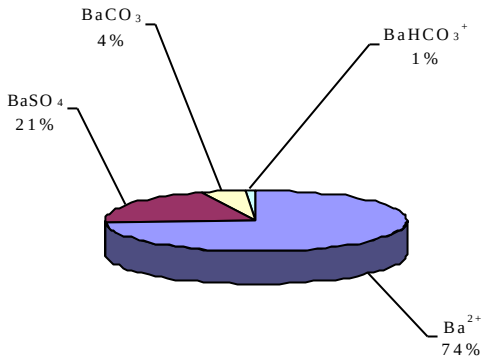
II. 4.5-5.5 m



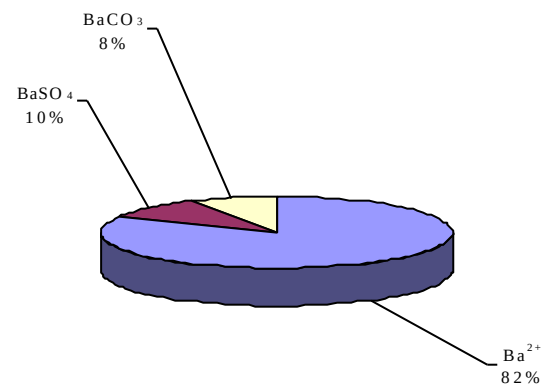
II. 5.5-6.5 m



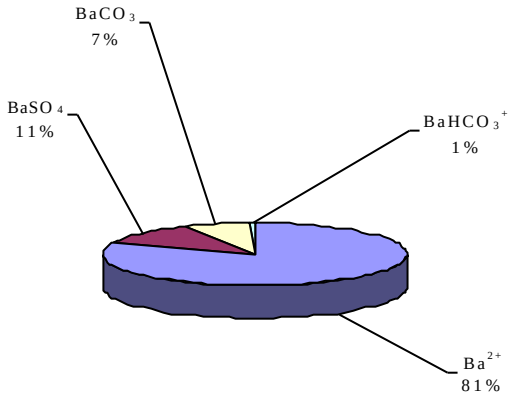
II. 6.5-7.5 m



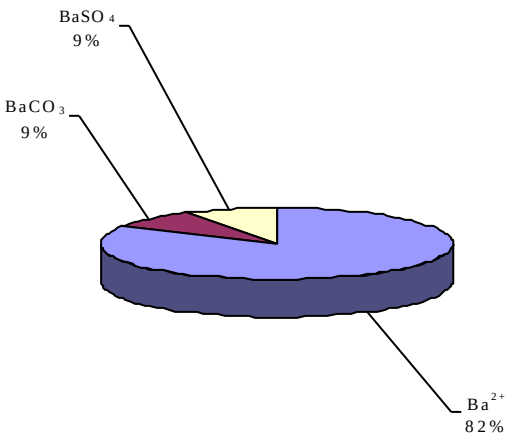
II. 7.5-8.5 m



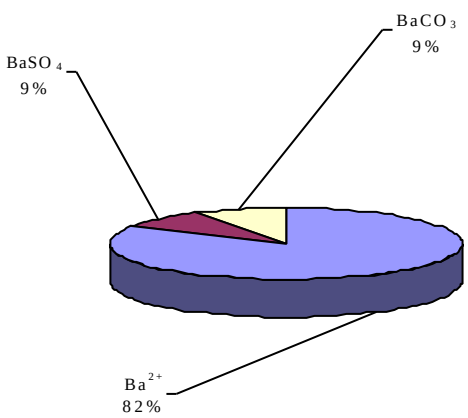
II. 8.5-9.5 m



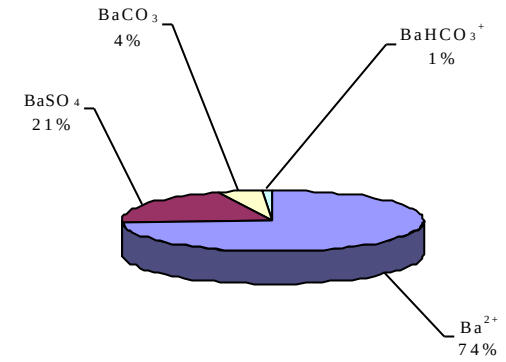
II. 9.5-10.5 m



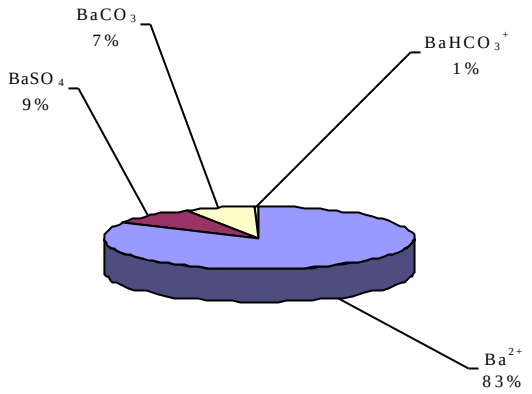
II. 10.5-11.5 m



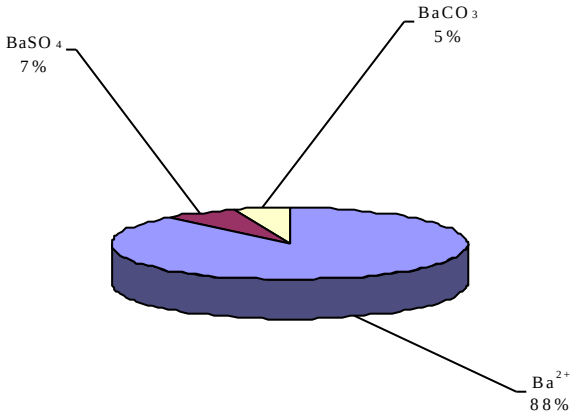
II. 11.5-12.5 m



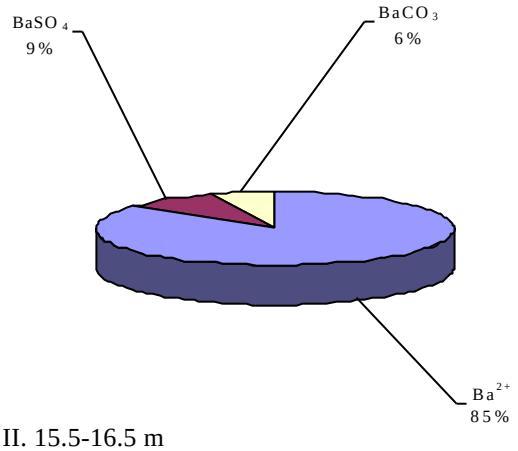
II. 12.5-13.5 m



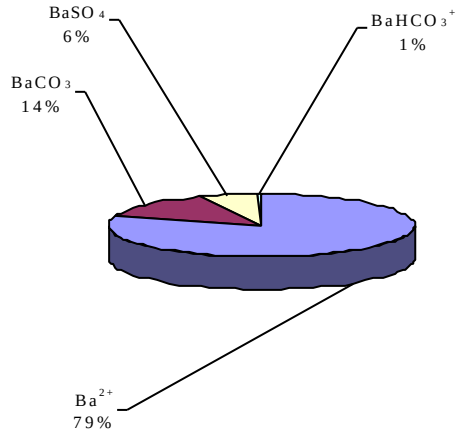
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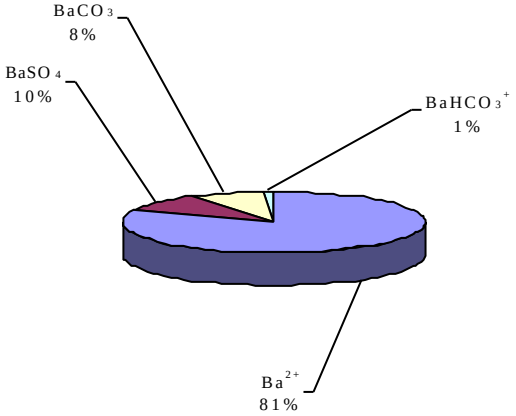
II. 14.5-15.5 m



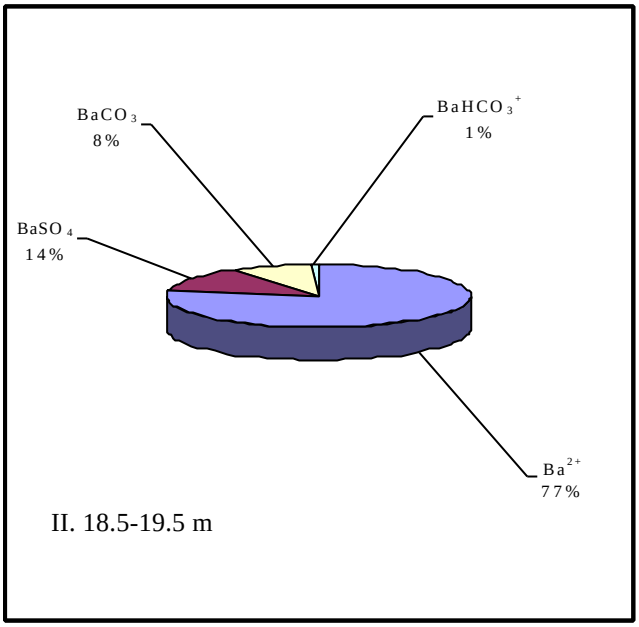
II. 15.5-16.5 m



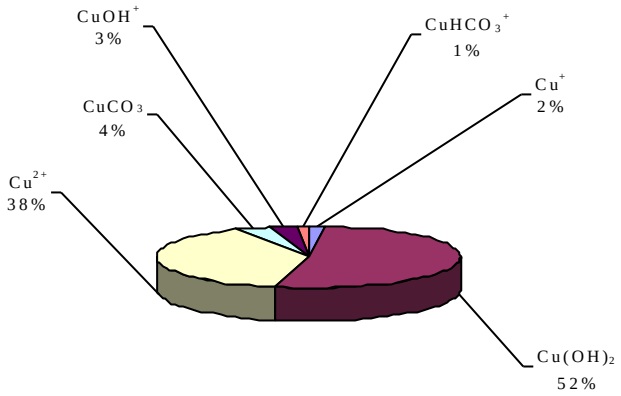
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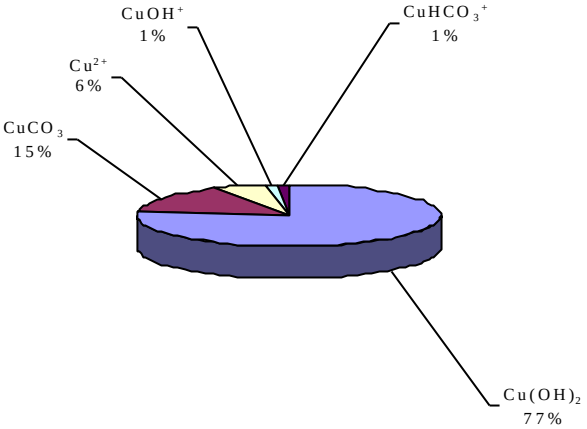
II. 17.5-18.5 m



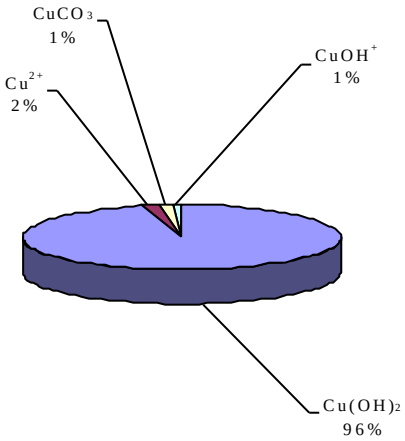
II. 18.5-19.5 m



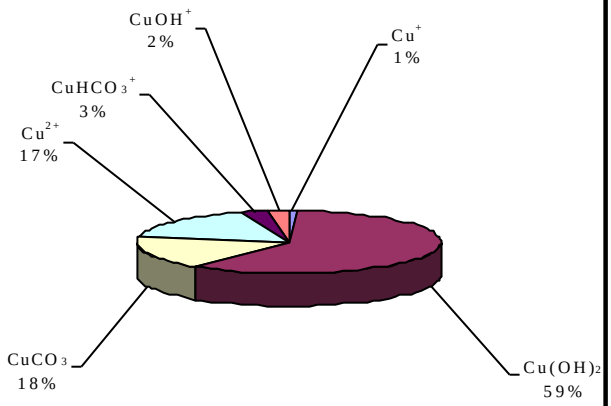
II. 0-0.5 m



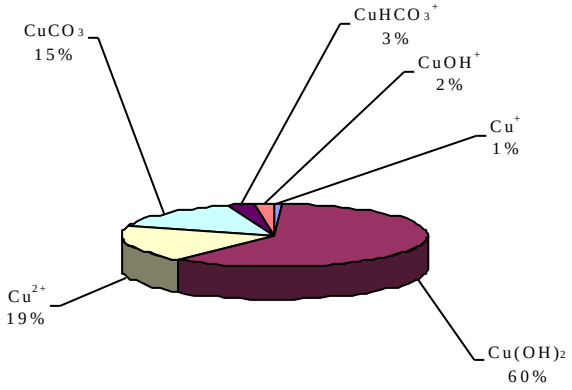
II. 0.5-1.5 m



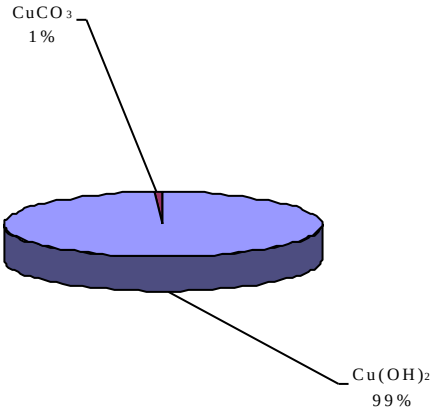
II. 2.5-3.5 m



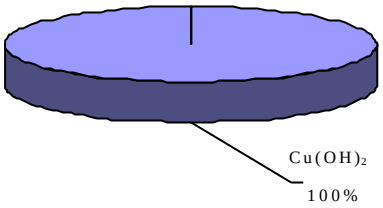
II. 3.5-4.5 m



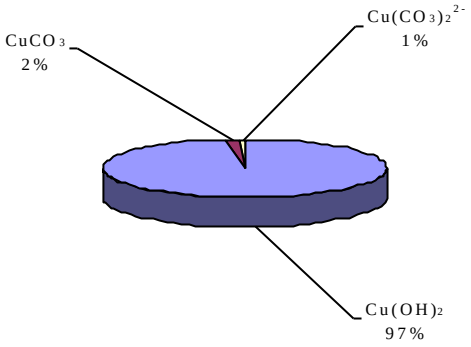
II. 4.5-5.5 m



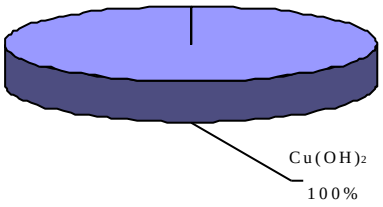
II. 5.5-6.5 m



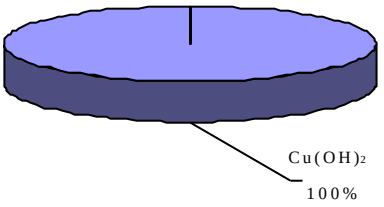
II. 6.5-7.5 m



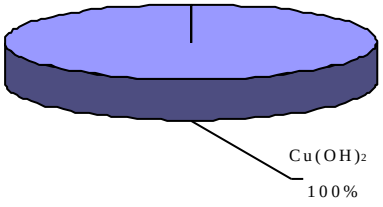
II. 7.5-8.5 m



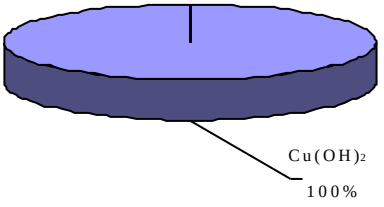
II. 8.5-9.5 m



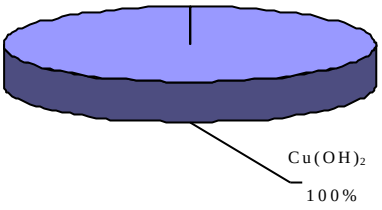
II. 9.5-10.5 m



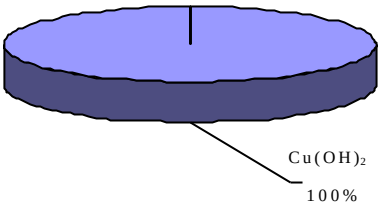
II. 10.5-11.5 m



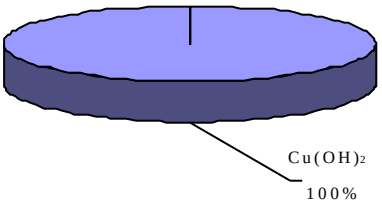
II. 11.5-12.5 m



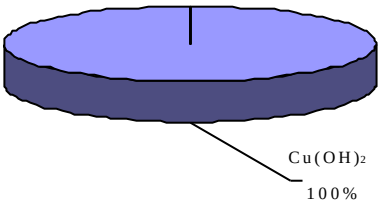
II. 12.5-13.5 m



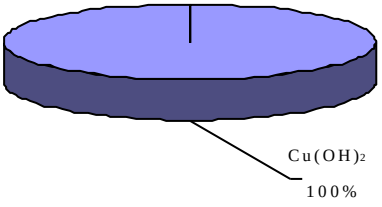
II. 13.5-14.5 m



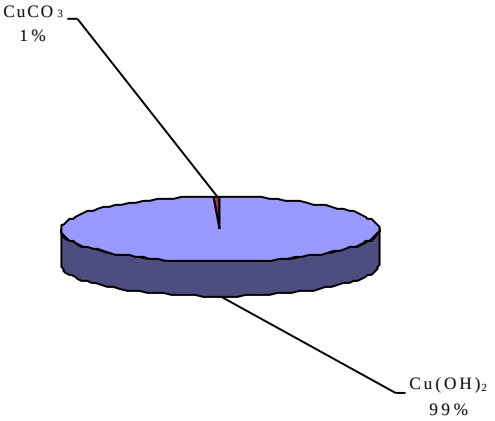
II. 14.5-15.5 m



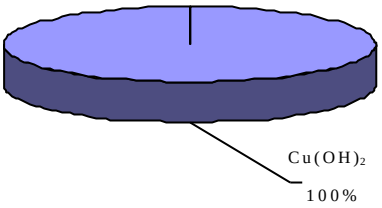
II. 15.5-16.5 m



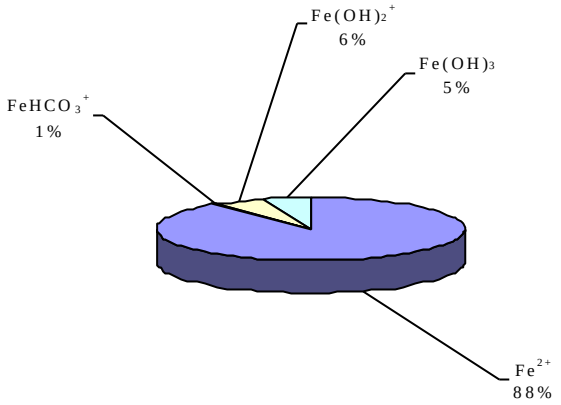
II. 16.5-17.5 m



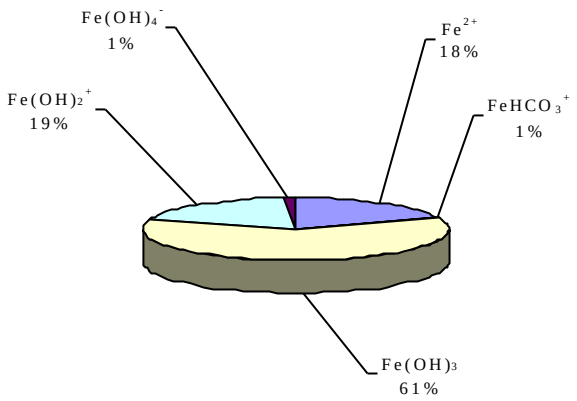
II. 17.5-18.5 m



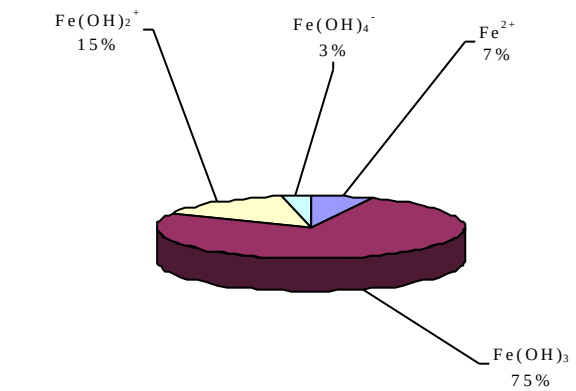
II. 18.5-19.5 m



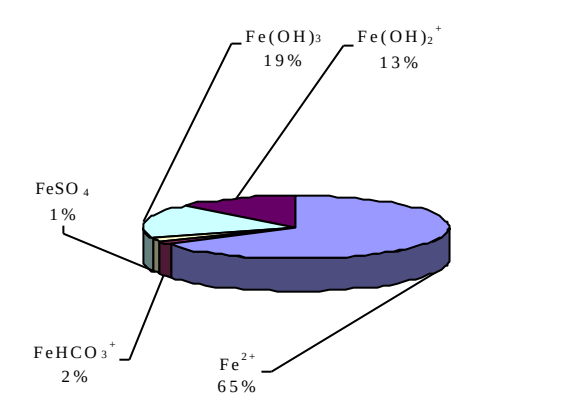
II. 0-0.5 m



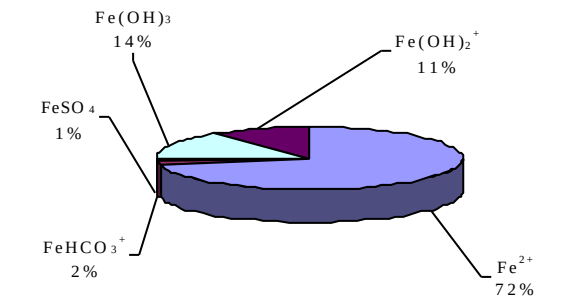
II. 0.5-1.5 m



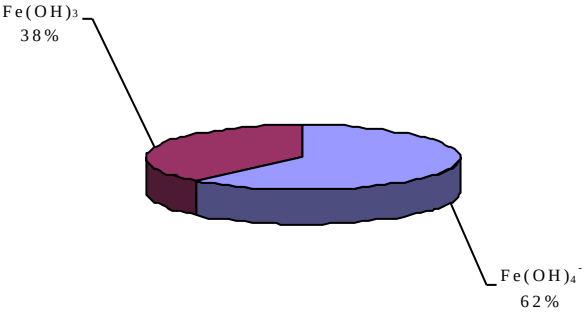
II. 2.5-3.5 m



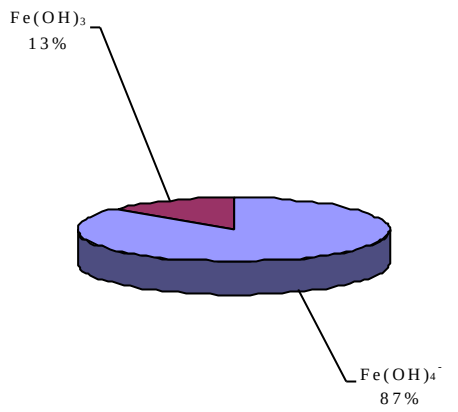
II. 3.5-4.5 m



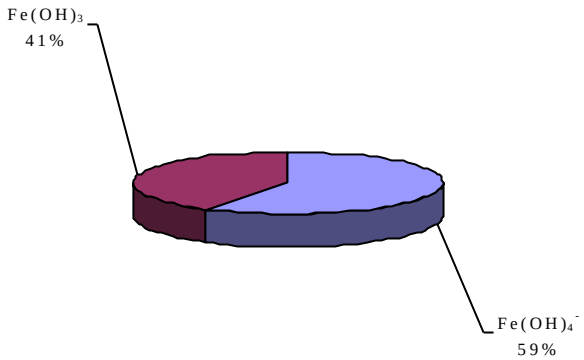
II. 4.5-5.5 m



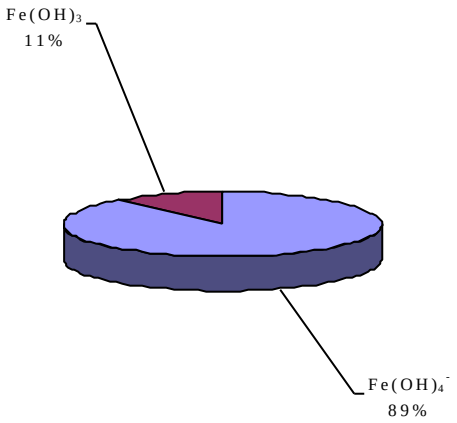
II. 5.5-6.5 m



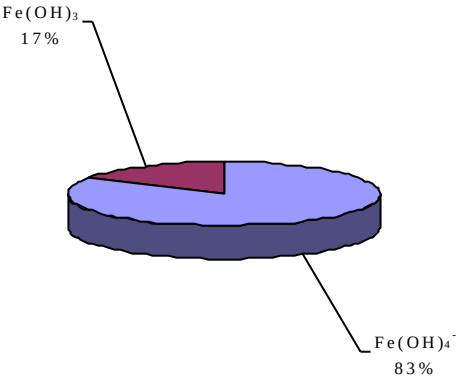
II. 6.5-7.5 m



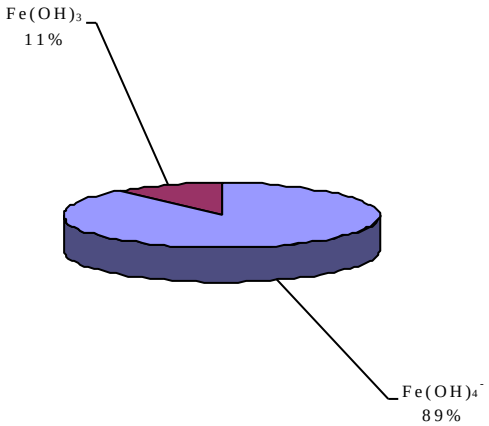
II. 7.5-8.5 m



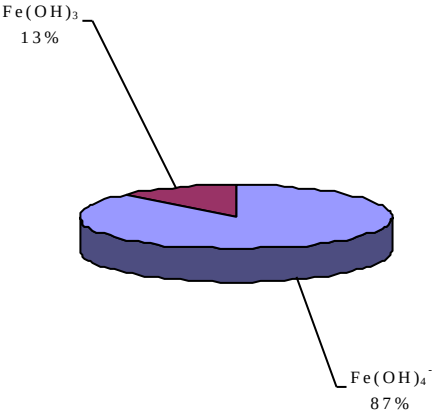
II. 8.5-9.5 m



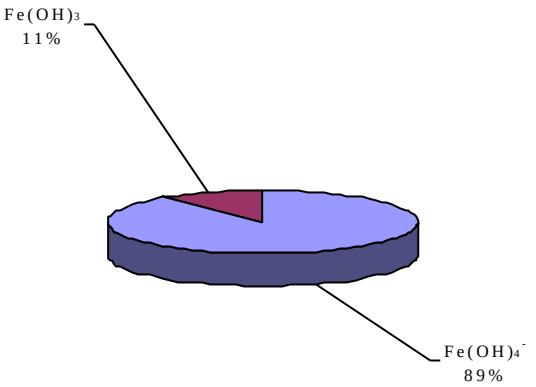
II. 9.5-10.5 m



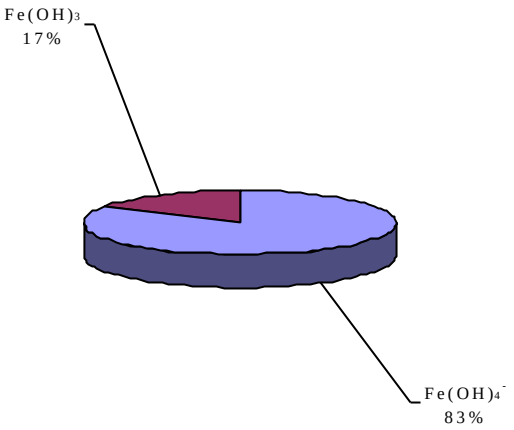
II. 10.5-11.5 m



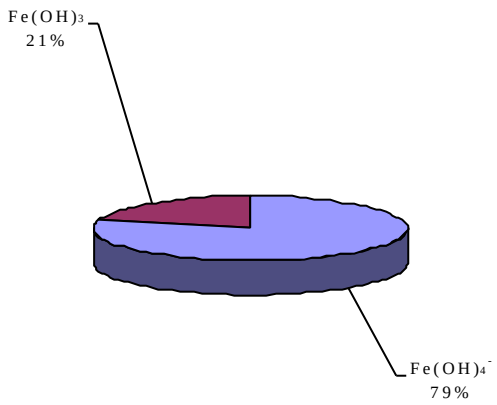
II. 11.5-12.5 m



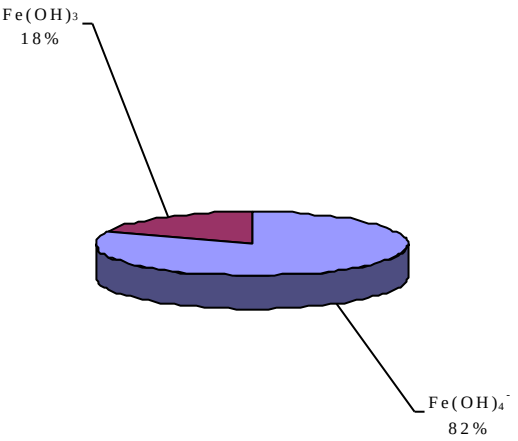
II. 12.5-13.5 m



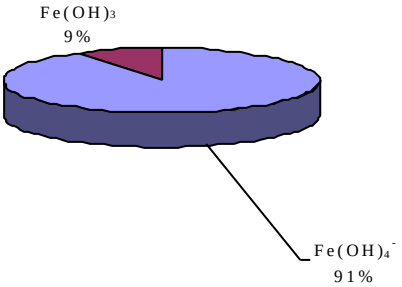
II. 13.5-14.5 m



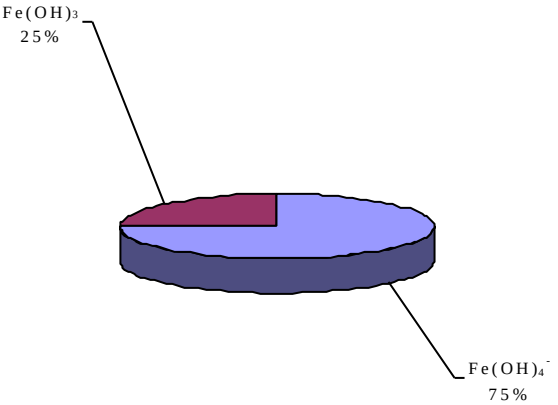
II. 14.5-15.5 m



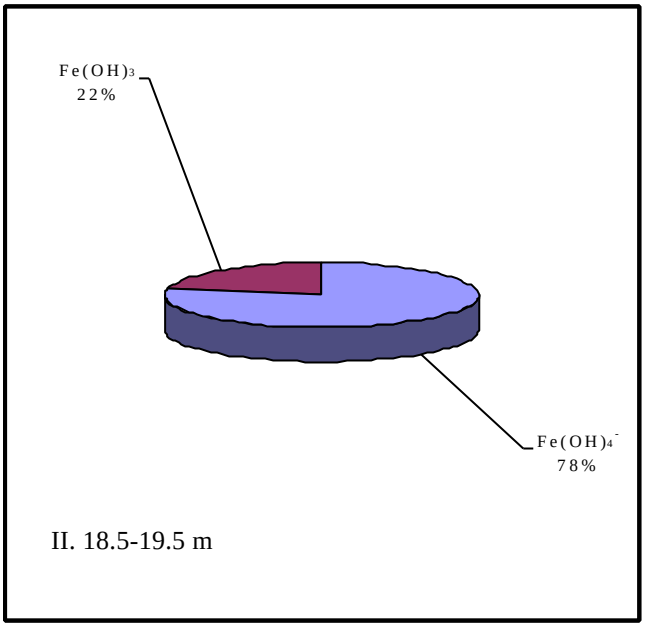
II. 15.5-16.5 m



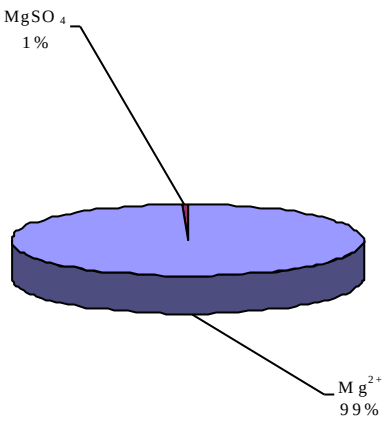
II. 16.5-17.5 m



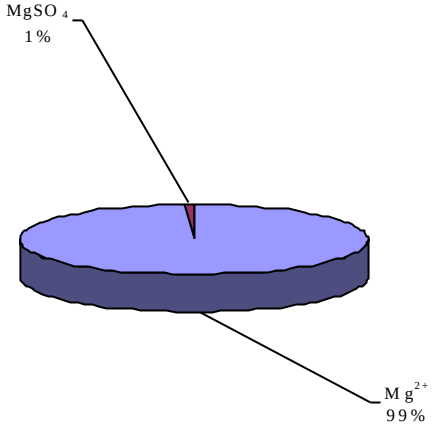
II. 17.5-18.5 m


Fe(OH)3
22%
Fe(OH)4-
78%
II. 18.5-19.5 m

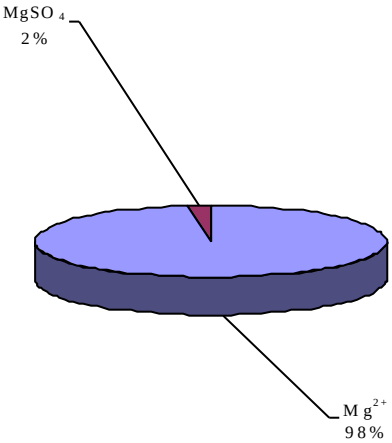
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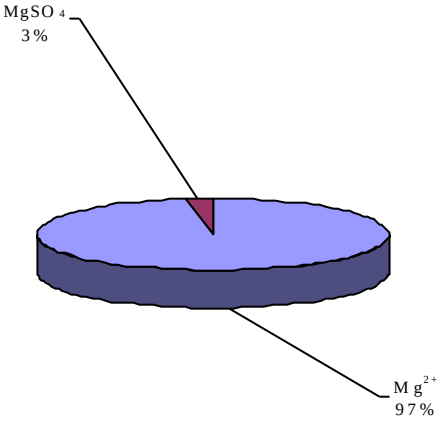
II. 0-0.5 m



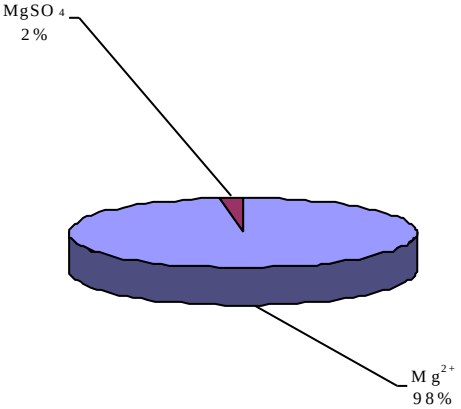
II. 0.5-1.5 m



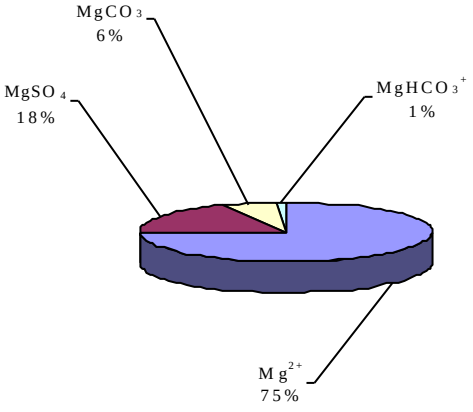
II. 2.5-3.5 m



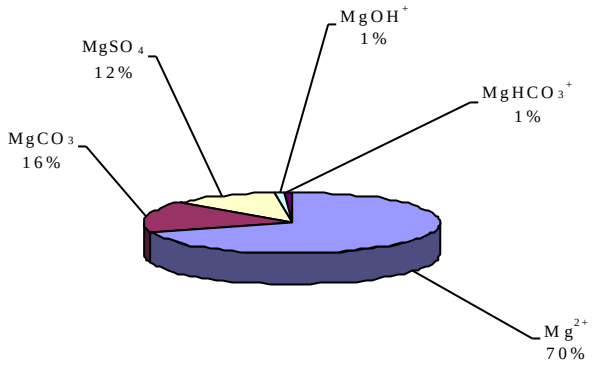
II. 3.5-4.5 m



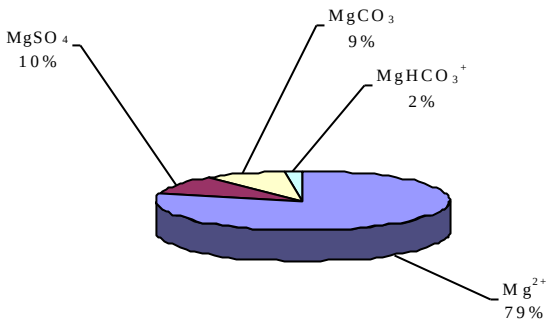
II. 4.5-5.5 m



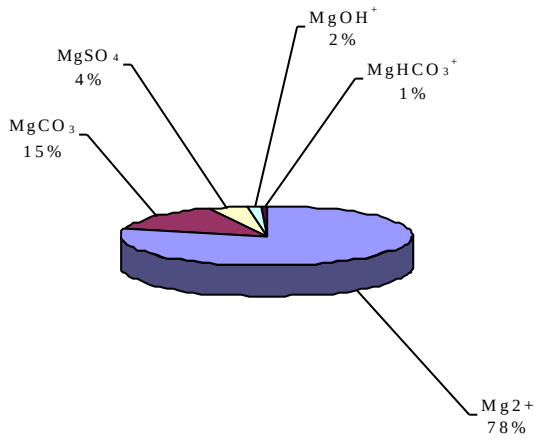
II. 5.5-6.5 m



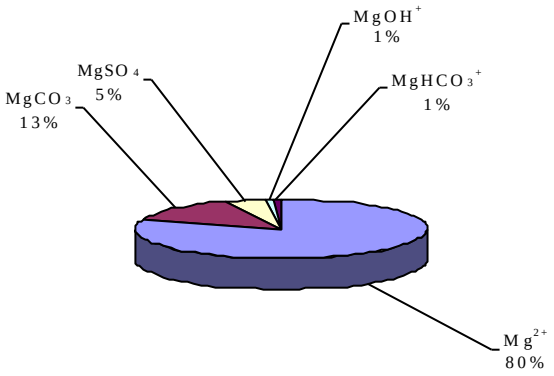
II. 6.5-7.5 m



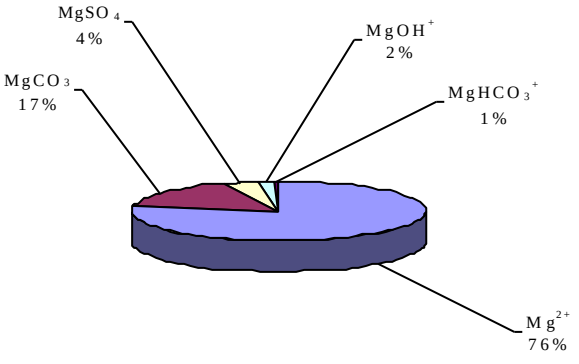
II. 7.5-8.5 m



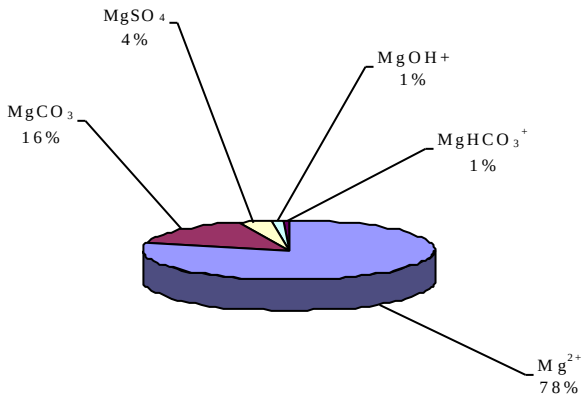
II. 8.5-9.5 m



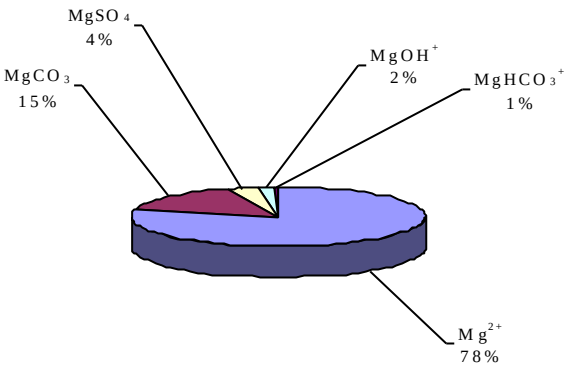
II. 9.5-10.5 m



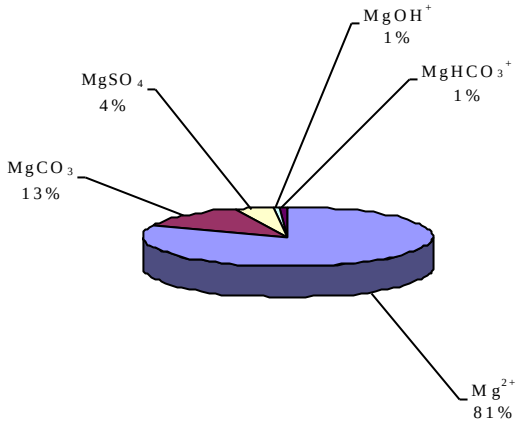
II. 10.5-11.5 m



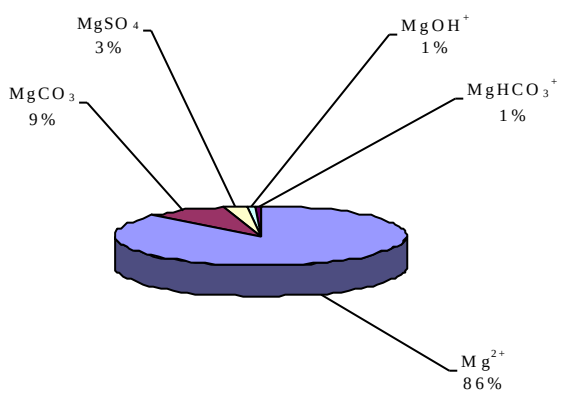
II. 11.5-12.5 m



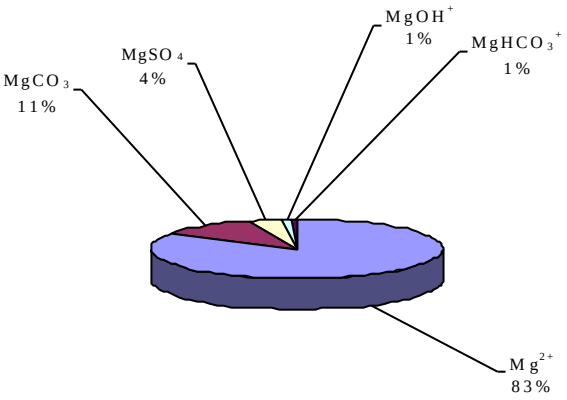
II. 12.5-13.5 m



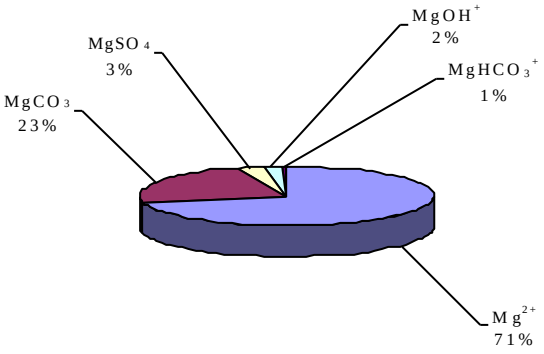
II. 13.5-14.5 m



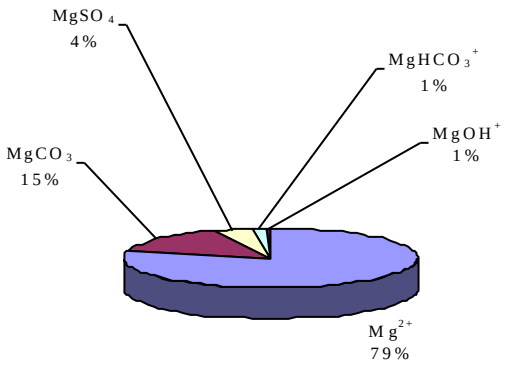
II. 14.5-15.5 m



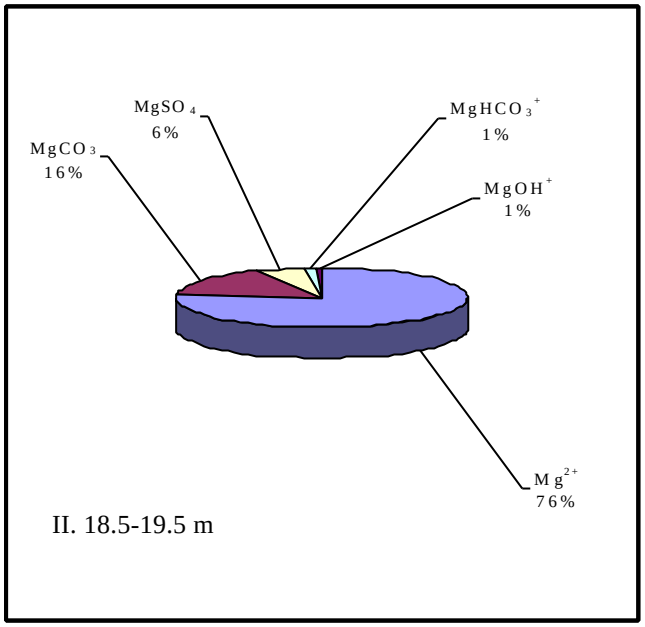
II. 15.5-16.5 m



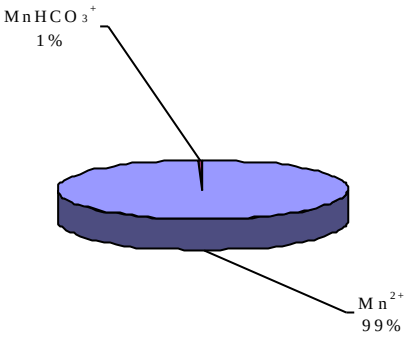
II. 16.5-17.5 m



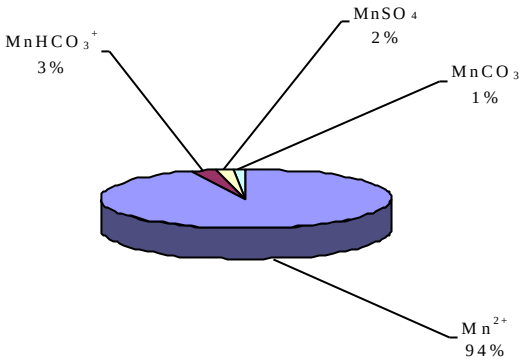
II. 17.5-18.5 m



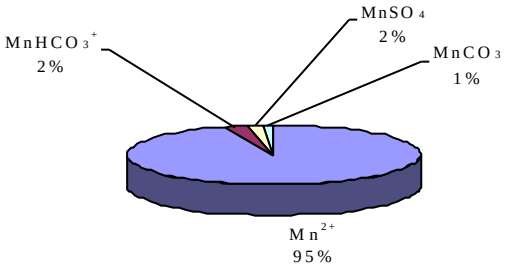
II. 18.5-19.5 m



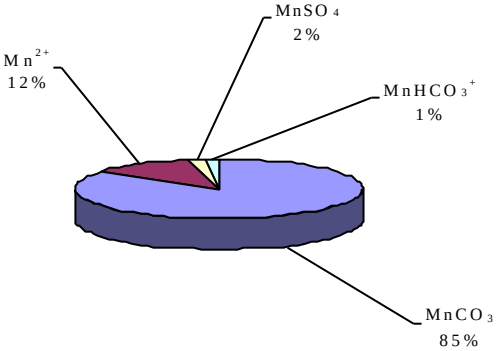
II. 0-0.5 m



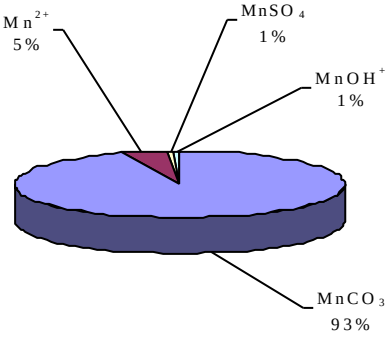
II. 3.5-4.5 m



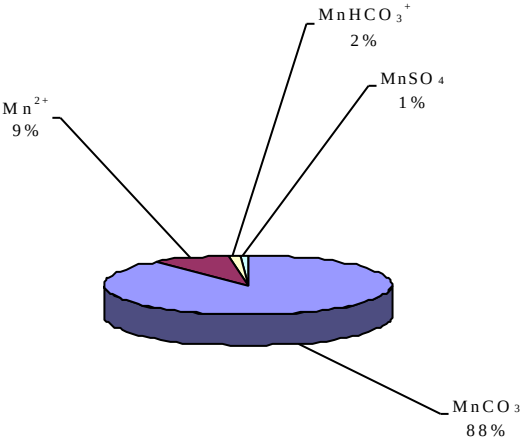
II. 4.5-5.5 m



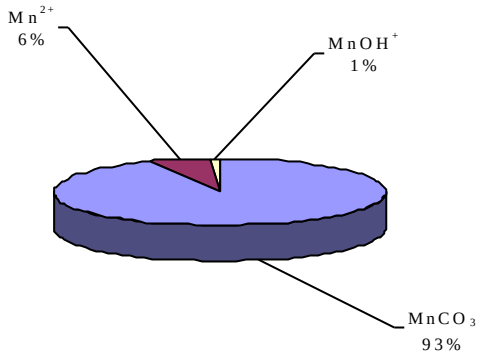
II. 5.5-6.5 m



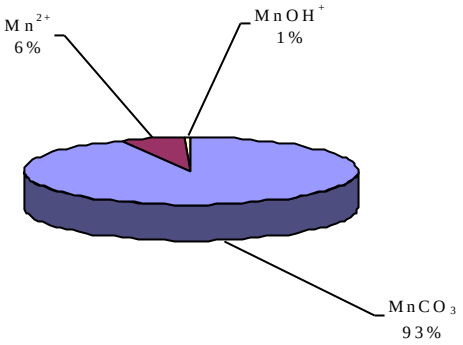
II. 6.5-7.5 m



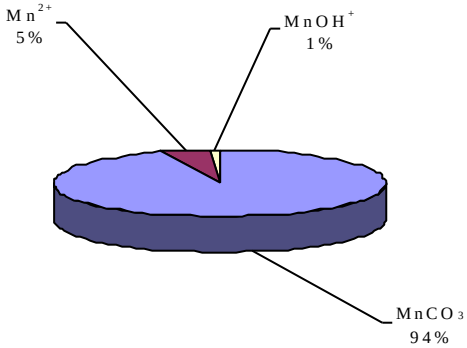
II. 7.5-8.5 m



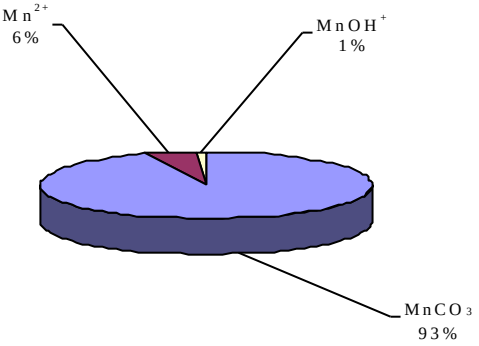
II. 8.5-9.5 m



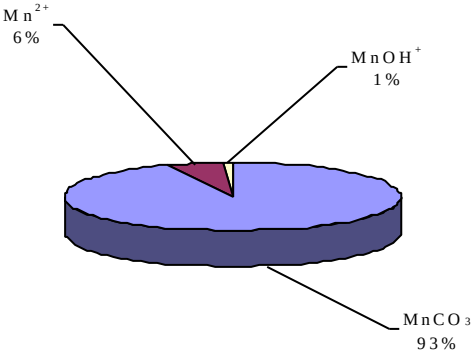
II. 9.5-10.5 m



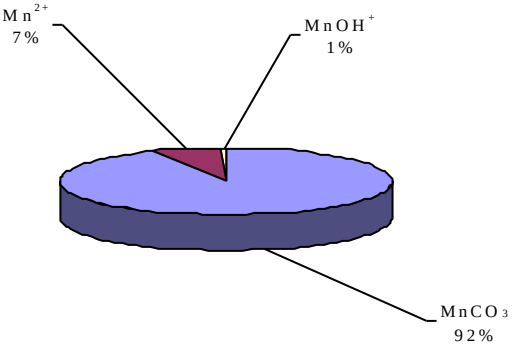
II. 10.5-11.5 m



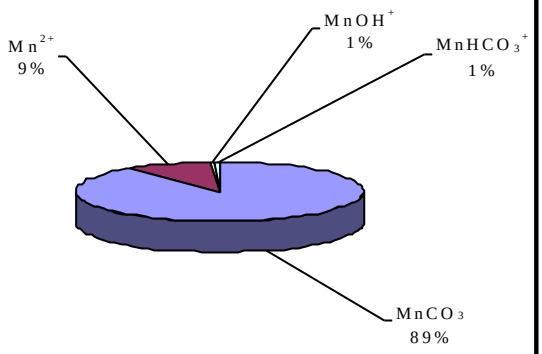
II. 11.5-12.5 m



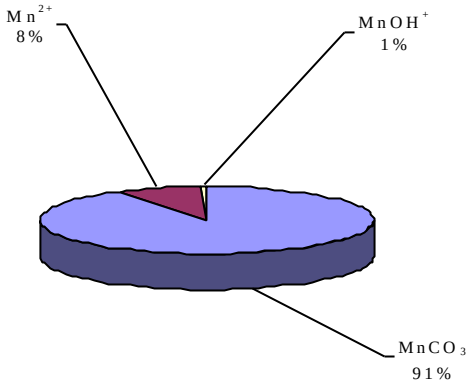
II. 12.5-13.5 m



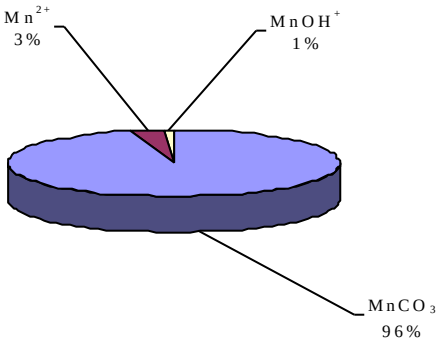
II. 13.5-14.5 m



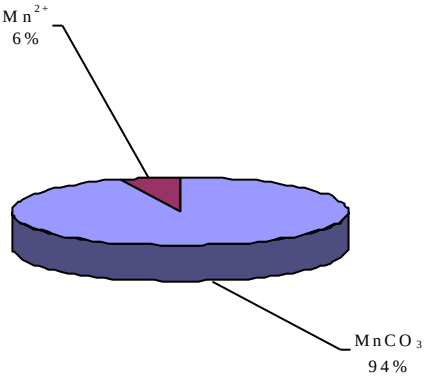
II. 14.5-15.5 m



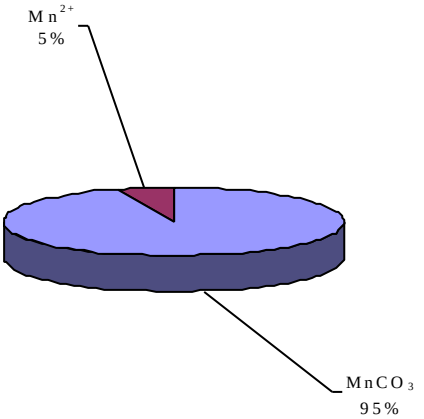
II. 15.5-16.5 m



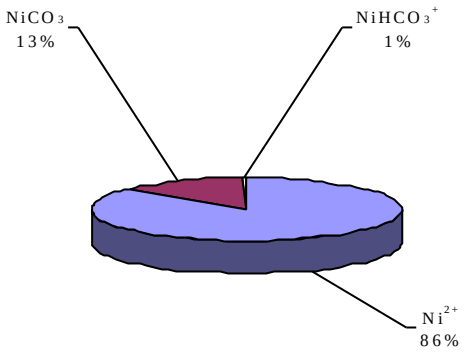
II. 16.5-17.5 m



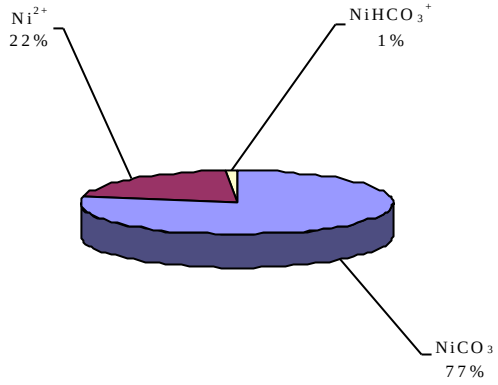
II. 17.5-18.5 m



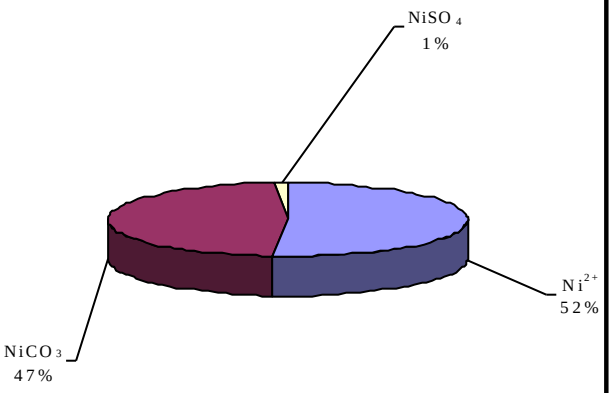
II. 18.5-19.5 m



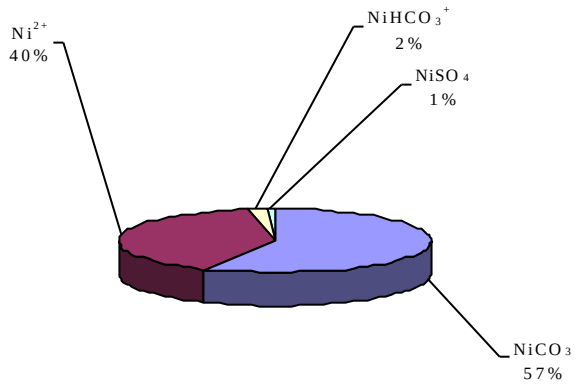
II. 0-0.5 m



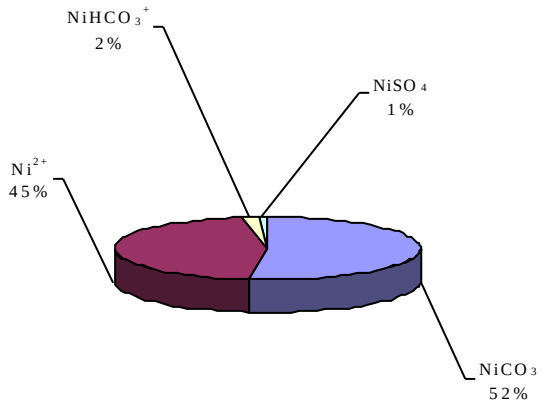
II. 0.5-1.5 m



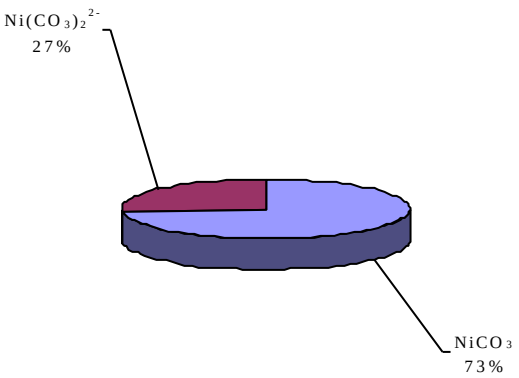
II. 2.5-3.5 m



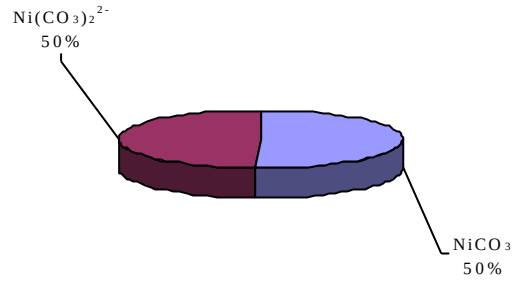
II. 3.5-4.5 m



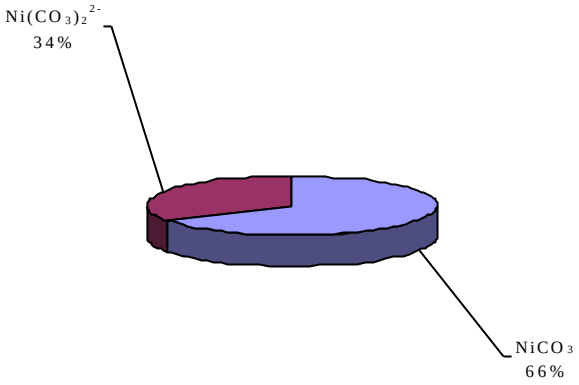
II. 4.5-5.5 m



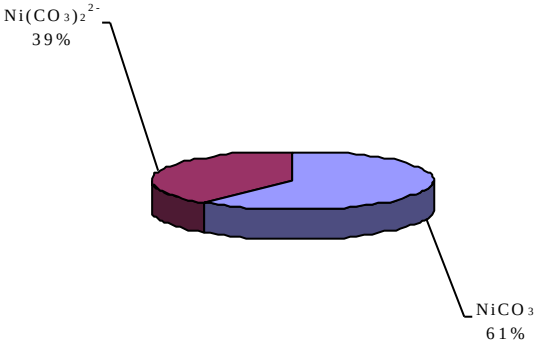
II. 5.5-6.5 m



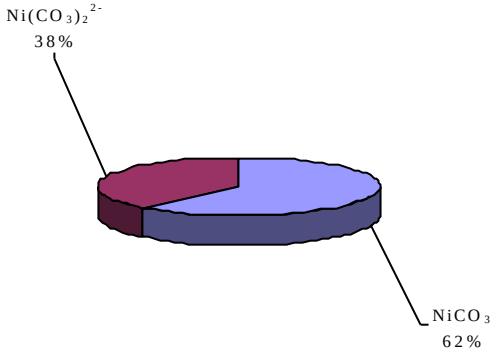
II. 6.5-7.5 m



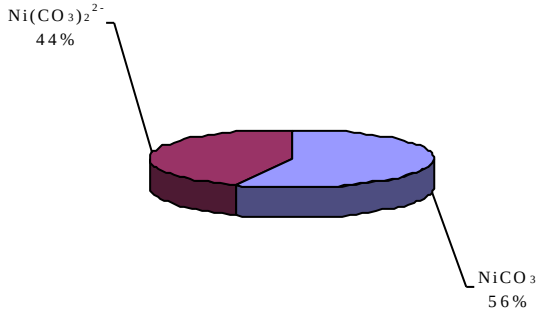
II. 7.5-8.5 m



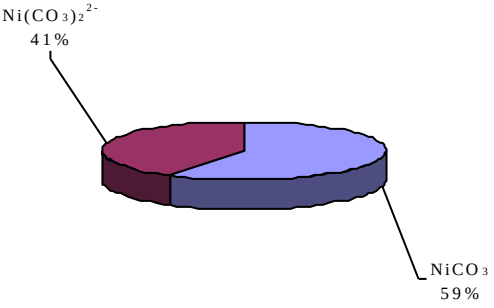
II. 8.5-9.5 m



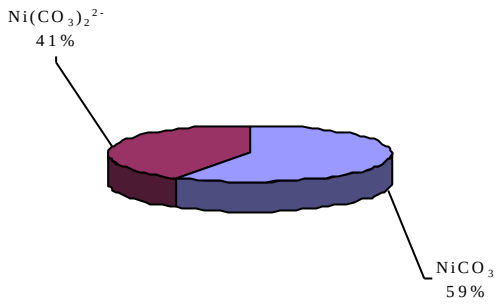
II. 9.5-10.5 m



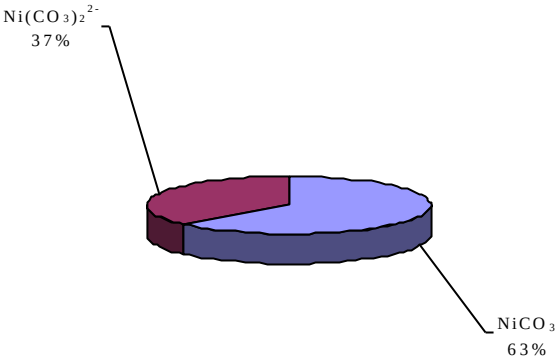
II. 10.5-11.5 m



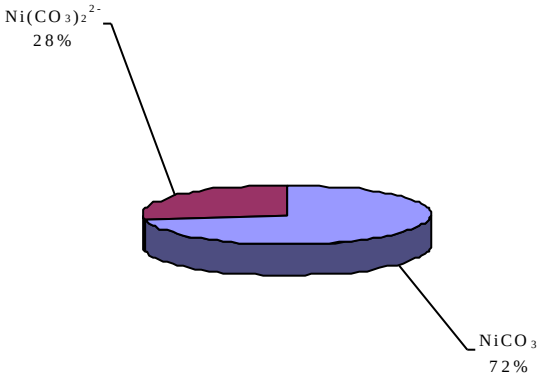
II. 11.5-12.5 m



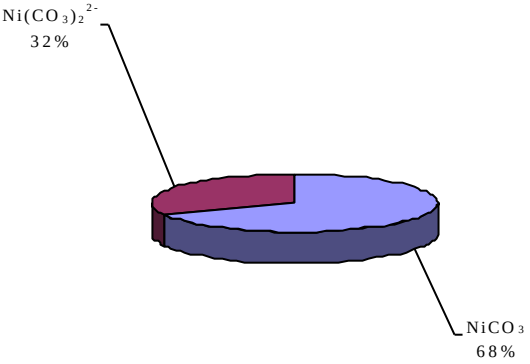
II. 12.5-13.5 m



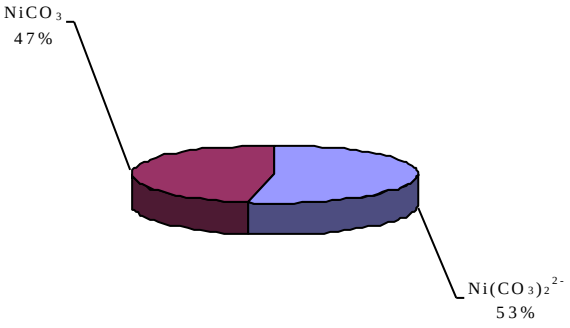
II. 13.5-14.5 m



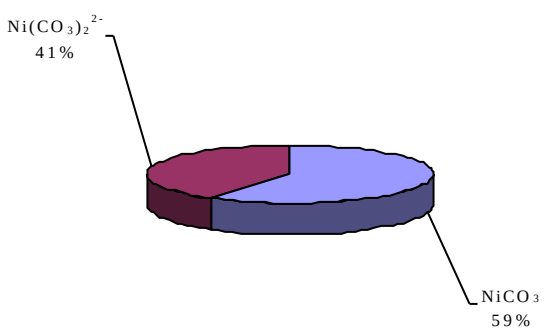
II. 14.5-15.5 m



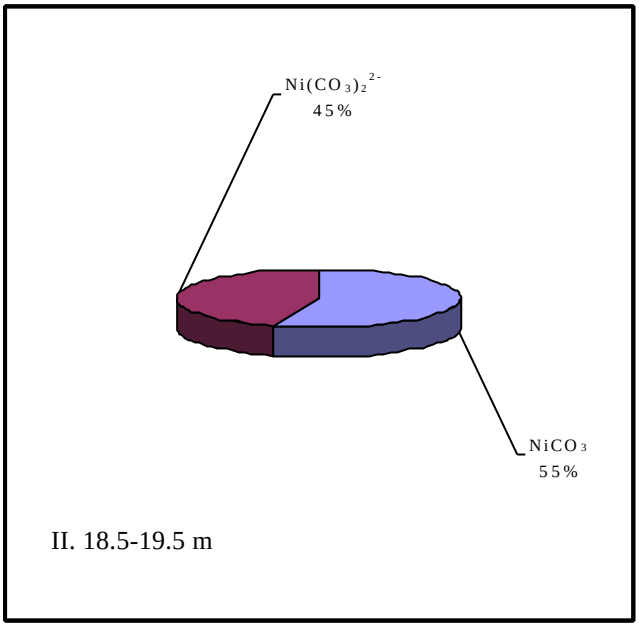
II. 15.5-16.5 m



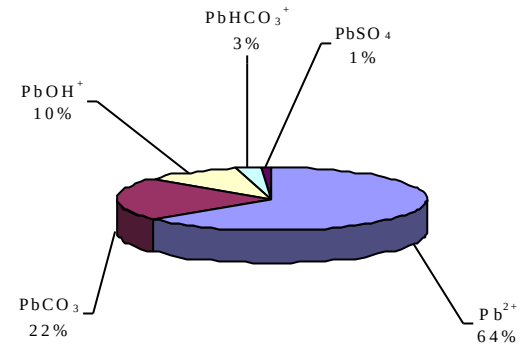
II. 16.5-17.5 m



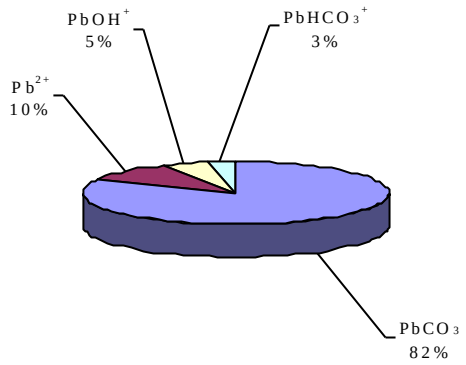
II. 17.5-18.5 m



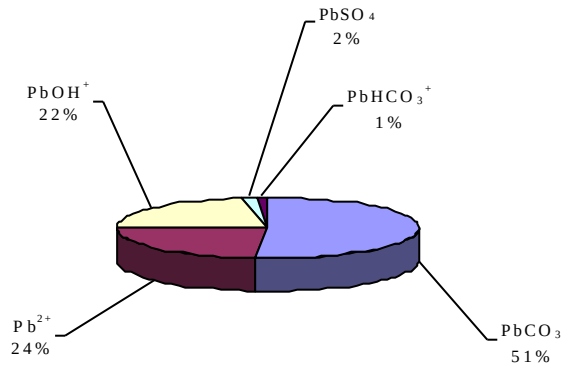
II. 18.5-19.5 m



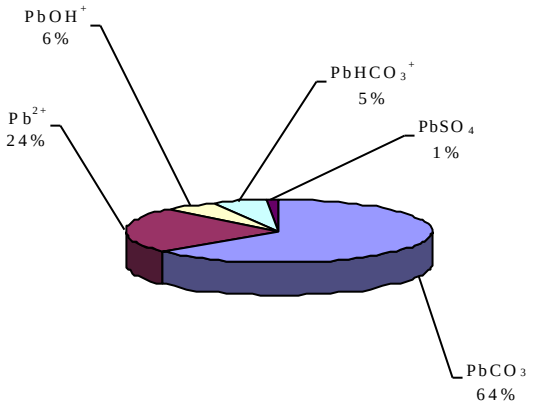
II. 0-0.5 m



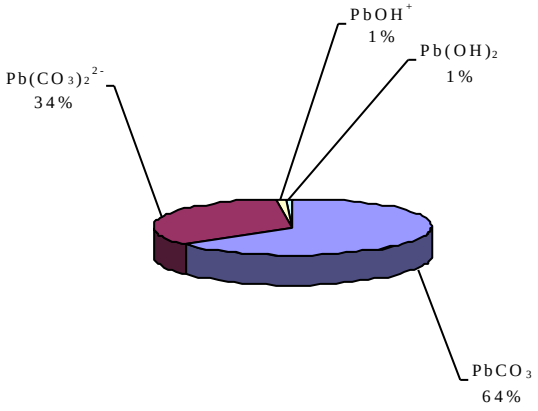
II. 0.5-1.5 m



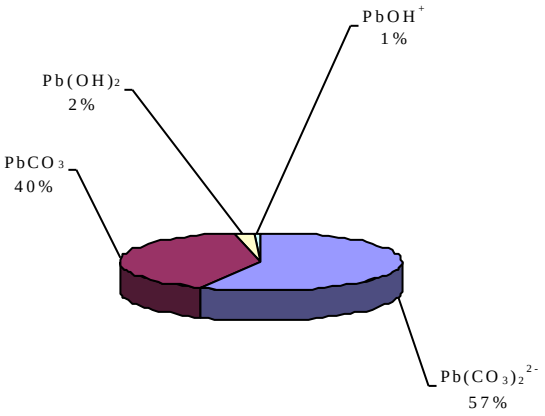
II. 2.5-3.5 m



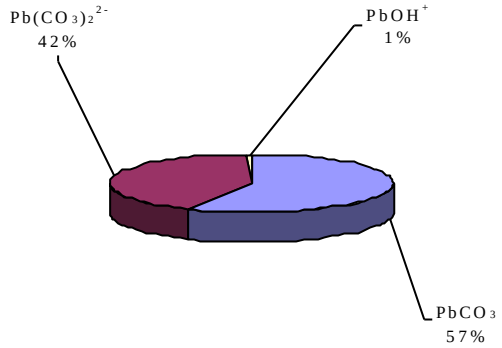
II. 4.5-5.5 m



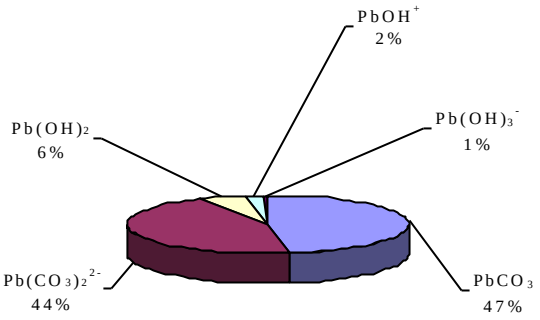
II. 5.5-6.5 m



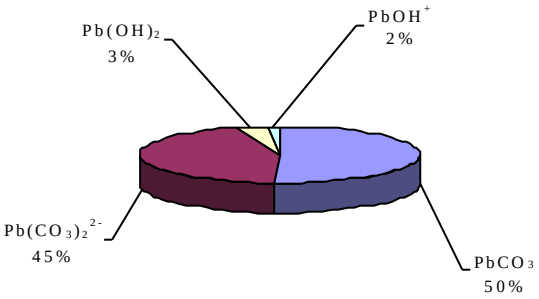
II. 6.5-7.5 m



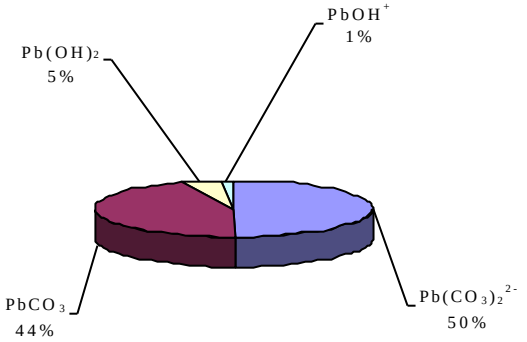
II. 7.5-8.5 m



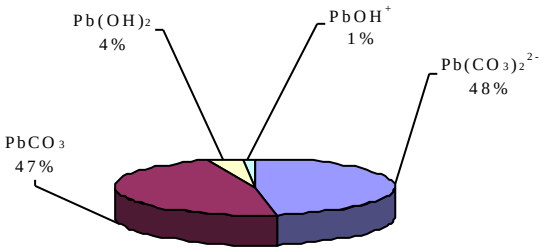
II. 8.5-9.5 m



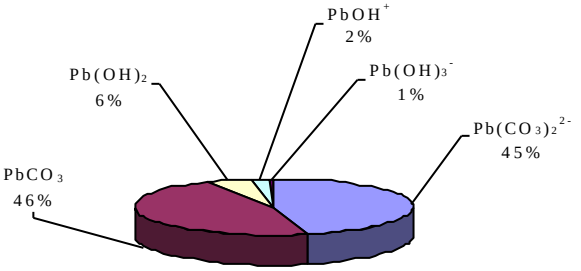
II. 9.5-10.5 m



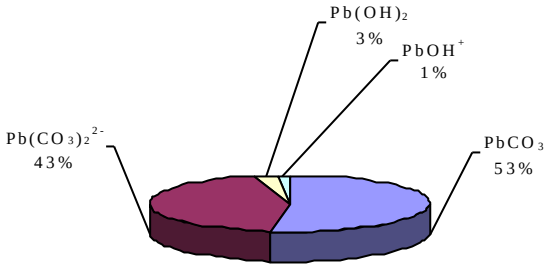
II. 10.5-11.5 m



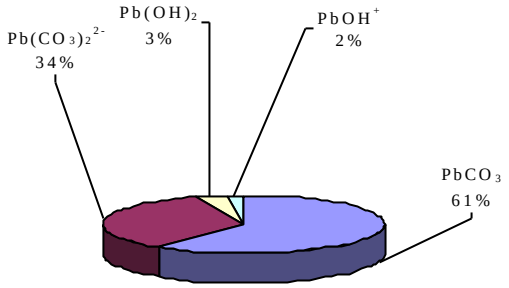
II. 11.5-12.5 m



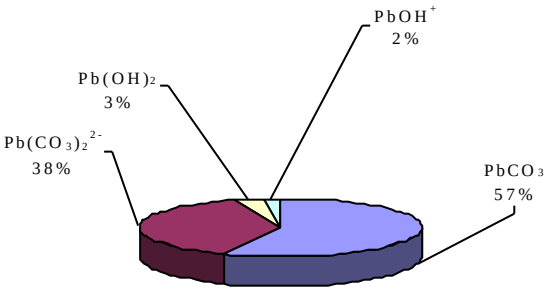
II. 12.5-13.5 m



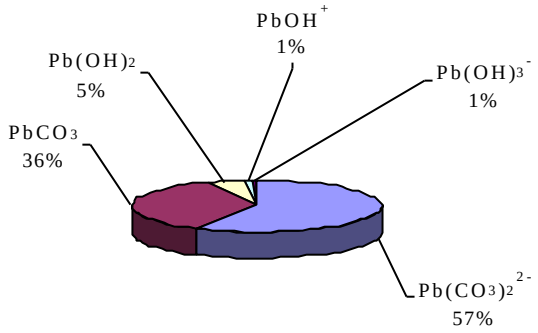
II. 13.5-14.5 m



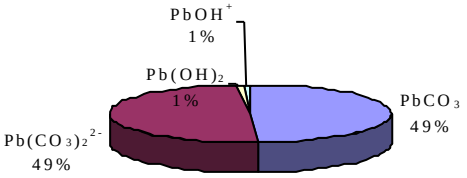
II. 14.5-15.5 m



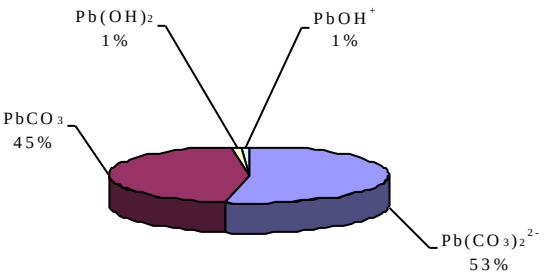
II. 15.5-16.5 m



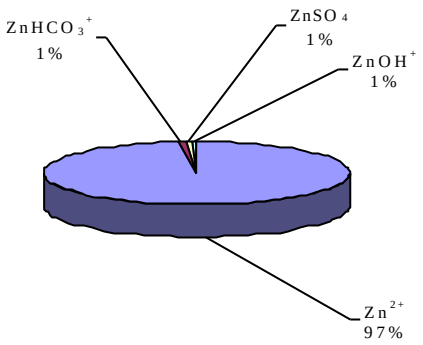
II. 16.5-17.5 m



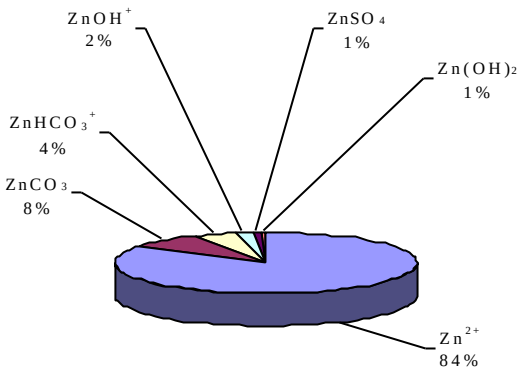
II. 17.5-18.5 m



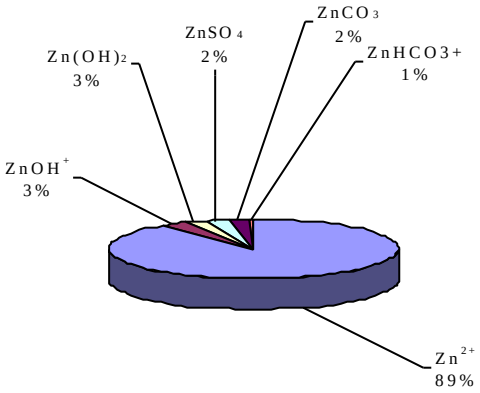
II. 18.5-19.5 m



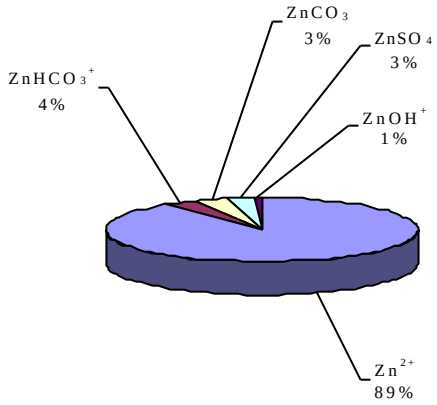
II. 0-0.5 m



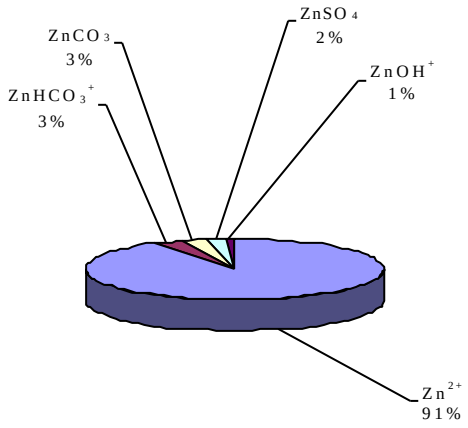
II. 0.5-1.5 m



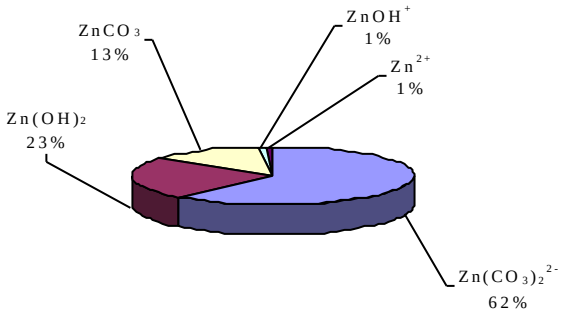
II. 2.5-3.5 m



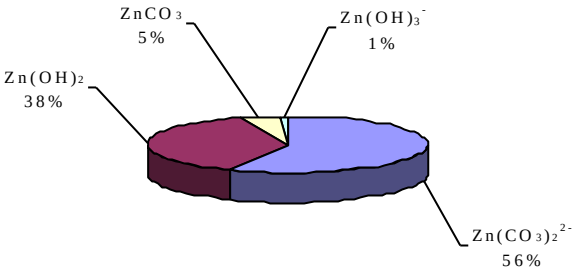
II. 3.5-4.5 m



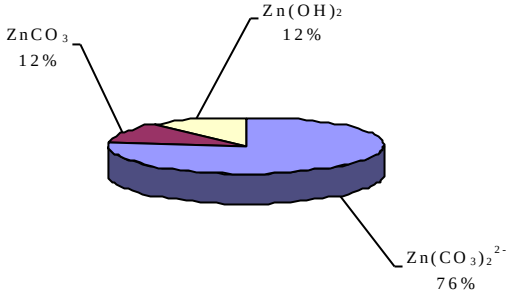
II. 4.5-5.5 m



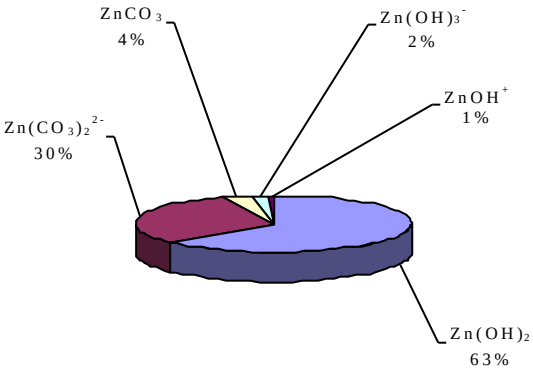
II. 5.5-6.5 m



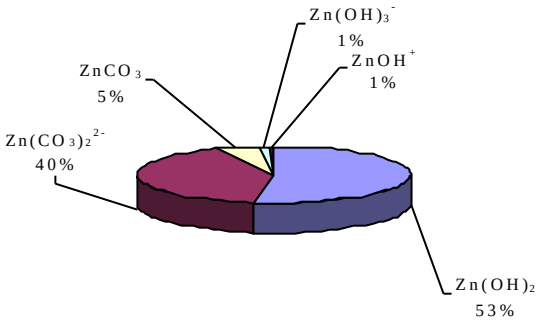
II. 6.5-7.5 m



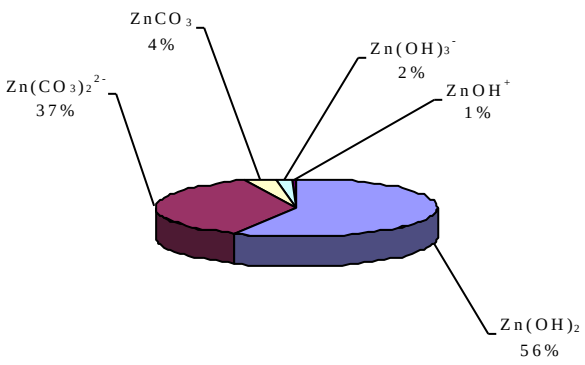
II. 7.5-8.5 m



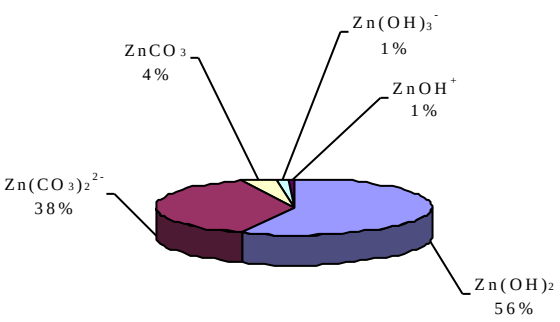
II. 8.5-9.5 m



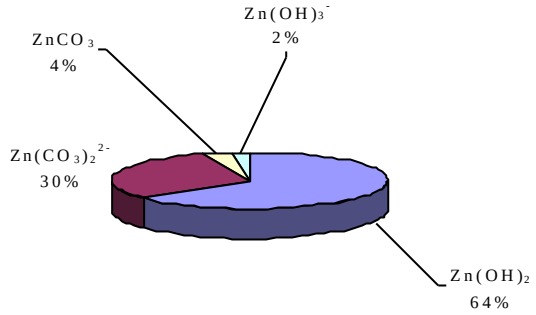
II. 9.5-10.5 m



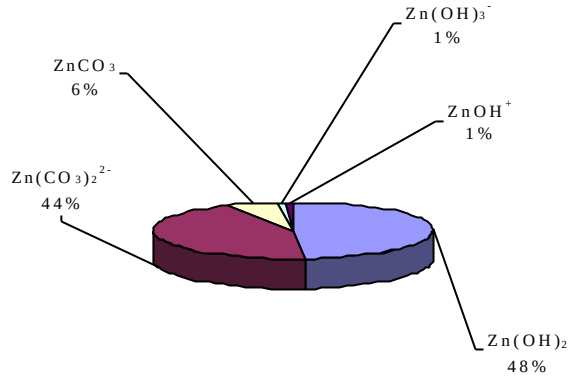
II. 10.5-11.5 m



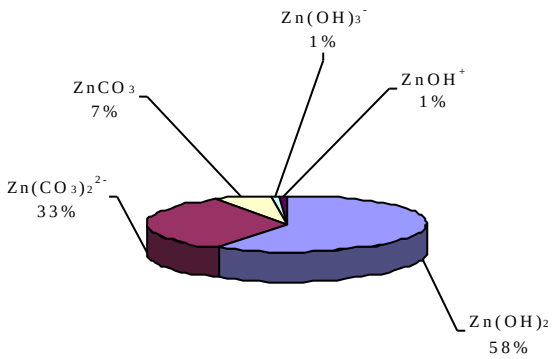
II. 11.5-12.5 m



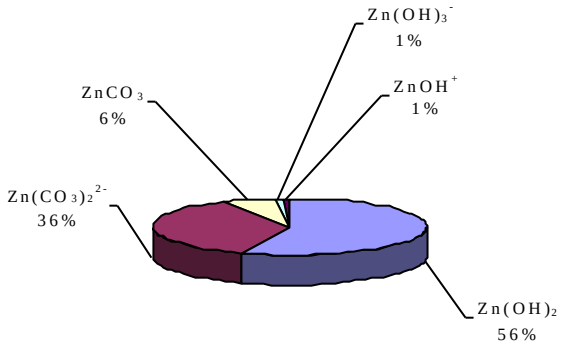
II. 12.5-13.5 m



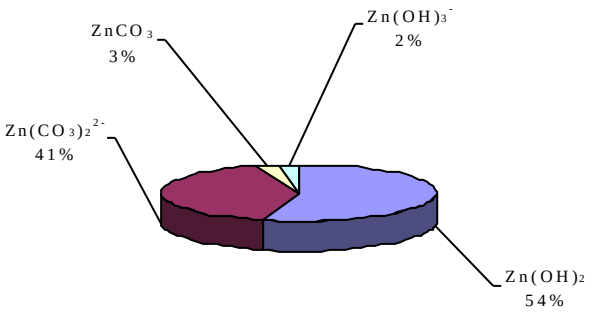
II. 13.5-14.5 m



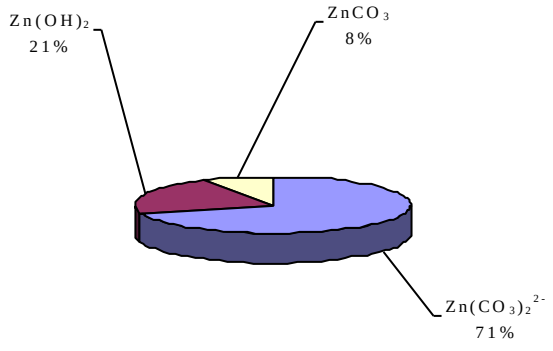
II. 14.5-15.5 m



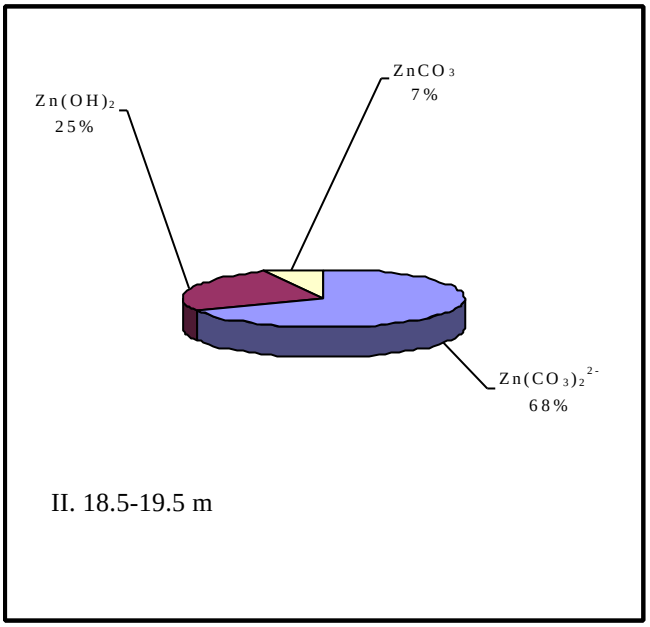
II. 15.5-16.5m



II. 16.5-17.5 m



II. 17.5-18.5 m



II. 18.5-19.5 m