

- APPENDIX -

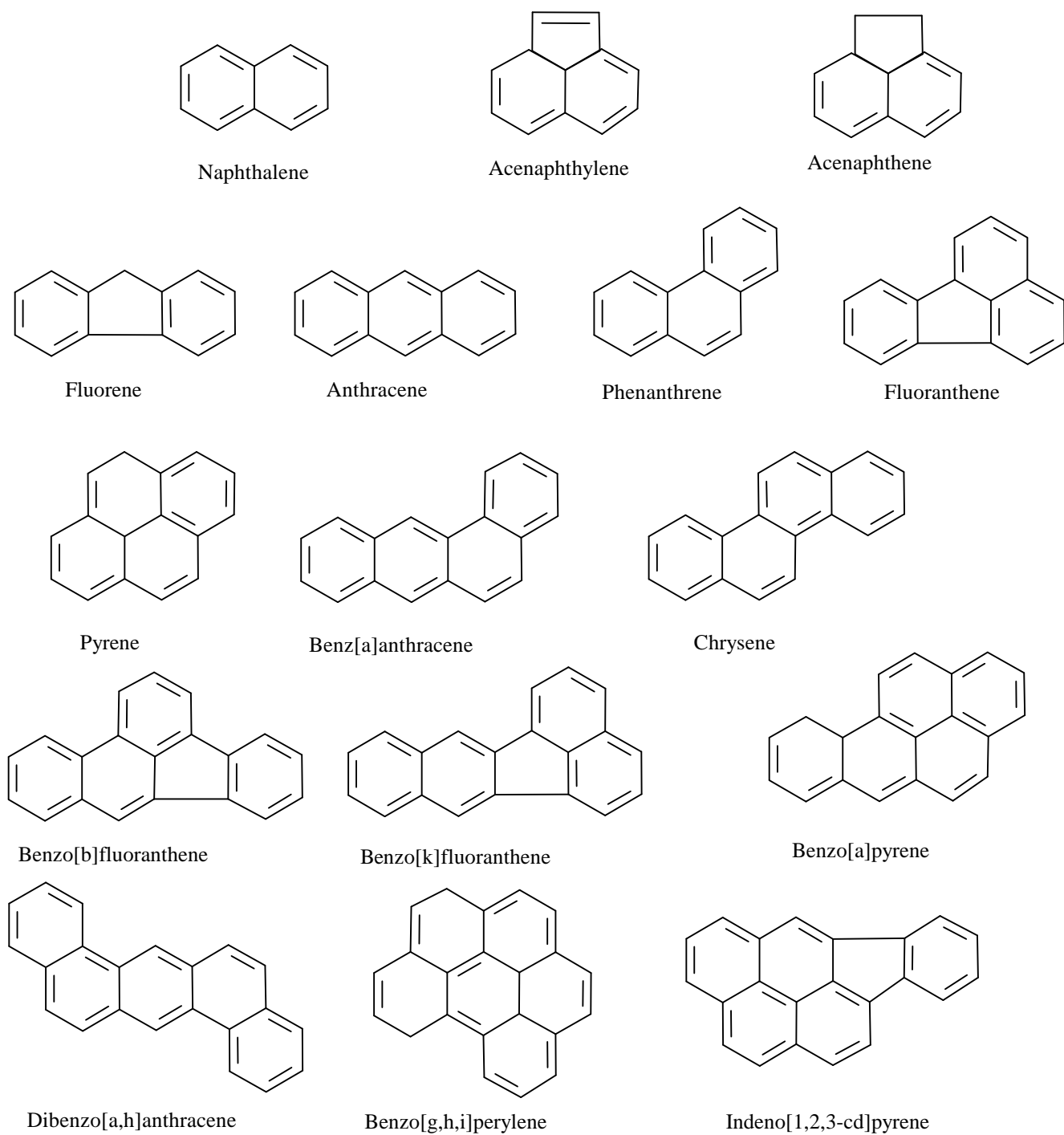


Fig. A1: Chemical structures of priority polyaromatic hydrocarbons (PAH)

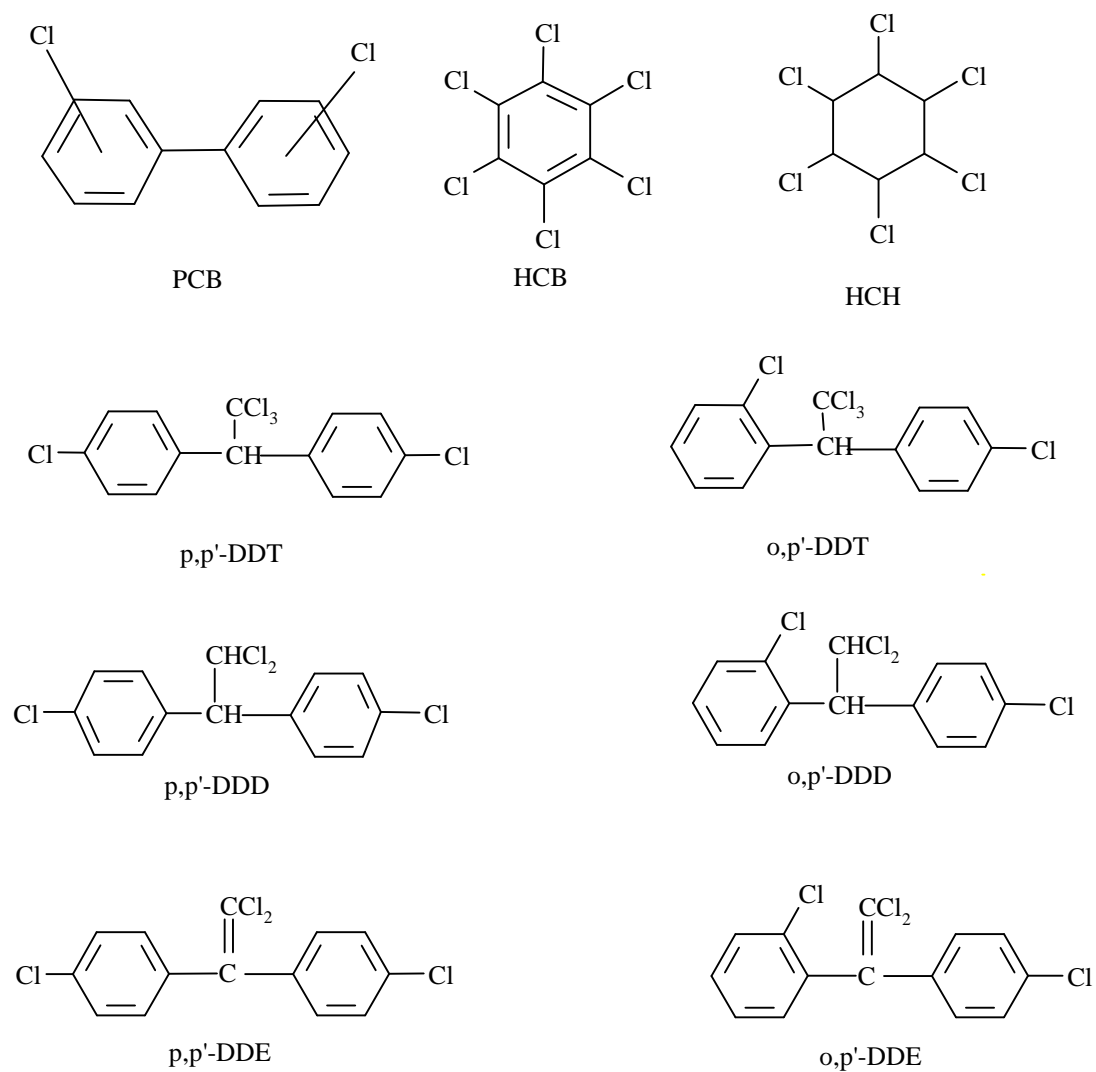


Fig. A2: Chemical structures of polychlorinated biphenyls (PCB), hexachlorocyclohexane (HCH), Hexachlorocyclohexane (HCB), and DDT-metabolites

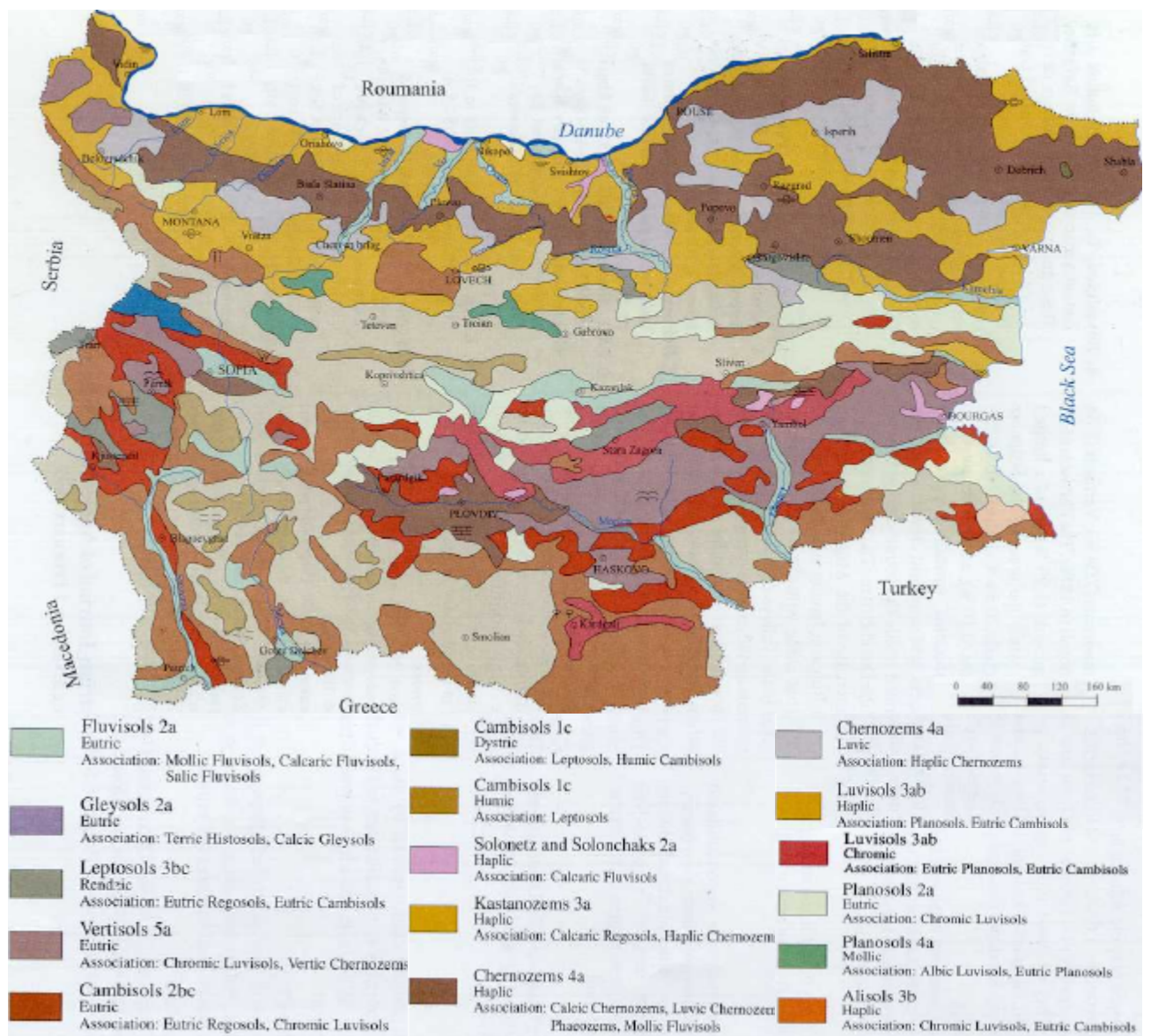


Fig. A3: Soil map of Bulgaria according FAO-UNESCO-IRSIC revised legend (Boyadgiev 1997)



Profile 1: Orthic Luvisol



Profile 2: Eutric Fluvisol



Profile 3: Calcic Fluvisol



Profile 4: Cambisol



Profile 5: Cambisol

Fig. A4: Pictures of studied soil profiles.

Tab. A5: Concentration of Cd, Cu, Ni, Pb, and Zn in whole soil of studied profiles.

Profile	Horizon	Cd	Cu	Fe	Ni	Mn	Pb	Zn
		mg/kg						
1	Ap	2	167	34892	47	425	38	65
	B ₁	2	82	45240	74	339	29	76
	B ₂	2	63	47110	72	297	26	116
	C ₁	3	39	51250	74	317	28	114
2	Ap	2	180	36510	54	1380	33	93
	A ^{II}	2	168	38070	41	1350	29	115
	A ^{III}	2	49	39760	44	1510	19	90
	AC	1	21	41840	47	1470	19	99
	AC ₂	2	23	41340	47	1370	21	221
3	Ap	32	136	17650	34	450	1370	1890
	A	16	82	17750	33	454	630	1180
	aC	<1	15	14970	27	340	44	70
	C ₁	<1	16	14720	28	330	42	60
	C ₂	<1	17	13850	36	270	55	80
4	Ah	<1	34	37440	80	930	42	153
	A	<1	33	35650	74	850	35	87
	AB	<1	33	45630	100	970	33	95
	BC	1	39	45980	110	760	36	102
	C	1	48	49440	115	890	69	98
5	Ah	<1	<10	22940	15	660	41	70
	Af	<1	<10	25760	15	650	39	70
	ABf	<1	<10	28990	18	530	29	72

Tab. A6: Concentration of Cd, Cu, Ni, Pb, and Zn in particle size fraction separate from main soil horizons of studied profiles.

Profile	Horizons	Particles, mm	Cd	Cu	Fe	Ni	Mn	Pb	Zn
			mg/kg						
1	Ap	2.0-0.2	1	51	17254	20	520	26	29
		0.2-0.02	2	204	37461	51	409	32	94
		0.02-0.002	3	307	47930	71	460	37	130
		<0.002	3	274	52057	82	403	47	189
	B ₁	2.0-0.2	1	33	18760	37	510	<20	35
		0.2-0.02	2	112	44640	73	460	34	113
		0.02-0.002	3	150	52090	88	310	25	120
<0.002		4	146	65520	112	205	45	180	
2	Ap	2.0-0.2	2	55	37710	55	1610	26	95
		0.2-0.02	2	256	34560	39	1090	30	150
		0.02-0.002	2	258	39980	44	1200	25	125
		<0.002	2	309	43180	61	1550	46	265
	A ^{II}	2.0-0.2	2	56	41190	42	1760	32	89
		0.2-0.02	2	228	35770	34	1230	30	121
		0.02-0.002	2	250	40630	43	1190	35	120
		<0.002	2	298	42680	86	1300	42	408
	A ^{III}	2.0-0.2	2	16	43410	44	1600	19	100
		0.2-0.02	3	41	39220	37	1270	17	97
		0.02-0.002	2	65	42080	47	1350	21	130
		<0.002	3	86	47290	65	1900	38	239
	AC	2.0-0.2	2	15	43620	47	1610	17	92
		0.2-0.02	1	28	40210	40	1270	14	104
		0.02-0.002	2	54	40856	44	1290	23	113
		<0.002	3	99	51380	70	1940	36	236
	AC ₂	2.0-0.2	2	14	44290	47	1590	19	98
		0.2-0.02	2	29	41080	43	1200	17	138
		0.02-0.002	2	61	42990	48	4220	32	120
		<0.002	2	110	47960	76	1590	41	280
3	Ap	2.0-0.2	3	16	5551	15	170	188	204
		<0.2	60	268	26161	72	759	2731	3872
	A	2.0-0.2	5	27	8208	20	243	238	389
		<0.2	14	76	15109	35	401	568	1074
	aC	2.0-0.2	<1	11	9056	23	261	31	44
		<0.2	<1	21	15295	38	395	55	69
	C ₁	2.0-0.2	<1	10	7865	21	234	26	35
		<0.2	<1	20	12535	29	311	45	58
	C ₂	2.0-0.2	<1	7	7126	18	198	24	34
		<0.2	<1	19	13416	31	299	61	87

**Continue Tab. A6: Concentration of Cd, Cu, Ni, Pb, and Zn in particle size fraction
separate from main soil horizons of studied profiles.**

Profile	Horizons	Particles, mm	Cd	Cu	Fe	Ni	Mn	Pb	Zn
			mg/kg						
4	Ah	2.0-0.2	<1	22	27300	69	600	25	69
		0.2-0.02	1	120	39850	84	820	49	167
		0.02-0.002	<1	96	42850	85	920	43	150
		<0.002	1	82	55530	98	1150	78	297
	A	2.0-0.2	<1	21	23300	64	710	30	69
		0.2-0.02	1	73	38240	79	890	47	118
		0.02-0.002	<1	91	46660	88	910	82	149
		<0.002	1	75	53270	99	1000	78	780
	AB	2.0-0.2	<1	28	32200	81	630	30	75
		0.2-0.02	1	62	40960	96	1090	39	112
		0.02-0.002	<1	83	50540	120	1010	67	136
		<0.002	2	67	72260	135	1230	55	300
	BC	2.0-0.2	<	40	41090	107	570	31	94
		0.2-0.02	<	60	40520	110	690	30	127
		0.02-0.002	1	91	48240	116	910	65	136
		<0.002	1	77	65310	128	1320	51	322
5	Ah	2.0-0.2	<1	<10	15790	8	620	28	47
		0.2-0.02	<1	12	16350	8	390	27	62
		0.02-0.002	<1	75	28930	20	690	48	122
		<0.002	<1	95	38860	33	950	104	690
	Af	2.0-0.2	<1	<10	17830	9	610	20	51
		0.2-0.02	<1	10	17730	10	440	30	107
		0.02-0.002	<1	71	35320	23	790	92	287
		<0.002	<1	86	40390	34	950	97	740
	ABf	2.0-0.2	<1	<10	28000	15	480	21	73
		0.2-0.02	<1	19	30140	19	490	27	90
		0.02-0.002	<1	57	32900	30	630	56	119
		<0.002	<1	54	39900	33	880	55	100

Tab. A7: Chemical composition of investigated soil profiles.

Profile	Horizon	Depth cm	SiO ₂	TiO ₂	Al ₂ O ₃	Fe ₂ O ₃	MgO	CaO	Na ₂ O	K ₂ O	P ₂ O ₅
			%								
1	Ap	0-23	64.5	0.835	16.77	6.470	1.362	0.686	1.396	2.291	0.121
	B ₁	23-44	58.0	0.693	19.10	7.900	1.822	0.910	1.214	2.144	0.062
	B ₂	44-60	57.9	0.770	18.80	8.212	2.131	0.888	1.363	2.587	0.067
	C ₁	60-75	58.0	0.842	18.56	8.191	2.275	1.039	1.550	3.374	0.242
2	Ap	0-29	58.6	0.963	17.54	7.183	1.852	0.565	1.353	2.390	0.239
	A ^{II}	29-52	60.0	0.953	17.84	7.253	1.847	0.488	1.427	2.316	0.212
	A ^{III}	52-72	61.2	0.970	18.42	7.541	2.022	0.590	1.438	2.341	0.092
	AC	72-95	60.6	0.913	18.63	7.592	2.055	0.609	1.467	2.488	0.041
	AC ₂	95-118	60.8	0.970	18.78	7.635	2.140	0.654	1.467	2.291	0.058
3	Ap	0-28	52.9	0.393	10.75	3.501	2.389	11.73	1.632	1.799	0.162
	A	28-44	52.6	0.398	10.75	3.421	2.432	12.850	1.666	1.627	0.129
	aC	44-67	43.2	0.337	9.15	2.857	2.673	19.090	1.437	1.429	0.103
	C ₁	67-100	41.4	0.334	8.93	2.731	2.828	20.300	1.428	1.683	0.118
	C ₂	100-↓	43.3	0.298	8.15	2.562	2.517	20.120	1.417	1.301	0.073
4	Ah	0-10	58.0	0.711	15.19	6.131	2.135	0.297	0.553	1.874	0.216
	A	10-25	53.8	0.773	15.53	6.071	1.935	0.203	0.595	2.193	0.295
	AB	25-55	59.6	0.903	18.11	7.100	2.431	0.161	0.633	2.256	0.111
	BC	55-70	56.9	0.934	19.08	7.400	2.700	0.114	0.648	2.702	0.145
	C	70-↓	56.5	1.083	20.49	7.65	2.455	0.047	0.646	2.829	0.099
5	Ah	0-8	54.3	0.626	15.68	4.043	0.892	0.454	1.607	2.002	0.261
	A	8-30	60.0	0.682	16.49	4.067	0.912	0.376	1.755	2.511	0.253
	AB	30-60	60.8	0.835	20.62	4.802	1.320	0.431	2.070	1.970	0.118
	C	60-↓	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.

Tab. A8: Chemicals and Materials

Name	Formula	Quality	Produce
Acetic acid	CH ₃ COOH	100%, suprapur ®	MERCK KGaA
Aceton	C ₃ H ₆ O	for Residue Analysis	PROMOCHEM GmbH
Hydrochloric acid	HCl	30%, suprapur ®	MERCK KGaA
Dichlormethan	CH ₂ Cl	for Residue Analysis	PROMOCHEM GmbH
Hexan	C ₆ H ₁₄	for Residue Analysis	PROMOCHEM GmbH
Kiesel gel 60		0.015-0.040 mm	MERCK KGaA
Lithium meta-borate	BLiO ₂	98%, suprapur	MERCK KGaA
Methanol	CH ₃ OH	for Residue Analysis	PROMOCHEM GmbH
Nitric acid	HNO ₃	65%, suprapur ®	MERCK KGaA
Penthan	C ₅ H ₁₂	for Residue Analysis	PROMOCHEM GmbH

Tab. A9: Instruments

Instrument	Name	Produce
Gaschromatograph Massspectrometric detector Autosampler	HP 5890II series HP 5971A HP 7673	HEWLETT PACKARD
ICP-AES	SPECTROFLAME	SECTRO ANALYTICAL -Instruments
pH/Eh -Meter	pH Meter 91	WTW
Rotary-evaporator Vacuum pomp	VV 2000 CVC 2	HEIDOLPH VACUUMBRAND
Laboratory drier	UT 6200	HERAEUS Instruments
Centrifuge	Biofuge primo	HERAEUS Instruments
Ultrasonic bath	Sonorex Super RU 514	BAUDELIN