WAGENINGEN EVALUATING PROGRAMS

FOR ANALYTICAL LABORATORIES

Certificate of Analysis

International Sediment Exchange for Tests on Organic Contaminants

REFERENCE MATERIAL

SETOC sample 713

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis SETOC 713

General Information

In this report an overview is given of analytical data for this sample collected in our proficiency testing program. The consensus values are calculated using a robust statistical model. With this NDA model, the mean and standard deviation are calculated using all reported data when at least 4 results are left after removal of reported 'lower than' (<) and 0 (= zero) values. No outliers are removed.

This report is divided into two sections: Consensus Values and Indicative Values. The division is made on the reliability of the data. Consensus Values are based on at least 8 results and a maximum relative uncertainty of 6.25%. Indicative Values are based on a maximum relative uncertainty of 35% and a minimum of 4 and maximum of 7 results, or a relative uncertainty greater than 6.25% when there are at least 8 results.

For each determinand the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median, MAD (Median of Absolute Deviation), the uncertainty of the mean (consensus or indicative) value and the relative uncertainty.

All values, expressed on a weight basis (kg or %), are reported as oven-dried (105°C) material. Moisture is reported in the material as received.

Sample information

WEPAL reference materials are from natural sources only. There is no spiking, mixing or other alterations of the samples. For sample preparation, the SETOC samples are dried at 40°C and milled to pass a 0.5 mm sieve.

This SETOC sample 713 of Marine Sediment, from Netherlands, is prepared for the WEPAL proficiency programs. The sample has been used in 6 periods (or rounds). Only results from the last 5 periods are used. This way, the consensus values reflect the latest 'state of the art' analytical techniques used by the laboratories. The results on which the values in this report are based were taken from the periods given in the following table:

Year	Round	Number
2001	2	4
1999	3	4
1998	1	1
1996	3	1
1995	4	3

Consensus Values SETOC 713

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
phenanthrene	µg/kg	16.0	9.96	62.1	170	20.0	6.55	0.955	5.95
fluoranthene	µg/kg	19.4	8.31	43.0	191	20.0	5.00	0.752	3.88
pyrene	µg/kg	14.2	6.47	45.6	168	16.0	4.00	0.624	4.40
benzo(b)fluoranthene	µg/kg	23.0	8.64	37.6	184	24.5	5.55	0.797	3.46
benzo(k)fluoranthene	µg/kg	9.42	4.44	47.1	138	12.0	2.21	0.472	5.02
benzo(a)pyrene	µg/kg	10.0	4.30	43.0	158	12.0	2.00	0.427	4.27
indeno(1,2,3-cd)pyrene	µg/kg	18.7	8.73	46.6	169	20.7	5.30	0.840	4.48
benzo(ghi)perylene	µg/kg	17.9	8.51	47.6	173	20.0	5.20	0.809	4.52

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
AOX	mg/kg	33.2	7.30	22.0	26	34.1	5.15	1.79	5.39
Particles < 2 µm	%	7.08	1.14	16.2	46	7.02	0.700	0.211	2.98
Particles < 63 µm	%	16.9	2.31	13.7	17	16.7	1.30	0.701	4.16

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	mg/kg	5.23	0.828	15.8	122	5.30	0.490	0.094	1.79
Cr	mg/kg	17.8	4.01	22.5	156	18.0	3.00	0.401	2.25
Cu	mg/kg	3.50	0.885	25.3	111	3.60	0.500	0.105	3.00
Ni	mg/kg	9.11	1.49	16.3	152	9.10	0.900	0.151	1.66
Pb	mg/kg	9.46	1.97	20.8	130	9.51	1.35	0.216	2.28
Zn	mg/kg	27.8	3.28	11.8	159	28.0	2.00	0.325	1.17

Indicative Values SETOC 713

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
naphthalene	µg/kg	6.95	5.79	83.3	88	10.7	5.26	0.771	11.1
acenaphthylene	µg/kg	0.979	1.83	187.2	30	1.49	1.23	0.418	42.7
acenaphthene	µg/kg	4.04	6.11	151.3	48	7.84	6.65	1.10	27.3
fluorene	µg/kg	2.88	3.14	109.1	64	3.81	2.34	0.491	17.0
anthracene	µg/kg	2.06	2.35	113.9	70	2.92	1.87	0.351	17.0
chrysene	µg/kg	7.32	5.00	68.3	123	12.0	4.00	0.564	7.70
benz(a)anthracene	µg/kg	6.92	3.97	57.4	125	11.0	3.58	0.444	6.42
dibenz(ah)anthracene	µg/kg	4.07	3.28	80.6	63	4.76	2.26	0.517	12.7

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PCB 028	µg/kg	0.243	0.310	127.9	15	0.680	0.380	0.100	41.3
PCB 052	µg/kg	0.442	0.300	67.8	14	1.34	1.05	0.100	22.7
PCB 101	µg/kg	0.377	0.723	191.6	22	1.10	0.750	0.193	51.1
PCB 118	µg/kg	0.241	0.391	162.6	15	0.890	0.670	0.126	52.5
PCB 138	µg/kg	0.494	0.714	144.5	28	1.00	0.660	0.169	34.1
PCB 153	µg/kg	0.586	0.737	125.7	26	1.05	0.550	0.181	30.8
PCB 180	µg/kg	0.351	0.642	183.0	24	1.00	0.725	0.164	46.7

Method: Organochlorine pesticides

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
p,p`-DDT	µg/kg	0.494	0.329	66.6	6	3.50	2.68	0.168	34.0

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Mineral oil, IR	mg/kg	13.5	10.6	79.0	29	18.0	7.00	2.47	18.3
Mineral oil, GC	mg/kg	14.8	12.6	85.2	20	20.7	9.99	3.53	23.8
EOX	mg/kg	0.084	0.085	101.2	63	0.160	0.070	0.013	15.9
Organic carbon	g/kg	3.24	2.11	65.3	32	3.33	1.37	0.467	14.4
Inorganic carbon	g/kg	4.88	1.81	37.1	15	5.30	0.900	0.585	12.0
Particles > 63 µm	%	79.8	3.54	4.4	7	81.0	2.00	1.67	2.10
CN - Total	mg/kg	0.100	0.227	226.3	9	0.200	0.180	0.095	94.3

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cd	mg/kg	0.046	0.055	120.1	27	0.060	0.040	0.013	28.9
Hg	mg/kg	0.024	0.019	76.1	48	0.030	0.010	0.003	13.7