WAGENINGEN EVALUATING PROGRAMS

FOR ANALYTICAL LABORATORIES

Certificate of Analysis

International Sediment Exchange for Tests on Organic Contaminants

REFERENCE MATERIAL

SETOC sample 715

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis SETOC 715

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 715 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
2009	2	4
2000	2	2
1998	2	2
1997	2	3
1996	2	2

Consensus Values SETOC 715

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Particles > 63 µm	%	98.6	0.763	0.8	10	98.5	0.450	0.302	0.306

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	mg/kg	1.34	0.353	26.4	78	1.36	0.235	0.050	3.74
Cr	mg/kg	13.1	4.08	31.3	145	13.0	2.80	0.424	3.25
Ni	mg/kg	1.29	0.525	40.9	80	1.39	0.370	0.073	5.71
Pb	mg/kg	3.49	0.862	24.7	89	3.50	0.500	0.114	3.27
Zn	mg/kg	4.64	1.71	36.8	107	5.28	1.08	0.206	4.45

Indicative Values SETOC 715

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
naphthalene	µg/kg	3.69	6.49	175.8	45	6.60	5.70	1.21	32.8
acenaphthylene	µg/kg	0.711	2.12	298.7	16	0.980	0.955	0.664	93.3
acenaphthene	µg/kg	0.761	1.52	200.0	22	1.00	0.940	0.405	53.3
fluorene	µg/kg	0.798	1.40	174.9	35	1.60	1.25	0.295	36.9
phenanthrene	µg/kg	6.32	9.58	151.5	59	10.0	8.51	1.56	24.7
anthracene	µg/kg	0.682	1.83	268.8	28	1.57	1.48	0.433	63.5
fluoranthene	µg/kg	3.84	5.56	144.9	52	5.85	4.84	0.963	25.1
pyrene	µg/kg	1.57	1.89	120.0	39	2.50	1.50	0.378	24.0
chrysene	µg/kg	0.874	1.19	136.1	33	1.54	1.14	0.259	29.6
benz(a)anthracene	µg/kg	0.816	1.48	181.8	35	1.80	1.54	0.313	38.4
benzo(b)fluoranthene	µg/kg	1.23	1.92	156.0	32	2.50	1.73	0.424	34.5
benzo(k)fluoranthene	µg/kg	0.866	1.70	196.1	29	1.90	1.61	0.394	45.5
benzo(a)pyrene	µg/kg	0.749	1.42	189.5	33	1.19	0.940	0.309	41.2
dibenz(ah)anthracene	µg/kg	0.512	0.979	191.1	21	1.00	0.840	0.267	52.1
indeno(1,2,3-cd)pyrene	µg/kg	3.15	5.49	174.2	34	10.0	8.45	1.18	37.3
benzo(ghi)perylene	µg/kg	2.31	5.81	251.2	32	4.99	4.25	1.28	55.5

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PCB 028	µg/kg	0.238	0.464	194.9	14	0.520	0.425	0.155	65.1
PCB 052	µg/kg	0.226	0.489	216.3	18	1.28	1.13	0.144	63.7
PCB 101	µg/kg	0.308	0.494	160.7	19	0.820	0.620	0.142	46.1
PCB 118	µg/kg	0.222	0.529	238.8	14	0.755	0.640	0.177	79.8
PCB 138	µg/kg	0.512	0.727	141.9	25	1.00	0.700	0.182	35.5
PCB 153	µg/kg	0.501	0.814	162.4	28	0.895	0.730	0.192	38.4
PCB 180	µg/kg	0.387	0.627	162.2	26	0.700	0.560	0.154	39.8

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Mineral oil, IR	mg/kg	5.76	7.02	121.9	14	36.0	17.5	2.35	40.7
Mineral oil, GC	mg/kg	7.99	16.3	204.5	27	19.4	17.6	3.93	49.2
AOX	mg/kg	12.0	5.43	45.3	24	12.4	3.25	1.39	11.5
EOX	mg/kg	0.051	0.044	85.4	26	0.240	0.135	0.011	20.9
Organic carbon	g/kg	0.618	0.425	68.9	24	0.675	0.295	0.109	17.6
Inorganic carbon	g/kg	0.248	0.244	98.6	8	0.300	0.145	0.108	43.6
Particles < 2 µm	%	0.888	0.782	88.1	28	0.970	0.630	0.185	20.8
Particles < 63 µm	%	0.917	0.808	88.0	17	1.10	0.600	0.245	26.7

Indicative Values SETOC 715

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cd	mg/kg	0.036	0.060	164.2	23	0.100	0.090	0.016	42.8
Cu	mg/kg	0.846	0.411	48.6	74	0.955	0.335	0.060	7.06
Hg	mg/kg	0.008	0.008	108.6	22	0.030	0.020	0.002	28.9