WAGENINGEN EVALUATING PROGRAMS

FOR ANALYTICAL LABORATORIES

Certificate of Analysis

International Sediment Exchange for Tests on Organic Contaminants

REFERENCE MATERIAL

SETOC sample 681

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis SETOC 681

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 681 of Marine sediment, from Netherlands, is prepared for the WEPAL proficiency programs. The sample has been used in 1 period (or round). The results on which the values in this report are based were taken from the period given in the following table:

Year	Round	Number
2019	3	1

Consensus Values SETOC 681

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	mg/kg	11.6	0.777	6.7	13	11.6	0.400	0.269	2.33
Cr	mg/kg	23.3	3.57	15.3	13	22.8	2.21	1.24	5.31
Ni	mg/kg	4.25	0.756	17.8	13	4.16	0.501	0.262	6.17
Pb	mg/kg	8.33	0.633	7.6	13	8.30	0.373	0.219	2.63
Zn	mg/kg	25.9	2.99	11.5	13	26.9	2.40	1.04	4.00
Co	mg/kg	1.93	0.292	15.1	11	1.90	0.300	0.110	5.70

Indicative Values SETOC 681

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
naphthalene	µg/kg	9.23	11.8	127.5	12	10.3	7.60	4.25	46.0
acenaphthylene	µg/kg	2.41	2.16	89.4	9	2.13	1.19	0.899	37.3
fluorene	µg/kg	3.28	2.54	77.6	9	4.90	1.75	1.06	32.3
phenanthrene	µg/kg	12.2	6.46	52.7	18	12.2	3.90	1.90	15.5
anthracene	µg/kg	2.79	2.22	79.8	11	3.52	1.49	0.838	30.1
fluoranthene	µg/kg	15.1	4.78	31.8	18	16.5	2.70	1.41	9.36
pyrene	µg/kg	10.9	3.07	28.3	18	11.7	2.02	0.905	8.34
chrysene	µg/kg	7.23	2.35	32.5	15	8.00	1.90	0.757	10.5
benz(a)anthracene	µg/kg	6.97	4.25	61.1	16	7.15	2.49	1.33	19.1
benzo(b)fluoranthene	µg/kg	13.3	6.69	50.1	16	12.9	3.73	2.09	15.7
benzo(k)fluoranthene	µg/kg	5.64	2.44	43.3	13	5.60	1.30	0.847	15.0
benzo(a)pyrene	µg/kg	6.41	2.48	38.7	16	6.80	1.52	0.775	12.1
indeno(1,2,3-cd)pyrene	µg/kg	7.87	3.11	39.6	15	8.60	2.10	1.01	12.8
benzo(ghi)perylene	µg/kg	6.94	1.67	24.1	13	6.95	1.05	0.580	8.35
EPA ∑PAH(16)	µg/kg	94.1	41.4	44.0	11	109	24.9	15.6	16.6

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PCB 101	µg/kg	0.695	0.317	45.6	9	0.680	0.170	0.132	19.0
PCB 118	µg/kg	0.381	0.270	70.9	7	0.340	0.140	0.128	33.5
PCB 138	µg/kg	1.31	0.915	69.6	12	1.60	0.543	0.330	25.1
PCB 153	µg/kg	1.35	0.771	57.1	13	1.54	0.538	0.267	19.8
PCB 180	µg/kg	1.16	0.627	54.1	13	1.33	0.370	0.217	18.8
∑PCB(7)	µg/kg	5.50	3.09	56.1	6	5.96	1.69	1.58	28.6

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Mineral oil, GC	mg/kg	17.7	8.30	47.0	18	18.9	4.61	2.44	13.8
Organic carbon	g/kg	3.16	1.31	41.3	14	3.43	0.935	0.436	13.8
Particles < 2 µm	%	6.34	1.92	30.3	4	6.15	0.900	1.20	18.9
Particles < 63 µm	%	10.2	3.87	37.9	5	11.7	2.02	2.16	21.2

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cd	mg/kg	0.047	0.020	42.5	7	0.054	0.008	0.009	20.1
Cu	mg/kg	2.07	0.628	30.4	12	2.16	0.355	0.227	11.0
Hg	mg/kg	0.022	0.009	40.5	7	0.026	0.006	0.004	19.2

Indicative Values SETOC 681

Method: Metals (cont.)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ba	mg/kg	7.17	2.13	29.7	9	7.70	1.24	0.889	12.4
Mo	mg/kg	0.202	0.117	58.0	8	0.200	0.090	0.052	25.6