WAGENINGEN EVALUATING PROGRAMS

FOR ANALYTICAL LABORATORIES

Certificate of Analysis

International Sediment Exchange for Tests on Organic Contaminants

REFERENCE MATERIAL

SETOC sample 770

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis SETOC 770

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 770 of Sediment, from Netherlands, is prepared for the WEPAL proficiency programs. The sample has been used in 2 periods (or rounds). The results on which the values in this report are based were taken from the periods given in the following table:

Year	Round	Number
2006	3	4
2005	3	2

Consensus Values SETOC 770

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
acenaphthene	µg/kg	43.7	15.9	36.4	70	46.0	10.3	2.38	5.44
fluorene	µg/kg	70.7	15.7	22.2	97	71.0	9.00	1.99	2.81
phenanthrene	µg/kg	673	128	19.0	106	657	75.0	15.5	2.31
anthracene	µg/kg	102	35.4	34.5	102	108	23.1	4.38	4.27
fluoranthene	µg/kg	2057	393	19.1	108	2055	259	47.3	2.30
pyrene	µg/kg	1423	278	19.5	99	1423	189	34.9	2.45
chrysene	µg/kg	956	234	24.5	107	935	153	28.3	2.96
benz(a)anthracene	µg/kg	741	137	18.5	107	731	79.0	16.6	2.24
benzo(b)fluoranthene	µg/kg	1185	277	23.4	93	1190	190	36.0	3.03
benzo(k)fluoranthene	µg/kg	519	94.5	18.2	101	513	50.2	11.7	2.26
benzo(a)pyrene	µg/kg	672	132	19.6	108	673	85.5	15.8	2.35
dibenz(ah)anthracene	µg/kg	159	44.5	27.9	98	163	29.5	5.62	3.53
indeno(1,2,3-cd)pyrene	µg/kg	725	182	25.2	106	726	116	22.1	3.05
benzo(ghi)perylene	µg/kg	704	166	23.6	105	697	107	20.3	2.88

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PCB 101	µg/kg	3.42	1.14	33.5	61	3.43	0.580	0.183	5.36
PCB 138	µg/kg	4.96	2.03	41.0	72	5.00	1.13	0.299	6.04
PCB 153	µg/kg	5.63	1.83	32.6	69	5.96	1.04	0.276	4.90
PCB 180	µg/kg	3.52	1.03	29.3	60	3.55	0.545	0.166	4.72

Method: Organochlorine pesticides

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
p,p`-DDE	µg/kg	40.2	10.4	25.9	44	42.0	6.30	1.96	4.89
p,p`-DDD	µg/kg	49.8	15.8	31.7	41	52.7	9.70	3.08	6.20

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Mineral oil, GC	mg/kg	231	58.2	25.2	71	231	39.0	8.63	3.74
Organic carbon	g/kg	61.1	6.71	11.0	31	61.2	4.79	1.51	2.47
Inorganic carbon	g/kg	10.8	1.69	15.6	15	11.2	0.900	0.546	5.05
Particles < 2 µm	%	29.9	3.66	12.2	19	30.0	2.00	1.05	3.51

Consensus Values SETOC 770

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	mg/kg	13.2	2.94	22.2	55	13.3	2.10	0.496	3.75
Cd	mg/kg	1.08	0.203	18.8	55	1.10	0.120	0.034	3.16
Cr	mg/kg	63.3	10.1	16.0	55	64.0	6.90	1.71	2.69
Cu	mg/kg	53.1	3.96	7.5	56	53.1	2.35	0.661	1.24
Hg	mg/kg	0.442	0.085	19.3	50	0.440	0.051	0.015	3.41
Ni	mg/kg	37.2	4.01	10.8	56	37.9	2.77	0.670	1.80
Pb	mg/kg	84.9	12.1	14.2	55	85.0	7.50	2.03	2.40
Zn	mg/kg	256	19.9	7.8	56	254	12.3	3.32	1.29

Indicative Values SETOC 770

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
naphthalene	µg/kg	48.8	24.8	50.8	77	53.0	17.0	3.53	7.23
acenaphthylene	µg/kg	44.5	33.8	75.9	56	54.6	24.3	5.64	12.7

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PCB 028	µg/kg	1.03	0.626	60.9	33	1.40	0.400	0.136	13.3
PCB 052	µg/kg	1.83	0.739	40.4	41	2.00	0.400	0.144	7.89
PCB 118	µg/kg	1.63	0.552	33.9	39	1.70	0.300	0.110	6.79
PCB 149	µg/kg	4.78	1.51	31.7	8	5.24	0.955	0.668	14.0

Method: Organochlorine pesticides

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
hexachlorobenzene	µg/kg	0.946	0.613	64.7	8	0.975	0.375	0.271	28.6
p,p`-DDT	µg/kg	3.33	2.56	77.0	22	4.16	1.95	0.683	20.5
o,p`-DDE	µg/kg	1.11	0.723	65.0	12	1.50	0.500	0.261	23.4
o,p`-DDD	µg/kg	2.80	1.17	42.0	16	3.00	0.580	0.367	13.1

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Mineral oil, IR	mg/kg	188	48.0	25.5	24	191	26.5	12.3	6.51
AOX	mg/kg	37.9	11.4	29.9	14	38.5	6.90	3.79	10.00
EOX	mg/kg	0.486	0.153	31.6	39	0.500	0.090	0.031	6.32
Particles < 63 µm	%	58.5	20.1	34.4	11	58.0	19.8	7.57	13.0
Particles > 63 µm	%	21.7	3.78	17.4	8	22.3	2.60	1.67	7.71
CN - Total	mg/kg	1.16	0.827	71.5	30	1.49	0.750	0.189	16.3
CN - Free	mg/kg	0.566	0.508	89.7	10	0.635	0.400	0.201	35.5