QUASIMEME

Quality assurance of information for marine environmental monitoring

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Certificate of Analysis

Biota

REFERENCE MATERIAL

Biota sample 359

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis Biota 359

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 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 10 results while the relative uncertainty is smaller than 6.25%. Indicative Values are based on a relative uncertainty of maximum 35% with at least 4 and less than 10 results or a relative uncertainty higher than 6.25%.

For each determinand the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median, MAD (Median of Absolute Deviation) and the uncertainty in the assigned value. The confidence limits (at 95 % probabilty) are calculated for these determinands.

The results of each determinand is expressed on a wet weight basis.

Sample information

QUASIMEME reference materials cover a range of natural Biota species from contaminated waters from the North Sea and/or Mediterranean. The supplied wet test materials are homogenised and sterilised by autoclaving.

This Biota sample 359 of Mussels spiked with determinands from Kattegat is prepared for the QUASIMEME proficiency programs. The results on which the values in this report are based were taken from the periods given in the following table.

Year.Round	Program	Sample Round Id
2021.1	BT8	QSP078BT
2019.1	BT4	QPH094BT
2018.2	BT8	QSP068BT
2018.2	BT9	QBC058BT
2018.2	BT10	QPF012BT

Consensus Values BT4

Method: Polycyclic aromatic hydrocarbons - BT4

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Benzo[a]anthracene	µg/kg	3.75	0.494	13.2	18	3.85	0.350	0.146	3.51 - 4.00
Benzo[a]pyrene	µg/kg	1.39	0.261	18.7	20	1.40	0.180	0.073	1.27 - 1.52
Benzo[g,h,i]perylene	µg/kg	2.71	0.402	14.8	17	2.68	0.280	0.122	2.51 - 2.92
Chrysene	µg/kg	3.50	0.477	13.6	14	3.57	0.320	0.159	3.23 - 3.78
Fluoranthene	µg/kg	7.76	1.296	16.7	19	7.90	0.860	0.372	7.14 - 8.38
Phenanthrene	µg/kg	7.05	0.876	12.4	17	7.15	0.600	0.266	6.61 - 7.50
Pyrene	µg/kg	5.50	0.910	16.6	15	5.50	0.590	0.294	5.00 - 6.00

Indicative Values BT4

Method: Polycyclic aromatic hydrocarbons - BT4

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Acenaphthene	µg/kg	2.20	0.415	18.9	12	2.21	0.289	0.150	1.94 - 2.46
Acenaphthylene	µg/kg	4.42	0.916	20.7	10	4.25	0.621	0.362	3.77 - 5.06
Anthracene	µg/kg	0.864	0.3065	35.5	17	0.910	0.2180	0.0929	0.707 - 1.02
Benzo[b]fluoranthene	µg/kg	3.79	1.304	34.4	16	3.83	0.915	0.408	3.09 - 4.48
Benzo[e]pyrene	µg/kg	4.39	0.629	14.3	7	4.68	0.450	0.297	3.83 - 4.95
Benzo[k]fluoranthene	µg/kg	1.62	0.297	18.3	13	1.64	0.200	0.103	1.45 - 1.80
Chrysene + Triphenylene	µg/kg	5.10	0.454	8.9	7	5.10	0.330	0.214	4.70 - 5.51
Dibenz[ah]anthracene	µg/kg	0.800	0.2258	28.2	12	0.866	0.1524	0.0815	0.658 - 0.942
Dibenzothiophene	µg/kg	0.266	0.1222	45.9	4	0.310	0.0925	0.0764	0.0967 - 0.436
Fluorene	µg/kg	1.50	0.316	21.0	12	1.50	0.195	0.114	1.31 - 1.70
Indeno[1,2,3-cd]pyrene	µg/kg	1.43	0.354	24.7	17	1.55	0.250	0.107	1.25 - 1.62
Naphthalene	µg/kg	2.68	0.563	21.0	10	2.62	0.385	0.222	2.28 - 3.07
2-methylphenanthrene	µg/kg	1.04	0.160	15.4	4	1.05	0.104	0.100	0.815 - 1.26
3-6-dimethylphenanthrene	µg/kg	0.293	0.0424	14.5	4	0.310	0.0325	0.0265	0.234 - 0.352

Method: Lipids - BT4

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Total-Lipid	%	2.23	0.154	6.9	9	2.22	0.110	0.064	2.12 - 2.35

Indicative Values BT8

Method: Organometals - BT8

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Dibutyltin (DBT)	µg Sn/kg	3.22	1.216	37.7	19	3.60	0.806	0.349	2.64 - 3.81
Monobutyltin (MBT)	µg Sn/kg	2.16	0.967	44.7	18	2.30	0.660	0.285	1.69 - 2.64
Tributyltin (TBT)	µg Sn/kg	6.83	2.685	39.3	23	6.90	1.900	0.700	5.67 - 7.99
Triphenyltin (TPhT)	µg Sn/kg	0.424	0.2548	60.1	10	0.584	0.1745	0.1007	0.244 - 0.603

Consensus Values BT9

Method: Brominated Flame Retardants - BT9

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
BDE28	µg/kg	0.267	0.0288	10.8	19	0.260	0.0210	0.0083	0.253 - 0.281
BDE99	µg/kg	0.429	0.0840	19.6	20	0.426	0.0590	0.0235	0.389 - 0.468
BDE100	µg/kg	0.669	0.1325	19.8	20	0.674	0.0920	0.0370	0.607 - 0.731
BDE153	µg/kg	0.713	0.1045	14.7	20	0.712	0.0750	0.0292	0.664 - 0.761
BDE154	µg/kg	1.02	0.154	15.1	20	1.03	0.103	0.043	0.947 - 1.09

Indicative Values BT9

Method: Brominated Flame Retardants - BT9

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
BDE47	µg/kg	7.06	1.599	22.6	20	7.38	1.148	0.447	6.31 - 7.81
BDE66	µg/kg	0.0743	0.0229	30.8	11	0.0740	0.0170	0.0086	0.0591 - 0.0895
BDE85	µg/kg	0.373	0.0971	26.1	12	0.373	0.0660	0.0350	0.312 - 0.434
BDE183	µg/kg	0.128	0.0240	18.7	13	0.137	0.0170	0.0083	0.114 - 0.142
BDE209	µg/kg	0.0652	0.0356	54.6	5	0.0640	0.0240	0.0199	0.0243 - 0.106

Indicative Values BT10

Method: Perfluorinated alkyl substances - BT10

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
n-PFOS	µg/kg	1.00	0.272	27.2	5	1.00	0.200	0.152	0.688 - 1.31
total-PFOS	µg/kg	1.48	0.457	30.9	6	1.47	0.308	0.233	1.02 - 1.93
PFHpA	µg/kg	0.116	0.0413	35.6	4	0.132	0.0305	0.0258	0.0586 - 0.173
PFDA	µg/kg	0.326	0.0592	18.2	4	0.324	0.0360	0.0370	0.244 - 0.408