QUASIMEME

Quality assurance of information for marine environmental monitoring

Certificate of Analysis

Biota

REFERENCE MATERIAL

Biota sample 357

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis Biota 357

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 357 of Mussels spiked with contaminants 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
2021.2	BT8	QSP080BT
2021.1	BT9	QBC068BT
2021.1	BT10	QPF023BT
2019.1	BT4	QPH093BT
2019.1	BT9	QBC060BT
2019.1	BT10	QPF015BT
2018.1	BT8	QSP065BT
2018.1	BT9	QBC054BT
2018.1	BT10	QPF010BT

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	3.93	0.627	16.0	18	3.93	0.440	0.185	3.62	-	4.24
Benzo[g,h,i]perylene	µg/kg	3.02	0.386	12.8	17	3.02	0.250	0.117	2.82	-	3.21
Benzo[k]fluoranthene	µg/kg	1.67	0.264	15.8	13	1.74	0.180	0.091	1.51	-	1.83
Chrysene	µg/kg	3.65	0.679	18.6	15	3.70	0.480	0.219	3.27	-	4.02
Dibenz[ah]anthracene	µg/kg	1.10	0.151	13.7	12	1.08	0.100	0.054	1.01	-	1.20
Fluoranthene	µg/kg	8.26	1.442	17.5	19	8.35	0.960	0.414	7.56	-	8.95
Phenanthrene	µg/kg	7.62	0.759	10.0	17	7.52	0.536	0.230	7.23	-	8.00
Pyrene	µg/kg	5.49	1.043	19.0	16	5.51	0.706	0.326	4.94	-	6.04

Indicative Values BT4

Method: Polycyclic aromatic hydrocarbons - BT4

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Acenaphthene	µg/kg	3.09	0.562	18.2	12	3.00	0.360	0.203	2.73 - 3.44
Acenaphthylene	µg/kg	5.89	1.025	17.4	10	5.84	0.656	0.405	5.17 - 6.61
Anthracene	µg/kg	0.981	0.3237	33.0	18	0.990	0.2200	0.0954	0.821 - 1.14
Benzo[a]pyrene	µg/kg	1.51	0.346	22.9	20	1.56	0.245	0.097	1.35 - 1.68
Benzo[b]fluoranthene	µg/kg	3.98	1.793	45.1	16	4.03	1.329	0.560	3.03 - 4.93
Benzo[e]pyrene	µg/kg	4.32	0.616	14.2	7	4.38	0.469	0.291	3.77 - 4.87
Chrysene + Triphenylene	µg/kg	5.27	0.673	12.8	7	5.45	0.498	0.318	4.67 - 5.88
Fluorene	µg/kg	1.71	0.326	19.1	12	1.68	0.230	0.118	1.51 - 1.91
Indeno[1,2,3-cd]pyrene	µg/kg	1.55	0.425	27.4	17	1.68	0.307	0.129	1.33 - 1.77
Naphthalene	µg/kg	3.27	0.745	22.8	10	3.33	0.525	0.294	2.74 - 3.79
2-methylphenanthrene	µg/kg	0.976	0.2716	27.8	4	0.985	0.1800	0.1697	0.599 - 1.35
3-6-dimethylphenanthrene	µg/kg	0.281	0.0613	21.8	4	0.305	0.0470	0.0383	0.196 - 0.366

Method: Lipids - BT4

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Total-Lipid	%	2.36	0.226	9.6	9	2.30	0.170	0.094	2.19 - 2.53

Indicative Values BT8

Method: Organometals - BT8

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Dibutyltin (DBT)	µg Sn/kg	2.41	0.748	31.0	17	2.30	0.530	0.227	2.03 - 2.79
Monobutyltin (MBT)	µg Sn/kg	2.20	1.048	47.7	14	2.32	0.710	0.350	1.60 - 2.80
Tributyltin (TBT)	µg Sn/kg	5.91	1.460	24.7	20	6.02	0.955	0.408	5.23 - 6.59
Triphenyltin (TPhT)	µg Sn/kg	0.442	0.2585	58.5	7	0.580	0.1500	0.1221	0.211 - 0.673

Consensus Values BT9

Method: Brominated Flame Retardants - BT9

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
BDE28	µg/kg	0.323	0.0695	21.5	41	0.327	0.0468	0.0136	0.301 - 0.345
BDE47	µg/kg	4.00	0.557	13.9	44	4.03	0.388	0.105	3.83 - 4.17
BDE66	µg/kg	0.233	0.0406	17.4	24	0.232	0.0278	0.0104	0.216 - 0.250
BDE85	µg/kg	1.62	0.287	17.7	24	1.67	0.195	0.073	1.50 - 1.74
BDE99	µg/kg	0.478	0.0841	17.6	42	0.481	0.0590	0.0162	0.451 - 0.504
BDE100	µg/kg	0.797	0.1224	15.4	43	0.780	0.0800	0.0233	0.759 - 0.835
BDE153	µg/kg	1.14	0.223	19.6	45	1.13	0.153	0.042	1.07 - 1.20
BDE154	µg/kg	0.794	0.1428	18.0	44	0.795	0.1015	0.0269	0.751 - 0.838
BDE183	µg/kg	0.143	0.0316	22.0	33	0.142	0.0215	0.0069	0.132 - 0.155

Indicative Values BT9

Method: Brominated Flame Retardants - BT9

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
BDE209	µg/kg	0.0849	0.0608	71.6	10	0.0920	0.0445	0.0240	0.0421 - 0.128
TBBP-A	µg/kg	0.107	0.0405	37.9	4	0.106	0.0260	0.0253	0.0505 - 0.163
a-HBCD	µg/kg	0.0128	0.0012	9.2	4	0.0132	0.0009	0.0007	0.0111 - 0.0144
Total lipid	(%)	2.37	0.200	8.4	5	2.36	0.111	0.112	2.15 - 2.60

Consensus Values BT10

Method: Perfluorinated alkyl substances - BT10

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
n-PFOS	µg/kg	1.75	0.314	17.9	20	1.79	0.208	0.088	1.61 - 1.90
total-PFOS	µg/kg	2.15	0.436	20.3	18	2.05	0.255	0.128	1.93 - 2.36
PFOSA	µg/kg	2.69	0.302	11.2	15	2.70	0.220	0.098	2.52 - 2.85

Indicative Values BT10

Method: Perfluorinated alkyl substances - BT10

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
PFBA	µg/kg	0.389	0.1236	31.7	7	0.413	0.0745	0.0584	0.279 - 0.500
PFPeA	µg/kg	0.0730	0.0469	64.3	6	0.1077	0.0336	0.0240	0.0261 - 0.120
PFHxA	µg/kg	0.0917	0.0337	36.8	15	0.1050	0.0258	0.0109	0.0731 - 0.110
PFHpA	µg/kg	0.0708	0.0299	42.3	12	0.0691	0.0206	0.0108	0.0520 - 0.0896
PFOA	µg/kg	0.123	0.0572	46.4	16	0.131	0.0406	0.0179	0.0930 - 0.154
PFNA	µg/kg	0.322	0.1000	31.0	18	0.326	0.0715	0.0295	0.273 - 0.372
PFDA	µg/kg	0.648	0.1720	26.5	20	0.670	0.1140	0.0481	0.568 - 0.729
PFUnDA	µg/kg	0.507	0.1550	30.6	19	0.518	0.1080	0.0444	0.432 - 0.581
PFDoA	µg/kg	0.377	0.0896	23.7	18	0.380	0.0660	0.0264	0.333 - 0.421
PFTrDA	µg/kg	0.429	0.2239	52.2	12	0.557	0.1430	0.0808	0.288 - 0.570
PFTeDA	µg/kg	0.212	0.0805	38.0	12	0.225	0.0535	0.0291	0.161 - 0.263
L-PFBS	µg/kg	0.223	0.0606	27.2	17	0.222	0.0400	0.0184	0.192 - 0.254
L-PFHxS	µg/kg	0.335	0.0967	28.9	19	0.349	0.0660	0.0277	0.288 - 0.381