QUASIMEME

Quality assurance of information
for marine environmental monitoring

Certificate of Analysis

Biota

REFERENCE MATERIAL

Biota sample 362

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis   Biota 362

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 362 of Mussel spiked with organics from Limfjord, Denmark 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
2020.2	BT4	QPH100BT
2020.2	BT8	QSP076BT
2020.2	BT9	QBC066BT
2020.2	BT10	QPF021BT
2020.1	BT2	QOR143BT

Consensus Values   BT2

Method: Chlorinated organics - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
PCB28	µg/kg	0.962	0.1854	19.3	16	0.967	0.1265	0.0580	0.864 -	1.06
PCB52	µg/kg	0.870	0.1518	17.5	16	0.873	0.1060	0.0475	0.789 -	0.950
PCB101	µg/kg	0.921	0.1198	13.0	15	0.901	0.0850	0.0387	0.856 -	0.987
PCB118	µg/kg	3.59	0.186	5.2	17	3.57	0.142	0.057	3.50 -	3.69
PCB138	µg/kg	1.07	0.157	14.6	13	1.03	0.110	0.054	0.980 -	1.17
PCB153	µg/kg	5.70	0.408	7.2	17	5.63	0.284	0.124	5.49 -	5.91
PCB180	µg/kg	0.757	0.0790	10.4	16	0.759	0.0540	0.0247	0.715 -	0.799
pp'-DDD	µg/kg	2.11	0.324	15.3	14	2.19	0.220	0.108	1.93 -	2.30
pp'-DDE	µg/kg	1.25	0.179	14.3	15	1.23	0.137	0.058	1.15 -	1.35

Method: Chlorinated organics - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
PCB31	µg/kg	0.553	0.2300	41.6	9	0.586	0.1550	0.0958	0.379 -	0.726
PCB138+PCB163	µg/kg	1.15	0.107	9.3	5	1.18	0.070	0.060	1.02 -	1.27
a-HCH	µg/kg	0.0641	0.0067	10.5	6	0.0650	0.0050	0.0034	0.0574 -	0.0708
b-HCH	µg/kg	0.199	0.0579	29.1	7	0.225	0.0360	0.0274	0.147 -	0.250
HCB	µg/kg	0.414	0.0849	20.5	13	0.410	0.0590	0.0294	0.363 -	0.465
Dieldrin	µg/kg	0.655	0.2763	42.2	6	0.699	0.1845	0.1410	0.379 -	0.931

Method: Lipids - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
Total-Lipid	%	2.86	0.275	9.6	8	2.90	0.193	0.122	2.64 -	3.08
Extractable-Lipid	%	3.19	0.663	20.8	4	3.19	0.454	0.415	2.27 -	4.11

Method: Polycyclic aromatic hydrocarbons - BT4

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Chrysene	µg/kg	4.23	0.814	19.3	16	4.25	0.510	0.255	3.79	-	4.66
Fluoranthene	µg/kg	22.5	5.26	23.4	22	22.6	3.74	1.40	20.2	-	24.8

Indicative Values   BT4

Method: Polycyclic aromatic hydrocarbons - BT4

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Acenaphthene	µg/kg	0.961	0.3919	40.8	14	1.073	0.2885	0.1309	0.736	-	1.19
Acenaphthylene	µg/kg	1.15	0.552	47.8	12	1.24	0.377	0.199	0.808	-	1.50
Anthracene	µg/kg	1.62	0.428	26.4	19	1.72	0.307	0.123	1.42	-	1.83
Benzo[a]anthracene	µg/kg	3.24	1.099	33.9	18	3.30	0.724	0.324	2.70	-	3.79
Benzo[a]pyrene	µg/kg	2.35	0.686	29.2	21	2.30	0.473	0.187	2.04	-	2.66
Benzo[b]fluoranthene	µg/kg	4.17	1.164	27.9	16	4.32	0.820	0.364	3.55	-	4.78
Benzo[e]pyrene	µg/kg	4.84	0.171	3.5	7	4.90	0.126	0.081	4.69	-	5.00
Benzo[g,h,i]perylene	µg/kg	3.28	1.191	36.3	15	3.30	0.831	0.384	2.63	-	3.94
Benzo[k]fluoranthene	µg/kg	2.28	0.990	43.3	15	2.37	0.720	0.319	1.74	-	2.83
Chrysene + Triphenylene	µg/kg	6.14	1.289	21.0	5	5.90	0.970	0.720	4.66	-	7.63
Dibenz[ah]anthracene	µg/kg	1.71	0.619	36.1	15	1.90	0.445	0.200	1.37	-	2.05
Dibenzothiophene	µg/kg	2.73	0.804	29.4	7	2.84	0.528	0.380	2.01	-	3.45
Fluorene	µg/kg	2.35	0.835	35.5	17	2.55	0.594	0.253	1.93	-	2.78
Indeno[1,2,3-cd]pyrene	µg/kg	1.98	0.773	39.0	16	2.16	0.563	0.242	1.57	-	2.39
Naphthalene	µg/kg	5.96	2.606	43.7	15	7.04	1.720	0.841	4.52	-	7.39
Perylene	µg/kg	1.15	0.431	37.6	6	1.09	0.285	0.220	0.717	-	1.58
Phenanthrene	µg/kg	16.8	3.80	22.7	19	16.6	2.61	1.09	14.9	-	18.6
Pyrene	µg/kg	13.6	3.79	28.0	18	13.7	2.62	1.12	11.7	-	15.4
1-methylnaphtalene	µg/kg	0.784	0.4869	62.1	6	0.816	0.3426	0.2485	0.297	-	1.27
2-methylnaphtalene	µg/kg	1.09	0.740	67.6	6	1.18	0.504	0.377	0.355	-	1.83
2-methylphenanthrene	µg/kg	2.06	0.540	26.2	4	2.06	0.375	0.337	1.31	-	2.81
C1-phenanthrenes/anthracenes	µg/kg	7.31	0.312	4.3	4	7.18	0.238	0.195	6.87	-	7.74

Method: Lipids - BT4

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Total-Lipid	%	2.95	0.159	5.4	8	2.92	0.115	0.070	2.82	-	3.08

Method: Organometals - BT8

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Dibutyltin (DBT)	µg Sn/kg	6.73	1.261	18.7	7	6.90	0.830	0.596	5.60	-	7.85
Monobutyltin (MBT)	µg Sn/kg	9.43	4.257	45.1	7	10.28	3.080	2.011	5.63	-	13.2
Tributyltin (TBT)	µg Sn/kg	17.4	2.29	13.2	8	17.8	1.58	1.01	15.5	-	19.2

Consensus Values   BT9

Method: Brominated Flame Retardants - BT9

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
BDE28	µg/kg	0.209	0.0343	16.4	14	0.208	0.0225	0.0115	0.190 -	0.229
BDE47	µg/kg	4.07	0.454	11.1	14	4.08	0.297	0.152	3.81 -	4.33
BDE99	µg/kg	0.577	0.0816	14.2	15	0.570	0.0560	0.0263	0.532 -	0.622
BDE100	µg/kg	0.146	0.0247	16.9	15	0.144	0.0170	0.0080	0.132 -	0.160
BDE153	µg/kg	0.138	0.0200	14.5	14	0.135	0.0140	0.0067	0.126 -	0.149
BDE154	µg/kg	0.144	0.0225	15.6	15	0.147	0.0150	0.0073	0.132 -	0.156

Method: Brominated Flame Retardants - BT9

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
BDE66	µg/kg	0.0510	0.0179	35.0	7	0.0550	0.0128	0.0084	0.0350 -	0.0670
BDE85	µg/kg	0.0543	0.0121	22.3	6	0.0555	0.0076	0.0062	0.0422 -	0.0665
BDE183	µg/kg	0.123	0.0386	31.5	8	0.128	0.0220	0.0171	0.0912 -	0.154
BDE209	µg/kg	0.725	0.1780	24.5	4	0.794	0.1369	0.1112	0.478 -	0.973
Total lipid	(%)	2.89	0.306	10.6	9	2.90	0.200	0.127	2.66 -	3.12

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	0.522	0.2709	51.9	6	0.615	0.1760	0.1382	0.251 -	0.793
total-PFOS	µg/kg	0.784	0.1745	22.3	5	0.830	0.1230	0.0976	0.583 -	0.985
PFOSA	µg/kg	0.859	0.2433	28.3	5	0.870	0.1610	0.1360	0.580 -	1.14
PFDA	µg/kg	0.498	0.1672	33.5	5	0.580	0.0900	0.0935	0.306 -	0.691
L-PFHxS	µg/kg	0.261	0.0969	37.1	4	0.284	0.0665	0.0606	0.127 -	0.396