QUASIMEME

Quality assurance of information for marine environmental monitoring

Certificate of Analysis

Metals in seawater

REFERENCE MATERIAL

AQ3 sample 172

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis AQ3 172

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.

Sample information

QUASIMEME reference materials cover a range of natural SeaWater species from contaminated waters from the North Sea and/or Mediterranean.

This AQ3 sample 172 of Low sal. Seawater spiked with high conc. Metals from North Sea (diluted) 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
2022.1	AQ3	QTM330SW

Consensus Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Arsenic	µg/l	156	7.6	4.9	19	156	4.9	2.2	152.1 - 159.4
Cadmium	µg/l	45.3	2.13	4.7	19	45.0	1.50	0.61	44.3 - 46.3
Chromium	µg/l	82.8	3.58	4.3	17	81.5	2.50	1.08	80.9 - 84.6
Cobalt	µg/l	127	7.8	6.1	13	130	5.8	2.7	123 - 132
Copper	µg/l	330	34.0	10.3	18	328	24.1	10.0	313 - 346
Iron	µg/l	257	15.1	5.9	14	254	11.0	5.0	249 - 266
Lead	µg/l	97.3	4.29	4.4	18	98.0	3.05	1.26	95.2 - 99.4
Manganese	µg/l	150	8.4	5.6	15	149	6.0	2.7	146 - 155
Nickel	µg/l	241	20.3	8.4	17	240	14.0	6.1	231 - 252
Silver	µg/l	48.0	3.41	7.1	10	48.9	2.45	1.35	45.6 - 50.4
Tin	µg/l	152	2.8	1.9	11	152	2.0	1.1	149.8 - 153.6
Vanadium	µg/l	118	3.2	2.7	12	119	2.3	1.2	116.0 - 120.1
Zinc	µg/l	413	37.4	9.0	18	409	26.8	11.0	395 - 432

Indicative Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Boron	µg/l	1240	87	7.1	8	1240	62	39	1164 - 1307
Thallium	µg/l	36.2	1.33	3.7	6	36.3	0.89	0.68	34.9 - 37.5
Uranium	µg/l	12.7	0.47	3.7	4	12.7	0.32	0.29	12.0 - 13.3