QUASIMEME

Quality assurance of information for marine environmental monitoring

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Certificate of Analysis

Metals in seawater

REFERENCE MATERIAL

AQ3 sample 190

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis AQ3 190

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.

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 190 of Seawater spiked with metals from North Sea, Neeltje Jans, Netherlands 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
2024.2	AQ3	QTM368SW

Consensus Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Copper	µg/l	6.20	0.831	13.4	18	6.31	0.370	0.245	3.95
Lead	µg/l	2.13	0.187	8.7	17	2.10	0.173	0.057	2.65
Cobalt	µg/l	0.316	0.037	11.6	8	0.324	0.021	0.016	5.12
Manganese	µg/l	3.86	0.355	9.2	11	3.84	0.219	0.134	3.46
Arsenic	µg/l	1.94	0.266	13.7	13	1.96	0.156	0.092	4.76
Nickel	µg/l	2.49	0.371	14.9	17	2.52	0.270	0.112	4.51
Zinc	µg/l	10.8	0.765	7.1	16	11.0	0.390	0.239	2.21
Boron	µg/l	4407	356	8.1	11	4454	293	134	3.05
Tin	µg/l	98.7	13.0	13.2	11	100	5.40	4.91	4.97
Uranium	µg/l	3.04	0.085	2.8	9	3.01	0.060	0.035	1.16
Magnesium	mg/l	1188	35.3	3.0	11	1180	20.0	13.3	1.12
Strontium	mg/l	7.41	0.820	11.1	13	7.59	0.635	0.284	3.83

Indicative Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cadmium	µg/l	0.076	0.018	24.1	11	0.080	0.012	0.007	9.09
Iron	µg/l	2.71	0.795	29.3	7	2.81	0.480	0.376	13.9
Chromium	µg/l	0.807	0.159	19.7	12	0.828	0.102	0.057	7.12
Silver	µg/l	0.153	0.082	53.6	5	0.138	0.043	0.046	29.9
Vanadium	µg/l	2.95	0.551	18.7	12	2.99	0.407	0.199	6.73
Thallium	µg/l	0.199	0.024	12.0	7	0.204	0.011	0.011	5.67