QUASIMEME

Quality assurance of information for marine environmental monitoring

Certificate of Analysis

Metals in seawater

REFERENCE MATERIAL

AQ3 sample 184

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis AQ3 184

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 184 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
2023.2	AQ3	QTM354SW

Consensus Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Copper	µg/l	119	12.0	10.1	15	120	9.0	3.9	112 - 126
Cadmium	µg/l	15.5	1.29	8.3	15	15.7	0.77	0.42	14.8 - 16.2
Lead	µg/l	219	23.0	10.5	15	220	13.6	7.4	206 - 231
Iron	µg/l	162	9.9	6.1	10	163	4.7	3.9	155 - 169
Manganese	µg/l	204	14.1	6.9	10	202	8.0	5.6	194 - 214
Arsenic	µg/l	144	11.6	8.1	12	142	6.3	4.2	137 - 151
Chromium	µg/l	233	14.4	6.2	13	232	7.9	5.0	224 - 241
Nickel	µg/l	549	40.1	7.3	13	560	22.4	13.9	525 - 573
Zinc	µg/l	322	32.3	10.0	13	314	16.0	11.2	302 - 341
Vanadium	µg/l	271	16.2	6.0	10	270	9.2	6.4	259 - 282

Indicative Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Cobalt	µg/l	73.8	3.02	4.1	8	73.5	1.55	1.34	71.3 - 76.3
Silver	µg/l	15.1	3.07	20.3	7	15.4	1.40	1.45	12.4 - 17.9
Boron	µg/l	1608	34.2	2.1	6	1619	23.5	17.4	1574 - 1642
Tin	µg/l	68.8	3.49	5.1	7	69.7	1.70	1.65	65.7 - 71.9
Thallium	µg/l	2.94	0.366	12.5	6	2.88	0.289	0.187	2.58 - 3.31
Uranium	µg/l	-	-	-	5	3.61	0.1	-	- - -
Magnesium	mg/l	452	17.8	3.9	7	454	9.0	8.4	436 - 468
Strontium	mg/l	2.66	0.190	7.1	7	2.69	0.075	0.090	2.49 - 2.83