Certificate of Analysis

Trihalomethanes

Certified Reference Material

Description

Product ID QC1456-1.2ML
Lot **LRAC4280**
Expiration Date December 2022
Manufacturing Date December 2019
Storage Conditions Refrigerate
Solvent/Matrix METHANOL

Certified Values

Analyte	*Units*	*Certified Value* [1,4]
Bromodichloromethane	µg/L	16.3 ± 0.4
Bromoform	µg/L	16.7 ± 0.5
Chloroform	µg/L	27.4 ± 0.6
Dibromochloromethane	µg/L	42.3 ± 1.1
Total trihalomethanes	µg/L	105 ± 3

Informational Values

Analyte	*Units*	*Suggested Acceptance Windows*	*Standard Deviation*
Bromodichloromethane	µg/L	13.04 to 19.56	1.63
Bromoform	µg/L	13.36 to 20.04	1.67
Chloroform	µg/L	21.92 to 32.88	2.74
Dibromochloromethane	µg/L	33.84 to 50.76	4.23
Total trihalomethanes	µg/L	88.2 to 122	8.34

Additional Information:

DESCRIPTION

This sample is packaged as a 1.2 mL concentrate.
The solvent for this sample is methanol.
The sample is not preserved. Handle carefully and use immediately after opening. If transfered properly to a clean vial the remaining sample may be stored for up to 3 months.
The sample must be stored at 4ºC.

SAMPLE PREPARATION

Fill a 100 mL Class A Volumetric Flask with 100 mL of organic free reagent water.
Allow the ampule concentrate to equilibrate to room temperature.
Open the ampule and pipet exactly 20 µL of the concentrate into the flask.
Fill to volume and mix well.
This represents the sample for analysis.

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

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Solvent/Matrix	METHANOL

1 **Metrological traceability:** Traceable to the SI and higher order standards from NIST through an unbroken chain of comparisons. The balance used to weigh raw materials is accurate to +/-0.0001 g and calibrated regularly using mass standards traceable to NIST. All dilutions were performed gravimetrically. Additionally, individual analytes are traceable to NIST SRMs where available and specified above.
4 Ucrm - Uncertainty values in this document are expressed as Expanded Uncertainty (Ucrm) corresponding to the 95% confidence interval. Ucrm is derived from the combined standard uncertainty multiplied by the coverage factor k, which is obtained from a *t*-distribution and degrees of freedom. The components of combined standard uncertainty include the uncertainties due to characterization, homogeneity, long term stability, and short term stability (transport). The components due to stability are generally considered to be negligible unless otherwise indicated by stability studies. The mathematical representation of the Ucrm calculation is as follows:

$$u_{CRM} = \sqrt{u_{char}^2 + u_{\text{hom}\ ogeneity}^2 + u_{stability}^2}$$

k: Coverage factor derived from a t-distribution table, based on the degrees of freedom of the data set. Assume 2.0 for a **Confidence interval = 95%**

6 Analytical Value- For QC verification of the certified value only- not to be used in calculations. Represents the analytical data obtained by comparison to a standard as analyzed by the method described in the CoA or another acceptable method. The result may differ from the certified value and UCRM based on method uncertainty as well as the uncertainty associated with the standard used for comparison.

Traceability: The standard was manufactured under an ISO/IEC 17025:2017 certified quality system. The balance used to weigh raw materials is accurate to +/- 0.0001g and calibrated regularly using mass standards traceable to NIST. All dilutions were preformed gravimetrically. Additionally, individual analytes are traceable to NIST SRMs where available and specified above.

Homogeneity: Homogeneity was assessed in accordance with ISO 17034:2016. Completed units were sampled using a random stratified sampling protocol. The results of chemical analysis were then compared using a one-way analysis of variance approach as described by TNI EL-V3-2009 Appendix A.2. See Instructions for minimum sub-sample size.

Expiration is at end of month given on certificate and label.

MSDS reports for components comprising greater than 1.0% of the solution or 0.1% for components known to be carcinogens are available upon request.

THIS PRODUCT WAS DESIGNED, PRODUCED AND VERIFIED FOR ACCURACY AND STABILITY IN ACCORDANCE WITH **ISO/IEC 17025:2017 (ANAB Cert AT-1467)** and **ISO 17034:2016 (ANAB Cert AR-1470).**

Andy Ommen - QC Manager

Mark Pooler - QA Supervisor

Certification Date	December 05, 2019
Version	0-1252019

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