

1.0 INORGANIC VENTURES is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."



2.0 DESCRIPTION OF CRM Ion Chromatography 1000 µg/mL Nitrate as N in H2O

Catalog Number: ICNNO31-1 and ICNNO31-5

Lot Number: **G2-NOX02109**

Starting Material: NaNO3

Starting Material Purity (%): 100.0000

Starting Material Lot No.: 1571

Matrix: H2O

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Concentration: 1,005 ± 5 µg/mL No weighted mean

Certified Density: 1.002 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence interval using a coverage factor of k = 2.

Characterization of CRM by two independent methods

Characterization of CRM by one method

<p>Certified Value, X_{CRM}, where two methods of characterization are used, is the weighted mean of the two results = $[(w_a) (X_a) + (w_b) (X_b)]$</p> <p>$X_a$ is the mean of Assay Method A with standard uncertainty $U_{char a}$.</p> <p>X_b is the mean of Assay Method B with standard uncertainty $U_{char b}$.</p> <p>w_a and w_b = The weighting factors for each method calculated using the inverse square of the variance:</p> $w_a = (1/U_{char a})^2 / ((1/U_{char a})^2 + (1/U_{char b})^2);$ $w_b = (1/U_{char b})^2 / ((1/U_{char a})^2 + (1/U_{char b})^2)$ <p>CRM Expanded Uncertainty (\pm) = $U_{CRM} = k (U_{char a \& b}^2 + u_{bb}^2 + u_{lts}^2 + u_{sts}^2)^{1/2}$</p> <p>$U_{char a \& b} = [(w_a)^2 (U_{char a})^2 + (w_b)^2 (U_{char b})^2]^{0.5}$; $U_{char a}$ and $U_{char b}$ are the square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume; k, coverage factor = 2 in all cases at Inorganic Ventures; u_{bb} = bottle to bottle homogeneity standard uncertainty; u_{lts} = long term stability standard uncertainty (storage); u_{sts} = short term stability standard uncertainty (transportation).</p>	<p>Certified Value, X_{CRM}, where one method of characterization is used, is the mean of individual results:</p> <p>$X_a = \text{Mean } X_a$ is the mean of Assay Method A with standard uncertainty $U_{char a}$.</p> <p>CRM Expanded Uncertainty (\pm) = $U_{CRM} = k (U_{char a}^2 + u_{bb}^2 + u_{lts}^2 + u_{sts}^2)^{1/2}$</p> <p>$U_{char a}$ is the square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume; k, coverage factor = 2 in all cases at Inorganic Ventures; u_{bb} = bottle to bottle homogeneity standard uncertainty; u_{lts} = long term stability standard uncertainty (storage); u_{sts} = short term stability standard uncertainty (transportation).</p>
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4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at $20 \pm 4^{\circ}\text{C}$. **Do Not** pipette from the container. **Do Not** return portions removed from pipetting to container.

Element Specific Information - For specific information regarding any element: Contact technical staff.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous.

Inorganic Ventures homogeneity data indicate that the end user should take a minimum sample size of 0.2mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- SAI Global File Number 010105

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"

- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission

- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

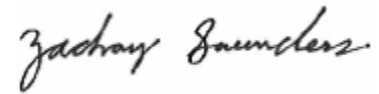
11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: September 24, 2013

Expiration Date:

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By: Zach Saunders, Product Documentation Technician



Certificate Approved By: Brian Alexander
PhD., Technical Process Director



Certifying Officer: Paul Gaines
PhD., Senior Technical Director

