Catálogo

QUIMIGOL IMPORTAÇÃO E COMÉRCIO LTDA
RUA DOM JOSÉ ALARCÃO, 55 - CONJ. 26 - IPIRANGA
SÃO PAULO - SP - CEP 04208-040 - FONE: 11 2478-8418
www.quimigol.com - vendas@quimigol.com
CNPJ: 28.545.344/0001-03 - I.E.: 118.471.511.118

PROPOSTA COMERCIAL 008831

DATA: 24/01/2023

COMPANHIA DE SANEAMENTO MUNICIPAL - CESAMA
AV. BARÃO DO RIO BRANCO , 184310 AND - JUIZ DE FORA - MG -
Telefone: 32 3692-9331
CNPJ: 21.572.243/0001-74 - I.Est.: 367.698.776.0099
Contato: MEIRE MELLO - Tel.:32 3692-9332 - e-mail: mconde@cesama.com.br

Entrega: Vide Item
Condição : 30 DDL
FRETE: CIF
Moeda : R$
Válido por : 60 **Dia(s)**

Código	Qtd.	Descrição	Un.	Entrega	Unitário	Total
1 ICCL1-125ML	2	PADRÃO DE CLORETO P/ IC (CROMATOGRAFIA DE ÍONS), 1000 PPM EM ÁGUA, MRC - ISO 17034, FR. DE 125ML MARCA:INORGANIC VENTURES; NCM: 38229000	FR	60 dias	535,000	1.070,00
2 ICNO31-125ML	2	PADRÃO DE NITRATO P/ IC (CROMATOGRAFIA DE ÍONS), 1000 PPM EM ÁGUA, MRC - ISO 17034, FR. DE 125ML MARCA:INORGANIC VENTURES; NCM: 38229000	FR	60 dias	530,000	1.060,00
4 54124	2	PADRÃO DE CLORO TOTAL RESIDUAL LIVRE DE 1000PPM, ISO GUIDE 34, FRASCO COM 100ML MARCA:ABSOLUTE STANDARDS; NCM: 38229000	FR	60 dias	575,00	1.150,00
5 AAFE1-125ML	2	PADRÃO DE FERRO PARA AA (ABSORÇÃO ATÔMICA) DE 1000 PPM, MRC - ISO 17034, FRASCO DE 125ML MARCA:INORGANIC VENTURES; NCM: 38229000	FR	60 dias	400,000	800,00
6 54142	2	PADRÃO DE ALCALINIDADE - DUREZA (CACO3) DE 1000PPM EM ÁGUA, ISO GUIDE 34, FRASCO C/ 100ML MARCA:ABSOLUTE STANDARDS; NCM: 38229000	FR	60 dias	480,550	961,10
7 54156	2	PADRÃO DE DUREZA "WP TOTAL HARDNESS", 1000 UG/ML EM ÁGUA, ISO GUIDE 34, FRASCO C/ 100ML MARCA:ABSOLUTE STANDARDS; NCM: 38229000	FR	60 dias	477,460	954,92
8 IV-STOCK-4-125M	2	PADRÃO MULTIELEMENTAR C/ 23 ELEMENTOS DE 1000PPM (OEM: N9303941), ISO GUIDE 34, FRASCO C/ 125ML MARCA:INORGANIC VENTURES; NCM: 38229000 Quality Control Standard 23 - Contém os seguintes elementos: Ag, Al, B, Ba, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, In, K, Li, Mg, Mn, Na, Ni, Pb, Sr, Tl e Zn.	FR	60 dias	3.800,000	7.600,00
9 ICNO21-125ML	2	PADRÃO DE NITRITO P/ IC (CROMATOGRAFIA DE ÍONS), 1000 PPM EM ÁGUA, MRC - ISO 17034, FR. DE 125ML MARCA:INORGANIC VENTURES; NCM: 38229000	FR	60 dias	600,000	1.200,00
10 AAAL1-125ML	3	PADRÃO DE ALUMÍNIO PARA AA (ABSORÇÃO ATÔMICA) DE 1000 PPM, MRC - ISO 17034, FRASCO DE 125ML MARCA:INORGANIC VENTURES; NCM: 38229000	FR	60 dias	550,000	1.650,00
11 AAMN1-125ML	3	PADRÃO DE MANGANÊS PARA AA (ABSORÇÃO ATÔMICA) DE 1000 PPM, MRC - ISO 17034, FRASCO DE 125ML MARCA:INORGANIC VENTURES; NCM: 38229000	FR	60 dias	550,000	1.650,00

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14	ETURB100	3	PADRAO DE FORMAZINA 100NTU (TURBIDEZ), ISO GUIDE 34, FRASCO C/ 100ML MARCA:ELUS; NCM: 38229000	FR	60 dias	521,330	1.564,00

VALOR TOTAL 19.660,02

Observações :
Valor Total com todos impostos inclusos - Faturamento Mínimo: R$ 200,00 - Frete CIF para compras acima de R$800,00, abaixo desse valor o frete será FOB.

Atenciosamente
ROBERTO GAMBOA
Celular: (011)-99158-4939
E-mail: roberto@quimigol.com.br

REGINA CELIA GAMBOA:31962851893
Assinado de forma digital por REGINA CELIA GAMBOA:31962851893
Dados: 2023.01.24 11:33:07 -03'00'

Certificate of Analysis

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

P: 800-669-6799/540-585-3030
F: 540-585-3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Ion Chromatography Solution
Catalog Number:	ICCL1
Lot Number:	T2-CL719186
Matrix:	H2O
Value / Analyte(s):	1 000 µg/mL ea: Chloride
Starting Material:	Potassium Chloride
Starting Material Lot#:	2389
Starting Material Purity:	99.8400%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1002 ± 4 µg/mL

Density: 1.000 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **1004 ± 5 µg/mL**
Fajans NIST SRM 999c Lot Number: 999c

Assay Method #2 **1001 ± 4 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

Assay Method #3 **1003 ± 5 µg/mL**
IC Assay NIST SRM 3182 Lot Number: 190830

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

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 level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{½}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{½}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{½}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

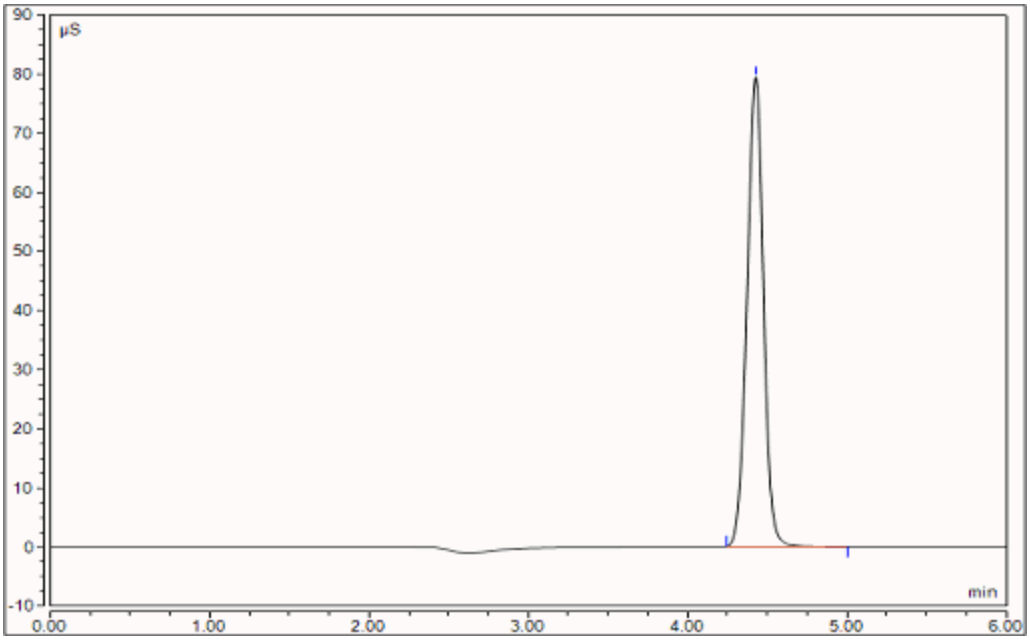
4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 CHROMATOGRAM



Thermo Easion Ion Chromatograph

Analytical Column:	IonPac AS22 4 x 250 mm	**Eluent:**	4.5mM Na2CO3/1.4mM NaHCO3
Guard Column:	IonPac AG22 4 x 50 mm	**Eluent Flow Rate:**	1.2 mL/min
Anion Self Regen Suppressor/ Chemical Suppression:	ACRS 500 4 mm/36mM H2SO4	**Column Temp:**	20°C
		Cell Temp:	35°C
Cation Self Regen Suppressor/ Chemical Suppression:	N/A	**Scale X-Axis:**	minutes
		Scale Y-Axis:	90 µS/cm
		Concentration:	20 µg/g
Suppressor Current/ Chemical Suppressant:	N/A		

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

June 15, 2022

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **June 15, 2027**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

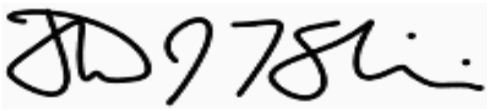
12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:

Uyen Truong
Supervisor, Product Documentation

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

INORGANIC VENTURES™
Refine your results. Redefine your industry.

Certificate of Analysis

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ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Ion Chromatography Solution
Catalog Number:	ICNO31
Lot Number:	T2-NOX717225
Matrix:	H2O
Value / Analyte(s):	1 000 µg/mL ea: Nitrate
Starting Material:	Sodium nitrate
Starting Material Lot#:	1571
Starting Material Purity:	100.0000%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1000 ± 4 µg/mL

Density: 0.999 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **1000 ± 2 µg/mL**
IC Assay NIST SRM 3185 Lot Number: 170309

Assay Method #2 **1000 ± 4 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

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 level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

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X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

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k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{½}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

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Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{½}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

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u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

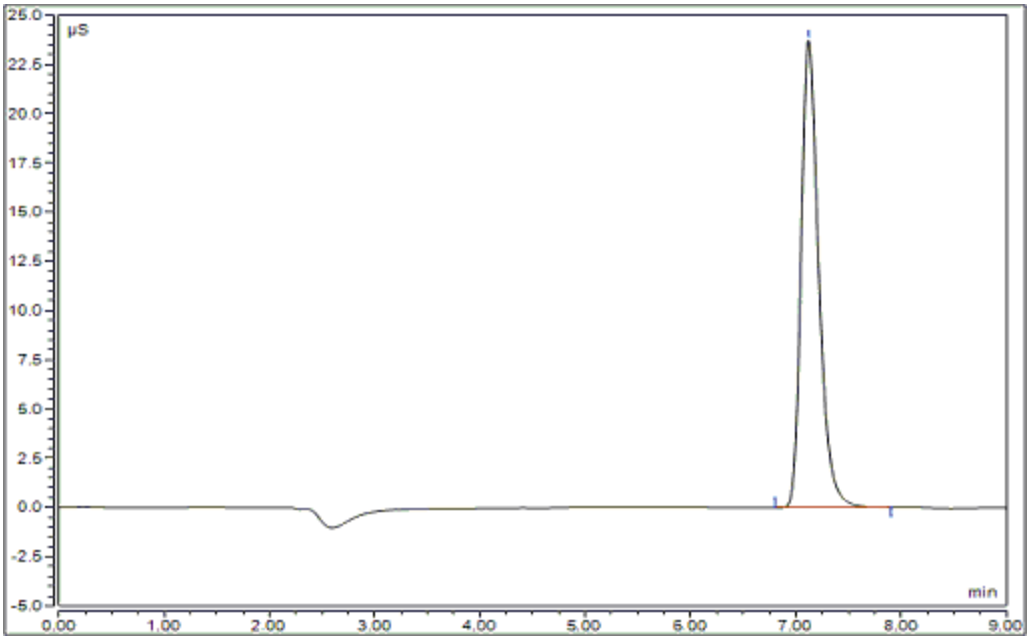
4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 CHROMATOGRAM



Thermo Easion Ion Chromatograph

Analytical Column:	IonPac AS22 4 x 250 mm	**Eluent:**	4.5mM Na2CO3/1.4mM NaHCO3
Guard Column:	IonPac AG22 4 x 50 mm	**Eluent Flow Rate:**	1.2 mL/min
Anion Self Regen Suppressor/ Chemical Suppression:	ACRS 500 4 mm/36mM H2SO4	**Column Temp:**	20°C
		Cell Temp:	35°C
Cation Self Regen Suppressor/ Chemical Suppression:	N/A	**Scale X-Axis:**	minutes
		Scale Y-Axis:	30µS/cm
		Concentration:	20 µg/g
Suppressor Current/ Chemical Suppressant:	N/A		

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

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- For more information, visit **www.inorganicventures.com/TCT**

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

April 11, 2022

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **April 11, 2027**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

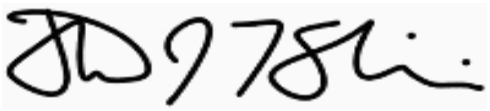
12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:

Uyen Truong
Supervisor, Product Documentation

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

Absolute Standards, Inc.
800-368-1131
www.absolutestandards.com

Certified Reference Material CRM

ANAB ISO 17034 Accredited
AR-1539 Certificate Number
https://Absolutestandards.com

CERTIFIED WEIGHT REPORT:

Part Number: **54124**
Lot Number: **122922**
Description: **Total Residual Free Chlorine (Cl)**
Avoid Light, Store at 4ºC.
Expiration Date: 122925
Recommended Storage: Refrigerate (4 ºC)
Nominal Concentration (µg/mL): **1000**
NIST Test Number: 6UTB 5E-05 Balance Uncertainty
Weight shown below was diluted to (mL): 4000.0 0.058 Flask Uncertainty

Lot #
Solvent: 122922 ASTM Type 1 Water

Formulated By:	Giovanni Esposito	122922
Reviewed By:	Pedro L. Rentas	122922

	Compound	RM#	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	**Actual Conc. (µg/mL)**	Expanded Uncertainty +/- (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.) CAS#	OSHA PEL (TWA)	LD50	NIST SRM
1.	Sodium hypochlorite (Cl)	IN181	E622124	1000	99.99	0.20	7.45	53.7328	53.7348	**1000.0**	**4.0**	7681-52-9	NA	NA	NA*

Avoid Light.
Store at 4ºC.

N/A* - No NIST SRM is available for this analyte.
CRM status was validated following ISO Guide 34 procedures.
The formulated value is verified by titration.
Standard Methods for the Examination of Water and Wasterwater, 19th Edition, 1995. Method 4500-Cl B Iodometric Method I.

* The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
* Purified acids, 18.2 megohm deionized water, calibrated Class A glassware and the highest purity raw materials are used in the preparation of all standards.
* All standard containers are meticulously cleaned prior to use.
* Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
* Standards are certifed (+/-) 0.5% of the stated value, unless otherwise stated.
* All Standards should be stored with caps tight and under appropriate laboratory conditions.
* Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, D.C. (1994).

INORGANIC VENTURES™
Refine your results. Redefine your industry.

Certificate of Analysis

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1.0 ACCREDITATION / REGISTRATION

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2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Atomic Absorption Solution
Catalog Number:	AAFE1
Lot Number:	T2-FE721402
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	1 000 µg/mL ea: Iron

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value:	1000 ± 10 µg/mL
Density:	1.011 g/mL (measured at 20 ± 4 ºC)

4.0 TRACEABILITY TO NIST

The concentration of this solution standard has been verified by Inductively Coupled Plasma Spectroscopy (ICP) and is traceable to NIST SRM 3126a.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 55.85 +3 6 $Fe(H_2O)_6^{3+}$

Chemical Compatibility -Stable in HCl, HNO_3, H_2SO_4 ,HF and H_3PO_4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO_3 / LDPE container.

Fe Containing Samples (Preparation and Solution) - Metal (Soluble in HCl); Oxides (If the oxide has been at high temperature then Na_2CO_3 fusion in Pt0 followed by HCl dissolution otherwise dissolve in dilute HCl); Ores (See Oxides above using only the fusion approach).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 56 amu	970 ppt	N/A	40Ar15N1H, 40Ar16O, 36Ar17O1H , 38Ar18O, 37Cl18O1H, 40Ca16O
ICP-OES 238.204 nm	0.005/0.001 µg/mL	1	Ru, Co
ICP-OES 239.562 nm	0.005/0.001 µg/mL	1	Co, W, Cr
ICP-OES 259.940 nm	0.006/0.001 µg/mL	1	Hf, Nb

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

July 20, 2022

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **July 20, 2027**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

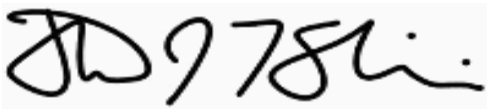
- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

Absolute Standards, Inc.
800-368-1131
www.absolutestandards.com

Certified Reference Material CRM

ANAB ISO 17034 Accredited
AR-1539 Certificate Number
https://Absolutestandards.com

CERTIFIED WEIGHT REPORT:

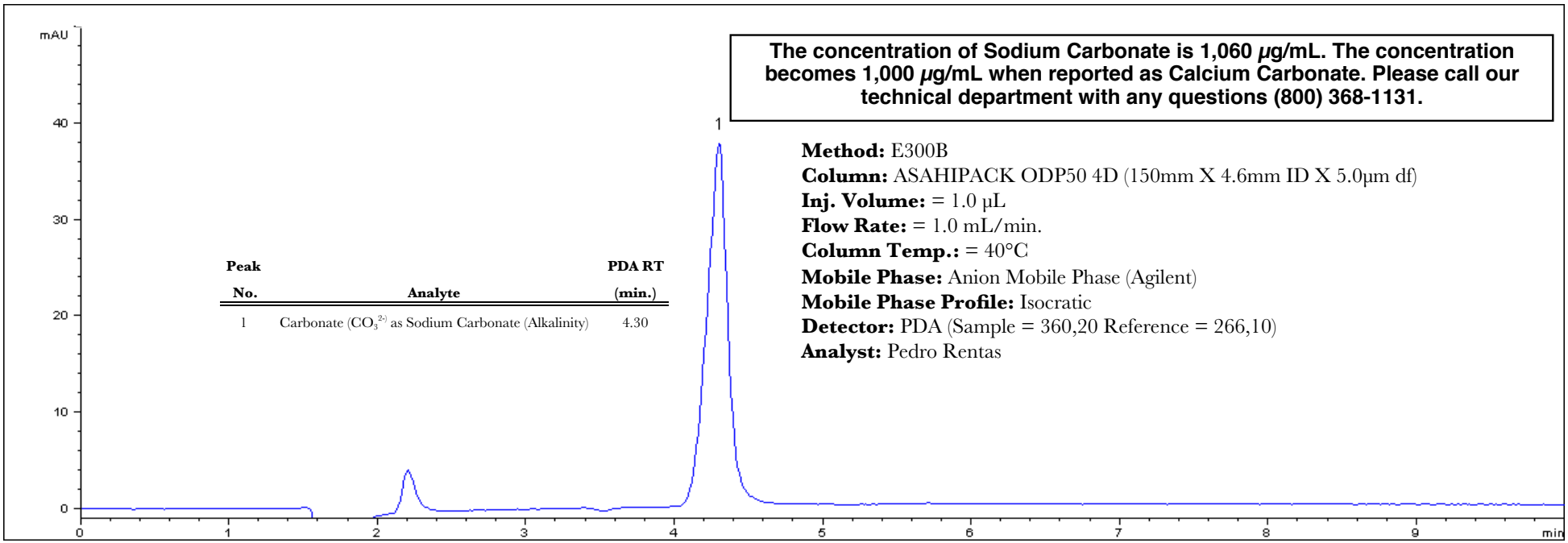
Part Number: **54142**
Lot Number: **122822**
Description: **Alkalinity, as Calcium Carbonate**

Solvent: **Lot #** 122822 ASTM Type 1 Water

Expiration Date: 122824
Recommended Storage: Refrigerate (4 ºC)
Nominal Concentration (µg/mL): **1000**
NIST Test Number: 6UTB 5E-05 Balance Uncertainty
Weight shown below was diluted to (mL): 4000.0 0.06 Flask Uncertainty

Formulated By:	Giovanni Esposito	122822
Reviewed By:	Pedro L. Rentas	122822

Compound	RM#	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	**Actual Conc. (µg/mL)**	Expanded Uncertainty +/- (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.) CAS#	OSHA PEL (TWA)	LD50	NIST SRM
1. Sodium carbonate (Na2CO3)	IN115	BCCF5382	1000	99.99	0.10	100.0	4.2405	4.2411	**1060.2**	**2.1**	497-19-8	NA	orl-rat 2800 mg/kg	351



The concentration of Sodium Carbonate is 1,060 µg/mL. The concentration becomes 1,000 µg/mL when reported as Calcium Carbonate. Please call our technical department with any questions (800) 368-1131.

Peak No.	Analyte	PDA RT (min.)
1	Carbonate (CO_3^{2-}) as Sodium Carbonate (Alkalinity)	4.30

Method: E300B
Column: ASAHIPACK ODP50 4D (150mm X 4.6mm ID X 5.0µm df)
Inj. Volume: = 1.0 µL
Flow Rate: = 1.0 mL/min.
Column Temp.: = 40°C
Mobile Phase: Anion Mobile Phase (Agilent)
Mobile Phase Profile: Isocratic
Detector: PDA (Sample = 360,20 Reference = 266,10)
Analyst: Pedro Rentas

* The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
* Purified acids, 18.2 megohm deionized water, calibrated Class A glassware and the highest purity raw materials are used in the preparation of all standards.
* All standard containers are meticulously cleaned prior to use.
* Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
* Standards are certifed (+/-) 0.5% of the stated value, unless otherwise stated.
* All standards should be stored with caps tight and under appropriate laboratory conditions.
* Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, D.C. (1994).

Absolute Standards, Inc.
800-368-1131
www.absolutestandards.com

Certified Reference Material CRM

ANAB ISO 17034 Accredited
AR-1539 Certificate Number
https://Absolutestandards.com

CERTIFIED WEIGHT REPORT:

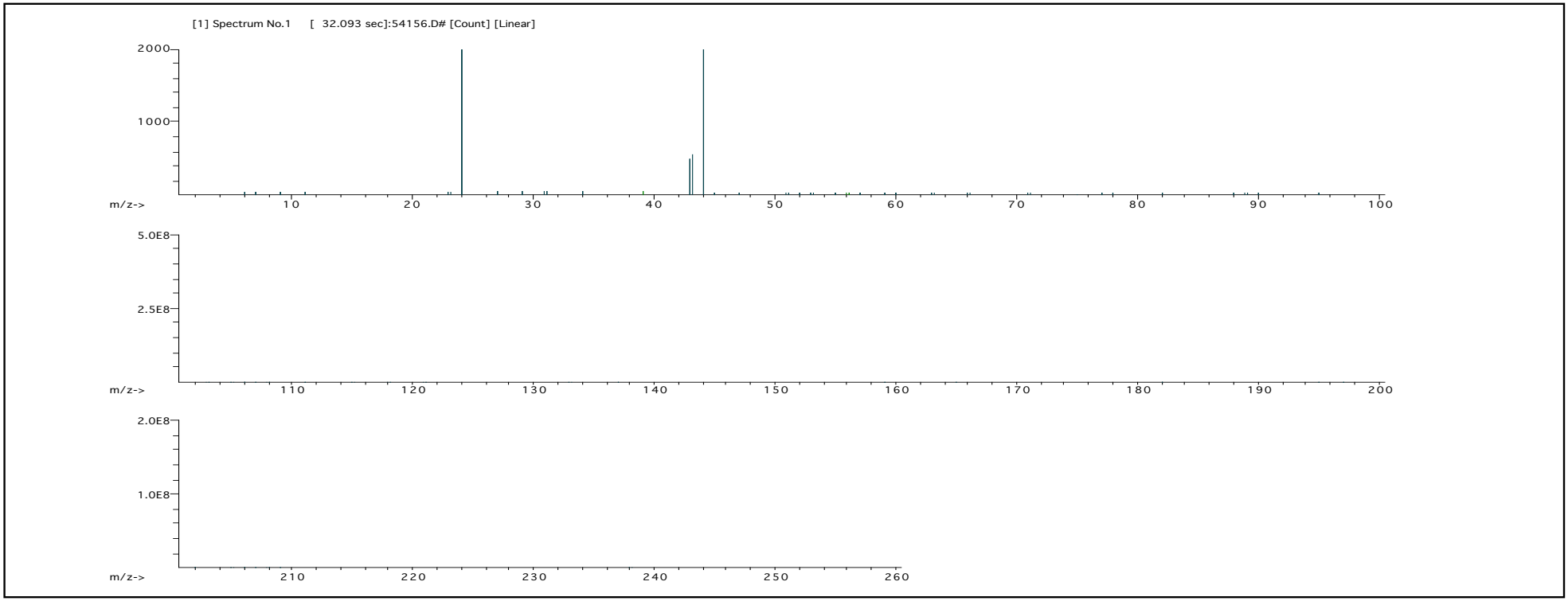
Part Number: **54156**
Lot Number: **102922**
Description: **WP Total Hardness**
Minerals
Expiration Date: 102925
Recommended Storage: Ambient (20 ºC)
Nominal Concentration (µg/mL): **1000**
NIST Test Number: 6UTB

Lot #
Solvent: 102922 ASTM Type 1 Water

5E-05 Balance Uncertainty
Weights shown below were diluted to (mL): 4000.3
0.06 Flask Uncertainty

Formulated By:	Giovanni Esposito 102922
Reviewed By:	Pedro L. Rentas 102922

	Compound	RM#	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	**Actual Conc. (µg/mL)**	Expanded Uncertainty +/- (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.) CAS#	OSHA PEL (TWA)	LD50	NIST SRM
1.	Calcium chloride dihydrate (Ca)	IN171	MKCG9612	151.1	99.9	0.10	27.3	2.2196	2.2207	151.2	0.3	10035-04-8	NA	drm-rab >5000mg/kg	3109a
2.	Magnesium chloride, 6-hydrate (Mg)	IN046	BCBS1961V	151.1	99.7	0.10	12.0	5.0691	5.0726	151.2	0.3	7791-18-6	NA	NA	3131a
	Total Hardness									**1000.2**	**0.6**				



Instrumental Analysis by Inductively Coupled Plasma Mass Spectrometry (ICP-MS):

Trace Metals Verification by ICP-MS (µg/mL)																	
Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pr	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	T	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Te	<0.02	U	<0.02
As	<0.2	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	T	Os	<0.02	Rh	<0.02	Ag	<0.02	Tl	<0.02	V	<0.02
Ba	<0.02	Cs	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.02	Pd	<0.02	Rb	<0.02	Na	<0.2	Th	<0.02	Yb	<0.02
Be	<0.01	Cr	<0.02	Ga	<0.02	Fe	<0.2	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	<0.02	Tm	<0.02	Y	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	Sn	<0.02	Zn	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	Ti	<0.02	Zr	<0.02

(T)= Target analyte

Physical Characterization:

Homogeneity: No heterogeneity was observed in the preparation of this standard.

Certified by:

* The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
* Purified acids, 18.2 megohm deionized water, calibrated Class A glassware and the highest purity raw materials are used in the preparation of all standards.
* All standard containers are meticulously cleaned prior to use.
* Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
* Standards are certifed (+/-) 0.5% of the stated value, unless otherwise stated.
* All standards should be stored with caps tight and under appropriate laboratory conditions.
* Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, D.C. (1994).

Certificate of Analysis

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

P: 800-669-6799/540-585-3030
F: 540-585-3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Multi Analyte Custom Grade Solution
Catalog Number:	IV-STOCK-4
Lot Number:	T2-MEB723630
Matrix:	5% (v/v) HNO3
Value / Analyte(s):	1 000 µg/mL ea:

Silver,	Aluminum,
Boron,	Barium,
Bismuth,	Calcium,
Cadmium,	Cobalt,
Chromium,	Copper,
Iron,	Gallium,
Indium,	Potassium,
Lithium,	Magnesium,
Manganese,	Sodium,
Nickel,	Lead,
Strontium,	Thallium,
Zinc	

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Aluminum, Al	1 001 ± 3 µg/mL	Barium, Ba	1 001 ± 4 µg/mL
Bismuth, Bi	1 001 ± 7 µg/mL	Boron, B	1 001 ± 6 µg/mL
Cadmium, Cd	1 001 ± 4 µg/mL	Calcium, Ca	1 001 ± 4 µg/mL
Chromium, Cr	1 001 ± 7 µg/mL	Cobalt, Co	1 001 ± 5 µg/mL
Copper, Cu	1 001 ± 4 µg/mL	Gallium, Ga	1 001 ± 4 µg/mL
Indium, In	1 001 ± 4 µg/mL	Iron, Fe	1 001 ± 4 µg/mL
Lead, Pb	1 001 ± 4 µg/mL	Lithium, Li	1 001 ± 4 µg/mL
Magnesium, Mg	1 001 ± 4 µg/mL	Manganese, Mn	1 001 ± 4 µg/mL
Nickel, Ni	1 001 ± 4 µg/mL	Potassium, K	1 001 ± 4 µg/mL
Silver, Ag	1 001 ± 4 µg/mL	Sodium, Na	1 001 ± 4 µg/mL
Strontium, Sr	1 001 ± 4 µg/mL	Thallium, Tl	1 001 ± 7 µg/mL
Zinc, Zn	1 001 ± 4 µg/mL		

Density: 1.096 g/mL (measured at 20 ± 4 ºC)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ag	ICP Assay	3151	160729
Ag	Volhard	999c	999c
Al	ICP Assay	3101a	140903
Al	EDTA	928	928
B	ICP Assay	3107	190605
Ba	ICP Assay	3104a	140909
Ba	Gravimetric		See Sec. 4.2
Bi	ICP Assay	3106	180815
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
Cd	ICP Assay	3108	130116
Cd	EDTA	928	928
Co	ICP Assay	3113	190630
Co	EDTA	928	928
Cr	ICP Assay	3112a	170630
Cu	ICP Assay	3114	121207
Cu	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
Ga	ICP Assay	3119a	140124
Ga	EDTA	928	928
In	ICP Assay	3124a	110516
In	EDTA	928	928
K	ICP Assay	3141a	140813
K	Gravimetric		See Sec. 4.2
Li	ICP Assay	3129a	100714
Li	Gravimetric		See Sec. 4.2
Mg	ICP Assay	3131a	140110
Mg	EDTA	928	928
Mn	ICP Assay	3132	050429
Mn	EDTA	928	928
Na	ICP Assay	Traceable to 3152A	S2-NA700842
Na	Gravimetric		See Sec. 4.2
Ni	ICP Assay	3136	120619
Ni	EDTA	928	928
Pb	ICP Assay	3128	101026
Pb	EDTA	928	928
Sr	EDTA	928	928
Sr	ICP Assay	Traceable to 3153a	K2-SR650985
Tl	ICP Assay	3158	151215
Zn	ICP Assay	3168a	120629
Zn	EDTA	928	928

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 level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{½}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{½}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{½}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 13, 2022

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **September 13, 2027**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

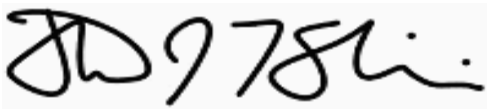
- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

Certificate of Analysis

Refine your results. Redefine your industry.

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

P: 800-669-6799/540-585-3030
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1.0 ACCREDITATION / REGISTRATION

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ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Ion Chromatography Solution
Catalog Number:	ICNO21
Lot Number:	T2-NOX722443
Matrix:	H2O
Value / Analyte(s):	1 000 µg/mL ea: Nitrite
Starting Material:	Sodium nitrite
Starting Material Lot#:	1574
Starting Material Purity:	99.5500%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1004 ± 4 µg/mL

Density: 0.999 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **1005 ± 3 µg/mL**
IC Assay NIST SRM Lot Number: traceable to 40h

Assay Method #2 **1001 ± 4 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

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 level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{½}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{½}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{½}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

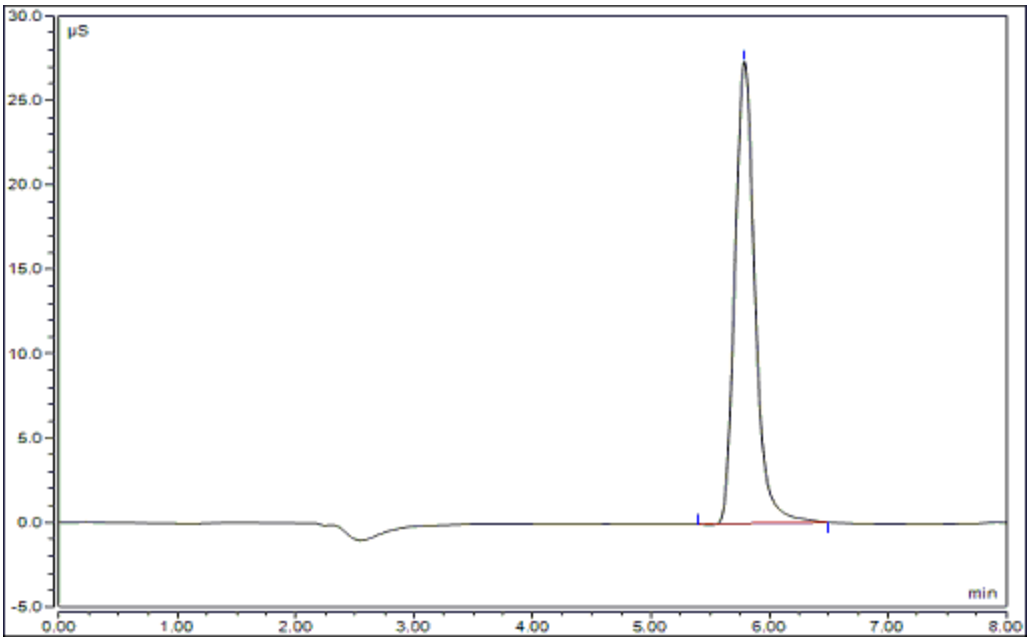
4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 CHROMATOGRAM



Thermo Easion Ion Chromatograph

Analytical Column:	IonPac AS22 4 x 250 mm	**Eluent:**	4.5mM Na2CO3/1.4mM NaHCO3
Guard Column:	IonPac AG22 4 x 50 mm	**Eluent Flow Rate:**	1.2 mL/min
Anion Self Regen Suppressor/ Chemical Suppression:	ACRS 500 4 mm/36mM H2SO4	**Column Temp:**	20°C
		Cell Temp:	35°C
		Scale X-Axis:	minutes
Cation Self Regen Suppressor/ Chemical Suppression:	N/A	**Scale Y-Axis:**	30 µS/cm
		Concentration:	20 µg/g
Suppressor Current/ Chemical Suppressant:	N/A		

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

August 26, 2022

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **August 26, 2027**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

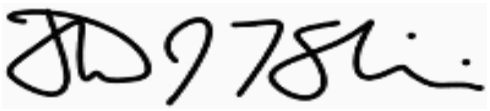
12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:

Uyen Truong
Supervisor, Product Documentation

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

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Certificate of Analysis

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Atomic Absorption Solution
Catalog Number:	AAAL1
Lot Number:	T2-AL720303
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	1 000 µg/mL ea: Aluminum

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value:	1000 ± 10 µg/mL
Density:	1.019 g/mL (measured at 20 ± 4 ºC)

4.0 TRACEABILITY TO NIST

The concentration of this solution standard has been verified by Inductively Coupled Plasma Spectroscopy (ICP) and is traceable to NIST SRM 3101a.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 26.98 +3 6 Al(H2O)6+3

Chemical Compatibility -Soluble in HCl, HNO3, HF and H2SO4. Avoid neutral media. Soluble in strongly basic NaOH forming the Al(OH)4(H2O)21- species. Stable with most metals and inorganic anions. The phosphate is insoluble in water and only slightly soluble in acid.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 2-5% HNO3 / LDPE container.

Al Containing Samples (Preparation and Solution) -Metal (Best dissolved in HCl / HNO3); a- Al2O3 (Na2CO3 fusion in Pt0);

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 27 amu	30 ppt	N/A	12C15N, 13C14N, 1H12C14N, 11B16O, 54Cr2+, 54Fe2+
ICP-OES 167.078 nm	0.1/0.009 µg/mL	1	Fe
ICP-OES 394.401 nm	0.05/0.006 µg/mL	1	U, Ce
ICP-OES 396.152 nm	0.03/0.006 µg/mL	1	Mo, Zr, Ce

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

June 17, 2022

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **June 17, 2027**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

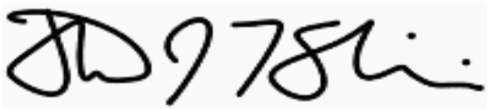
- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Atomic Absorption Solution
Catalog Number:	AAMN1
Lot Number:	T2-MN719527
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	1 000 µg/mL ea: Manganese

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value:	1000 ± 10 µg/mL
Density:	1.016 g/mL (measured at 20 ± 4 ºC)

4.0 TRACEABILITY TO NIST

The concentration of this solution standard has been verified by Inductively Coupled Plasma Spectroscopy (ICP) and is traceable to NIST SRM 3132.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 54.94 +2 6 $Mn(H_2O)_6^{2+}$

Chemical Compatibility -Stable in HCl, HNO_3, H_2SO_4 ,HF, H_3PO_4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5 % HNO_3/LDPE container.

Mn Containing Samples (Preparation and Solution) -Metal (Soluble in dilute acids); Oxides (Soluble in dilute acids); Ores (Dissolve with HCl. If silica is present add HF and then fume off silica by adding H_2SO_4 and heat to SO_3 fumes - dense white fumes).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 55 amu	10 ppt	n/a	40Ar14N1H,39K16O,37Cl18O,40Ar15N,38Ar17O,36Ar18O1H ,38Ar16O1H,37Cl17O1H,23Na32S
ICP-OES 257.610 nm	0.0014 / 0.00002 µg/mL	1	Ce, W, Re
ICP-OES 259.373 nm	0.0016 / 0.00002 µg/mL	1	U, Ta, Mo, Fe, Nb
ICP-OES 260.569 nm	0.0021 / 0.00002 µg/mL	1	Co

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

May 26, 2022

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **May 26, 2027**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

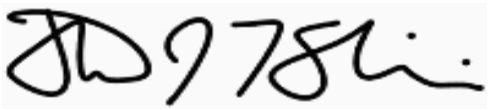
- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

Certificado de Material de Referência

Certificado de Materiales de Referencia

Número de Acreditação PMR-003. Data de Acreditação 2016-10-18

Número de Acreditación PMR-003. Fecha de Acreditación 2016-10-18

MRC: Suspensão de Formazina 100 NTU

Código: ELNTU100 Lote: 0821-ELNTU100-0686 N°Certificado: MR-171/21 Folha 01/01

Descrição do MRC

O Material de Referência Certificado consiste de uma Suspensão de Formazina 100 NTU oriunda da mistura de sais e água purificada.

Preparação do MRC

O Material de Referência Certificado foi preparado gravimetricamente a partir dos sais de Sulfato de hidrazina e Hexametilenotetramina. O envase do Material de Referência Certificado foi feito em frasco de Polietileno de alta densidade.

Metodologia Analítica

O valor certificado foi obtido pela caracterização utilizando um único método. Os estudos de estabilidade e homogeneidade foram realizados de acordo com acordo com a ABNT ISO 17034, utilizando um turbidímetro calibrado.

Rastreabilidade

A cadeia de rastreabilidade dos resultados das medições foi garantida seguindo a metodologia EPA 180.1 e SMEWW 2130, que são equivalentes.

Finalidade de uso

O MRC tem sua finalidade básica, o uso para calibração de medidores de turbidez.

Armazenamento e Manipulação

O volume mínimo de MRC a ser utilizado é de 10 mL.
Homogenize o frasco lentamente antes da utilização, sem agitar. A agitação vigorosa causa bolhas que interferem nos valores da amostra.
Utilizar a suspensão em temperatura ambiente. A leitura deve ser feita imediatamente após a homogeneização da suspensão.
O MRC deve ser armazenado em ambiente protegido contra a incidência de luz em temperatura de 2 a 8°C.
O uso de unidades abertas após esse prazo implica na não garantia de validade dos valores certificados e aqui apresentados.
Cabe ao usuário manter uma rotina de controle de uso de suas unidades.

Valor Certificado e Incerteza de Medição

O valor declarado do Material de Referência Certificado, com sua respectiva incerteza expandida, é baseada na incerteza combinada dos estudos de homogeneidade, estabilidade e caracterização para um nível de confiança de aproximadamente 95% (k = 2), baseada no "Guia para Expressão da Incerteza de Medição".

Suspensão de Formazina	**100 NTU ± 2,2 NTU**

A certificação foi realizada no dia : **05/08/2021**

O lote do MRC referente a este certificado tem validade até : **agosto-22**

Informações Adicionais

- É assegurado a integridade deste material até a abertura de sua embalagem se a mesma estiver íntegra.
- Este MRC deve ser manuseado de acordo com as instruções contidas neste certificado e também conforme as informações referente ao transporte e a segurança descritas na FISPQ que segue em anexo.
- Este certificado não terá valor, caso o MRC seja danificado, contaminado ou alterado.
- A Elus mantém um estudo de estabilidade de longa duração dos MRCs produzidos, sendo que observando qualquer alteração em relação ao valor declarado neste certificado, o cliente será imediatamente comunicado, para que possamos tomar as devidas providências.
- Este certificado é válido apenas para o lote produzido, não sendo extensivo a quaisquer lotes.
- A reprodução deste certificado só poderá ser total, sem nenhuma alteração.
- Este certificado atende aos requisitos da ISO 17034 e ISO/IEC 17025.

Responsável Técnico

Assinado de forma digital por GEORGE GOMES CORDEIRO:33816157858
DN: c=BR, o=ICP-Brasil, ou=Presencial, ou=62457049000125, ou=Secretaria da Receita Federal do Brasil - RFB, ou=RFB e-CPF A3, ou=(em branco), cn=GEORGE GOMES CORDEIRO:33816157858

George G. Cordeiro
Signatário Autorizado

PRODUCTOR DE MATERIALES DE REFERENCIA
PMR-003

Av. Dr. Assis Ribeiro, 10.098 | Vila Jacuí | São Paulo | SP | 03827-001 | Tel.+55 (11) 2214-9069 | e-mail: atendimento@elusinstrumentacao.com.br

FISPQ - FICHA DE INFORMAÇÃO
DE SEGURANÇA DE PRODUTO QUÍMICO

FISPQ nº	PRODUTO	REVISÃO	DATA	PÁGINA
F-027	**Suspensão de Turbidez de Formazina**	Rev. 02	13/01/2021	**1** de **5**

1. IDENTIFICAÇÃO DO PRODUTO E DA EMPRESA

Nome do produto: **Suspensão de Turbidez de Formazina**

Código interno de identificação do produto: **ELNTU0,5 / ELNTUS0,5 / ELNTU1 / ELNTUS1 / ELNTU2 / ELNTUS2 / ELNTU5 / ELNSTUS5 / ELNTU8 / ELNTUS8 / ELNTU10 / ELNTUS10 / ELNTU20 / ELNTUS20 / ELNTU40 / ELNTUS40 ELNTU50 / ELNTUS50 / ELNTU80 / ELNTUS80 / ELNTU100 / ELNTUS100 / ELNTU200 / ELNTUS200.**

Nome da empresa: **Elus Serviços Técnicos Ltda. – EPP.**

Endereço: **Av. Dr. Assis Ribeiro, 10.098 – Vila Jacuí – São Paulo – SP – CEP: 03827-001**

Telefone: **(11) 2214-9069.**

Telefone para emergências: **0800-11-8270 (Pró-Química da Abiquim)**

E-mail: **atendimento@elusinstrumentacao.com.br**

2. IDENTIFICAÇÃO DE PERIGOS

- Classificação da substância ou mistura: De acordo com o Sistema Harmonizado Global (GHS) não é uma substância ou mistura perigosa.

3. COMPOSIÇÃO E INFORMAÇÕES SOBRE OS INGREDIENTES

- Substância: Mistura química.
- Nome químico comum ou nome genérico: Água destilada / Sulfato de Hidrazina e Hexametilenotetramina.
- Registro no *Chemical Abstract Service* (no CAS): 7732-18-5 / 10034-93-2 / 100-97-0.
- Concentração ou faixa de concentração: > 99 % / < 0,1 % / < 1 %.

4. MEDIDAS DE PRIMEIROS SOCORROS

- Contato com os olhos: Lavar os olhos com quantidade abundante de água durante no mínimo 15 minutos, levantando ocasionalmente as pálpebras superiores e inferiores. Procurar assistência médica imediatamente.
- Contato com a pele: Remover roupas e sapatos contaminados. Lavar a pele com quantidade abundante de água.

- Inalação: Levar a pessoa para local ventilado ou arejado e mantenha em repouso, numa posição que não dificulte a respiração. Contate imediatamente o médico.
- Ingestão: Lavar a boca com quantidade abundante de água. Não provocar vômito. Procurar assistência médica imediatamente.
- Notas para o médico: Não disponível.
- Principais sintomas: Não disponível.

5. MEDIDAS DE COMBATE A INCÊNDIO

- Meios de extinção apropriados**:** Material não inflamável, não combustível, não comburente e não explosivo. Quando envolvido em fogo, use meios de extinção conforme o combustível envolvido no incêndio.
- Meios de extinção não apropriados: Não disponível.
- Perigos específicos: Não disponível.
- Métodos especiais: Não disponível.
- Equipamentos de proteção no combate à incêndio: Use EPI conforme o combustível envolvido no incêndio.
- Produto de decomposição térmica: Não disponível.

6. MEDIDAS DE CONTROLE PARA DERRAMAMENTO OU VAZAMENTO

Precauções ao meio ambiente:

- Grandes derramamentos e vazamentos: Não disponível.
- Pequenos derramamentos e vazamentos: Evitar o contato com a substância. Não inalar os vapores/aerossóis. Garantir a ventilação com ar fresco em recintos fechados. Não deixar escapar para a canalização de águas residuais. Absorver com um agente higroscópico para limpeza / Absorção. Proceder à eliminação de resíduos. Limpeza posterior.

7. MANUSEIO E ARMAZENAMENTO

- Manuseio: Utilizar equipamentos de proteção individual (EPI) adequados que impeçam o contato com a pele e os olhos. Após aberto, manipular apenas durante o tempo necessário para a realização da leitura.
- Armazenamento**:** Manter longe de alimentos e bebidas. Estocar na embalagem original, fechada, em local protegido contra a incidência de luz e na temperatura recomendada de 2 a 8°C. Recomenda-se que após o uso, o frasco seja fechado e armazenado sob refrigeração, evitando contato com possíveis contaminantes.

8. CONTROLE DE EXPOSIÇÃO E PROTEÇÃO INDIVIDUAL

- Parâmetros de controle: As medidas necessárias de controle para impedir/minimizar a exposição aos materiais são os usos corretos dos EPIs e o descarte adequado dos rejeitos em recipientes apropriados. As instalações para estocagem e uso deste material devem ser equipadas com lavadores de olhos e chuveiro de segurança.
- Equipamento de proteção individual apropriado:
    - Proteção respiratória: Não aplicável.

- Proteção das mãos: Luvas.
- Proteção dos olhos: Óculos de proteção.
- Proteção da pele e do corpo: Avental.
- Proteção térmica: Não aplicável.

9. PROPRIEDADES FÍSICO-QUÍMICAS

- Estado físico: Líquido de aspecto leitoso e com material em suspensão.
- Odor: Inodoro.
- pH: Não disponível
- Formula química: H_2O / $N_2H_6SO_4$ / $C_6H_{12}N_4$.
- Temperaturas específicas ou faixas de temperaturas nas quais ocorrem mudanças de estado físico: Não disponível.
  - Ponto de ebulição: Não disponível.
  - Faixa de temperatura de ebulição**:** Não disponível.
  - Faixa de destilação: Não disponível.
  - Ponto de fusão: Não disponível.

- Temperatura de decomposição: Não disponível.
- Ponto de fulgor: Não disponível.
- Temperatura de auto-ignição: Não disponível.
- Limites de inflamabilidade ou explosividade superior/inferior: Não disponível.
- Pressão de vapor: Não disponível.
- Densidade de vapor: Não disponível.
- Densidade: Não disponível.
- Solubilidade/miscibilidade: Não disponível.
- Coeficiente de partição octanol/água: Não disponível.
- Taxa de evaporação: Não disponível.

10. ESTABILIDADE E REATIVIDADE

- Estabilidade química**:** Estável sob as condições recomendadas de armazenamento.
- Reatividade / possibilidade de reações perigosas: Não aplicável.
- Condições a serem evitadas: Não aplicável.
- Materiais incompatíveis: Não aplicável.
- Produtos perigosos de decomposição: Não aplicável.

11. INFORMAÇÕES TOXICOLÓGICAS

- Toxicidade aguda: Não disponível.
- Mutagenicidade: Não disponível.
- Carcinogenicidade: Nenhum componente deste produto presente a níveis maiores ou iguais a 0.1% é identificado como carcinogênico provável, conforme a norma vigente NBR 14725-2.
- Teratogenicidade: Não disponível.

- Sintomas de exposição aguda: Não disponível.
- Sintomas de exposição crônica: Não disponível.
- Substâncias que podem causar potenciação ou sinergia: Não disponível.
- Corrosão / irritação da pele: Não disponível.

12. INFORMAÇÕES ECOLÓGICAS

- Ecotoxicidade: Não disponível.
- Persistência e degradabilidade: Não disponível.
- Potencial bioacumulativo: Não disponível.
- Mobilidade no solo: Não disponível.
- Outros efeitos adversos: Não são conhecidos outros efeitos ambientais para este produto.

13. CONSIDERAÇÕES SOBRE TRATAMENTO E DISPOSIÇÃO

- Propor a entrega de soluções excedentes e não recicláveis à uma empresa idônea de tratamento de resíduos.
- Não reutilizar a embalagem para qualquer outro fim.
- Dispor conforme a legislação ambiental local, estadual e ou federal.

14. INFORMAÇÕES SOBRE TRANSPORTE

- Classificação de risco: Não aplicável

Condições para transporte:

- Produto químico classificado como não perigoso.
- Este material se mantém estável na temperatura máxima de transporte de 5 a 40 ºC por até 15 dias.
- Transporte terrestre: substância que apresenta risco para o meio ambiente, líquida, n.e (Resolução ANTT 5232/16).
- Transporte fluvial: não relevante.
- Transporte aéreo: produto não perigoso segundo o regulamento de transporte (IATA/DGR).
- Transporte marítimo: produto não perigoso segundo o regulamento de transporte (IMDG).

15. REGULAMENTAÇÕES

Regulamentos aplicáveis:

- Resolução ANTT 5232/16: Regulamento do Transporte Terrestre de Produtos Perigosos.
- IATA/DGR: Regulamento de Mercadorias Perigosas (transporte aéreo).
- IMDG: Código Marítimo Internacional de Mercadorias Perigosas.

16. OUTRAS INFORMAÇÕES

- Referências bibliográficas: ABNT NBR 14725-4:2014 e 14725-2.
- *United Nations. Globally Harmonized System of Classification and Labelling of Chemicals. 4. ed. (revised). New York and Geneva, 2011.*
- Legendas e abreviaturas: MRC – Material de Referência Certificado
- Informações adicionais: As informações contidas nesta FISPQ dizem respeito especificamente a este produto. As informações podem não ser válidas para este produto se utilizado em combinação com quaisquer outros materiais.

Acredita-se que as informações acima estejam corretas, embora não pretendam ser totalmente abrangentes, devendo ser usadas apenas como um guia. A Elus Serviços Técnicos não deverá ter responsabilidade legal por quaisquer danos resultantes do manuseio ou do contato com o produto acima.