

DATA OF KNOWN QUALITY CONFORMANCE/NON-CONFORMANCE SUMMARY QUESTIONNAIRE

Laboratory Name : CHEMTECH

Client : G Environmental

Project Location : _____

Project Number : - Amsterdam

Laboratory Sample ID(s) : Q1355

Sampling Date(s) : 2/11/2025

List DKQP Methods Used (e.g., 8260,8270, et Cetra) **,6010D,7470A,8260-Low,9056A,SOP**

1	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the NJDEP Data of Known Quality performance standards?	☒ Yes ☐ No
1A	Were the method specified handling, preservation, and holding time requirements met?	☒ Yes ☐ No
1B	EPH Method: Was the EPH method conducted without significant modifications (see Section 11.3 of respective DKQ methods)	☐ Yes ☐ No ☒ N/A
2	Were all samples received by the laboratory in a condition consistent with that described on the associated chain-of-custody document(s)?	☒ Yes ☐ No
3	Were samples received at an appropriate temperature (4±2° C)?	☒ Yes ☐ No ☐ N/A
4	Were all QA/QC performance criteria specified in the NJDEP DKQP standards achieved?	☒ Yes ☐ No
5	a)Were reporting limits specified or referenced on the chain-of-custody or communicated to the laboratory prior to sample receipt? b)Were these reporting limits met?	☒ Yes ☐ No ☒ Yes ☐ No ☐ N/A
6	For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the DKQP documents and/or site-specific QAPP?	☒ Yes ☐ No
7	Are project-specific matrix spikes and/or laboratory duplicates included in this data set?	☒ Yes ☐ No

Notes: For all questions to which the response was "No" (with the exception of question #7), additional information should be provided in an attached narrative. If the answer to question #1, #1A, or #1B is "No", the data package does not meet the requirements for "Data of Known Quality."

Cover Page

Order ID : Q1355

Project ID : Amsterdam

Client : G Environmental

Lab Sample Number

Q1355-01
Q1355-02

Client Sample Number

RW1
MW2

I certify that the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the laboratory manager or his designee, as verified by the following signature.

Signature : _____

Date: 2/25/2025

NYDOH CERTIFICATION NO - 11376

NJDEP CERTIFICATION NO - 20012



284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

CASE NARRATIVE

G Environmental

Project Name: Amsterdam

Project # N/A

Chemtech Project # Q1355

Test Name: Metals ICP-TAL,Mercury

A. Number of Samples and Date of Receipt:

2 Water samples were received on 02/11/2025.

B. Parameters:

According to the Chain of Custody document, the following analyses were requested:

Anions Group1, Mercury, Metals ICP-TAL, METALS-TAL, Sulfate and VOCMS

Group1. This data package contains results for Metals ICP-TAL,Mercury.

C. Analytical Techniques:

The analysis of Metals ICP-TAL was based on method 6010D, digestion based on method 3010 (waters). The analysis and digestion of Mercury was based on method 7470A.

D. QA/ QC Samples:

The Holding Times were met for all analysis.

The Blank Spike met requirements for all samples.

The Duplicate (TWP-1-WCDUP) analysis met criteria for all samples except for Aluminum.

The Matrix Spike (TWP-1-WCMS) analysis met criteria for all samples except for Aluminum, Iron.

The Matrix Spike Duplicate (TWP-1-WCMSD) analysis met criteria for all samples except for Iron.

The Blank analysis did not indicate the presence of lab contamination.

The Calibration met the requirements.

The Serial Dilution (TWP-1-WCL) met criteria for all samples except for Aluminum, Chromium.

E. Additional Comments:

I certify that the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. The laboratory manager or his designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

Signature_____

DATA REPORTING QUALIFIERS- INORGANIC

For reporting results, the following “ Results Qualifiers” are used:

J	Indicates the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL), but greater than or equal to the Instrument Detection Limit (IDL).
U	Indicates the analyte was analyzed for, but not detected.
ND	Indicates the analyte was analyzed for, but not detected
E	Indicates the reported value is estimated because of the presence of interference
M	Indicates Duplicate injection precision not met.
N	Indicates the spiked sample recovery is not within control limits.
S	Indicates the reported value was determined by the Method of Standard Addition (MSA).
*	Indicates that the duplicate analysis is not within control limits.
+	Indicates the correlation coefficient for the MSA is less than 0.995.
D	Indicates the reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range.
M	Method qualifiers “P” for ICP instrument “PM” for ICP when Microwave Digestion is used “CV” for Manual Cold Vapor AA “AV” for automated Cold Vapor AA “CA” for MIDI-Distillation Spectrophotometric “AS” for Semi -Automated Spectrophotometric “C” for Manual Spectrophotometric “T” for Titrimetric “NR” for analyte not required to be analyzed
OR	Indicates the analyte’s concentration exceeds the calibrated range of the instrument for that specific analysis.
Q	Indicates the LCS did not meet the control limits requirements
H	Sample Analysis Out Of Hold Time

APPENDIX A

QA REVIEW GENERAL DOCUMENTATION

Project #: Q1355

Completed

For thorough review, the report must have the following:

GENERAL:

Are all original paperwork present (chain of custody, record of communication,airbill, sample management lab chronicle, login page)

✓

Check chain-of-custody for proper relinquish/return of samples

✓

Is the chain of custody signed and complete

✓

Check internal chain-of-custody for proper relinquish/return of samples /sample extracts

✓

Collect information for each project id from server. Were all requirements followed

✓

COVER PAGE:

Do numbers of samples correspond to the number of samples in the Chain of Custody on login page

✓

Do lab numbers and client Ids on cover page agree with the Chain of Custody

✓

CHAIN OF CUSTODY:

Do requested analyses on Chain of Custody agree with form I results

✓

Do requested analyses on Chain of Custody agree with the log-in page

✓

Were the correct method log-in for analysis according to the Analytical Request and Chain of Castody

✓

Were the samples received within hold time

✓

Were any problems found with the samples at arrival recorded in the Sample Management Laboratory Chronicle

✓

ANALYTICAL:

Was method requirement followed?

✓

Was client requirement followed?

✓

Does the case narrative summarize all QC failure?

✓

All runlogs and manual integration are reviewed for requirements

✓

All manual calculations and /or hand notations verified

✓

QA Review Signature: SOHIL JODHANI

Date: 02/25/2025

LAB CHRONICLE

OrderID:	Q1355	OrderDate:	2/11/2025 1:38:32 PM
Client:	G Environmental	Project:	Amsterdam
Contact:	Gary Landis	Location:	N41,VOA Ref. #3 Water

LabID	ClientID	Matrix	Test	Method	Sample Date	Prep Date	Anal Date	Received
Q1355-01	RW1	Water			02/11/25			02/11/25
			Mercury	7470A		02/12/25	02/12/25	
			Metals ICP-TAL	6010D		02/12/25	02/13/25	
Q1355-02	MW2	Water			02/11/25			02/11/25
			Mercury	7470A		02/12/25	02/12/25	
			Metals ICP-TAL	6010D		02/12/25	02/13/25	

Hit Summary Sheet
SW-846

SDG No.: Q1355

Order ID: Q1355

Client: G Environmental

Project ID: Amsterdam

Sample ID	Client ID	Matrix	Parameter	Concentration	C	MDL	RDL	Units
Client ID : RW1								
Q1355-01	RW1	Water	Aluminum	605		28.3	50.0	ug/L
Q1355-01	RW1	Water	Antimony	3.88	J	2.06	25.0	ug/L
Q1355-01	RW1	Water	Arsenic	252		3.48	10.0	ug/L
Q1355-01	RW1	Water	Barium	333		6.28	50.0	ug/L
Q1355-01	RW1	Water	Beryllium	0.74	J	0.13	3.00	ug/L
Q1355-01	RW1	Water	Cadmium	2.01	J	0.094	3.00	ug/L
Q1355-01	RW1	Water	Calcium	100000		33.0	1000	ug/L
Q1355-01	RW1	Water	Chromium	41.8		0.66	5.00	ug/L
Q1355-01	RW1	Water	Cobalt	0.64	J	0.50	15.0	ug/L
Q1355-01	RW1	Water	Copper	38.9		7.07	10.0	ug/L
Q1355-01	RW1	Water	Iron	29600		18.5	50.0	ug/L
Q1355-01	RW1	Water	Lead	18.7		3.51	6.00	ug/L
Q1355-01	RW1	Water	Magnesium	12000		39.4	1000	ug/L
Q1355-01	RW1	Water	Manganese	333		1.46	10.0	ug/L
Q1355-01	RW1	Water	Mercury	2.57		0.081	0.20	ug/L
Q1355-01	RW1	Water	Nickel	6.90	J	0.85	20.0	ug/L
Q1355-01	RW1	Water	Potassium	16000		685	1000	ug/L
Q1355-01	RW1	Water	Sodium	81600		237	1000	ug/L
Q1355-01	RW1	Water	Vanadium	7.53	J	3.06	20.0	ug/L
Q1355-01	RW1	Water	Zinc	112		1.75	20.0	ug/L
Client ID : MW2								
Q1355-02	MW2	Water	Aluminum	39200		28.3	50.0	ug/L
Q1355-02	MW2	Water	Arsenic	42.0		3.48	10.0	ug/L
Q1355-02	MW2	Water	Barium	961		6.28	50.0	ug/L
Q1355-02	MW2	Water	Beryllium	2.83	J	0.13	3.00	ug/L
Q1355-02	MW2	Water	Cadmium	5.34		0.094	3.00	ug/L
Q1355-02	MW2	Water	Calcium	124000		33.0	1000	ug/L
Q1355-02	MW2	Water	Chromium	67.4		0.66	5.00	ug/L
Q1355-02	MW2	Water	Cobalt	43.0		0.50	15.0	ug/L
Q1355-02	MW2	Water	Copper	56.4		7.07	10.0	ug/L
Q1355-02	MW2	Water	Iron	60900		18.5	50.0	ug/L
Q1355-02	MW2	Water	Lead	70.1		3.51	6.00	ug/L
Q1355-02	MW2	Water	Magnesium	19900		39.4	1000	ug/L
Q1355-02	MW2	Water	Manganese	4380		1.46	10.0	ug/L
Q1355-02	MW2	Water	Mercury	0.81		0.081	0.20	ug/L
Q1355-02	MW2	Water	Nickel	60.1		0.85	20.0	ug/L
Q1355-02	MW2	Water	Potassium	16200		685	1000	ug/L

Hit Summary Sheet
SW-846

SDG No.: Q1355

Order ID: Q1355

Client: G Environmental

Project ID: Amsterdam

Sample ID	Client ID	Matrix	Parameter	Concentration	C	MDL	RDL	Units
Q1355-02	MW2	Water	Sodium	23800		237	1000	ug/L
Q1355-02	MW2	Water	Vanadium	114		3.06	20.0	ug/L
Q1355-02	MW2	Water	Zinc	211		1.75	20.0	ug/L



SAMPLE DATA

Report of Analysis

Client:	G Environmental	Date Collected:	02/11/25
Project:	Amsterdam	Date Received:	02/11/25
Client Sample ID:	RW1	SDG No.:	Q1355
Lab Sample ID:	Q1355-01	Matrix:	Water
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.	Prep Met.
7429-90-5	Aluminum	605	N*	1	28.3	50.0	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7440-36-0	Antimony	3.88	J	1	2.06	25.0	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7440-38-2	Arsenic	252		1	3.48	10.0	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7440-39-3	Barium	333		1	6.28	50.0	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7440-41-7	Beryllium	0.74	J	1	0.13	3.00	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7440-43-9	Cadmium	2.01	J	1	0.094	3.00	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7440-70-2	Calcium	100000		1	33.0	1000	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7440-47-3	Chromium	41.8		1	0.66	5.00	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7440-48-4	Cobalt	0.64	J	1	0.50	15.0	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7440-50-8	Copper	38.9		1	7.07	10.0	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7439-89-6	Iron	29600	N	1	18.5	50.0	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7439-92-1	Lead	18.7		1	3.51	6.00	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7439-95-4	Magnesium	12000		1	39.4	1000	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7439-96-5	Manganese	333		1	1.46	10.0	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7439-97-6	Mercury	2.57		1	0.081	0.20	ug/L	02/12/25 12:25	02/12/25 15:31	SW7470A	
7440-02-0	Nickel	6.90	J	1	0.85	20.0	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7440-09-7	Potassium	16000		1	685	1000	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7782-49-2	Selenium	5.88	U	1	5.88	10.0	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7440-22-4	Silver	0.58	U	1	0.58	5.00	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7440-23-5	Sodium	81600		1	237	1000	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7440-28-0	Thallium	2.32	U	1	2.32	20.0	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7440-62-2	Vanadium	7.53	J	1	3.06	20.0	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010
7440-66-6	Zinc	112		1	1.75	20.0	ug/L	02/12/25 09:30	02/13/25 14:01	SW6010	SW3010

Color Before: Light yellow

Clarity Before: Clear

Texture:

Color After: Yellow

Clarity After: Clear

Artifacts:

Comments: METALS-TAL

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

D = Dilution

Q = indicates LCS control criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

* = indicates the duplicate analysis is not within control limits.

E = Indicates the reported value is estimated because of the presence of interference.

OR = Over Range

N = Spiked sample recovery not within control limits

Report of Analysis

Client:	G Environmental	Date Collected:	02/11/25
Project:	Amsterdam	Date Received:	02/11/25
Client Sample ID:	MW2	SDG No.:	Q1355
Lab Sample ID:	Q1355-02	Matrix:	Water
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.	Prep Met.
7429-90-5	Aluminum	39200	N*	1	28.3	50.0	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7440-36-0	Antimony	2.06	U	1	2.06	25.0	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7440-38-2	Arsenic	42.0		1	3.48	10.0	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7440-39-3	Barium	961		1	6.28	50.0	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7440-41-7	Beryllium	2.83	J	1	0.13	3.00	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7440-43-9	Cadmium	5.34		1	0.094	3.00	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7440-70-2	Calcium	124000		1	33.0	1000	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7440-47-3	Chromium	67.4		1	0.66	5.00	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7440-48-4	Cobalt	43.0		1	0.50	15.0	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7440-50-8	Copper	56.4		1	7.07	10.0	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7439-89-6	Iron	60900	N	1	18.5	50.0	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7439-92-1	Lead	70.1		1	3.51	6.00	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7439-95-4	Magnesium	19900		1	39.4	1000	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7439-96-5	Manganese	4380		1	1.46	10.0	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7439-97-6	Mercury	0.81		1	0.081	0.20	ug/L	02/12/25 12:25	02/12/25 15:33	SW7470A	
7440-02-0	Nickel	60.1		1	0.85	20.0	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7440-09-7	Potassium	16200		1	685	1000	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7782-49-2	Selenium	5.88	U	1	5.88	10.0	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7440-22-4	Silver	0.58	U	1	0.58	5.00	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7440-23-5	Sodium	23800		1	237	1000	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7440-28-0	Thallium	2.32	U	1	2.32	20.0	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7440-62-2	Vanadium	114		1	3.06	20.0	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010
7440-66-6	Zinc	211		1	1.75	20.0	ug/L	02/12/25 09:30	02/13/25 14:06	SW6010	SW3010

Color Before:	Brown	Clarity Before:	Clear	Texture:
Color After:	Yellow	Clarity After:	Clear	Artifacts:
Comments:	METALS-TAL			

U = Not Detected
 LOQ = Limit of Quantitation
 MDL = Method Detection Limit
 LOD = Limit of Detection
 D = Dilution
 Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
 B = Analyte Found in Associated Method Blank
 * = indicates the duplicate analysis is not within control limits.
 E = Indicates the reported value is estimated because of the presence of interference.
 OR = Over Range
 N = Spiked sample recovery not within control limits



METAL CALIBRATION DATA

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: G Environmental **SDG No.:** Q1355
Contract: GENV01 **Lab Code:** CHEM **Case No.:** Q1355 **SAS No.:** Q1355
Initial Calibration Source: EPA
Continuing Calibration Source: PLASMA-PURE

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV02	Mercury	3.65	4.0	91	90 - 110	CV	02/12/2025	14:04	LB134685

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: G Environmental **SDG No.:** Q1355
Contract: GENV01 **Lab Code:** CHEM **Case No.:** Q1355 **SAS No.:** Q1355
Initial Calibration Source: EPA
Continuing Calibration Source: PLASMA-PURE

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CCV63	Mercury	4.96	5.0	99	90 - 110	CV	02/12/2025	14:11	LB134685
CCV64	Mercury	4.61	5.0	92	90 - 110	CV	02/12/2025	14:44	LB134685
CCV65	Mercury	5.24	5.0	105	90 - 110	CV	02/12/2025	15:19	LB134685
CCV66	Mercury	5.18	5.0	104	90 - 110	CV	02/12/2025	15:50	LB134685

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: G Environmental **SDG No.:** Q1355
Contract: GENV01 **Lab Code:** CHEM **Case No.:** Q1355 **SAS No.:** Q1355
Initial Calibration Source: EPA
Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV01	Aluminum	2360	2500	94	90 - 110	P	02/13/2025	12:17	LB134709
	Antimony	993	1000	99	90 - 110	P	02/13/2025	12:17	LB134709
	Arsenic	957	1000	96	90 - 110	P	02/13/2025	12:17	LB134709
	Barium	556	520	107	90 - 110	P	02/13/2025	12:17	LB134709
	Beryllium	488	510	96	90 - 110	P	02/13/2025	12:17	LB134709
	Cadmium	488	510	96	90 - 110	P	02/13/2025	12:17	LB134709
	Calcium	9460	10000	95	90 - 110	P	02/13/2025	12:17	LB134709
	Chromium	525	520	101	90 - 110	P	02/13/2025	12:17	LB134709
	Cobalt	495	520	95	90 - 110	P	02/13/2025	12:17	LB134709
	Copper	513	510	100	90 - 110	P	02/13/2025	12:17	LB134709
	Iron	10000	10000	100	90 - 110	P	02/13/2025	12:17	LB134709
	Lead	963	1000	96	90 - 110	P	02/13/2025	12:17	LB134709
	Magnesium	5600	6000	93	90 - 110	P	02/13/2025	12:17	LB134709
	Manganese	485	520	93	90 - 110	P	02/13/2025	12:17	LB134709
	Nickel	498	530	94	90 - 110	P	02/13/2025	12:17	LB134709
	Potassium	9690	9900	98	90 - 110	P	02/13/2025	12:17	LB134709
	Selenium	999	1000	100	90 - 110	P	02/13/2025	12:17	LB134709
	Silver	246	250	98	90 - 110	P	02/13/2025	12:17	LB134709
	Sodium	9310	10000	93	90 - 110	P	02/13/2025	12:17	LB134709
	Thallium	1010	1000	101	90 - 110	P	02/13/2025	12:17	LB134709
	Vanadium	478	500	96	90 - 110	P	02/13/2025	12:17	LB134709
	Zinc	1010	1000	101	90 - 110	P	02/13/2025	12:17	LB134709

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: G Environmental **SDG No.:** Q1355
Contract: GENV01 **Lab Code:** CHEM **Case No.:** Q1355 **SAS No.:** Q1355
Initial Calibration Source: EPA
Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
LLICV01	Aluminum	100	100	100	80 - 120	P	02/13/2025	12:22	LB134709
	Antimony	51.1	50.0	102	80 - 120	P	02/13/2025	12:22	LB134709
	Arsenic	20.8	20.0	104	80 - 120	P	02/13/2025	12:22	LB134709
	Barium	83.2	100	83	80 - 120	P	02/13/2025	12:22	LB134709
	Beryllium	5.65	6.0	94	80 - 120	P	02/13/2025	12:22	LB134709
	Cadmium	5.68	6.0	95	80 - 120	P	02/13/2025	12:22	LB134709
	Calcium	1890	2000	94	80 - 120	P	02/13/2025	12:22	LB134709
	Chromium	10.2	10.0	102	80 - 120	P	02/13/2025	12:22	LB134709
	Cobalt	29.0	30.0	97	80 - 120	P	02/13/2025	12:22	LB134709
	Copper	21.8	20.0	109	80 - 120	P	02/13/2025	12:22	LB134709
	Iron	96.6	100	97	80 - 120	P	02/13/2025	12:22	LB134709
	Lead	11.2	12.0	93	80 - 120	P	02/13/2025	12:22	LB134709
	Magnesium	2000	2000	100	80 - 120	P	02/13/2025	12:22	LB134709
	Manganese	18.4	20.0	92	80 - 120	P	02/13/2025	12:22	LB134709
	Nickel	39.4	40.0	98	80 - 120	P	02/13/2025	12:22	LB134709
	Potassium	1910	2000	95	80 - 120	P	02/13/2025	12:22	LB134709
	Selenium	22.0	20.0	110	80 - 120	P	02/13/2025	12:22	LB134709
	Silver	10.2	10.0	102	80 - 120	P	02/13/2025	12:22	LB134709
	Sodium	1680	2000	84	80 - 120	P	02/13/2025	12:22	LB134709
	Thallium	37.6	40.0	94	80 - 120	P	02/13/2025	12:22	LB134709
	Vanadium	38.3	40.0	96	80 - 120	P	02/13/2025	12:22	LB134709
	Zinc	42.3	40.0	106	80 - 120	P	02/13/2025	12:22	LB134709

Metals

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: G Environmental **SDG No.:** Q1355

Contract: GENV01 **Lab Code:** CHEM **Case No.:** Q1355 **SAS No.:** Q1355

Initial Calibration Source: EPA

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CCV01	Aluminum	9450	10000	94	90 - 110	P	02/13/2025	13:23	LB134709
	Antimony	4820	5000	96	90 - 110	P	02/13/2025	13:23	LB134709
	Arsenic	4840	5000	97	90 - 110	P	02/13/2025	13:23	LB134709
	Barium	9350	10000	94	90 - 110	P	02/13/2025	13:23	LB134709
	Beryllium	237	250	95	90 - 110	P	02/13/2025	13:23	LB134709
	Cadmium	2400	2500	96	90 - 110	P	02/13/2025	13:23	LB134709
	Calcium	23400	25000	94	90 - 110	P	02/13/2025	13:23	LB134709
	Chromium	979	1000	98	90 - 110	P	02/13/2025	13:23	LB134709
	Cobalt	2390	2500	96	90 - 110	P	02/13/2025	13:23	LB134709
	Copper	1220	1250	98	90 - 110	P	02/13/2025	13:23	LB134709
	Iron	4820	5000	96	90 - 110	P	02/13/2025	13:23	LB134709
	Lead	4800	5000	96	90 - 110	P	02/13/2025	13:23	LB134709
	Magnesium	23400	25000	94	90 - 110	P	02/13/2025	13:23	LB134709
	Manganese	2330	2500	93	90 - 110	P	02/13/2025	13:23	LB134709
	Nickel	2400	2500	96	90 - 110	P	02/13/2025	13:23	LB134709
	Potassium	23900	25000	96	90 - 110	P	02/13/2025	13:23	LB134709
	Selenium	4850	5000	97	90 - 110	P	02/13/2025	13:23	LB134709
	Silver	1220	1250	97	90 - 110	P	02/13/2025	13:23	LB134709
	Sodium	23800	25000	95	90 - 110	P	02/13/2025	13:23	LB134709
	Thallium	4800	5000	96	90 - 110	P	02/13/2025	13:23	LB134709
	Vanadium	2360	2500	94	90 - 110	P	02/13/2025	13:23	LB134709
	Zinc	2430	2500	97	90 - 110	P	02/13/2025	13:23	LB134709
CCV02	Aluminum	9750	10000	98	90 - 110	P	02/13/2025	14:24	LB134709
	Antimony	4970	5000	100	90 - 110	P	02/13/2025	14:24	LB134709
	Arsenic	4930	5000	99	90 - 110	P	02/13/2025	14:24	LB134709
	Barium	9740	10000	97	90 - 110	P	02/13/2025	14:24	LB134709
	Beryllium	244	250	98	90 - 110	P	02/13/2025	14:24	LB134709
	Cadmium	2460	2500	98	90 - 110	P	02/13/2025	14:24	LB134709
	Calcium	24300	25000	97	90 - 110	P	02/13/2025	14:24	LB134709
	Chromium	1010	1000	101	90 - 110	P	02/13/2025	14:24	LB134709
	Cobalt	2460	2500	98	90 - 110	P	02/13/2025	14:24	LB134709
	Copper	1250	1250	100	90 - 110	P	02/13/2025	14:24	LB134709
	Iron	4980	5000	100	90 - 110	P	02/13/2025	14:24	LB134709
	Lead	4920	5000	98	90 - 110	P	02/13/2025	14:24	LB134709

Metals

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: G Environmental **SDG No.:** Q1355

Contract: GENV01 **Lab Code:** CHEM **Case No.:** Q1355 **SAS No.:** Q1355

Initial Calibration Source: EPA

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CCV02	Magnesium	24200	25000	97	90 - 110	P	02/13/2025	14:24	LB134709
	Manganese	2420	2500	97	90 - 110	P	02/13/2025	14:24	LB134709
	Nickel	2460	2500	99	90 - 110	P	02/13/2025	14:24	LB134709
	Potassium	25000	25000	100	90 - 110	P	02/13/2025	14:24	LB134709
	Selenium	4950	5000	99	90 - 110	P	02/13/2025	14:24	LB134709
	Silver	1260	1250	101	90 - 110	P	02/13/2025	14:24	LB134709
	Sodium	24500	25000	98	90 - 110	P	02/13/2025	14:24	LB134709
	Thallium	4960	5000	99	90 - 110	P	02/13/2025	14:24	LB134709
	Vanadium	2440	2500	98	90 - 110	P	02/13/2025	14:24	LB134709
	Zinc	2520	2500	101	90 - 110	P	02/13/2025	14:24	LB134709
CCV03	Aluminum	9760	10000	98	90 - 110	P	02/13/2025	14:47	LB134709
	Antimony	4940	5000	99	90 - 110	P	02/13/2025	14:47	LB134709
	Arsenic	4890	5000	98	90 - 110	P	02/13/2025	14:47	LB134709
	Barium	9670	10000	97	90 - 110	P	02/13/2025	14:47	LB134709
	Beryllium	239	250	96	90 - 110	P	02/13/2025	14:47	LB134709
	Cadmium	2420	2500	97	90 - 110	P	02/13/2025	14:47	LB134709
	Calcium	23900	25000	96	90 - 110	P	02/13/2025	14:47	LB134709
	Chromium	981	1000	98	90 - 110	P	02/13/2025	14:47	LB134709
	Cobalt	2420	2500	97	90 - 110	P	02/13/2025	14:47	LB134709
	Copper	1250	1250	100	90 - 110	P	02/13/2025	14:47	LB134709
	Iron	4930	5000	99	90 - 110	P	02/13/2025	14:47	LB134709
	Lead	4840	5000	97	90 - 110	P	02/13/2025	14:47	LB134709
	Magnesium	23600	25000	94	90 - 110	P	02/13/2025	14:47	LB134709
	Manganese	2380	2500	95	90 - 110	P	02/13/2025	14:47	LB134709
	Nickel	2420	2500	97	90 - 110	P	02/13/2025	14:47	LB134709
	Potassium	24900	25000	100	90 - 110	P	02/13/2025	14:47	LB134709
	Selenium	4910	5000	98	90 - 110	P	02/13/2025	14:47	LB134709
	Silver	1240	1250	99	90 - 110	P	02/13/2025	14:47	LB134709
	Sodium	24800	25000	99	90 - 110	P	02/13/2025	14:47	LB134709
	Thallium	4840	5000	97	90 - 110	P	02/13/2025	14:47	LB134709
	Vanadium	2410	2500	96	90 - 110	P	02/13/2025	14:47	LB134709
	Zinc	2430	2500	97	90 - 110	P	02/13/2025	14:47	LB134709



284 Sheffield Street, Mountainside, New Jersey 07092, Phone : 908 789 8900,
Fax : 908 789 8922

Metals

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CRDL STANDARD FOR AA & ICP

Client: G Environmental SDG No.: Q1355
Contract: GENV01 Lab Code: CHEM Case No.: Q1355 SAS No.: Q1355
Initial Calibration Source: _____
Continuing Calibration Source: _____

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CRA	Mercury	0.22	0.2	108	40 - 160	CV	02/12/2025	14:16	LB134685
CRI01	Aluminum	95.4	100	95	40 - 160	P	02/13/2025	12:54	LB134709
	Antimony	50.3	50.0	101	40 - 160	P	02/13/2025	12:54	LB134709
	Arsenic	21.2	20.0	106	40 - 160	P	02/13/2025	12:54	LB134709
	Barium	84.9	100	85	40 - 160	P	02/13/2025	12:54	LB134709
	Beryllium	5.67	6.0	94	40 - 160	P	02/13/2025	12:54	LB134709
	Cadmium	5.67	6.0	94	40 - 160	P	02/13/2025	12:54	LB134709
	Calcium	1890	2000	95	40 - 160	P	02/13/2025	12:54	LB134709
	Chromium	10.3	10.0	103	40 - 160	P	02/13/2025	12:54	LB134709
	Cobalt	28.7	30.0	96	40 - 160	P	02/13/2025	12:54	LB134709
	Copper	21.8	20.0	109	40 - 160	P	02/13/2025	12:54	LB134709
	Iron	96.7	100	97	40 - 160	P	02/13/2025	12:54	LB134709
	Lead	10.4	12.0	86	40 - 160	P	02/13/2025	12:54	LB134709
	Magnesium	2030	2000	102	40 - 160	P	02/13/2025	12:54	LB134709
	Manganese	18.3	20.0	92	40 - 160	P	02/13/2025	12:54	LB134709
	Nickel	38.5	40.0	96	40 - 160	P	02/13/2025	12:54	LB134709
	Potassium	2000	2000	100	40 - 160	P	02/13/2025	12:54	LB134709
	Selenium	21.0	20.0	105	40 - 160	P	02/13/2025	12:54	LB134709
	Silver	10.2	10.0	102	40 - 160	P	02/13/2025	12:54	LB134709
	Sodium	1740	2000	87	40 - 160	P	02/13/2025	12:54	LB134709
	Thallium	38.1	40.0	95	40 - 160	P	02/13/2025	12:54	LB134709
	Vanadium	37.1	40.0	93	40 - 160	P	02/13/2025	12:54	LB134709
	Zinc	42.0	40.0	105	40 - 160	P	02/13/2025	12:54	LB134709



284 Sheffield Street, Mountainside, New Jersey 07092, Phone : 908 789 8900,
Fax : 908 789 8922

Metals

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client:	G Environmental				SDG No.:	Q1355				
Contract:	GENV01	Lab Code:	CHEM		Case No.:	Q1355	SAS No.:	Q1355		
Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number	
ICB02	Mercury	0.20	+/-0.20	U	0.20	CV	02/12/2025	14:06	LB134685	

Metals

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: G Environmental

SDG No.: Q1355

Contract: GENV01

Lab Code: CHEM

Case No.: Q1355

SAS No.: Q1355

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
CCB63	Mercury	0.20	+/-0.20	U	0.20	CV	02/12/2025	14:14	LB134685
CCB64	Mercury	0.20	+/-0.20	U	0.20	CV	02/12/2025	14:46	LB134685
CCB65	Mercury	0.20	+/-0.20	U	0.20	CV	02/12/2025	15:22	LB134685
CCB66	Mercury	0.20	+/-0.20	U	0.20	CV	02/12/2025	15:52	LB134685

Metals

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: G Environmental SDG No.: Q1355
Contract: GENV01 Lab Code: CHEM Case No.: Q1355 SAS No.: Q1355

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
ICB01	Aluminum	100	+/-100	U	100	P	02/13/2025	12:50	LB134709
	Antimony	50.0	+/-50.0	U	50.0	P	02/13/2025	12:50	LB134709
	Arsenic	20.0	+/-20.0	U	20.0	P	02/13/2025	12:50	LB134709
	Barium	100	+/-100	U	100	P	02/13/2025	12:50	LB134709
	Beryllium	6.00	+/-6.00	U	6.00	P	02/13/2025	12:50	LB134709
	Cadmium	6.00	+/-6.00	U	6.00	P	02/13/2025	12:50	LB134709
	Calcium	2000	+/-2000	U	2000	P	02/13/2025	12:50	LB134709
	Chromium	10.0	+/-10.0	U	10.0	P	02/13/2025	12:50	LB134709
	Cobalt	30.0	+/-30.0	U	30.0	P	02/13/2025	12:50	LB134709
	Copper	20.0	+/-20.0	U	20.0	P	02/13/2025	12:50	LB134709
	Iron	100	+/-100	U	100	P	02/13/2025	12:50	LB134709
	Lead	12.0	+/-12.0	U	12.0	P	02/13/2025	12:50	LB134709
	Magnesium	2000	+/-2000	U	2000	P	02/13/2025	12:50	LB134709
	Manganese	20.0	+/-20.0	U	20.0	P	02/13/2025	12:50	LB134709
	Nickel	40.0	+/-40.0	U	40.0	P	02/13/2025	12:50	LB134709
	Potassium	2000	+/-2000	U	2000	P	02/13/2025	12:50	LB134709
	Selenium	20.0	+/-20.0	U	20.0	P	02/13/2025	12:50	LB134709
	Silver	10.0	+/-10.0	U	10.0	P	02/13/2025	12:50	LB134709
	Sodium	2000	+/-2000	U	2000	P	02/13/2025	12:50	LB134709
	Thallium	40.0	+/-40.0	U	40.0	P	02/13/2025	12:50	LB134709
	Vanadium	40.0	+/-40.0	U	40.0	P	02/13/2025	12:50	LB134709
	Zinc	40.0	+/-40.0	U	40.0	P	02/13/2025	12:50	LB134709

Metals

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: G Environmental		SDG No.: Q1355							
Contract: GENV01	Lab Code: CHEM	Case No.: Q1355	SAS No.: Q1355						
Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
CCB01	Aluminum	100	+/-100	U	100	P	02/13/2025	13:27	LB134709
	Antimony	50.0	+/-50.0	U	50.0	P	02/13/2025	13:27	LB134709
	Arsenic	20.0	+/-20.0	U	20.0	P	02/13/2025	13:27	LB134709
	Barium	100	+/-100	U	100	P	02/13/2025	13:27	LB134709
	Beryllium	6.00	+/-6.00	U	6.00	P	02/13/2025	13:27	LB134709
	Cadmium	6.00	+/-6.00	U	6.00	P	02/13/2025	13:27	LB134709
	Calcium	2000	+/-2000	U	2000	P	02/13/2025	13:27	LB134709
	Chromium	10.0	+/-10.0	U	10.0	P	02/13/2025	13:27	LB134709
	Cobalt	30.0	+/-30.0	U	30.0	P	02/13/2025	13:27	LB134709
	Copper	20.0	+/-20.0	U	20.0	P	02/13/2025	13:27	LB134709
	Iron	100	+/-100	U	100	P	02/13/2025	13:27	LB134709
	Lead	12.0	+/-12.0	U	12.0	P	02/13/2025	13:27	LB134709
	Magnesium	2000	+/-2000	U	2000	P	02/13/2025	13:27	LB134709
	Manganese	20.0	+/-20.0	U	20.0	P	02/13/2025	13:27	LB134709
	Nickel	40.0	+/-40.0	U	40.0	P	02/13/2025	13:27	LB134709
	Potassium	2000	+/-2000	U	2000	P	02/13/2025	13:27	LB134709
	Selenium	20.0	+/-20.0	U	20.0	P	02/13/2025	13:27	LB134709
	Silver	10.0	+/-10.0	U	10.0	P	02/13/2025	13:27	LB134709
	Sodium	2000	+/-2000	U	2000	P	02/13/2025	13:27	LB134709
	Thallium	40.0	+/-40.0	U	40.0	P	02/13/2025	13:27	LB134709
	Vanadium	40.0	+/-40.0	U	40.0	P	02/13/2025	13:27	LB134709
	Zinc	40.0	+/-40.0	U	40.0	P	02/13/2025	13:27	LB134709
CCB02	Aluminum	100	+/-100	U	100	P	02/13/2025	14:29	LB134709
	Antimony	50.0	+/-50.0	U	50.0	P	02/13/2025	14:29	LB134709
	Arsenic	20.0	+/-20.0	U	20.0	P	02/13/2025	14:29	LB134709
	Barium	100	+/-100	U	100	P	02/13/2025	14:29	LB134709
	Beryllium	6.00	+/-6.00	U	6.00	P	02/13/2025	14:29	LB134709
	Cadmium	6.00	+/-6.00	U	6.00	P	02/13/2025	14:29	LB134709
	Calcium	2000	+/-2000	U	2000	P	02/13/2025	14:29	LB134709
	Chromium	10.0	+/-10.0	U	10.0	P	02/13/2025	14:29	LB134709
	Cobalt	30.0	+/-30.0	U	30.0	P	02/13/2025	14:29	LB134709
	Copper	20.0	+/-20.0	U	20.0	P	02/13/2025	14:29	LB134709
	Iron	100	+/-100	U	100	P	02/13/2025	14:29	LB134709
	Lead	12.0	+/-12.0	U	12.0	P	02/13/2025	14:29	LB134709
	Magnesium	2000	+/-2000	U	2000	P	02/13/2025	14:29	LB134709
	Manganese	20.0	+/-20.0	U	20.0	P	02/13/2025	14:29	LB134709
	Nickel	40.0	+/-40.0	U	40.0	P	02/13/2025	14:29	LB134709
	Potassium	2000	+/-2000	U	2000	P	02/13/2025	14:29	LB134709
	Selenium	20.0	+/-20.0	U	20.0	P	02/13/2025	14:29	LB134709

Metals

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: G Environmental		SDG No.: Q1355							
Contract: GENV01	Lab Code: CHEM	Case No.: Q1355	SAS No.: Q1355						
Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
CCB02	Silver	10.0	+/-10.0	U	10.0	P	02/13/2025	14:29	LB134709
	Sodium	2000	+/-2000	U	2000	P	02/13/2025	14:29	LB134709
	Thallium	40.0	+/-40.0	U	40.0	P	02/13/2025	14:29	LB134709
	Vanadium	40.0	+/-40.0	U	40.0	P	02/13/2025	14:29	LB134709
	Zinc	40.0	+/-40.0	U	40.0	P	02/13/2025	14:29	LB134709
CCB03	Aluminum	100	+/-100	U	100	P	02/13/2025	14:51	LB134709
	Antimony	50.0	+/-50.0	U	50.0	P	02/13/2025	14:51	LB134709
	Arsenic	20.0	+/-20.0	U	20.0	P	02/13/2025	14:51	LB134709
	Barium	100	+/-100	U	100	P	02/13/2025	14:51	LB134709
	Beryllium	6.00	+/-6.00	U	6.00	P	02/13/2025	14:51	LB134709
	Cadmium	6.00	+/-6.00	U	6.00	P	02/13/2025	14:51	LB134709
	Calcium	2000	+/-2000	U	2000	P	02/13/2025	14:51	LB134709
	Chromium	10.0	+/-10.0	U	10.0	P	02/13/2025	14:51	LB134709
	Cobalt	30.0	+/-30.0	U	30.0	P	02/13/2025	14:51	LB134709
	Copper	20.0	+/-20.0	U	20.0	P	02/13/2025	14:51	LB134709
	Iron	100	+/-100	U	100	P	02/13/2025	14:51	LB134709
	Lead	12.0	+/-12.0	U	12.0	P	02/13/2025	14:51	LB134709
	Magnesium	2000	+/-2000	U	2000	P	02/13/2025	14:51	LB134709
	Manganese	20.0	+/-20.0	U	20.0	P	02/13/2025	14:51	LB134709
	Nickel	40.0	+/-40.0	U	40.0	P	02/13/2025	14:51	LB134709
	Potassium	2000	+/-2000	U	2000	P	02/13/2025	14:51	LB134709
	Selenium	20.0	+/-20.0	U	20.0	P	02/13/2025	14:51	LB134709
	Silver	10.0	+/-10.0	U	10.0	P	02/13/2025	14:51	LB134709
	Sodium	2000	+/-2000	U	2000	P	02/13/2025	14:51	LB134709
	Thallium	40.0	+/-40.0	U	40.0	P	02/13/2025	14:51	LB134709
	Vanadium	40.0	+/-40.0	U	40.0	P	02/13/2025	14:51	LB134709
	Zinc	40.0	+/-40.0	U	40.0	P	02/13/2025	14:51	LB134709

Metals

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: G Environmental

SDG No.: Q1355

Contract: GENV01

Lab Code: CHEM

Case No.: Q1355

SAS No.: Q1355

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
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Metals
- 3b -
PREPARATION BLANK SUMMARY

Client: G Environmental

SDG No.: Q1355

Instrument: CV1

Sample ID	Analyte	Result (ug/L)	Acceptance Limit	Conc Qual	CRQL ug/L	M	Analysis Date	Analysis Time	Run
PB166706BL		WATER		Batch Number:	PB166706		Prep Date:	02/12/2025	
	Mercury	0.20	<0.20	U	0.20	CV	02/12/2025	15:02	LB134685

Metals
- 3b -
PREPARATION BLANK SUMMARY

Client: G Environmental

SDG No.: Q1355

Instrument: P4

Sample ID	Analyte	Result (ug/L)	Acceptance Limit	Conc Qual	CRQL ug/L	M	Analysis Date	Analysis Time	Run
PB166694BL	WATER			Batch Number:	PB166694		Prep Date:	02/12/2025	
	Aluminum	50.0	<50.0	U	50.0	P	02/13/2025	14:20	LB134709
	Antimony	25.0	<25.0	U	25.0	P	02/13/2025	14:20	LB134709
	Arsenic	10.0	<10.0	U	10.0	P	02/13/2025	14:20	LB134709
	Barium	50.0	<50.0	U	50.0	P	02/13/2025	14:20	LB134709
	Beryllium	3.00	<3.00	U	3.00	P	02/13/2025	14:20	LB134709
	Cadmium	3.00	<3.00	U	3.00	P	02/13/2025	14:20	LB134709
	Calcium	1000	<1000	U	1000	P	02/13/2025	14:20	LB134709
	Chromium	5.00	<5.00	U	5.00	P	02/13/2025	14:20	LB134709
	Cobalt	15.0	<15.0	U	15.0	P	02/13/2025	14:20	LB134709
	Copper	10.0	<10.0	U	10.0	P	02/13/2025	14:20	LB134709
	Iron	50.0	<50.0	U	50.0	P	02/13/2025	14:20	LB134709
	Lead	6.00	<6.00	U	6.00	P	02/13/2025	14:20	LB134709
	Magnesium	1000	<1000	U	1000	P	02/13/2025	14:20	LB134709
	Manganese	3.24	<10.0	J	10.0	P	02/13/2025	14:20	LB134709
	Nickel	20.0	<20.0	U	20.0	P	02/13/2025	14:20	LB134709
	Potassium	1000	<1000	U	1000	P	02/13/2025	14:20	LB134709
	Selenium	10.0	<10.0	U	10.0	P	02/13/2025	14:20	LB134709
	Silver	5.00	<5.00	U	5.00	P	02/13/2025	14:20	LB134709
	Sodium	1000	<1000	U	1000	P	02/13/2025	14:20	LB134709
	Thallium	20.0	<20.0	U	20.0	P	02/13/2025	14:20	LB134709
	Vanadium	20.0	<20.0	U	20.0	P	02/13/2025	14:20	LB134709
	Zinc	20.0	<20.0	U	20.0	P	02/13/2025	14:20	LB134709

Metals
- 4 -
INTERFERENCE CHECK SAMPLE

Client: G Environmental **SDG No.:** Q1355
Contract: GENV01 **Lab Code:** CHEM **Case No.:** Q1355 **SAS No.:** Q1355
ICS Source: EPA **Instrument ID:** P4

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Low Limit (ug/L)	High Limit (ug/L)	Analysis Date	Analysis Time	Run Number
ICSA01	Aluminum	239000	255000	94	216000	294000	02/13/2025	13:03	LB134709
	Antimony	0.47			-50	50	02/13/2025	13:03	LB134709
	Arsenic	4.70			-20	20	02/13/2025	13:03	LB134709
	Barium	0.98	6.0	16	-94	106	02/13/2025	13:03	LB134709
	Beryllium	3.33			-6	6	02/13/2025	13:03	LB134709
	Cadmium	-1.02	1.0	102	-5	7	02/13/2025	13:03	LB134709
	Calcium	227000	245000	93	208000	282000	02/13/2025	13:03	LB134709
	Chromium	59.8	52.0	115	42	62	02/13/2025	13:03	LB134709
	Cobalt	2.26			-30	30	02/13/2025	13:03	LB134709
	Copper	20.3	2.0	1015	-18	22	02/13/2025	13:03	LB134709
	Iron	103000	101000	102	85600	116500	02/13/2025	13:03	LB134709
	Lead	5.57			-12	12	02/13/2025	13:03	LB134709
	Magnesium	243000	255000	95	216000	294000	02/13/2025	13:03	LB134709
	Manganese	-4.94	7.0	71	-13	27	02/13/2025	13:03	LB134709
	Nickel	4.18	2.0	209	-38	42	02/13/2025	13:03	LB134709
	Potassium	45.5			0	0	02/13/2025	13:03	LB134709
	Selenium	-12.0			-20	20	02/13/2025	13:03	LB134709
	Silver	-2.24			-10	10	02/13/2025	13:03	LB134709
	Sodium	63.8			0	0	02/13/2025	13:03	LB134709
	Thallium	-4.95			-40	40	02/13/2025	13:03	LB134709
	Vanadium	3.77			-40	40	02/13/2025	13:03	LB134709
	Zinc	7.33			-40	40	02/13/2025	13:03	LB134709
ICSAB01	Aluminum	240000	247000	97	209000	285000	02/13/2025	13:19	LB134709
	Antimony	624	618	101	525	711	02/13/2025	13:19	LB134709
	Arsenic	105	104	101	88.4	120	02/13/2025	13:19	LB134709
	Barium	469	537	87	437	637	02/13/2025	13:19	LB134709
	Beryllium	489	495	99	420	570	02/13/2025	13:19	LB134709
	Cadmium	1010	972	104	826	1120	02/13/2025	13:19	LB134709
	Calcium	227000	235000	97	199000	271000	02/13/2025	13:19	LB134709
	Chromium	581	542	107	460	624	02/13/2025	13:19	LB134709
	Cobalt	510	476	107	404	548	02/13/2025	13:19	LB134709
	Copper	520	511	102	434	588	02/13/2025	13:19	LB134709
	Iron	102000	99300	103	84400	114500	02/13/2025	13:19	LB134709
	Lead	55.0	49.0	112	37	61	02/13/2025	13:19	LB134709
	Magnesium	244000	248000	98	210000	286000	02/13/2025	13:19	LB134709
	Manganese	459	507	90	430	584	02/13/2025	13:19	LB134709
	Nickel	1010	954	106	810	1100	02/13/2025	13:19	LB134709
	Potassium	56.7			0	0	02/13/2025	13:19	LB134709
	Selenium	30.7	46.0	67	26	66	02/13/2025	13:19	LB134709
	Silver	211	201	105	170	232	02/13/2025	13:19	LB134709
	Sodium	57.2			0	0	02/13/2025	13:19	LB134709
	Thallium	89.9	108	83	68	148	02/13/2025	13:19	LB134709

Metals

- 4 -

INTERFERENCE CHECK SAMPLE

Client: G Environmental **SDG No.:** Q1355
Contract: GENV01 **Lab Code:** CHEM **Case No.:** Q1355 **SAS No.:** Q1355
ICS Source: EPA **Instrument ID:** P4

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Low Limit (ug/L)	High Limit (ug/L)	Analysis Date	Analysis Time	Run Number
ICSAB01	Vanadium	474	491	96	417	565	02/13/2025	13:19	LB134709
	Zinc	1070	952	112	809	1095	02/13/2025	13:19	LB134709



METAL

QC

DATA

metals
- 5a -
MATRIX SPIKE SUMMARY

client: G Environmental **level:** low **sdg no.:** Q1355
contract: GENV01 **lab code:** CHEM **case no.:** Q1355 **sas no.:** Q1355
matrix: Water **sample id:** Q1348-01 **client id:** TWP-1-WCMS
Percent Solids for Sample: NA **Spiked ID:** Q1348-01MS **Percent Solids for Spike Sample:** NA

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Aluminum	ug/L	75 - 125	3330		2720		1000	61	N	P
Antimony	ug/L	75 - 125	373		25.0	U	400	93		P
Arsenic	ug/L	75 - 125	375		10.0	U	400	94		P
Barium	ug/L	75 - 125	159		70.1		100	89		P
Beryllium	ug/L	75 - 125	86.5		0.14	J	100	86		P
Cadmium	ug/L	75 - 125	92.2		0.34	J	100	92		P
Calcium	ug/L	75 - 125	65800		65400		500	90		P
Chromium	ug/L	75 - 125	199		8.37		200	95		P
Cobalt	ug/L	75 - 125	93.5		0.52	J	100	93		P
Copper	ug/L	75 - 125	143		10.0	U	150	95		P
Iron	ug/L	75 - 125	5060		4220		1500	56	N	P
Lead	ug/L	75 - 125	440		5.42	J	500	87		P
Magnesium	ug/L	75 - 125	11900		11100		1000	74		P
Manganese	ug/L	75 - 125	373		285		100	89		P
Nickel	ug/L	75 - 125	234		2.96	J	250	92		P
Potassium	ug/L	75 - 125	14900		10100		5000	95		P
Selenium	ug/L	75 - 125	903		10.0	U	1000	90		P
Silver	ug/L	75 - 125	29.1		5.00	U	37.5	78		P
Sodium	ug/L	75 - 125	148000		142000		1500	412		P
Thallium	ug/L	75 - 125	864		20.0	U	1000	86		P
Vanadium	ug/L	75 - 125	142		7.00	J	150	90		P
Zinc	ug/L	75 - 125	118		23.1		100	95		P

metals
- 5a -
MATRIX SPIKE DUPLICATE SUMMARY

client: G Environmental **level:** low **sdg no.:** Q1355
contract: GENV01 **lab code:** CHEM **case no.:** Q1355 **sas no.:** Q1355
matrix: Water **sample id:** Q1348-01 **client id:** TWP-1-WCMSD
Percent Solids for Sample: NA **Spiked ID:** Q1348-01MSD **Percent Solids for Spike Sample:** NA

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Aluminum	ug/L	75 - 125	3660		2720		1000	94		P
Antimony	ug/L	75 - 125	377		25.0	U	400	94		P
Arsenic	ug/L	75 - 125	376		10.0	U	400	94		P
Barium	ug/L	75 - 125	158		70.1		100	88		P
Beryllium	ug/L	75 - 125	85.4		0.14	J	100	85		P
Cadmium	ug/L	75 - 125	92.2		0.34	J	100	92		P
Calcium	ug/L	75 - 125	65300		65400		500	-29		P
Chromium	ug/L	75 - 125	199		8.37		200	95		P
Cobalt	ug/L	75 - 125	93.8		0.52	J	100	93		P
Copper	ug/L	75 - 125	142		10.0	U	150	95		P
Iron	ug/L	75 - 125	5140		4220		1500	62	N	P
Lead	ug/L	75 - 125	441		5.42	J	500	87		P
Magnesium	ug/L	75 - 125	11800		11100		1000	69		P
Manganese	ug/L	75 - 125	368		285		100	83		P
Nickel	ug/L	75 - 125	234		2.96	J	250	93		P
Potassium	ug/L	75 - 125	15200		10100		5000	101		P
Selenium	ug/L	75 - 125	911		10.0	U	1000	91		P
Silver	ug/L	75 - 125	32.6		5.00	U	37.5	87		P
Sodium	ug/L	75 - 125	147000		142000		1500	357		P
Thallium	ug/L	75 - 125	861		20.0	U	1000	86		P
Vanadium	ug/L	75 - 125	142		7.00	J	150	90		P
Zinc	ug/L	75 - 125	118		23.1		100	95		P

metals
- 5a -
MATRIX SPIKE SUMMARY

client: G Environmental **level:** low **sdg no.:** Q1355
contract: GENV01 **lab code:** CHEM **case no.:** Q1355 **sas no.:** Q1355
matrix: Water **sample id:** Q1349-01 **client id:** TWP-1-PERMITMS
Percent Solids for Sample: NA **Spiked ID:** Q1349-01MS **Percent Solids for Spike Sample:** NA

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Mercury	ug/L	75 - 125	4.24		0.77		4.0	87		CV

metals
- 5a -
MATRIX SPIKE DUPLICATE SUMMARY

client: G Environmental **level:** low **sdg no.:** Q1355
contract: GENV01 **lab code:** CHEM **case no.:** Q1355 **sas no.:** Q1355
matrix: Water **sample id:** Q1349-01 **client id:** TWP-1-PERMITMSD
Percent Solids for Sample: NA **Spiked ID:** Q1349-01MSD **Percent Solids for Spike Sample:** NA

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Mercury	ug/L	75 - 125	4.15		0.77		4.0	85		CV

Metals
- 5b -
POST DIGEST SPIKE SUMMARY

Client: G Environmental **SDG No.:** Q1355
Contract: GENV01 **Lab Code:** CHEM **Case No.:** Q1355 **SAS No.:** Q1355
Matrix: Water **Level:** LOW **Client ID:** TWP-1-WCA
Sample ID: Q1348-01 **Spiked ID:** Q1348-01A

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Aluminum	ug/L	75 - 125	3810		2720		10000	11		P
Iron	ug/L	75 - 125	5180		4220		1500	64		P

Metals

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DUPLICATE SAMPLE SUMMARY

Client: G Environmental **Level:** LOW **SDG No.:** Q1355
Contract: GENV01 **Lab Code:** CHEM **Case No.:** Q1355 **SAS No.:** Q1355
Matrix: Water **Sample ID:** Q1348-01 **Client ID:** TWP-1-WCDUP
Percent Solids for Sample: NA **Duplicate ID** Q1348-01DUP **Percent Solids for Spike Sample:** NA

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Aluminum	ug/L	20	2720		3400		22	*	P
Antimony	ug/L	20	25.0	U	25.0	U			P
Arsenic	ug/L	20	10.0	U	10.0	U			P
Barium	ug/L	20	70.1		76.8		9		P
Beryllium	ug/L	20	0.14	J	0.16	J	15		P
Cadmium	ug/L	20	0.34	J	0.38	J	11		P
Calcium	ug/L	20	65400		67200		3		P
Chromium	ug/L	20	8.37		9.09		8		P
Cobalt	ug/L	20	0.52	J	0.54	J	3		P
Copper	ug/L	20	10.0	U	10.0	U			P
Iron	ug/L	20	4220		4430		5		P
Lead	ug/L	20	5.42	J	5.65	J	4		P
Magnesium	ug/L	20	11100		11500		4		P
Manganese	ug/L	20	285		295		3		P
Nickel	ug/L	20	2.96	J	3.20	J	8		P
Potassium	ug/L	20	10100		10500		4		P
Selenium	ug/L	20	10.0	U	10.0	U			P
Silver	ug/L	20	5.00	U	5.00	U			P
Sodium	ug/L	20	142000		153000		7		P
Thallium	ug/L	20	20.0	U	20.0	U			P
Vanadium	ug/L	20	7.00	J	9.28	J	28		P
Zinc	ug/L	20	23.1		23.8		3		P

Metals

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DUPLICATE SAMPLE SUMMARY

Client: G Environmental **Level:** LOW **SDG No.:** Q1355
Contract: GENV01 **Lab Code:** CHEM **Case No.:** Q1355 **SAS No.:** Q1355
Matrix: Water **Sample ID:** Q1348-01MS **Client ID:** TWP-1-WCMSD
Percent Solids for Sample: NA **Duplicate ID** Q1348-01MSD **Percent Solids for Spike Sample:** NA

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Aluminum	ug/L	20	3330		3660		9		P
Antimony	ug/L	20	373		377		1		P
Arsenic	ug/L	20	375		376		0		P
Barium	ug/L	20	159		158		1		P
Beryllium	ug/L	20	86.5		85.4		1		P
Cadmium	ug/L	20	92.2		92.2		0		P
Calcium	ug/L	20	65800		65300		1		P
Chromium	ug/L	20	199		199		0		P
Cobalt	ug/L	20	93.5		93.8		0		P
Copper	ug/L	20	143		142		1		P
Iron	ug/L	20	5060		5140		2		P
Lead	ug/L	20	440		441		0		P
Magnesium	ug/L	20	11900		11800		1		P
Manganese	ug/L	20	373		368		1		P
Nickel	ug/L	20	234		234		0		P
Potassium	ug/L	20	14900		15200		2		P
Selenium	ug/L	20	903		911		1		P
Silver	ug/L	20	29.1		32.6		11		P
Sodium	ug/L	20	148000		147000		1		P
Thallium	ug/L	20	864		861		0		P
Vanadium	ug/L	20	142		142		0		P
Zinc	ug/L	20	118		118		0		P

Metals

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DUPLICATE SAMPLE SUMMARY

Client: G Environmental **Level:** LOW **SDG No.:** Q1355
Contract: GENV01 **Lab Code:** CHEM **Case No.:** Q1355 **SAS No.:** Q1355
Matrix: Water **Sample ID:** Q1349-01 **Client ID:** TWP-1-PERMITDUP
Percent Solids for Sample: NA **Duplicate ID** Q1349-01DUP **Percent Solids for Spike Sample:** NA

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Mercury	ug/L	20	0.77		0.85		11		CV

Metals

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DUPLICATE SAMPLE SUMMARY

Client: G Environmental **Level:** LOW **SDG No.:** Q1355
Contract: GENV01 **Lab Code:** CHEM **Case No.:** Q1355 **SAS No.:** Q1355
Matrix: Water **Sample ID:** Q1349-01MS **Client ID:** TWP-1-PERMITMSD
Percent Solids for Sample: NA **Duplicate ID** Q1349-01MSD **Percent Solids for Spike Sample:** NA

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Mercury	ug/L	20	4.24		4.15		2		CV

Metals

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LABORATORY CONTROL SAMPLE SUMMARY

Client: G Environmental **SDG No.:** Q1355
Contract: GENV01 **Lab Code:** CHEM **Case No.:** Q1355 **SAS No.:** Q1355

Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
PB166694BS							
Aluminum	ug/L	1000	888		89	80 - 120	P
Antimony	ug/L	400	369		92	80 - 120	P
Arsenic	ug/L	400	353		88	80 - 120	P
Barium	ug/L	100	81.3		81	80 - 120	P
Beryllium	ug/L	100	83.2		83	80 - 120	P
Cadmium	ug/L	100	85.7		86	80 - 120	P
Calcium	ug/L	500	462	J	92	80 - 120	P
Chromium	ug/L	200	195		98	80 - 120	P
Cobalt	ug/L	100	90.0		90	80 - 120	P
Copper	ug/L	150	143		95	80 - 120	P
Iron	ug/L	1500	1380		92	80 - 120	P
Lead	ug/L	500	425		85	80 - 120	P
Magnesium	ug/L	1000	870	J	87	80 - 120	P
Manganese	ug/L	100	88.1		88	80 - 120	P
Nickel	ug/L	250	224		90	80 - 120	P
Potassium	ug/L	5000	4530		91	80 - 120	P
Selenium	ug/L	1000	854		85	80 - 120	P
Silver	ug/L	37.5	34.9		93	80 - 120	P
Sodium	ug/L	1500	1230		82	80 - 120	P
Thallium	ug/L	1000	869		87	80 - 120	P
Vanadium	ug/L	150	133		89	80 - 120	P
Zinc	ug/L	100	93.5		94	80 - 120	P

Metals

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LABORATORY CONTROL SAMPLE SUMMARY

Client: G Environmental

SDG No.: Q1355

Contract: GENV01

Lab Code: CHEM

Case No.: Q1355

SAS No.: Q1355

Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
PB166706BS Mercury	ug/L	4.0	3.87		97	80 - 120	CV

Metals
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ICP SERIAL DILUTIONS

SAMPLE NO.

TWP-1-WCL

Lab Name: Chemtech Consulting Group

Contract: GENV01

Lab Code: CHEM **Lb No.:** lb134709 **Lab Sample ID :** Q1348-01L **SDG No.:** Q1355

Matrix (soil/water): Water **Level (low/med):** LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)		Serial Dilution Result (S)		% Differ-ence	Q	M
		C		C			
Aluminum	2720		3910		44		P
Antimony	25.0	U	125	U			P
Arsenic	10.0	U	50.0	U			P
Barium	70.1		72.8	J	4		P
Beryllium	0.14	J	15.0	U	100.0		P
Cadmium	0.34	J	0.47	J	38		P
Calcium	65400		68300		4		P
Chromium	8.37		11.3	J	35		P
Cobalt	0.52	J	75.0	U	100.0		P
Copper	10.0	U	50.0	U			P
Iron	4220		4500		7		P
Lead	5.42	J	30.0	U	100.0		P
Magnesium	11100		11800		6		P
Manganese	285		302		6		P
Nickel	2.96	J	100	U	100.0		P
Potassium	10100		9890		2		P
Selenium	10.0	U	50.0	U			P
Silver	5.00	U	25.0	U			P
Sodium	142000		145000		2		P
Thallium	20.0	U	100	U			P
Vanadium	7.00	J	100	U	100.0		P
Zinc	23.1		23.9	J	4		P

Metals

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ICP SERIAL DILUTIONS

SAMPLE NO.

TWP-1-PERMITL

Lab Name: Chemtech Consulting Group

Contract: GENV01

Lab Code: CHEM

Lb No.: lb134685

Lab Sample ID : Q1349-01L

SDG No.: Q1355

Matrix (soil/water): Water

Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I) C	Serial Dilution Result (S) C	% Differ- ence	Q	M
Mercury	0.77	1.02	33		CV



METAL PREPARATION & INSTRUMENT DATA

Metals

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ICP INTERELEMENT CORRECTION FACTORS

Client: G Environmental

SDG No.: Q1355

Contract: GENV01

Lab Code: CHEM

Case No.: Q1355

SAS No.: Q1355

Instrument ID: _____

Date: _____

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave- Length (nm)	ICP Interelement Correction Factors For:				
		Al	Ca	Fe	Mg	Ag
Aluminum	396.100	0.0000000	-0.0002060	0.0000000	0.0000000	0.0000000
Antimony	206.833	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	193.759	0.0000000	0.0000000	-0.0000440	0.0000000	0.0000000
Barium	493.409	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	234.861	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.502	0.0000000	0.0000000	0.0000930	0.0000000	0.0000000
Calcium	373.690	0.0000000	0.0000000	-0.0075970	0.0000000	0.0000000
Chromium	267.716	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.616	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	224.700	0.0000000	0.0000000	0.0007850	0.0000000	0.0000000
Iron	240.488	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.353	-0.0000920	0.0000000	0.0000380	0.0000000	0.0000000
Magnesium	279.079	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.610	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.604	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.490	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.090	0.0000000	0.0000000	-0.0001440	0.0000000	0.0000000
Silver	328.068	0.0000000	0.0000000	-0.0001490	0.0000000	0.0000000
Sodium	589.592	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.856	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.402	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	213.800	0.0000000	0.0000000	0.0001050	0.0000000	0.0000000

Metals

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ICP INTERELEMENT CORRECTION FACTORS

Client: G Environmental

SDG No.: Q1355

Contract: GENV01

Lab Code: CHEM

Case No.: Q1355

SAS No.: Q1355

Instrument ID: _____

Date: _____

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave- Length (nm)	ICP Interelement Correction Factors For:				
		As	Ba	Be	Cd	Co
Aluminum	396.100	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.833	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	193.759	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	493.409	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	234.861	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.502	0.0000000	0.0000000	0.0000000	0.0000000	0.0002870
Calcium	373.690	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.716	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.616	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	224.700	0.0000000	0.0000000	0.0000000	0.0000000	0.0009530
Iron	240.488	0.0000000	0.0000000	0.0000000	0.0000000	-0.0039600
Lead	220.353	0.0000000	0.0003170	0.0000000	0.0000000	0.0000000
Magnesium	279.079	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.610	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.604	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.490	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.090	0.0000000	0.0000000	0.0000000	0.0000000	-0.0003570
Silver	328.068	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.592	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.856	0.0000000	0.0000000	0.0000000	0.0000000	0.0054900
Vanadium	292.402	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	213.800	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Metals

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ICP INTERELEMENT CORRECTION FACTORS

Client: G Environmental

SDG No.: Q1355

Contract: GENV01

Lab Code: CHEM

Case No.: Q1355

SAS No.: Q1355

Instrument ID: _____

Date: _____

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave- Length (nm)	ICP Interelement Correction Factors For:				
		Cr	Cu	K	Mn	Mo
Aluminum	396.100	0.0000000	0.0000000	0.0000590	0.0000000	0.0396900
Antimony	206.833	0.0122000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	193.759	-0.0029000	0.0000000	0.0000000	0.0000000	0.0004900
Barium	493.409	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	234.861	0.0000000	0.0000000	0.0000000	-0.0000710	-0.0003400
Cadmium	226.502	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	373.690	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.716	0.0000000	0.0000000	0.0000070	0.0002200	0.0000000
Cobalt	228.616	0.0000000	0.0000000	0.0000000	0.0000000	-0.0007860
Copper	224.700	0.0000000	0.0000000	0.0000000	0.0006510	0.0020500
Iron	240.488	0.0000000	0.0000000	0.0000730	0.0000000	-0.0015250
Lead	220.353	0.0000000	0.0000000	0.0000000	0.0001400	-0.0008600
Magnesium	279.079	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.610	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.604	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.490	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.090	0.0000000	0.0000000	0.0000000	0.0007460	0.0000000
Silver	328.068	0.0000000	0.0000000	0.0000000	0.0000000	-0.0000120
Sodium	589.592	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.856	0.0000000	0.0000000	0.0000000	0.0017400	-0.0100400
Vanadium	292.402	-0.0025100	0.0000000	0.0000000	0.0000000	-0.0072000
Zinc	213.800	0.0000000	0.0009010	0.0000000	0.0000000	0.0000000

Metals

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ICP INTERELEMENT CORRECTION FACTORS

Client: G Environmental

SDG No.: Q1355

Contract: GENV01

Lab Code: CHEM

Case No.: Q1355

SAS No.: Q1355

Instrument ID: _____

Date: _____

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave- Length (nm)	ICP Interelement Correction Factors For:				
		Na	Ni	Pb	Sb	Se
Aluminum	396.100	0.0000000	0.0000000	0.0012800	0.0000000	0.0000000
Antimony	206.833	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	193.759	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	493.409	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	234.861	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.502	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	373.690	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.716	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.616	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	224.700	0.0000000	-0.0047000	0.0036100	0.0000000	0.0000000
Iron	240.488	0.0000000	-0.0017000	0.0000000	0.0000000	0.0000000
Lead	220.353	0.0000000	0.0006580	0.0000000	0.0000000	0.0001290
Magnesium	279.079	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.610	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.604	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.490	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.090	0.0000000	0.0000000	0.0003330	0.0000000	0.0000000
Silver	328.068	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.592	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.856	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.402	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	213.800	0.0000000	0.0067600	0.0000000	0.0000000	0.0000000

Metals

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ICP INTERELEMENT CORRECTION FACTORS

Client: G Environmental

SDG No.: Q1355

Contract: GENV01

Lab Code: CHEM

Case No.: Q1355

SAS No.: Q1355

Instrument ID: _____

Date: _____

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave- Length (nm)	ICP Interelement Correction Factors For:				
		Sn	Ti	Tl	V	Zn
Aluminum	396.100	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.833	-0.0035600	-0.0007970	0.0000000	-0.0018900	0.0000000
Arsenic	193.759	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	493.409	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	234.861	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.502	0.0000000	0.0000630	0.0001280	0.0000000	0.0000000
Calcium	373.690	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.716	0.0000000	0.0000000	0.0000000	0.0001110	0.0000000
Cobalt	228.616	0.0000000	0.0018800	0.0000000	0.0000000	0.0000000
Copper	224.700	0.0000000	0.0003840	0.0000000	0.0000000	0.0000000
Iron	240.488	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.353	0.0000000	-0.0003610	0.0000000	0.0000000	0.0000000
Magnesium	279.079	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.610	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.604	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.490	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.090	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.068	0.0000000	-0.0007420	0.0000000	0.0000000	0.0000000
Sodium	589.592	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.856	0.0000000	-0.0039700	0.0000000	-0.0115600	0.0000000
Vanadium	292.402	0.0000000	0.0005320	0.0000000	0.0000000	0.0000000
Zinc	213.800	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000



METAL PREPARATION & ANALYICAL SUMMARY

Metals

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SAMPLE PREPARATION SUMMARY

Client:	<u>G Environmental</u>	SDG No.:	<u>Q1355</u>
Contract:	<u>GENV01</u>	Lab Code:	<u>CHEM</u>
		Method:	<u></u>
		Case No.:	<u>Q1355</u>
		SAS No.:	<u>Q1355</u>

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(mL)	Final Sample Volume (mL)	Percent Solids
Batch Number: PB166694							
PB166694BL	PB166694BL	MB	WATER	02/12/2025	50.0	25.0	
PB166694BS	PB166694BS	LCS	WATER	02/12/2025	50.0	25.0	
Q1348-01DUP	TWP-1-WCDUP	DUP	WATER	02/12/2025	50.0	25.0	
Q1348-01MS	TWP-1-WCMS	MS	WATER	02/12/2025	50.0	25.0	
Q1348-01MSD	TWP-1-WCMSD	MSD	WATER	02/12/2025	50.0	25.0	
Q1355-01	RW1	SAM	WATER	02/12/2025	50.0	25.0	
Q1355-02	MW2	SAM	WATER	02/12/2025	50.0	25.0	

Metals

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SAMPLE PREPARATION SUMMARY

Client:	<u>G Environmental</u>	SDG No.:	<u>Q1355</u>
Contract:	<u>GENV01</u>	Lab Code:	<u>CHEM</u>
		Method:	<u></u>
		Case No.:	<u>Q1355</u>
		SAS No.:	<u>Q1355</u>

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(mL)	Final Sample Volume (mL)	Percent Solids
Batch Number: PB166706							
PB166706BL	PB166706BL	MB	WATER	02/12/2025	30.0	30.0	
PB166706BS	PB166706BS	LCS	WATER	02/12/2025	30.0	30.0	
Q1349-01DUP	TWP-1-PERMITDUP	DUP	WATER	02/12/2025	30.0	30.0	
Q1349-01MS	TWP-1-PERMITMS	MS	WATER	02/12/2025	30.0	30.0	
Q1349-01MSD	TWP-1-PERMITMSD	MSD	WATER	02/12/2025	30.0	30.0	
Q1355-01	RW1	SAM	WATER	02/12/2025	30.0	30.0	
Q1355-02	MW2	SAM	WATER	02/12/2025	30.0	30.0	

metals
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ANALYSIS RUN LOG

Client: G Environmental **Contract:** GENV01

Lab code: CHEM **Case no.:** Q1355 **Sas no.:** Q1355 **Sdg no.:** Q1355

Instrument id number: **Method:** **Run number:** LB134685

Start date: 02/12/2025 **End date:** 02/12/2025

Lab sample id.	Client Sample Id	d/f	Time	Parameter list
S0	S0	1	1350	HG
S0.2	S0.2	1	1352	HG
S2.5	S2.5	1	1354	HG
S5	S5	1	1356	HG
S7.5	S7.5	1	1359	HG
S10	S10	1	1401	HG
ICV02	ICV02	1	1404	HG
ICB02	ICB02	1	1406	HG
CCV63	CCV63	1	1411	HG
CCB63	CCB63	1	1414	HG
CRA	CRA	1	1416	HG
CCV64	CCV64	1	1444	HG
CCB64	CCB64	1	1446	HG
PB166706BL	PB166706BL	1	1502	HG
PB166706BS	PB166706BS	1	1507	HG
CCV65	CCV65	1	1519	HG
CCB65	CCB65	1	1522	HG
Q1349-01DUP	TWP-1-PERMITDUP	1	1524	HG
Q1349-01MS	TWP-1-PERMITMS	1	1526	HG
Q1349-01MSD	TWP-1-PERMITMSD	1	1529	HG
Q1355-01	RW1	1	1531	HG
Q1355-02	MW2	1	1533	HG
Q1349-01L	TWP-1-PERMITL	5	1545	HG
CCV66	CCV66	1	1550	HG
CCB66	CCB66	1	1552	HG

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ANALYSIS RUN LOG

Client: G Environmental **Contract:** GENV01

Lab code: CHEM **Case no.:** Q1355 **Sas no.:** Q1355 **Sdg no.:** Q1355

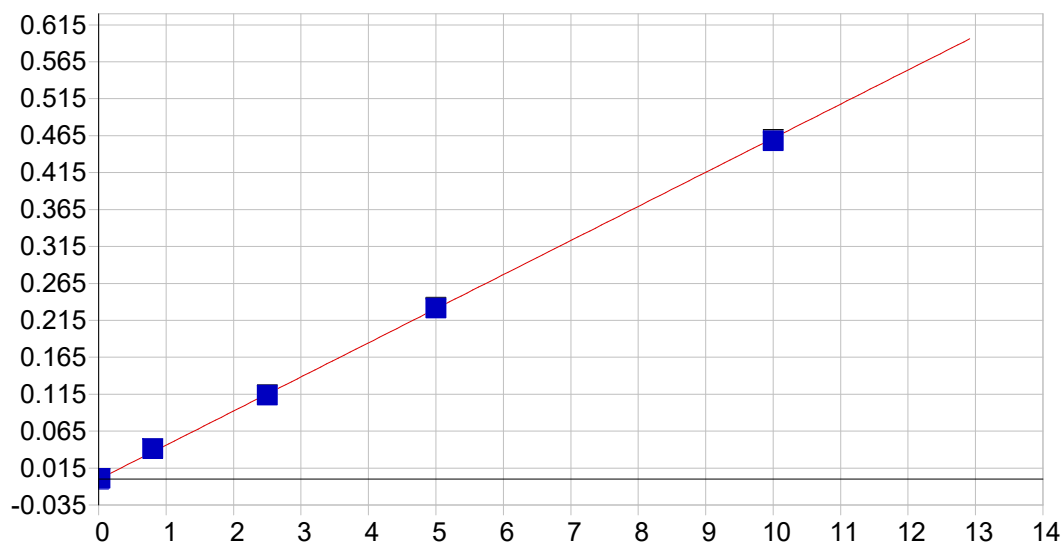
Instrument id number: **Method:** **Run number:** LB134709

Start date: 02/13/2025 **End date:** 02/13/2025

Lab sample id.	Client Sample Id	d/f	Time	Parameter list
S0	S0	1	1140	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
S1	S1	1	1144	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
S2	S2	1	1149	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
S3	S3	1	1153	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
S4	S4	1	1157	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
S5	S5	1	1201	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
ICV01	ICV01	1	1217	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
LLICV01	LLICV01	1	1222	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
ICB01	ICB01	1	1250	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
CRI01	CRI01	1	1254	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
ICSA01	ICSA01	1	1303	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
ICSAB01	ICSAB01	1	1319	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
CCV01	CCV01	1	1323	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
CCB01	CCB01	1	1327	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
Q1348-01DUP	TWP-1-WCDUP	1	1336	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
Q1348-01L	TWP-1-WCL	5	1340	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
Q1348-01MS	TWP-1-WCMS	1	1344	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
Q1348-01MSD	TWP-1-WCMSD	1	1349	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
Q1348-01A	TWP-1-WCA	1	1353	Al,Fe
Q1355-01	RW1	1	1401	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
Q1355-02	MW2	1	1406	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
PB166694BL	PB166694BL	1	1420	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
CCV02	CCV02	1	1424	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
CCB02	CCB02	1	1429	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
PB166694BS	PB166694BS	1	1433	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
CCV03	CCV03	1	1447	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
CCB03	CCB03	1	1451	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn



METAL RAW DATA

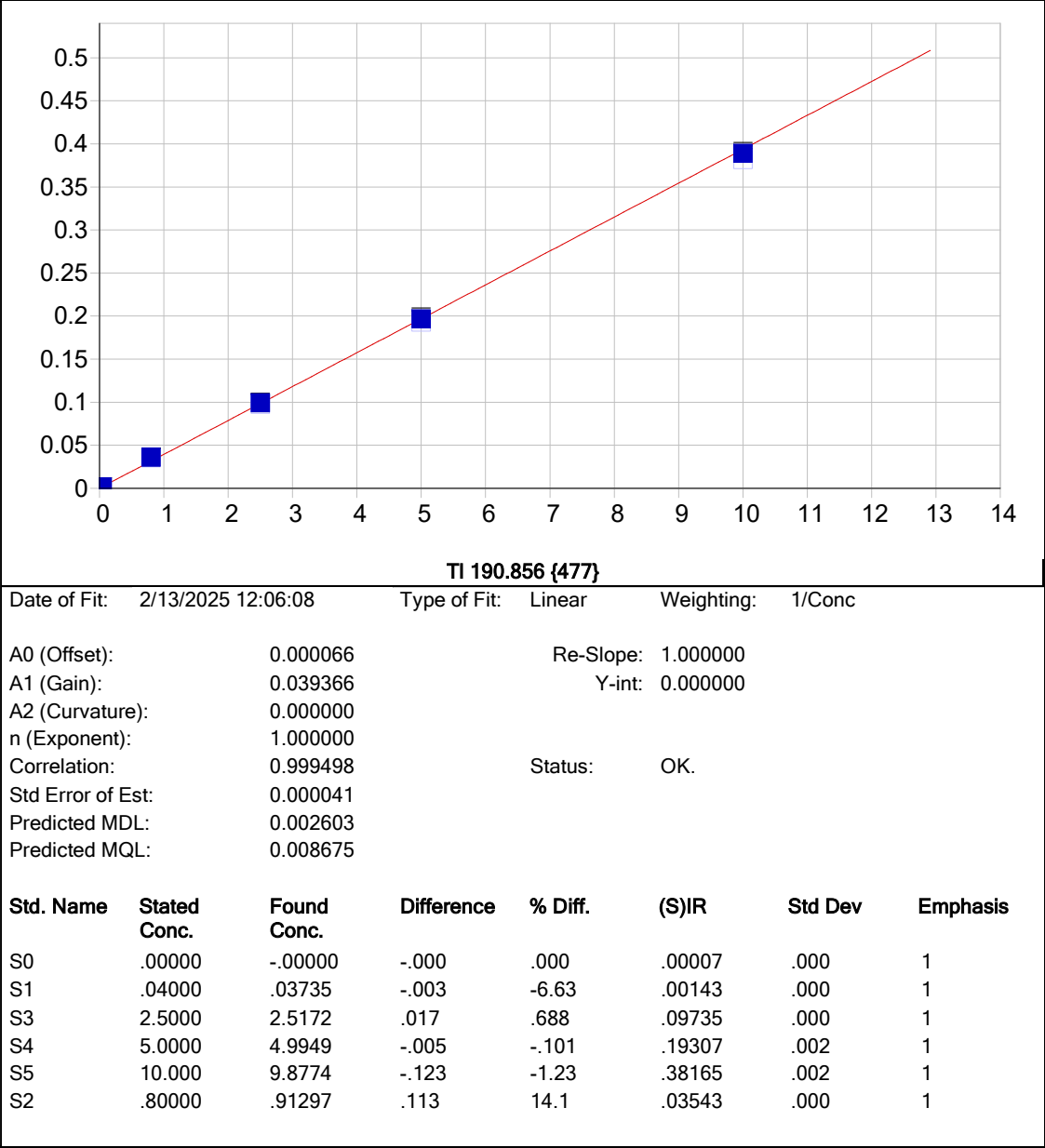


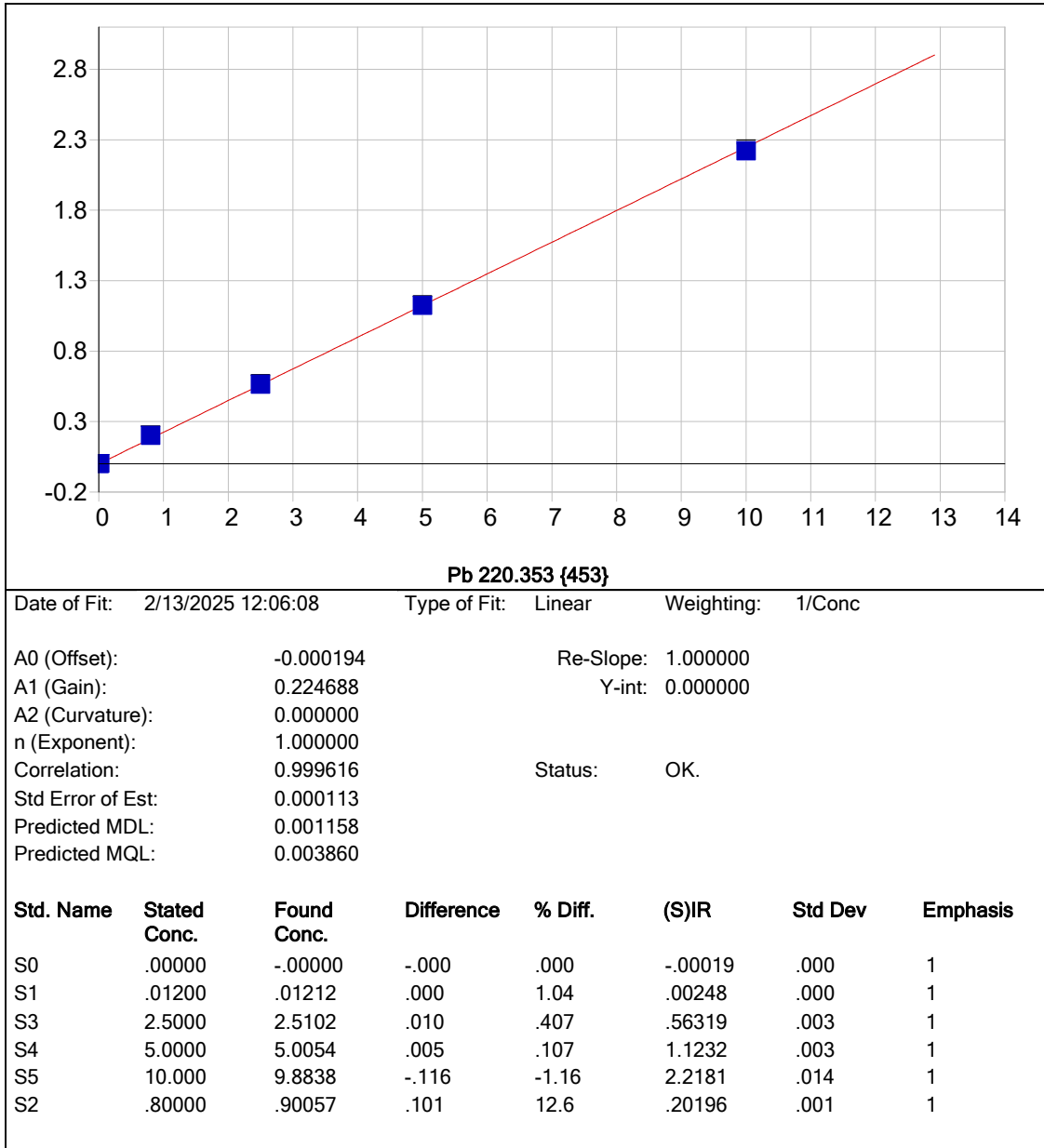
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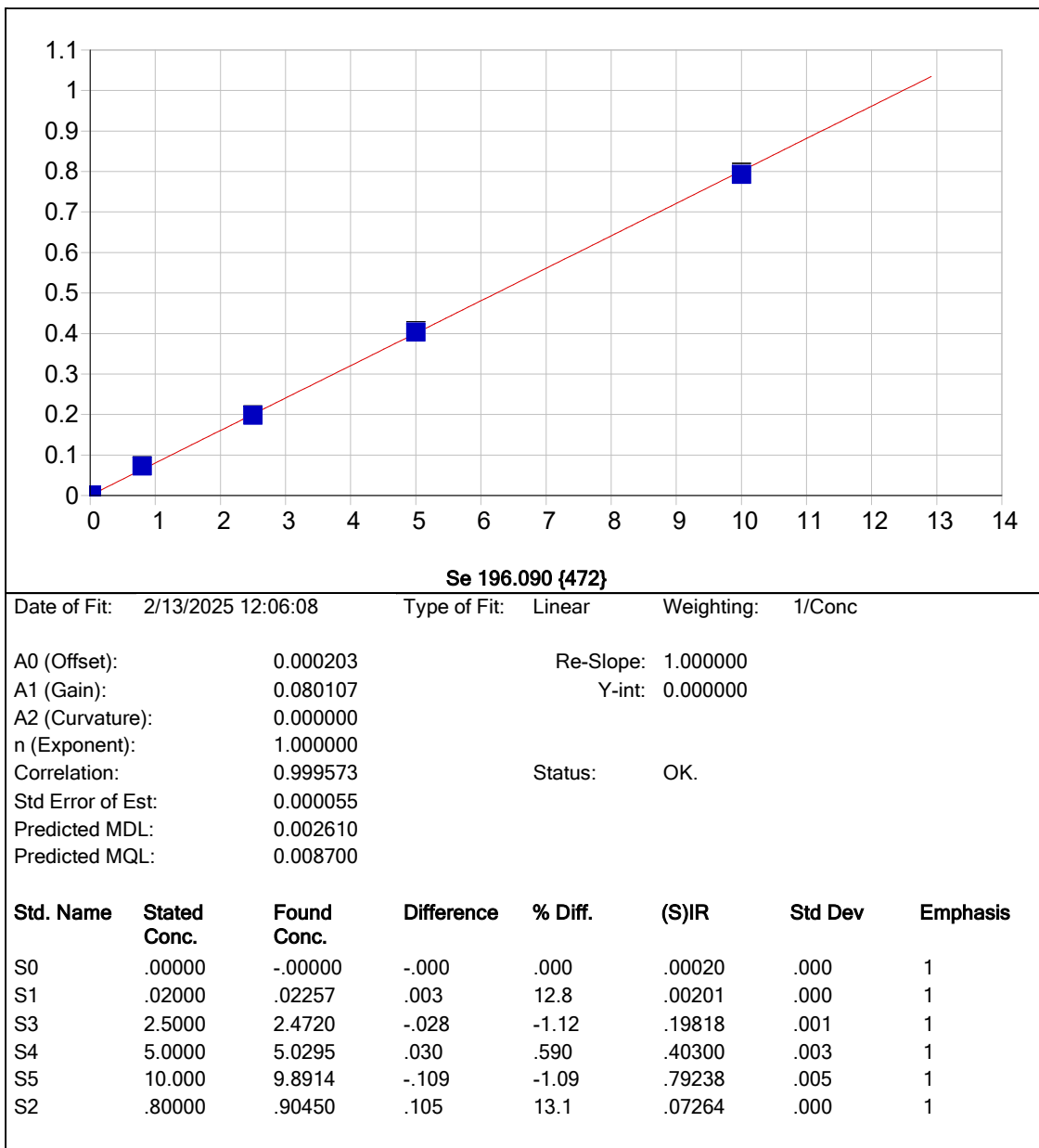
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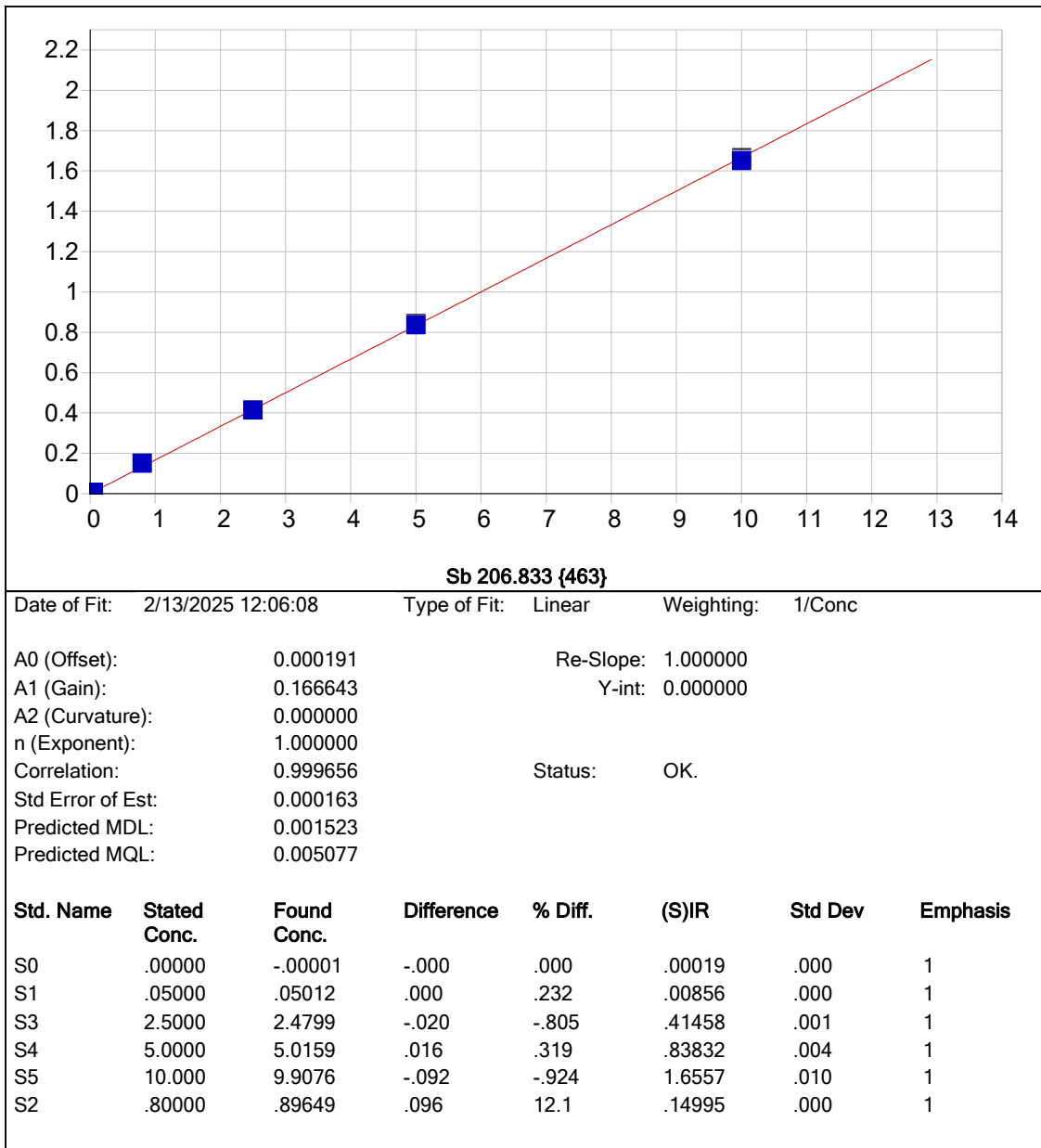
A0 (Offset): -0.000187 Re-Slope: 1.000000
A1 (Gain): 0.046172 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999655 Status: OK.
Std Error of Est: 0.000028
Predicted MDL: 0.003218
Predicted MQL: 0.010728

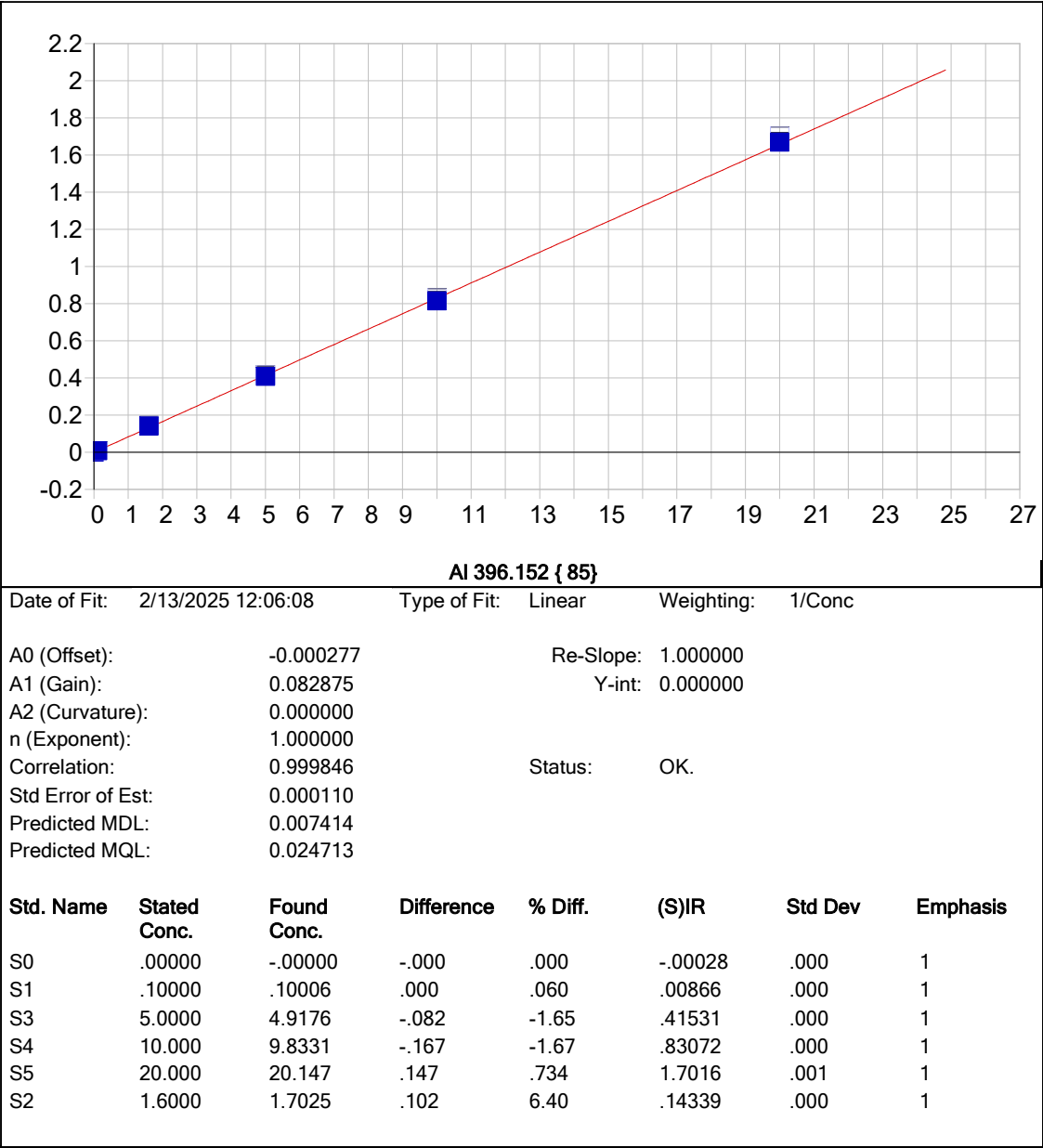
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	-.00019	.000	1
S1	.02000	.02173	.002	8.63	.00081	.000	1
S3	2.5000	2.4633	-.037	-1.47	.11342	.001	1
S4	5.0000	5.0197	.020	.394	.23133	.001	1
S5	10.000	9.9205	-.080	-.795	.45737	.002	1
S2	.80000	.89479	.095	11.8	.04109	.000	1

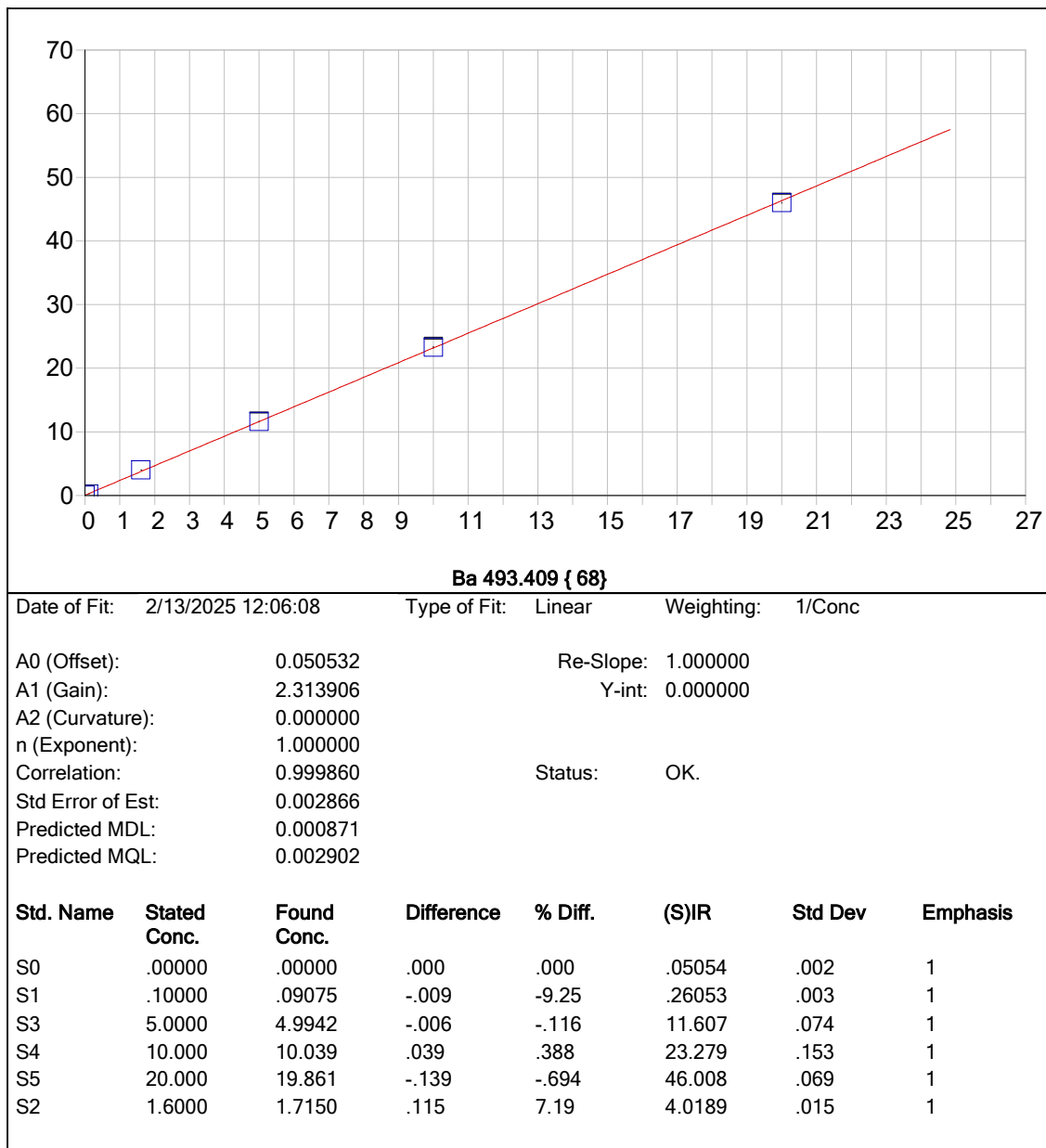


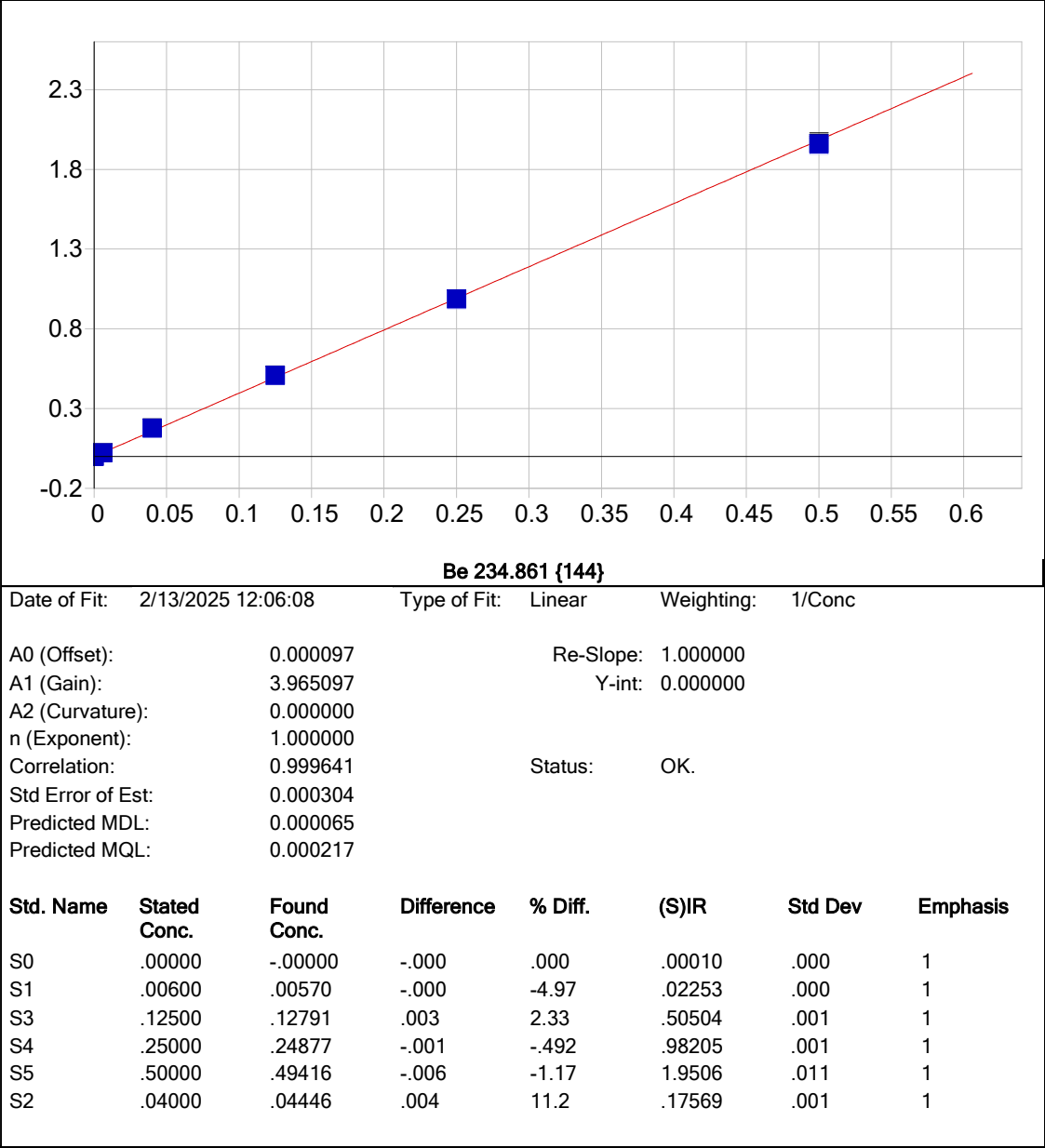


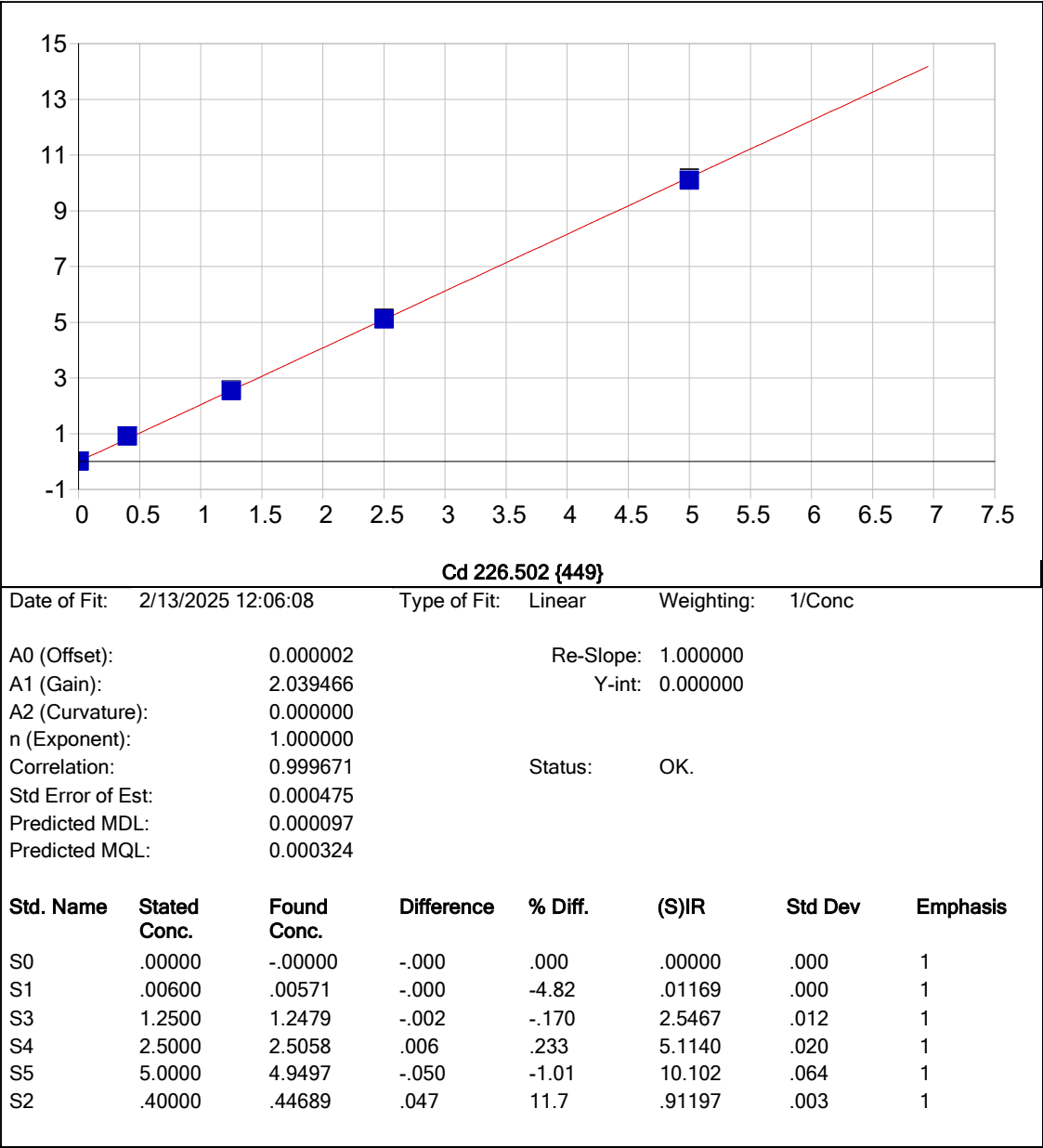


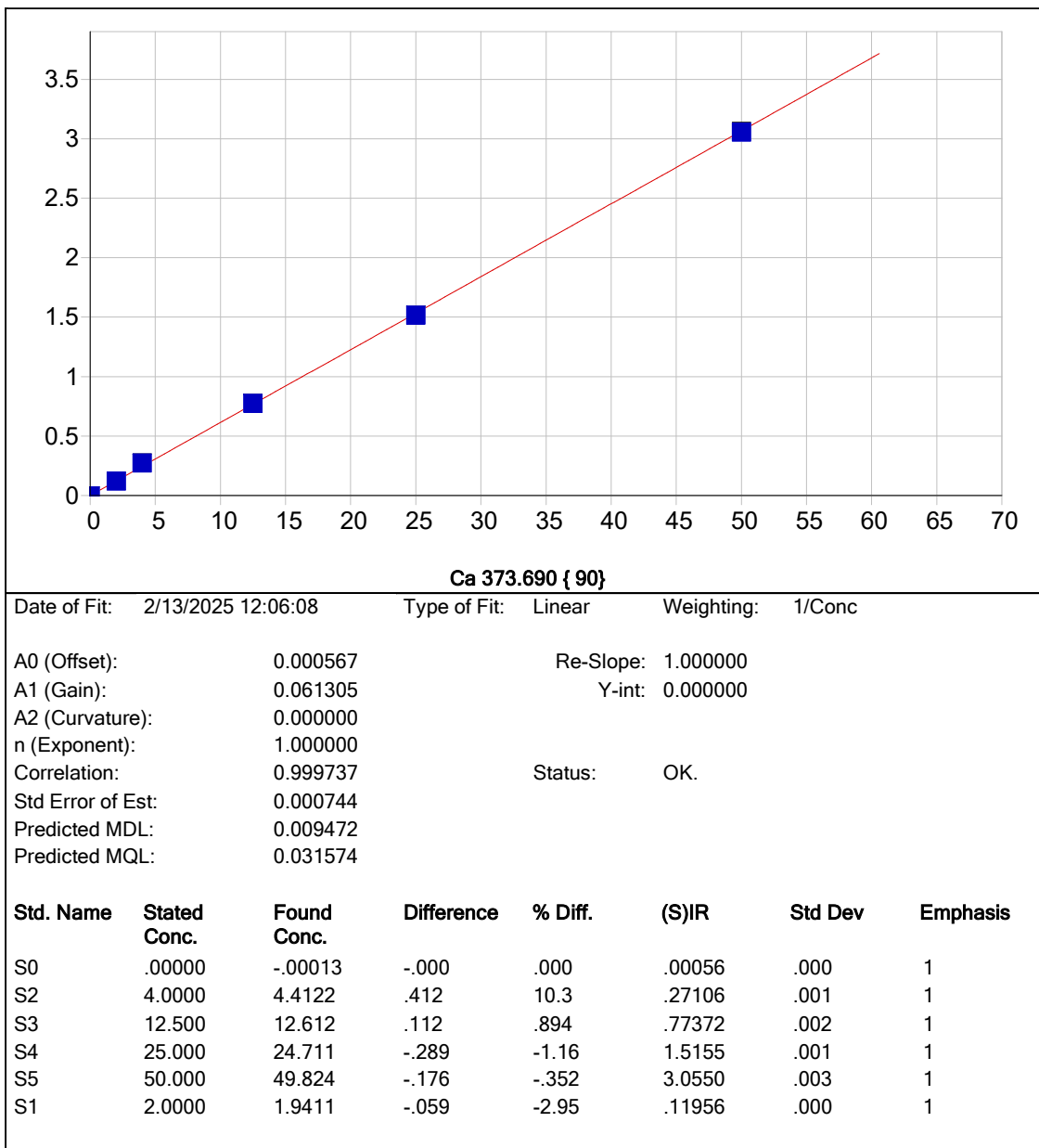


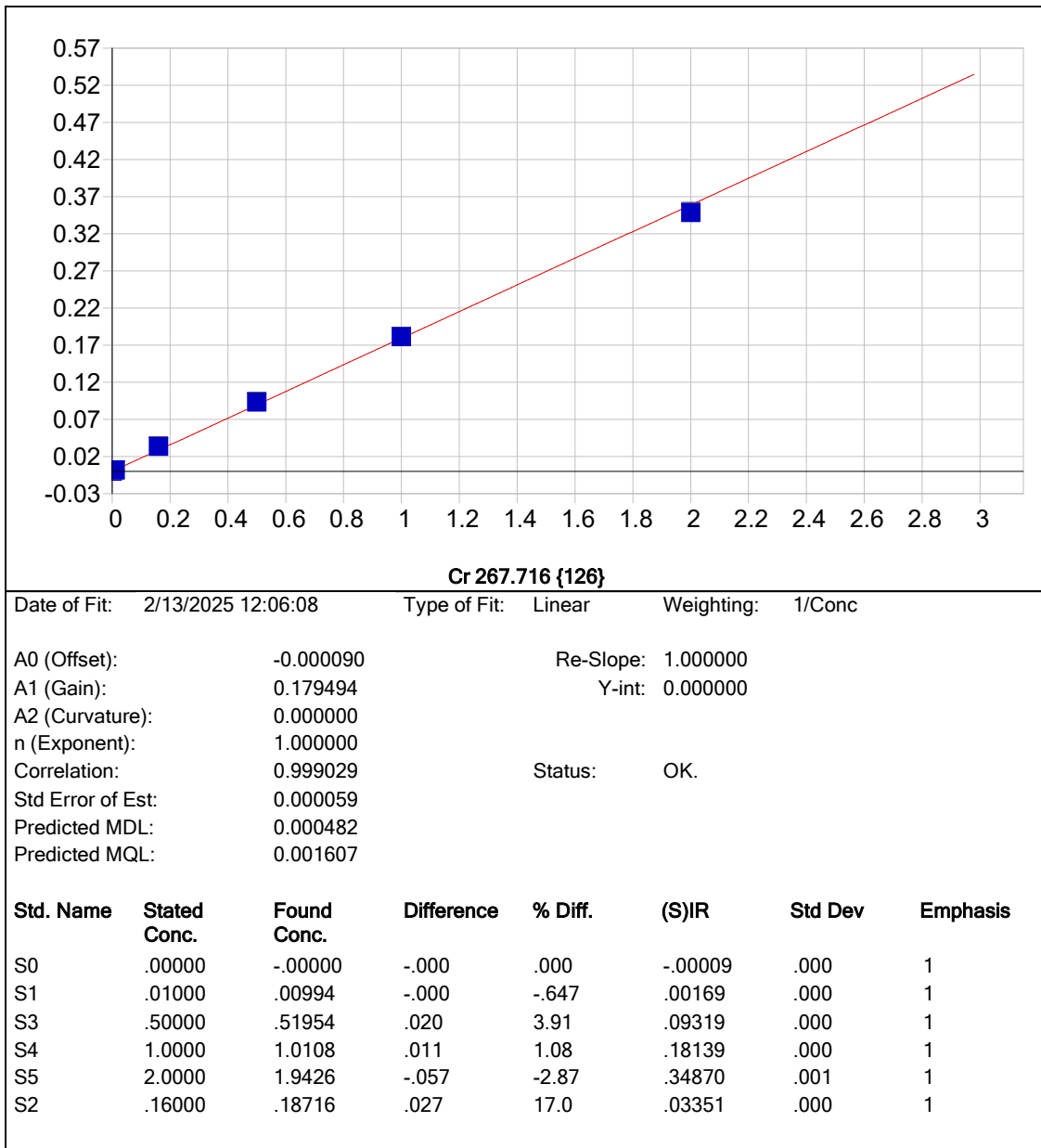


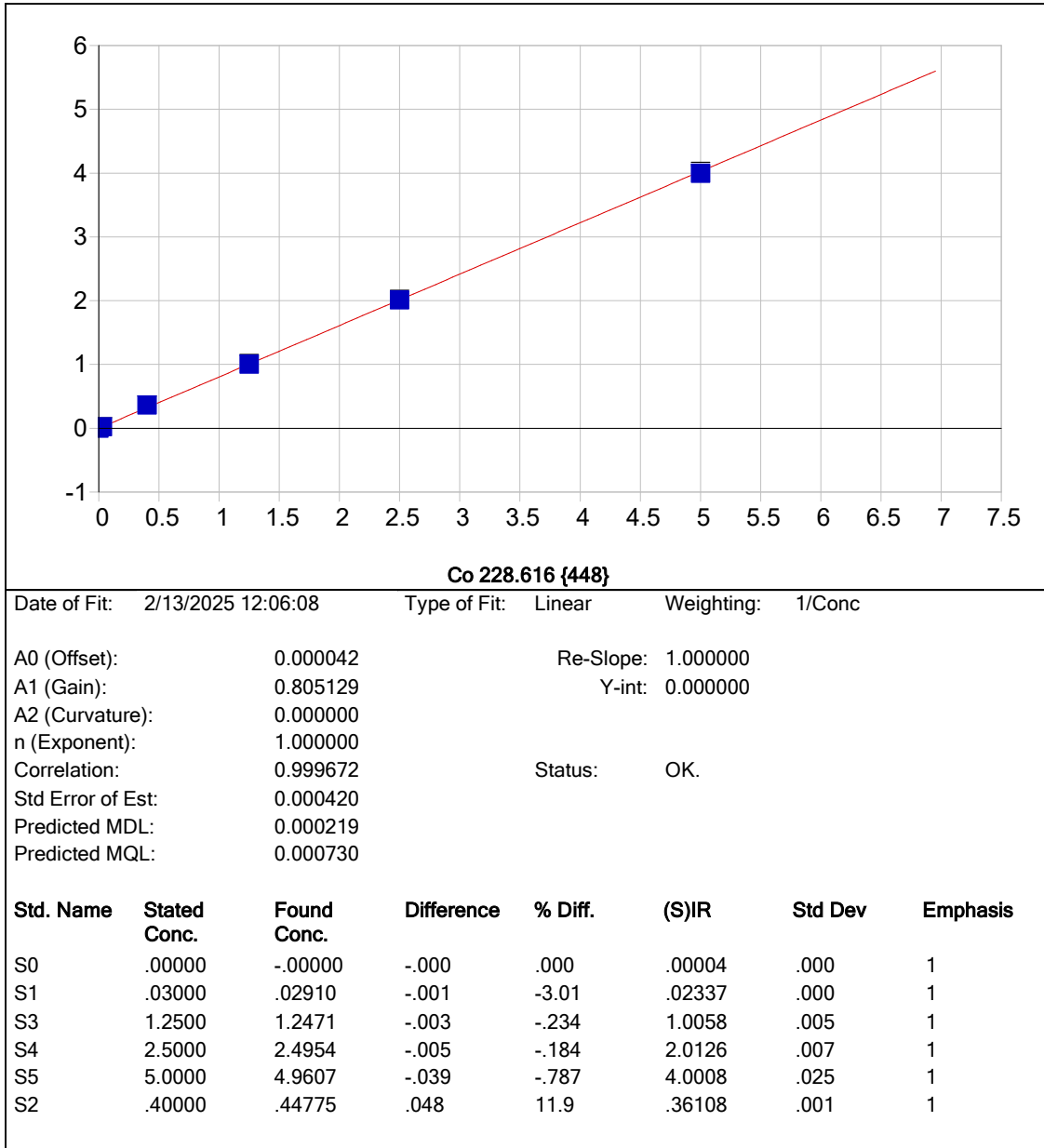


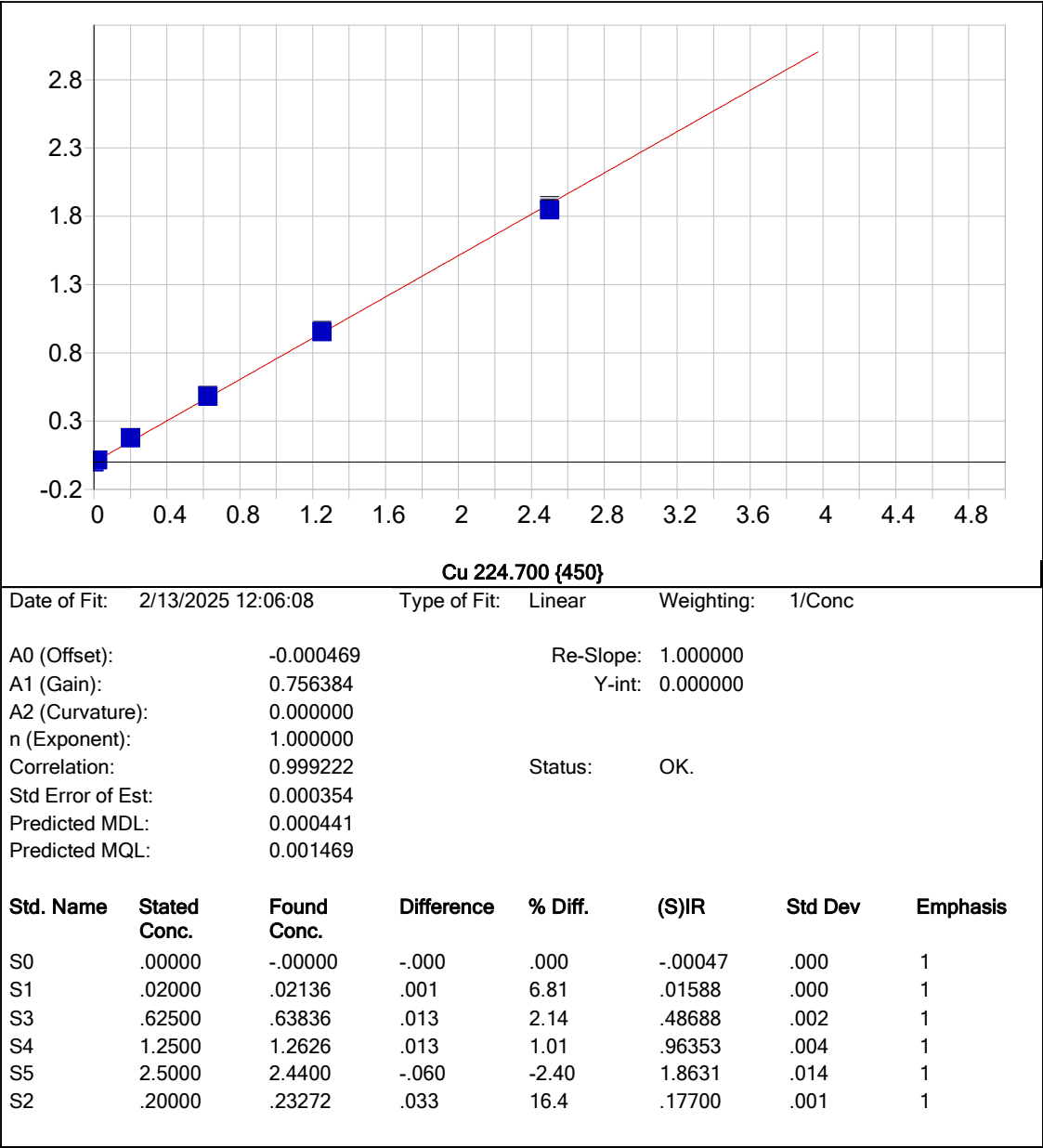


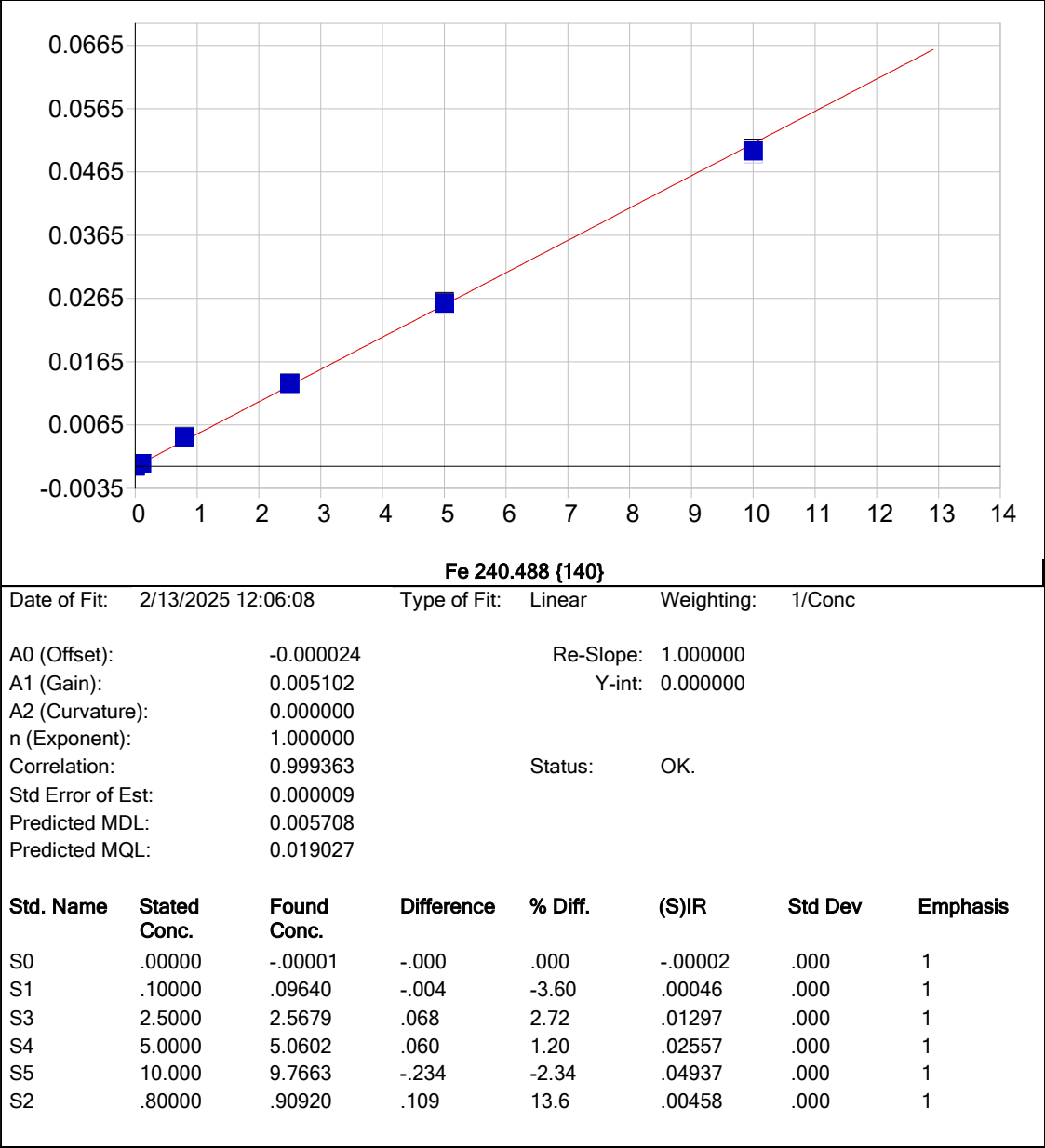


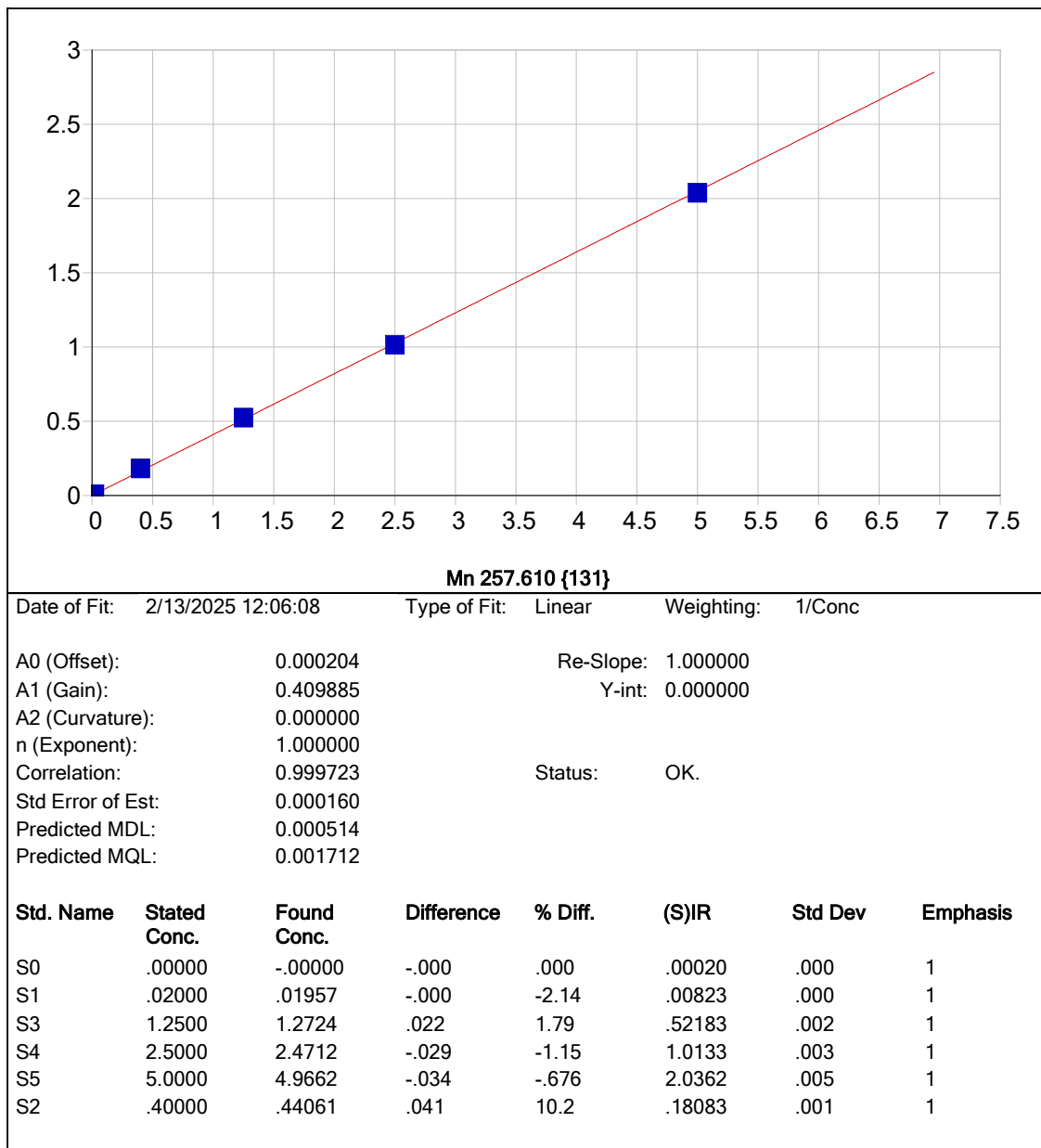


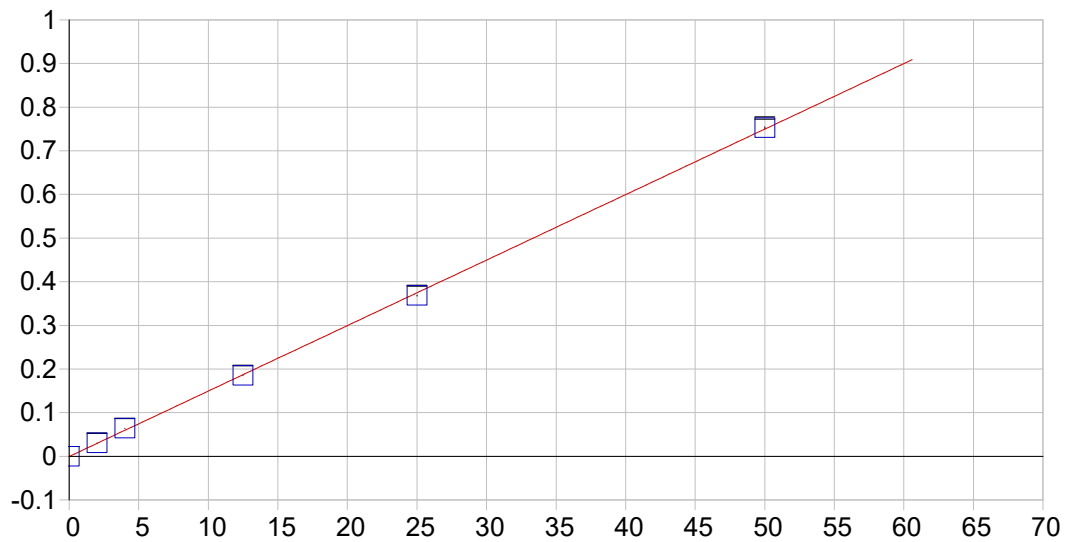










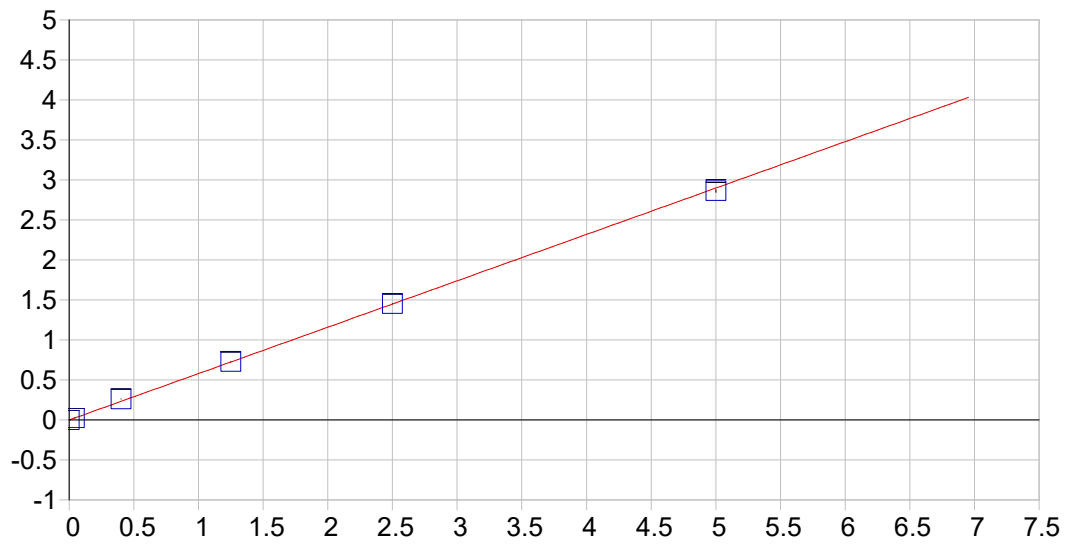


Mg 279.079 {121}

Date of Fit: 2/13/2025 12:06:08 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.000541 Re-Slope: 1.000000
A1 (Gain): 0.015006 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999827 Status: OK.
Std Error of Est: 0.000148
Predicted MDL: 0.016272
Predicted MQL: 0.054240

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00016	-.000	.000	-.00054	.000	1
S2	4.0000	4.2954	.295	7.39	.06392	.000	1
S3	12.500	12.376	-.124	-.989	.18518	.000	1
S4	25.000	24.582	-.418	-1.67	.36833	.001	1
S5	50.000	50.192	.192	.384	.75263	.003	1
S1	2.0000	2.0544	.054	2.72	.03029	.000	1

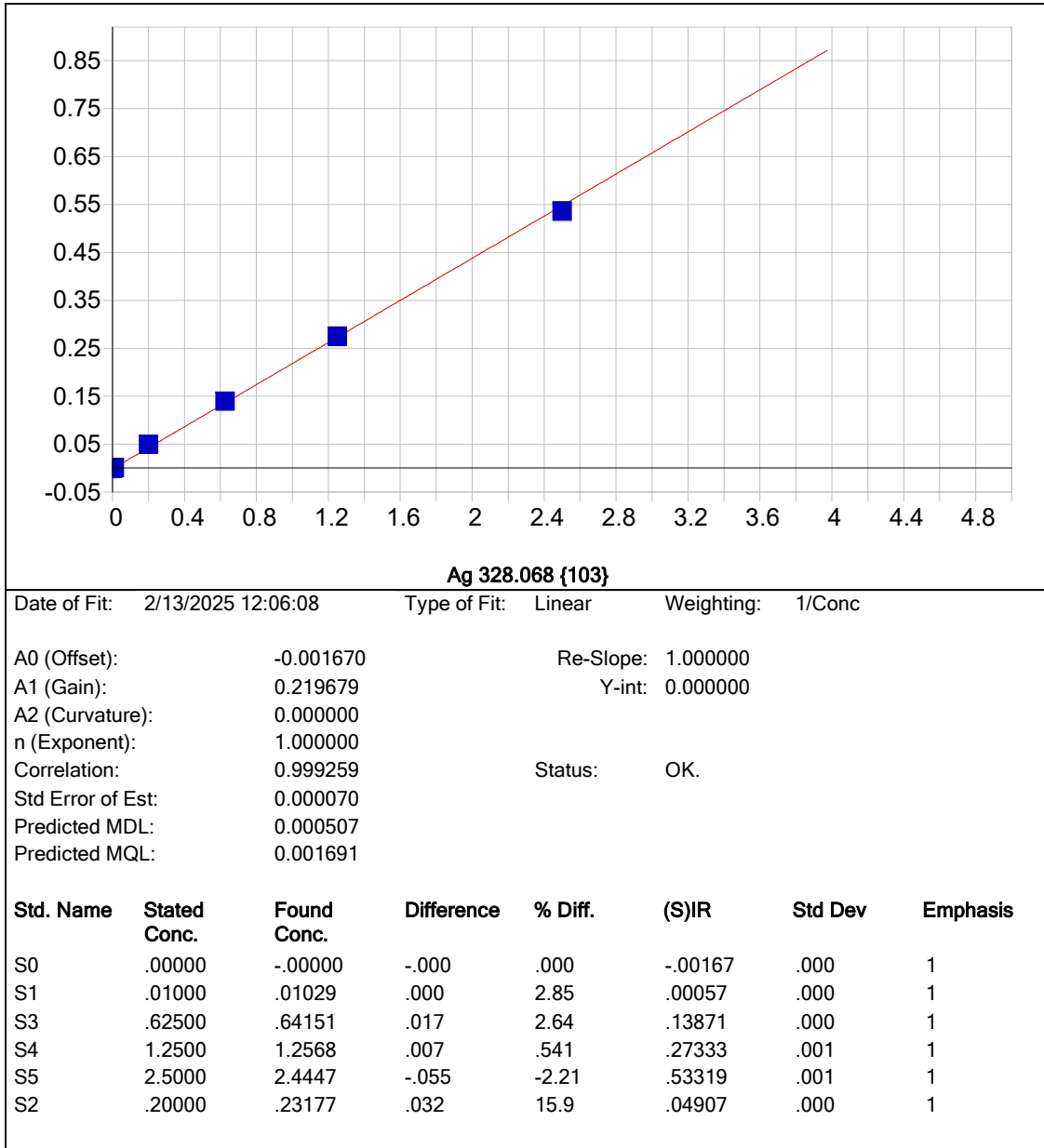


Ni 231.604 {446}

Date of Fit: 2/13/2025 12:06:08 Type of Fit: Linear Weighting: 1/Conc

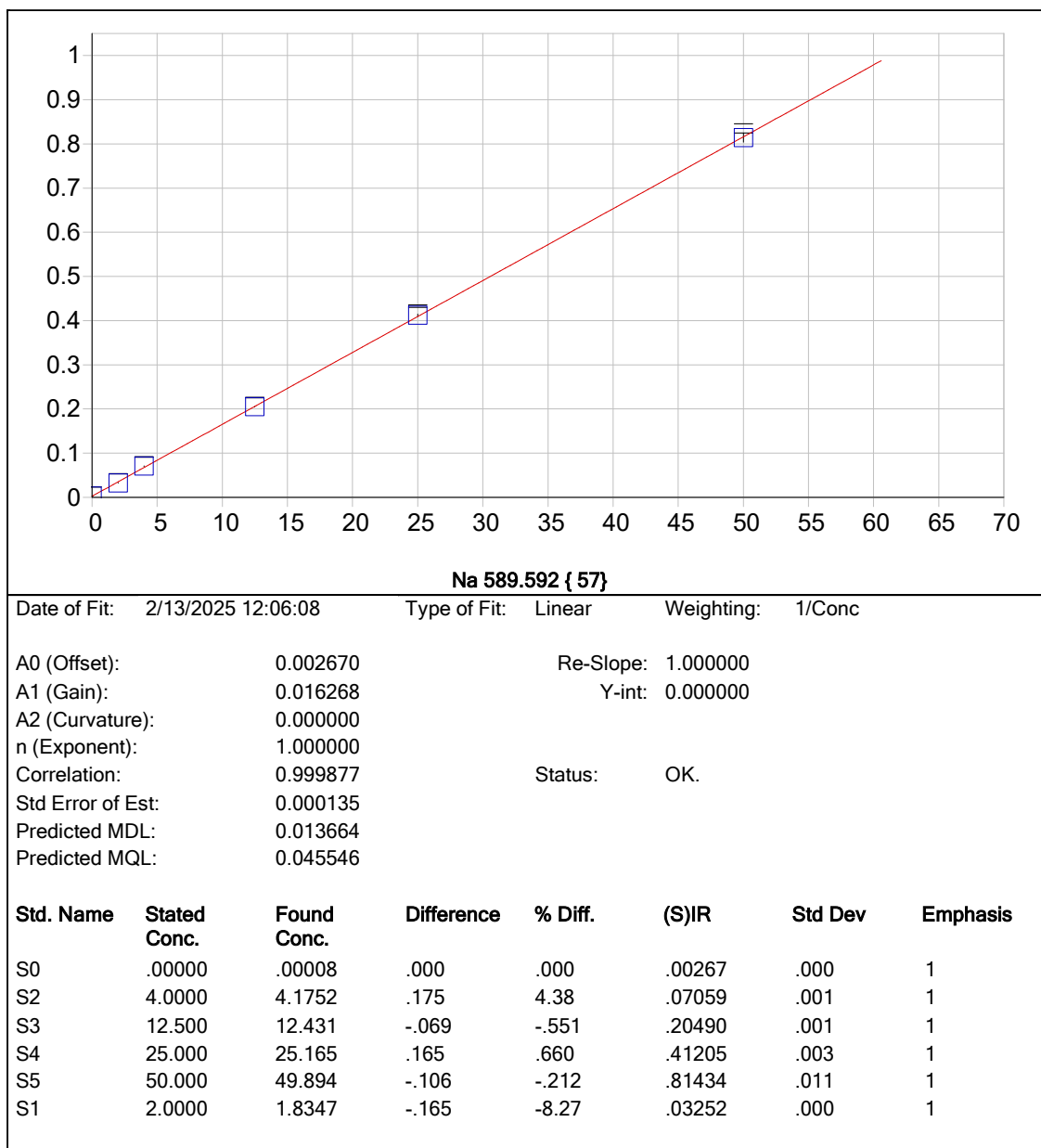
A0 (Offset):	-0.000450	Re-Slope:	1.000000
A1 (Gain):	0.579700	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999588	Status:	OK.
Std Error of Est:	0.000391		
Predicted MDL:	0.000340		
Predicted MQL:	0.001134		

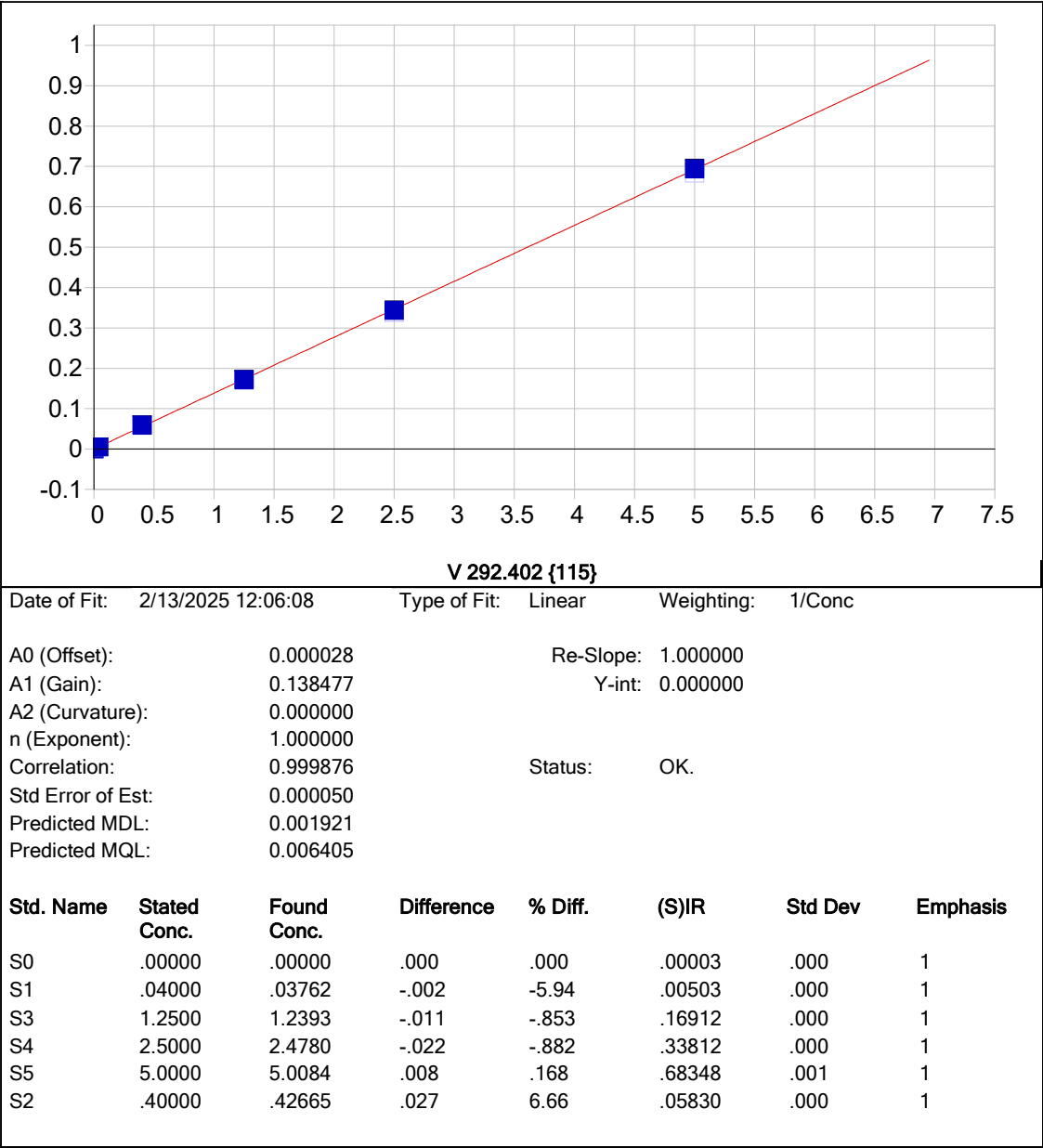
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	-.00045	.000	1
S1	.04000	.03926	-.001	-1.85	.02231	.000	1
S3	1.2500	1.2554	.005	.431	.72729	.004	1
S4	2.5000	2.5039	.004	.154	1.4510	.005	1
S5	5.0000	4.9394	-.061	-1.21	2.8629	.018	1
S2	.40000	.45215	.052	13.0	.26166	.001	1

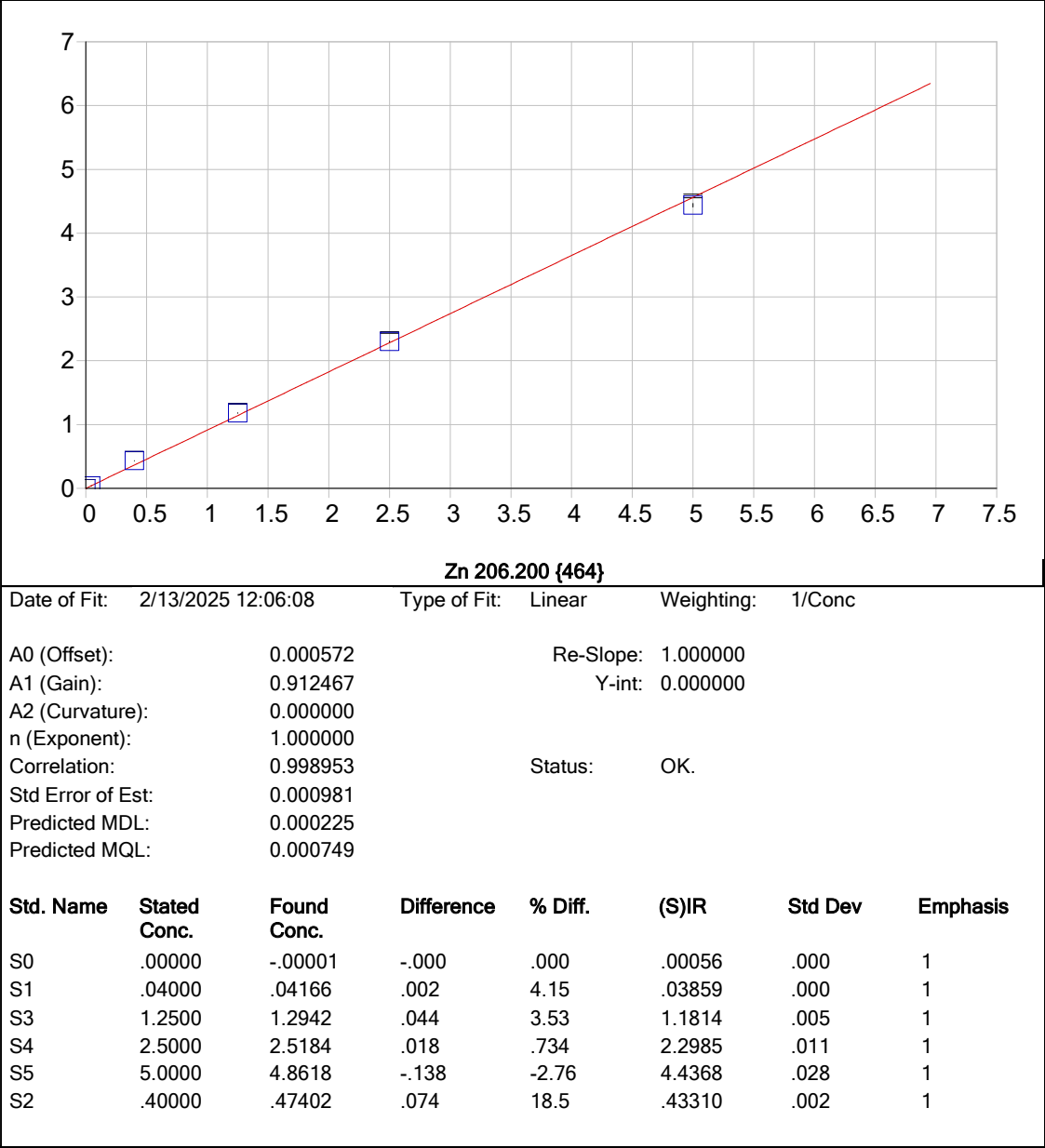


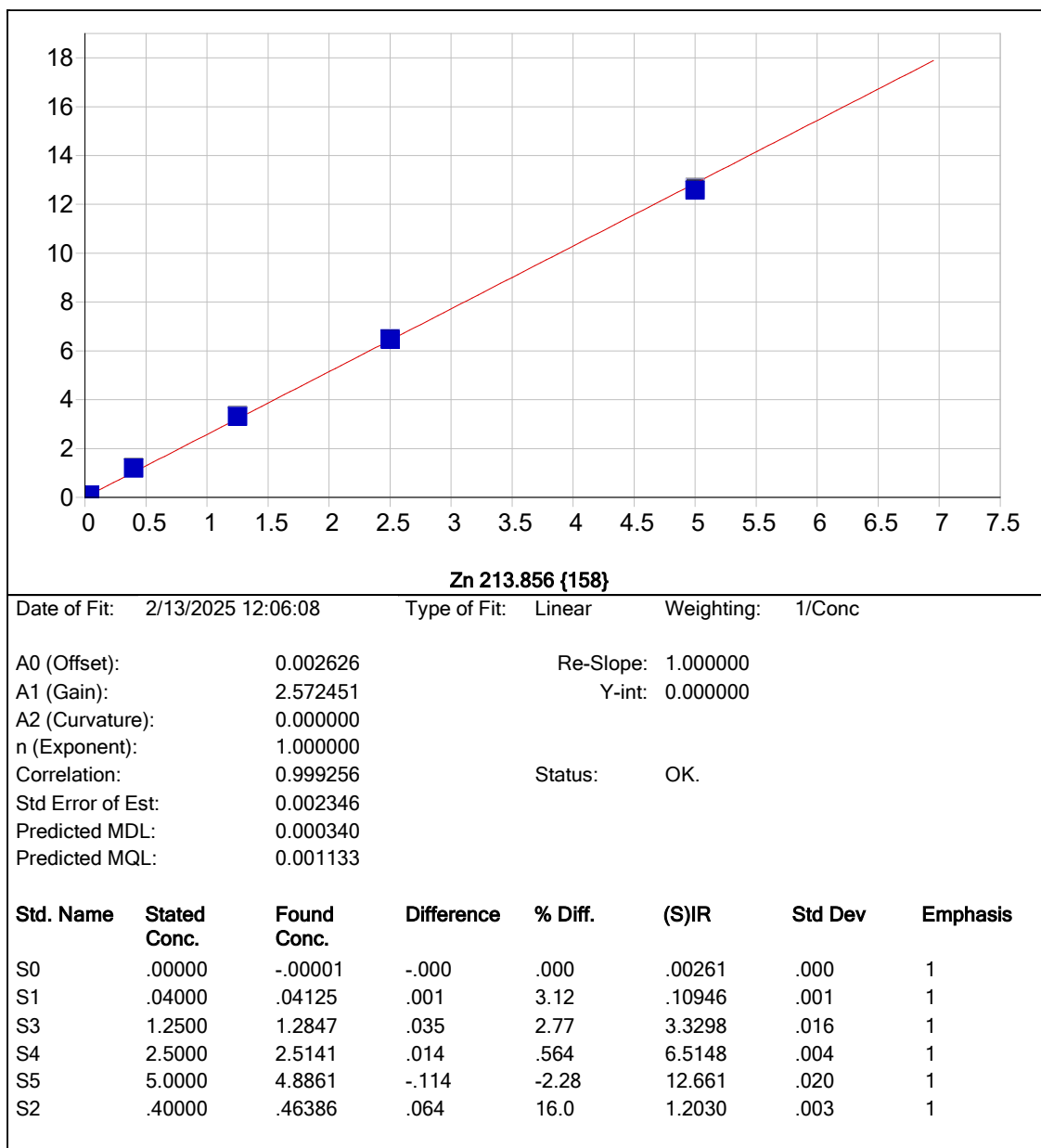
Date of Fit: 2/13/2025 12:06:08 Type of Fit: Linear Weighting: 1/Conc

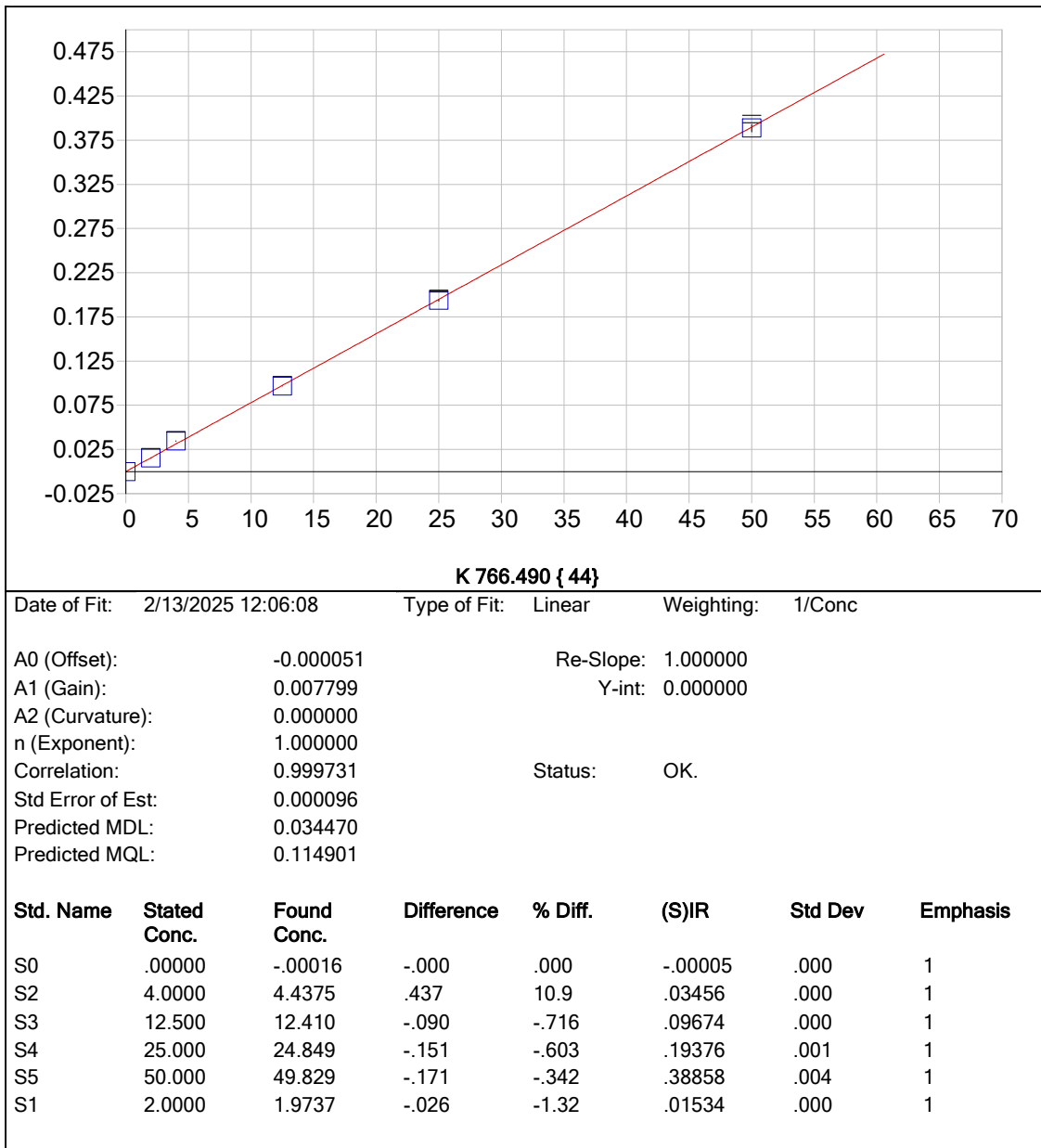
A0 (Offset): -0.001670 Re-Slope: 1.000000
A1 (Gain): 0.219679 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999259 Status: OK.
Std Error of Est: 0.000070
Predicted MDL: 0.000507
Predicted MQL: 0.001691

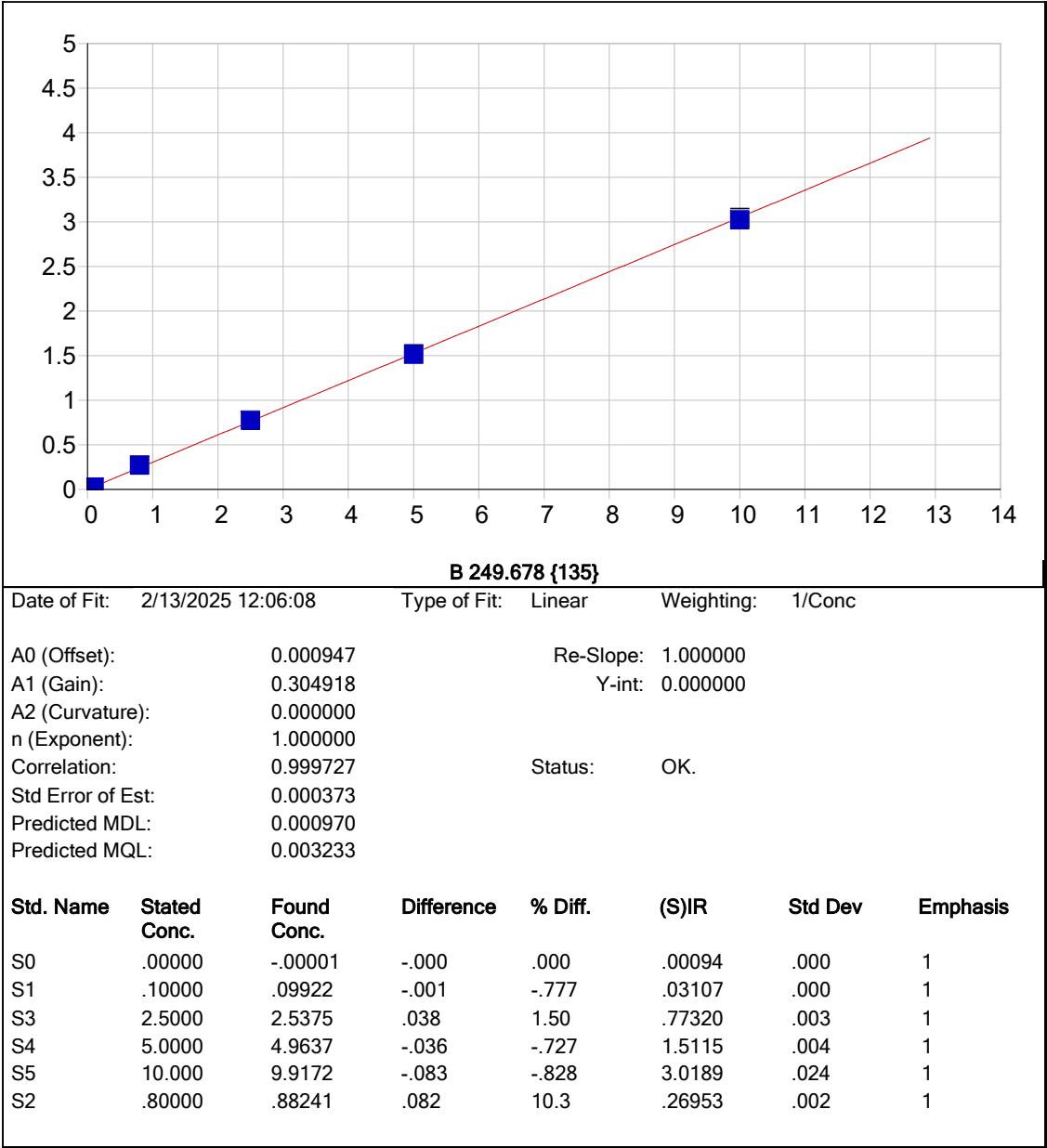


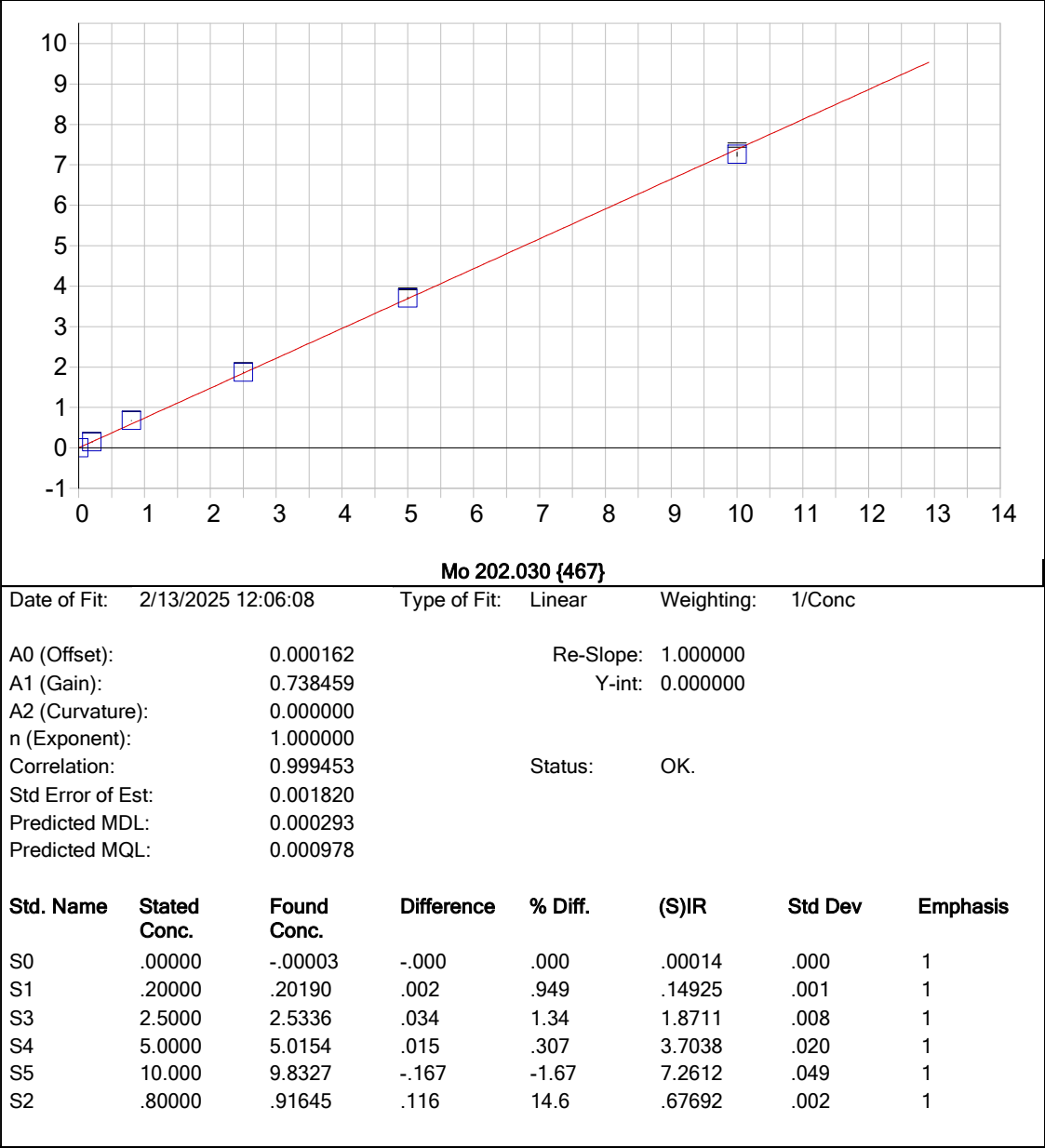


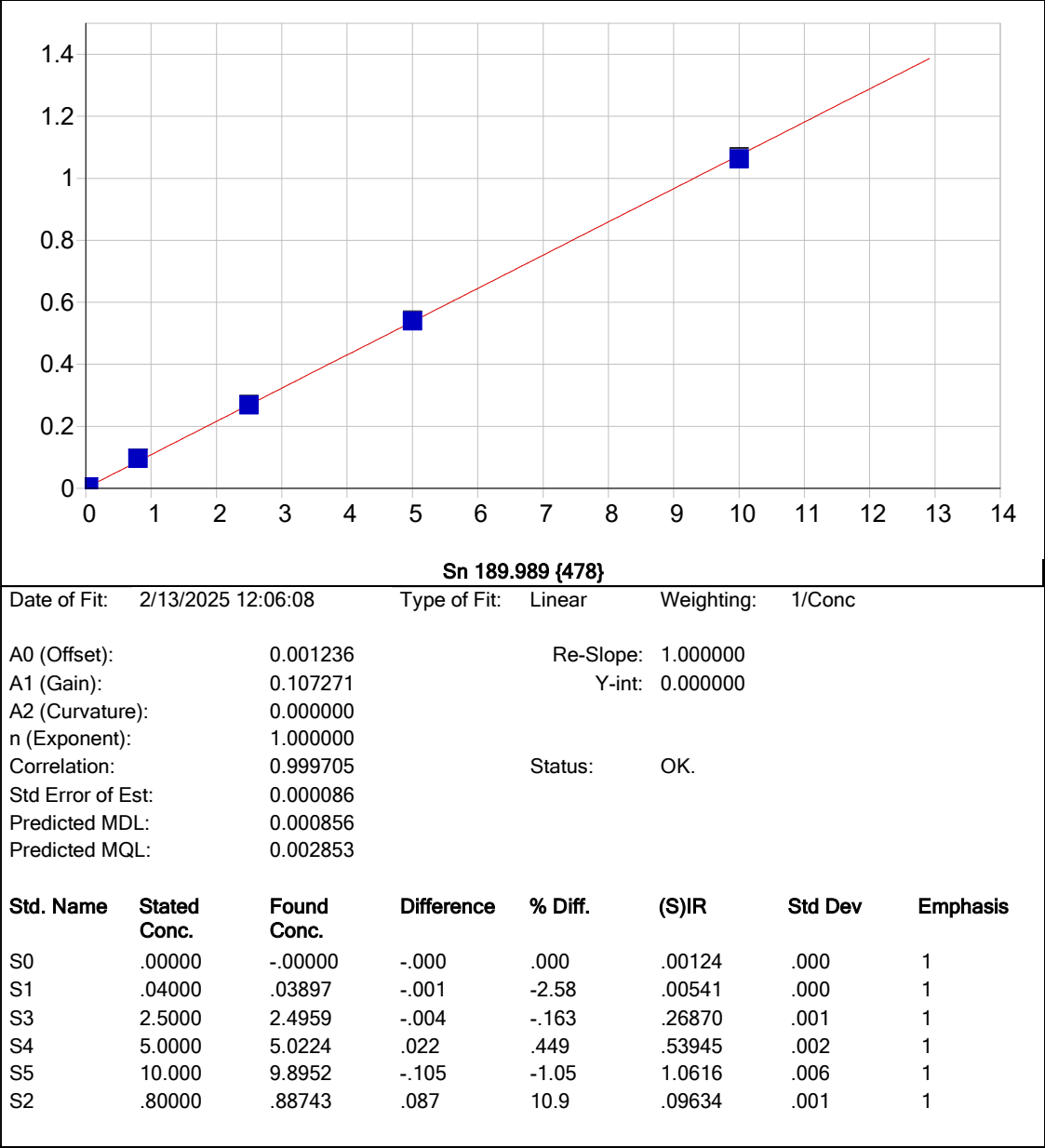


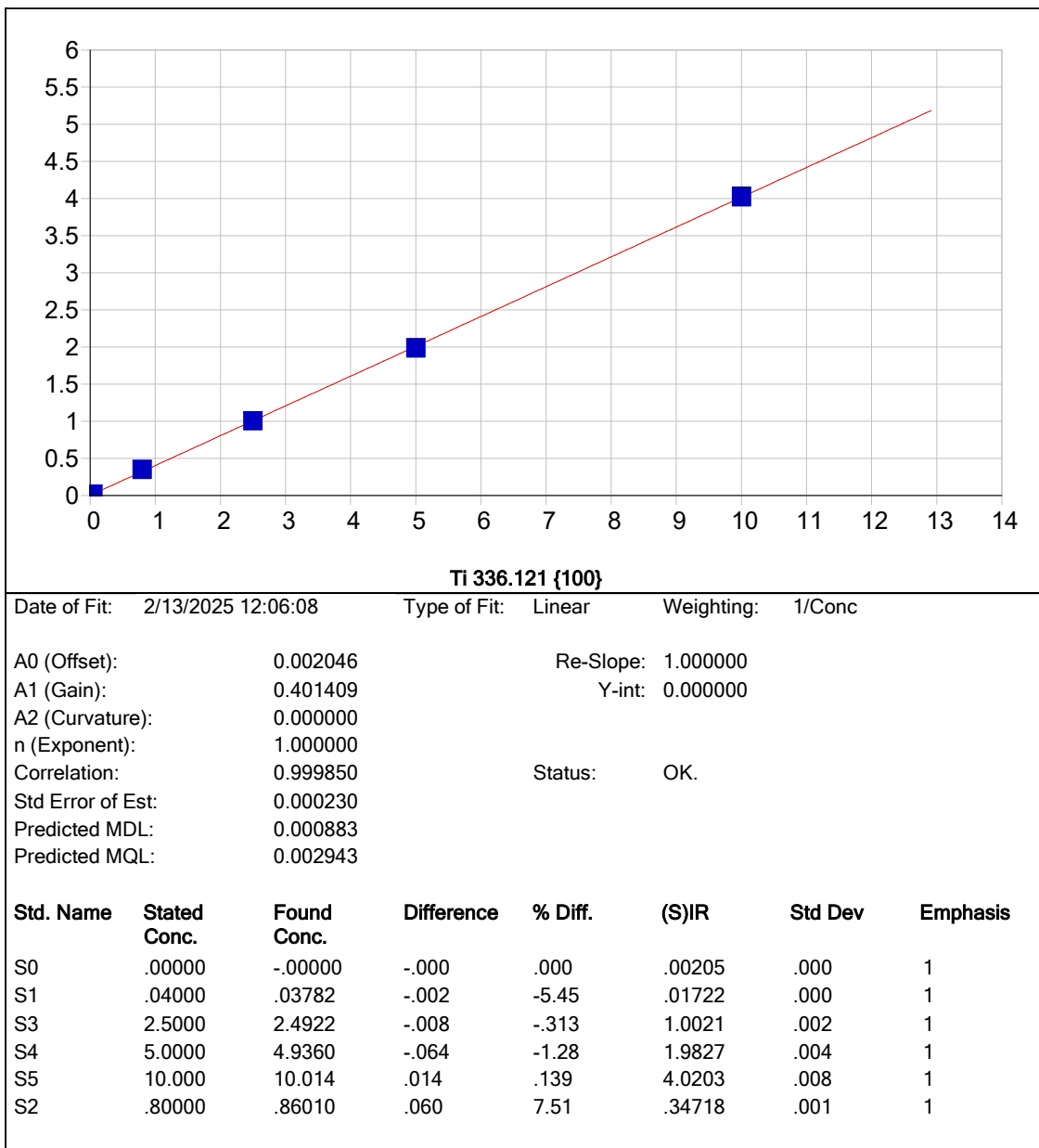


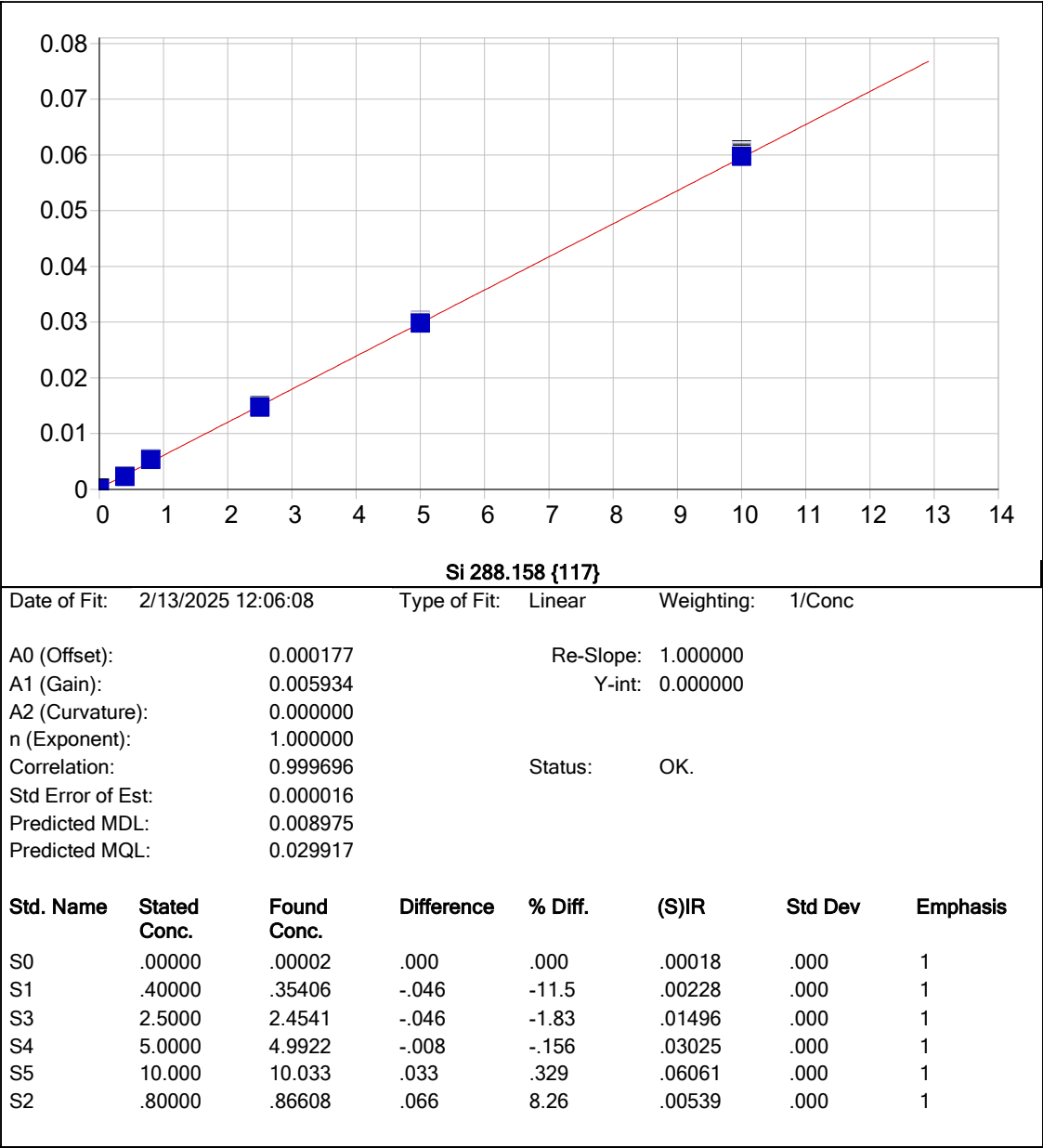


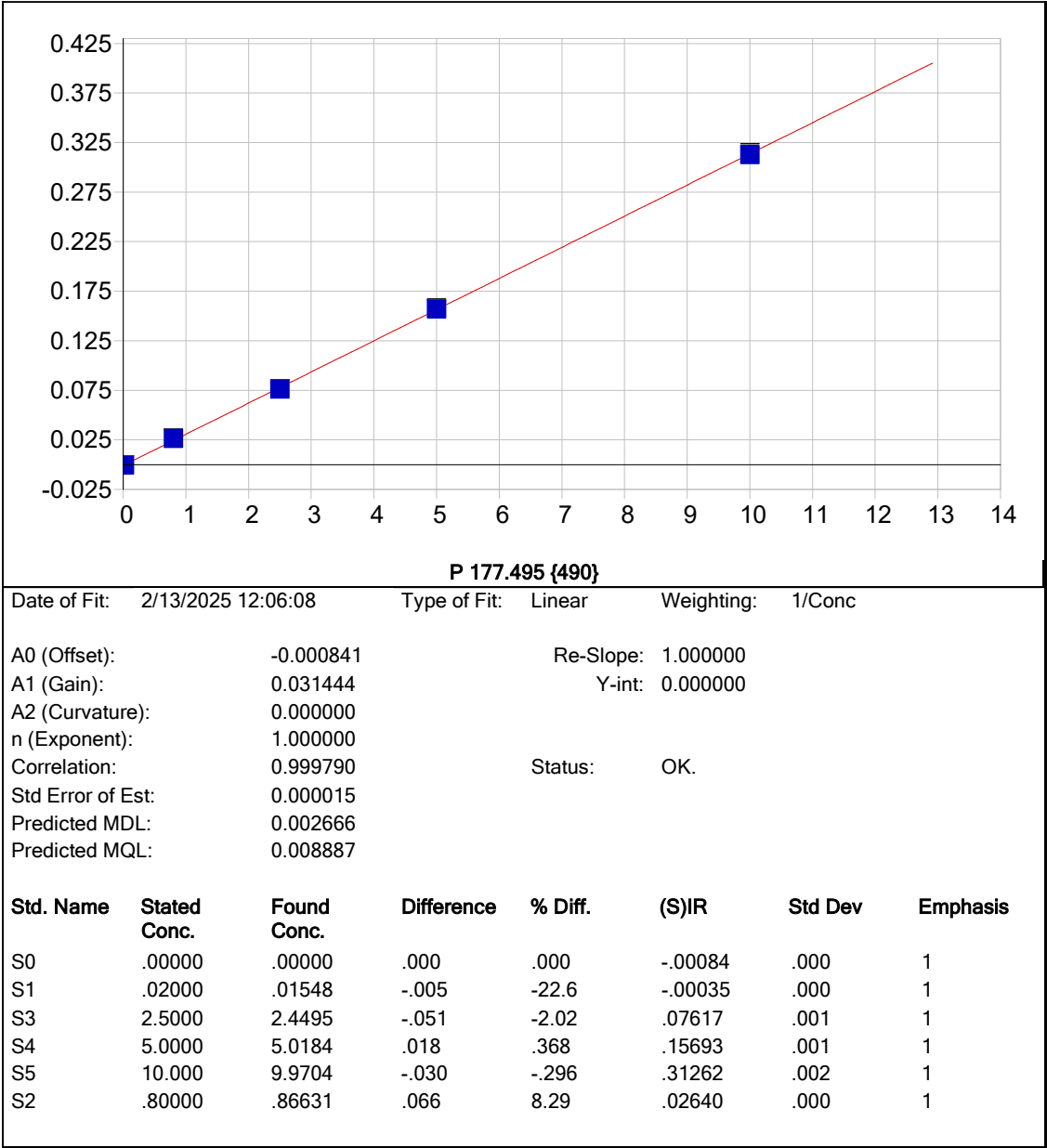


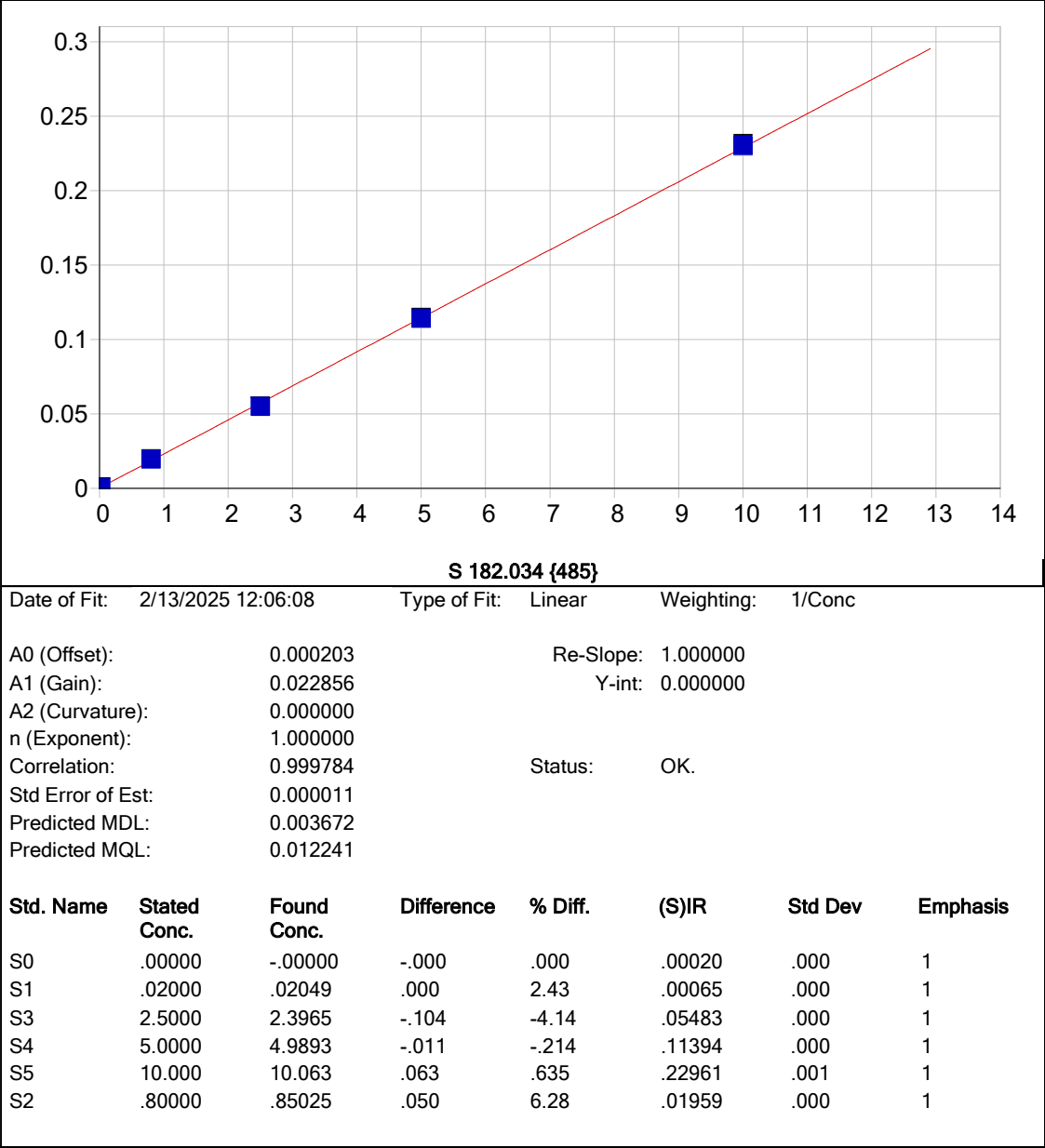


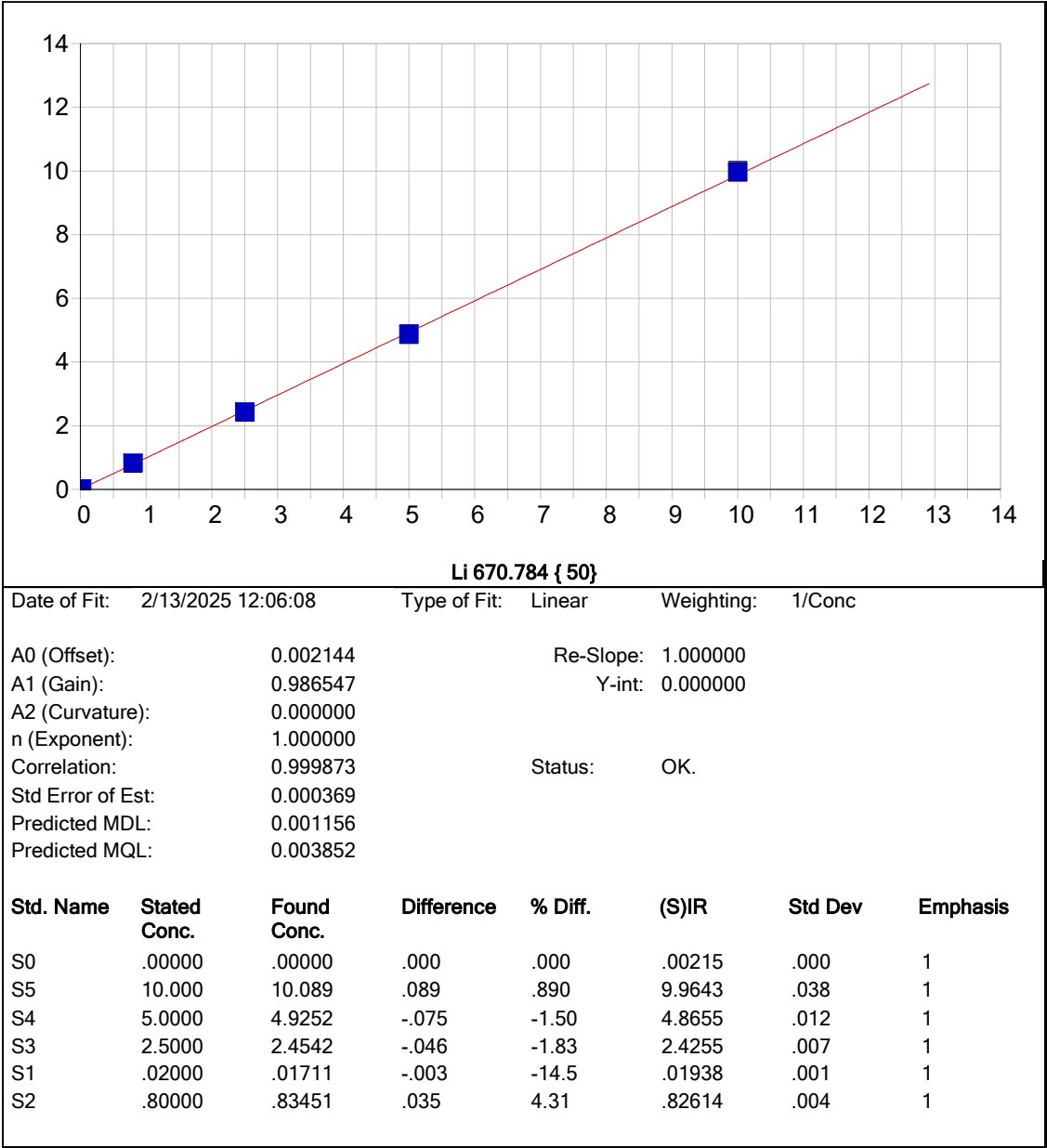


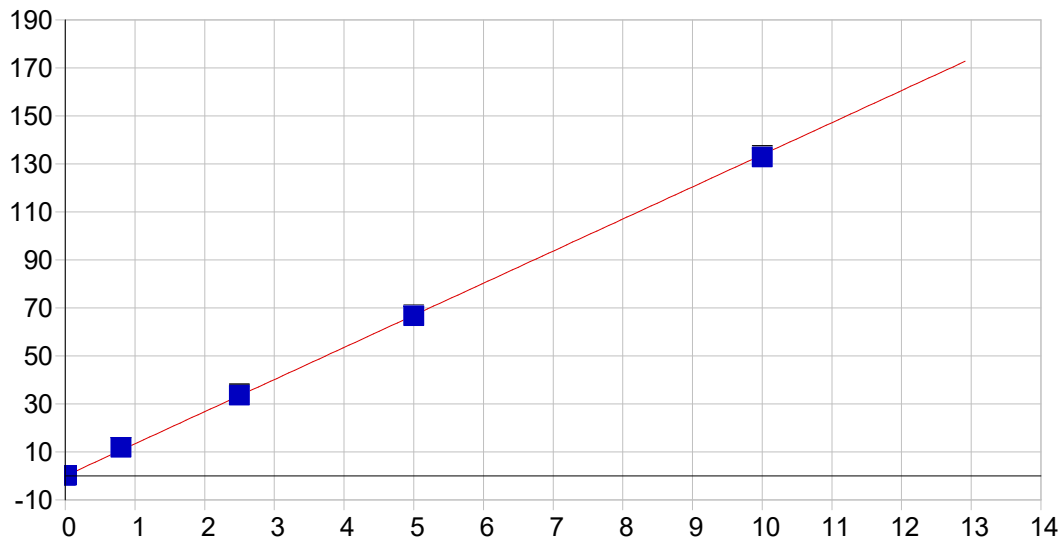










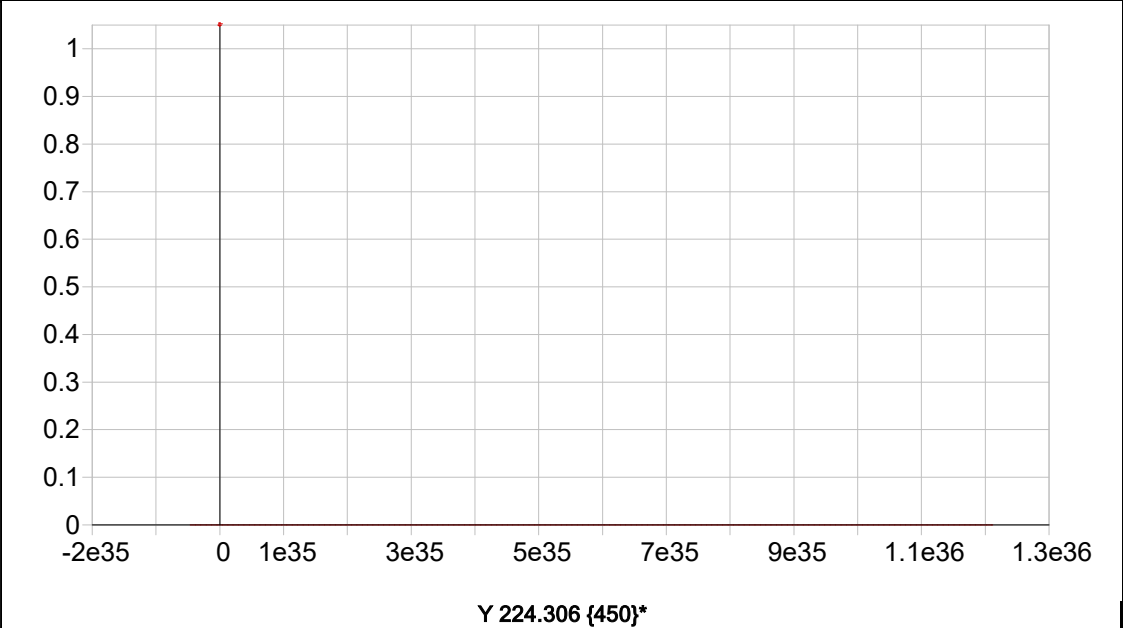


Sr 407.771 { 83}

Date of Fit: 2/13/2025 12:06:08 Type of Fit: Linear Weighting: 1/Conc

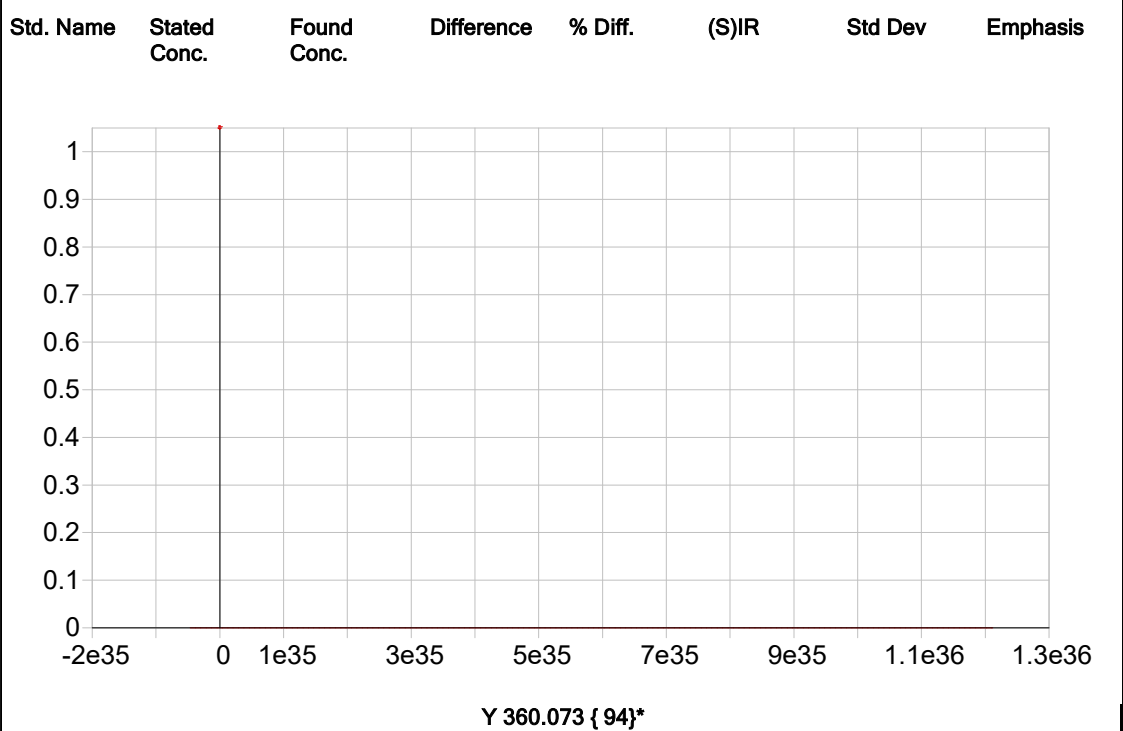
A0 (Offset): 0.000235 Re-Slope: 1.000000
A1 (Gain): 13.379638 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999747 Status: OK.
Std Error of Est: 0.007061
Predicted MDL: 0.000049
Predicted MQL: 0.000165

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	.00022	.001	1
S1	.02000	.01887	-.001	-5.66	.25403	.001	1
S3	2.5000	2.5137	.014	.549	33.667	.480	1
S4	5.0000	4.9842	-.016	-.316	66.754	.271	1
S5	10.000	9.9209	-.079	-.791	132.87	.637	1
S2	.80000	.88236	.082	10.3	11.817	.037	1



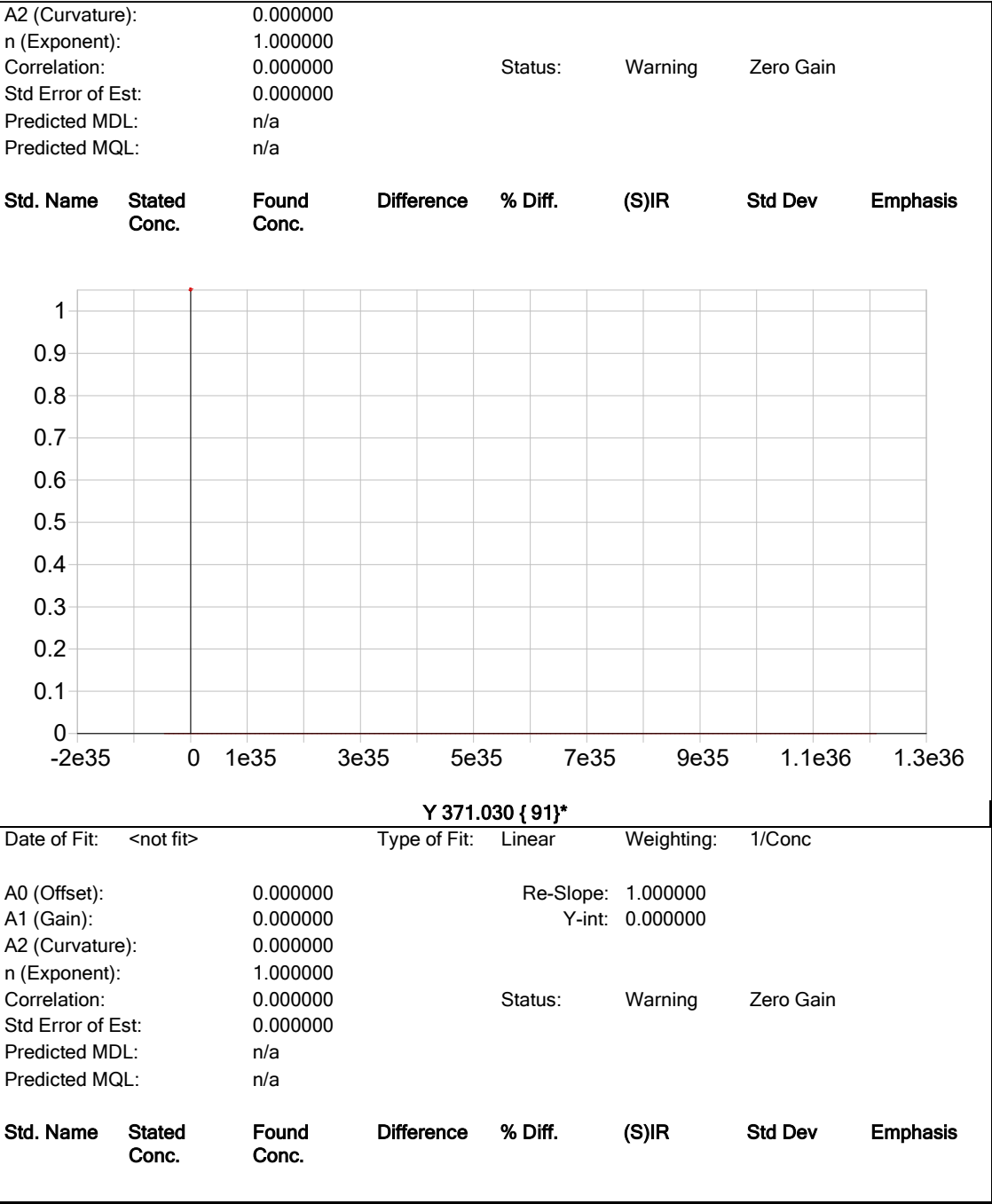
Date of Fit: 12/16/2024 23:39:18 Type of Fit: Linear Weighting: 1/Conc

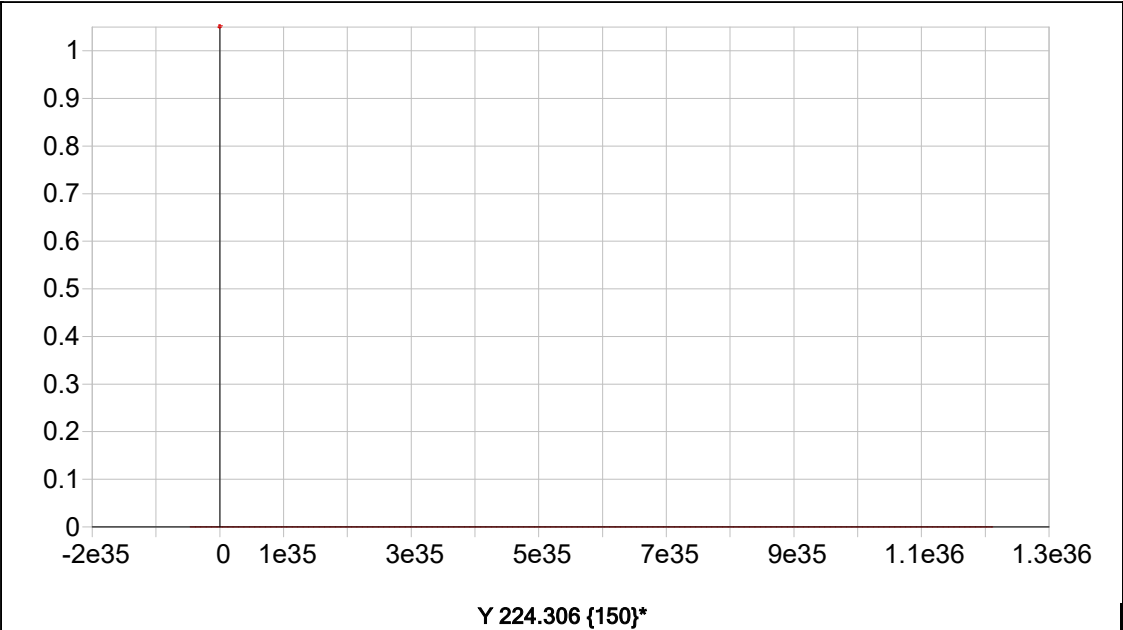
A0 (Offset):	0.000000	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.000000	Status:	Warning Zero Gain
Std Error of Est:	0.000000		
Predicted MDL:	n/a		
Predicted MQL:	n/a		



Date of Fit: <not fit> Type of Fit: Linear Weighting: 1/Conc

A0 (Offset):	0.000000	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000





Date of Fit:	<not fit>		Type of Fit:	Linear	Weighting:	1/Conc
A0 (Offset):	0.000000		Re-Slope:	1.000000		
A1 (Gain):	0.000000		Y-int:	0.000000		
A2 (Curvature):	0.000000					
n (Exponent):	1.000000					
Correlation:	0.000000		Status:	Warning	Zero Gain	
Std Error of Est:	0.000000					
Predicted MDL:	n/a					
Predicted MQL:	n/a					

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
ln 230.606 {446}*							

Date of Fit:	<not fit>		Type of Fit:	Linear	Weighting:	1/Conc
A0 (Offset):	0.000000		Re-Slope:	1.000000		
A1 (Gain):	0.000000		Y-int:	0.000000		

A2 (Curvature):		0.000000		Status:	Warning	Zero Gain	
n (Exponent):		1.000000					
Correlation:		0.000000					
Std Error of Est:		0.000000					
Predicted MDL:		n/a					
Predicted MQL:		n/a					
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis

Sample Name: S0 Acquired: 2/13/2025 11:40:34 Type: Cal
Method: NON EPA-6010-200.7(v2536) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934	Be2348
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-.00019	.00007	-.00019	.00020	.00019	-.00028	.05054	.00010
Stddev	.00007	.00005	.00008	.00015	.00017	.00015	.00174	.00017
%RSD	38.197	82.058	42.714	76.124	90.259	53.933	3.4332	182.11
#1	-.00027	.00012	-.00014	.00026	.00012	-.00028	.05067	.00027
#2	-.00014	.00006	-.00015	.00003	.00006	-.00043	.04874	.00010
#3	-.00016	.00001	-.00029	.00032	.00039	-.00013	.05220	-.00008
Elem	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00000	.00056	-.00009	.00004	-.00047	-.00002	.00020	-.00054
Stddev	.00027	.00017	.00007	.00015	.00021	.00001	.00020	.00009
%RSD	17643.	31.276	79.361	368.60	45.103	30.897	96.694	15.668
#1	-.00032	.00042	-.00007	.00016	-.00038	-.00003	.00023	-.00050
#2	.00015	.00051	-.00017	.00008	-.00072	-.00002	.00039	-.00064
#3	.00017	.00075	-.00003	-.00012	-.00032	-.00002	-.00001	-.00049
Elem	Ni2316	Ag3280	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-.00045	-.00167	.00267	.00003	.00261	-.00005	.00094	.00014
Stddev	.00022	.00005	.00005	.00020	.00003	.00015	.00024	.00020
%RSD	48.898	2.7894	1.8974	710.78	1.0386	282.90	25.183	145.79
#1	-.00051	-.00172	.00273	.00022	.00258	-.00015	.00071	.00001
#2	-.00064	-.00166	.00263	.00005	.00263	-.00012	.00093	.00037
#3	-.00021	-.00163	.00265	-.00018	.00261	.00012	.00119	.00004
Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707	Sr4077	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	.00124	.00205	.00018	-.00084	.00020	.00215	.00022	
Stddev	.00009	.00025	.00004	.00006	.00004	.00035	.00071	
%RSD	7.2893	12.136	19.869	7.0448	21.738	16.484	315.49	
#1	.00114	.00189	.00014	-.00089	.00016	.00255	.00063	
#2	.00131	.00233	.00021	-.00077	.00025	.00198	.00063	
#3	.00126	.00191	.00017	-.00086	.00019	.00191	-.00059	

Sample Name: S0 Acquired: 2/13/2025 11:40:34 Type: Cal
Method: NON EPA-6010-200.7(v2536) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2610.0	54433.	10124.	1730.3	4647.8
Stddev	2.4	232.	7.	2.7	3.3
%RSD	.09224	.42606	.07260	.15478	.07035
#1	2609.5	54177.	10132.	1730.8	4651.5
#2	2607.8	54491.	10119.	1727.5	4646.4
#3	2612.6	54630.	10120.	1732.8	4645.5

Sample Name: S1 Acquired: 2/13/2025 11:44:58 Type: Cal
Method: NON EPA-6010-200.7(v2536) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934	Be2348
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00081	.00143	.00248	.00201	.00856	.00866	.26053	.02253
Stddev	.00011	.00007	.00024	.00002	.00005	.00027	.00268	.00025
%RSD	13.192	4.7928	9.7833	.94325	.53449	3.1515	1.0297	1.1257
#1	.00090	.00148	.00221	.00203	.00851	.00887	.25947	.02273
#2	.00085	.00147	.00254	.00199	.00859	.00835	.26358	.02261
#3	.00069	.00136	.00268	.00201	.00858	.00876	.25854	.02224
Elem	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.01169	.11956	.00169	.02337	.01588	.00046	.00823	.03029
Stddev	.00015	.00021	.00003	.00011	.00009	.00000	.00011	.00017
%RSD	1.2582	.17645	1.8748	.48565	.58344	.98931	1.3319	.56217
#1	.01156	.11938	.00169	.02348	.01579	.00046	.00813	.03019
#2	.01167	.11952	.00167	.02337	.01588	.00047	.00835	.03018
#3	.01185	.11979	.00173	.02325	.01597	.00046	.00821	.03048
Elem	Ni2316	Ag3280	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.02231	.00057	.03252	.00503	.10946	.01534	.03107	.14925
Stddev	.00015	.00008	.00009	.00025	.00058	.00019	.00023	.00054
%RSD	.67150	13.196	.28132	4.9940	.53374	1.2086	.73782	.36250
#1	.02233	.00066	.03260	.00527	.10975	.01547	.03081	.14863
#2	.02215	.00054	.03253	.00477	.10878	.01543	.03115	.14953
#3	.02245	.00052	.03242	.00506	.10984	.01513	.03125	.14960
Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707	Sr4077	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	.00541	.01722	.00228	-.00035	.00065	.01938	.25403	
Stddev	.00008	.00027	.00002	.00003	.00009	.00065	.00100	
%RSD	1.3960	1.5490	1.0607	8.1417	14.309	3.3499	.39308	
#1	.00533	.01693	.00226	-.00033	.00059	.02008	.25431	
#2	.00546	.01725	.00231	-.00034	.00061	.01880	.25486	
#3	.00545	.01746	.00227	-.00039	.00076	.01925	.25292	

Sample Name: S1 Acquired: 2/13/2025 11:44:58 Type: Cal
Method: NON EPA-6010-200.7(v2536) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2654.8	55553.	10343.	1762.3	4696.5
Stddev	5.8	157.	29.	5.5	13.2
%RSD	.21957	.28220	.27667	.31402	.28135
#1	2659.2	55648.	10375.	1768.7	4699.7
#2	2657.0	55372.	10319.	1759.6	4707.9
#3	2648.2	55638.	10337.	1758.7	4682.0

Sample Name: S2 Acquired: 2/13/2025 11:49:22 Type: Cal
Method: NON EPA-6010-200.7(v2536) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934	Be2348
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.04109	.03543	.20196	.07264	.14995	.14339	4.0189	.17569
Stddev	.00030	.00005	.00058	.00019	.00050	.00034	.0146	.00103
%RSD	.73823	.13538	.28961	.26169	.33191	.23590	.36244	.58606

#1	.04106	.03543	.20136	.07272	.15015	.14325	4.0213	.17451
#2	.04080	.03547	.20199	.07243	.14938	.14314	4.0321	.17616
#3	.04140	.03537	.20253	.07278	.15031	.14378	4.0033	.17641

Elem	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.91197	.27106	.03351	.36108	.17700	.00458	.18083	.06392
Stddev	.00293	.00133	.00021	.00149	.00094	.00006	.00087	.00018
%RSD	.32132	.49078	.62811	.41230	.53229	1.4099	.48104	.27803

#1	.91015	.27078	.03368	.36037	.17598	.00464	.18098	.06393
#2	.91042	.27250	.03328	.36008	.17716	.00451	.18162	.06409
#3	.91535	.26989	.03359	.36280	.17785	.00459	.17990	.06373

Elem	Ni2316	Ag3280	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.26166	.04907	.07059	.05830	1.2030	.03456	.26953	.67692
Stddev	.00101	.00008	.00055	.00008	.0033	.00036	.00171	.00236
%RSD	.38421	.16942	.77825	.14416	.27745	1.0411	.63559	.34934

#1	.26105	.04903	.07120	.05840	1.2068	.03485	.26773	.67547
#2	.26111	.04917	.07014	.05826	1.2005	.03416	.27114	.67564
#3	.26282	.04902	.07043	.05825	1.2018	.03467	.26973	.67965

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707	Sr4077	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	.09634	.34718	.00539	.02640	.01959	.82614	11.817	
Stddev	.00059	.00121	.00006	.00020	.00010	.00427	.037	
%RSD	.61629	.34967	1.1628	.74841	.48975	.51659	.31624	

#1	.09586	.34788	.00545	.02625	.01956	.82847	11.822	
#2	.09617	.34788	.00532	.02631	.01951	.82874	11.851	
#3	.09701	.34578	.00540	.02662	.01970	.82122	11.777	

Sample Name: S2 Acquired: 2/13/2025 11:49:22 Type: Cal
Method: NON EPA-6010-200.7(v2536) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2601.8	54486.	10209.	1755.5	4504.9
Stddev	8.6	202.	30.	6.4	13.7
%RSD	.33075	.36982	.29700	.36546	.30419
#1	2606.1	54301.	10227.	1748.5	4515.5
#2	2607.5	54701.	10174.	1761.0	4509.7
#3	2591.9	54456.	10225.	1757.0	4489.4

Sample Name: S3 Acquired: 2/13/2025 11:53:28 Type: Cal
Method: NON EPA-6010-200.7(v2536) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934	Be2348
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.11342	.09735	.56319	.19818	.41458	.41531	11.607	.50504
Stddev	.00052	.00047	.00321	.00058	.00120	.00040	.074	.00131
%RSD	.45747	.48119	.57050	.29245	.28844	.09618	.63594	.25931

#1	.11312	.09680	.56052	.19818	.41406	.41500	11.614	.50487
#2	.11313	.09762	.56230	.19759	.41372	.41517	11.676	.50643
#3	.11402	.09761	.56676	.19875	.41594	.41576	11.529	.50382

Elem	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2.5467	.77372	.09319	1.0058	.48688	.01297	.52183	.18518
Stddev	.0125	.00206	.00024	.0050	.00249	.00004	.00187	.00049
%RSD	.49045	.26672	.25747	.49618	.51140	.32674	.35838	.26392

#1	2.5380	.77493	.09305	1.0023	.48547	.01301	.52298	.18533
#2	2.5411	.77491	.09305	1.0036	.48543	.01292	.52284	.18556
#3	2.5611	.77134	.09347	1.0115	.48976	.01297	.51967	.18463

Elem	Ni2316	Ag3280	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.72729	.13871	.20490	.16912	3.3298	.09674	.77320	1.8711
Stddev	.00387	.00027	.00050	.00039	.0163	.00022	.00262	.0078
%RSD	.53232	.19637	.24622	.22974	.48900	.22228	.33915	.41508

#1	.72444	.13903	.20545	.16954	3.3412	.09656	.77423	1.8659
#2	.72574	.13855	.20447	.16906	3.3111	.09698	.77515	1.8674
#3	.73170	.13856	.20477	.16877	3.3370	.09669	.77022	1.8800

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707	Sr4077	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	.26870	1.0021	.01496	.07617	.05483	2.4255	33.667	
Stddev	.00114	.0019	.00006	.00057	.00027	.0068	.480	
%RSD	.42556	.18573	.37570	.75133	.49454	.27932	1.4270	

#1	.26805	1.0032	.01501	.07576	.05459	2.4292	33.122	
#2	.26804	1.0031	.01490	.07592	.05477	2.4297	33.846	
#3	.27002	.99991	.01498	.07682	.05512	2.4177	34.031	

Sample Name: S3 Acquired: 2/13/2025 11:53:28 Type: Cal
Method: NON EPA-6010-200.7(v2536) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2588.5	53625.	9820.7	1723.5	4410.2
Stddev	7.7	117.	13.9	14.5	17.4
%RSD	.29820	.21738	.14158	.83928	.39546
#1	2590.9	53509.	9810.4	1715.5	4421.3
#2	2594.8	53742.	9815.2	1740.2	4419.3
#3	2579.9	53626.	9836.5	1714.8	4390.1

Sample Name: S4 Acquired: 2/13/2025 11:57:44 Type: Cal
Method: NON EPA-6010-200.7(v2536) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934	Be2348
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.23133	.19307	1.1232	.40300	.83832	.83072	23.279	.98205
Stddev	.00108	.00200	.0027	.00301	.00423	.00049	.153	.00146
%RSD	.46762	1.0380	.23693	.74744	.50436	.05859	.65899	.14841

#1	.23027	.19180	1.1231	.40075	.83555	.83064	23.412	.98371
#2	.23131	.19204	1.1206	.40183	.83623	.83028	23.111	.98100
#3	.23243	.19538	1.1259	.40642	.84319	.83124	23.314	.98143

Elem	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	5.1140	1.5155	.18139	2.0126	.96353	.02557	1.0133	.36833
Stddev	.0204	.0013	.00032	.0073	.00403	.00022	.0029	.00111
%RSD	.39952	.08544	.17621	.36125	.41835	.84503	.28306	.30250

#1	5.1095	1.5161	.18137	2.0110	.96225	.02569	1.0158	.36740
#2	5.0962	1.5163	.18172	2.0062	.96029	.02571	1.0139	.36802
#3	5.1363	1.5140	.18108	2.0205	.96804	.02532	1.0102	.36956

Elem	Ni2316	Ag3280	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1.4510	.27333	.41205	.33812	6.5148	.19376	1.5115	3.7038
Stddev	.0047	.00073	.00273	.00049	.0045	.00100	.0043	.0199
%RSD	.32624	.26743	.66198	.14415	.06906	.51842	.28328	.53842

#1	1.4494	.27417	.41406	.33790	6.5171	.19366	1.5136	3.6894
#2	1.4473	.27296	.41315	.33779	6.5176	.19481	1.5066	3.6954
#3	1.4564	.27285	.40894	.33868	6.5096	.19280	1.5143	3.7266

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707	Sr4077	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	.53945	1.9827	.03025	.15693	.11394	4.8655	66.754	
Stddev	.00222	.0042	.00003	.00087	.00048	.0121	.271	
%RSD	.41139	.21367	.08270	.55233	.41903	.24869	.40602	

#1	.53837	1.9875	.03022	.15716	.11373	4.8713	66.682	
#2	.53797	1.9813	.03027	.15598	.11360	4.8737	67.053	
#3	.54200	1.9793	.03026	.15766	.11449	4.8516	66.526	

Sample Name: S4 Acquired: 2/13/2025 11:57:44 Type: Cal
Method: NON EPA-6010-200.7(v2536) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2492.8	52883.	9760.2	1662.2	4174.9
Stddev	9.4	30.	20.7	4.3	12.4
%RSD	.37644	.05646	.21222	.26028	.29667
#1	2497.1	52853.	9766.3	1666.0	4176.3
#2	2499.3	52884.	9777.3	1657.5	4186.5
#3	2482.1	52913.	9737.2	1663.0	4161.9

Sample Name: S5 Acquired: 2/13/2025 12:01:57 Type: Cal
Method: NON EPA-6010-200.7(v2536) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934	Be2348
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.45737	.38165	2.2181	.79238	1.6557	1.7016	46.008	1.9506
Stddev	.00206	.00219	.0141	.00498	.0100	.0014	.069	.0107
%RSD	.45022	.57327	.63621	.62895	.60189	.07970	.15056	.55003

#1	.45589	.38296	2.2121	.78996	1.6522	1.7014	46.022	1.9413
#2	.45650	.37913	2.2080	.78906	1.6480	1.7003	46.068	1.9482
#3	.45972	.38287	2.2342	.79811	1.6670	1.7030	45.932	1.9623

Elem	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	10.102	3.0550	.34870	4.0008	1.8631	.04937	2.0362	.75263
Stddev	.064	.0035	.00099	.0252	.0135	.00045	.0048	.00252
%RSD	.63102	.11364	.28478	.63074	.72611	.91181	.23412	.33526

#1	10.067	3.0551	.34815	3.9901	1.8557	.04968	2.0398	.74973
#2	10.063	3.0585	.34985	3.9827	1.8549	.04956	2.0380	.75383
#3	10.175	3.0515	.34811	4.0297	1.8787	.04885	2.0308	.75433

Elem	Ni2316	Ag3280	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2.8629	.53319	.81434	.68348	12.661	.38858	3.0189	7.2612
Stddev	.0185	.00093	.01057	.00145	.020	.00413	.0236	.0487
%RSD	.64438	.17463	1.2985	.21221	.16121	1.0625	.78057	.67086

#1	2.8535	.53265	.82308	.68498	12.648	.39169	2.9988	7.2336
#2	2.8510	.53427	.81735	.68208	12.685	.39016	3.0130	7.2327
#3	2.8841	.53266	.80259	.68338	12.651	.38390	3.0449	7.3175

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707	Sr4077	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	1.0616	4.0203	.06061	.31262	.22961	9.9643	132.87	
Stddev	.0064	.0084	.00030	.00179	.00138	.0377	.64	
%RSD	.60033	.20841	.49632	.57217	.60218	.37795	.47938	

#1	1.0585	4.0280	.06069	.31219	.22949	9.9996	133.47	
#2	1.0574	4.0214	.06086	.31108	.22830	9.9688	132.21	
#3	1.0689	4.0114	.06028	.31458	.23105	9.9246	132.94	

Sample Name: S5 Acquired: 2/13/2025 12:01:57 Type: Cal
Method: NON EPA-6010-200.7(v2536) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2426.2	51851.	9302.3	1588.6	3985.0
Stddev	15.6	253.	23.9	6.7	22.7
%RSD	.64128	.48862	.25707	.42041	.56839
#1	2434.1	51759.	9329.0	1585.5	3994.0
#2	2436.2	51656.	9295.2	1584.0	4001.7
#3	2408.3	52137.	9282.8	1596.2	3959.2

Sample Name: ICV01 Acquired: 2/13/2025 12:17:43 Type: Unk
Method: NON EPA-6010-200.7(v2691) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICV01 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9569858	1.013924	.9630046	.9989103	.9931056	2.362601
Stddev	.0072435	.005911	.0064963	.0061319	.0063637	.001739
%RSD	.7569106	.5830170	.6745847	.6138623	.6407882	.0735957

#1	.9487592	1.007121	.9564127	.9922055	.9857724	2.362408
#2	.9597911	1.016833	.9632004	1.000291	.9963664	2.360967
#3	.9624072	1.017816	.9694008	1.004234	.9971781	2.364429

Elem	Ba4934	Be2348	Cd2265	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5559394	.4876156	.4884791	9.457509	.5251203	.4949860
Stddev	.0025976	.0030938	.0025702	.016872	.0011065	.0032852
%RSD	.4672449	.6344840	.5261728	.1783987	.2107175	.6636979

#1	.5587787	.4900377	.4861565	9.459876	.5250457	.4920121
#2	.5553570	.4841304	.4880402	9.439579	.5240529	.4944335
#3	.5536823	.4886786	.4912405	9.473073	.5262622	.4985124

Elem	Cu2247	Fe2404	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5126606	10.00765	.4852408	5.604799	.4980521	.2458825
Stddev	.0033524	.01668	.0031324	.013094	.0031983	.0005911
%RSD	.6539235	.1666558	.6455298	.2336190	.6421608	.2403830

#1	.5093620	9.98839	.4879827	5.590301	.4953041	.2459995
#2	.5125554	10.01722	.4818270	5.615764	.4972893	.2452416
#3	.5160643	10.01733	.4859128	5.608332	.5015628	.2464062

Elem	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.307742	.4780183	1.010089	9.689900	F -.027978	F -.000561
Stddev	.047140	.0017910	.002984	.030991	.000573	.000160
%RSD	.5064624	.3746766	.2953944	.3198244	2.048316	28.44740

#1	9.301977	.4761415	1.006674	9.675930	-.028640	-.000669
#2	9.357500	.4797089	1.011405	9.725416	-.027648	-.000378
#3	9.263750	.4782046	1.012189	9.668353	-.027648	-.000636

Sample Name: ICV01 Acquired: 2/13/2025 12:17:43 Type: Unk
Method: NON EPA-6010-200.7(v2691) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICV01 Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F -.010630	F -.000441	F -.003577	F .0009725	F -.000421	F -.003235
Stddev	.000010	.000279	.001511	.0010745	.003208	.001144
%RSD	.0930728	63.17455	42.23449	110.4803	762.5868	35.36126
#1	-.010620	-.000331	-.004192	.0007698	-.001691	-.002601
#2	-.010632	-.000759	-.004684	.0021340	-.002798	-.004555
#3	-.010639	-.000235	-.001856	.0000139	.003228	-.002548

Elem	Sr4077
Units	ppm
Avg	F -.008867
Stddev	.000063
%RSD	.7158997
#1	-.008917
#2	-.008796
#3	-.008889

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2637.311	54327.09	10423.70	1723.810	4626.775
Stddev	8.300	58.18	68.71	2.766	16.330
%RSD	.3147285	.1070912	.6591541	.1604417	.3529360
#1	2644.180	54394.24	10373.36	1726.569	4638.573
#2	2639.666	54295.26	10501.98	1723.822	4633.615
#3	2628.088	54291.77	10395.77	1721.038	4608.138

Sample Name: LLICV01 Acquired: 2/13/2025 12:22:56 Type: Unk
Method: NON EPA-6010-200.7(v2692) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LLICV01 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0207642	.0376491	.0111595	.0219716	.0510701	.1002116
Stddev	.0027232	.0021661	.0003286	.0021827	.0016678	.0009439
%RSD	13.11494	5.753481	2.944533	9.934220	3.265741	.9419264

#1	.0193398	.0369175	.0111711	.0231414	.0500458	.1002996
#2	.0190486	.0359436	.0114821	.0194533	.0529946	.1011085
#3	.0239042	.0400864	.0108252	.0233200	.0501700	.0992268

Elem	Ba4934	Be2348	Cd2265	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0832320	.0056529	.0056821	1.890737	.0102123	.0290347
Stddev	.0005384	.0001224	.0000352	.003375	.0003097	.0002247
%RSD	.6468628	2.165846	.6195866	.1785036	3.032905	.7737747

#1	.0826573	.0055234	.0056656	1.886951	.0100186	.0290427
#2	.0833139	.0057667	.0056582	1.891829	.0105695	.0288061
#3	.0837247	.0056686	.0057225	1.893431	.0100487	.0292552

Elem	Cu2247	Fe2404	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0218093	.0965645	.0183753	1.999399	.0394009	.0101551
Stddev	.0003208	.0031524	.0002358	.016845	.0004064	.0006543
%RSD	1.470691	3.264608	1.283342	.8424966	1.031541	6.442716

#1	.0216561	.0979335	.0182420	1.980372	.0394015	.0094005
#2	.0221779	.0988011	.0186476	2.005419	.0389942	.0105012
#3	.0215939	.0929590	.0182363	2.012407	.0398071	.0105637

Elem	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.680963	.0382941	.0422569	1.906650	.0991965	.2035888
Stddev	.027671	.0026791	.0002824	.010267	.0028485	.0007831
%RSD	1.646154	6.996068	.6681655	.5384627	2.871534	.3846695

#1	1.706633	.0374931	.0421919	1.895099	.0959429	.2039800
#2	1.651651	.0412823	.0425661	1.910120	.1012408	.2026871
#3	1.684604	.0361068	.0420127	1.914733	.1004057	.2040993

Sample Name: LLICV01 Acquired: 2/13/2025 12:22:56 Type: Unk
Method: NON EPA-6010-200.7(v2692) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LLICV01 Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0377824	.0364555	.3365311	.0167265	.0174944	F .0149913
Stddev	.0006890	.0001952	.0028420	.0019829	.0018093	.0003198
%RSD	1.823527	.5354825	.8445092	11.85481	10.34226	2.133396
#1	.0370424	.0364024	.3397340	.0172270	.0154057	.0147038
#2	.0378996	.0362923	.3355488	.0184113	.0185014	.0149344
#3	.0384053	.0366717	.3343105	.0145414	.0185763	.0153358

Elem	Sr4077
Units	ppm
Avg	.0180429
Stddev	.0000815
%RSD	.4518232
#1	.0180252
#2	.0179716
#3	.0181318

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2595.526	55091.44	10366.45	1718.546	4605.552
Stddev	8.010	65.42	91.20	5.538	15.629
%RSD	.3086025	.1187485	.8797418	.3222694	.3393452
#1	2588.757	55069.80	10471.68	1712.183	4602.156
#2	2604.369	55039.59	10310.58	1721.168	4622.599
#3	2593.453	55164.94	10317.07	1722.286	4591.900

Sample Name: ICB01 Acquired: 2/13/2025 12:50:05 Type: Unk
Method: NON EPA-6010-200.7(v2692) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICB01 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0021461	.0017441	-.000697	.0026899	.0007870	.0049458	-.005758
Stddev	.0008925	.0021596	.000602	.0016427	.0007247	.0047454	.000551
%RSD	41.58806	123.8220	86.39153	61.06784	92.08659	95.94866	9.562815

#1	.0025791	.0002943	-.000153	.0045800	.0004264	.0014954	-.005248
#2	.0027396	.0042260	-.000593	.0016064	.0016213	.0103575	-.006342
#3	.0011197	.0007119	-.001344	.0018834	.0003133	.0029845	-.005685

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000009	-.000102	.0055541	.0009051	-.000036	-.000009	-.000101
Stddev	.000013	.000044	.0067030	.0004437	.000272	.000380	.001510
%RSD	146.6414	43.06063	120.6866	49.01944	765.6969	4421.722	1494.305

#1	-.000005	-.000152	.0061965	.0011154	.000254	.000214	-.001843
#2	.000002	-.000081	.0119128	.0012046	-.000074	-.000448	.000722
#3	-.000024	-.000072	-.001447	.0003954	-.000286	.000208	.000818

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000079	.0113024	.0003932	.0004165	-.055058	.0004352	.0001720
Stddev	.000085	.0120185	.0002369	.0004218	.004136	.0010106	.0002374
%RSD	107.5956	106.3359	60.25001	101.2759	7.512177	232.2246	138.0041

#1	.000017	.0243202	.0003914	.0008151	-.053408	.0013694	-.000091
#2	-.000144	.0089585	.0006309	.0004598	-.059764	.0005737	.000370
#3	-.000110	.0006285	.0001572	-.000025	-.052001	-.000638	.000238

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0075519	.0005106	-.000063	-.009329	.0001704	.0023281	-.002047
Stddev	.0190619	.0012670	.000179	.000284	.0004400	.0060844	.001810
%RSD	252.4123	248.1666	284.3489	3.040959	258.2587	261.3422	88.40553

#1	-.004436	-.000866	-.000066	-.009038	-.000338	.0042238	-.003114
#2	.029533	.000771	-.000240	-.009343	.000415	-.004478	-.003070
#3	-.002441	.001627	.000117	-.009605	.000434	.007239	.000042

Sample Name: ICB01 Acquired: 2/13/2025 12:50:05 Type: Unk
Method: NON EPA-6010-200.7(v2692) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICB01 Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	-.002133	-.002923	-.000073
Stddev	.003252	.000419	.000020
%RSD	152.4293	14.33486	27.44197
#1	-.004469	-.002465	-.000092
#2	.001580	-.003287	-.000074
#3	-.003511	-.003017	-.000052

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2569.142	54022.94	10387.96	1679.542	4609.911
Stddev	6.891	222.74	52.20	11.932	8.540
%RSD	.2682079	.4123105	.5025005	.7104392	.1852461
#1	2568.330	54163.72	10447.96	1679.304	4607.767
#2	2576.403	54138.97	10362.93	1691.592	4619.318
#3	2562.693	53766.14	10352.99	1667.731	4602.647

Sample Name: CRI01 Acquired: 2/13/2025 12:54:26 Type: Unk
Method: NON EPA-6010-200.7(v2692) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CRI01 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0212164	.0381056	.0103548	.0209861	.0502927	.0953748	.0848882
Stddev	.0013269	.0020096	.0003508	.0029357	.0002101	.0028569	.0009149
%RSD	6.253926	5.273740	3.387874	13.98891	.4176731	2.995490	1.077786

#1	.0199875	.0357887	.0105075	.0192107	.0500643	.0954998	.0858808
#2	.0210384	.0391524	.0099535	.0193729	.0504777	.0981672	.0847053
#3	.0226232	.0393758	.0106033	.0243747	.0503360	.0924574	.0840785

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0056704	.0056688	1.893432	.0103254	.0286610	.0217933	.0967336
Stddev	.0000692	.0001064	.003234	.0005765	.0003304	.0002210	.0011839
%RSD	1.219593	1.876016	.1708063	5.583351	1.152875	1.014122	1.223861

#1	.0057160	.0055796	1.889975	.0099118	.0288491	.0216095	.0980326
#2	.0055908	.0056403	1.896384	.0109839	.0282795	.0217319	.0964530
#3	.0057043	.0057865	1.893936	.0100804	.0288544	.0220386	.0957152

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0183376	2.033419	.0384576	.0101502	1.736203	.0370947	.0419963
Stddev	.0004260	.017620	.0002411	.0003672	.011906	.0017549	.0002238
%RSD	2.323237	.8665441	.6268873	3.617167	.6857391	4.730822	.5328364

#1	.0180158	2.040619	.0383096	.0098331	1.743238	.0390277	.0417522
#2	.0188208	2.013339	.0383274	.0105525	1.742914	.0366546	.0421917
#3	.0181763	2.046299	.0387358	.0100650	1.722457	.0356017	.0420449

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.001151	.0978114	.2027990	.0368636	.0364571	.3578388	.0176826
Stddev	.015615	.0004783	.0017391	.0005357	.0004688	.0025938	.0010652
%RSD	.7803215	.4890294	.8575546	1.453326	1.285796	.7248628	6.024073

#1	2.018078	.0976759	.2025097	.0373277	.0368025	.3589429	.0169056
#2	1.998070	.0974153	.2012227	.0369858	.0366452	.3596979	.0172453
#3	1.987306	.0983428	.2046647	.0362773	.0359235	.3548756	.0188968

Sample Name: CRI01 Acquired: 2/13/2025 12:54:26 Type: Unk
Method: NON EPA-6010-200.7(v2692) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CRI01 Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0166279	.0151866	.0183166
Stddev	.0015132	.0009524	.0000046
%RSD	9.100084	6.271075	.0251347
#1	.0183457	.0141686	.0183146
#2	.0154928	.0160558	.0183219
#3	.0160451	.0153353	.0183133

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2633.250	53752.57	10324.29	1695.385	4725.452
Stddev	7.384	28.02	35.50	6.396	8.792
%RSD	.2804118	.0521302	.3438708	.3772824	.1860572
#1	2632.062	53742.23	10336.30	1688.857	4723.185
#2	2641.156	53784.29	10352.23	1695.656	4735.155
#3	2626.532	53731.19	10284.34	1701.641	4718.015

Sample Name: ICSA01 Acquired: 2/13/2025 13:03:55 Type: Unk
Method: NON EPA-6010-200.7(v2692) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSA01 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0047024	-.004953	.0055741	-.011998	.0004659	238.4999
Stddev	.0030492	.000955	.0018729	.004094	.0019199	1.2699
%RSD	64.84319	19.27418	33.59932	34.11975	412.1263	.5324696

#1	.0081706	-.005591	.0044071	-.007767	.0014594	237.4285
#2	.0024427	-.003856	.0077344	-.015939	.0016854	238.1685
#3	.0034939	-.005414	.0045809	-.012289	-.001747	239.9026

Elem	Ba4934	Be2348	Cd2265	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0009833	.0033278	-.001024	227.1172	.0598488	.0022569
Stddev	.0008528	.0000876	.000096	.2015	.0004193	.0002429
%RSD	86.72438	2.632607	9.413495	.0887378	.7005706	10.76363

#1	.0003100	.0034148	-.001095	227.0036	.0603311	.0022985
#2	.0019422	.0032396	-.000914	227.3499	.0595715	.0024764
#3	.0006977	.0033291	-.001062	226.9981	.0596437	.0019959

Elem	Cu2247	Fe2404	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0202719	102.6897	-.004938	243.3971	.0041843	-.002242
Stddev	.0004985	.2311	.000529	.2985	.0003501	.000564
%RSD	2.459072	.2250165	10.70432	.1226231	8.366284	25.14856

#1	.0197103	102.6668	-.004998	243.0579	.0041067	-.002016
#2	.0204435	102.9314	-.005434	243.5139	.0038795	-.002884
#3	.0206620	102.4710	-.004382	243.6194	.0045666	-.001827

Elem	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0637961	.0037656	.0073288	.0454866	F -.300742	-.000024
Stddev	.0095864	.0031088	.0003473	.0271485	.000593	.000426
%RSD	15.02659	82.55711	4.738114	59.68454	.1972393	1787.449

#1	.0574707	.0046166	.0072655	.0159396	-.300634	-.000350
#2	.0748258	.0003200	.0077033	.0693303	-.300210	-.000180
#3	.0590917	.0063603	.0070175	.0511899	-.301381	.000458

Sample Name: ICSA01 Acquired: 2/13/2025 13:03:55 Type: Unk
Method: NON EPA-6010-200.7(v2692) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSA01 Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.005512	-.002839	.0090387	.0029178	-.018287	F -.038089
Stddev	.001780	.000459	.0056866	.0013951	.004256	.000850
%RSD	32.28430	16.17397	62.91364	47.81342	23.27193	2.230865
#1	-.005230	-.002830	.0153385	.0031341	-.019912	-.037366
#2	-.007416	-.003302	.0042851	.0041921	-.021490	-.037878
#3	-.003891	-.002384	.0074926	.0014272	-.013458	-.039025

Elem	Sr4077
Units	ppm
Avg	-.009147
Stddev	.000244
%RSD	2.664992
#1	-.008871
#2	-.009240
#3	-.009331

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2295.516	47804.31	10039.70	1508.320	3715.379
Stddev	3.771	62.84	23.93	5.873	4.822
%RSD	.1642700	.1314567	.2383911	.3893673	.1297863
#1	2298.542	47785.97	10048.71	1505.318	3711.780
#2	2296.715	47874.28	10057.81	1504.554	3720.858
#3	2291.291	47752.67	10012.57	1515.087	3713.498

Sample Name: ICSAB01 Acquired: 2/13/2025 13:19:08 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSAB01 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1048825	.0899240	.0550319	.0307016	.6235645	239.6252
Stddev	.0045212	.0025206	.0006295	.0017438	.0027140	3.0627
%RSD	4.310711	2.803059	1.143793	5.679813	.4352456	1.278116

#1	.1097782	.0908790	.0553535	.0320700	.6243795	243.1121
#2	.1008646	.0918277	.0554355	.0287382	.6205364	237.3707
#3	.1040047	.0870655	.0543066	.0312967	.6257777	238.3927

Elem	Ba4934	Be2348	Cd2265	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.4689492	.4886167	1.013432	226.8923	.5809586	.5103984
Stddev	.0005913	.0024666	.002812	.6570	.0009512	.0012864
%RSD	.1260960	.5048047	.2774550	.2895716	.1637337	.2520322

#1	.4682700	.4914638	1.014880	227.6049	.5799049	.5104180
#2	.4693495	.4872624	1.010191	226.3106	.5812171	.5091023
#3	.4692282	.4871241	1.015225	226.7614	.5817539	.5116748

Elem	Cu2247	Fe2404	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5196234	102.2215	.4590774	243.7052	1.009407	.2109424
Stddev	.0013824	.3226	.0005854	.9196	.003447	.0003498
%RSD	.2660489	.3156269	.1275164	.3773563	.3414827	.1658230

#1	.5200032	101.9460	.4596943	244.7077	1.009714	.2112217
#2	.5180907	102.1421	.4585296	242.9006	1.005817	.2110554
#3	.5207762	102.5764	.4590083	243.5074	1.012691	.2105500

Elem	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0572387	.4736613	1.068175	.0566966	F -.303348	F -.000602
Stddev	.0069329	.0020790	.006672	.0241475	.003064	.000744
%RSD	12.11223	.4389163	.6245704	42.59072	1.010198	123.5098

#1	.0634524	.4753795	1.064942	.0290214	-.304699	-.000816
#2	.0497607	.4742542	1.075847	.0675903	-.305505	-.001217
#3	.0585031	.4713503	1.063736	.0734780	-.299841	.000225

Sample Name: ICSAB01 Acquired: 2/13/2025 13:19:08 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSAB01 Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F -.007208	F -.004613	F .0016924	F .0048271	F -.019793	F -.038232
Stddev	.001166	.000675	.0038477	.0035993	.006568	.001002
%RSD	16.17152	14.62897	227.3469	74.56468	33.18179	2.619833
#1	-.007104	-.004440	.0024038	.0064343	-.021571	-.037457
#2	-.006099	-.005358	-.002461	.0007042	-.025289	-.039363
#3	-.008423	-.004042	.005135	.0073427	-.012520	-.037875

Elem	Sr4077
Units	ppm
Avg	F -.008836
Stddev	.000220
%RSD	2.493325
#1	-.008775
#2	-.008652
#3	-.009080

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2322.720	47927.90	10004.39	1517.046	3775.516
Stddev	4.617	124.08	63.07	3.000	8.275
%RSD	.1987565	.2588988	.6304009	.1977213	.2191734
#1	2321.414	47804.11	9931.77	1516.472	3774.202
#2	2327.849	48052.28	10045.48	1514.375	3784.369
#3	2318.898	47927.32	10035.92	1520.291	3767.977

Sample Name: CCV01 Acquired: 2/13/2025 13:23:23 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV01 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.837647	4.798179	4.797541	4.846313	4.824515	9.447597	9.345346
Stddev	.005986	.004125	.014588	.012130	.008766	.024105	.097577
%RSD	.1237385	.0859621	.3040797	.2502862	.1816874	.2551413	1.044122

#1	4.833170	4.802923	4.789631	4.843967	4.825564	9.471375	9.440068
#2	4.835323	4.796174	4.788615	4.835528	4.815272	9.448238	9.350825
#3	4.844446	4.795441	4.814375	4.859444	4.832709	9.423178	9.245145

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2365431	2.401854	23.43729	.9785721	2.390048	1.221337	4.818681
Stddev	.0012706	.007666	.11212	.0012908	.007395	.002255	.024386
%RSD	.5371525	.3191754	.4783843	.1319087	.3094169	.1846676	.5060728

#1	.2365811	2.396822	23.56331	.9778134	2.384160	1.220434	4.841030
#2	.2377943	2.398063	23.39996	.9778403	2.387637	1.219673	4.792672
#3	.2352539	2.410677	23.34859	.9800625	2.398348	1.223904	4.822340

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.332075	23.37486	2.397650	1.216484	23.76626	2.357251	2.428209
Stddev	.013702	.08980	.005306	.002893	.22129	.009823	.012905
%RSD	.5875533	.3841877	.2213010	.2378435	.9311300	.4167305	.5314474

#1	2.344479	23.46306	2.393889	1.215835	23.99671	2.368198	2.431944
#2	2.334378	23.37800	2.395342	1.219646	23.55543	2.354353	2.438835
#3	2.317367	23.28353	2.403719	1.213970	23.74666	2.349203	2.413849

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	23.90601	4.703804	4.862701	4.815199	4.698564	4.771202	4.828183
Stddev	.14920	.030098	.010259	.012565	.022360	.022063	.018125
%RSD	.6241106	.6398622	.2109680	.2609389	.4758912	.4624267	.3754084

#1	24.04837	4.704679	4.858763	4.802754	4.723038	4.769885	4.815987
#2	23.75080	4.733454	4.854995	4.814963	4.693452	4.749827	4.819552
#3	23.91887	4.673277	4.874345	4.827880	4.679203	4.793895	4.849011

Sample Name: CCV01 Acquired: 2/13/2025 13:23:23 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV01 Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	4.773137	4.655293	4.737537
Stddev	.012949	.032867	.012145
%RSD	.2712803	.7060131	.2563500
#1	4.762758	4.692456	4.740588
#2	4.769006	4.643378	4.724158
#3	4.787647	4.630046	4.747865

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2476.716	52452.56	9807.453	1630.747	4178.578
Stddev	2.450	35.59	41.828	5.276	9.031
%RSD	.0989298	.0678600	.4264952	.3235123	.2161355
#1	2477.378	52463.50	9803.186	1627.625	4185.415
#2	2478.767	52481.40	9767.921	1627.778	4181.979
#3	2474.003	52412.78	9851.251	1636.838	4168.340

Sample Name: CCB01 Acquired: 2/13/2025 13:27:34 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB01 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0014423	.0002834	-.000794	.0034458	.0002735	.0047137	-.005461
Stddev	.0022417	.0022184	.000887	.0022147	.0005849	.0014364	.001123
%RSD	155.4270	782.7286	111.7269	64.27194	213.8603	30.47394	20.56775

#1	.0039254	.0025674	-.000238	.0059986	.0004816	.0061529	-.005292
#2	-.000432	-.001863	-.001816	.0023003	.0007259	.0032800	-.006659
#3	.000834	.000146	-.000327	.0020385	-.000387	.0047082	-.004432

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000030	-.000010	.0072822	.0005761	.0000169	-.000089	.0051974
Stddev	.000015	.000021	.0025642	.0000717	.0002102	.000073	.0032070
%RSD	51.31841	215.4207	35.21209	12.44426	1243.105	81.78519	61.70370

#1	-.000034	.000001	.0047839	.0005924	.0001985	-.000136	.0088933
#2	-.000013	.000003	.0099076	.0006382	-.000213	-.000005	.0035500
#3	-.000042	-.000033	.0071552	.0004976	.000066	-.000127	.0031489

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000841	.0064383	.0006185	-.000098	.0141867	.0000950	-.000250
Stddev	.000146	.0178398	.0002201	.000063	.0087047	.0015630	.000172
%RSD	17.38250	277.0891	35.58460	64.16013	61.35839	1645.789	68.87063

#1	-.001007	.0063871	.0005390	-.000115	.0041539	.0005728	-.000413
#2	-.000780	-.011376	.0008672	-.000029	.0197313	-.001651	-.000268
#3	-.000735	.024304	.0004491	-.000151	.0186749	.001363	-.000070

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0661011	.0098885	.0002989	-.009778	-.000158	.0041190	.0001026
Stddev	.0220677	.0002231	.0002453	.000056	.000454	.0028196	.0007684
%RSD	33.38482	2.255915	82.08412	.5738363	286.9198	68.45383	748.8708

#1	.0866084	.0101016	.0004557	-.009814	-.000025	.0073342	.0009483
#2	.0689460	.0096566	.0000162	-.009713	-.000664	.0020672	-.000553
#3	.0427488	.0099072	.0004248	-.009806	.000214	.0029557	-.000088

Sample Name: CCB01 Acquired: 2/13/2025 13:27:34 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB01 Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	-.001112	-.003111	.0000033
Stddev	.001529	.000734	.0000156
%RSD	137.4312	23.60312	471.4179
#1	-.000819	-.003844	-.000009
#2	.000248	-.003112	-.000002
#3	-.002766	-.002376	.000021

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2566.015	54238.45	10430.62	1688.171	4620.010
Stddev	6.612	140.74	7.67	.727	2.703
%RSD	.2576929	.2594764	.0735564	.0430672	.0585048
#1	2568.306	54310.42	10425.71	1687.877	4622.033
#2	2571.178	54076.29	10426.68	1687.637	4621.056
#3	2558.562	54328.65	10439.46	1688.999	4616.940

Sample Name: Q1348-01 Acquired: 2/13/2025 13:31:56 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.003093	-.007177	.0108304	-.000132	.0032252	5.440398
Stddev	.000830	.001940	.0009488	.000895	.0013777	.023704
%RSD	26.81982	27.03609	8.760664	676.4630	42.71749	.4356949
#1	-.004033	-.007639	.0099464	-.001103	.0043914	5.443159
#2	-.002782	-.008844	.0118329	.000047	.0017050	5.462600
#3	-.002464	-.005047	.0107118	.000660	.0035791	5.415434
Elem	Ba4934	Be2348	Cd2265	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1402546	.0002806	.0006840	130.7980	.0167340	.0010414
Stddev	.0012248	.0000826	.0000597	.6150	.0001333	.0001702
%RSD	.8732441	29.43929	8.726615	.4701553	.7964518	16.33995
#1	.1416087	.0003378	.0007262	131.3392	.0168147	.0008698
#2	.1392242	.0001859	.0007100	130.9255	.0165801	.0012101
#3	.1399308	.0003181	.0006157	130.1293	.0168071	.0010442
Elem	Cu2247	Fe2404	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0106544	8.438529	.5690927	22.29417	.0059132	-.001173
Stddev	.0004728	.023720	.0030202	.13068	.0004489	.000091
%RSD	4.437238	.2810904	.5306991	.5861487	7.592156	7.747959
#1	.0111780	8.448875	.5724427	22.41762	.0056547	-.001116
#2	.0102588	8.411393	.5682570	22.30759	.0064316	-.001278
#3	.0105264	8.455318	.5665784	22.15730	.0056533	-.001126
Elem	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	283.3895	.0140000	.0461768	20.22153	.2190040	.0053913
Stddev	3.1817	.0011065	.0002542	.07430	.0024475	.0003164
%RSD	1.122722	7.903875	.5505769	.3674106	1.117562	5.868551
#1	284.1594	.0151541	.0461830	20.19233	.2218198	.0057555
#2	279.8936	.0129481	.0459195	20.16627	.2173867	.0051840
#3	286.1157	.0138976	.0464278	20.30599	.2178055	.0052344

Sample Name: Q1348-01 Acquired: 2/13/2025 13:31:56 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.011165	.1159720	F 29.90431	2.526393	1.699768	-.015140
Stddev	.000822	.0039972	.07129	.015276	.006649	.000569
%RSD	7.357860	3.446726	.2383961	.6046520	.3911995	3.759095
#1	-.011898	.1196774	29.84156	2.544031	1.697100	-.015795
#2	-.011319	.1165025	29.88953	2.517395	1.694867	-.014771
#3	-.010277	.1117360	29.98183	2.517754	1.707337	-.014853

Elem	Sr4077
Units	ppm
Avg	.6313053
Stddev	.0028163
%RSD	.4461030
#1	.6344479
#2	.6304583
#3	.6290098

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2305.651	49473.50	10284.73	1496.060	3843.977
Stddev	5.448	111.95	53.38	1.355	6.215
%RSD	.2363019	.2262812	.5190115	.0905480	.1616907
#1	2299.411	49442.16	10233.78	1497.051	3836.885
#2	2309.461	49597.78	10280.16	1494.516	3846.569
#3	2308.083	49380.56	10340.24	1496.613	3848.477

Sample Name: Q1348-01DUP Acquired: 2/13/2025 13:36:18 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.004846	-.007298	.0113025	.0011366	.0034173	6.805036
Stddev	.001172	.001547	.0004911	.0017309	.0016335	.028437
%RSD	24.18897	21.20467	4.345309	152.2835	47.80151	.4178765

#1	-.003493	-.007813	.0107545	.0030368	.0040524	6.772645
#2	-.005531	-.005558	.0117029	.0007234	.0015616	6.816564
#3	-.005516	-.008522	.0114501	-.000350	.0046378	6.825898

Elem	Ba4934	Be2348	Cd2265	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1536642	.0003245	.0007604	134.3651	.0181851	.0010715
Stddev	.0011491	.0000615	.0000683	.4669	.0001011	.0002418
%RSD	.7477741	18.93953	8.983712	.3474905	.5561608	22.56716

#1	.1548858	.0003568	.0007621	134.5131	.0182930	.0008596
#2	.1535020	.0003630	.0008279	133.8421	.0181699	.0010199
#3	.1526049	.0002536	.0006913	134.7400	.0180924	.0013349

Elem	Cu2247	Fe2404	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0106846	8.865991	.5900695	23.08481	.0064005	-.001455
Stddev	.0002832	.019460	.0050522	.07636	.0002344	.000399
%RSD	2.650603	.2194919	.8562115	.3307678	3.661547	27.43817

#1	.0103612	8.886412	.5913210	23.07330	.0062191	-.000994
#2	.0108044	8.847661	.5845091	23.01487	.0063172	-.001685
#3	.0108883	8.863900	.5943783	23.16627	.0066651	-.001686

Elem	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	305.1475	.0185616	.0476965	21.05735	.2257445	.0051480
Stddev	2.7942	.0023221	.0008196	.08195	.0006311	.0002262
%RSD	.9156796	12.51006	1.718372	.3891846	.2795555	4.394545

#1	307.8698	.0190493	.0478326	21.12246	.2254602	.0049083
#2	302.2867	.0206012	.0468174	21.08425	.2253055	.0053579
#3	305.2861	.0160345	.0484396	20.96532	.2264677	.0051777

Sample Name: Q1348-01DUP Acquired: 2/13/2025 13:36:18 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.011138	.2016119	F 33.44697	2.553035	1.701618	-.014661
Stddev	.000879	.0088217	.07575	.012992	.002783	.000390
%RSD	7.888737	4.375603	.2264863	.5088824	.1635780	2.659833
#1	-.010460	.2116725	33.39077	2.550212	1.702188	-.014218
#2	-.010823	.1979641	33.53312	2.541687	1.704072	-.014951
#3	-.012131	.1951991	33.41702	2.567207	1.698593	-.014816

Elem	Sr4077
Units	ppm
Avg	.6502237
Stddev	.0022064
%RSD	.3393252
#1	.6527453
#2	.6486478
#3	.6492779

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2312.706	49003.81	10141.26	1511.107	3845.143
Stddev	2.185	32.05	44.03	11.931	5.288
%RSD	.0944982	.0654010	.4341421	.7895398	.1375331
#1	2311.557	48978.11	10145.44	1501.028	3839.367
#2	2315.226	49039.72	10183.04	1524.280	3849.747
#3	2311.334	48993.59	10095.29	1508.012	3846.316

Sample Name: Q1348-01LX5 Acquired: 2/13/2025 13:40:41 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0024200	-.002384	.0016115	.0003496	.0013248	1.564115	.0291326
Stddev	.0015269	.002014	.0003978	.0009942	.0013706	.009383	.0010948
%RSD	63.09397	84.47019	24.68397	284.3901	103.4585	.5998797	3.757811

#1	.0030999	-.004047	.0011563	-.000504	.0026233	1.573340	.0278931
#2	.0034887	-.002960	.0018923	.000112	.0014590	1.554582	.0295376
#3	.0006713	-.000145	.0017859	.001441	-.000108	1.564423	.0299672

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000795	.0001888	27.31285	.0045298	-.000193	.0023044	1.800727
Stddev	.0000387	.0000535	.02365	.0004338	.000148	.0000312	.012096
%RSD	48.72327	28.32898	.0865753	9.575994	76.64801	1.353555	.6717328

#1	.0001076	.0001509	27.33968	.0043429	-.000024	.0023340	1.810263
#2	.0000955	.0002500	27.30381	.0042209	-.000259	.0023075	1.804796
#3	.0000353	.0001655	27.29505	.0050257	-.000298	.0022718	1.787121

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1207219	4.713626	.0016919	-.000601	57.81385	.0029638	.0095714
Stddev	.0002965	.002954	.0001439	.000333	.31970	.0006217	.0002252
%RSD	.2455626	.0626790	8.503234	55.47120	.5529740	20.97591	2.352672

#1	.1209855	4.716722	.0018169	-.000914	58.16464	.0036733	.0093543
#2	.1207793	4.710837	.0015347	-.000638	57.73802	.0027041	.0095560
#3	.1204010	4.713320	.0017241	-.000250	57.53888	.0025141	.0098039

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	3.955877	.0525887	.0011146	-.011051	.0525003	6.852934	.5064282
Stddev	.039990	.0004659	.0001039	.000309	.0026850	.019707	.0011114
%RSD	1.010904	.8859715	9.321317	2.800044	5.114216	.2875682	.2194494

#1	3.972776	.0520688	.0009958	-.010702	.0555044	6.862057	.5051459
#2	3.984642	.0527289	.0011886	-.011157	.0503345	6.830319	.5071114
#3	3.910211	.0529684	.0011594	-.011293	.0516619	6.866428	.5070275

Sample Name: Q1348-01LX5 Acquired: 2/13/2025 13:40:41 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.3388602	-.003974	.1285416
Stddev	.0036017	.001377	.0001799
%RSD	1.062880	34.64748	.1399362
#1	.3425547	-.004937	.1287493
#2	.3386669	-.004588	.1284332
#3	.3353592	-.002397	.1284424

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2512.722	52729.32	10438.59	1656.295	4306.759
Stddev	.401	249.62	16.54	9.585	2.050
%RSD	.0159493	.4734045	.1584644	.5786782	.0476037
#1	2512.707	52531.69	10436.84	1653.959	4305.458
#2	2513.130	52646.43	10423.00	1648.094	4305.696
#3	2512.329	53009.85	10455.94	1666.832	4309.122

Sample Name: Q1348-01MS Acquired: 2/13/2025 13:44:59 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.7499897	1.728347	.8803024	1.806170	.7468235	6.660000
Stddev	.0020427	.007170	.0022636	.002598	.0038031	.021091
%RSD	.2723659	.4148714	.2571373	.1438344	.5092338	.3166830

#1	.7490556	1.736627	.8803438	1.803595	.7424377	6.666626
#2	.7485811	1.724204	.8780184	1.808790	.7492079	6.636392
#3	.7523325	1.724211	.8825450	1.806125	.7488250	6.676983

Elem	Ba4934	Be2348	Cd2265	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3178797	.1729917	.1843750	131.6993	.3971595	.1869761
Stddev	.0014161	.0002977	.0004551	.1206	.0008650	.0006494
%RSD	.4454683	.1720623	.2468566	.0915542	.2177940	.3473189

#1	.3195046	.1729078	.1838659	131.6574	.3981575	.1862421
#2	.3172256	.1727450	.1847425	131.8353	.3966250	.1872101
#3	.3169089	.1733223	.1845166	131.6053	.3966960	.1874760

Elem	Cu2247	Fe2404	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2851921	10.11851	.7461744	23.77570	.4676913	.0582080
Stddev	.0011032	.05665	.0017853	.07778	.0010918	.0006950
%RSD	.3868420	.5598715	.2392568	.3271211	.2334400	1.193921

#1	.2845363	10.14739	.7457389	23.69246	.4667014	.0580545
#2	.2845742	10.15489	.7481371	23.84651	.4675102	.0589669
#3	.2864658	10.05324	.7446472	23.78814	.4688623	.0576027

Elem	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	295.7583	.2849188	.2355390	29.75823	.4442908	.3967740
Stddev	1.5948	.0008942	.0008515	.06454	.0014997	.0011531
%RSD	.5392125	.3138342	.3614948	.2168758	.3375500	.2906286

#1	296.6679	.2838880	.2345675	29.78337	.4433006	.3960499
#2	296.6902	.2853836	.2361558	29.80641	.4435556	.3961684
#3	293.9169	.2854849	.2358936	29.68490	.4460163	.3981038

Sample Name: Q1348-01MS Acquired: 2/13/2025 13:44:59 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.6269368	.2921906	F 29.39569	8.186411	1.449050	.1726895
Stddev	.0015715	.0064011	.09685	.016764	.006983	.0005715
%RSD	.2506684	2.190725	.3294642	.2047831	.4818957	.3309550
#1	.6253807	.2884062	29.36331	8.187412	1.451938	.1728758
#2	.6269064	.2995812	29.50457	8.169168	1.441086	.1731447
#3	.6285233	.2885843	29.31917	8.202652	1.454126	.1720481

Elem	Sr4077
Units	ppm
Avg	.8127028
Stddev	.0020077
%RSD	.2470360
#1	.8141023
#2	.8136037
#3	.8104025

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2313.776	49628.38	10109.77	1514.978	3859.122
Stddev	3.376	84.80	14.88	5.179	4.134
%RSD	.1459111	.1708800	.1471811	.3418789	.1071101
#1	2316.515	49587.57	10102.06	1517.993	3857.854
#2	2314.809	49571.68	10100.34	1508.997	3863.741
#3	2310.004	49725.87	10126.92	1517.943	3855.771

Sample Name: Q1348-01MSD Acquired: 2/13/2025 13:49:08 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.7527357	1.722271	.8811765	1.822569	.7548547	7.328367
Stddev	.0024795	.004207	.0011419	.004480	.0006072	.036654
%RSD	.3294028	.2442824	.1295882	.2458200	.0804419	.5001606
#1	.7504675	1.722345	.8800106	1.822688	.7555217	7.370536
#2	.7523567	1.718027	.8812261	1.826989	.7547084	7.304145
#3	.7553829	1.726440	.8822928	1.818031	.7543340	7.310421
Elem	Ba4934	Be2348	Cd2265	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3167988	.1707451	.1843098	130.5070	.3986486	.1876043
Stddev	.0008024	.0006574	.0000256	.3662	.0004683	.0000361
%RSD	.2532940	.3850301	.0138871	.2806362	.1174814	.0192459
#1	.3176668	.1710665	.1843001	130.7568	.3982832	.1876460
#2	.3166457	.1699889	.1842905	130.0866	.3991766	.1875845
#3	.3160840	.1711801	.1843389	130.6776	.3984862	.1875824
Elem	Cu2247	Fe2404	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2847430	10.28522	.7351670	23.67442	.4686496	.0651768
Stddev	.0002199	.01837	.0036899	.03702	.0009377	.0071954
%RSD	.0772411	.1786047	.5019081	.1563742	.2000874	11.03981
#1	.2849793	10.27096	.7389202	23.65562	.4690569	.0682419
#2	.2845443	10.30595	.7315439	23.65057	.4675771	.0703321
#3	.2847054	10.27875	.7350371	23.71707	.4693147	.0569564
Elem	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	294.0871	.2843812	.2352437	30.31755	.4379352	.3970672
Stddev	1.2793	.0008128	.0006206	.08379	.0002831	.0004296
%RSD	.4349948	.2858237	.2638257	.2763731	.0646478	.1081860
#1	292.6130	.2850827	.2357357	30.41430	.4379865	.3967889
#2	294.9073	.2845705	.2345465	30.26996	.4381891	.3968508
#3	294.7409	.2834905	.2354490	30.26839	.4376299	.3975619

Sample Name: Q1348-01MSD Acquired: 2/13/2025 13:49:08 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.6299721	.3519845	F 31.27896	8.118301	1.449845	.1712618
Stddev	.0016542	.0095639	.04997	.011466	.004287	.0007095
%RSD	.2625770	2.717140	.1597492	.1412309	.2957061	.4142924
#1	.6306302	.3409808	31.32194	8.105067	1.444895	.1712709
#2	.6280902	.3566756	31.22414	8.124606	1.452380	.1719667
#3	.6311960	.3582970	31.29081	8.125231	1.452260	.1705478

Elem	Sr4077
Units	ppm
Avg	.8070002
Stddev	.0029691
%RSD	.3679233
#1	.8102864
#2	.8045106
#3	.8062037

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2312.948	49471.82	10253.49	1507.008	3857.123
Stddev	2.817	16.65	36.91	4.494	3.657
%RSD	.1217971	.0336607	.3599611	.2982158	.0948136
#1	2310.237	49472.08	10240.30	1504.761	3855.751
#2	2312.746	49488.35	10295.18	1512.183	3854.349
#3	2315.860	49455.04	10224.99	1504.082	3861.267

Sample Name: Q1348-01A Acquired: 2/13/2025 13:53:18 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.7574792	1.726116	.8825779	1.840805	.7618603	7.617588
Stddev	.0021964	.001444	.0021759	.005550	.0022593	.015313
%RSD	.2899650	.0836324	.2465359	.3015039	.2965572	.2010269
#1	.7557142	1.727456	.8817605	1.837638	.7621747	7.618940
#2	.7567843	1.724587	.8809290	1.837563	.7594602	7.601643
#3	.7599390	1.726304	.8850441	1.847213	.7639460	7.632181
Elem	Ba4934	Be2348	Cd2265	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3232180	.1725670	.1847845	132.1168	.3993046	.1882092
Stddev	.0017813	.0006718	.0003828	.3679	.0015361	.0001988
%RSD	.5511012	.3892821	.2071661	.2784432	.3846827	.1056293
#1	.3225581	.1723708	.1847622	131.8729	.4006352	.1880338
#2	.3218609	.1720151	.1844133	131.9376	.3976236	.1881687
#3	.3252351	.1733150	.1851780	132.5399	.3996550	.1884251
Elem	Cu2247	Fe2404	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2846679	10.36023	.7435916	23.94953	.4697997	.0640887
Stddev	.0006215	.00643	.0026240	.00953	.0006608	.0064970
%RSD	.2183279	.0620325	.3528859	.0397887	.1406615	10.13747
#1	.2840605	10.35832	.7406394	23.93998	.4690550	.0705301
#2	.2846408	10.35497	.7444770	23.94958	.4700279	.0641984
#3	.2853026	10.36739	.7456584	23.95903	.4703162	.0575376
Elem	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	299.1585	.2871569	.2367710	30.52031	.4440114	.3987257
Stddev	2.4406	.0032268	.0019927	.09811	.0031986	.0003968
%RSD	.8158187	1.123705	.8416290	.3214531	.7203984	.0995231
#1	296.4898	.2905574	.2364701	30.43502	.4452639	.3991730
#2	299.7088	.2841376	.2349459	30.49838	.4403760	.3984158
#3	301.2770	.2867758	.2388971	30.62752	.4463943	.3985885

Sample Name: Q1348-01A Acquired: 2/13/2025 13:53:18 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.6315012	.3792799	F 32.03981	8.092236	1.457094	.1721235
Stddev	.0016125	.0114262	.01354	.016590	.002014	.0011141
%RSD	.2553503	3.012597	.0422516	.2050112	.1382267	.6472748
#1	.6330656	.3897964	32.02468	8.106783	1.459317	.1726046
#2	.6298445	.3809218	32.05078	8.074168	1.455391	.1729163
#3	.6315937	.3671216	32.04396	8.095756	1.456574	.1708497

Elem	Sr4077
Units	ppm
Avg	.8155193
Stddev	.0023761
%RSD	.2913591
#1	.8147726
#2	.8136062
#3	.8181791

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2304.931	49336.39	10151.06	1501.753	3843.477
Stddev	4.397	102.59	40.08	10.101	6.192
%RSD	.1907511	.2079444	.3948431	.6726338	.1611089
#1	2300.586	49363.78	10172.65	1506.750	3838.359
#2	2309.378	49422.51	10175.72	1508.382	3850.360
#3	2304.830	49222.88	10104.81	1490.127	3841.713

Sample Name: Q1349-01 Acquired: 2/13/2025 13:57:28 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0283461	-.019958	.2969099	-.021863	.0008232	102.1409
Stddev	.0017652	.002298	.0020805	.001950	.0021252	.2141
%RSD	6.227399	11.51613	.7007091	8.918509	258.1499	.2096104
#1	.0263365	-.020848	.2953807	-.023918	-.000373	102.3529
#2	.0290557	-.017348	.2960700	-.021631	-.000434	102.1451
#3	.0296461	-.021678	.2992790	-.020039	.003277	101.9248
Elem	Ba4934	Be2348	Cd2265	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5939770	.0077294	.0088406	130.4418	.2854342	.0353508
Stddev	.0009214	.0001090	.0000084	.2119	.0004211	.0003050
%RSD	.1551243	1.410558	.0946098	.1624235	.1475382	.8626306
#1	.5930967	.0077400	.0088425	130.4316	.2850273	.0351935
#2	.5938996	.0078329	.0088315	130.6586	.2854072	.0351567
#3	.5949346	.0076155	.0088479	130.2352	.2858682	.0357023
Elem	Cu2247	Fe2404	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1998827	115.6250	.8984590	34.53655	.1040545	-.013195
Stddev	.0011047	.8317	.0018612	.06049	.0000531	.000469
%RSD	.5526927	.7193047	.2071515	.1751393	.0510014	3.557722
#1	.1996293	115.3013	.8996109	34.46671	.1041090	-.013633
#2	.2010920	115.0039	.8994543	34.57241	.1040030	-.013252
#3	.1989266	116.5700	.8963118	34.57052	.1040513	-.012699
Elem	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	287.0481	.2118131	.8938414	40.23116	-.005648	.0161354
Stddev	2.4200	.0001652	.0019743	.31120	.003603	.0001181
%RSD	.8430810	.0779944	.2208819	.7735395	63.80552	.7319762
#1	285.3054	.2116666	.8946297	40.19540	-.009149	.0160221
#2	289.8113	.2117805	.8915947	39.93937	-.005844	.0162578
#3	286.0277	.2119921	.8952998	40.55869	-.001950	.0161261

Sample Name: Q1349-01 Acquired: 2/13/2025 13:57:28 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0371703	1.283837	F 71.09510	3.815896	F 19.14870	.0938613
Stddev	.0010543	.004850	.67234	.015764	.00959	.0007655
%RSD	2.836524	.3777499	.9456852	.4131185	.0500726	.8155800
#1	.0360750	1.285934	70.62218	3.797763	19.13983	.0944422
#2	.0381783	1.278292	70.79836	3.826345	19.15887	.0941479
#3	.0372575	1.287286	71.86475	3.823580	19.14739	.0929939

Elem	Sr4077
Units	ppm
Avg	.5808316
Stddev	.0012132
%RSD	.2088685
#1	.5821485
#2	.5805866
#3	.5797596

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2373.936	50346.13	10522.24	1558.485	3791.224
Stddev	3.599	123.51	44.81	10.539	2.922
%RSD	.1515861	.2453190	.4258162	.6762527	.0770741
#1	2369.825	50365.78	10505.31	1554.947	3791.523
#2	2375.466	50458.64	10488.36	1570.338	3788.163
#3	2376.517	50213.98	10573.04	1550.170	3793.984

Sample Name: Q1355-01 Acquired: 2/13/2025 14:01:42 Type: Unk
 Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
 User: Kareem Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5036863	-.009132	.0374926	-.011503	.0077692	1.209277
Stddev	.0012987	.002717	.0017406	.003766	.0013937	.008985
%RSD	.2578363	29.75658	4.642443	32.73445	17.93869	.7429746
#1	.5026067	-.008874	.0392541	-.009652	.0092766	1.204317
#2	.5051275	-.011970	.0357738	-.015836	.0075033	1.219648
#3	.5033247	-.006553	.0374500	-.009022	.0065275	1.203865
Elem	Ba4934	Be2348	Cd2265	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.6666239	.0014724	.0040106	200.8236	.0835919	.0012720
Stddev	.0039357	.0000730	.0000721	1.1976	.0005457	.0001693
%RSD	.5903959	4.959957	1.796814	.5963360	.6528208	13.31036
#1	.6621020	.0014369	.0040822	199.6111	.0831592	.0013931
#2	.6692772	.0015563	.0040115	202.0056	.0842049	.0013443
#3	.6684925	.0014238	.0039381	200.8541	.0834115	.0010785
Elem	Cu2247	Fe2404	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0778269	59.15461	.6663957	24.04519	.0138001	-.007349
Stddev	.0004103	.26396	.0036055	.16876	.0003712	.000660
%RSD	.5272204	.4462207	.5410464	.7018547	2.689698	8.982922
#1	.0780219	58.93494	.6622436	23.86531	.0137838	-.006676
#2	.0773554	59.44743	.6687357	24.20004	.0141791	-.007995
#3	.0781033	59.08145	.6682077	24.07022	.0134373	-.007375
Elem	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	163.1264	.0150593	.2231447	32.05521	.1128915	.0048945
Stddev	.4752	.0007736	.0008973	.09842	.0021732	.0003582
%RSD	.2912825	5.137272	.4021289	.3070336	1.925003	7.318187
#1	162.6941	.0151335	.2227610	31.97988	.1114286	.0051833
#2	163.6352	.0142513	.2241701	32.16657	.1153886	.0044937
#3	163.0499	.0157932	.2225030	32.01917	.1118572	.0050066

Sample Name: Q1355-01 Acquired: 2/13/2025 14:01:42 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.011950	.0401709	F 46.24185	1.504424	F 55.49908	.0992734
Stddev	.000923	.0006791	.17863	.004509	.19467	.0005756
%RSD	7.726875	1.690414	.3863051	.2997404	.3507691	.5797760
#1	-.011659	.0397412	46.14400	1.509623	55.70140	.0995337
#2	-.012983	.0409538	46.44803	1.501566	55.48276	.0986137
#3	-.011207	.0398177	46.13352	1.502085	55.31308	.0996728

Elem	Sr4077
Units	ppm
Avg	1.373744
Stddev	.001087
%RSD	.0791299
#1	1.374904
#2	1.373580
#3	1.372748

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2364.402	50056.04	10356.26	1539.731	4006.813
Stddev	3.650	133.54	30.35	3.378	7.580
%RSD	.1543550	.2667874	.2930481	.2194090	.1891845
#1	2366.504	50066.19	10385.81	1538.778	3998.929
#2	2360.188	49917.71	10325.18	1536.932	4007.462
#3	2366.515	50184.21	10357.80	1543.484	4014.048

Sample Name: Q1355-02 Acquired: 2/13/2025 14:06:01 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0839952	-.008183	.1401995	-.019941	.0031411	78.41259
Stddev	.0033052	.003845	.0006055	.001153	.0001897	.06387
%RSD	3.934972	46.98933	.4318634	5.779597	6.038067	.0814529
#1	.0818170	-.011126	.1406879	-.019634	.0029962	78.46690
#2	.0877983	-.003832	.1403885	-.021216	.0033557	78.34222
#3	.0823702	-.009590	.1395220	-.018974	.0030713	78.42863
Elem	Ba4934	Be2348	Cd2265	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.921890	.0056613	.0106800	248.0452	.1347800	.0860846
Stddev	.003960	.0000962	.0000166	2.2949	.0009220	.0001286
%RSD	.2060248	1.699182	.1556087	.9251932	.6841085	.1494299
#1	1.920025	.0055515	.0106750	245.8641	.1348668	.0859564
#2	1.919208	.0057305	.0106986	250.4390	.1356556	.0860837
#3	1.926438	.0057019	.0106666	247.8324	.1338176	.0862137
Elem	Cu2247	Fe2404	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1127002	121.8103	8.757198	39.87453	.1201367	-.014523
Stddev	.0008402	.4227	.030196	.13023	.0006264	.000173
%RSD	.7455229	.3469928	.3448189	.3266115	.5213657	1.188152
#1	.1123253	121.7294	8.723756	39.73321	.1200521	-.014514
#2	.1136626	121.4338	8.782465	39.98971	.1195569	-.014700
#3	.1121127	122.2675	8.765374	39.90068	.1208010	-.014355
Elem	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	47.62789	.2270832	.4216541	32.34723	-.114026	.0078419
Stddev	.29340	.0017886	.0006457	.29810	.001344	.0001029
%RSD	.6160228	.7876344	.1531401	.9215667	1.178608	1.312256
#1	47.64157	.2251374	.4217044	32.43765	-.113323	.0077717
#2	47.32789	.2286557	.4209847	32.01439	-.115575	.0077940
#3	47.91421	.2274564	.4222732	32.58966	-.113178	.0079600

Sample Name: Q1355-02 Acquired: 2/13/2025 14:06:01 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.011939	1.636421	F 68.85750	2.844743	F 38.27961	.0820694
Stddev	.001351	.005981	.38073	.015716	.07295	.0010513
%RSD	11.31315	.3655091	.5529208	.5524543	.1905641	1.280965
#1	-0.013327	1.638588	69.04872	2.830901	38.20618	.0815895
#2	-0.011863	1.629659	68.41906	2.841500	38.28059	.0813437
#3	-0.010629	1.641017	69.10471	2.861827	38.35207	.0832750

Elem	Sr4077
Units	ppm
Avg	3.458390
Stddev	.053612
%RSD	1.550210
#1	3.397190
#2	3.480916
#3	3.497064

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2550.226	53859.64	11206.25	1672.746	3979.237
Stddev	1.479	105.04	95.81	3.911	6.682
%RSD	.0580098	.1950343	.8549950	.2338066	.1679113
#1	2551.854	53863.76	11257.81	1668.239	3982.478
#2	2548.964	53752.60	11095.70	1674.750	3983.679
#3	2549.860	53962.57	11265.25	1675.249	3971.553

Sample Name: PB166694BL Acquired: 2/13/2025 14:20:17 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.001785	-.002254	-.000670	.0019457	.0010635	.0034420
Stddev	.002059	.001670	.000370	.0005578	.0010765	.0042550
%RSD	115.3674	74.09369	55.17226	28.66767	101.2188	123.6201
#1	-.001392	-.003200	-.000593	.0019205	-.000059	.0083025
#2	-.004013	-.000326	-.000345	.0014010	.001162	.0003896
#3	.000049	-.003236	-.001073	.0025157	.002087	.0016339
Elem	Ba4934	Be2348	Cd2265	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.008386	-.000032	-.000003	.0231109	.0012429	-.000081
Stddev	.000624	.000061	.000103	.0074255	.0003625	.000144
%RSD	7.446568	188.6177	3977.021	32.12989	29.16095	177.7350
#1	-.009095	.000038	-.000120	.0287158	.0012802	-.000233
#2	-.007916	-.000068	.000067	.0146891	.0015853	-.000063
#3	-.008147	-.000067	.000045	.0259277	.0008633	.000053
Elem	Cu2247	Fe2404	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000234	.0111655	.0064859	.0174368	.0006699	-.000017
Stddev	.000098	.0027398	.0002450	.0067738	.0000905	.000366
%RSD	42.11232	24.53780	3.776950	38.84808	13.51458	2139.050
#1	-.000130	.0143161	.0067563	.0238638	.0006403	-.000423
#2	-.000244	.0098386	.0064229	.0180839	.0007716	.000087
#3	-.000326	.0093418	.0062786	.0103626	.0005979	.000285
Elem	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2842839	.0001445	.0032856	.0921300	.0071627	.0002652
Stddev	.0072447	.0004727	.0002597	.0257010	.0004497	.0002536
%RSD	2.548394	327.0794	7.903518	27.89643	6.278666	95.59233
#1	.2858870	.0005487	.0030664	.0751287	.0076742	.0001546
#2	.2763719	-.000375	.0032180	.1216962	.0069844	.0000858
#3	.2905928	.000260	.0035724	.0795650	.0068294	.0005553

Sample Name: PB166694BL Acquired: 2/13/2025 14:20:17 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.009655	.0003546	.0173387	-.001078	F .0128589	-.001681
Stddev	.000562	.0006427	.0033523	.002246	.0015618	.000600
%RSD	5.824414	181.2234	19.33392	208.3774	12.14572	35.68387
#1	-.009011	.0010555	.0142520	-.000119	.0113681	-.002260
#2	-.010050	-.000207	.0168593	-.003644	.0144832	-.001062
#3	-.009904	.000216	.0209049	.000529	.0127253	-.001720

Elem	Sr4077
Units	ppm
Avg	.0001325
Stddev	.0000314
%RSD	23.72117
#1	.0001150
#2	.0001688
#3	.0001138

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2603.959	55920.25	10504.88	1710.959	4671.319
Stddev	5.637	20.83	57.25	1.998	8.032
%RSD	.2164626	.0372406	.5449708	.1167653	.1719493
#1	2608.000	55905.84	10527.29	1708.743	4679.662
#2	2606.357	55944.12	10439.81	1712.622	4670.656
#3	2597.520	55910.77	10547.53	1711.513	4663.639

Sample Name: CCV02 Acquired: 2/13/2025 14:24:43 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV02 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.934595	4.955270	4.922806	4.945551	4.973919	9.754175	9.736662
Stddev	.025942	.016804	.029978	.021222	.023144	.018788	.121112
%RSD	.5257179	.3391120	.6089625	.4291145	.4653102	.1926144	1.243875

#1	4.908710	4.935943	4.892877	4.921831	4.947802	9.734428	9.862073
#2	4.934481	4.966426	4.922707	4.952083	4.982067	9.756268	9.727548
#3	4.960593	4.963441	4.952833	4.962740	4.991887	9.771829	9.620365

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2436273	2.461290	24.26214	1.007621	2.461305	1.252360	4.979907
Stddev	.0010120	.015419	.06982	.003290	.013643	.008307	.039091
%RSD	.4154022	.6264438	.2877822	.3265278	.5543066	.6633237	.7849766

#1	.2429949	2.445277	24.18477	1.010985	2.447191	1.243257	5.023362
#2	.2430925	2.462558	24.28117	1.004410	2.462301	1.254293	4.968757
#3	.2447946	2.476036	24.32047	1.007468	2.474423	1.259530	4.947603

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.415949	24.17073	2.464870	1.258676	24.53722	2.441212	2.518321
Stddev	.006737	.10323	.014891	.001800	.17712	.003335	.006626
%RSD	.2788483	.4270972	.6041483	.1430107	.7218482	.1366105	.2631070

#1	2.409842	24.06597	2.449121	1.260336	24.74129	2.437362	2.519788
#2	2.414829	24.17387	2.466766	1.256763	24.44694	2.443201	2.511085
#3	2.423175	24.27236	2.478722	1.258929	24.42343	2.443073	2.524091

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	24.97833	4.868792	5.019814	4.928638	4.861086	5.084134	4.972530
Stddev	.12590	.027333	.029612	.028057	.010236	.018324	.029399
%RSD	.5040232	.5614012	.5898948	.5692713	.2105669	.3604234	.5912351

#1	25.12290	4.841025	4.986751	4.899476	4.855619	5.093036	4.941557
#2	24.89283	4.869679	5.028798	4.930995	4.854744	5.063059	4.975984
#3	24.91925	4.895670	5.043893	4.955442	4.872894	5.096308	5.000050

Sample Name: CCV02 Acquired: 2/13/2025 14:24:43 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV02 Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	4.869157	4.827408	4.929085
Stddev	.017558	.002857	.047075
%RSD	.3605999	.0591764	.9550401
#1	4.855962	4.827216	4.875688
#2	4.862424	4.830355	4.964591
#3	4.889086	4.824651	4.946976

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2529.110	53151.49	9932.155	1647.394	4265.168
Stddev	14.609	199.87	35.488	4.802	23.259
%RSD	.5776372	.3760458	.3573067	.2915052	.5453215
#1	2545.405	52942.62	9961.058	1644.027	4289.440
#2	2524.742	53340.94	9942.861	1652.893	4262.990
#3	2517.183	53170.91	9892.547	1645.262	4243.075

Sample Name: CCB02 Acquired: 2/13/2025 14:29:01 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB02 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0020655	.0007392	-.000393	.0018774	.0006248	.0017884	-.005487
Stddev	.0010791	.0025131	.001295	.0011644	.0003132	.0016182	.000712
%RSD	52.24502	339.9791	329.8553	62.02289	50.13108	90.48382	12.97819

#1	.0015422	.0033935	-.001670	.0024778	.0007830	.0004729	-.004978
#2	.0033065	-.001604	-.000428	.0005353	.0008273	.0012969	-.006301
#3	.0013478	.000428	.000920	.0026191	.0002640	.0035954	-.005182

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000018	-.000045	-.000446	.0005768	-.000018	.0003115	.0055979
Stddev	.000022	.000028	.007180	.0003178	.000152	.0002553	.0032955
%RSD	117.1325	62.43664	1610.427	55.09346	824.6459	81.94542	58.87003

#1	-.000021	-.000076	.007380	.0003834	.000154	.0000215	.0085247
#2	-.000039	-.000021	-.001988	.0009435	-.000133	.0004107	.0062407
#3	.000004	-.000038	-.006730	.0004034	-.000077	.0005023	.0020284

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000555	.0114121	.0004000	-.000382	.0809332	-.000828	-.000242
Stddev	.000071	.0080295	.0001139	.000111	.0156944	.000964	.000141
%RSD	12.85359	70.35979	28.47694	29.00481	19.39182	116.4083	58.21041

#1	-.000568	.0171048	.0003483	-.000261	.0670755	-.000857	-.000100
#2	-.000619	.0149035	.0003211	-.000406	.0777483	.000150	-.000382
#3	-.000478	.0022279	.0005306	-.000479	.0979758	-.001776	-.000244

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0961422	.0117765	.0001107	-.009186	-.000166	.0047711	-.001498
Stddev	.0185777	.0003562	.0001010	.000460	.000364	.0021374	.002297
%RSD	19.32315	3.024799	91.26691	5.009049	219.4793	44.79907	153.3287

#1	.0749108	.0121692	.0002096	-.009351	-.000475	.0072389	.000983
#2	.1041025	.0116860	.0001148	-.009541	-.000258	.0035668	-.001927
#3	.1094133	.0114742	.0000077	-.008666	.000235	.0035075	-.003551

Sample Name: CCB02 Acquired: 2/13/2025 14:29:01 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB02 Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0009015	-.000686	.0000260
Stddev	.0016785	.001277	.0000179
%RSD	186.1837	186.2150	68.67953
#1	.0019058	-.001066	.0000223
#2	.0018351	-.001729	.0000103
#3	-.001036	.000738	.0000454

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2635.866	55233.48	10490.14	1732.277	4788.089
Stddev	6.023	102.89	45.59	4.680	18.044
%RSD	.2285132	.1862789	.4346030	.2701905	.3768544
#1	2641.201	55231.47	10438.90	1733.087	4801.067
#2	2637.064	55337.36	10505.32	1727.245	4795.718
#3	2629.334	55131.61	10526.21	1736.500	4767.484

Sample Name: PB166694BS Acquired: 2/13/2025 14:33:30 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.7057308	1.738557	.8495828	1.707548	.7371152	1.776452
Stddev	.0023747	.010892	.0051766	.005538	.0046545	.008093
%RSD	.3364831	.6265062	.6093045	.3243493	.6314497	.4555935

#1	.7041620	1.747802	.8456727	1.710526	.7372003	1.769890
#2	.7084628	1.726550	.8476226	1.701157	.7324188	1.773969
#3	.7045676	1.741320	.8554532	1.710960	.7417266	1.785496

Elem	Ba4934	Be2348	Cd2265	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1625584	.1664482	.1714418	.9243280	.3895244	.1799011
Stddev	.0007441	.0009320	.0009909	.0100076	.0003907	.0008329
%RSD	.4577304	.5599492	.5780001	1.082689	.1002991	.4629752

#1	.1620527	.1656165	.1709066	.9127892	.3898203	.1794471
#2	.1634128	.1662726	.1708335	.9295557	.3890816	.1793939
#3	.1622097	.1674556	.1725852	.9306393	.3896714	.1808624

Elem	Cu2247	Fe2404	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2863239	2.769731	.1761158	1.739411	.4486252	.0698332
Stddev	.0012979	.006648	.0002851	.007724	.0019594	.0005751
%RSD	.4532859	.2400177	.1618708	.4440618	.4367587	.8235122

#1	.2851480	2.763379	.1760190	1.746940	.4472545	.0697548
#2	.2861074	2.776640	.1758918	1.739788	.4477517	.0704435
#3	.2877165	2.769173	.1764367	1.731505	.4508695	.0693014

Elem	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.469801	.2668677	.1869406	9.069248	F .2265987	.4023462
Stddev	.025821	.0008125	.0003431	.089696	.0024382	.0009612
%RSD	1.045477	.3044574	.1835332	.9890090	1.076017	.2389103

#1	2.486882	.2661125	.1871251	9.160873	.2244210	.4024216
#2	2.482425	.2667631	.1871520	9.065257	.2261421	.4013495
#3	2.440097	.2677273	.1865448	8.981615	.2292329	.4032675

Sample Name: PB166694BS Acquired: 2/13/2025 14:33:30 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.6087620	.1747646	F .7421307	4.833325	F .0053413	.1717297
Stddev	.0020490	.0005899	.0048490	.017962	.0020397	.0008236
%RSD	.3365826	.3375438	.6533823	.3716366	38.18834	.4795657
#1	.6073950	.1753879	.7416895	4.828744	.0076362	.1708328
#2	.6077730	.1746907	.7375174	4.818096	.0046526	.1724519
#3	.6111178	.1742151	.7471852	4.853134	.0037350	.1719042

Elem	Sr4077
Units	ppm
Avg	.1737230
Stddev	.0003491
%RSD	.2009670
#1	.1736645
#2	.1740976
#3	.1734068

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2535.562	55106.23	10533.67	1666.212	4594.231
Stddev	3.095	135.90	62.69	5.495	14.947
%RSD	.1220564	.2466172	.5951783	.3298112	.3253369
#1	2537.260	54958.37	10565.34	1667.505	4603.706
#2	2537.436	55225.67	10574.20	1670.945	4601.987
#3	2531.990	55134.65	10461.45	1660.185	4577.001

Sample Name: LR1 Acquired: 2/13/2025 14:38:14 Type: Unk
Method: NON EPA-6010-200.7(v2693) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0241305	-.064292	.1548451	-.241748	-.011978	2028.892	.0445617
Stddev	.0099041	.014068	.0013022	.016436	.006279	13.926	.0001798
%RSD	41.04388	21.88104	.8409776	6.798620	52.42223	.6863831	.4034931

#1	.0343441	-.078973	.1536335	-.232773	-.010676	2037.076	.0446503
#2	.0145681	-.050930	.1562221	-.231754	-.006452	2036.788	.0446800
#3	.0234792	-.062974	.1546797	-.260717	-.018806	2012.813	.0443548

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0176415	.0903458	1773.423	.0106017	.0272947	.0865180	1017.804
Stddev	.0002551	.0032812	6.060	.0007460	.0001581	.0255265	15.017
%RSD	1.445875	3.631883	.3416905	7.036947	.5793199	29.50424	1.475425

#1	.0177788	.0889518	1773.098	.0101091	.0271818	.0725681	1024.726
#2	.0177984	.0879916	1767.533	.0114600	.0272270	.0710062	1028.111
#3	.0173472	.0940939	1779.639	.0102359	.0274754	.1159796	1000.574

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.123388	1669.661	.0594670	-.115168	2064.028	.0192020	.2080586
Stddev	.000441	6.310	.0010319	.001764	37.527	.0002595	.0036845
%RSD	.3570366	.3779248	1.735187	1.531947	1.818120	1.351532	1.770889

#1	-.122897	1672.932	.0584142	-.116878	2073.403	.0189090	.2093943
#2	-.123517	1673.663	.0604765	-.115272	2095.977	.0194030	.2108889
#3	-.123749	1662.387	.0595102	-.113354	2022.702	.0192939	.2038925

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1325.937	^ *****	.0054730	-.004455	-.047413	.1429474	.0775542
Stddev	20.167	-----	.0010643	.000836	.000942	.0046373	.0053847
%RSD	1.520934	-----	19.44611	18.77538	1.987071	3.244085	6.943083

#1	1323.728	^ -----	.0042643	-.004374	-.046446	.1383987	.0775276
#2	1347.117	^ -----	.0062696	-.005329	-.048328	.1427749	.0829521
#3	1306.966	^ -----	.0058851	-.003662	-.047465	.1476686	.0721829

Sample Name: LR1 Acquired: 2/13/2025 14:38:14 Type: Unk
Method: NON EPA-6010-200.7(v2693) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	-.217303	-.278802	-1.00641
Stddev	.000978	.000861	.01493
%RSD	.4499602	.3086627	1.483827
#1	-.218408	-.277855	-1.01329
#2	-.216952	-.279016	-1.01666
#3	-.216550	-.279535	-.98927

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1719.113	37041.00	8873.998	1119.575	2537.331
Stddev	16.664	506.36	18.544	14.927	20.485
%RSD	.9693337	1.367037	.2089750	1.333259	.8073531
#1	1729.579	36741.96	8877.218	1113.833	2550.683
#2	1727.863	36755.40	8854.054	1108.372	2547.566
#3	1699.897	37625.65	8890.721	1136.520	2513.745

Sample Name: LR2 Acquired: 2/13/2025 14:43:11 Type: Unk
Method: NON EPA-6010-200.7(v2693) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0047190	.0414452	258.9547	.0101765	.0068779	.2106937	^F *****
Stddev	.0005745	.0036379	.5297	.0014717	.0012911	.0190882	-----
%RSD	12.17381	8.777655	.2045438	14.46223	18.77129	9.059699	-----

#1	.0040736	.0373810	259.4346	.0117924	.0066903	.2222916	^ -----
#2	.0051745	.0443971	259.0430	.0089128	.0056910	.2211268	79.85381
#3	.0049088	.0425576	258.3864	.0098242	.0082526	.1886628	^ -----

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.004176	-.004427	.3612143	.0182740	-.003860	254.9044	.0375073
Stddev	.000126	.000089	.0121967	.0003515	.000402	.4499	.0057179
%RSD	3.006965	1.999431	3.376597	1.923570	10.42561	.1765026	15.24485

#1	-.004182	-.004528	.3733213	.0178820	-.004125	254.9793	.0441020
#2	-.004299	-.004388	.3613919	.0183788	-.003397	255.3122	.0344885
#3	-.004048	-.004364	.3489297	.0185611	-.004058	254.4218	.0339315

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	47.90468	-.024840	53.60902	.0028143	.2785329	-.010788	31.88737
Stddev	.21814	.012227	.08786	.0003147	.0053555	.000177	.22383
%RSD	.4553707	49.22147	.1638962	11.18225	1.922736	1.643784	.7019362

#1	48.09680	-.015098	53.71045	.0024959	.2772914	-.010637	32.10341
#2	47.66754	-.020862	53.56038	.0031251	.2844001	-.010745	31.90222
#3	47.94970	-.038561	53.55623	.0028219	.2739073	-.010983	31.65649

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3052517	.0028186	-.008836	-.015062	-.049022	-.011900	.2390274
Stddev	.0318441	.0007256	.000132	.000699	.000928	.004392	.0059993
%RSD	10.43207	25.74479	1.496187	4.641133	1.892918	36.90944	2.509863

#1	.3409929	.0024734	-.008988	-.015382	-.049046	-.016282	.2361842
#2	.2948621	.0036524	-.008754	-.015543	-.048083	-.007498	.2459197
#3	.2799000	.0023300	-.008765	-.014260	-.049938	-.011921	.2349783

Sample Name: LR2 Acquired: 2/13/2025 14:43:11 Type: Unk
Method: NON EPA-6010-200.7(v2693) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	-.015788	-.003389	.0013279
Stddev	.002447	.000676	.0000187
%RSD	15.50119	19.93612	1.404933

#1	-.018233	-.003427	.0013379
#2	-.015794	-.004044	.0013063
#3	-.013338	-.002695	.0013393

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2192.126	54168.25	10545.24	1618.149	4418.748
Stddev	3.143	168.40	69.27	3.711	9.229
%RSD	.1433603	.3108916	.6568450	.2293166	.2088659

#1	2190.358	54333.16	10499.00	1615.621	4410.143
#2	2190.265	53996.56	10511.84	1616.417	4417.606
#3	2195.754	54175.03	10624.88	1622.409	4428.496

Sample Name: CCV03 Acquired: 2/13/2025 14:47:23 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV03 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.890789	4.844878	4.837471	4.906947	4.940959	9.755831	9.671846
Stddev	.018504	.020394	.023424	.032063	.029669	.027067	.117621
%RSD	.3783464	.4209381	.4842111	.6534218	.6004649	.2774426	1.216119

#1	4.886584	4.868325	4.822228	4.897608	4.937603	9.786175	9.795012
#2	4.874748	4.835054	4.825742	4.880590	4.913111	9.747146	9.560691
#3	4.911033	4.831256	4.864442	4.942643	4.972163	9.734173	9.659836

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2387766	2.418068	23.87437	.9809739	2.420988	1.246617	4.929837
Stddev	.0004307	.011061	.10519	.0020232	.012656	.006851	.031719
%RSD	.1803739	.4574514	.4406114	.2062410	.5227607	.5495783	.6434119

#1	.2391977	2.412932	23.99540	.9827597	2.414942	1.243243	4.961178
#2	.2383369	2.410508	23.80498	.9813853	2.412489	1.242107	4.930581
#3	.2387953	2.430763	23.82272	.9787766	2.435533	1.254501	4.897753

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.381853	23.63725	2.423385	1.236365	24.84911	2.411986	2.434437
Stddev	.013928	.10572	.014027	.002366	.10633	.012615	.011520
%RSD	.5847481	.4472497	.5788320	.1913826	.4279162	.5229990	.4732206

#1	2.397847	23.70352	2.415080	1.238932	24.96990	2.426320	2.447737
#2	2.372397	23.69289	2.415496	1.234271	24.76964	2.407058	2.427584
#3	2.375315	23.51533	2.439581	1.235893	24.80779	2.402578	2.427988

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	24.89682	4.788174	4.964478	4.840355	4.817629	5.011077	4.831563
Stddev	.06849	.003595	.027975	.014252	.018524	.009058	.025527
%RSD	.2751146	.0750715	.5635009	.2944448	.3844956	.1807690	.5283422

#1	24.96903	4.790791	4.954720	4.831552	4.838545	5.011211	4.828567
#2	24.88866	4.784075	4.942689	4.832714	4.811046	5.020068	4.807667
#3	24.83278	4.789654	4.996025	4.856798	4.803295	5.001952	4.858457

Sample Name: CCV03 Acquired: 2/13/2025 14:47:23 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV03 Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	4.791401	4.841592	4.913580
Stddev	.031718	.017973	.047517
%RSD	.6619790	.3712199	.9670518

#1	4.794483	4.862343	4.968017
#2	4.758255	4.830984	4.892301
#3	4.821466	4.831448	4.880421

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2547.434	54077.25	10144.85	1675.649	4317.700
Stddev	11.310	126.19	25.35	12.524	17.300
%RSD	.4439803	.2333427	.2498950	.7474068	.4006648

#1	2554.676	53957.49	10117.40	1661.642	4328.616
#2	2553.226	54065.25	10149.77	1685.767	4326.730
#3	2534.401	54209.00	10167.38	1679.537	4297.754

Sample Name: CCB03 Acquired: 2/13/2025 14:51:36 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB03 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000572	.0001283	.0007200	.0012593	.0009612	.0045194	-.006999
Stddev	.001620	.0005644	.0004162	.0030266	.0009579	.0022608	.000201
%RSD	283.0098	439.9655	57.80298	240.3349	99.65839	50.02337	2.868290

#1	.001067	-.000349	.0012003	-.000862	.0004420	.0070942	-.007229
#2	-.002171	.000751	.0004922	-.000085	.0020666	.0036044	-.006910
#3	-.000613	-.000017	.0004674	.004725	.0003749	.0028596	-.006858

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000121	.0000325	-.001496	.0009428	-.000101	.0007453	.0049363
Stddev	.0000340	.0000377	.005929	.0002960	.000161	.0003203	.0028322
%RSD	280.0112	115.9183	396.3091	31.39836	159.8460	42.97486	57.37527

#1	.0000505	.0000087	.001968	.0006015	.000072	.0011097	.0029636
#2	-.000014	.0000759	.001886	.0011302	-.000128	.0005087	.0036637
#3	.000000	.0000129	-.008342	.0010968	-.000247	.0006174	.0081815

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000246	.0266054	.0004475	.0002007	.1950596	-.000264	.0000226
Stddev	.000336	.0122967	.0003358	.0002593	.0195112	.000755	.0004634
%RSD	136.5974	46.21902	75.03921	129.2354	10.00266	285.8218	2054.069

#1	-.000366	.0383474	.0007242	-.000038	.1766627	.000281	.0004996
#2	-.000506	.0138203	.0005445	.000476	.1929953	.000052	-.000426
#3	.000134	.0276485	.0000739	.000164	.2155208	-.001126	-.000006

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1494063	.0078516	.0001808	-.009655	-.000067	.0074896	-.001887
Stddev	.0127934	.0004666	.0001630	.000393	.000196	.0084032	.001732
%RSD	8.562827	5.942470	90.13637	4.075296	291.5728	112.1975	91.77375

#1	.1641003	.0082179	.0000125	-.009977	.000110	.0167035	-.003886
#2	.1407422	.0080107	.0003380	-.009772	-.000279	.0055175	-.000924
#3	.1433763	.0073263	.0001920	-.009217	-.000034	.0002479	-.000851

Sample Name: CCB03 Acquired: 2/13/2025 14:51:36 Type: Unk
Method: NON EPA-6010-200.7(v2536) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB03 Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	-.001499	-.001018	.0000577
Stddev	.001194	.000566	.0000175
%RSD	79.65233	55.63214	30.27237
#1	-.000445	-.001620	.0000454
#2	-.001257	-.000495	.0000500
#3	-.002796	-.000939	.0000777

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2655.209	56465.22	10819.38	1736.829	4827.400
Stddev	4.394	150.93	46.00	7.830	1.922
%RSD	.1654741	.2672978	.4252024	.4508420	.0398235
#1	2650.137	56308.27	10807.09	1740.486	4826.756
#2	2657.806	56609.31	10780.76	1742.162	4829.562
#3	2657.686	56478.08	10870.28	1727.839	4825.883

7470A
SFAM01.1

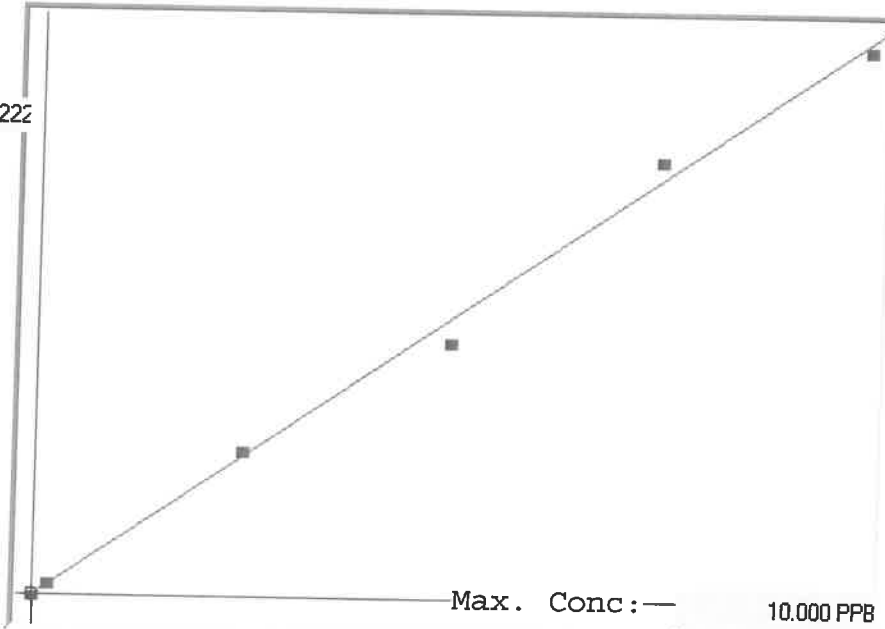
LB134685

INSTRUMENT ID: CV1

Linear

μ Abs.:

42222



A= 0.0000e+000

B= 2.3342e-004

C= 1.0178e-002

Rho= 0.9979778

Accept=Accepted

Std ID	Conc.	Calc.	Dev.	Mean	SD or %RSD	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	0/0
0.00	0.000	0.036	0.036	111	0.000	111					
0.05	0.050										
0.20	0.200	0.228	0.028	934	0.0 %	934					
2.50	2.500	2.605	0.105	11118	0.0 %	11118					
5.00	5.000	4.596	-0.404	19648	0.0 %	19648					
7.50	7.500	7.869	0.369	33667	0.0 %	33667					
10.0	10.000	9.865	-0.135	42222	0.0 %	42222					

LB134685 INSTRUMENT ID : CV1

Method: SFAM01.1

Operator: Admin

Date of Analysis: 12 Feb 2025 13:26:52

Sample ID	Extended ID	μ Abs.	Conc.	Std Conc	Method	Units	Date	Type	Type
0.00 - 1	50	111	-	0.0000	SFAM01.1	PPB	12 Feb 2025 13:50:05	S	Std
0.20 - 1	50.2	934	-	0.2000	SFAM01.1	PPB	12 Feb 2025 13:52:22	S	Std
2.50 - 1	52.5	11118	-	2.5000	SFAM01.1	PPB	12 Feb 2025 13:54:39	S	Std
5.00 - 1	55	19648	-	5.0000	SFAM01.1	PPB	12 Feb 2025 13:56:56	S	Std
7.50 - 1	57.5	33667	-	7.5000	SFAM01.1	PPB	12 Feb 2025 13:59:13	S	Std
10.0 - 1	510	42222	-	10.0000	SFAM01.1	PPB	12 Feb 2025 14:01:31	S	Std
ICV02 - 1	ICV02	15609	3.6536	-	SFAM01.1	PPB	12 Feb 2025 14:04:35	U	SMPL
ICB02 - 1	ICB02	38	0.0190	-	SFAM01.1	PPB	12 Feb 2025 14:06:50	U	SMPL
CCV63 - 1	CCV63	21189	4.9560	-	SFAM01.1	PPB	12 Feb 2025 14:11:46	U	SMPL
CCB63 - 1	CCB63	-155	-0.0260	-	SFAM01.1	PPB	12 Feb 2025 14:14:01	U	SMPL
CRA - 1	CRA	878	0.2151	-	SFAM01.1	PPB	12 Feb 2025 14:16:19	U	SMPL
HighStd - 1	HighStd	42703	9.9778	-	SFAM01.1	PPB	12 Feb 2025 14:18:34	U	SMPL
ChkStd - 1	ChkStd	30728	7.1826	-	SFAM01.1	PPB	12 Feb 2025 14:20:49	U	SMPL
PB166705BL - 1	PBW	38	0.0190	-	SFAM01.1	PPB	12 Feb 2025 14:26:00	U	SMPL
PB166705BS - 1	LCSW	17312	4.0511	-	SFAM01.1	PPB	12 Feb 2025 14:28:16	U	SMPL
Q1343-04 - 1	WC-9	-200	-0.0365	-	SFAM01.1	PPB	12 Feb 2025 14:30:32	U	SMPL
Q1343-08 - 1	WC-10	49	0.0216	-	SFAM01.1	PPB	12 Feb 2025 14:32:50	U	SMPL
Q1343-12 - 1	WC-7	384	0.0998	-	SFAM01.1	PPB	12 Feb 2025 14:35:08	U	SMPL
Q1343-16 - 1	WC-13	127	0.0398	-	SFAM01.1	PPB	12 Feb 2025 14:37:26	U	SMPL
Q1343-20 - 1	WC-14	382	0.0993	-	SFAM01.1	PPB	12 Feb 2025 14:39:41	U	SMPL
CCV64 - 1	CCV64	19711	4.6110	-	SFAM01.1	PPB	12 Feb 2025 14:44:38	U	SMPL
CCB64 - 1	CCB64	-158	-0.0267	-	SFAM01.1	PPB	12 Feb 2025 14:46:54	U	SMPL
Q1344-02 - 1	SOIL-1	412	0.1063	-	SFAM01.1	PPB	12 Feb 2025 14:49:12	U	SMPL
Q1344-04 - 1	SOIL-2	472	0.1204	-	SFAM01.1	PPB	12 Feb 2025 14:51:27	U	SMPL
Q1346-02 - 1	SOIL-COMP	162	0.0480	-	SFAM01.1	PPB	12 Feb 2025 14:53:42	U	SMPL
Q1346-02DUP - 1	SOIL-COMPDUP	111	0.0361	-	SFAM01.1	PPB	12 Feb 2025 14:55:58	U	SMPL
Q1346-02MS - 1	SOIL-COMPMS	17732	4.1491	-	SFAM01.1	PPB	12 Feb 2025 14:58:16	U	SMPL
Q1346-02MSD - 1	SOIL-COMPMSD	16340	3.8242	-	SFAM01.1	PPB	12 Feb 2025 15:00:33	U	SMPL
PB166706BL - 1	PBW	-38	0.0013	-	SFAM01.1	PPB	12 Feb 2025 15:02:51	U	SMPL
PB166706BS - 1	LCSW	16556	3.8746	-	SFAM01.1	PPB	12 Feb 2025 15:07:45	U	SMPL
Q1348-01 - 1	TWP-1-WC	60	0.0242	-	SFAM01.1	PPB	12 Feb 2025 15:10:02	U	SMPL
Q1349-01 - 1	TWP-1-PERMIT	3232	0.7646	-	SFAM01.1	PPB	12 Feb 2025 15:12:19	U	SMPL
CCV65 - 1	CCV65	22424	5.2443	-	SFAM01.1	PPB	12 Feb 2025 15:19:56	U	SMPL
CCB65 - 1	CCB65	-290	-0.0575	-	SFAM01.1	PPB	12 Feb 2025 15:22:13	U	SMPL
Q1349-01DUP - 1	TWP-1-PERMITDUP	3614	0.8537	-	SFAM01.1	PPB	12 Feb 2025 15:24:31	U	SMPL
Q1349-01MS - 1	TWP-1-PERMITMS	18112	4.2378	-	SFAM01.1	PPB	12 Feb 2025 15:26:46	U	SMPL
Q1349-01MSD - 1	TWP-1-PERMITMSD	17741	4.1512	-	SFAM01.1	PPB	12 Feb 2025 15:29:04	U	SMPL
Q1355-01 - 1	RW1	10976	2.5722	-	SFAM01.1	PPB	12 Feb 2025 15:31:22	U	SMPL
Q1355-02 - 1	MW2	3417	0.8078	-	SFAM01.1	PPB	12 Feb 2025 15:33:40	U	SMPL
PB166651TB - 1	PB166651TB	353	0.0926	-	SFAM01.1	PPB	12 Feb 2025 15:35:58	U	SMPL
Q1346-02LX5 - 1		24	0.0158	-	SFAM01.1	PPB	12 Feb 2025 15:38:15	U	SMPL
Q1346-02A - 1		16490	3.8592	-	SFAM01.1	PPB	12 Feb 2025 15:40:32	U	SMPL
Q1349-01LX5 - 1		830	0.2039	-	SFAM01.1	PPB	12 Feb 2025 15:45:56	U	SMPL
Q1349-01A - 1		18330	4.2887	-	SFAM01.1	PPB	12 Feb 2025 15:48:12	U	SMPL
CCV66 - 1	CCV66	22142	5.1785	-	SFAM01.1	PPB	12 Feb 2025 15:50:27	U	SMPL
CCB66 - 1	CCB66	-224	-0.0421	-	SFAM01.1	PPB	12 Feb 2025 15:52:45	U	SMPL

SOP ID : M3010A-Digestion-17

SDG No : N/A

Matrix : WATER

Pipette ID: ICP A

Balance ID : N/A

Filter paper ID : N/A

pH Strip ID : M6069

Hood ID : #3

Block ID: 1. HOT BLOCK #1 2. N/A

Start Digest Date: 02/12/2025 Time : 09:30 Temp : 96 °C

End Digest Date: 02/12/2025 Time : 12:40 Temp : 96 °C

Digestion tube ID: M5595

Block thermometer ID: MET-DIG. # 1

Dig Technician Signature: SKS

Supervisor Signature: MS

Temp : 1. 96°C 2. N/A

Standardized Name	MLS USED	STD REF. # FROM LOG
LFS-1	0.25	M6002
LFS-2	0.25	M6011
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

Chemical Used	ML/SAMPLE USED	Lot Number
Conc. HNO3	3.00	M6126
1:1 HCL	5.00	MP84297
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

Extraction Conformance/Non-Conformance Comments:

HOT BLOCK#1CELL #55 Temp: 96 C

Date / Time	Prepped Sample Relinquished By/Location	Received By/Location
02/12/25 13:40	SKS. met. dig.	MS metal lab
	Preparation Group	Analysis Group

Lab Sample ID	Client Sample ID	pH	Initial Vol (ml)	Final Vol (ml)	Color Before	Color After	Clarity Before	Clarity After	Comment	Prep Pos
PB166694BL	PBW694	<2	50	25	Colorless	Colorless	Clear	Clear	N/A	1
PB166694BS	LCS694	<2	50	25	Colorless	Colorless	Clear	Clear	M6002,M6011	2
Q1348-01MS	TWP-1-WCMS	<2	50	25	Colorless	Colorless	Clear	Clear	M6002,M6011	5
Q1348-01MSD	TWP-1-WCMSD	<2	50	25	Colorless	Colorless	Clear	Clear	M6002,M6011	6
Q1348-01DUP	TWP-1-WCDUP	<2	50	25	Colorless	Colorless	Clear	Clear	N/A	4
Q1348-01	TWP-1-WC	<2	50	25	Colorless	Colorless	Clear	Clear	N/A	3
Q1349-01	TWP-1-PERMIT	<2	50	25	Gray	Yellow	Clear	Clear	N/A	7
Q1355-01	RW1	<2	50	25	Light yellow	Yellow	Clear	Clear	N/A	8
Q1355-02	MW2	<2	50	25	Brown	Yellow	Clear	Clear	N/A	9

WORKLIST(Hardcopy Internal Chain)

Worklist Name : PB166694

Worklist ID : 187663

Department : Digestion

Date : 02-12-2025 08:27:44

Sample	Customer Sample	Matrix	Test	Preservative	Customer	Raw Sample Storage Location	Collect Date	Method
Q1348-01	TWP-1-WC	Water	Metals ICP-TAL	1:1 HNO3 to pH < 2	PSEG03	N51	02/10/2025	6010D
Q1349-01	TWP-1-PERMIT	Water	Metals ICP-TAL	1:1 HNO3 to pH < 2	PSEG03	N41	02/10/2025	6010D
Q1355-01	RW1	Water	Metals ICP-TAL	1:1 HNO3 to pH < 2	GENV01	N41	02/11/2025	6010D
Q1355-02	MW2	Water	Metals ICP-TAL	1:1 HNO3 to pH < 2	GENV01	N41	02/11/2025	6010D

Date/Time

02/12/25

09:00

Raw Sample Received by:

Sps.met.dig

Raw Sample Relinquished by:

SPS

Date/Time

02/12/25

10:00

Raw Sample Received by:

SPS

Raw Sample Relinquished by:

Sps.met.dig

SOP ID : M7470A-Mercury-19

SDG No : NA

Matrix : WATER

Pipette ID: HG A

Balance ID : N/A

Filter paper ID : NA

pH Strip ID : M6069

Hood ID : #1

Block ID: 1. HG HOT BLOCK#3 2. N/A

Start Digest Date: 02/12/2025 Time : 12:25 Temp : 94 °C

End Digest Date: 02/12/2025 Time : 14:25 Temp : 95 °C

Digestion tube ID: M5595

Block thermometer ID: HG-DIG#3

Dig Technician Signature: *MS*

Supervisor Signature: *MS*

Temp : 1. 94°C 2. N/A

Standardized Name	MLS USED	STD REF. # FROM LOG
ICV	30mL	MP84458
CCV	30mL	MP84460
CRA	30mL	MP84462
Blank Spike	0.48mL	MP84449
Matrix Spike	0.48mL	MP84449

Chemical Used	ML/SAMPLE USED	Lot Number
HNO3/H2SO4(1:2)	2.5mL	MP83691
KMnO4 (5%)	4.5mL	MP83692
K2S2O8 (5%)	2.5mL	MP83693
Hydroxylamine HCL (12%)	2.0mL	MP83694
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

LAB SAMPLE ID	CLIENT SAMPLE ID	Wt(g)/Vol(ml)	Comment
0.0 ppb	S0	30mL	MP84450
0.05 ppb	S0.05	N/A	N/A
0.2 ppb	S0.2	30mL	MP84452
2.5 ppb	S2.5	30mL	MP84453
5.0 ppb	S5.0	30mL	MP84454
7.5 ppb	S7.5	30mL	MP84456
10.0 ppb	S10.0	30mL	MP84457
ICV	ICV	30mL	MP84458
ICB	ICB	30mL	MP84459
CCV	CCV	30mL	MP84460
CCB	CCB	30mL	MP84461
CRI	CRI	30mL	MP84462
CHK STD	CHK STD	30mL	MP84463

Extraction Conformance/Non-Conformance Comments:

N/A

Date / Time	Prepped Sample Relinquished By/Location	Received By/Location
2/12/25 @ 14:40	<i>MS - Dig, Lab</i>	<i>MS - Distal Lab</i>
	Preparation Group	Analysis Group

Lab Sample ID	Client Sample ID	Initial Vol (ml)	Final Vol (ml)	pH	Comment	Prep Pos
PB166706BL	PBW706	30	30	<2	N/A	3-19
PB166706BS	LCS706	30	30	<2	MP84449	20
Q1348-01	TWP-1-WC	30	30	<2	N/A	21
Q1349-01	TWP-1-PERMIT	30	30	<2	N/A	22
Q1349-01DUP	TWP-1-PERMITDUP	30	30	<2	N/A	23
Q1349-01MS	TWP-1-PERMITMS	30	30	<2	MP84449	24
Q1349-01MSD	TWP-1-PERMITMSD	30	30	<2	MP84449	25
Q1355-01	RW1	30	30	<2	N/A	26
Q1355-02	MW2	30	30	<2	N/A	27

WORKLIST(Hardcopy Internal Chain)

WorkList Name : 021125_7470 **WorkList ID :** 187634 **Department :** Digestion **Date :** 02-11-2025 10:44:48

Sample	Customer Sample	Matrix	Test	Preservative	Customer	Raw Sample Storage Location	Collect Date	Method
Q1355-01	RW1	Water	Mercury	1:1 HNO3 to pH < 2	GENV01	N41	02/11/2025	7470A
Q1355-02	MW2	Water	Mercury	1:1 HNO3 to pH < 2	GENV01	N41	02/11/2025	7470A
Q1348-01	TWP-1-WC	Water	Mercury	1:1 HNO3 to pH < 2	PSEG03	N51	02/10/2025	7470A
Q1349-01	TWP-1-PERMIT	Water	Mercury	1:1 HNO3 to pH < 2	PSEG03	N41	02/10/2025	7470A

Date/Time 2/11/25 10:45
Raw Sample Received by: AB-1129-10-10-10
Raw Sample Relinquished by: AB-1129-10-10-10

Date/Time 2/11/25 11:25
Raw Sample Received by: AB-1129-10-10-10
Raw Sample Relinquished by: AB-1129-10-10-10

Instrument ID: CV1

Daily Analysis Runlog For Sequence/QC Batch ID # LB134685

Review By	Mohan	Review On	2/18/2025 11:51:12 AM
Supervise By	kareem	Supervise On	2/18/2025 11:53:42 AM

STD. NAME	STD REF.#
ICAL Standard	MP84450,MP84452,MP84453,MP84454,MP84456,MP84457
ICV Standard	MP84458
CCV Standard	MP84460
ICSA Standard	
CRI Standard	MP84462
LCS Standard	
Chk Standard	MP84459,MP84461,MP84463,MP84490

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	S0	S0	CAL1	02/12/25 13:50		Mohan	OK
2	S0.2	S0.2	CAL2	02/12/25 13:52		Mohan	OK
3	S2.5	S2.5	CAL3	02/12/25 13:54		Mohan	OK
4	S5	S5	CAL4	02/12/25 13:56		Mohan	OK
5	S7.5	S7.5	CAL5	02/12/25 13:59		Mohan	OK
6	S10	S10	CAL6	02/12/25 14:01		Mohan	OK
7	ICV02	ICV02	ICV	02/12/25 14:04		Mohan	OK
8	ICB02	ICB02	ICB	02/12/25 14:06		Mohan	OK
9	CCV63	CCV63	CCV	02/12/25 14:11		Mohan	OK
10	CCB63	CCB63	CCB	02/12/25 14:14		Mohan	OK
11	CRA	CRA	CRDL	02/12/25 14:16		Mohan	OK
12	HighStd	HighStd	HIGH STD	02/12/25 14:18		Mohan	OK
13	ChkStd	ChkStd	SAM	02/12/25 14:20		Mohan	OK
14	PB166705BL	PB166705BL	MB	02/12/25 14:26		Mohan	OK
15	PB166705BS	PB166705BS	LCS	02/12/25 14:28		Mohan	OK
16	Q1343-04	WC-9	SAM	02/12/25 14:30		Mohan	OK
17	Q1343-08	WC-10	SAM	02/12/25 14:32		Mohan	OK
18	Q1343-12	WC-7	SAM	02/12/25 14:35		Mohan	OK

Instrument ID: CV1

Daily Analysis Runlog For Sequence/QC Batch ID # LB134685

Review By	Mohan	Review On	2/18/2025 11:51:12 AM
Supervise By	kareem	Supervise On	2/18/2025 11:53:42 AM
STD. NAME	STD REF.#		
ICAL Standard	MP84450,MP84452,MP84453,MP84454,MP84456,MP84457		
ICV Standard	MP84458		
CCV Standard	MP84460		
ICSA Standard			
CRI Standard	MP84462		
LCS Standard			
Chk Standard	MP84459,MP84461,MP84463,MP84490		

19	Q1343-16	WC-13	SAM	02/12/25 14:37		Mohan	OK
20	Q1343-20	WC-14	SAM	02/12/25 14:39		Mohan	OK
21	CCV64	CCV64	CCV	02/12/25 14:44		Mohan	OK
22	CCB64	CCB64	CCB	02/12/25 14:46		Mohan	OK
23	Q1344-02	SOIL-1	SAM	02/12/25 14:49		Mohan	OK
24	Q1344-04	SOIL-2	SAM	02/12/25 14:51		Mohan	OK
25	Q1346-02	SOIL-COMP	SAM	02/12/25 14:53		Mohan	OK
26	Q1346-02DUP	SOIL-COMPDUP	DUP	02/12/25 14:55		Mohan	OK
27	Q1346-02MS	SOIL-COMPMS	MS	02/12/25 14:58		Mohan	OK
28	Q1346-02MSD	SOIL-COMPMSD	MSD	02/12/25 15:00		Mohan	OK
29	PB166706BL	PB166706BL	MB	02/12/25 15:02		Mohan	OK
30	PB166706BS	PB166706BS	LCS	02/12/25 15:07		Mohan	OK
31	Q1348-01	TWP-1-WC	SAM	02/12/25 15:10		Mohan	OK
32	Q1349-01	TWP-1-PERMIT	SAM	02/12/25 15:12		Mohan	OK
33	CCV65	CCV65	CCV	02/12/25 15:19		Mohan	OK
34	CCB65	CCB65	CCB	02/12/25 15:22		Mohan	OK
35	Q1349-01DUP	TWP-1-PERMITDUP	DUP	02/12/25 15:24		Mohan	OK
36	Q1349-01MS	TWP-1-PERMITMS	MS	02/12/25 15:26		Mohan	OK
37	Q1349-01MSD	TWP-1-PERMITMSD	MSD	02/12/25 15:29		Mohan	OK
38	Q1355-01	RW1	SAM	02/12/25 15:31		Mohan	OK

Instrument ID: CV1

Daily Analysis Runlog For Sequence/QC Batch ID # LB134685

Review By	Mohan	Review On	2/18/2025 11:51:12 AM
Supervise By	kareem	Supervise On	2/18/2025 11:53:42 AM
STD. NAME	STD REF.#		
ICAL Standard	MP84450,MP84452,MP84453,MP84454,MP84456,MP84457		
ICV Standard	MP84458		
CCV Standard	MP84460		
ICSA Standard			
CRI Standard	MP84462		
LCS Standard			
Chk Standard	MP84459,MP84461,MP84463,MP84490		

39	Q1355-02	MW2	SAM	02/12/25 15:33		Mohan	OK
40	PB166651TB	PB166651TB	MB	02/12/25 15:35		Mohan	OK
41	Q1346-02L	SOIL-COMPL	SD	02/12/25 15:38		Mohan	OK
42	Q1346-02A	SOIL-COMPA	PS	02/12/25 15:40		Mohan	OK
43	Q1349-01L	TWP-1-PERMITL	SD	02/12/25 15:45		Mohan	OK
44	Q1349-01A	TWP-1-PERMITA	PS	02/12/25 15:48		Mohan	OK
45	CCV66	CCV66	CCV	02/12/25 15:50		Mohan	OK
46	CCB66	CCB66	CCB	02/12/25 15:52		Mohan	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134709

Review By	kareem	Review On	2/14/2025 7:58:53 PM
Supervise By	JANVI	Supervise On	2/18/2025 12:11:21 PM
STD. NAME	STD REF.#		
ICAL Standard	MP84204,MP84223,MP84224,MP84225,MP84226,MP84228		
ICV Standard	MP84446		
CCV Standard	MP84232		
ICSA Standard	MP84230,MP84231		
CRI Standard	MP84228		
LCS Standard	MP84387		
Chk Standard	MP84218,MP84219		

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	S0	S0	CAL1	02/13/25 11:40		Kareem	OK
2	S1	S1	CAL2	02/13/25 11:44		Kareem	OK
3	S2	S2	CAL3	02/13/25 11:49		Kareem	OK
4	S3	S3	CAL4	02/13/25 11:53		Kareem	OK
5	S4	S4	CAL5	02/13/25 11:57		Kareem	OK
6	S5	S5	CAL6	02/13/25 12:01		Kareem	OK
7	ICV01	ICV01	ICV	02/13/25 12:17		Kareem	OK
8	LLICV01	LLICV01	LLICV	02/13/25 12:22		Kareem	OK
9	ICB01	ICB01	ICB	02/13/25 12:50		Kareem	OK
10	CRI01	CRI01	CRDL	02/13/25 12:54		Kareem	OK
11	ICSA01	ICSA01	ICSA	02/13/25 13:03		Kareem	OK
12	ICSAB01	ICSAB01	ICSAB	02/13/25 13:19		Kareem	OK
13	CCV01	CCV01	CCV	02/13/25 13:23		Kareem	OK
14	CCB01	CCB01	CCB	02/13/25 13:27		Kareem	OK
15	Q1348-01	TWP-1-WC	SAM	02/13/25 13:31		Kareem	OK
16	Q1348-01DUP	TWP-1-WCDUP	DUP	02/13/25 13:36		Kareem	OK
17	Q1348-01L	TWP-1-WCL	SD	02/13/25 13:40		Kareem	OK
18	Q1348-01MS	TWP-1-WCMS	MS	02/13/25 13:44	0.1 ML M6001 AND M6010 WERE ADDED TO 10 ML OF SAMPLE	Kareem	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134709

Review By	kareem	Review On	2/14/2025 7:58:53 PM
Supervise By	JANVI	Supervise On	2/18/2025 12:11:21 PM
STD. NAME	STD REF.#		
ICAL Standard	MP84204,MP84223,MP84224,MP84225,MP84226,MP84228		
ICV Standard	MP84446		
CCV Standard	MP84232		
ICSA Standard	MP84230,MP84231		
CRI Standard	MP84228		
LCS Standard	MP84387		
Chk Standard	MP84218,MP84219		

19	Q1348-01MSD	TWP-1-WCMSD	MSD	02/13/25 13:49	0.1 ML M6001 AND M6010 WERE ADDED TO 10 ML OF SAMPLE	Kareem	OK
20	Q1348-01A	TWP-1-WCA	PS	02/13/25 13:53	0.1 ML M6001 AND M6010 WERE ADDED TO 10 ML OF SAMPLE	Kareem	OK
21	Q1349-01	TWP-1-PERMIT	SAM	02/13/25 13:57		Kareem	OK
22	Q1355-01	RW1	SAM	02/13/25 14:01		Kareem	OK
23	Q1355-02	MW2	SAM	02/13/25 14:06		Kareem	OK
24	PB166694BL	PB166694BL	MB	02/13/25 14:20		Kareem	OK
25	CCV02	CCV02	CCV	02/13/25 14:24		Kareem	OK
26	CCB02	CCB02	CCB	02/13/25 14:29		Kareem	OK
27	PB166694BS	PB166694BS	LCS	02/13/25 14:33	0.1 ML M6001 AND M6010 WERE ADDED TO 10 ML OF SAMPLE	Kareem	OK
28	LR1	LR1	HIGH STD	02/13/25 14:38		Kareem	OK
29	LR2	LR2	HIGH STD	02/13/25 14:43		Kareem	OK
30	CCV03	CCV03	CCV	02/13/25 14:47		Kareem	OK
31	CCB03	CCB03	CCB	02/13/25 14:51		Kareem	OK

Prep Standard - Chemical Standard Summary

Order ID : Q1355

Test : Mercury, Metals ICP-TAL

Prepbatch ID : PB166694, PB166706,

Sequence ID/Qc Batch ID: LB134685, LB134709,

Standard ID :

MP84204, MP84218, MP84219, MP84223, MP84224, MP84225, MP84226, MP84227, MP84228, MP84230, MP84231, MP84232, MP84297, MP84387, MP84446, MP84449, MP84450, MP84452, MP84453, MP84454, MP84456, MP84457, MP84458, MP84459, MP84460, MP84461, MP84462, MP84463, MP84490,

Chemical ID :

M4884, M5062, M5130, M5192, M5218, M5223, M5288, M5298, M5393, M5429, M5467, M5472, M5476, M5496, M5497, M5498, M5519, M5532, M5658, M5697, M5747, M5748, M5798, M5799, M5800, M5801, M5802, M5811, M5814, M5815, M5816, M5817, M5819, M5820, M5875, M5882, M5959, M5961, M5962, M5970, M5977, M5978, M5985, M6002, M6011, M6021, M6023, M6025, M6028, M6030, M6032, M6077, M6121, M6126, M6127, M6128, M6144, M6145, M6146, M6150, W3112,

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
902	ICP AES CAL BLK (SO/ICB/CCB)	MP84204	01/24/2025	02/24/2025	Kareem Khairalla	None	None	Sarabjit Jaswal 01/27/2025

FROM 125.00000ml of M6121 + 2350.00000ml of W3112 + 25.00000ml of M6126 = Final Quantity: 2500.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
919	ICP AES INTERNAL STD	MP84218	01/24/2025	02/24/2025	Kareem Khairalla	None	None	Sarabjit Jaswal 01/27/2025

FROM 1.00000ml of M5959 + 10.00000ml of M5985 + 1969.00000ml of W3112 + 20.00000ml of M6126 = Final Quantity: 2000.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
903	ICP AES RINSE SOLN	MP84219	01/24/2025	02/24/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/27/2025

FROM 200.00000ml of M6126 + 9800.00000ml of W3112 = Final Quantity: 10000.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
907	ICP AES STD S (S5)	MP84223	01/24/2025	02/24/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/28/2025

FROM 5.00000ml of M5393 + 5.00000ml of M5467 + 5.00000ml of M5472 + 5.00000ml of M5802 + 5.00000ml of M5816 + 5.00000ml of M5820 + 5.00000ml of M5875 + 5.00000ml of M5970 + 5.00000ml of M6077 + 455.00000ml of MP84204 = Final Quantity: 500.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
910	ICP AES STD S4	MP84224	01/24/2025	02/24/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/28/2025

FROM 50.00000ml of MP84204 + 50.00000ml of MP84223 = Final Quantity: 100.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
909	ICP AES STD S3	MP84225	01/24/2025	02/24/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/28/2025

FROM 25.00000ml of MP84223 + 75.00000ml of MP84204 = Final Quantity: 100.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
3913	ICP AES STD S2	MP84226	01/24/2025	02/24/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/28/2025

FROM 16.00000ml of MP84223 + 184.00000ml of MP84204 = Final Quantity: 200.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
2950	ICP AES S1/CRI STOCK STD	MP84227	01/24/2025	02/24/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/28/2025

FROM 0.00200ml of M5816 + 0.00400ml of M5978 + 0.03000ml of M5798 + 0.03000ml of M6028 + 0.05000ml of M5298 + 0.05000ml of M5496 + 0.05000ml of M5658 + 0.05000ml of M6030 + 0.06000ml of M5747 + 0.10000ml of M5472 + 0.10000ml of M5697 + 0.10000ml of M5801 + 0.10000ml of M5962 + 0.10000ml of M5970 + 0.10000ml of M6128 + 0.15000ml of M5800 + 0.20000ml of M5748 + 0.20000ml of M5799 + 0.20000ml of M5819 + 0.20000ml of M6021 + 0.20000ml of M6023 + 0.25000ml of M5467 + 0.25000ml of M5802 + 0.50000ml of M5814 + 0.50000ml of M6032 + 1.00000ml of M5192 + 1.00000ml of M5288 + 1.00000ml of M5497 + 1.00000ml of M6127 + 1.00000ml of M6144 + 2.00000ml of M4884 + 77.68000ml of MP84204 = Final Quantity: 100.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
2951	ICP AES S1/CRI WORK STD	MP84228	01/24/2025	02/24/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/28/2025

FROM 2.00000ml of MP84227 + 98.00000ml of MP84204 = Final Quantity: 100.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
904	ICP AES ICSA SOLN	MP84230	01/24/2025	02/24/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/28/2025

FROM 25.00000ml of M5130 + 225.00000ml of MP84204 = Final Quantity: 250.000 ml



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
3494	ICP AES ICSAB SOLN-1	MP84231	01/24/2025	02/24/2025	Kareem Khairalla	None	None	Sarabjit Jaswal 01/28/2025
<u>FROM</u>	0.01000ml of M5815 + 0.01000ml of M5817 + 0.10000ml of M5472 + 0.10000ml of M5970 + 0.10000ml of M6077 + 10.00000ml of M5130 + 10.00000ml of M5223 + 79.50000ml of MP84204 = Final Quantity: 100.000 ml							

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
911	ICP AES CCV SOLN	MP84232	01/24/2025	02/24/2025	Kareem Khairalla	None	None	Sarabjit Jaswal 01/28/2025
<u>FROM</u> 50.00000ml of MP84204 + 50.00000ml of MP84223 = Final Quantity: 100.000 ml								

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
170	1:1HCL	MP84297	01/31/2025	02/28/2025	Eman Mughal	None	None	Sarabjit Jaswal
								01/31/2025

FROM 1250.00000ml of M6121 + 1250.00000ml of W3112 = Final Quantity: 2500.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
994	ICPAES ISM01.2 S1 (CONC.)	MP84387	01/27/2025	02/24/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								02/10/2025

FROM 0.02000ml of M5815 + 0.03000ml of M5429 + 0.10000ml of M5798 + 0.10000ml of M6028 + 0.14000ml of M5799 + 0.20000ml of M5476 + 0.20000ml of M5658 + 0.20000ml of M5801 + 0.20000ml of M5811 + 0.20000ml of M5817 + 0.20000ml of M5977 + 0.20000ml of M6025 + 0.20000ml of M6030 + 0.30000ml of M6128 + 0.40000ml of M5496 + 0.50000ml of M5697 + 0.50000ml of M6023 + 0.70000ml of M5962 + 0.80000ml of M5961 + 1.00000ml of M5800 + 1.00000ml of M6021 + 1.20000ml of M6145 + 1.20000ml of M6146 + 10.00000ml of M4884 + 10.00000ml of M5498 + 10.00000ml of M5519 + 10.00000ml of M6127 + 10.00000ml of M6144 + 2.00000ml of M5978 + 4.00000ml of M6032 + 34.24000ml of MP84204 = Final Quantity: 100.000 ml



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
912	ICP AES ICV SOLN	MP84446	01/27/2025	02/24/2025	Kareem Khairalla	None	None	Janvi Patel 02/12/2025
<u>FROM</u>	0.02500ml of M5429 + 0.02500ml of M5815 + 0.02500ml of M5817 + 0.10000ml of M5467 + 0.25000ml of M5218 + 0.25000ml of M5472 + 10.00000ml of M6150 + 87.77500ml of MP84204 = Final Quantity: 100.000 ml							

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
871	MERCURY INTERMEDIATE B 250PPB WORKING STD.	MP84449	02/11/2025	02/12/2025	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Janvi Patel 02/12/2025
<u>FROM</u>	1.00000ml of M6126 + 2.50000ml of M5062 + 96.50000ml of W3112 = Final Quantity: 100.000 ml							



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1340	Hg 0.00 PPB STD	MP84450	02/11/2025	02/12/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG	Janvi Patel
FROM 2.50000ml of M6126 + 247.50000ml of W3112 = Final Quantity: 250.000 ml								

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1341	Hg 0.2 PPB STD	MP84452	02/11/2025	02/12/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG)	Janvi Patel
FROM 2.50000ml of M6126 + 247.30000ml of W3112 + 0.20000ml of MP84449 = Final Quantity: 250.000 ml A)								



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1342	Hg 2.5 PPB STD	MP84453	02/11/2025	02/12/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG)	Janvi Patel 02/12/2025
FROM 2.50000ml of M6126 + 245.00000ml of W3112 + 2.50000ml of MP84449 = Final Quantity: 250.000 ml								

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1343	Hg 5.0 PPB STD	MP84454	02/11/2025	02/12/2025	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Janvi Patel 02/12/2025
<u>FROM</u>	2.50000ml of M6126 + 242.50000ml of W3112 + 5.00000ml of MP84449 = Final Quantity: 250.000 ml							



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1344	Hg 7.5 PPB STD	MP84456	02/11/2025	02/12/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG)	Janvi Patel
FROM 2.50000ml of M6126 + 240.00000ml of W3112 + 7.50000ml of MP84449 = Final Quantity: 250.000 ml								

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1345	Hg 10.0 PPB STD	MP84457	02/11/2025	02/12/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG)	Janvi Patel 02/12/2025
FROM 2.50000ml of M6126 + 237.50000ml of W3112 + 10.00000ml of MP84449 = Final Quantity: 250.000 ml A)								



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1346	Hg ICV SOLUTION	MP84458	02/11/2025	02/12/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG)	Janvi Patel 02/12/2025
<u>FROM</u>	2.50000ml of M5532 + 2.50000ml of M6126 + 245.00000ml of W3112 = Final Quantity: 250.000 ml							

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1351	ICB (Hg 0.00 PPB SOLUTION)	MP84459	02/11/2025	02/12/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG)	Janvi Patel
FROM 2.50000ml of M6126 + 247.50000ml of W3112 = Final Quantity: 250.000 ml								



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1358	CCV (Hg 5.0 PPB SOLUTION)	MP84460	02/11/2025	02/12/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG)	Janvi Patel 02/12/2025
<u>FROM</u> 485.00000ml of W3112 + 5.00000ml of M6126 + 10.00000ml of MP84449 = Final Quantity: 500.000 ml								

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1352	CCB (Hg 0.00 PPB SOLUTION)	MP84461	02/11/2025	02/12/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG A)	Janvi Patel 02/12/2025
FROM 495.00000ml of W3112 + 5.00000ml of M6126 = Final Quantity: 500.000 ml								



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1349	CRA/CRI (Hg 0.2 PPB SOLUTION)	MP84462	02/11/2025	02/12/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG)	Janvi Patel 02/12/2025
FROM 2.50000ml of M6126 + 247.30000ml of W3112 + 0.20000ml of MP84449 = Final Quantity: 250.000 ml A)								

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1350	CHK STD (Hg 7.0 PPB SOLUTION)	MP84463	02/11/2025	02/12/2025	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Janvi Patel 02/12/2025
<u>FROM</u>	2.50000ml of M6126 + 240.50000ml of W3112 + 7.00000ml of MP84449 = Final Quantity: 250.000 ml							



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
68	STANNOUS CHLORIDE SOLUTION	MP84490	02/12/2025	02/13/2025	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Janvi Patel 02/12/2025
<u>FROM</u> 450.00000ml of W3112 + 50.00000gram of M5882 + 50.00000ml of M6121 = Final Quantity: 500.000 ml								

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57014 / Si, 1000 PPM, 125 ml	030921	03/09/2025	08/06/2021 / jaswal	08/05/2021 / jaswal	M4884

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	MSHG-10PPM / MERCURY HCl 125mL 10ug/mL	S2-HG709270	09/22/2026	05/28/2022 / mohan	01/27/2022 / mohan	M5062

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
EPA	PART A / ICSA (ICP) STOCK SOLN	ICSA-1211	01/31/2025	05/20/2024 /	04/20/2021 / bin	M5130

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57042 / Mo, 1000 PPM, 125 ml	051722	05/17/2025	07/01/2022 / bin	06/17/2022 / jaswal	M5192

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	CHEM-QC-4 / CHEM-QC-4, Second Source, 1000 ug/ml, B, Mo, Si, Sn, Ti	S2-MEB711674	11/02/2026	07/01/2022 / bin	09/10/2021 / bin	M5218

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
EPA	PART B / ICSAB (ICP) STOCK SOLN	ICSB-0710	01/31/2025	05/20/2024 /	04/20/2021 / bin	M5223

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58119 / K, 10000 PPM, 500 ml	071122	07/11/2025	09/01/2022 / jaswal	07/21/2022 / jaswal	M5288

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58126 / Fe, 10000 PPM, 500 ml	020422	02/04/2025	05/02/2023 / jaswal	06/15/2022 / jaswal	M5298

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	CLPP-CAL-3 / CLP CAL SOLUTION #3, 125mL	T2-MEB714159	01/13/2027	10/12/2022 / bin	09/19/2022 / bin	M5393

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57103 / Li, 10000 PPM, 125 ml	070622	07/06/2025	01/30/2023 / bin	01/26/2023 / bin	M5429

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57058 / Cerium, 1000PPM, 100ML	020623	02/06/2026	03/06/2023 / bin	03/01/2023 / bin	M5467

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57038 / Sr, 1000 PPM, 125 ml	082922	08/29/2025	01/14/2025 / Jaswal	03/16/2023 / jaswal	M5472

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57138 / Sr, 10000 PPM, 125 ml	082922	08/29/2025	07/29/2024 /	03/16/2023 / jaswal	M5476

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58113 / Al, 10000 PPM, 500 ml	011623	01/16/2026	08/15/2023 / jaswal	03/17/2023 / bin	M5496

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58120 / Ca, 10000 PPM, 500 ml	031523	03/15/2026	03/18/2023 / bin	03/17/2023 / bin	M5497

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58120 / Ca, 10000 PPM, 500 ml	031523	03/15/2026	08/15/2023 / jaswal	03/17/2023 / bin	M5498

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57119 / Potassium (K) 10,000PPM	120822	12/08/2025	01/08/2024 / bin	03/17/2023 / bin	M5519

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
EPA	ICV-5 / ICV (HG) STOCK SOLN	ICV5-0415	02/28/2025	01/02/2025 /	03/30/2023 / mohan	M5532

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58024 / Chromium, Cr, 500 ml, 1000 PPM	060523	06/05/2026	08/28/2023 / jaswal	08/25/2023 / jaswal	M5658

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58029 / Cu, 1000 PPM, 500 ml	102523	10/25/2026	04/03/2024 / jaswal	10/27/2023 / jaswal	M5697

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	/ Lead (Pb) 1000PPM	100923	10/09/2026	05/20/2024 / Jaswal	12/20/2023 / jaswal	M5747

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	/ Nickel (Ni) 1000PPM	091223	09/12/2026	01/02/2024 / bin	12/20/2023 / jaswal	M5748

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57004 / Be, 1000 PPM, 125 ml	102523	10/25/2026	02/09/2024 / bin	02/09/2024 / bin	M5798

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57050 / Sn, 1000 PPM, 125 ml	071123	07/11/2026	02/09/2024 / bin	02/09/2024 / bin	M5799

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57027 / CO, 1000 PPM, 125 ml	091923	09/19/2026	05/31/2024 / bin	02/09/2024 / bin	M5800

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57033 / As, 1000 PPM, 125 ml	111323	11/13/2026	02/09/2024 / bin	02/09/2024 / bin	M5801

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57051 / Sb, 1000 PPM, 125 ml	120523	12/05/2026	08/07/2024 / jaswal	01/03/2024 / jaswal	M5802

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58126 / Fe, 10000 PPM, 500 ml	051523	05/15/2026	02/06/2025 / kareem	01/03/2024 / jaswal	M5811

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57005 / B, 1000 PPM, 125 ml	071123	07/11/2026	03/26/2024 / Sohil	01/03/2024 / jaswal	M5814

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57115 / P, 10000 PPM, 125 ml	041723	04/17/2026	05/21/2024 / Jaswal	02/09/2024 / jaswal	M5815

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57016 / S, 1000 PPM, 125 ml	122923	12/29/2026	05/20/2024 / Jaswal	02/09/2024 / jaswal	M5816

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57116 / S, 10000 PPM, 125 ml	071123	07/11/2026	03/01/2024 / jaswal	02/09/2024 / jaswal	M5817

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58030 / Zinc, Zn, 500 ml, 1000 PPM	111623	11/16/2026	03/20/2024 / jaswal	02/09/2024 / jaswal	M5819

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57015 / P, 1000 PPM, 125 ml	091123	09/11/2026	05/01/2024 / jaswal	02/09/2024 / jaswal	M5820

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	CLPP-CAL-1 / CLP CAL SOLUTION #1, 125mL	T2-MEB714417	01/27/2027	04/19/2024 / jaswal	02/22/2024 / jaswal	M5875

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-3980-01 / Stannous Chloride (cs/4x500g)	232820	08/31/2028	04/30/2024 / mohan	04/25/2024 / mohan	M5882

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	CGY10-1 / YTTRIUM 125mL 10,000ug/mL	V2-Y740548	02/20/2029	07/01/2024 / Jaswal	06/14/2024 / Jaswal	M5959

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57028 / Ni, 1000 PPM, 125 ml	041124	04/11/2027	07/02/2024 / Jaswal	06/11/2024 / Jaswal	M5961

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57034 / Se, 1000 PPM, 125 ml	060624	06/06/2027	07/02/2024 / Jaswal	06/14/2024 / Jaswal	M5962

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57003 / Li, 1000 PPM, 125 ml	061224	06/21/2027	07/01/2024 / Jaswal	07/01/2024 / Jaswal	M5970

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	CGMO1-1 / MOLYBDENUM 125mL 1000ug/mL	T2-MO720876	07/17/2027	01/16/2025 / JANVI	02/22/2024 / Jaswal	M5977

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	CGTI1-1 / TITANIUM 125mL 1000ug/mL	T2-TI719972	06/17/2027	08/07/2024 / jaswal	02/22/2024 / Jaswal	M5978

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	CGIN10-5 / INDIUM 1 x 500 ml	U2-IN729349	02/21/2028	10/08/2024 / Jaswal	06/14/2024 / Jaswal	M5985

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	WW-LFS-1 / Laboratory Fortified Stock Solution 1, 125 ml	T2-MEB723367	07/14/2025	01/14/2025 / Eman	05/14/2024 / Jaswal	M6002

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	WW-LFS-2 / Laboratory Fortified Stock Solution 2, 125 ml	U2-MEB731108	07/14/2025	01/14/2025 / Eman	05/14/2024 / Jaswal	M6011

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57023 / V, 1000 PPM, 125 ml	062424	06/24/2027	09/28/2024 / jaswal	08/05/2024 / Jaswal	M6021

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57081 / TI, 1000 PPM, 125 ml	0624724	06/27/2027	08/05/2024 / kareem	08/05/2024 / Jaswal	M6023

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57082 / Pb, 1000 PPM, 125 ml	061224	11/09/2026	08/05/2024 / Jaswal	08/05/2024 / Jaswal	M6025

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57048 / Cd, 1000 PPM, 125 ml	070124	07/01/2027	08/05/2024 / kareem	08/05/2024 / Jaswal	M6028

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57047 / Ag, 1000 PPM, 125 ml	122823	12/28/2026	08/05/2024 / kareem	08/05/2024 / Jaswal	M6030

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57056 / Ba, 1000 PPM, 125 ml	010924	01/09/2027	01/14/2025 / Jaswal	08/05/2024 / Jaswal	M6032

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	Z9651Q / CHEM-CLP-4/.25L	V2-MEB746762	09/06/2029	01/23/2025 / kareem	09/19/2024 / kareem	M6077

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9530-33 / Hydrochloric Acid, Instra-Analyzed (cs/6x2.5L)	0000275677	05/13/2025	11/13/2024 / Eman	10/13/2024 / Eman	M6121

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9598-34 / Nitric Acid, Instra-Analyzed (cs/4x2.5L)	24D1062002	06/03/2025	12/03/2024 / Janvi	11/12/2024 / Janvi	M6126

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58112 / Mg, 10000 PPM, 500 ml	112124	11/21/2027	01/13/2025 / kareem	01/13/2025 / kareem	M6127

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58025 / Mn, 1000 PPM, 500 ml	101124	10/11/2027	01/13/2025 / kareem	01/13/2025 / kareem	M6128

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58111 / Na, 10000 PPM, 500 ml	072424	07/24/2027	01/23/2025 / kareem	01/13/2025 / Jaswal	M6144

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58030 / Zinc, Zn, 500 ml, 1000 PPM	121724	12/17/2027	02/04/2025 / kareem	01/13/2025 / Jaswal	M6145

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57051 / Sb, 1000 PPM, 125 ml	071724	07/17/2027	01/31/2025 / kareem	10/18/2024 / kareem	M6146

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
EPA	ICV-1 / ICV (ICP/ICPMS) STOCK SOLN	ICV1-1014	07/07/2025	02/07/2025 / JANVI	04/20/2021 / JANVI	M6150

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	DIW / DI Water	Daily Lab-Certified	07/03/2029	07/03/2024 / lwona	07/03/2024 / lwona	W3112

M5882
 M3

Certificate of Analysis

1 Reagent Lane
 Fair Lawn, NJ 07410
 201.796.7100 tel
 201.796.1329 fax

Thermo Fisher Scientific's Quality System has been found to conform to Quality Management System
 Standard ISO9001:2015 by SAI Global Certificate Number CERT – 0120633

This is to certify that units of the lot number below were tested and found to comply with the specifications of the grade listed. Certain data have been supplied by third parties. Thermo Fisher Scientific expressly disclaims all warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose. Products are for research use or further manufacturing. Not for direct administration to humans or animals. It is the responsibility of the final formulator and end user to determine suitability based upon the intended use of the end product. Products are tested to meet the analytical requirements of the noted grade. The following information is the actual analytical results obtained.

Catalog Number	T142	Quality Test / Release Date	08/17/2023
Lot Number	232820		
Description	STANNOUS CHLORIDE, DIHYDRATE CERTIFIED ACS (Suitable for Mercury Determination)		
Country of Origin	United States	Suggested Retest Date	Aug/2028
Chemical Origin	Inorganic-non animal		
BSE/TSE Comment	No animal products are used as starting raw material ingredients, or used in processing, including lubricants, processing aids, or any other material that might migrate to the finished product.		

N/A			
Result Name	Units	Specifications	Test Value
APPEARANCE		REPORT	Clear crystals
ASSAY	%	Inclusive Between 98 - 103	100.65
CALCIUM	%	<= 0.005	0.0017
IDENTIFICATION	PASS/FAIL	= PASS TEST	PASS TEST
IRON (Fe)	%	<= 0.003	0.0011
LEAD (Pb)	%	<= 0.01	0.0006
MERCURY (Hg)	ppm	<= 0.05	<0.05
POTASSIUM (K)	%	<= 0.005	0.0001
SODIUM (Na)	%	<= 0.01	<0.01
SOLUBILITY IN HCL	PASS/FAIL	= PASS TEST	PASS TEST
SULFATE (SO4)	PASS/FAIL	= P.T. (ABOUT 0.003%)	P.T. (ABOUT 0.003%)



Harout Sahagian - Quality Control Supervisor - Fair Lawn

Note: The data listed is valid for all package sizes of this lot of this product, expressed as an extension of this catalog number listed above.

If there are any questions with this certificate, please call at (800) 227-6701.

*Based on suggested storage condition.



CERTIFIED WEIGHT REPORT:

Part Number:	57056	Lot #	
Lot Number:	010924	Solvent:	Nitric Acid
Description:	Barium (Ba)		
Expiration Date:	010927	2%	40.0 (mL)
Recommended Storage:	Ambient (20 °C)		Nitric Acid
Nominal Concentration (µg/mL):	1000		
NIST Test Number:	6UTB	5E-05	Balance Uncertainty
Weight shown below was diluted to (mL):	2000.02	0.058	Flask Uncertainty

Formulated By: Giovanni Esposito

Reviewed By: Pedro L. Renterias

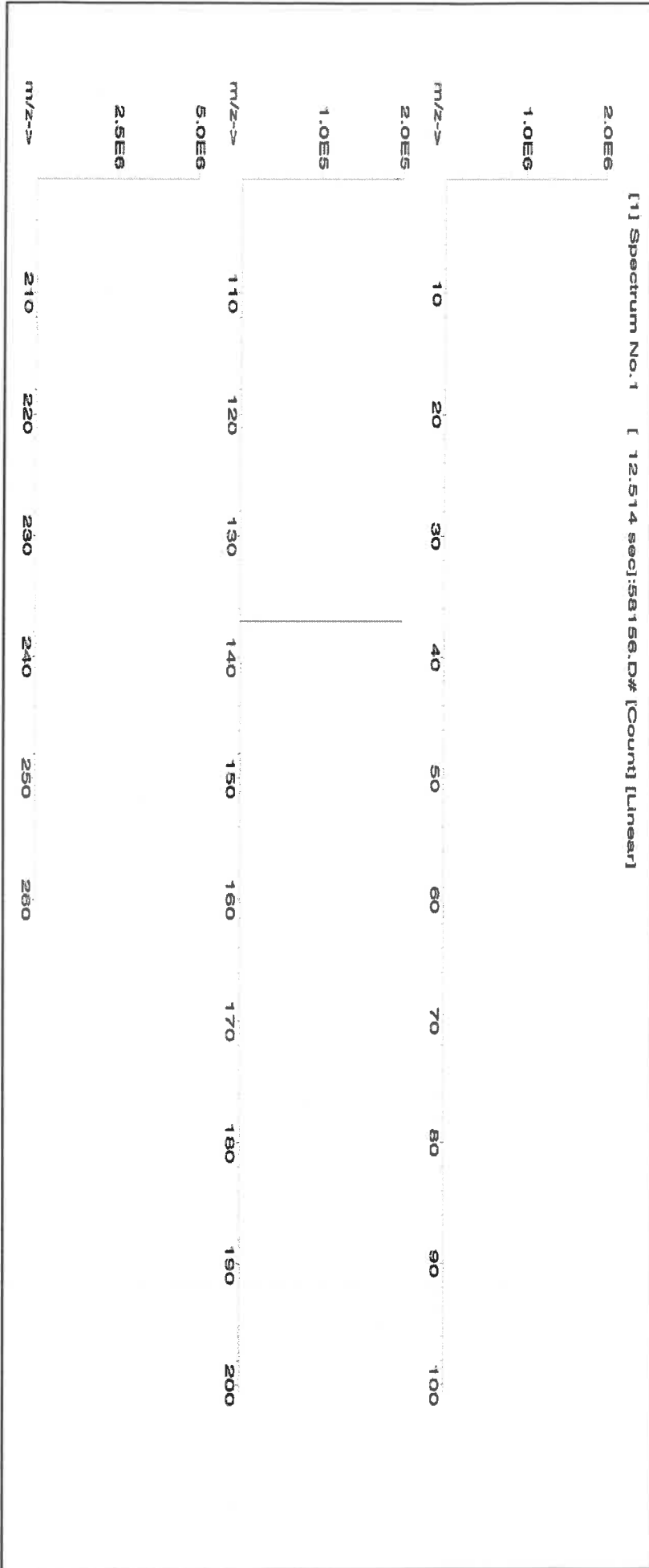
010924

010924

SDS Information

Compound	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
----------	------------	-----------------------	------------	-----------------	-----------	-------------------	-------------------	----------------------	----------------------------------	------	----------------	------	----------

1. Barium nitrate (Ba) IN023 BA0022019A1 1000 99.999 0.10 52.3 3.82417 3.82441 1000.1 2.0 10022-31-8 0.5 mg/m3 or-hat 355 mg/kg 3104a





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	<0.2	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	<0.01	Os	<0.02	Rh	<0.02	Ag	<0.02	Tl	<0.02	V	<0.02
Ba	T	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 certified (+/-) 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).



CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57048
070124
Cadmium (Cd)

Solvent: 24002546 Nitric Acid

R: 815/24

Lot #

2% 40.0 Nitric Acid (mL)

Expiration Date: 070127

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL): 1000

NIST Test Number: 6UTB

SE-05 Balance Uncertainty

Weight shown below was diluted to (mL): 2000.07 0.100 Flask Uncertainty

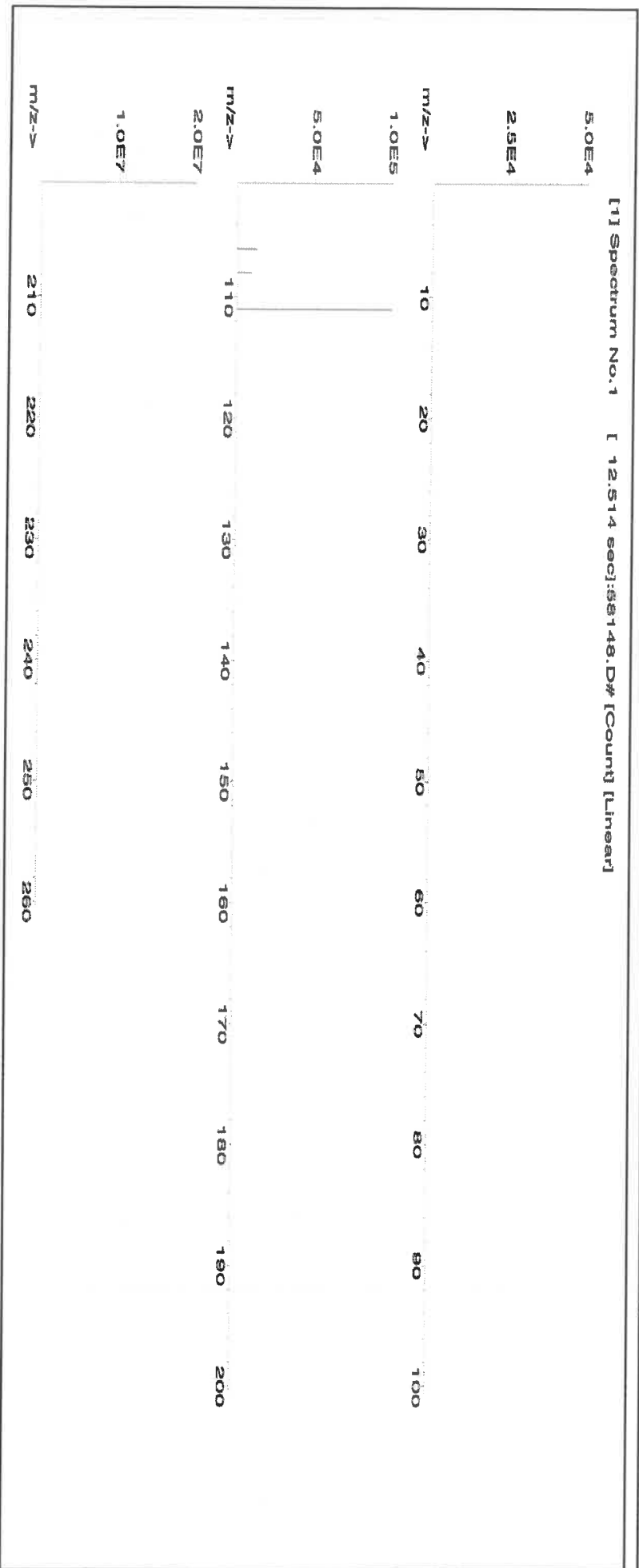
<i>Aleah O'Brady</i>	
Formulated By:	Aleah O'Brady
	070124
<i>Pedro L. Rentas</i>	
Reviewed By:	Pedro L. Rentas
	070124

Compound

Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
------------	-----------------------	------------	-----------------	-----------	-------------------	-------------------	----------------------	----------------------------------	------	----------------	------	----------

1. Cadmium nitrate tetrahydrate (Cd) IN024 CDM09221A1 1000 99.999 0.10 36.5 5.4797 5.4804 1000.1 2.0 10022-68-1 0.01 mg/m3 or-rat 60.2mg/kg 3108

[T1 Spectrum No.1 [12.514 sec]:\$8148.D# [Count] [Linear]





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

Trace Metals Verification by ICP-MS (µg/mL)

Al	<0.02	Cd	<0.2	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	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	Ba	<0.02	In	<0.02	Mg	<0.01	Os	<0.02	Rh	<0.02	Ag	<0.02	Tl	<0.02	V	<0.02
Ba	<0.02	Cs	<0.02	Cd	<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	Pr	<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 certified (+/-) 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).



Refine your results. Redefine your industry.

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).



2.0 PRODUCT DESCRIPTION

Product Code:	Multi Analyte Custom Grade Solution	
Catalog Number:	CLPP-CAL-1	
Lot Number:	T2-MEB714417	
Matrix:	5% (v/v) HNO ₃	
Value / Analyte(s):	5 000 µg/mL ea:	Potassium, Sodium,
	Calcium, Magnesium,	
	2 000 µg/mL ea:	Barium,
	Aluminum,	
	1 000 µg/mL ea:	
	Iron,	
	500 µg/mL ea:	Vanadium, Cobalt,
	Nickel,	
	Zinc,	
	Manganese,	
	250 µg/mL ea:	Copper,
	Silver,	
	200 µg/mL ea:	
	Chromium,	
	50 µg/mL ea:	
	Beryllium	

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Aluminum, Al	2 000 ± 7 µg/mL	Barium, Ba	2 000 ± 9 µg/mL
Beryllium, Be	50.00 ± 0.26 µg/mL	Calcium, Ca	5 000 ± 22 µg/mL
Chromium, Cr	200.0 ± 1.0 µg/mL	Cobalt, Co	500.0 ± 2.4 µg/mL
Copper, Cu	250.0 ± 1.0 µg/mL	Iron, Fe	1 000 ± 4 µg/mL
Magnesium, Mg	5 000 ± 20 µg/mL	Manganese, Mn	500.0 ± 2.0 µg/mL
Nickel, Ni	500.0 ± 2.2 µg/mL	Potassium, K	5 000 ± 19 µg/mL
Silver, Ag	250.0 ± 1.1 µg/mL	Sodium, Na	5 000 ± 18 µg/mL
Vanadium, V	499.7 ± 2.2 µg/mL	Zinc, Zn	500.0 ± 2.2 µg/mL

Density: 1.118 g/mL (measured at 20 ± 4 °C)

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
Ba	ICP Assay	3104a	140909
Ba	Gravimetric		See Sec. 4.2
Be	ICP Assay	3105a	090514
Be	Calculated		See Sec. 4.2
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
Co	ICP Assay	3113	190630
Co	EDTA	928	928
Cr	ICP Assay	3112a	170630
Cr	Calculated		See Sec. 4.2
Cu	ICP Assay	3114	121207
Cu	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
K	ICP Assay	3141a	140813
K	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	3152a	120715
Na	Gravimetric		See Sec. 4.2
Ni	ICP Assay	3136	120619
Ni	EDTA	928	928
V	IC Assay	3165	160906
V	EDTA	928	928
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, $X_{\text{CRM/RM}}$, where two or more methods of characterization are used is the weighted mean of the results:

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

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

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

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

$$\text{CRM/RM Expanded Uncertainty } (\pm) = U_{\text{CRM/RM}} = k (u_{\text{char}}^2 + u_{\text{bb}}^2 + u_{\text{Its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2

$u_{\text{char}} = [\sum(w_i)^2 (u_{\text{char } i})^2]^{1/2}$ where $u_{\text{char } i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

$$\text{CRM/RM Expanded Uncertainty } (\pm) = U_{\text{CRM/RM}} = k (u_{\text{char } a}^2 + u_{\text{bb}}^2 + u_{\text{Its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{Its} = 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

Note: This solution contains Silver (Ag), please refer to our Sample Preparation Guide for more information.

<https://www.inorganicventures.com/sample-preparation-guide/samples-containing-silver>

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

January 27, 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

- January 27, 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





Refine your results. Redefine your industry.

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).



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: CLPP-CAL-3
Lot Number: T2-MEB714159
Matrix: 7% (v/v) HNO₃
Value / Analyte(s):
1 000 µg/mL ea:
Arsenic, Lead,
Selenium, Thallium,
500 µg/mL ea:
Cadmium

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Arsenic, As	1 000 ± 8 µg/mL	Cadmium, Cd	500.0 ± 2.1 µg/mL
Lead, Pb	1 000 ± 5 µg/mL	Selenium, Se	1 000 ± 8 µg/mL
Thallium, Tl	1 000 ± 7 µg/mL		

Density: 1.043 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
As	ICP Assay	3103a	100818
Cd	ICP Assay	3108	130116
Cd	EDTA	928	928
Pb	ICP Assay	3128	101026
Pb	EDTA	928	928
Se	ICP Assay	3149	100901
Tl	ICP Assay	3158	151215

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

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

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

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

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

$$\text{CRM/RM Expanded Uncertainty } (\pm) = U_{\text{CRM/RM}} = k (u_{\text{char}}^2 + u_{\text{bb}}^2 + u_{\text{Its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2

$u_{\text{char}} = [\sum(w_i)^2 (u_{\text{char } i}^2)]^{1/2}$ where $u_{\text{char } i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

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u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

$$\text{CRM/RM Expanded Uncertainty } (\pm) = U_{\text{CRM/RM}} = k (u_{\text{char } a}^2 + u_{\text{bb}}^2 + u_{\text{Its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{Its} = 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.

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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

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 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

- **January 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





CERTIFIED WEIGHT REPORT:

Part Number: 58126
Lot Number: 051523
Description: Iron (Fe)

Solvent: 21110221 Nitric Acid

Lot #

Expiration Date: 051526

5.0% 250.0 (mL) Nitric Acid

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL): 10000

NIST Test Number: 6UTB

5E-05 Balance Uncertainty

Weight shown below was diluted to (mL): 5000.1 **0.12 Flask Uncertainty**

Giovanni Esposito

Formulated By: Giovanni Esposito **051523**

Pedro L. Renias

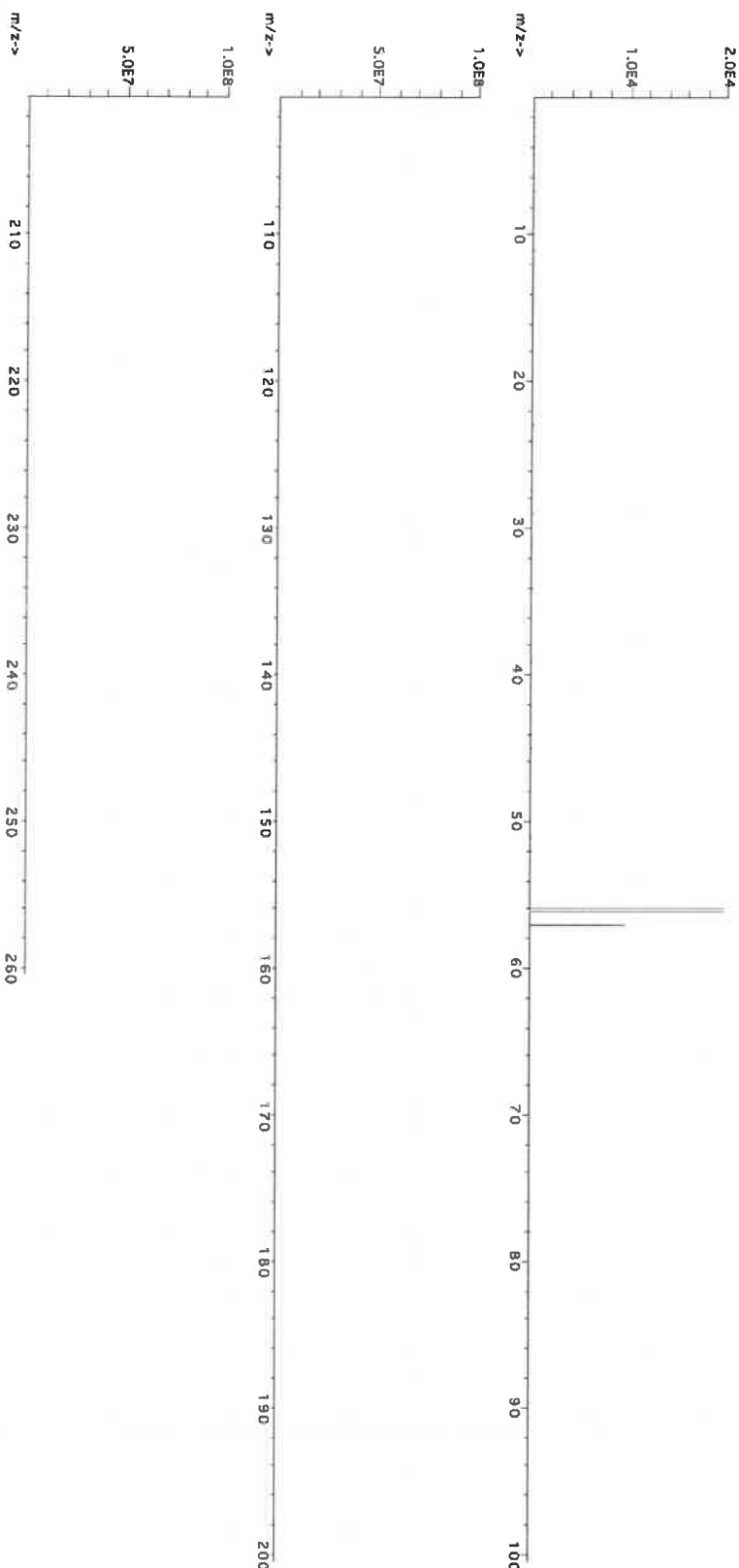
Reviewed By: Pedro L. Renias **051523**

SDS Information

Compound	Lot	Nominal	Purity	Uncertainty	Assay	Target	Actual	Actual	Expanded	(Solvent Safety Info. On Attached pg.)	NIST
	Number	Conc. (µg/mL)	(%)	Purity (%)	(%)	Weight (g)	Weight (g)	Conc. (µg/mL)	+/- (µg/mL)	CAS#	SRM
										OSHA PEL (TWA)	

1. Iron (Fe) IN346 2302010-500 10000 99.995 0.10 100.0 50.0034 50.0111 10001.5 20.0 7439-89-6 5 mg/m3 or-tral 7500mg/kg 3126a

[1] Spectrum No.1 [30.763 sec]:58126.D# [Count] [Linear]





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	<0.10	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	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	<0.01	Os	<0.02	Rb	<0.02	Ag	<0.02	Tl	<0.02	V	<0.02
Ba	<0.02	Cs	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.10	Pd	<0.02	Rb	<0.02	Na	<0.2	Th	<0.02	Yb	<0.02
Be	<0.01	Cr	<0.05	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	<0.10	Ge	<0.10	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	Sn	<0.02	Zn	<0.10
B	<0.02	Cu	<0.10	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	Tl	<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 certified (+/-) 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).



Certified Reference Material CRM

Lot #

R: 815/24

M6025



CERTIFIED WEIGHT REPORT:

Part Number: **57182**
Lot Number: **110923**
Description: **Lead (Pb)**

Solvent: **24002546 Nitric Acid**

Expiration Date: **110926**
Recommended Storage: **Ambient (20 °C)**
Nominal Concentration (µg/mL): **10000**
NIST Test Number: **6UTB**

2% **40.0** **Nitric Acid**
(mL)

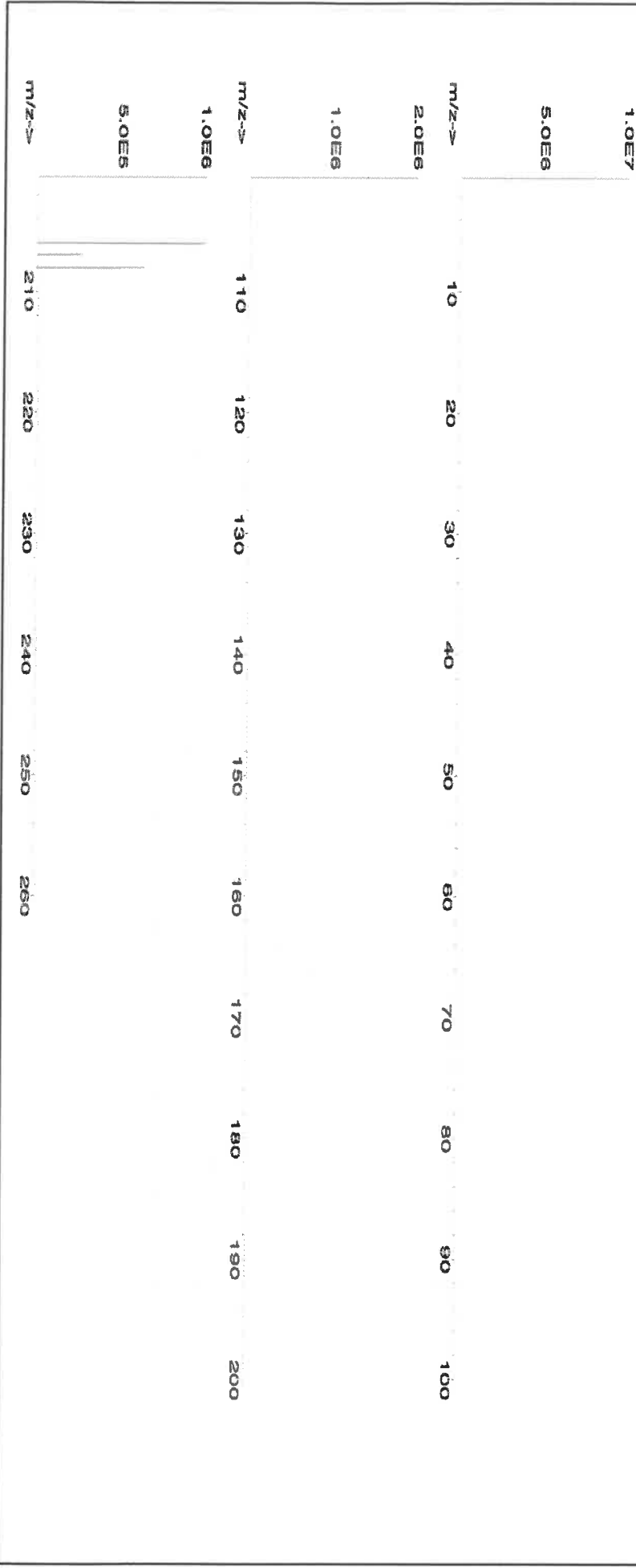
Weight shown below was diluted to (mL): **2000.02** **0.058** **Flask Uncertainty**

Formulated By:	Lawrence Barry
Reviewed By:	Pedro L. Rentas

Compound	SDS Information									
	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)

1. Lead(II) nitrate (Pb) IN029 PED12016A1 10000 99.999 0.10 62.5 32.0006 32.0040 10001.1 20.0 10099-74-8 0.05 mg/m3 Inverse rat 83 mg/kg 3128

[1] Spectrum No.1 [17.284 sec]:58182.D# [Count] [Linear]





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

Trace Metals Verification by ICP-MS ($\mu\text{g/mL}$)

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	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	<0.01	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	T	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	Ti	<0.02	Zr	<0.02

Physical Characterization:

(T)= Target analyte

Certified by:

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

- * 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 certified (+/-) 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).



Refine your results. Redefine your industry. RD:05/14/2024

Certificate of Analysis

300 Technology Drive
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inorganicventures.com

P: 800-669-6799/540-585-3030

F: 540-585-3012

info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

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2.0 PRODUCT DESCRIPTION

Product Code:	Multi Analyte Custom Grade Solution
Catalog Number:	WW-LFS-1
Lot Number:	T2-MEB723367
Matrix:	5% (v/v) HNO ₃

Value / Analyte(s):	1 000 µg/mL ea:	
	Potassium,	
	600 µg/mL ea:	
	Phosphorus,	
	300 µg/mL ea:	
	Sodium,	Iron,
	200 µg/mL ea:	
	Magnesium,	Aluminum,
	Cerium,	Selenium,
	Thallium,	
	100 µg/mL ea:	
	Lead,	Calcium,
	80 µg/mL ea:	
	Arsenic,	
	70 µg/mL ea:	
	Mercury,	
	50 µg/mL ea:	
	Nickel,	
	40 µg/mL ea:	
	Chromium,	
	30 µg/mL ea:	
	Copper,	Boron,
	Vanadium,	
	20 µg/mL ea:	
	Zinc,	Strontium,
	Barium,	Beryllium,
	Cadmium,	Cobalt,
	Manganese,	Lithium,
	7.5 µg/mL ea:	
	Silver	

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Aluminum, Al	200.0 ± 0.7 µg/mL	Arsenic, As	80.0 ± 0.7 µg/mL
Barium, Ba	20.00 ± 0.09 µg/mL	Beryllium, Be	20.00 ± 0.13 µg/mL
Boron, B	30.00 ± 0.18 µg/mL	Cadmium, Cd	20.00 ± 0.09 µg/mL
Calcium, Ca	100.0 ± 0.4 µg/mL	Cerium, Ce	200.0 ± 0.8 µg/mL
Chromium, Cr	40.00 ± 0.30 µg/mL	Cobalt, Co	20.00 ± 0.10 µg/mL
Copper, Cu	30.00 ± 0.13 µg/mL	Iron, Fe	300.0 ± 1.3 µg/mL
Lead, Pb	100.0 ± 0.4 µg/mL	Lithium, Li	20.00 ± 0.08 µg/mL
Magnesium, Mg	200.0 ± 0.8 µg/mL	Manganese, Mn	20.00 ± 0.08 µg/mL
Mercury, Hg	70.0 ± 0.3 µg/mL	Nickel, Ni	50.00 ± 0.22 µg/mL
Phosphorus, P	600.0 ± 2.7 µg/mL	Potassium, K	1 000 ± 4 µg/mL
Selenium, Se	200.0 ± 1.3 µg/mL	Silver, Ag	7.50 ± 0.03 µg/mL
Sodium, Na	300.0 ± 1.4 µg/mL	Strontium, Sr	20.01 ± 0.08 µg/mL
Thallium, Tl	200.0 ± 1.4 µg/mL	Vanadium, V	30.00 ± 0.13 µg/mL
Zinc, Zn	20.00 ± 0.09 µg/mL		

Density: 1.034 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ag	ICP Assay	3151	160729
Ag	Volhard	999c	999c
Ag	Calculated		See Sec. 4.2
Al	ICP Assay	3101a	140903
Al	EDTA	928	928
As	ICP Assay	3103a	100818
B	ICP Assay	3107	190605
Ba	ICP Assay	3104a	140909
Ba	Gravimetric		See Sec. 4.2
Be	ICP Assay	3105a	090514
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
Cd	ICP Assay	3108	130116
Cd	EDTA	928	928
Ce	ICP Assay	3110	090504
Ce	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
Hg	ICP Assay	3133	160921
Hg	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
P	ICP Assay	3139a	060717
P	Acidimetric	84L	84L
Pb	ICP Assay	3128	101026
Pb	EDTA	928	928
Se	ICP Assay	3149	100901
Sr	EDTA	928	928
Sr	ICP Assay	Traceable to 3153a	K2-SR650985
Tl	ICP Assay	3158	151215
V	IC Assay	3165	160906
V	EDTA	928	928
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, $X_{\text{CRM/RM}}$, where two or more methods of characterization are used is the weighted mean of the results:

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

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

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

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

$$\text{CRM/RM Expanded Uncertainty (z)} = U_{\text{CRM/RM}} = k (u_{\text{char}}^2 + u_{\text{bb}}^2 + u_{\text{ts}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2

$u_{\text{char}} = [\sum ((w_i)^2 (u_{\text{char } i}^2))]^{1/2}$ where $u_{\text{char } i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

$$\text{CRM/RM Expanded Uncertainty (z)} = U_{\text{CRM/RM}} = k (u_{\text{char } a}^2 + u_{\text{bb}}^2 + u_{\text{ts}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{ts} = 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

Low Silver Note: This solution contains "LOW" levels of Silver. Please store this entire bottle inside a sealed glass jar.

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; info@inorganicventures.com; inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

August 30, 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 30, 2026

- 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





Refine your results. Redefine your industry.

RD:05/14/2024

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).



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: WW-LFS-2
Lot Number: U2-MEB731108
Matrix: 5% (v/v) HNO₃
tr. HF
Value / Analyte(s):
200 µg/mL ea:
Silica,
80 µg/mL ea:
Antimony,
70 µg/mL ea:
Tin,
40 µg/mL ea:
Molybdenum,
20 µg/mL ea:
Titanium

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Antimony, Sb	80.1 ± 0.6 µg/mL	Molybdenum, Mo	40.03 ± 0.18 µg/mL
Silica, SiO ₂	200.2 ± 1.3 µg/mL	Tin, Sn	70.0 ± 0.4 µg/mL
Titanium, Ti	20.01 ± 0.13 µg/mL		

Density: 1.025 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Mo	ICP Assay	3134	130418
Mo	Calculated		See Sec. 4.2
Sb	ICP Assay	3102a	140911
SiO ₂	ICP Assay	3150	130912
Sn	ICP Assay	3161a	140917
Ti	ICP Assay	3162a	130925
Ti	Calculated		See Sec. 4.2

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

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

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

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

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

$$\text{CRM/RM Expanded Uncertainty } (z) = U_{\text{CRM/RM}} = k (u_{\text{char}}^2 + u_{\text{bb}}^2 + u_{\text{ITS}}^2 + u_{\text{TS}}^2)^{1/2}$$

k = coverage factor = 2

$u_{\text{char}} = [\sum (w_i)^2 (u_{\text{char } i}^2)]^{1/2}$ where $u_{\text{char } i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{TS} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

$$\text{CRM/RM Expanded Uncertainty } (z) = U_{\text{CRM/RM}} = k (u_{\text{char } a}^2 + u_{\text{bb}}^2 + u_{\text{ITS}}^2 + u_{\text{TS}}^2)^{1/2}$$

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{ITS} = 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

6.1 This standard is intended for the calibration of analytical instruments and validation of analytical methods as appropriate. This CRM may be used in connection with EPA Methods 6010, 6020 (all versions), Standard Methods 3120 B and USP <232> / ICH Q3D.

6.2 For products attaining traceability through Inorganic Ventures' Primary Certified Reference Materials (PCRM™) see the Limited License to Use PCRM™ in the Inorganic Ventures Terms and Conditions of Sale, <https://www.inorganicventures.com/terms-and-conditions-sale>. The Terms and Conditions contain information on the use of materials traceable to PCRM™ certified reference materials. This Limited License agreement is especially pertinent for laboratories accredited under ISO:17034.

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

HF Note: This standard should not be prepared or stored in glass.

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

March 17, 2023

- 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

- **March 17, 2028**

- 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





Certified Reference Material CRM



CERTIFIED WEIGHT REPORT:

Part Number:

57014

Lot Number:

030921

Description:

Silicon (Si)

Lot #

19410105

Solvent:

Nitric Acid

Expiration Date:

030924

Recommended Storage:

Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

5E-05 Balance Uncertainty

0.058 Flask Uncertainty

Volume shown below was diluted to (mL):

3000.41

Nitric Acid

60.0

(mL)

Formulated By:

Lawrence Barry

030921

Reviewed By:

Pedro L. Rentas

030921

SDS Information

Expanded

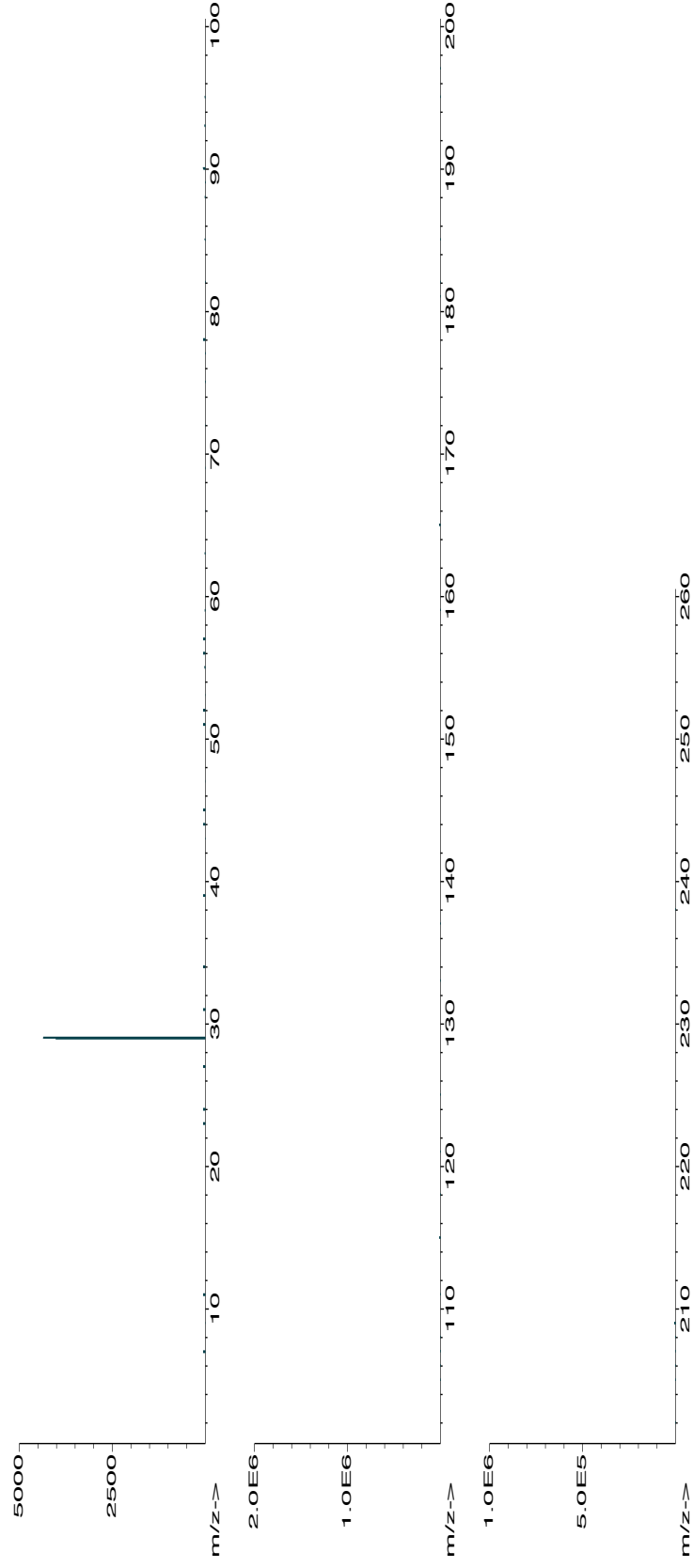
Uncertainty (Solvent Safety Info. On Attached pg.) NIST

+/- (µg/mL) CAS# OSHA PEL (TWA) LD50 SRM

Compound

1. Ammonium hexafluorosilicate (Si) 58114 070120 0.1000 300.0 0.084 1000 10000.0 1000.0 2.1 16919-19-0 2.50 mg/m3 orl-rat 70 mg/kg NA

[1] Spectrum No.1 [31.393 sec]:58014.D# [Count] [Linear]





Instrumental Analysis by Inductively Coupled Plasma Mass Spectroscopy (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	<0.2	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	T	Te	<0.02	U	<0.02
As	<0.2	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.01	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	<0.02	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 certified (+/-) 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).

300 Technology Drive
 Christiansburg, VA 24073 USA
 inorganicventures.com

MS062
 MS063
 MS

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).



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Mass Spec Solution
 Catalog Number: MSHG-10PPM
 Lot Number: S2-HG709270
 Matrix: 10% (v/v) HCl
 Value / Analyte(s): 10 µg/mL ea:
 Mercury
 Starting Material: Hg metal
 Starting Material Lot#: 1959
 Starting Material Purity: 99.9994%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10.001 ± 0.053 µg/mL
Density: 1.020 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Hg	ICP Assay	3133	160921
Hg	EDTA	928	928
Hg	Calculated		See Sec. 4.2

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:

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

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

$$CRM/RM \text{ Expanded Uncertainty } (\pm) = U_{CRM/RM} = k (u_{char}^2 + u_{bb}^2 + u_{lts}^2 + u_{ts}^2)^{1/2}$$

k = coverage factor = 2

$u_{char} = [\sum ((w_i)^2 (u_{char i})^2)]^{1/2}$ 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

$$CRM/RM \text{ Expanded Uncertainty } (\pm) = U_{CRM/RM} = k (u_{char a}^2 + u_{bb}^2 + u_{lts}^2 + u_{ts}^2)^{1/2}$$

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)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Ag	0.000011	M	Eu	<	0.000201	O	Na	0.000004	M	Se	<	0.015915	O	Zn	<	0.001510
O	Al	0.000001	O	Fe	0.000001	M	Nb	<	0.000201	O	Si	0.000005	M	Zr	<	0.000201	
M	As	<	0.000402	M	Ga	<	0.000201	M	Nd	<	0.000201	M	Sm	<	0.000201		
M	Au	<	0.003631	M	Gd	<	0.000201	M	Ni	<	0.000402	M	Sn	<	0.001007		
M	B	<	0.001208	M	Ge	<	0.000201	M	Os	<	0.000605	M	Sr	<	0.000201		
M	Ba	<	0.000201	M	Hf	<	0.000201	O	P	<	0.032370	M	Ta	<	0.000201		
M	Be	<	0.000201	s	Hg	<		M	Pb	<	0.000201	M	Tb	<	0.000201		
M	Bi	<	0.000201	M	Ho	<	0.000201	M	Pd	<	0.000403	M	Te	<	0.002216		
O	Ca	0.000007	M	In	<	0.000201	M	Pr	<	0.000201	M	Th	<	0.000201			
M	Cd	<	0.000201	M	Ir	<	0.000201	M	Pt	<	0.000402	M	Ti	<	0.000402		
M	Ce	<	0.000201	O	K	0.000020	M	Rb	<	0.000201	O	Tl	<	0.016508			
M	Co	<	0.000201	M	La	<	0.000201	M	Re	<	0.000201	M	Tm	<	0.000201		
O	Cr	<	0.003021	O	Li	<	0.000107	M	Rh	<	0.000201	M	U	<	0.008058		
M	Cs	<	0.001208	M	Lu	<	0.000201	M	Ru	<	0.000201	M	V	<	0.000201		
M	Cu	<	0.000402	O	Mg	0.000001	O	S	<	0.053950	M	W	<	0.000604			
M	Dy	<	0.000201	M	Mn	<	0.000604	M	Sb	<	0.001208	M	Y	<	0.000201		
M	Er	<	0.000201	M	Mo	0.000009	M	Sc	<	0.000201	M	Yb	<	0.000201			

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

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 - 200.59 +2 4 Hg(OH)(aq) 1+

Chemical Compatibility - Stable in HNO₃. Avoid basic media forming insoluble carbonate. The sulfide, basic carbonate, oxalate, phosphate, arsenite, arsenate and iodide are insoluble in water.

Stability - 2-100 ppb levels not stable in 1% HNO₃ / LDPE container, stable in 10% HNO₃ packaged in borosilicate glass. 1-100 ppm levels stable in 7% HNO₃ packaged in borosilicate glass. 1000-10,000 ppm solutions are chemically stable for years in 5-10% HNO₃ / LDPE container.

Hg Containing Samples (Preparation and Solution) - Metal (soluble in HNO₃); Oxide (Soluble in HNO₃); Ores and Organic based (The literature has more references to the preparation of Hg containing samples than any other element. Please consult the literature for your specific sample type, since such preparations are prone to error. Or e-mail our technical staff and we will contact you to discuss your particular sample preparation questions in further detail.).

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 202 amu	9 ppt	n/a	186W16O
ICP-OES 184.950 nm	0.03 / 0.005 µg/mL	1	
ICP-OES 194.227 nm	0.03 / 0.005 µg/mL	1	V
ICP-OES 253.652 nm	0.1 / 0.03 µg/mL	1	Ta, Co, Th ,Rh , Fe, U

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 22, 2021

- 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 22, 2026**

- 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:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





Instructions for QATS Reference Material: ICP-AES ICS

**QATS LABORATORY INORGANIC REFERENCE MATERIAL
INTERFERENCE CHECK SAMPLE SET FOR ICP-AES (ICSA WITH ICSB)**

NOTE: These instructions are for advisory purposes only. If any apparent conflict exists between these instructions and the analytical protocol or your contract, disregard these instructions.

APPLICATION: For use with the CLP SFAM01.0 SOW and revisions.

CAUTION: Read instructions carefully before opening bottle(s) and proceeding with the analyses.

Contains Heavy Metals
HAZARDOUS MATERIAL

Safety Data Sheets
Available Upon Request

(A) SAMPLE DESCRIPTION

Enclosed is a set of one (1) or more bottles of Aqueous Reference Material, each composed of metals at various concentrations and prepared with nitrate salts and oxy-acids of the respective elements in a 5% nitric acid matrix. **For the reference material source in reporting ICSA and ICSAB mixture use "USEPA". For the reference material lot number for the ICSA use "ICSA-1211" and for the ICSAB mixture use "ICSA-1211+ICSB-0710".**

CAUTION: The bottle(s) should be protected from light during storage to ensure the stability of silver which is contained in the ICSB solution. The bottle(s) should be stored at room temperature. **Do not allow the solution(s) to freeze.**

(B) BREAKAGE OR MISSING ITEMS

Check the contents of the shipment carefully for any broken, leaking, or missing items. Check that the seal is intact on each bottle. Refer to the enclosed chain of custody record. Report any problems to Mr. Keith Strout, APTIM Federal Services, LLC, at (702) 895-8722. If requested, return the chain-of-custody record with appropriate annotations and signatures to the address provided below.

**QUALITY ASSURANCE TECHNICAL SUPPORT LABORATORY
APTIM Federal Services, LLC
2700 Chandler Avenue - Building C
Las Vegas, NV 89120**

(C) ANALYSIS OF SAMPLES

The interference check sample set is to be used to verify inter-element and background correction factors of inductively-coupled plasma (ICP) spectrometers. This reference material set consists of two (2) concentrated solutions. The ICSA solution contains the four (4) interferent elements: Al, Ca, Fe, and Mg. The ICSB solution contains the analytes: Ag, As, Sb, Ba, Be,



Instructions for QATS Reference Material: ICP-AES ICS

Cd, Co, Cr, Cu, Mn, Ni, Pb, Tl, Se, V, and Zn. This instruction sheet provides the nominal values for ICP-AES Part A and Part B target analytes when diluted as directed.

Using Class "A" glassware, preparation and analysis must be performed according to the following instructions:

ICSA-1211, Interferents: Pipet 10 mL of the ICSA solution into a 100 mL volumetric flask and dilute to volume with 2% v/v HNO₃. Analyze this ICSA solution by ICP-AES.

ICSB-0710, Analytes, mixed with ICSA-1211, Interferents: Pipet 10 mL of the ICSA solution and 10 mL of the ICSB solution into a 100 mL volumetric flask and dilute to volume with 2% v/v HNO₃. Analyze this ICSAB solution by ICP-AES.

(D) "CERTIFIED VALUE" CONCENTRATIONS OF QATS ICP-AES ICS SOLUTION(S)

The "Certified Value" concentrations of the elements, listed in Table 1 below, were derived from statistically pooled analysis results from the following sources, if available: QATS Laboratory, CLP laboratories, Quarterly Blind (QB)/Proficiency Testing (PT) events, CLP pre-award events, and external referee laboratories.

Table 1. "CERTIFIED VALUES" FOR INTERFERENCE CHECK SAMPLE ICP-AES ICSA-1211, AND ICSA-1211 MIXED WITH ICSB-0710

Element	CRQL	Part A (µg/L)	Low Limit (µg/L)	High Limit (µg/L)	Part A +Part B (µg/L)	Low Limit (µg/L)	High Limit (µg/L)
Al	200	255000	216000	294000	247000	209000	285000
Sb	60	(0.0)	-60.0	60.0	618	525	711
As	10	(0.0)	-10.0	10.0	104	88.4	120
Ba	200	(6.0)	-194	206	(537)	337	737
Be	5.0	(0.0)	-5.0	5.0	495	420	570
Cd	5.0	(1.0)	-4.0	6.0	972	826	1120
Ca	5000	245000	208000	282000	235000	199000	271000
Cr	10	(52.0)	42.0	62.0	542	460	624
Co	50	(0.0)	-50.0	50.0	476	404	548
Cu	25	(2.0)	-23.0	27.0	511	434	588
Fe	100	101000	85600	116500	99300	84400	114500
Pb	10	(0.0)	-10.0	10.0	(49.0)	39.0	59.0
Mg	5000	255000	216000	294000	248000	210000	286000
Mn	15	(7.0)	-8.0	22.0	507	430	584
Ni	40	(2.0)	-38.0	42.0	954	810	1100
Se	35	(0.0)	-35.0	35.0	(46.0)	11.0	81.0
Ag	10	(0.0)	-10.0	10.0	201	170	232
Tl	25	(0.0)	-25.0	25.0	(108)	83.0	133
V	50	(0.0)	-50.0	50.0	491	417	565
Zn	60	(0.0)	-60.0	60.0	952	809	1095

The acceptance ranges for all analytes in parentheses in the above table were determined using the listed certified value ± 1 times the associated CLP SOW CRQL. The acceptance ranges for all other analytes were determined using the certified value ± 15 percent of the listed certified value.

ICSA
M5126
M5127
M5128
M5129
M5130

ICSB
M5219
M5220
M5221
M5222
M5223



CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57042
051722
Molybdenum (Mo)

Lot # **Solvent:**
MKB08597V Ammonium hydroxide

0.5% **15.0** **Ammonium hydroxide**
(mL)

Expiration Date: 051725

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

Volume shown below was diluted to (mL):

3000.41

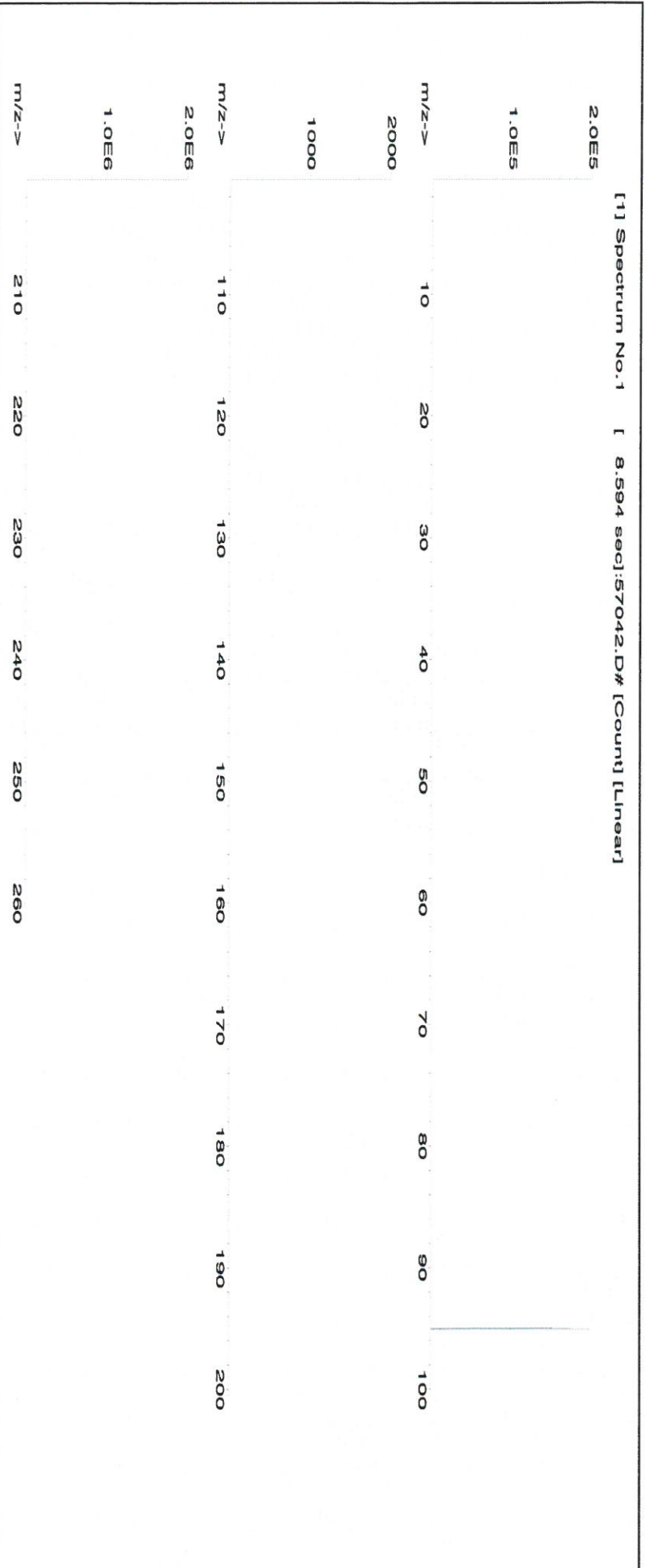
5E-05 **Balance Uncertainty**
0.058 **Flask Uncertainty**

Formulated By:	Lawrence Barry
	051722
Reviewed By:	Pedro L. Rendas
	051722

SDS Information

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	(Solvent Safety Info. On Attached pg.)	NIST SRM
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1. Ammonium molybdate (Mo) 58142 022222 0.1000 300.0 0.084 1000 10001.0 1000.0 2.1 13106-76-8 5 mg(Mo)/m3 or-trat 333 mg/kg 3134





Instrumental Analysis by Inductively Coupled Plasma Mass Spectroscopy (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	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	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	<0.01	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	T	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 certified (+/-) 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).



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
 Catalog Number: CHEM-QC-4
 Lot Number: S2-MEB711674
 Matrix: 3% (v/v) HNO₃
 3% (v/v) HF
 Value / Analyte(s): 1 000 µg/mL ea:
 Boron, Molybdenum,
 Silicon, Tin,
 Titanium

Second Source: Whenever possible, this solution was manufactured from a second set of concentrates in our manufacturing facility.

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Boron, B	1 000 ± 7 µg/mL	Molybdenum, Mo	1 000 ± 5 µg/mL
Silicon, Si	1 000 ± 7 µg/mL	Tin, Sn	1 000 ± 5 µg/mL
Titanium, Ti	1 001 ± 6 µg/mL		

Density: 1.032 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
B	ICP Assay	3107	110830
Mo	ICP Assay	3134	130418
Si	ICP Assay	3150	130912
Sn	ICP Assay	3161a	140917
Ti	ICP Assay	3162a	130925

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

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

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

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

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

$$\text{CRM/RM Expanded Uncertainty } (\pm) = U_{\text{CRM/RM}} = k(u_{\text{char}}^2 + u_{\text{bb}}^2 + u_{\text{Its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2

$u_{\text{char}} = [\sum(w_i)^2(u_{\text{char } i}^2)]^{1/2}$ where $u_{\text{char } i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

$$\text{CRM/RM Expanded Uncertainty } (\pm) = U_{\text{CRM/RM}} = k(u_{\text{char } a}^2 + u_{\text{bb}}^2 + u_{\text{Its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{Its} = 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

HF Note: This standard should not be prepared or stored in glass.

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

November 02, 2021

- 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

- **November 02, 2026**

- 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:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





Instructions for QATS Reference Material: ICP-AES ICS

**QATS LABORATORY INORGANIC REFERENCE MATERIAL
INTERFERENCE CHECK SAMPLE SET FOR ICP-AES (ICSA WITH ICSB)**

NOTE: These instructions are for advisory purposes only. If any apparent conflict exists between these instructions and the analytical protocol or your contract, disregard these instructions.

APPLICATION: For use with the CLP SFAM01.0 SOW and revisions.

CAUTION: Read instructions carefully before opening bottle(s) and proceeding with the analyses.

Contains Heavy Metals
HAZARDOUS MATERIAL

Safety Data Sheets
Available Upon Request

(A) SAMPLE DESCRIPTION

Enclosed is a set of one (1) or more bottles of Aqueous Reference Material, each composed of metals at various concentrations and prepared with nitrate salts and oxy-acids of the respective elements in a 5% nitric acid matrix. **For the reference material source in reporting ICSA and ICSAB mixture use "USEPA". For the reference material lot number for the ICSA use "ICSA-1211" and for the ICSAB mixture use "ICSA-1211+ICSB-0710".**

CAUTION: The bottle(s) should be protected from light during storage to ensure the stability of silver which is contained in the ICSB solution. The bottle(s) should be stored at room temperature. **Do not allow the solution(s) to freeze.**

(B) BREAKAGE OR MISSING ITEMS

Check the contents of the shipment carefully for any broken, leaking, or missing items. Check that the seal is intact on each bottle. Refer to the enclosed chain of custody record. Report any problems to Mr. Keith Strout, APTIM Federal Services, LLC, at (702) 895-8722. If requested, return the chain-of-custody record with appropriate annotations and signatures to the address provided below.

**QUALITY ASSURANCE TECHNICAL SUPPORT LABORATORY
APTIM Federal Services, LLC
2700 Chandler Avenue - Building C
Las Vegas, NV 89120**

(C) ANALYSIS OF SAMPLES

The interference check sample set is to be used to verify inter-element and background correction factors of inductively-coupled plasma (ICP) spectrometers. This reference material set consists of two (2) concentrated solutions. The ICSA solution contains the four (4) interferent elements: Al, Ca, Fe, and Mg. The ICSB solution contains the analytes: Ag, As, Sb, Ba, Be,





Instructions for QATS Reference Material: ICP-AES ICS

Cd, Co, Cr, Cu, Mn, Ni, Pb, Tl, Se, V, and Zn. This instruction sheet provides the nominal values for ICP-AES Part A and Part B target analytes when diluted as directed.

Using Class "A" glassware, preparation and analysis must be performed according to the following instructions:

ICSA-1211, Interferents: Pipet 10 mL of the ICSA solution into a 100 mL volumetric flask and dilute to volume with 2% v/v HNO₃. Analyze this ICSA solution by ICP-AES.

ICSB-0710, Analytes, mixed with ICSA-1211, Interferents: Pipet 10 mL of the ICSA solution and 10 mL of the ICSB solution into a 100 mL volumetric flask and dilute to volume with 2% v/v HNO₃. Analyze this ICSAB solution by ICP-AES.

(D) "CERTIFIED VALUE" CONCENTRATIONS OF QATS ICP-AES ICS SOLUTION(S)

The "Certified Value" concentrations of the elements, listed in Table 1 below, were derived from statistically pooled analysis results from the following sources, if available: QATS Laboratory, CLP laboratories, Quarterly Blind (QB)/Proficiency Testing (PT) events, CLP pre-award events, and external referee laboratories.

Table 1. "CERTIFIED VALUES" FOR INTERFERENCE CHECK SAMPLE ICP-AES ICSA-1211, AND ICSA-1211 MIXED WITH ICSB-0710

Element	CRQL	Part A (µg/L)	Low Limit (µg/L)	High Limit (µg/L)	Part A +Part B (µg/L)	Low Limit (µg/L)	High Limit (µg/L)
Al	200	255000	216000	294000	247000	209000	285000
Sb	60	(0.0)	-60.0	60.0	618	525	711
As	10	(0.0)	-10.0	10.0	104	88.4	120
Ba	200	(6.0)	-194	206	(537)	337	737
Be	5.0	(0.0)	-5.0	5.0	495	420	570
Cd	5.0	(1.0)	-4.0	6.0	972	826	1120
Ca	5000	245000	208000	282000	235000	199000	271000
Cr	10	(52.0)	42.0	62.0	542	460	624
Co	50	(0.0)	-50.0	50.0	476	404	548
Cu	25	(2.0)	-23.0	27.0	511	434	588
Fe	100	101000	85600	116500	99300	84400	114500
Pb	10	(0.0)	-10.0	10.0	(49.0)	39.0	59.0
Mg	5000	255000	216000	294000	248000	210000	286000
Mn	15	(7.0)	-8.0	22.0	507	430	584
Ni	40	(2.0)	-38.0	42.0	954	810	1100
Se	35	(0.0)	-35.0	35.0	(46.0)	11.0	81.0
Ag	10	(0.0)	-10.0	10.0	201	170	232
Tl	25	(0.0)	-25.0	25.0	(108)	83.0	133
V	50	(0.0)	-50.0	50.0	491	417	565
Zn	60	(0.0)	-60.0	60.0	952	809	1095

The acceptance ranges for all analytes in parentheses in the above table were determined using the listed certified value ± 1 times the associated CLP SOW CRQL. The acceptance ranges for all other analytes were determined using the certified value ± 15 percent of the listed certified value.

ICSA
M5126
M5127
M5128
M5129
M5130

ICSB
M5219
M5220
M5221
M5222
M5223



Certified Reference Material CRM



CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

58119
071122
Potassium (K)

Lot

Solvent: 20510011 Nitric Acid

Expiration Date:

Recommended Storage:

Nominal Concentration (µg/mL):

NIST Test Number:

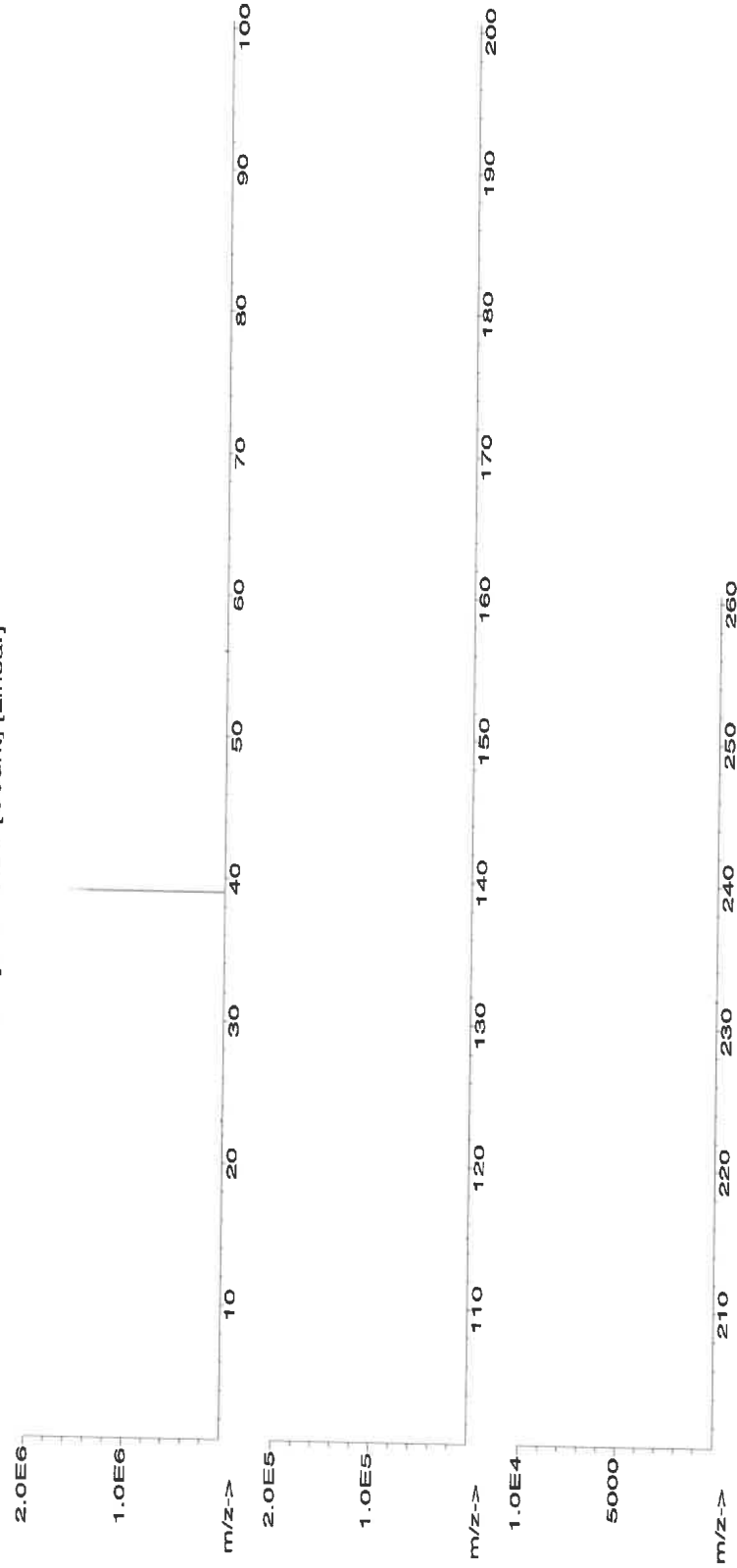
Weight shown below was diluted to (mL):

2%
40.0
(mL)
Nitric Acid

5E-05 Balance Uncertainty
0.058 Flask Uncertainty

Compound	RM#	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	SDS Information (Solvent Safety Info. On Attached pg.)	NIST SRM
1. Potassium nitrate (K)	IN034	KD022021A1	10000	99.999	0.10	37.6	53.1925	53.1934	10000.2	20.0	7757-79-1	5 mg/m3	orl-rat 3015 mg/kg 3141a

[1] Spectrum No.1 [35.763 sec]:58119.D# [Count] [Linear]





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	Pt	<0.02	Se	<0.02	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	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	<0.02	Os	<0.01	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	<0.02	Th	<0.02	Yb	<0.02
Be	<0.01	Cr	<0.02	Ga	<0.02	Fe	<0.02	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	<0.02	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 certified (+/-) 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).



Certified Reference Material CRM

CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

58126
020422
Iron (Fe)

Lot #

Solvent: 20370011 Nitric Acid

Expiration Date:
Recommended Storage:
Nominal Concentration (µg/mL):
NIST Test Number:

020425
Ambient (20 °C)
10000
6UTB
5E-05 Balance Uncertainty
0.058 Flask Uncertainty
3000.41
Weight shown below was diluted to (mL):

5.0%
150.0
(mL)
Nitric Acid

M15298

Formulated By: Giovanni Esposito
020422

Reviewed By: *Pedro L. Rentas*
020422

Reviewed By: Pedro L. Rentas
020422

SDS Information

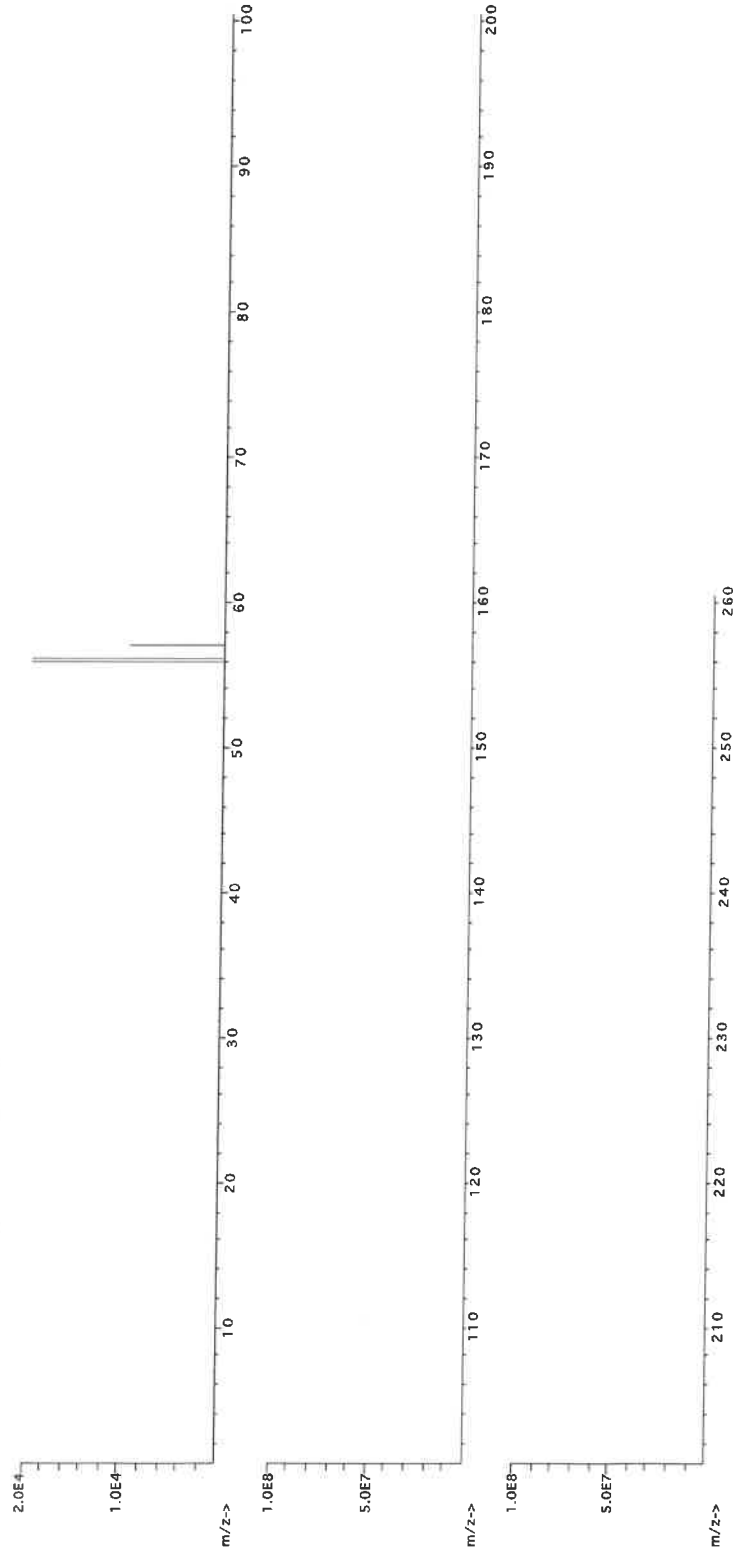
Expanded
Uncertainty
+/- (µg/mL)
CAS#
OSHA PEL (TWA)
LD50

(Solvent Safety Info. On Attached pg.)
NIST
SRM

Actual
Conc. (µg/mL)
10001.5
Actual
Weight (g)
30.0090
Target
Weight (g)
30.0044
Assay
(%)
100.0
Purity
(%)
99.999
Nominal
Conc. (µg/mL)
10000
Lot
Number
221035107
RM#
IN346

1. Iron(III) nitrate nonahydrate (Fe) 221035107 10000 99.999 0.10 100.0 30.0044 30.0090 10001.5 20.0 7782-61-8 5 mg/m3 or-hat 7500mg/kg 3126a

[1] Spectrum No.1 [30.763 sec]:58126.D# [Count] [Linear]





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

Trace Metals Verification by ICP-MS ($\mu\text{g/mL}$)

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.10	Pr	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	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	<0.01	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	<0.10	Mn	<0.10	Pd	<0.02	Rb	<0.02	Na	<0.2	Th	<0.02	Yb	<0.02
Be	<0.01	Cr	<0.5	Ga	<0.2	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	<0.10	Ge	<0.02	La	<0.10	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	Sn	<0.02	Zn	<0.02
B	<0.02	Cu	<0.10	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 certified (+/-) 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).



Certified Reference Material CRM

M5429 R1 0126/23 (B)

CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57103
070622
Lithium (Li)

Solvent: 20510011 Nitric Acid

Expiration Date:
Recommended Storage:
Nominal Concentration (µg/mL):
NIST Test Number:

070625
Ambient (20 °C)
10000
6UTB

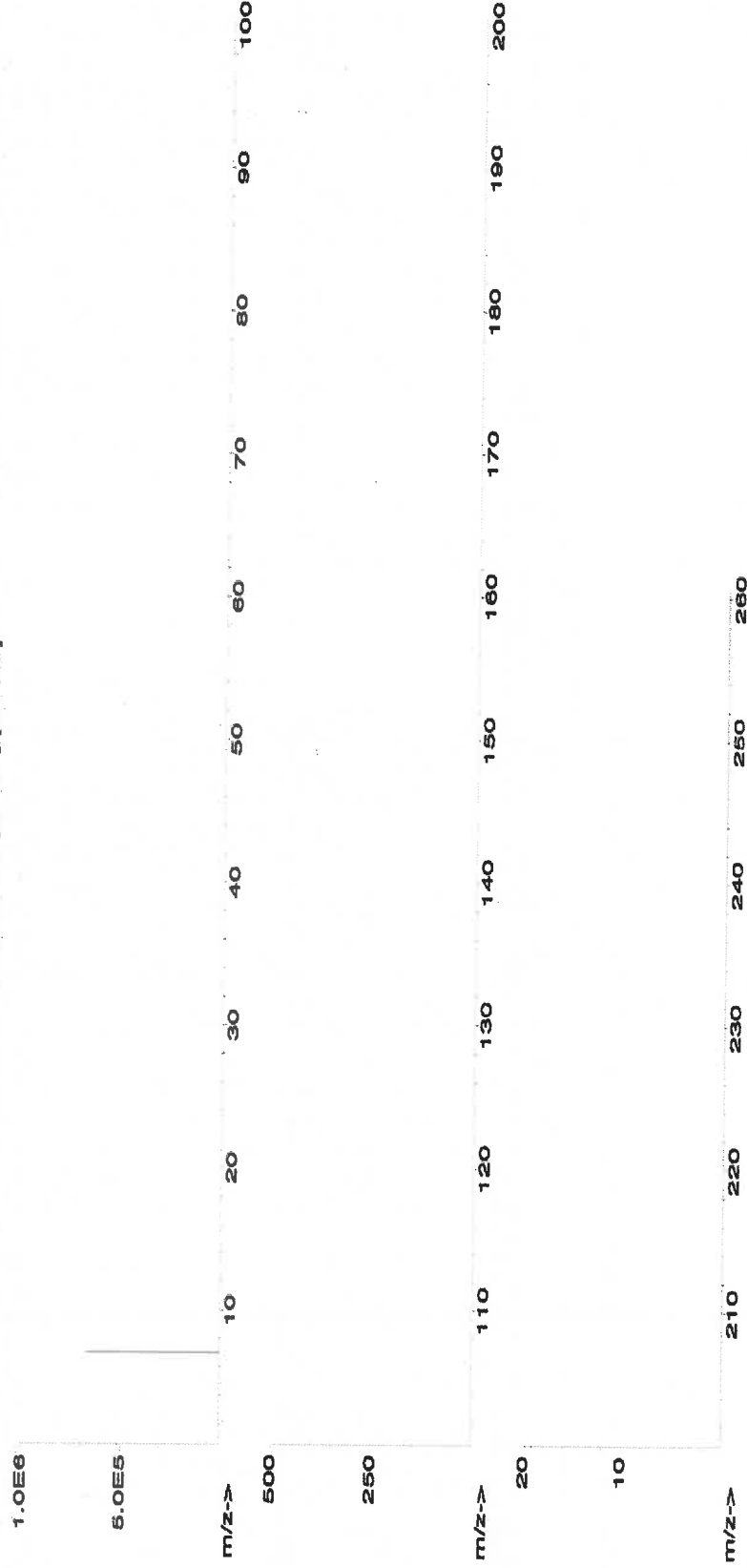
2% 20.0 (mL)

Weight shown below was diluted to (mL): 1000.12
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

Formulated By:	Lawrence Barry	070622
Reviewed By:	Pedro L. Rentas	070622

Compound	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.)	NIST SRM
1. Lithium nitrate (Li)	IN019	10000	99.999	0.10	10.0	100.0134	100.0173	10000.4	20.0	7790-69-4 5 mg/m3 of-rat 1426 mg/kg	NA

[1] Spectrum No.1 [9.619 sec]:58103.D# [Count] [Linear]





Instrumental Analysis by Inductively Coupled Plasma Mass Spectroscopy (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	<0.2	Er	<0.02	Ho	<0.02	La	<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	<0.01	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 certified (+/-) 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).



CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57058
020623
Cerium (Ce)

Expiration Date:
Recommended Storage:
Nominal Concentration (µg/mL):
NIST Test Number:

020626
Ambient (20 °C)
1000
6UTB

Weight shown below was diluted to (mL):

1000.12 **0.058** **Balance Uncertainty**
Flask Uncertainty

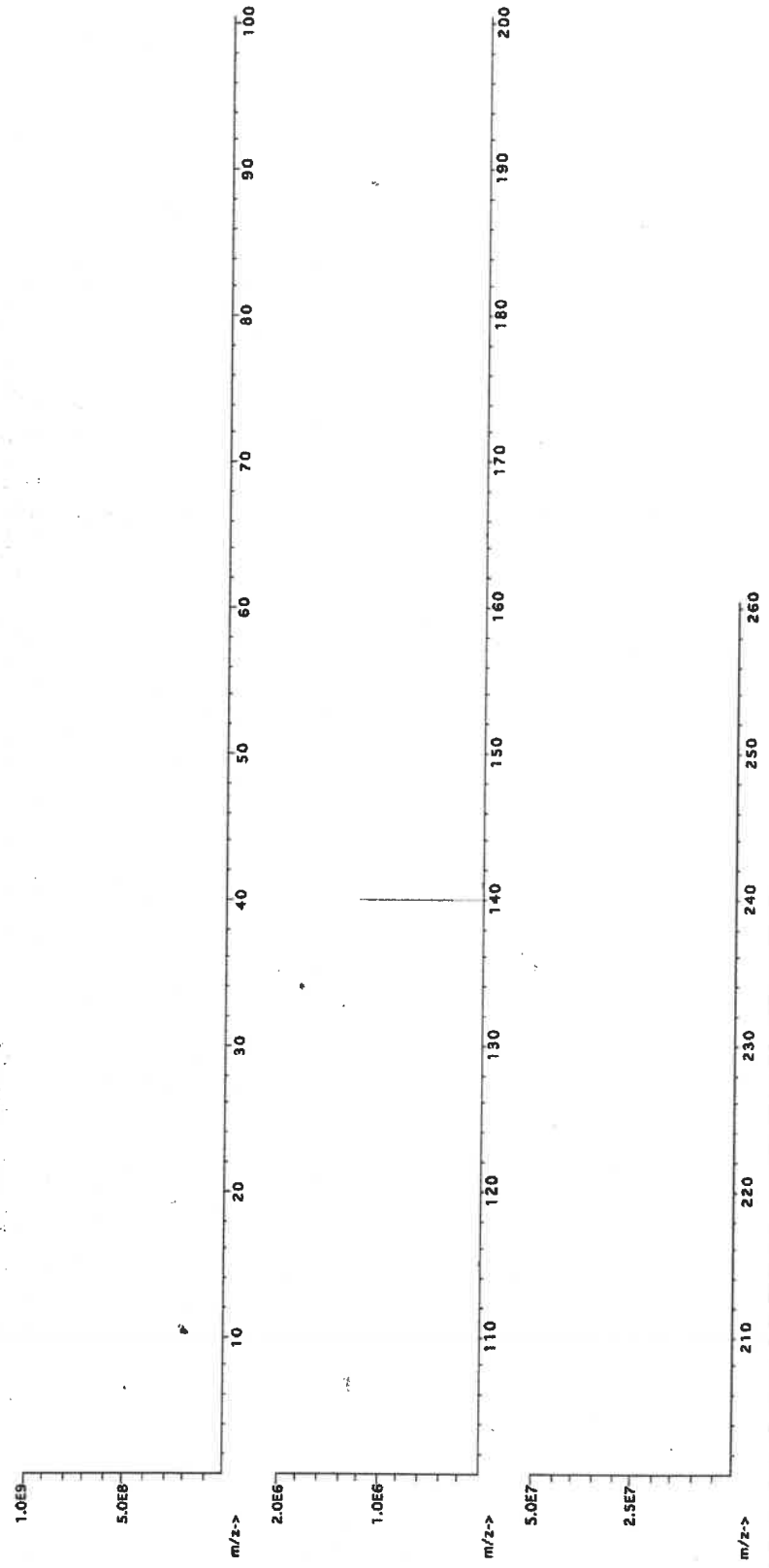
Solvent: **21110221** **Nitric Acid**

2% **20.0** **Nitric Acid**
(mL)

Lawrence Barry
Formulated By: **Lawrence Barry** **020623**
Pedro L. Rentas
Reviewed By: **Pedro L. Rentas** **020623**

Compound	RM#	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	SDS Information		
										(Solvent Safety Info. On Attached pg.)	LD50	SRM
										OSHA PEL (TWA)	CAS#	NA
Cerium nitrate hexahydrate (Ce)	IN146	Z512CEB1	1000	99.999	0.10	32.8	3.04919	3.04921	1000.0	2.0	10294-41-4	NA

[1] Spectrum No.1 [43.472 sec]58158.D# [Count] [Linear]





Instrumental Analysis by Inductively Coupled Plasma Mass Spectroscopy (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	<0.2	Er	<0.02	Ho	<0.02	La	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Tc	<0.02	U	<0.02
As	<0.2	Ce	T	Eu	<0.02	In	<0.02	Mg	<0.02	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	<0.02	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 certified (+/-) 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).



Certified Reference Material CRM



CERTIFIED WEIGHT REPORT:

Part Number: **58113**

Lot Number: **011623**

Description: **Aluminum (Al)**

Solvent: **20510011 Nitric Acid**

Lot #

M5496

R17120123

Expiration Date: **011626**

Recommended Storage: **Ambient (20 °C)**

Nominal Concentration (µg/mL): **10000**

NIST Test Number: **6UTB**

Weight shown below was diluted to (mL): **2000.02** **5E-05 Balance Uncertainty** **0.058 Flask Uncertainty**

Giovanni Esposito

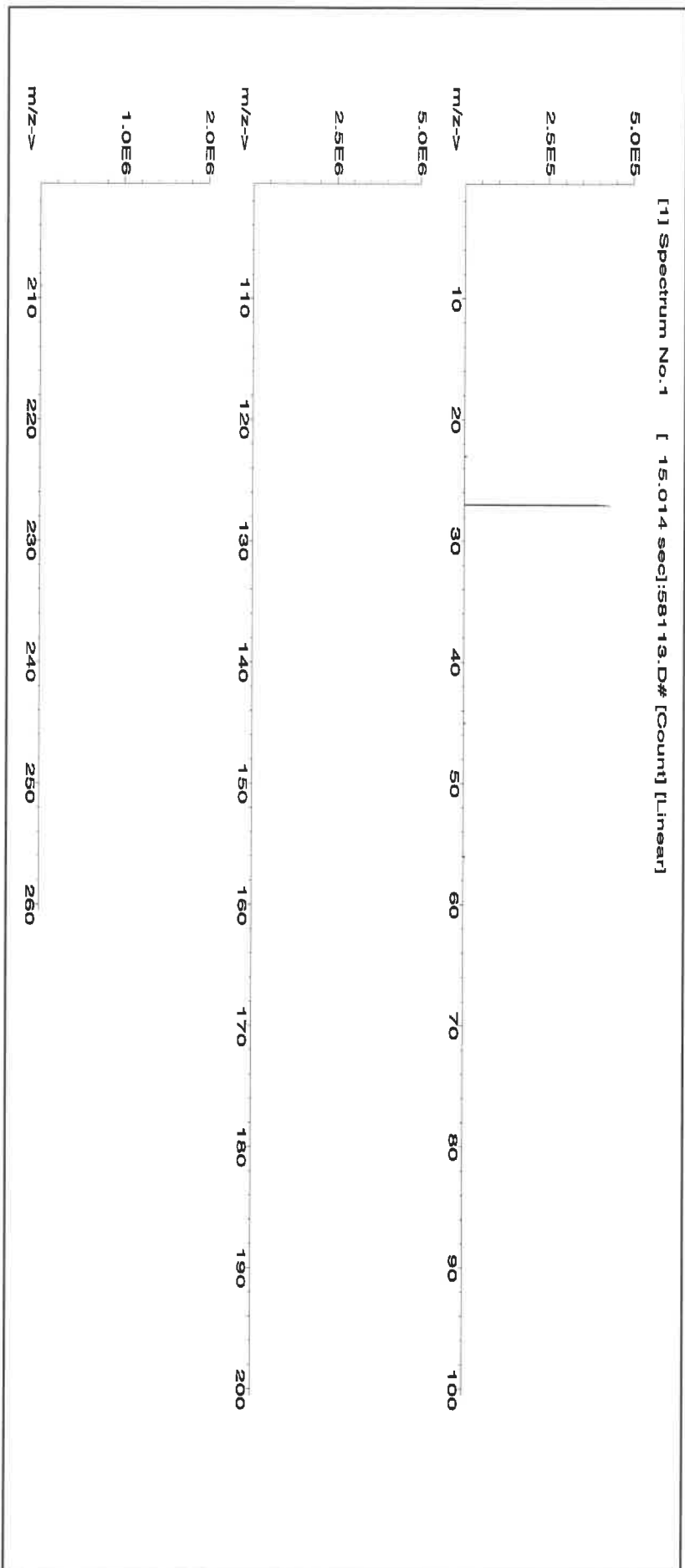
Formulated By: **Giovanni Esposito** **011623**

Reviewed By: **Pedro L. Rentas** **011623**

SDS Information

Compound	Lot	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
1. Aluminum nitrate nonahydrate (Al)	ALM112021A1	10000	99.999	0.10	7.30	273.9779	274.0078	10001.1	20.0	7784-27-2	2 mg/m3	or-hat 3671 mg/kg	3101a

[1] Spectrum No. 1 [15.014 sec]:58113.D# [Count] [Linear]





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	Pt	<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	Tc	<0.02	U	<0.02
As	<0.2	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.01	Os	<0.02	Rh	<0.02	Ag	<0.02	Ti	<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	<0.2	Fe	<0.02	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	Tl	<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 certified (+/-) 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).



15497-15498 R203/17/23(2)

CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

58120
031523
Calcium (Ca)

Solvent: 21110221 Nitric Acid

Expiration Date:
Recommended Storage:
Nominal Concentration (µg/mL):
NIST Test Number:

031526
Ambient (20 °C)
10000
6UTB
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

2%
60.0
Nitric Acid
(mL)

Weight shown below was diluted to (mL): 3000.41

<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito 031523
<i>Pedro L. Rentas</i>	
Reviewed By:	Pedro L. Rentas 031523

SDS Information

(Solvent Safety Info. On Attached pg.)
NIST
SRM

Expanded
Uncertainty

Actual
Conc. (µg/mL)

Actual
Weight (g)

Target
Weight (g)

Assay
(%)

Purity
(%)

Nominal
Conc. (µg/mL)

Lot
Number

RM#

Compound

1. Calcium carbonate (Ca)

IN014 CAD072022A1

10000

99.999

0.10

39.9

75.1990

75.2093

10001.4

20.0

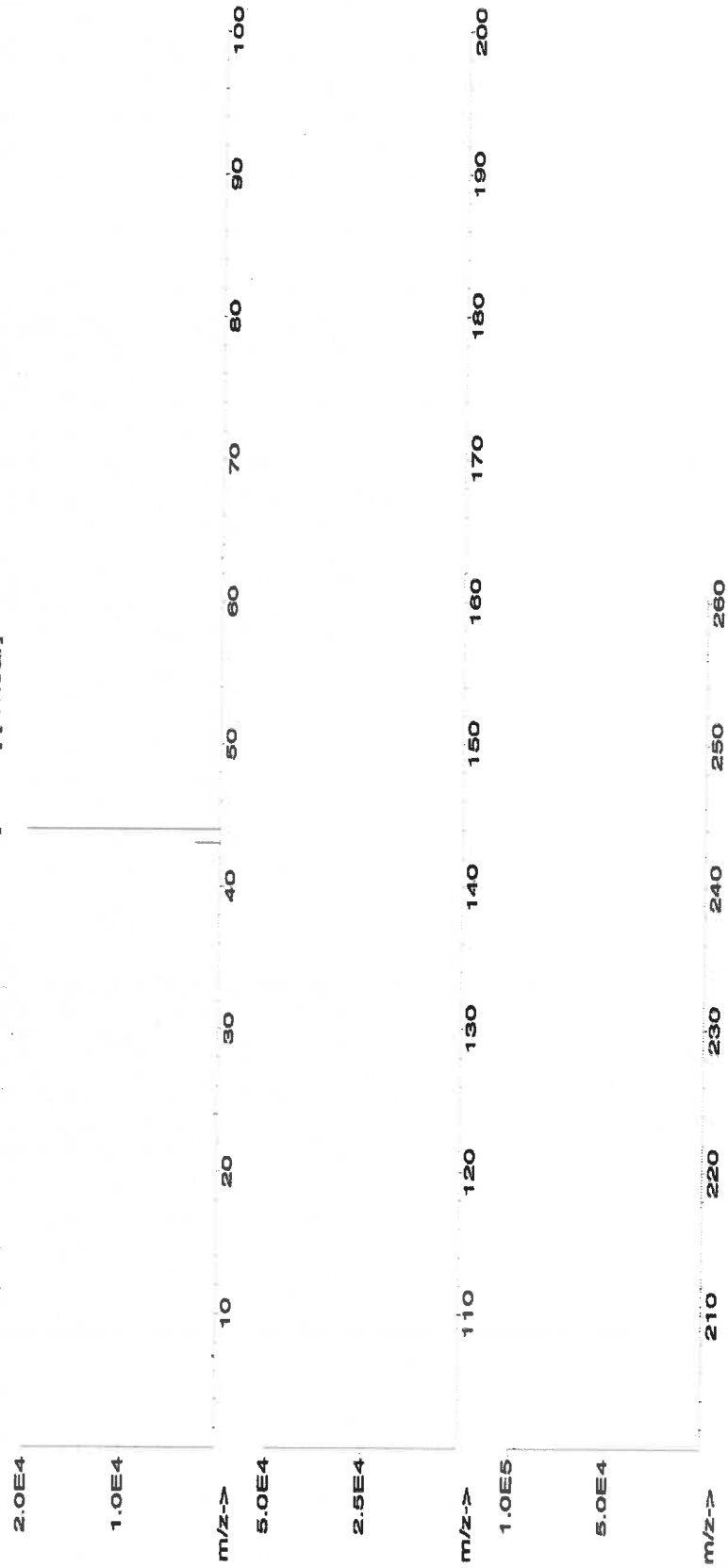
471-34-1

5 mg/m3

or-rat >2000mg/kg

3109a

[1] Spectrum No.1 [12.514 sec]:58120.D# [Count] [Linear]





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	Pt	<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	Tc	<0.02	U	<0.02
As	<0.2	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.01	Os	<0.02	Rh	<0.02	Ag	<0.02	Ti	<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	<0.2	Fe	<0.02	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	Tl	<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 certified (+/-) 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).



Certified Reference Material CRM

CERTIFIED WEIGHT REPORT:

Part Number: **58119**
Lot Number: **120822**
Description: **Potassium (K)**

Solvent: 20510011 Nitric Acid

Lot #

Expiration Date: 120825
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 10000
NIST Test Number: 6UTB

2% 60.0 (mL) Nitric Acid

Weight shown below was diluted to (mL): 3000.4

5E-05 Balance Uncertainty
0.06 Flask Uncertainty

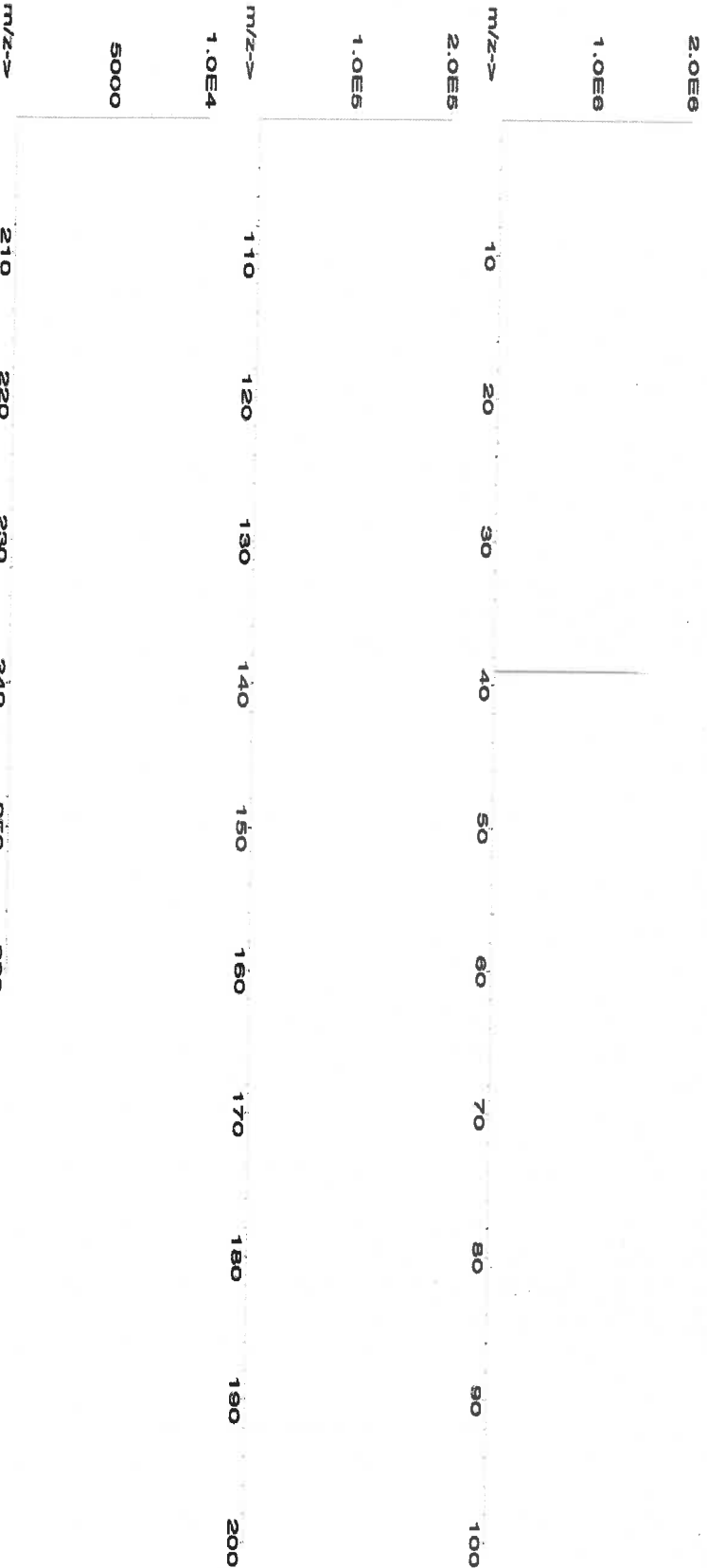
<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito
Reviewed By:	<i>Pedro L. Renteria</i>
	120822

Compound

Lot	Nominal	Purity	Uncertainty	Assay	Target	Actual	Actual	Expanded	SDS Information	NIST
Number	Conc. (µg/mL)	(%)	Purity (%)	(%)	Weight (g)	Weight (g)	Conc. (µg/mL)	Uncertainty +/- (µg/mL)	(Solvent Safety Info. On Attached pg.)	SRM

1. Potassium nitrate (K) IN034 KD022021A1 10000 99.989 0.10 37.6 79.7990 79.8075 10001.1 20.0 7757-79-1 5 mg/m3 crtat 3015 mg/kg 3141a

[1] Spectrum No.1 [35.763 sec]:58119.D# [Count] [Linear]





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	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	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	<0.01	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	<0.02	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 certified (+/-) 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).



QUALITY ASSURANCE TECHNICAL SUPPORT LABORATORY
"An ISO 9001:2015 Certified Program"

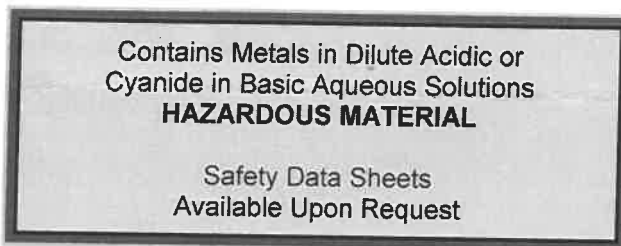
Instructions for QATS Reference Material: *Inorganic ICV Solutions*

QATS LABORATORY INORGANIC REFERENCE MATERIAL
INITIAL CALIBRATION VERIFICATION SOLUTIONS
(ICV1, ICV5, AND ICV6)

NOTE: These instructions are for advisory purposes only. If any apparent conflict exists between these instructions and the analytical protocol or your contract, disregard these instructions.

APPLICATION: For use with the CLP SFAM01.0 SOW and revisions.

CAUTION: Read instructions carefully before opening bottle(s) and proceeding with the analyses.



15528-32
MS

(A) SAMPLE DESCRIPTION

Enclosed is a set of one (1) or more Aqueous Inorganic Reference Materials containing various analyte concentrations. ICV1 and ICV5 are in a matrix of dilute nitric acid. ICV6 is in a matrix of dilute basic solution. **For the reference material source in reporting ICVs use "USEPA". For the reference material lot number for the ICV1, ICV5, and ICV6 solutions use "ICV1-1014", "ICV5-0415", and "ICV6-0400", respectively.**

(B) BREAKAGE OR MISSING ITEMS

Check the contents of the shipment carefully for any broken, leaking, or missing items. Check that the seal is intact on each bottle. Refer to the enclosed chain of custody record. Report any problems to Mr. Keith Strout, APTIM Federal Services, LLC, at (702) 895-8722. If requested, return the chain-of-custody record with appropriate annotations and signatures to the address provided below.

QUALITY ASSURANCE TECHNICAL SUPPORT LABORATORY
APTIM Federal Services, LLC
2700 Chandler Avenue - Building C
Las Vegas, NV 89120

(C) ANALYSIS OF SAMPLES

The Initial Calibration Verification Solutions (ICVs) are to be used to evaluate the accuracy of the initial calibrations of ICP, AA, and Cyanide colorimetric instruments, and are to be used with the CLP SOWs and revisions. The values for each element in the ICVs are listed below in $\mu\text{g/L}$ (ppb) for the resulting solution(s) after the dilution of the concentrate(s) according to the following instructions. Use Class 'A' glassware to prepare the solution(s).

ICV1-1014 For ICP-AES analysis, use a 10-fold dilution by pipetting 10 mL of the ICV1 concentrate into a 100 mL volumetric flask and dilute to volume with 2% (v/v) nitric acid.





QUALITY ASSURANCE TECHNICAL SUPPORT LABORATORY
"An ISO 9001:2015 Certified Program"

Instructions for QATS Reference Material: *Inorganic ICV Solutions*

ICV1-1014 For ICP-MS analysis, use a 50-fold dilution by pipetting 2 mL of the ICV1 concentrate into a 100 mL volumetric flask and dilute to volume with 1% (v/v) nitric acid.

ICV5-0415 For the cold vapor analysis of mercury by AA, use a 100-fold dilution by pipetting 1 mL of the ICV5 concentrate into a 100 mL volumetric flask and dilute to volume with 2% (v/v) nitric acid. The ICV5 concentrate is prepared in 0.05% (w/v) K₂Cr₂O₇ and 5% (v/v) nitric acid.

ICV6-0400 For the analysis of cyanide, use a 100-fold dilution by pipetting 1 mL of the ICV6 concentrate into a 100 mL volumetric flask and dilute to volume with Type II water. Distill this solution along with the samples before analysis. The cyanide concentrate is prepared from K₃Fe(CN)₆, Type II water, and 0.1 % sodium hydroxide, and will decompose rapidly if exposed to light.

NOTE: USE TYPE II WATER AND HIGH-PURITY ACIDS FOR ALL DILUTIONS.

(D) CERTIFIED CONCENTRATIONS OF QATS ICV1, ICV5, AND ICV6 SOLUTIONS

ICV1-1014		
Element	Concentration (µg/L) (after 10-fold dilution)	Concentration (µg/L) (after 50-fold dilution)
Al	2500	500
Sb	1000	200
As	1000	200
Ba	520	100
Be	510	100
Cd	510	100
Ca	10000	2000
Cr	520	100
Co	520	100
Cu	510	100
Fe	10000	2000
Pb	1000	200
Mg	6000	1200
Mn	520	100
Ni	530	110
K	9900	2000
Se	1000	200
Ag	250	50
Na	10000	2000
Tl	1000	210
V	500	100
Zn	1000	200

ICV5-0415		ICV6-0400	
Element	Concentration (µg/L) (after 100-fold dilution)	Analyte	Concentration (µg/L) (after 100-fold dilution)
Hg	4.0	CN ⁻	99



CERTIFIED WEIGHT REPORT:

Part Number: **58024**
Lot Number: **060523**
Description: **Chromium (Cr)**

Lot #: **2110221**
Solvent: **Nitric Acid**

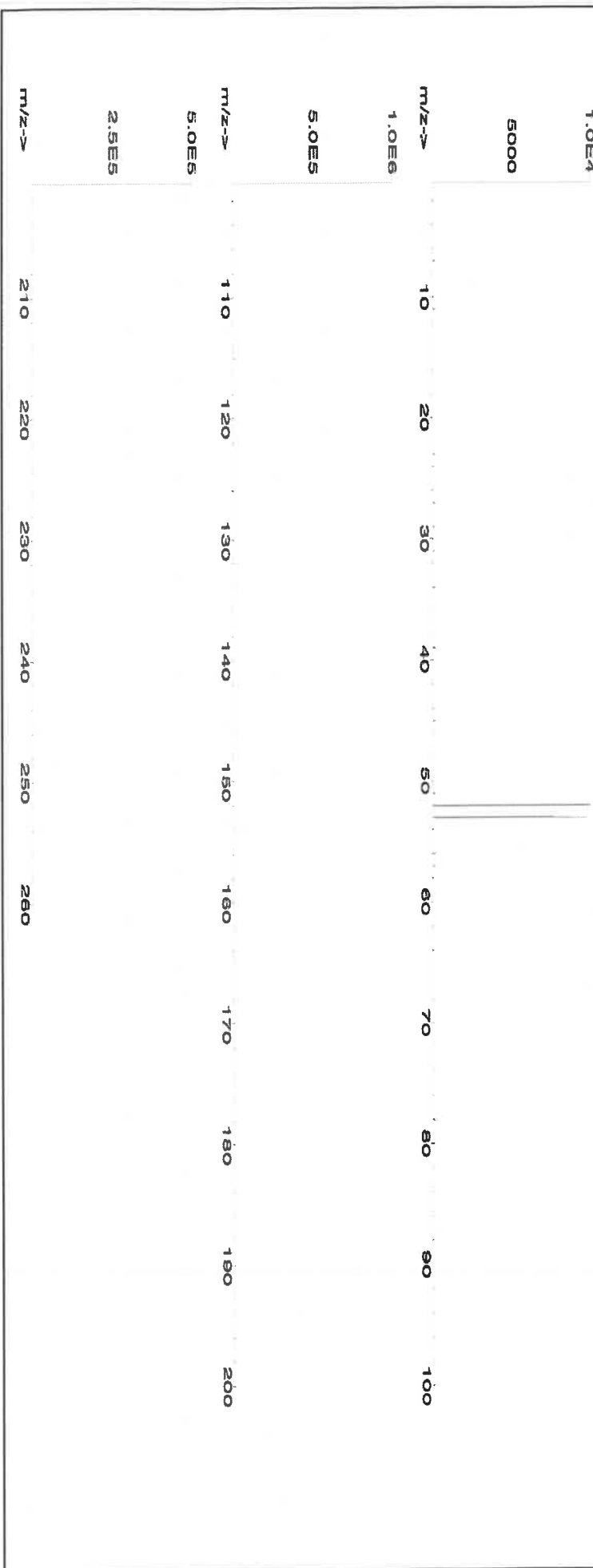
Formulated By:	Lawrence Barry
	060523
Reviewed By:	Pedro L. Ruelas
	060523

Expiration Date: 060526
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Volume shown below was diluted to (mL): 2000.02 0.058 Balance Uncertainty
Flask Uncertainty

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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1. Chromium(III) nitrate nonahydrate (Cr) 58124 071122 0.1000 200.0 0.084 1000 10000.1 1000.0 2.2 7789-02-8 0.5 mg(Cr)/m3 or rat 3250 mg/kg 3112a

[1] Spectrum No.1 [31.393 sec]:57024.D# [Count] [Linear]





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	<0.2	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	<0.01	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	T	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.
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- * 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).



Certified Reference Material CRM



M5697 R: 10/27/23

CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

58029
102523
Copper (Cu)

Lot #
Solvent:

24002546 Nitric Acid

Expiration Date:
Recommended Storage:
Nominal Concentration (µg/mL):
NIST Test Number:

102526
Ambient (20 °C)
1000
6UTB

2.0% Nitric Acid
40.0 (mL)

5E-05 Balance Uncertainty
0.058 Flask Uncertainty
Volume shown below was diluted to (mL): 2000.02

Formulated By:	Benson Chan	102523
Reviewed By:	Pedro L. Rentas	102523

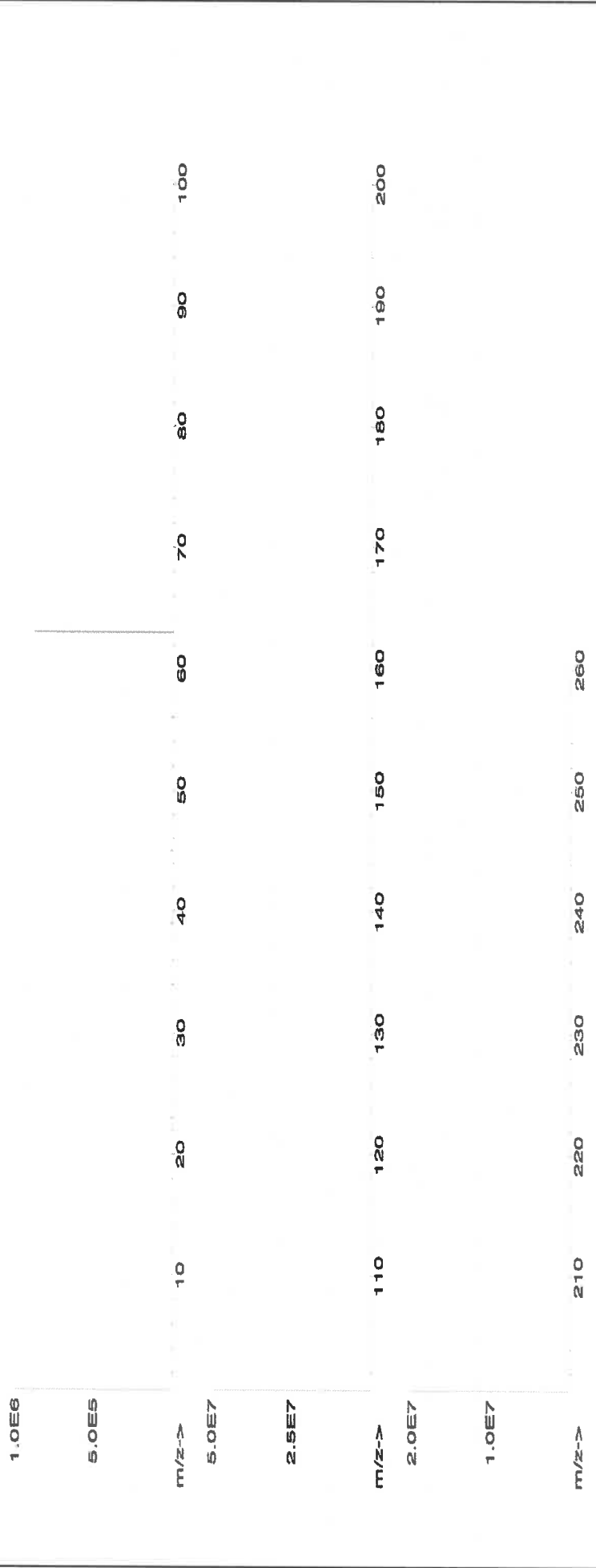
SDS Information

Expanded Uncertainty	(Solvent Safety Info. On Attached pg.)	NIST
+/- (µg/mL)	CAS#	LD50
1000.0	10031-43-3	1 mg/m3 orl-rat 794 mg/kg 3114

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty <th>SDS Information</th>	SDS Information
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1. Copper(II) nitrate trihydrate (Cu) 58129 100223 0.1000 200.0 0.084 1000 10000.1 1000.0 2.2 10031-43-3 1 mg/m3 orl-rat 794 mg/kg 3114

[1] Spectrum No. 1 [33.422 sec]:58029.D# [Count] [Linear]





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	<0.2	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	<0.02	Os	<0.01	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	<0.2	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	T	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.2	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.
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- * 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).



CERTIFIED WEIGHT REPORT:

Part Number: **57082**
Lot Number: **100923**
Description: **Lead (Pb)**

Solvent: **24002546 Nitric Acid**

Lot #

R: 12/20/23 MS747

Expiration Date:

2% 60.0 mL Nitric Acid

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL): **1000**

NIST Test Number: **6UTB**

Weight shown below was diluted to (mL): **3000.41** 5E-05 Balance Uncertainty 0.06 Flask Uncertainty

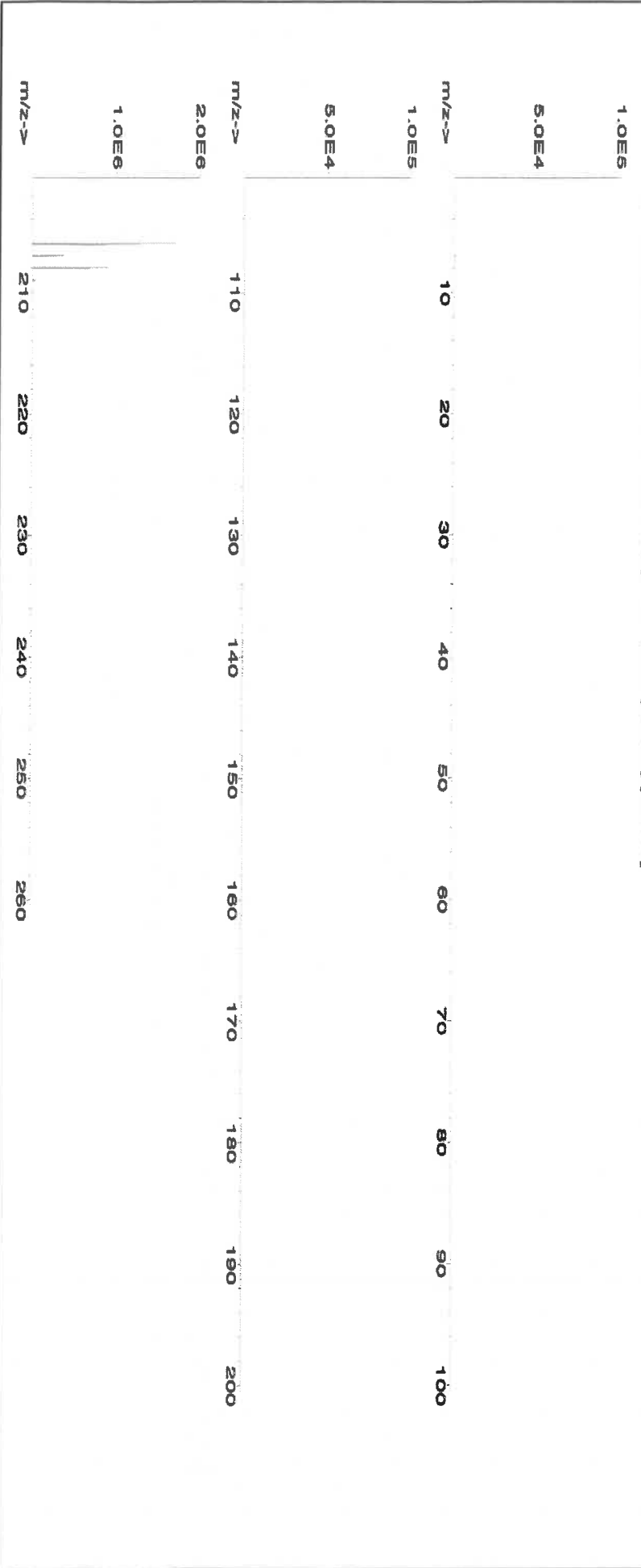
Formulated By:	Lawrence Barry
	100923
Reviewed By:	Pedro L. Rentas
	100923

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)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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1. **Lead(II) nitrate (Pb)** IN029 PB0122016A1 1000 99.999 0.10 62.5 4.80071 4.80077 1000.0 2.0 10099-74-8 0.05 mg/m3 Intvms-ret 89 mg/kg 3128

[1] Spectrum No. 1 [14.144 sec]:58082.D# [Count] [Linear]





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

Trace Metals Verification by ICP-MS ($\mu\text{g/mL}$)

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	<0.2	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	Ba	<0.02	In	<0.02	Mg	<0.01	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

Physical Characterization:

(T) = Target analyte

Certified by:

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

- * 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.
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- * 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).



CERTIFIED WEIGHT REPORT:

Part Number: **57028**
Lot Number: **091223**
Description: **Nickel (NI)**

Lot # **24002546** Solvent: **Nitric Acid**

Expiration Date: **091226**

Recommended Storage: **Ambient (20 °C)**

Nominal Concentration (µg/mL): **1000**

NIST Test Number: **6U7B**

Volume shown below was diluted to (mL): **2000.02**

Balance Uncertainty: **5E-05**

Flask Uncertainty: **0.056**

2.0%

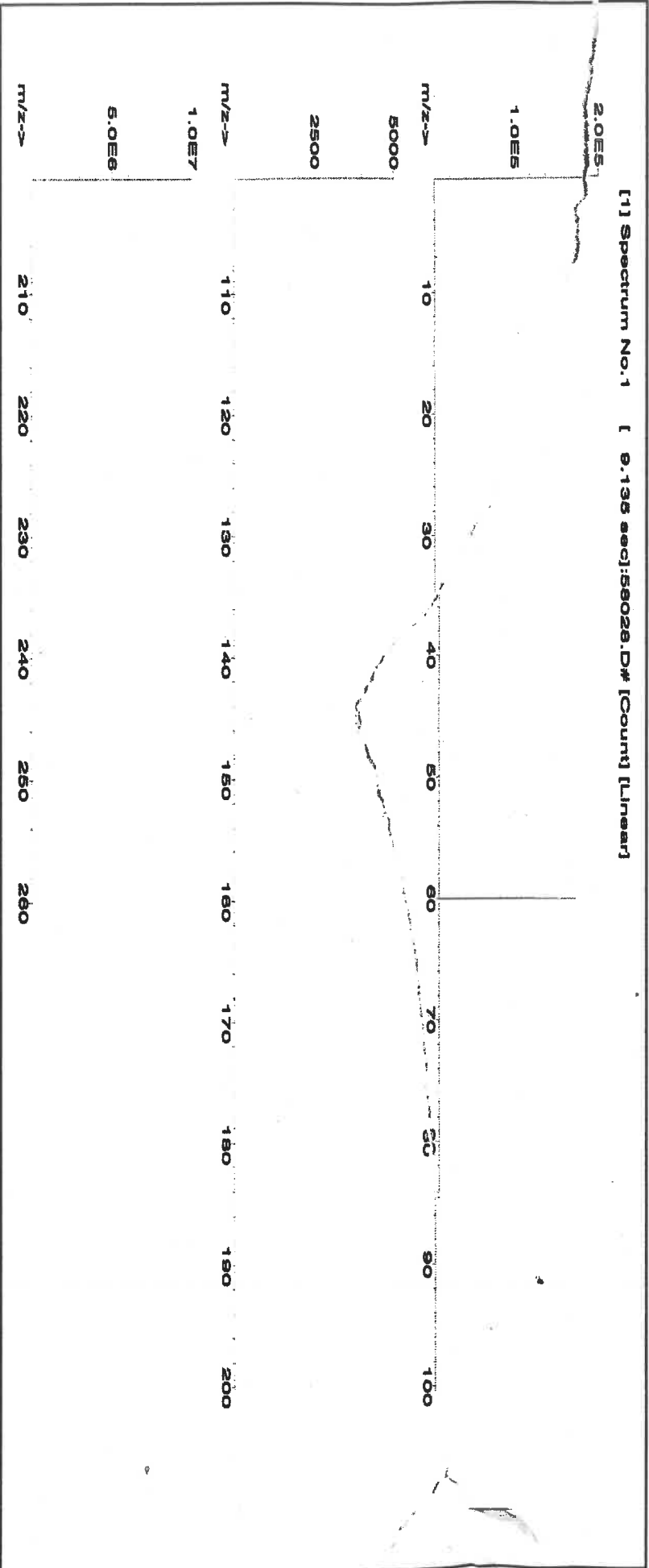
40.0 (mL)

Nitric Acid

Formulated By:	<i>Lawrence Barry</i>	091223
Reviewed By:	<i>Pedro L. Renteria</i>	091223

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty (mL)	Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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1. Nickel(II) nitrate hexahydrate (NI) 58128 062023 0.1000 200.0 0.084 1000 10000.4 1000.0 2.2 13478-00-7 1 mg/m3 or-rel 1620 mg/kg 3136





Instrumental Analysis by Inductively Coupled Plasma Mass Spectroscopy (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	T	Pr	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	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	<0.01	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	Tb	<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 certified (+/-) 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).



CERTIFIED WEIGHT REPORT:

Part Number: 57004
Lot Number: 102523
Description: Beryllium (Be)

Lot # 24002546
Solvent: Nitric Acid

Expiration Date:

102526

2.0%

40.0 (mL)

Nitric Acid

Recommended Storage:

Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

Volume shown below was diluted to (mL):

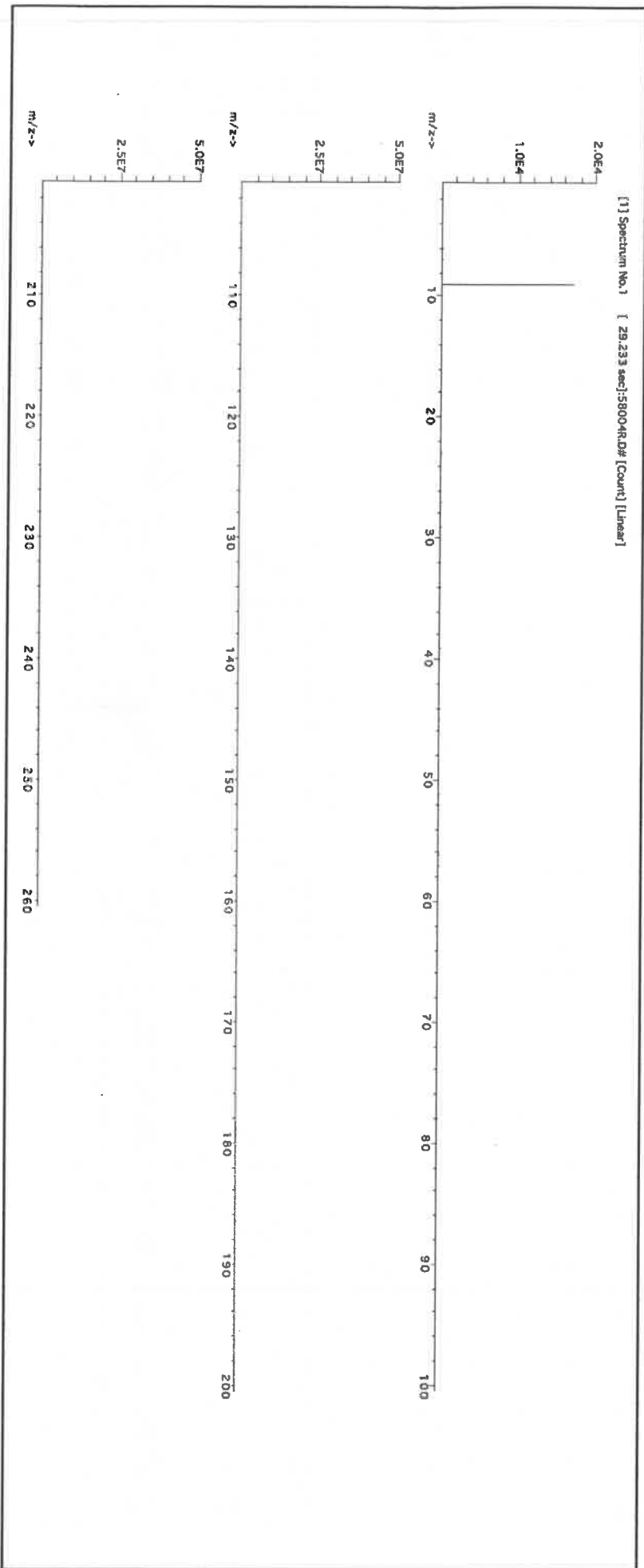
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

Formulated By:	Benson Chan	102523
Reviewed By:	Pedro L. Rentas	102523

SDS Information

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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1. Beryllium nitrate (Be)	58104	091423	0.1000	200.0	0.084	1000	10001.5	1000.0	2.2	13597-99-4	0.2µg/m3	intrinsc-rat 3.16mg/kg	NA
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Instrumental Analysis by Inductively Coupled Plasma Mass Spectrometry (ICP-MS):

Trace Metals Verification by ICP-MS ($\mu\text{g/mL}$)

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Tc	<0.02	U	<0.02
As	<0.02	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.01	Os	<0.02	Rh	<0.02	Ag	<0.02	Ti	<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	T	Cr	<0.02	Ga	<0.02	Fe	<0.02	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	<0.02	Sc	<0.02	Ta	<0.02	Tl	<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 certified (+/-) 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).



Certified Reference Material CRM

CERTIFIED WEIGHT REPORT:

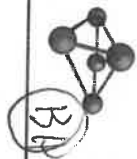
Part Number: 57050
Lot Number: 071123
Description: Tin (Sn)

Solvents: 21110221 Nitric Acid
22D0562008 Hydrochloric acid

Lot #

R-02509124

M599



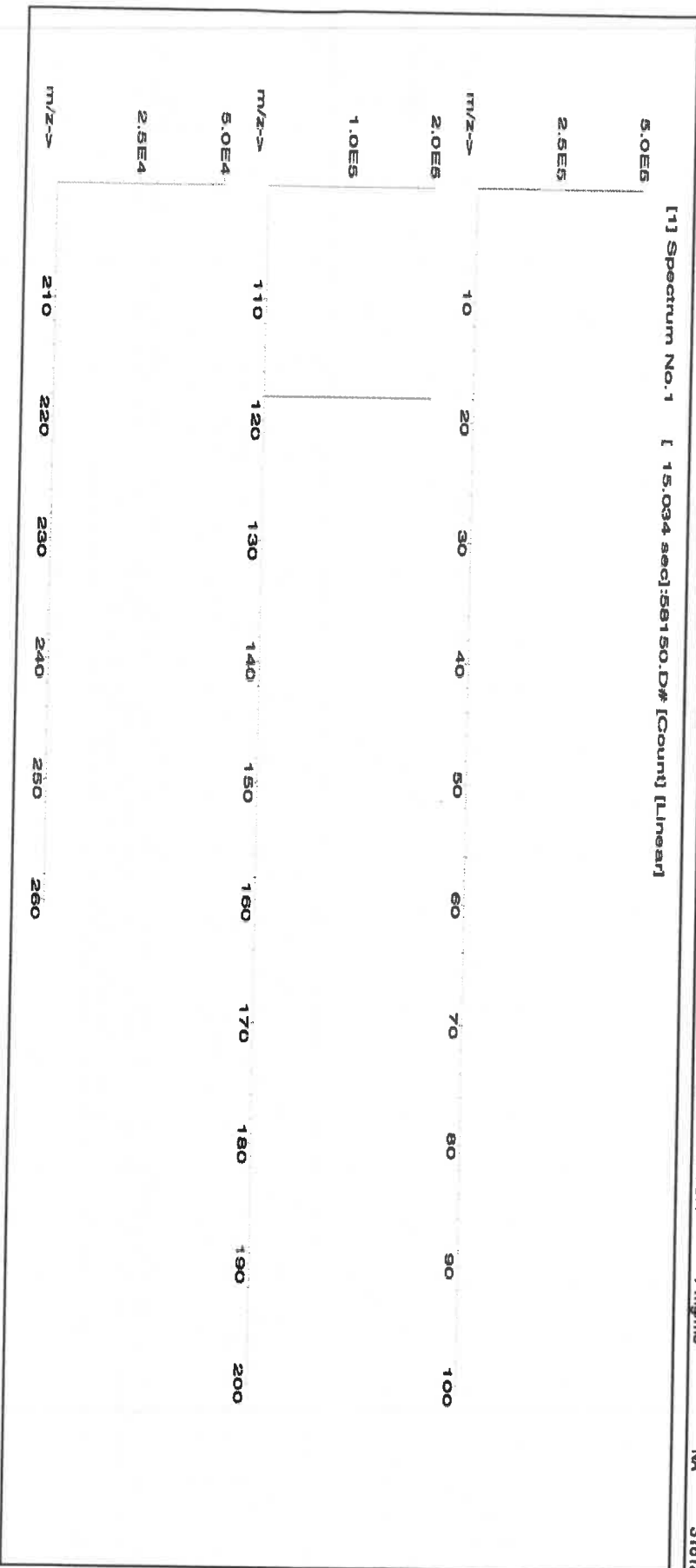
Expiration Date: 071126
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Weight shown below was diluted to (mL): 499.93
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

Formulated By: Benson Chan		071123
Reviewed By: Pedro L. Rientas		071123

Compound		Lot		Nominal	Purity	Uncertainty	Assay	Target	Actual	Actual	Expanded	SDS Information		
RM#	Number	Conc. (µg/mL)	(%)	Purity (%)	(%)	Weight (g)	Weight (g)	Conc. (µg/mL)	+/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	SRM	NIST

1. Ammonium hexafluoroantimonate(V) (Sn) IN010 SMD042023A1 1000 99.999 0.10 44.2 1.13107 1.13286 1001.6 2.0 16919-24-7 7 mg/m3 NA 3161a

[1] Spectrum No. 1 [15.034 sec]:56150.D# [Count] [Linear]





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	<0.2	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	<0.01	Os	<0.02	Rh	<0.02	Ag	<0.02	Ti	<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	<500	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	Ta	<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	Tl	<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 certified (+/-) 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).



R: 02/09/24 115800 (54)

CERTIFIED WEIGHT REPORT:

Part Number: 57027
Lot Number: 091923
Description: Cobalt (Co)

Expiration Date: 091926
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB

Volume shown below was diluted to (mL): 2000.02

5E-05 Balance Uncertainty
0.058 Flask Uncertainty

Lot # 24002546
Solvent: Nitric Acid

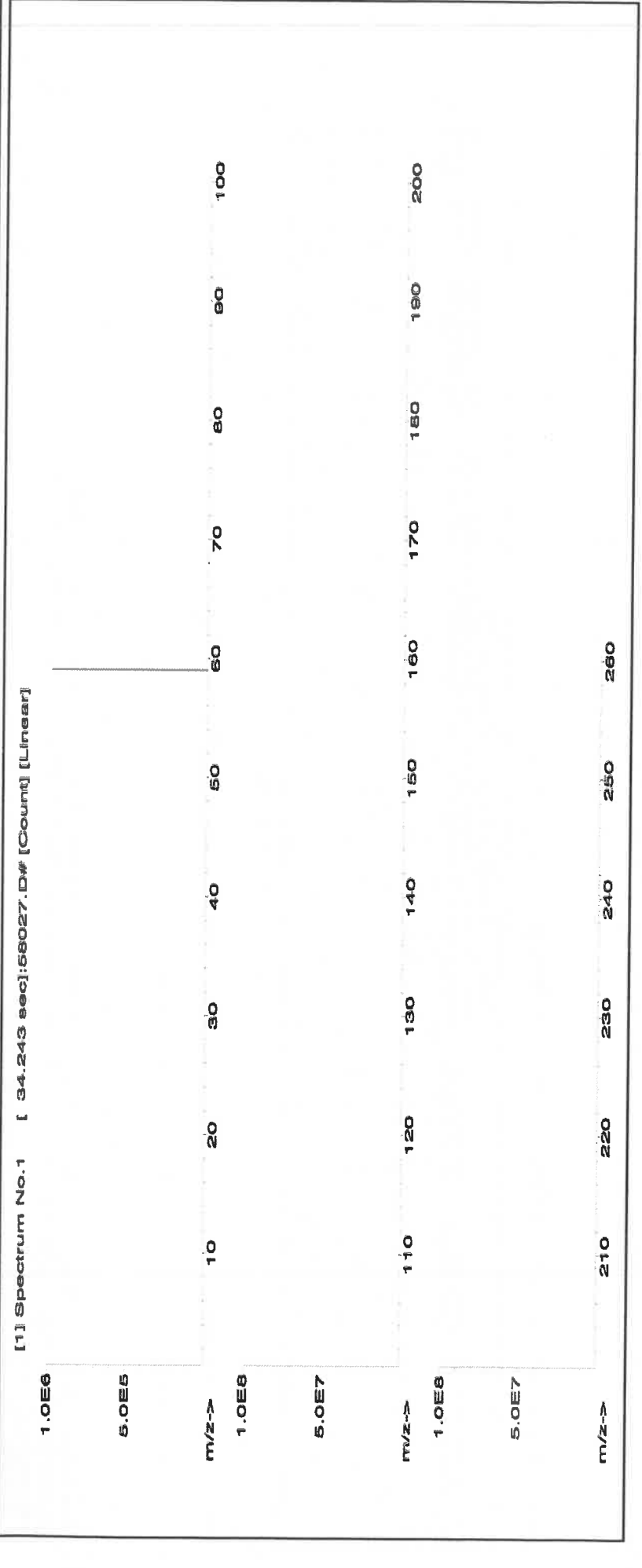
2.0% Nitric Acid
40.0 (mL)

Formulated By:	Lawrence Barry
Reviewed By:	Pedro L. Rentas

SDS Information

Expanded Uncertainty +/- (µg/mL)
(Solvent Safety Info. On Attached pg.)
NIST SRM
CAS# OSHA PEL (TWA) LD50

1. Cobalt(II) nitrate hexahydrate (Co) 58127 050923 0.1000 200.0 0.084 1000 10000.0 1000.0 2.2 10026-22-9 0.02 mg/m3 orl-rat 691 mg/kg 3113





Instrumental Analysis by Inductively Coupled Plasma Mass Spectroscopy (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	<0.2	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	<0.02	Os	<0.01	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	<0.2	Na	<0.02	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	T	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	<0.2	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 certified (+/-) 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).



CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57033
111323
Arsenic (As)

Lot #
Solvent:

24002546
Nitric Acid

2.0%

80.0

Nitric Acid

Expiration Date:
Recommended Storage:
Nominal Concentration (µg/mL):

111326
Ambient (20 °C)
1000

NIST Test Number:
Volume shown below was diluted to (mL):

6UTB
4000.0

5E-05
Balance Uncertainty
0.06
Flask Uncertainty

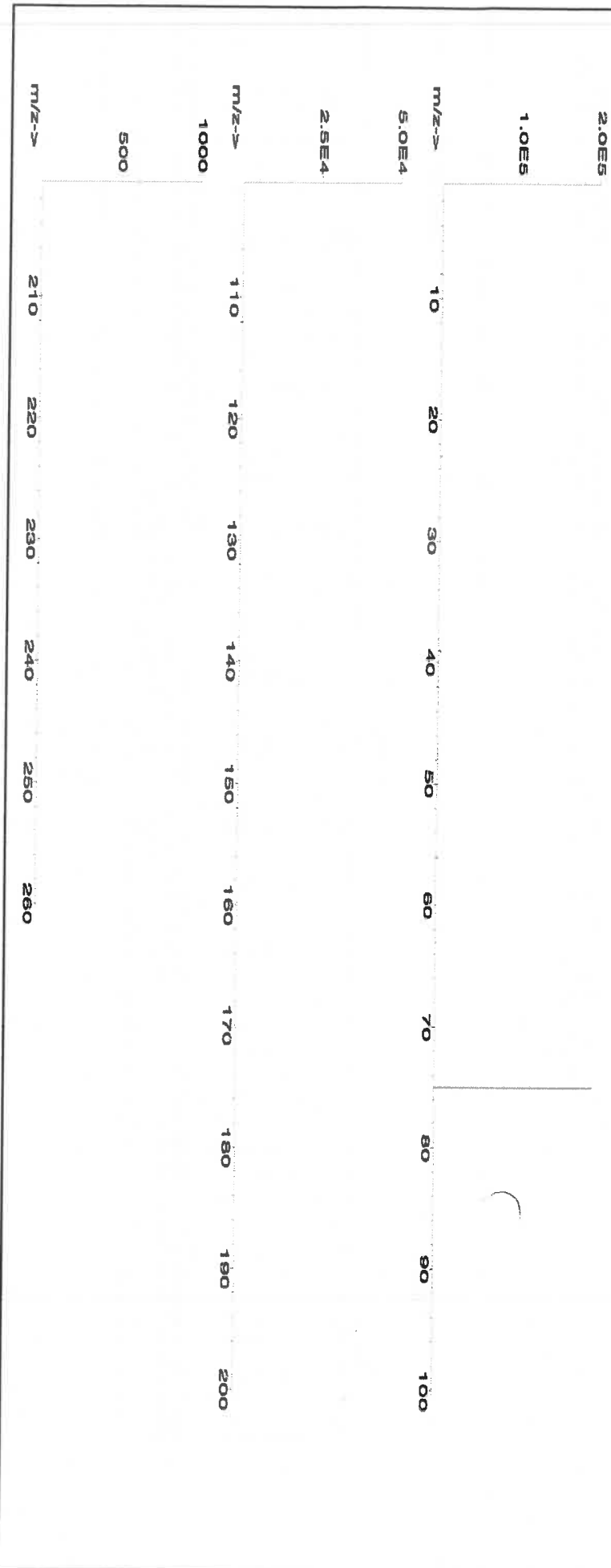
Formulated By:	Lawrence Barry	111323
Reviewed By:	Pedro L. Rendas	111323

Compound

Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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1. Arsenic (As)	58133	020522	0.1000	400.0	0.084	1000	10001.0	1000.0	2.0	7440-38-2	0.5 mg/m3	or-rat 500 mg/kg	3103a
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[1] Spectrum No.1 [34.433 sec]:57033.D# [Count] [Linear]





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	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	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	T	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.01	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	Tl	<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	Sa	<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.
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- * Standards are certified (+/-) 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).



CERTIFIED WEIGHT REPORT:

Part Number: **57005**
Lot Number: **071123**
Description: **Boron (B)**

Solvent: MKB0857V Ammonium hydroxide

Lot #

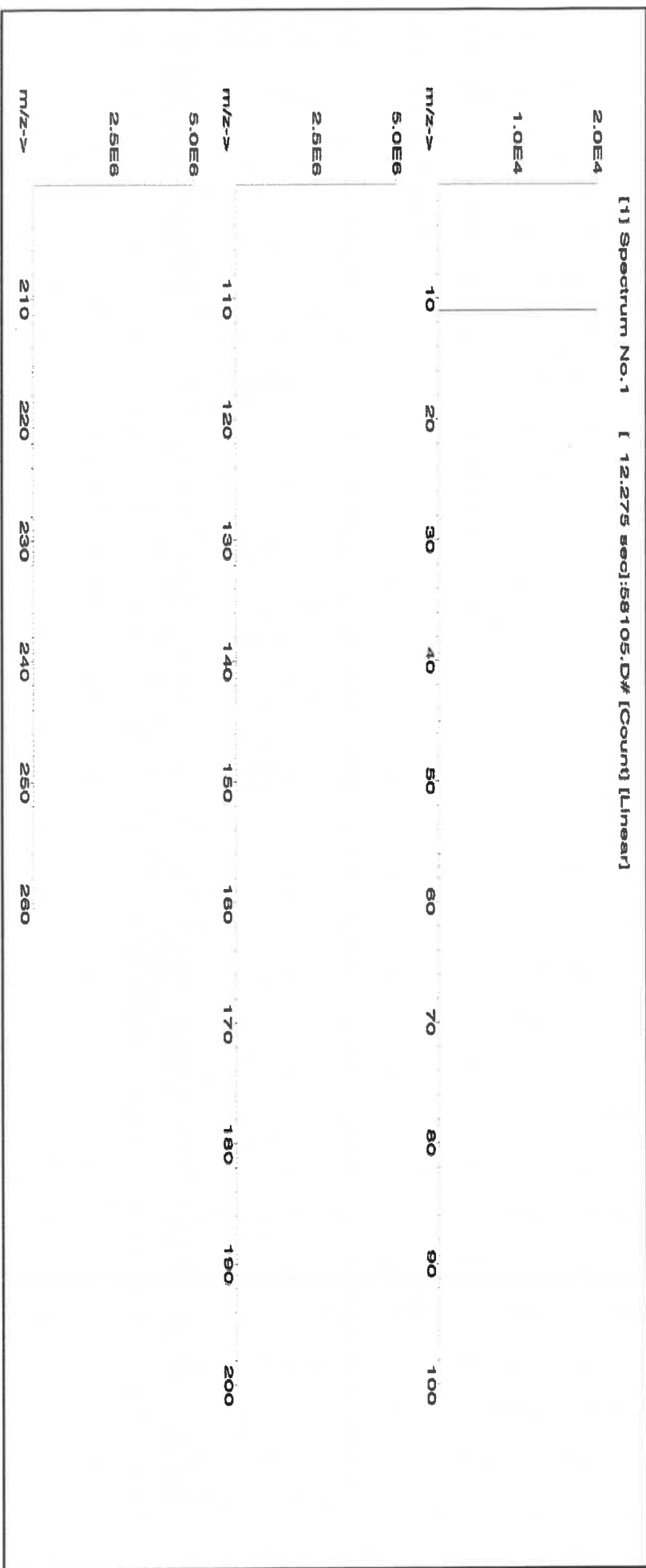
AI: 021009124 M5814

Expiration Date: 071126
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Weight shown below was diluted to (mL): 1999.48 0.058 Balance Uncertainty
2.0% 40.0 Ammonium hydroxide (mL)

Formulated By:	Benson Chan
Reviewed By:	Pedro L. Rientas
071123	

SDS Information									
Compound	Lot	Nominal	Purity	Uncertainty	Assay	Target	Actual	Actual	NIST
	Number	Conc. (µg/mL)	(%)	Purity (%)	(%)	Weight (g)	Weight (g)	Conc. (µg/mL)	SRM

1. Boric acid (B) IN018 BV082018A1 1000 99.999 0.10 17.3 11.55772 11.56201 1000.4 2.0 10043-35-3 2 mg/m3 or-nat 2660 mg/kg 3107





Instrumental Analysis by Inductively Coupled Plasma Mass Spectroscopy (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	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	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	<0.01	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	T	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:

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- * 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).



CERTIFIED WEIGHT REPORT:

Part Number: 57115
Lot Number: 041723
Description: Phosphorous (P)

Solvent: 21110221 Nitric Acid

Lot #

R102109124 M5815

Expiration Date: 041726
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 10000
NIST Test Number: 6UTB

2% 40.0 (mL) Nitric Acid

Weight shown below was diluted to (mL): 2000.02 0.058 Balance Uncertainty
Flask Uncertainty

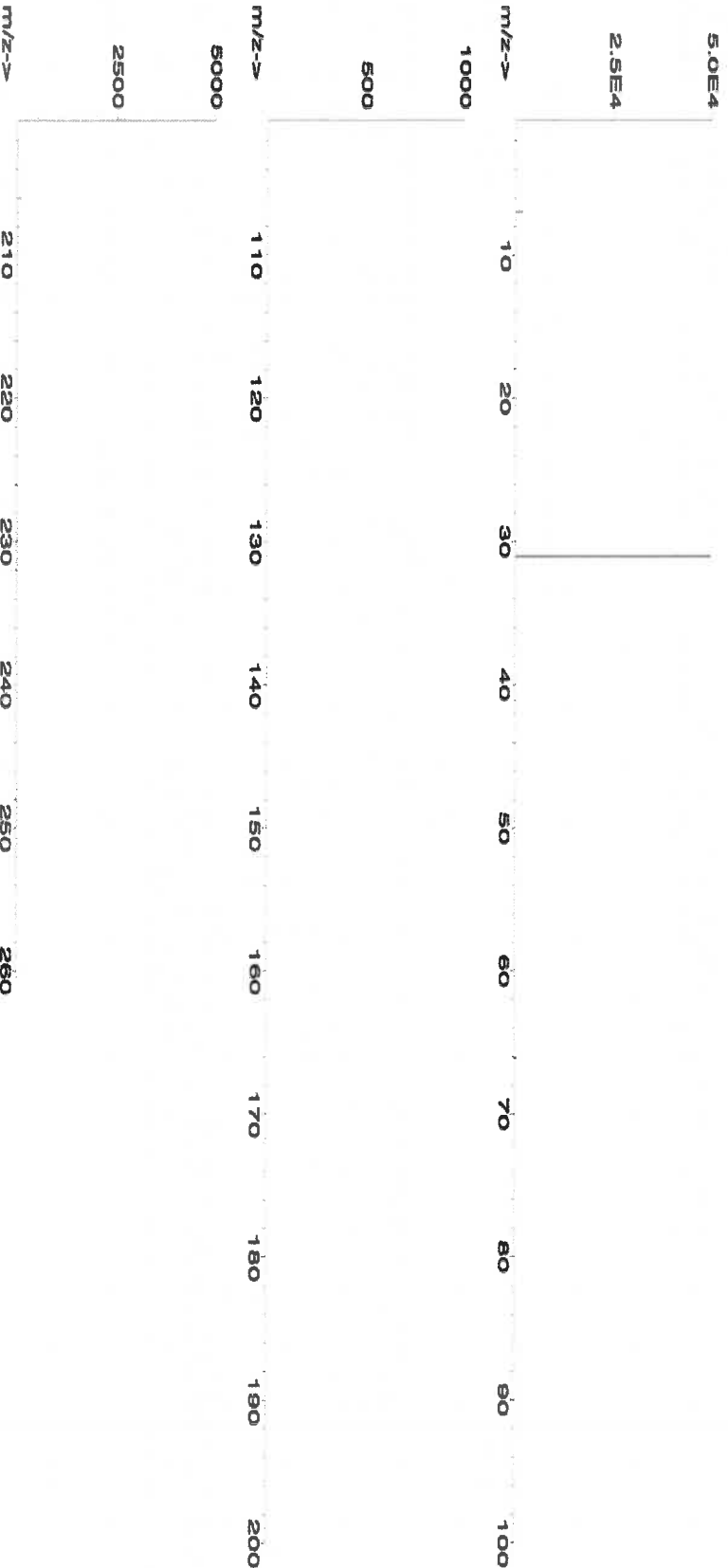
Formulated By: Lawrence Barry	041723
Reviewed By: Pedro L. Rentas	041723

SDS Information

Compound	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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1. Ammonium dihydrogen phosphate (P) IN008 PVR2019A1 10000 99.999 0.10 27.5 72.7287 72.7289 10000.0 20.0 7722-76-1 5 mg/m3 or-hal >2000mg/kg 3186

[1] Spectrum No.1 [12.074 sec]:58115.D# [Count] [Linear]





Instrumental Analysis by Inductively Coupled Plasma Mass Spectroscopy (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	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	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	<0.01	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	T	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 certified (+/-) 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).



CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57016
122923
Sulfur (S)

Lot #

ASTM Type 1 Water

Formulated By:	Benson Chan	122923
Reviewed By:	Pedro L. Rentas	122923

Expiration Date: 122926
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000

NIST Test Number: 6L7B
Weight shown below was diluted to (mL): 4000.0
SE-05 Balance Uncertainty
0.06 Flask Uncertainty

Compound

RM#	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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1. Ammonium sulfate (S) IN117 SLBR725V 1000 99.9 0.10 24.3 16.4979 16.4980 1000.0 2.0 7783-20-2 NA 0.01-0.14250mg/kg 3181

[1] Spectrum No. 1 [33.603 sec]:57016.D# [Count] [Linear]





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	<0.2	Er	<0.02	Ho	<0.02	La	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Te	<0.02	U	<0.02
As	<0.2	Ce	<0.02	Ba	<0.02	In	<0.02	Mg	<0.01	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	Ru	<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	S	<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	Ta	<0.02	Ti	<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.
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- * Standards are certified (+/-) 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).



CERTIFIED WEIGHT REPORT:

Part Number: **57116**
Lot Number: **071123**
Description: **Sulfur (S)**

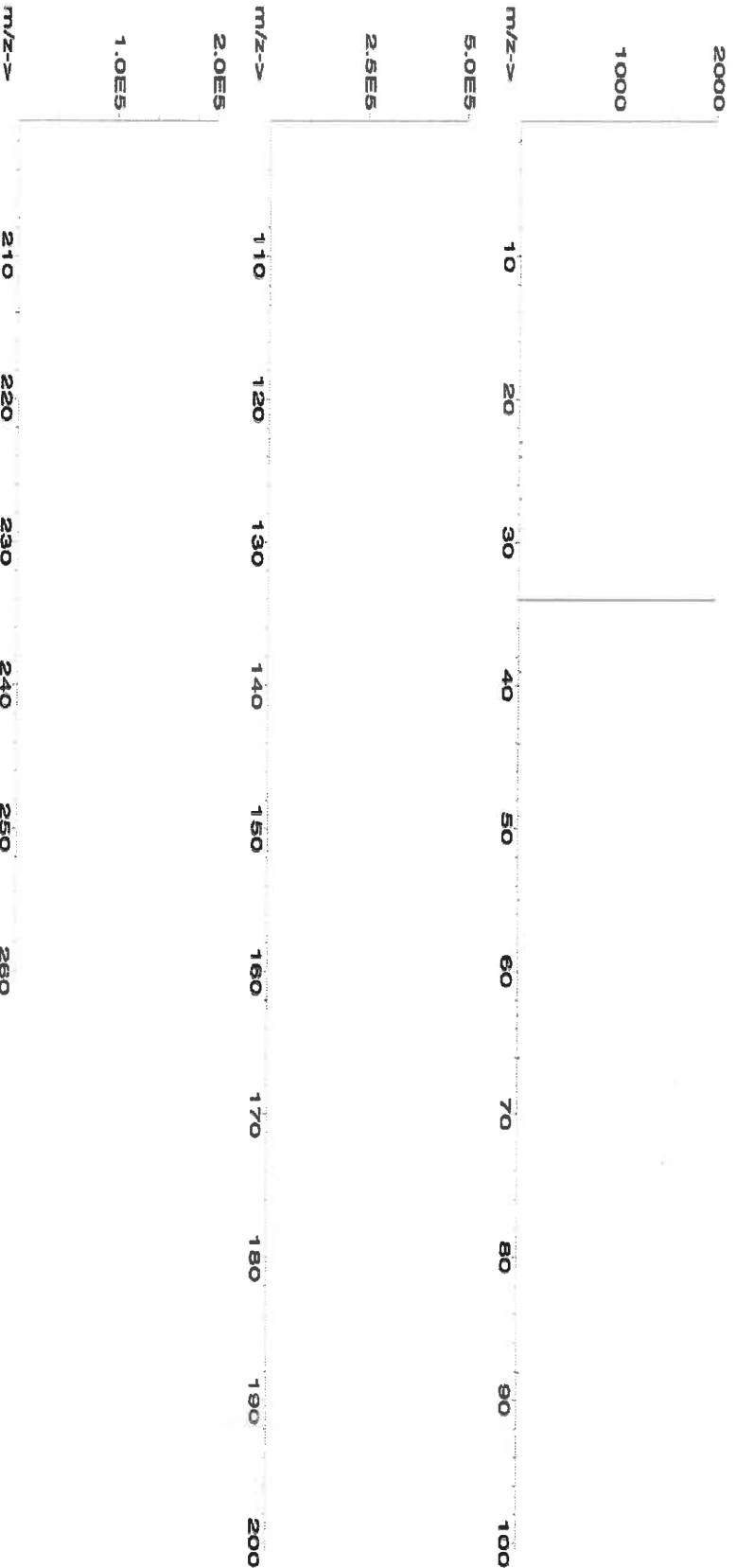
Lot #
Solvent: 071123
ASTM Type 1 Water

Formulated By:	Lawrence Barry
Reviewed By:	
Pedro L. Rentas	
071123	

Expiration Date: 071126
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 10000
NIST Test Number: 6UTB
Weight shown below was diluted to (mL): 1999.48
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

SDS Information									
Compound	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)
Ammonium sulfate (S)	IN117 SLBR7225V	10000	99.9	0.10	24.3	82.4675	82.4692	10000.1	20.0
						7763-20-2	NA	oralal 4250mg/kg	3181

[1] Spectrum No. 1 [24.004 sec]:58116.D# [Count] [Linear]





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	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	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	<0.01	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	T	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

Physical Characterization:

(T)= Target analyte

Certified by:

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

- * 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 certified (+/-) 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).



CERTIFIED WEIGHT REPORT:

Part Number: 58030
Lot Number: 111623
Description: Zinc (Zn)

Solvent: 24002546 Nitric Acid

2% 60.0 (mL) Nitric Acid

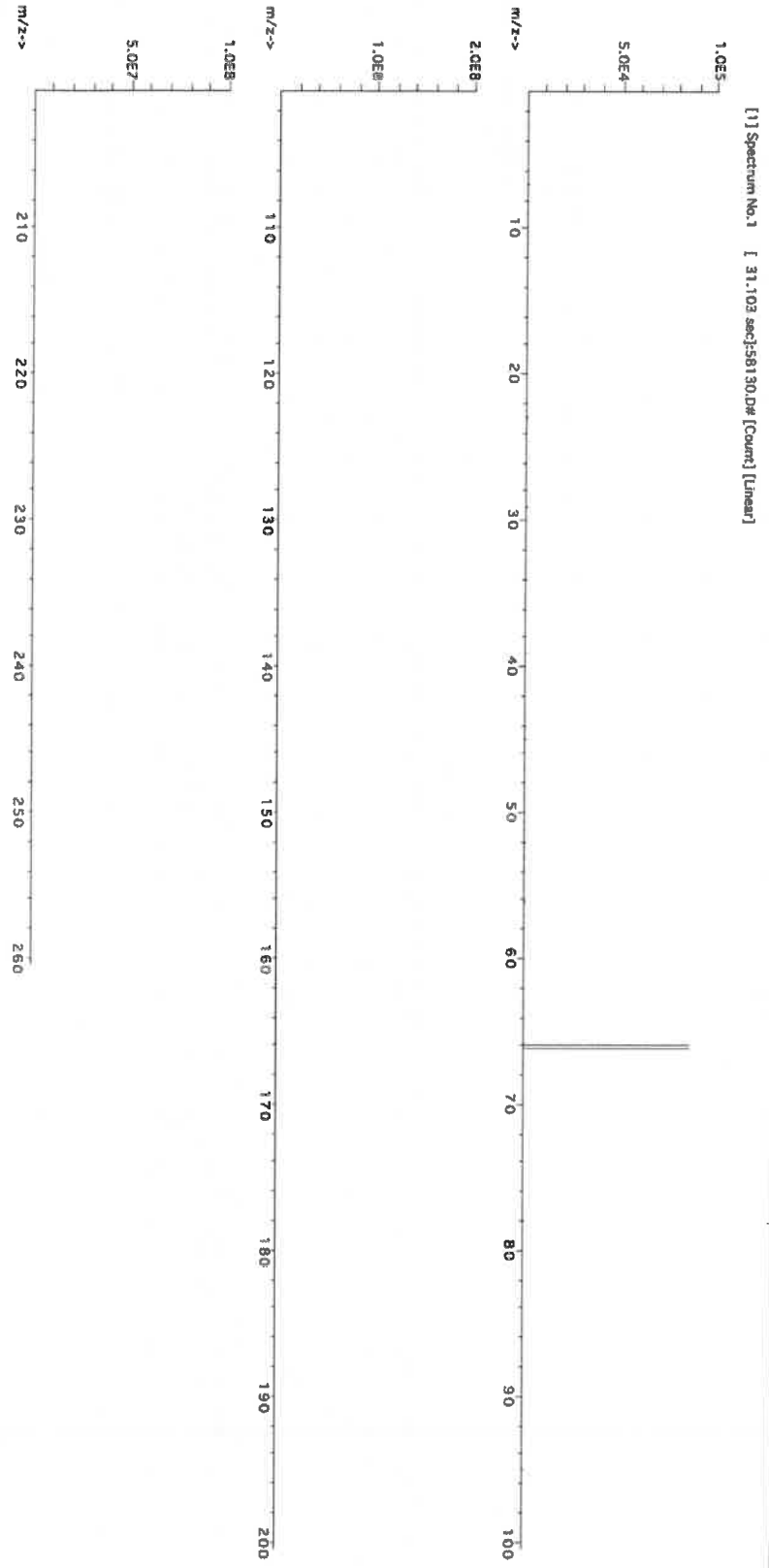
Expiration Date: 111626
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB

Weight shown below was diluted to (mL): 3000.4 0.06 Balance Uncertainty Flask Uncertainty

Formulated By:	Benson Chan
Reviewed By:	Pedro L. Reitas
111623	

Compound	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LDSO	NIST SRM
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1. Zinc nitrate hexahydrate (Zn) IN016 ZNE03021A1 1000 99.999 0.10 24.3 12.3475 12.3502 1000.2 2.0 10196-16-6 1 mg/mL 3168





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	<0.2	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	Bu	<0.02	In	<0.02	Mg	<0.01	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 certified (+/-) 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).



CERTIFIED WEIGHT REPORT:

Part Number: **57015**
Lot Number: **091123**
Description: **Phosphorous (P)**

Solvent: **24002546 Nitric Acid**

Lot #

R: 02109124 M5820

Formulated By:	Lawrence Barry
	091123
Reviewed By:	Pedro L. Rentas
	091123

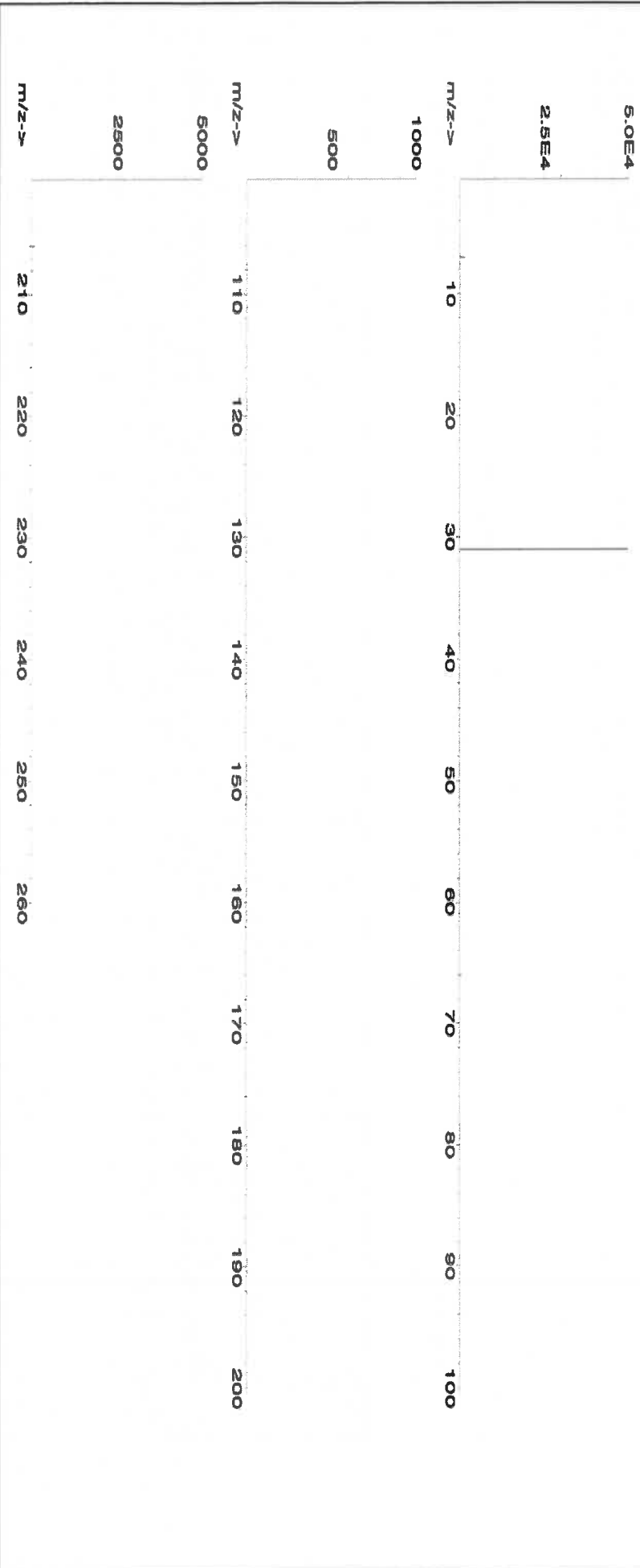
Expiration Date: 091126
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6LJB
Weight shown below was diluted to (mL): 2000.02
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

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)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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1. Ammonium dihydrogen phosphate (P) IN008 PY062019A1 1000 99.999 0.10 27.5 7.2729 7.2730 1000.0 2.0 7722-76-1 5 mg/m3 xH-rat >2000mg/kg 3186

[1] Spectrum No.1 [12.074 sec]:58115.D# [Count] [Linear]





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

Trace Metals Verification by ICP-MS ($\mu\text{g/mL}$)

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	<0.2	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Tc	<0.02	U	<0.02
As	<0.2	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.01	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	T	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	Sa	<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 certified (+/-) 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).

M5959 R: 6/14/24

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).



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
Catalog Number: CGY10
Lot Number: V2-Y740548
Matrix: 2% (v/v) HNO₃
Value / Analyte(s): 10 000 µg/mL ea:
Yttrium
Starting Material: Yttrium Oxide
Starting Material Lot#: 2661 and 06230520YL
Starting Material Purity: 99.9984%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10000 ± 30 µg/mL
Density: 1.032 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1	10011 ± 25 µg/mL EDTA NIST SRM 928 Lot Number: 928
Assay Method #2	9997 ± 50 µg/mL ICP Assay NIST SRM 3167a Lot Number: 190730
Assay Method #3	9984 ± 31 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:

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

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:

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

$$CRM/RM \text{ Expanded Uncertainty } (z) = U_{CRM/RM} = k(u_{char}^2 + u_{bb}^2 + u_{lts}^2 + u_{ts}^2)^{1/2}$$

k = coverage factor = 2

$u_{char} = [\sum(w_i)^2(u_{char i}^2)]^{1/2}$ 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

$$CRM/RM \text{ Expanded Uncertainty } (z) = U_{CRM/RM} = k(u_{char a}^2 + u_{bb}^2 + u_{lts}^2 + u_{ts}^2)^{1/2}$$

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)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M Ag <	0.004600	M Eu	0.009037	M Na	0.086360	M Se <	0.005200	M Zn	0.030125
M Al	0.014862	O Fe	0.002410	M Nb <	0.000570	O Si	0.024100	O Zr <	0.002600
M As <	0.003500	M Ga <	0.000570	M Nd	0.000923	M Sm	0.000461		
M Au <	0.001700	M Gd <	0.003500	M Ni <	0.005700	M Sn <	0.002300		
O B	0.002209	M Ge <	0.005200	M Os <	0.001200	M Sr <	0.004600		
O Ba <	0.002500	M Hf <	0.000570	n P <		M Ta <	0.000570		
O Be <	0.001400	M Hg <	0.000570	M Pb	0.005020	M Tb	0.001044		
M Bi <	0.003500	M Ho	0.009037	M Pd <	0.005100	M Te <	0.002300		
O Ca	0.009841	M In <	0.002300	M Pr <	0.002300	M Th <	0.000570		
M Cd <	0.000570	M Ir <	0.000570	M Pt <	0.000570	M Ti <	0.003500		
M Ce <	0.002300	O K	0.018677	M Rb <	0.000570	M Tl <	0.000570		
M Co <	0.000570	M La	0.000461	M Re <	0.000570	M Tm <	0.003500		
M Cr <	0.004000	O Li <	0.009300	M Rh <	0.008000	M U <	0.000570		
M Cs <	0.000570	M Lu	0.000582	M Ru <	0.000570	M V	0.001265		
M Cu	0.002610	O Mg	0.001486	n S <		M W <	0.002300		
M Dy	0.003815	M Mn	0.000582	M Sb	0.005422	s Y <			
M Er	0.003615	M Mo <	0.005700	M Sc <	0.001200	M Yb	0.001827		

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

6.1 This standard is intended for the calibration of analytical instruments and validation of analytical methods as appropriate. This CRM may be used in connection with EPA Methods 6010, 6020 (all versions), Standard Methods 3120 B and USP <232> / ICH Q3D.

6.2 For products attaining traceability through Inorganic Ventures' Primary Certified Reference Materials (PCRM™) see the Limited License to Use PCRM™ in the Inorganic Ventures Terms and Conditions of Sale, <https://www.inorganicventures.com/terms-and-conditions-sale>. The Terms and Conditions contain information on the use of materials traceable to PCRM™ certified reference materials. This Limited License agreement is especially pertinent for laboratories accredited under ISO:17034.

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 - 88.91 +3 6 Y(OH)(H₂O)_{x+2}

Chemical Compatibility -Soluble in HCl, H₂SO₄ and HNO₃. Avoid HF, H₃PO₄ and neutral to basic media.

Stable with most metals and inorganic anions forming an insoluble carbonate, oxide, oxalate, and fluoride.

Avoid mixing with elements / solutions containing moderate amounts of fluoride.

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.

Y Containing Samples (Preparation and Solution) - Metal (Soluble in acids); Oxide (Dissolve by heating in H₂O / HNO₃); Ores (Carbonate fusion in PtO followed by HCl dissolution); Organic Matrices (Dry ash and dissolve in 1:1 H₂O / HCl or HNO₃).

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 89 amu	0.8 ppt	N/A	73Ge16O, 178Hf+2
ICP-OES 360.073 nm	0.005 / 0.000036 µg/mL	1	Ce, Th
ICP-OES 371.030 nm	0.004 / 0.00007 µg/mL	1	Ce
ICP-OES 377.433 nm	0.005 / 0.0009 µg/mL	1	Ta, Th

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

February 20, 2024

- 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

- February 20, 2029

- 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
Custom Processing Supervisor



Certificate Approved By:

Muzzammil Khan
Stock Laboratory Supervisor



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





CERTIFIED WEIGHT REPORT:

Part Number: **57028**

Lot Number: **041124**

Description: **Nickel (NI)**

Solvent: **24002546 Nitric Acid**

Lot #

MS961 R-1 6/11/24

Expiration Date:

041127

2% 5.0 Nitric Acid

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

Weight shown below was diluted to (mL):

249.85 5E-05 Balance Uncertainty
0.002 Flask Uncertainty

Formulated By:	Brian Geddes	041124
Reviewed By:	Pedro L. Rentas	041124

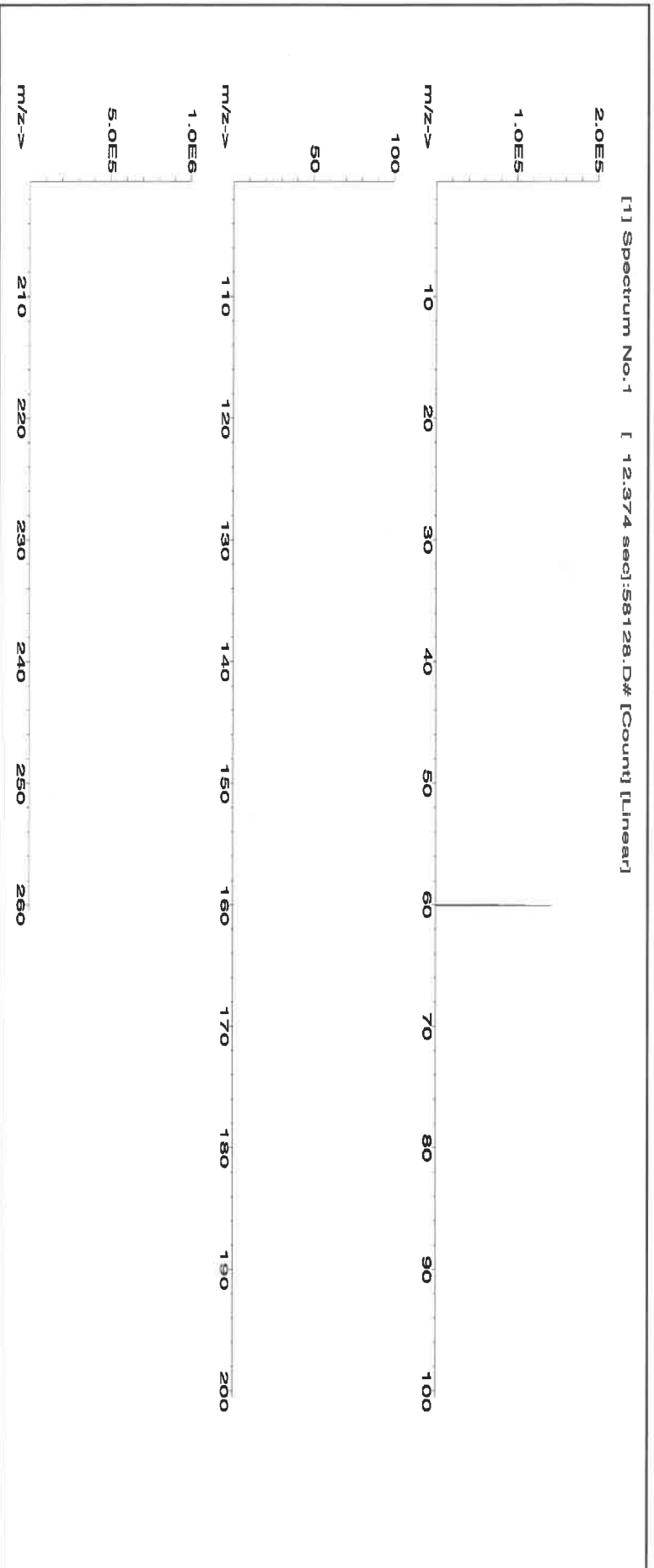
SDS Information

Compound

Compound	Lot	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	SRM
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1. Nickel(II) nitrate hexahydrate (NI) IN033 NIM052023A1 1000 99.999 0.10 20.2 1.2369 1.2369 **1000.0** **2.0** 13478-00-7 1 mg/m3 or-rat 1620 mg/kg 3136

[1] Spectrum No.1 [12.374 sec]:58128.D# [Count] [Linear]





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	T	Pr	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	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	Ba	<0.02	In	<0.02	Mg	<0.01	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
Bc	<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 certified (+/-) 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).



R: 06/14/2014



Lot # **Solvent:**

24002546

Nitric Acid

Selenium (Se)

Expiration Date:

Recommended Storage:

Nominal Concentration ($\mu\text{g/mL}$):

NIST Test Number:

Volume shown below was diluted to (mL): 2000.07

5E-05 Balance Uncertainty

0.100 Flask Uncertainty

Formulated By:	 Benson Chan	060624
Reviewed By:	 Pedro L. Rentas	060624

SDS Information

Expanded

Uncertainty

(Solvent Safety Info. On Attached pg.)

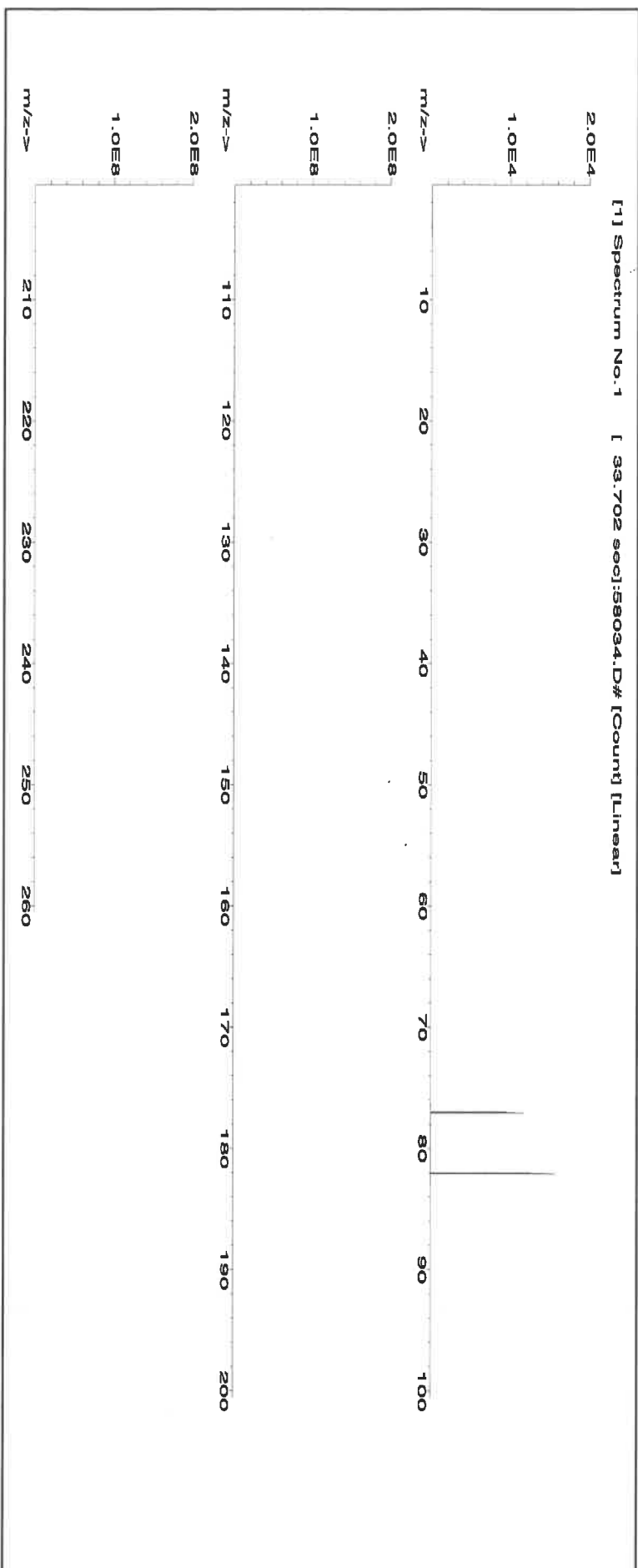
 $\pm$ (μg/mL)

CAS#	OSHA PEL (TWA)
------	----------------

1050

SRM

1. Selenium (Se)	58134	071223	0.1000	200.0	0.084	1000	10002.5	1000.0	2.2	7782-49-2	0.2 mg/m3	oral rat 6700 mg/kg	3149
------------------	-------	--------	--------	-------	-------	------	---------	---------------	------------	-----------	-----------	---------------------	------





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	Pt	<0.02	Se	T	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	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	<0.01	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	Ru	<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	Sr	<0.02	S	<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	Ta	<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		<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 certified (+/-) 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
M5970 M5971 R1 710124



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

CERTIFIED WEIGHT REPORT:

Part Number: **57003**
Lot Number: **062124**
Description: **Lithium (Li)**
Expiration Date: **06/127**
Recommended Storage: **Ambient (20 °C)**
Nominal Concentration (µg/mL): **1000**
NIST Test Number: **6UTB**
Volume shown below was diluted to (mL): **250.11**
SE-05 Balance Uncertainty
0.016 Flask Uncertainty

Lot # **24002546**
Solvent: **Nitric Acid**

2.0% 5.0 (mL) Nitric Acid

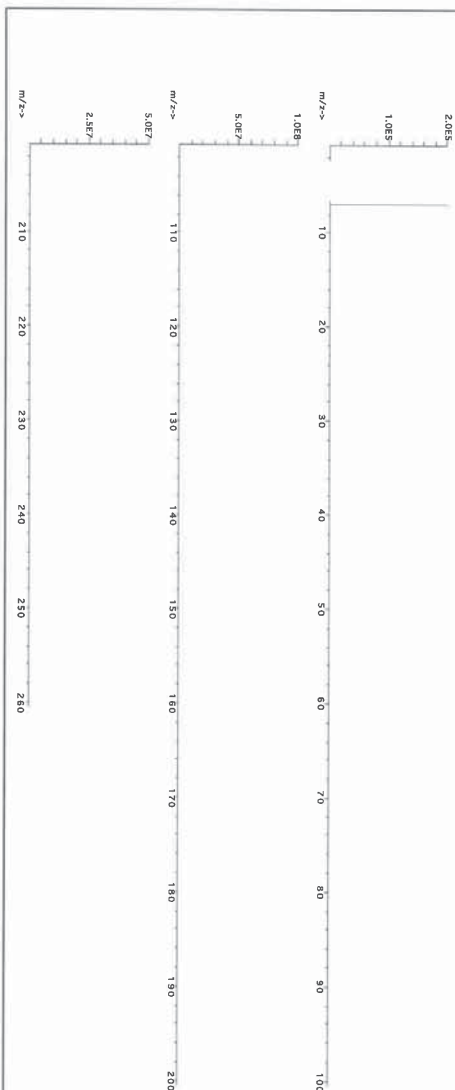
Microvial Capable	
Formulated By:	062124
Giovanni Esposito	

Reviewed By: *[Signature]*
Pietro L. Parias

Compound		Part		Lot		Dilution		Initial		Uncertainty		Nominal		Initial		Final		Expanded		SDS Information		NIST	
Number	Factor	Number	Factor	Number	Factor	Vol. (mL)	Pipette (mL)	Conc. (µg/mL)	Conc. (µg/mL)	Vol. (mL)	Pipette (mL)	Conc. (µg/mL)	Conc. (µg/mL)	Vol. (mL)	Pipette (mL)	Conc. (µg/mL)	Conc. (µg/mL)	Uncertainty	± (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	SM

1. Lithium nitrate (Li) 58103 070622 0.1000 25.0 0.004 1000 10000.4 1000.0 2.0 7790-68-4 5 mg/m3 or-hal 1428 mg/kg NA

[1] Spectrum No. 1 [32.093 sec; 15000.0Hz Count [Lines]





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

Trace Metals Verification by ICP-MS (µg/mL)															
Al	<0.02	Ca	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pb	<0.02	Se	<0.02
Sb	<0.02	Ce	<0.2	Er	<0.02	In	<0.02	Mg	<0.02	Nb	<0.02	Rb	<0.02	Si	<0.02
As	<0.2	Ce	<0.02	Eu	<0.02	Ir	<0.02	Mn	<0.02	Os	<0.02	Rh	<0.02	Ag	<0.02
Ba	<0.02	Cr	<0.02	Gd	<0.02	Te	<0.2	Hg	<0.2	Pd	<0.02	Ru	<0.02	Nd	<0.2
Be	<0.01	Cr	<0.02	Ga	<0.02	Ta	<0.02	K	<0.02	P	<0.02	Sn	<0.02	Sr	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	Tb	<0.02	Mo	<0.02	Fe	<0.2	Sb	<0.02	Sc	<0.02
B	<0.02	Co	<0.02	Au	<0.02	Ti	<0.02	Nd	<0.02	K	<0.2	Se	<0.02	Ta	<0.02

(T) = Target analyte

Physical Characterization:

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

Certified by:

[Signature]

- * 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 certified (+/-) 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

M5976, M5977

R: 02/22/24

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).



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
Catalog Number: CGMO1
Lot Number: T2-MO720876
Matrix: H2O
tr. NH4OH
Value / Analyte(s): 1 000 µg/mL ea:
Molybdenum
Starting Material: Ammonium Molybdate
Starting Material Lot#: 2361
Starting Material Purity: 99.9893%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 998 ± 7 µg/mL
Density: 1.000 g/mL (measured at 20 ± 4 °C)
Assay Information:

Assay Method #1 998 ± 4 µg/mL
ICP Assay NIST SRM 3134 Lot Number: 130418

- 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:

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

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.

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

$$CRM/RM \text{ Expanded Uncertainty } (\pm) = U_{CRM/RM} = k(u_{char}^2 + u_{bb}^2 + u_{lts}^2 + u_{ts}^2)^{1/2}$$

k = coverage factor = 2

$u_{char} = [\sum(w_i)^2(u_{char i}^2)]^{1/2}$ 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

$$CRM/RM \text{ Expanded Uncertainty } (\pm) = U_{CRM/RM} = k(u_{char a}^2 + u_{bb}^2 + u_{lts}^2 + u_{ts}^2)^{1/2}$$

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)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.000590	M	Eu	<	0.000300	M	Na		0.000879	M	Se	<	0.008000	M	Zn		0.000598
M	Al		0.000563	M	Fe	<	0.006500	M	Nb	<	0.029000	i	Si	<		M	Zr	<	0.001800
M	As	<	0.002100	M	Ga	<	0.000300	i	Nd	<		M	Sm	<	0.000300				
M	Au	<	0.000300	M	Gd	<	0.000300	M	Ni	<	0.008000	M	Sn	<	0.008900				
M	B	<	0.003300	M	Ge	<	0.000300	M	Os	<	0.000590	M	Sr		0.000175				
M	Ba		0.001689	M	Hf	<	0.001800	i	P	<		M	Ta	<	0.004200				
M	Be	<	0.000890	M	Hg	<	0.003300	M	Pb	<	0.000300	M	Tb	<	0.000300				
M	Bi	<	0.000890	M	Ho	<	0.000300	M	Pd	<	0.001800	M	Te	<	0.021000				
O	Ca		0.006334	M	In	<	0.032000	M	Pr	<	0.013000	M	Th	<	0.000300				
O	Cd	<	0.026000	M	Ir	<	0.000300	M	Pt	<	0.000300	O	Tl	<	0.032000				
M	Ce	<	0.008300	M	K		0.130213	M	Rb		0.004575	M	Tl		0.001266				
M	Co		0.000598	M	La	<	0.000300	M	Re	<	0.000300	M	Tm	<	0.000300				
M	Cr		0.000527	O	Li		0.000059	M	Rh	<	0.000300	M	U	<	0.005300				
M	Cs		0.000527	M	Lu	<	0.000300	M	Ru	<	0.079000	M	V	<	0.000890				
M	Cu		0.002252	M	Mg		0.000563	i	S	<		M	W		0.087982				
M	Dy	<	0.000300	M	Mn	<	0.005900	M	Sb		0.001513	M	Y	<	0.000300				
M	Er	<	0.000300	s	Mo	<		M	Sc	<	0.001200	M	Yb	<	0.000300				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

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 - 95.94 +6 6,7,8,9

[MoO4]-2(chemical form as received)

Chemical Compatibility -Mo is received in a NH4OH matrix giving the operator the option of using HCl or HF to stabilize acidic solutions. The [MoO4]-2 is soluble in concentrated HCl [MoOCl5]-2, dilute HF / HNO3 [MoOF5]-2 and basic media [MoO4]-2. Stable at ppm levels with some metals provided it is fluorinated. Do not mix with Alkaline or Rare Earths when HF is present. Stable with most inorganic anions provided it is in the [MoO4]-2 chemical form.

Stability - 2-100 ppb levels stable (alone or mixed with all other metals that are at comparable levels) as the [MoOF5]-2 for months in 1% HNO3 / LDPE container. 1-10,000 ppm single element solutions as the [MoO4]-2 chemically stable for years in 1% NH4OH in a LDPE container.

Mo Containing Samples (Preparation and Solution) -Metal (Soluble in HF / HNO3 or hot dilute HCl); Oxide (soluble in HF or NH4OH) ; Organic Matrices (Dry ash at 450EC in Pt0 and dissolve oxide with HF or HCl).

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 95 amu	3 ppt	n/a	40Ar39K16O,79Br16O,190Os2+,190Pt2+
ICP-OES 202.030 nm	0.008 / 0.0002 µg/mL	1	Os, Hf
ICP-OES 203.844 nm	0.012 / 0.002 µg/mL	1	
ICP-OES 204.598 nm	0.012 / 0.001 µg/mL	1	Ir, Ta

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: 800.669.6798; 540.585.3030, Fax: 540.585.3012; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

July 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

- July 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 Prepared By:

Uyen Truong
Supervisor, Product Documentation



Certificate Approved By:

Michael Booth
Director, Technical



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Certificate of Analysis

MS978, MS979



Refine your results. Redefine your industry.

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

R: 2/22/24

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).



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution

Catalog Number: CGT1

Lot Number: T2-T1719972

Matrix: 2% (v/v) HNO₃

Value / Analyte(s): tr. HF

1 000 µg/mL ea.

Titanium

Ti Metal

Starting Material Lot#: 2094

Starting Material Purity: 99.9975%

Certified Value: 1002 ± 5 µg/mL

Density: 1.012 g/mL (measured at 20 ± 4 °C)

Assay Method #1

1002 ± 4 µg/mL

ICP Assay NIST SRM 3162a Lot Number: 130925

- 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:

$X_{CRM/RM} = (k_p) (V_{char})$
 X_p = mean of Assay Method A with
 $U_{char A}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (U) = $U_{CRM/RM} = k (U_{char A}^2 + U_{lab}^2 + U_{eq}^2)^{1/2}$
k = coverage factor = 2
 $U_{char A}$ = the mean of Assay Method A with standard uncertainty $U_{char A}$
 U_{lab} = long term stability standard uncertainty (storage)
 U_{eq} = 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)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an UHPA-filtered Clean Room. An UHPA-filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M Ag	<	0.000536	M Eu	<	0.000268	O Na	<	0.032670	M Se	<	0.001204	O Zn	<	0.003267
M Al	<	0.000872	O Fe	<	0.003225	O Nb	<	0.043560	O Si	<	0.004735	O Zr	<	0.043560
M As	<	0.008586	M Ga	<	0.000268	M Nd	<	0.000268	M Sm	<	0.000268			
M Au	<	0.004577	M Gd	<	0.000268	O Ni	<	0.010890	M Sn	<	0.000986			
O B	<	0.008929	M Ge	<	0.002146	M Os	<	0.000269	O Sr	<	0.000986			
M Ba	<	0.002683	M Hf	<	0.002161	O P	<	0.054450	M Ta	<	0.010560			
M Be	<	0.005366	M Hg	<	0.003231	M Pb	<	0.001073	M Tb	<	0.000268			
M Bi	<	0.001609	M Ho	<	0.000268	M Pd	<	0.000268	M Th	<	0.001341			
O Ca	<	0.000676	M In	<	0.002683	M Pr	<	0.000268	M Tl	<	0.053663			
M Cd	<	0.000268	M Ir	<	0.000269	M Pt	<	0.000536	S Ti	<				
M Co	<	0.000268	M K	<	0.001172	M Rb	<	0.000268	M Tl	<	0.000268			
M Cr	<	0.000752	O Li	<	0.000268	M Re	<	0.000268	M Tm	<	0.000268			
M Cs	<	0.000268	M Lu	<	0.000268	M Rh	<	0.000268	M U	<	0.000268			
O Cu	<	0.010890	O Mg	<	0.005445	I S	<	0.006976	M Y	<	0.002146			
M Dy	<	0.000268	O Mn	<	0.003267	M Sb	<	0.004900	M Yb	<	0.000536			
M Er	<	0.000268	M Mo	<	0.000774	O Sc	<							

6.0 INTENDED USE

M - Checked by ICP-MS
O - Checked by ICP-OES
I - Spectral Interference
n - Not Checked For
s - Solution Standard Element

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

- 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: Soluble in concentrated HCl, HF, H₃PO₄, H₂SO₄ and HNO₃. Avoid neutral to basic media. Unstable at ppm levels with metals that would pull F- away (i.e. Do not mix with Alkaline or Rare Earths or high levels of transition elements unless they are fluorinated). Stable with most inorganic anions with a tendency to hydrolyze forming the hydrated oxide in all dilute acids except HF.

Stability: 2-100 ppb levels stable (Alone or mixed with all other metals) as the Ti(F)-6-2 for months in 1% HNO₃ / LDPE container. 1-10,000 ppm single element solutions as the Ti(F)-6-2 chemically stable for years in 2-5% HNO₃ / trace HF in an LDPE container.

Ti Containing Samples (Preparation and Solution) - Metal (Soluble in H₂O / HF caution - powder reacts violently): Oxide - low temperature history anatase or rutile (Dissolved by heating in 1:1:1 H₂O / HF / H₂SO₄); K₂SiO₃ - no KF if silica not present); Organic Matrices (Dry ash at 450°C in P10 and dissolve by heating with 1:1:1 H₂O / HF / H₂SO₄ or fuse ash with pyrosulfate if oxide is as plastic pigment and likely in brookite crystaline form).

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

Technique/Line	Estimated D.L.	14 ppt
ICP-MS 48 amu	N/A	32S160, 32S14N,
ICP-OES 323.452 nm	0.0054 / 0.00092 µg/mL	14N17N2, 36Ar12C,
ICP-OES 334.941 nm	0.0038 / 0.00028 µg/mL	48Ca, [96X=2
ICP-OES 336.121 nm	0.0053 / 0.00034 µg/mL	14N17N2, 36Ar12C,
HF Note: This standard should not be prepared or stored in glass.		W, Mo, Co
		Nb, Ta, Cr, U
		Ce, Ar, Ni
		Ru]]
		(where X = Zr, Mo,

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: 800.868.6786; 540.565.3030; Fax: 540.565.3030; Email: info@inorganicventures.com; <http://www.inorganicventures.com>

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 Kozlikowski
Manager, Quality Control

Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

Paul Gaines

80978

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

M5985
R: 6/14/24

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 Custom Grade Solution
Catalog Number: CGIN10
Lot Number: U2-IN729349
Matrix: 5% (v/v) HNO₃
Value / Analyte(s): 10 000 µg/mL ea:
Indium
Starting Material: Indium Metal
Starting Material Lot#: 2511
Starting Material Purity: 99.9995%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10022 ± 30 µg/mL
Density: 1.044 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1	10021 ± 56 µg/mL ICP Assay NIST SRM 3124a Lot Number: 110516
Assay Method #2	10035 ± 25 µg/mL EDTA NIST SRM 928 Lot Number: 928
Assay Method #3	10001 ± 33 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:

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

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:

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

$$CRM/RM \text{ Expanded Uncertainty } (k) = U_{CRM/RM} = k(u_{char}^2 + u_{bb}^2 + u_{lts}^2 + u_{ts}^2)^{1/2}$$

k = coverage factor = 2

$u_{char} = [\sum(w_i)^2(u_{char i}^2)]^{1/2}$ 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

$$CRM/RM \text{ Expanded Uncertainty } (k) = U_{CRM/RM} = k(u_{char a}^2 + u_{bb}^2 + u_{lts}^2 + u_{ts}^2)^{1/2}$$

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)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.000760	M	Eu	<	0.000760	O	Na	0.012771	M	Se	<	0.023000	M	Zn	<	0.006100
M	Al	0.003385	O	Fe	0.004462	M	Nb	<	0.000760	O	Si	0.024619	M	Zr	<	0.000760		
M	As	<	0.004600	M	Ga	<	0.000760	M	Nd	<	0.000760	M	Sm	<	0.000760			
M	Au	<	0.002300	M	Gd	<	0.000760	O	Ni	<	0.005100	M	Sn	<	0.000760			
O	B	0.003692	M	Ge	<	0.001600	M	Os	<	0.000760	O	Sr	<	0.000610				
M	Ba	<	0.001600	M	Hf	<	0.000760	n	P	<		M	Ta	<	0.000760			
O	Be	<	0.000130	M	Hg	<	0.003100	M	Pb	0.001400	M	Tb	<	0.000760				
M	Bi	<	0.000760	M	Ho	<	0.000760	M	Pd	<	0.001600	M	Te	<	0.000760			
O	Ca	0.004616	s	In	<			M	Pr	<	0.000760	M	Th	<	0.000760			
M	Cd	<	0.000760	M	Ir	<	0.000760	M	Pt	<	0.000760	O	Ti	<	0.001100			
M	Ce	<	0.000760	O	K	0.007078	M	Rb	<	0.000760	M	Tl	<	0.000760				
M	Co	<	0.000760	M	La	<	0.000760	M	Re	<	0.000760	M	Tm	<	0.000760			
O	Cr	<	0.001300	O	Li	<	0.000130	M	Rh	<	0.000760	M	U	<	0.000760			
M	Cs	<	0.000760	M	Lu	<	0.000760	M	Ru	<	0.000760	M	V	<	0.001600			
M	Cu	<	0.003800	O	Mg	0.000707	n	S	<		M	W	<	0.001600				
M	Dy	<	0.000760	O	Mn	0.000149	M	Sb	<	0.000760	M	Y	<	0.000760				
M	Er	<	0.000760	M	Mo	<	0.002300	M	Sc	<	0.000760	M	Yb	<	0.000760			

M - Checked by ICP-MS

O - Checked by ICP-OES

i - Spectral Interference

n - Not Checked For

s - Solution Standard Element

6.0 INTENDED USE

6.1 This standard is intended for the calibration of analytical instruments and validation of analytical methods as appropriate. This CRM may be used in connection with EPA Methods 6010, 6020 (all versions), Standard Methods 3120 B and USP <232> / ICH Q3D.

6.2 For products attaining traceability through Inorganic Ventures' Primary Certified Reference Materials (PCRM™) see the Limited License to Use PCRM™ in the Inorganic Ventures Terms and Conditions of Sale. <https://www.inorganicventures.com/terms-and-conditions-sale>. The Terms and Conditions contain information on the use of materials traceable to PCRM™ certified reference materials. This Limited License agreement is especially pertinent for laboratories accredited under ISO:17034.

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 - 114.82 +3 6 In(H₂O)₆+3

Chemical Compatibility -Soluble in HCl, HNO₃, and H₂SO₄. Avoid neutral and basic media. Stable with most metals and inorganic anions. The oxalate, sulfide, carbonate, hydroxide and phosphate are insoluble in water.

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.

In Containing Samples (Preparation and Solution) -Metal (Best dissolved in HCl / HNO₃); Oxide (Soluble in mineral acids); Ores (Carbonate fusion in PtO followed by HCl dissolution); Organic Matrices (Sulfuric/peroxide digestion or dry ash and dissolution in dilute HCl).

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 115 amu	1 ppt	n/a	115Sn, 99Ru16O
ICP-OES 158.583 nm	0.05 / 0.002 µg/mL	1	
ICP-OES 230.606 nm	0.1 / 0.03 µg/mL	1	Ni, Os
ICP-OES 325.609 nm	0.2 / 0.05 µg/mL	1	Mn, Mo, Th

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

February 21, 2023

- 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

- February 21, 2028

- 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





Refine your results. Redefine your industry.

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

Certificate of Analysis

M6074
M6075
M6076
M6077

P: 800-669-6799/540-585-3030

F: 540-585-3012

info@inorganicventures.com

EXP: 9/6/2029

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: Multi Analyte Custom Grade Solution
Catalog Number: CHEM-CLP-4
Lot Number: V2-MEB746762
Matrix: 3% (v/v) HNO₃
3% (v/v) HF
Value / Analyte(s): 1 000 µg/mL ea:
Boron, Molybdenum,
Silicon, Tin,
Titanium

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Boron, B	1 000 ± 5 µg/mL	Molybdenum, Mo	1 000 ± 5 µg/mL
Silicon, Si	1 000 ± 7 µg/mL	Tin, Sn	1 000 ± 5 µg/mL
Titanium, Ti	1 000 ± 6 µg/mL		

Density: 1.033 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
B	ICP Assay	3107	190605
B	Calculated		See Sec. 4.2
Mo	ICP Assay	traceable to 3134	U2-MO739068
Si	ICP Assay	Traceable to 3150	S2-SI702546
Sn	ICP Assay	3161a	140917
Ti	ICP Assay	traceable to 3162a	T2-TI725816

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

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

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

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

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

$$\text{CRM/RM Expanded Uncertainty } (\pm) = U_{\text{CRM/RM}} = k (u_{\text{char}}^2 + u_{\text{bb}}^2 + u_{\text{Its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2

$u_{\text{char}} = [\sum (w_i)^2 (u_{\text{char } i}^2)]^{1/2}$ where $u_{\text{char } i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

$$\text{CRM/RM Expanded Uncertainty } (\pm) = U_{\text{CRM/RM}} = k (u_{\text{char } a}^2 + u_{\text{bb}}^2 + u_{\text{Its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{Its} = 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

6.1 This standard is intended for the calibration of analytical instruments and validation of analytical methods as appropriate. This CRM may be used in connection with EPA Methods 6010, 6020 (all versions), Standard Methods 3120 B and USP <232> / ICH Q3D.

6.2 For products attaining traceability through Inorganic Ventures' Primary Certified Reference Materials (PCRM™) see the Limited License to Use PCRM™ in the Inorganic Ventures Terms and Conditions of Sale. <https://www.inorganicventures.com/terms-and-conditions-sale>. The Terms and Conditions contain information on the use of materials traceable to PCRM™ certified reference materials. This Limited License agreement is especially pertinent for laboratories accredited under ISO:17034.

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

HF Note: This standard should not be prepared or stored in glass.

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

September 06, 2024

- 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 06, 2029**

- 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:

Joseph Burns
Custom VS Manager



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Hydrochloric Acid, 36.5-38.0%
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis

avantor™



R → 16/13/24
Met dig

M 6121

Material No.: 9530-33
Batch No.: 0000275677
Manufactured Date: 2020/12/16
Retest Date: 2025/12/15
Revision No: 1

Certificate of Analysis

Test	Specification	Result
ACS - Assay (as HCl) (by acid-base titrn)	36.5 - 38.0 %	37.6
ACS - Color (APHA)	<= 10	5
ACS - Residue after Ignition	<= 3 ppm	1
ACS - Specific Gravity at 60°/60°F	1.185 - 1.192	1.190
ACS - Bromide (Br)	<= 0.005 %	< 0.005
ACS - Extractable Organic Substances	<= 5 ppm	1
ACS - Free Chlorine (as Cl ₂)	<= 0.5 ppm	< 0.5
Phosphate (PO ₄)	<= 0.05 ppm	< 0.03
Sulfate (SO ₄)	<= 0.5 ppm	< 0.3
Sulfite (SO ₃)	<= 0.8 ppm	0.3
Ammonium (NH ₄)	<= 3 ppm	< 1
Trace Impurities - Arsenic (As)	<= 0.010 ppm	< 0.003
Trace Impurities - Aluminum (Al)	<= 10.0 ppb	< 0.2
Arsenic and Antimony (as As)	<= 5 ppb	< 3
Trace Impurities - Barium (Ba)	<= 1.0 ppb	< 0.2
Trace Impurities - Beryllium (Be)	<= 1.0 ppb	< 0.2
Trace Impurities - Bismuth (Bi)	<= 10.0 ppb	< 1.0
Trace Impurities - Boron (B)	<= 20.0 ppb	< 5.0
Trace Impurities - Cadmium (Cd)	<= 1.0 ppb	< 0.3
Trace Impurities - Calcium (Ca)	<= 50.0 ppb	29.7
Trace Impurities - Chromium (Cr)	<= 1.0 ppb	< 0.4
Trace Impurities - Cobalt (Co)	<= 1.0 ppb	< 0.3
Trace Impurities - Copper (Cu)	<= 1.0 ppb	< 0.1
Trace Impurities - Gallium (Ga)	<= 1.0 ppb	< 0.2

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700

Avantor Performance Materials, LLC

100 Matsonford Rd, Suite 200, Radnor, PA 19087. U.S.A. Phone: 610.386.1700

Material No.: 9530-33

Batch No.: 0000275677

Test	Specification	Result
Trace Impurities – Germanium (Ge)	≤ 3.0 ppb	< 2.0
Trace Impurities – Gold (Au)	≤ 4.0 ppb	< 0.2
Heavy Metals (as Pb)	≤ 100 ppb	< 50
Trace Impurities – Iron (Fe)	≤ 15.0 ppb	< 1
Trace Impurities – Lead (Pb)	≤ 1.0 ppb	< 0.5
Trace Impurities – Lithium (Li)	≤ 1.0 ppb	0.2
Trace Impurities – Magnesium (Mg)	≤ 10.0 ppb	0.4
Trace Impurities – Manganese (Mn)	≤ 1.0 ppb	< 0.4
Trace Impurities – Mercury (Hg)	≤ 0.5 ppb	0.1
Trace Impurities – Molybdenum (Mo)	≤ 10.0 ppb	< 5.0
Trace Impurities – Nickel (Ni)	≤ 4.0 ppb	< 0.3
Trace Impurities – Niobium (Nb)	≤ 1.0 ppb	< 0.2
Trace Impurities – Potassium (K)	≤ 9.0 ppb	< 2.0
Trace Impurities – Selenium (Se), For Information Only	ppb	1.0
Trace Impurities – Silicon (Si)	≤ 100.0 ppb	< 10.0
Trace Impurities – Silver (Ag)	≤ 1.0 ppb	< 0.3
Trace Impurities – Sodium (Na)	≤ 100.0 ppb	< 5.0
Trace Impurities – Strontium (Sr)	≤ 1.0 ppb	< 0.2
Trace Impurities – Tantalum (Ta)	≤ 1.0 ppb	< 0.9
Trace Impurities – Thallium (Tl)	≤ 5.0 ppb	< 2.0
Trace Impurities – Tin (Sn)	≤ 5.0 ppb	< 0.8
Trace Impurities – Titanium (Ti)	≤ 1.0 ppb	0.2
Trace Impurities – Vanadium (V)	≤ 1.0 ppb	< 0.2
Trace Impurities – Zinc (Zn)	≤ 5.0 ppb	0.3
Trace Impurities – Zirconium (Zr)	≤ 1.0 ppb	< 0.1

For Laboratory, Research or Manufacturing Use

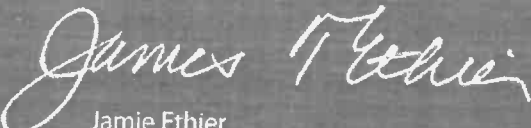
Product Information (not specifications):

Appearance (clear, fuming liquid)

Meets ACS Specifications

Country of Origin: US

Packaging Site: Phillipsburg Mfg Ctr & DC



Jamie Ethier
Vice President Global Quality

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700

Avantor Performance Materials, LLC

100 Matsonford Rd, Suite 200, Radnor, PA 19087. U.S.A. Phone: 610.386.1700

Nitric Acid 69%
CMOS



R → 11/12/24

M6126

Material No.: 9606-03
Batch No.: 24D1062002
Manufactured Date: 2024-03-26
Retest Date: 2029-03-25
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
Assay (HNO ₃)	69.0 – 70.0 %	69.7 %
Appearance	Passes Test	Passes Test
Color (APHA)	≤ 10	5
Residue after Ignition	≤ 2 ppm	1 ppm
Chloride (Cl)	≤ 0.08 ppm	< 0.03 ppm
Phosphate (PO ₄)	≤ 0.10 ppm	< 0.03 ppm
Sulfate (SO ₄)	≤ 0.2 ppm	< 0.2 ppm
Trace Impurities – Aluminum (Al)	≤ 40.0 ppb	< 1.0 ppb
Arsenic and Antimony (as As)	≤ 5.0 ppb	< 2.0 ppb
Trace Impurities – Barium (Ba)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Beryllium (Be)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Bismuth (Bi)	≤ 20.0 ppb	< 10.0 ppb
Trace Impurities – Boron (B)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities – Cadmium (Cd)	≤ 50 ppb	< 1 ppb
Trace Impurities – Calcium (Ca)	≤ 50.0 ppb	2.3 ppb
Trace Impurities – Chromium (Cr)	≤ 30.0 ppb	< 1.0 ppb
Trace Impurities – Cobalt (Co)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Copper (Cu)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Gallium (Ga)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Germanium (Ge)	≤ 20 ppb	< 10 ppb
Trace Impurities – Gold (Au)	≤ 20 ppb	< 5 ppb
Heavy Metals (as Pb)	≤ 100 ppb	100 ppb
Trace Impurities – Iron (Fe)	≤ 40.0 ppb	< 1.0 ppb
Trace Impurities – Lead (Pb)	≤ 20.0 ppb	< 10.0 ppb
Trace Impurities – Lithium (Li)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Magnesium (Mg)	≤ 20 ppb	< 1 ppb
Trace Impurities – Manganese (Mn)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Nickel (Ni)	≤ 20.0 ppb	< 5.0 ppb

>>> Continued on page 2 >>>

Nitric Acid 69%
CMOS

 **avantor**TM



Material No.: 9606-03
Batch No.: 24D1062002

Test	Specification	Result
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For Microelectronic Use

Country of Origin: USA
Packaging Site: Phillipsburg Mfg Ctr & DC



Jamie Croak
Director Quality Operations, Bioscience Production



CERTIFIED WEIGHT REPORT:

Part Number: 58112
Lot # 112124
Description: Magnesium (Mg)
Solvent: Nitric Acid

Expiration Date: 11/21/27
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 10000
NIST Test Number: 6LUB

Weight shown below was diluted to (mL): 2000.07
5E-05 Balance Uncertainty
0.100 Flask Uncertainty

<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito
Reviewed By:	Pedro L. Rentas
	112124

Compound

Lot	Nominal	Purity	Uncertainty	Assay	Target	Actual	Actual	Expanded	SDS Information	NIST
RM#	Number	Conc. (µg/mL)	(%)	Purity (%)	Weight (g)	Weight (g)	Conc. (µg/mL)	± (µg/mL)	(Solvent Safety Info. On Attached pg.)	SRM

1. Magnesium nitrate hexahydrate (Mg) IN030 MG000023A1 10000 99.999 0.10 8.51 234.9183 234.9459 10001.2 20.0 13446-18-9 NA off-rat 5440 mg/kg 3131a

[1] Spectrum No. 1 [19.823 sec]:58112.D# [Count] [Linear]





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	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Rc	<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	Rb	<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	Ru	<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	Sm	<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	Sc	<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			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 certified (+/-) 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).



CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

58025
101124
Manganese (Mn)

R-71113128

Lot #
Solvent: 24002546 Nitric Acid

Expiration Date:

101127

2% 80.0 (mL) Nitric Acid

Recommended Storage:

Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

Weight shown below was diluted to (mL):

4000.2

0.10 Flask Uncertainty

<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito
Reviewed By:	<i>Pedro L. Renteria</i>
	101124

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)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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1. Manganese(II) nitrate hydrate (Mn) IN031 MNM02020A1 1000 99.999 0.10 20.8 19.2322 19.2344 1000.1 2.0 15710-66-4 5 mg/m3 or-rel >300mg/kg 3132

[1] Spectrum No.1 [34.243 sec]:57025.D# [Count] [Linear]

5.0E6													
2.5E6													
m/z->	10	20	30	40	50	60	70	80	90	100			
1.0E6													
5.0E7													
m/z->	110	120	130	140	150	160	170	180	190	200			
1.0E6													
5.0E7													
m/z->	210	220	230	240	250	260							



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	<0.2	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	<0.01	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	T	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 certified (+/-) 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).



CERTIFIED WEIGHT REPORT:

Part Number: 58111
Lot Number: 072424
Description: Sodium (Na)

Lot # R-1113125
Solvent: 24002546 Nitric Acid

Expiration Date: 072427
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 10000
NIST Test Number: 6UTB

Weight shown below was diluted to (mL): 4000.2
5E-05 Balance Uncertainty
0.10 Flask Uncertainty

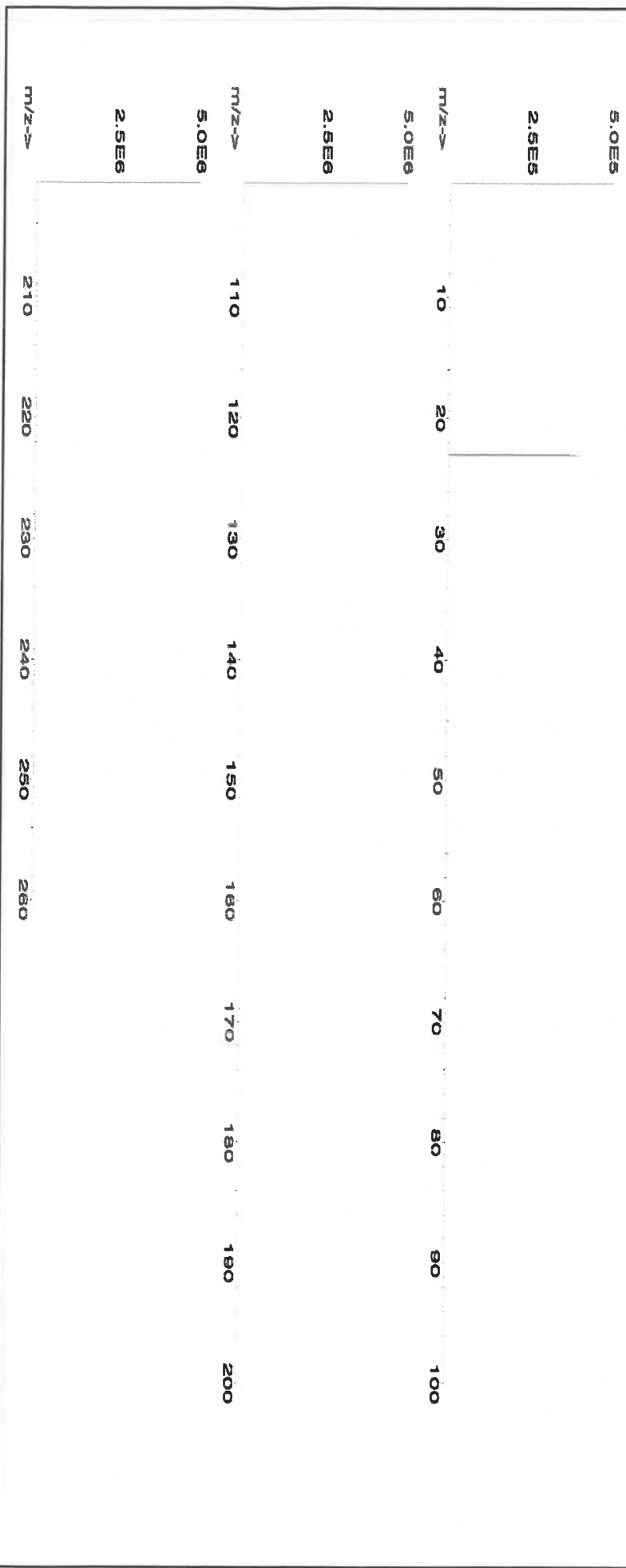
Formulated By:	Benson Chan	072424
Reviewed By:	Pedro L. Renteria	072424

Compound	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM

SDS Information

1. Sodium nitrate (Na) IN036 NAV01201511 10000 99.999 0.10 26.9 148.7096 ##### 10000.0 20.0 7631-99-4 5 mg/m3 orl-rat 3430 mg/kg 3152a

[1] Spectrum No. 1 [8.935 sec]: 58111.D# [Count] [Linear]





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	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	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	<0.01	Os	<0.02	Rb	<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	T	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.
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- * 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).



CERTIFIED WEIGHT REPORT:

Part Number: **58030** Lot # **24012496**
Lot Number: **121724** Nitric Acid
Description: **Zinc (Zn)**

Expiration Date: **121727** 2% 40.0 (mL)

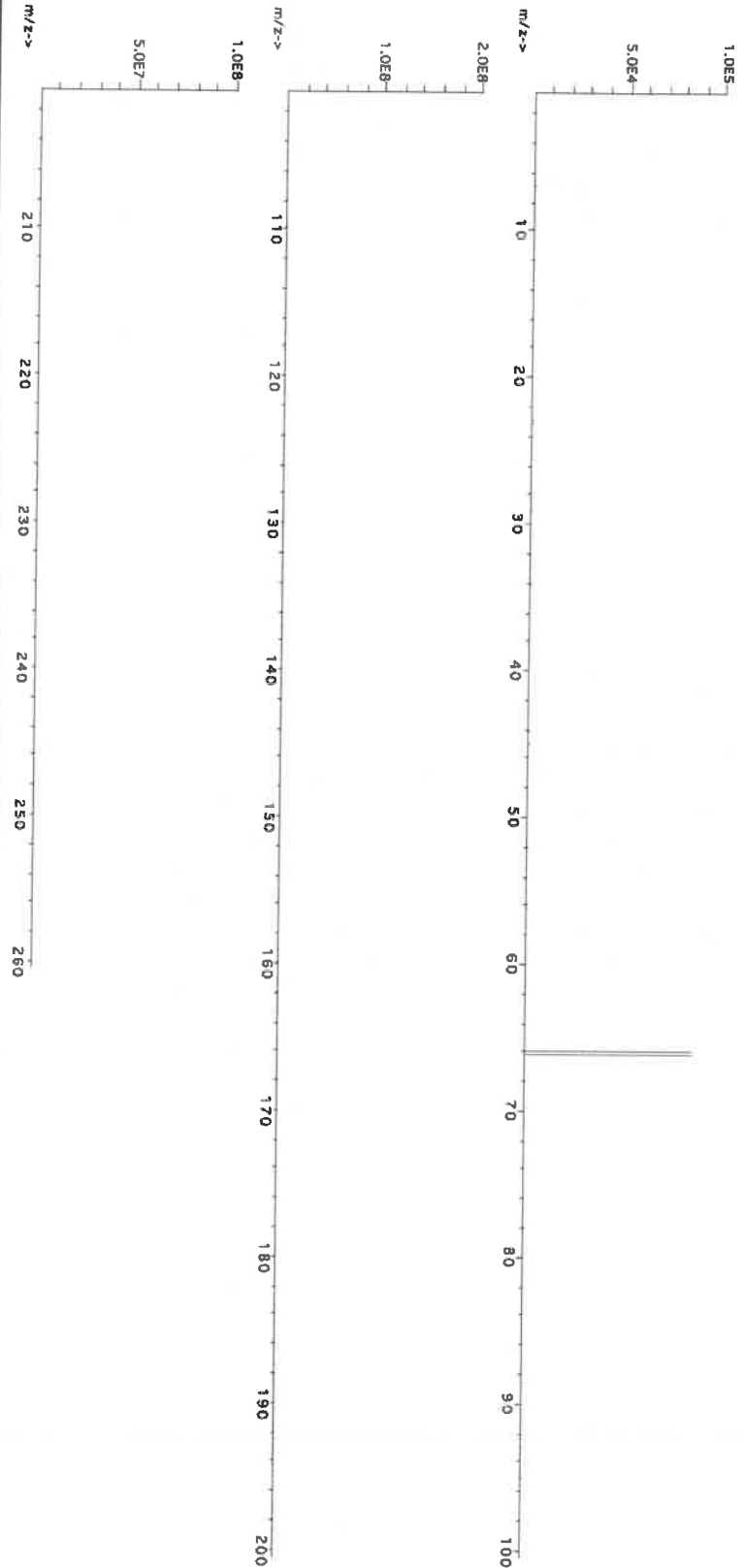
Recommended Storage: **Ambient (20 °C)** Nitric Acid
Nominal Concentration (µg/mL): **1000**

NIST Test Number: **6UTB** 5E-05 Balance Uncertainty
Weight shown below was diluted to (mL): **2000.1** 0.10 Flask Uncertainty

<i>Aleah O'Brady</i>	
Formulated By:	Aleah O'Brady
Reviewed By:	<i>Pedro L. Rentias</i>
	Pedro L. Rentias
	121724

SDS Information									
(Solvent Safety Info. On Attached pg.)									
Compound	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)
IN016 ZNE032021A1	1000	99.999	0.10	24.3	8.2308	8.2311	1000.0	2.0	10196-18-6
									1 mg/m3
									or-rat 1190mg/kg
									3168

[1] Spectrum No.1 [31.103 sec;58130.D# [Count] [Linear]





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	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	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	Bu	<0.02	In	<0.02	Mg	<0.01	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.
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- * Standards are certified (+/-) 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).



QUALITY ASSURANCE TECHNICAL SUPPORT LABORATORY
"An ISO 9001:2015 Certified Program"

R: 4/20/21

Instructions for QATS Reference Material: *Inorganic ICV Solutions*

QATS LABORATORY INORGANIC REFERENCE MATERIAL
INITIAL CALIBRATION VERIFICATION SOLUTIONS
(ICV1, ICV5, AND ICV6)

MG180

NOTE: These instructions are for advisory purposes only. If any apparent conflict exists between these instructions and the analytical protocol or your contract, disregard these instructions.

APPLICATION: For use with the CLP SFAM01.0 SOW and revisions.

CAUTION: Read instructions carefully before opening bottle(s) and proceeding with the analyses.

Contains Metals in Dilute Acidic or
Cyanide in Basic Aqueous Solutions
HAZARDOUS MATERIAL

Safety Data Sheets
Available Upon Request

(A) SAMPLE DESCRIPTION

Enclosed is a set of one (1) or more Aqueous Inorganic Reference Materials containing various analyte concentrations. ICV1 and ICV5 are in a matrix of dilute nitric acid. ICV6 is in a matrix of dilute basic solution. For the reference material source in reporting ICVs use "USEPA". For the reference material lot number for the ICV1, ICV5, and ICV6 solutions use "ICV1-1014", "ICV5-0415", and "ICV6-0400", respectively.

(B) BREAKAGE OR MISSING ITEMS

Check the contents of the shipment carefully for any broken, leaking, or missing items. Check that the seal is intact on each bottle. Refer to the enclosed chain of custody record. Report any problems to Mr. Keith Strout, APTIM Federal Services, LLC, at (702) 895-8722. If requested, return the chain-of-custody record with appropriate annotations and signatures to the address provided below.

QUALITY ASSURANCE TECHNICAL SUPPORT LABORATORY
APTIM Federal Services, LLC
2700 Chandler Avenue - Building C
Las Vegas, NV 89120

(C) ANALYSIS OF SAMPLES

The Initial Calibration Verification Solutions (ICVs) are to be used to evaluate the accuracy of the initial calibrations of ICP, AA, and Cyanide colorimetric instruments, and are to be used with the CLP SOWs and revisions. The values for each element in the ICVs are listed below in µg/L (ppb) for the resulting solution(s) after the dilution of the concentrate(s) according to the following instructions. Use Class 'A' glassware to prepare the solution(s).

ICV1-1014 For ICP-AES analysis, use a 10-fold dilution by pipetting 10 mL of the ICV1 concentrate into a 100 mL volumetric flask and dilute to volume with 2% (v/v) nitric acid.





QUALITY ASSURANCE TECHNICAL SUPPORT LABORATORY
"An ISO 9001:2015 Certified Program"

Instructions for QATS Reference Material: *Inorganic ICV Solutions*

ICV1-1014 For ICP-MS analysis, use a 50-fold dilution by pipetting 2 mL of the ICV1 concentrate into a 100 mL volumetric flask and dilute to volume with 1% (v/v) nitric acid.

ICV5-0415 For the cold vapor analysis of mercury by AA, use a 100-fold dilution by pipetting 1 mL of the ICV5 concentrate into a 100 mL volumetric flask and dilute to volume with 2% (v/v) nitric acid. The ICV5 concentrate is prepared in 0.05% (w/v) K₂Cr₂O₇ and 5% (v/v) nitric acid.

ICV6-0400 For the analysis of cyanide, use a 100-fold dilution by pipetting 1 mL of the ICV6 concentrate into a 100 mL volumetric flask and dilute to volume with Type II water. Distill this solution along with the samples before analysis. The cyanide concentrate is prepared from K₃Fe(CN)₆, Type II water, and 0.1 % sodium hydroxide, and will decompose rapidly if exposed to light.

NOTE: USE TYPE II WATER AND HIGH-PURITY ACIDS FOR ALL DILUTIONS.

(D) CERTIFIED CONCENTRATIONS OF QATS ICV1, ICV5, AND ICV6 SOLUTIONS

ICV1-1014		
Element	Concentration (µg/L) (after 10-fold dilution)	Concentration (µg/L) (after 50-fold dilution)
Al	2500	500
Sb	1000	200
As	1000	200
Ba	520	100
Be	510	100
Cd	510	100
Ca	10000	2000
Cr	520	100
Co	520	100
Cu	510	100
Fe	10000	2000
Pb	1000	200
Mg	6000	1200
Mn	520	100
Ni	530	110
K	9900	2000
Se	1000	200
Ag	250	50
Na	10000	2000
Tl	1000	210
V	500	100
Zn	1000	200

ICV5-0415		ICV6-0400	
Element	Concentration (µg/L) (after 100-fold dilution)	Analyte	Concentration (µg/L) (after 100-fold dilution)
Hg	4.0	CN ⁻	99



CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57051
120523
Antimony (Sb)

Lot #
Solvent:

24002546
Nitric Acid

2.0%
60.0
Nitric Acid
(mL)

Expiration Date:

120526

Recommended Storage:

Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6U7B

Volume shown below was diluted to (mL):

3000.41

5E-05 Balance Uncertainty
0.058 Flask Uncertainty

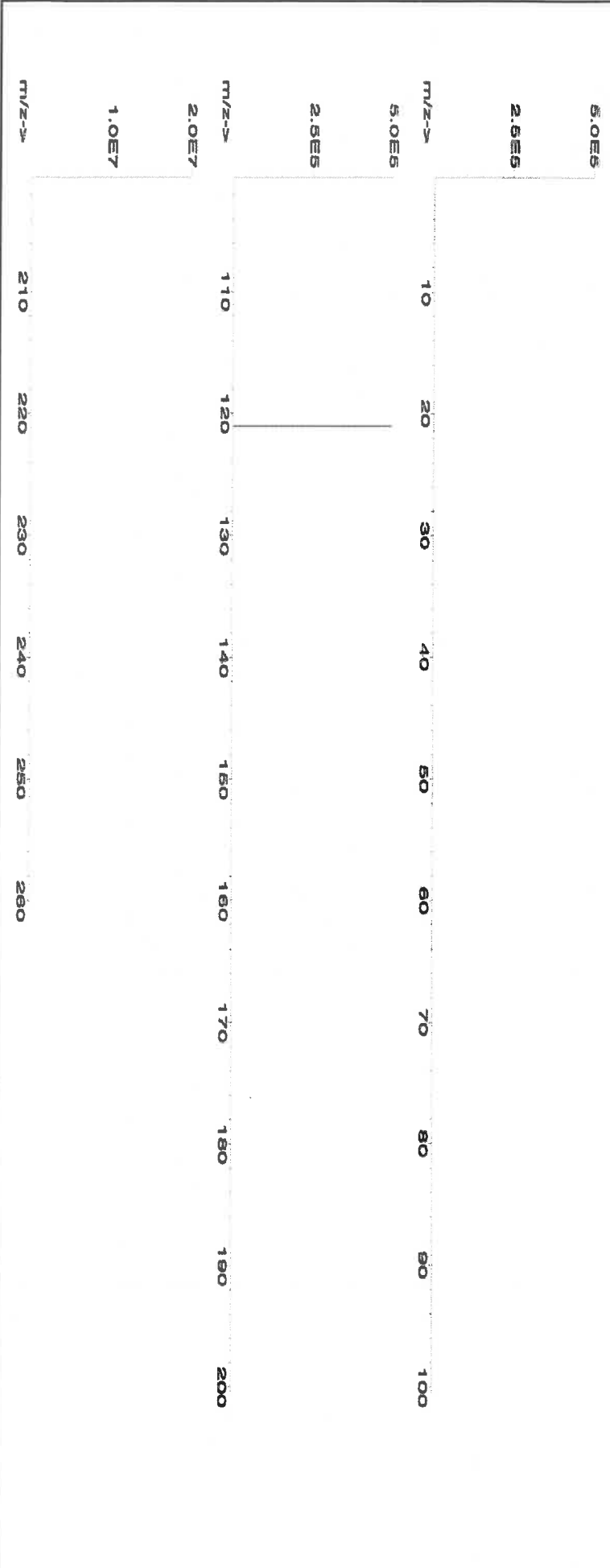
Formulated By:	Lawrence Barry	120523
Reviewed By:	Pedro L. Renteria	120523

SDS Information

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
----------	-------------	------------	-----------------	-------------------	--------------------------	-----------------------	-----------------------	---------------------	----------------------------------	------	----------------	------	----------

1. Antimony (Sb)	58151	100923	0.1000	300.0	0.084	1000	10001.4	1000.0	2.1	7440-36-0	0.5 mg/m3	or-rel 7000 mg/kg	3102a
------------------	-------	--------	--------	-------	-------	------	---------	--------	-----	-----------	-----------	-------------------	-------

[1] Spectrum No.1 [17.964 sec]:58051.D# [Count] [Linear]





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	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	T	Ca	<0.2	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	<0.01	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 certified (+/-) 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).



Certified Reference Material CRM

M6030



CERTIFIED WEIGHT REPORT:

Part Number: **57047**
Lot Number: **122823**
Description: **Silver (Ag)**
Solvent: 24002546 Nitric Acid
Lot #

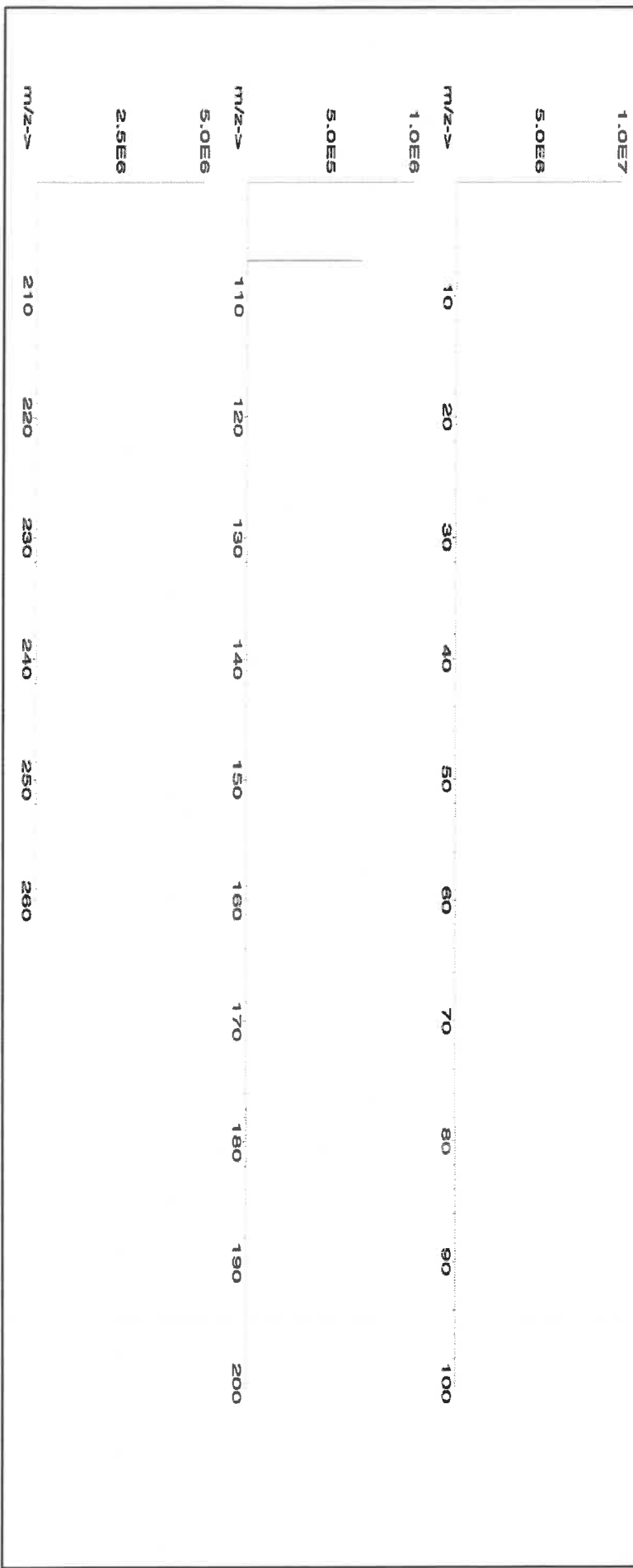
Expiration Date: 122826
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB

Weight shown below was diluted to (mL): 4000.30
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

Formulated By:	Benson Chan
Reviewed By:	Pedro L. Rentas
122823	

SDS Information									
Compound	RM#	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)
1. Silver nitrate (Ag)	IN035	J0612AGA1	1000.0	99.9996	0.10	63.7	6.27992	6.27998	1000.0
							2.0	7761-88-8	10 µg/mL
									NA
									3151

[1] Spectrum No. 1 [14.044 sec]:58147.D# [Count] [Linear]





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	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	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	<0.01	Os	<0.02	Rh	<0.02	Ag	T	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 meghm 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 certified (+/-) 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).



Certified Reference Material CRM
R: 10/18/24



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

CERTIFIED WEIGHT REPORT:

Part Number:

57051

Lot # 24002546

Solvent: Nitric Acid

Lot Number:

071724

Description: Antimony (Sb)

Expiration Date:

071727

2.0%

40.0 (mL)

Nitric Acid

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UJB

Volume shown below was diluted to (mL): 2000.26

5E-05 Balance Uncertainty

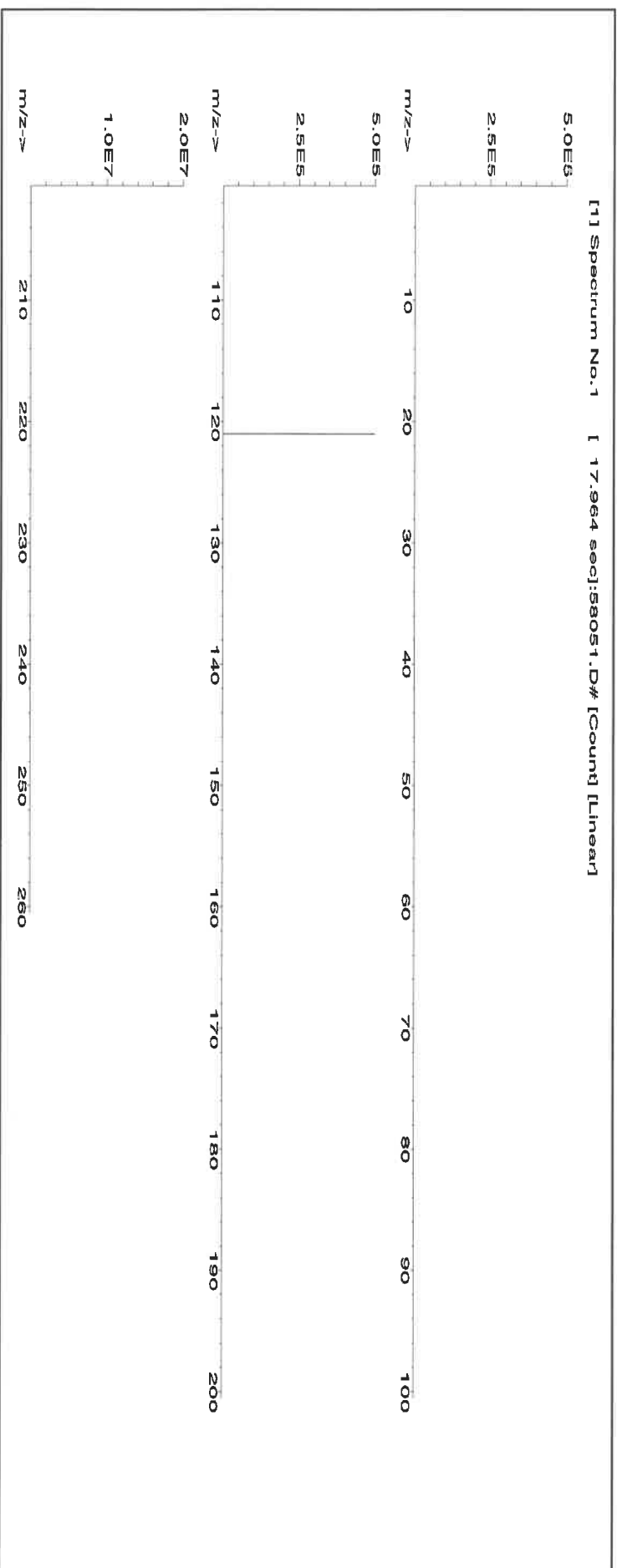
0.058 Flask Uncertainty

Formulated By:	Giovanni Esposito	071724
<i>Giovanni Esposito</i>		
Reviewed By:	Pedro L. Rentas	071724
<i>Pedro L. Rentas</i>		

SDS Information

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
----------	-------------	------------	-----------------	-------------------	--------------------------	-----------------------	-----------------------	---------------------	----------------------------------	------	----------------	------	----------

1. Antimony (Sb)	58151	060324	0.1000	200.0	0.084	1000	10001.4	1000.0	2.2	7440-36-0	0.5 mg/m3	or-rat 7000 mg/kg	3102a
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John P. ...

R: 8/5/24

M6019

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).



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
Catalog Number: CGSR1
Lot Number: U2-SR730227
Matrix: 0.1% (v/v) HNO₃
Value / Analyte(s): 1 000 µg/mL ea:
Strontium
Starting Material: SrCO₃
Starting Material Lot#: M2-2192
Starting Material Purity: 99.9993%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1001 ± 3 µg/mL
Density: 1.000 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1	998 ± 4 µg/mL ICP Assay NIST SRM Traceable to 3153a Lot Number: K2-SR650985
Assay Method #2	1001 ± 3 µg/mL EDTA NIST SRM 928 Lot Number: 928
Assay Method #3	1001 ± 2 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:

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

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:

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

$$CRM/RM \text{ Expanded Uncertainty } (k) = U_{CRM/RM} = k(u_{char}^2 + u_{bb}^2 + u_{ts}^2 + u_{ts}^2)^{1/2}$$

k = coverage factor = 2

$u_{char} = [\sum(w_i)^2(u_{char\ i})^2]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{ts} = 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

$$CRM/RM \text{ Expanded Uncertainty } (k) = U_{CRM/RM} = k(u_{char\ a}^2 + u_{bb}^2 + u_{ts}^2 + u_{ts}^2)^{1/2}$$

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{ts} = 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)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.001980	M	Eu	<	0.000495	O	Na	0.000200	M	Se	<	0.013862	O	Zn	0.000143	
O	Al	0.000370	O	Fe	0.000410	M	Nb	<	0.000495	i	Si	<			M	Zr	<	0.000495
M	As	<	0.000495	M	Ga	<	0.000495	M	Nd	<	0.000495	M	Sm	<	0.000495			
M	Au	<	0.000989	M	Gd	<	0.000495	O	Ni	<	0.007631	M	Sn	<	0.000990			
M	B	<	0.039606	M	Ge	<	0.000495	M	Os	<	0.000494	s	Sr	<				
M	Ba	0.006486	M	Hf	<	0.000495	i	P	<			M	Ta	<	0.000495			
M	Be	<	0.000990	M	Hg	<	0.000989	M	Pb	<	0.002970	M	Tb	<	0.000495			
M	Bi	<	0.000495	M	Ho	<	0.000495	M	Pd	<	0.003957	M	Te	<	0.027724			
O	Ca	0.004255	M	In	<	0.000495	M	Pr	<	0.000495	M	Th	<	0.000990				
M	Cd	0.001339	M	Ir	<	0.000494	M	Pt	<	0.002970	M	Ti	<	0.005940				
M	Ce	<	0.004950	O	K	<	0.008184	M	Rb	<	0.002970	M	Tl	<	0.000495			
M	Co	<	0.000495	M	La	<	0.000495	M	Re	<	0.000495	M	Tm	<	0.000495			
O	Cr	<	0.003207	O	Li	<	0.000884	O	Rh	<	0.012829	M	U	<	0.001485			
M	Cs	<	0.000990	M	Lu	<	0.002970	M	Ru	<	0.000989	M	V	<	0.001980			
M	Cu	0.000099	O	Mg	0.000064	i	S	<				M	W	<	0.003960			
M	Dy	<	0.000495	O	Mn	0.000066	M	Sb	<	0.014852	O	Y	<	0.000995				
M	Er	<	0.000495	M	Mo	<	0.001980	M	Sc	<	0.001980	M	Yb	<	0.000495			

M - Checked by ICP-MS

O - Checked by ICP-OES

i - Spectral Interference

n - Not Checked For

s - Solution Standard Element

6.0 INTENDED USE

6.1 This standard is intended for the calibration of analytical instruments and validation of analytical methods as appropriate. This CRM may be used in connection with EPA Methods 6010, 6020 (all versions), Standard Methods 3120 B and USP <232> / ICH Q3D.

6.2 For products attaining traceability through Inorganic Ventures' Primary Certified Reference Materials (PCRM™) see the Limited License to Use PCRM™ in the Inorganic Ventures Terms and Conditions of Sale, <https://www.inorganicventures.com/terms-and-conditions-sale>. The Terms and Conditions contain information on the use of materials traceable to PCRM™ certified reference materials. This Limited License agreement is especially pertinent for laboratories accredited under ISO:17034.

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 - 87.62 +2 6 Sr(H₂O)₆+2

Chemical Compatibility - Soluble in HCl, and HNO₃. Avoid H₂SO₄, HF and neutral to basic media. Stable with most metals and inorganic anions forming insoluble silicate, carbonate, hydroxide, oxide, fluoride, sulfate, oxalate, chromate, arsenate and tungstate in neutral aqueous media.

Stability - 2-100 ppb levels stable for months in 1% HNO₃ / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1 - 3.5% HNO₃ / LDPE container.

Sr Containing Samples (Preparation and Solution) -Metal (Best dissolved in diluted HNO₃); Ores (Carbonate fusion in PtO followed by HCl dissolution); Organic Matrices (Dry ash and dissolution in dilute HCl).

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 88 amu	1200 ppt	N/A	72Ge16O, 176Yb+2, 176Lu+2 , 176Hf+2
ICP-OES 407.771 nm	0.0004 / 0.00006 µg/mL	1	U, Ce
ICP-OES 421.552 nm	0.0008 / 0.00004 µg/mL	1	Rb
ICP-OES 460.733 nm	0.07 / 0.003 µg/mL	1	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

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

March 03, 2023

- 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

- March 03, 2028

- 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





Certified Reference Material CRM



R: 03/16/23 MS473 MS474 MS475 MS476

CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

56138
082922
Strontium (Sr)

Expiration Date:
Recommended Storage:
Nominal Concentration (µg/mL):
NIST Test Number:

082925
Ambient (20 °C)
10000
6UTB

Solvent: 20510011 Nitric Acid

2% 20.0 Nitric Acid
(mL)

5E-05 Balance Uncertainty
0.058 Flask Uncertainty

Weight shown below was diluted to (mL): 1000.12

Lot #

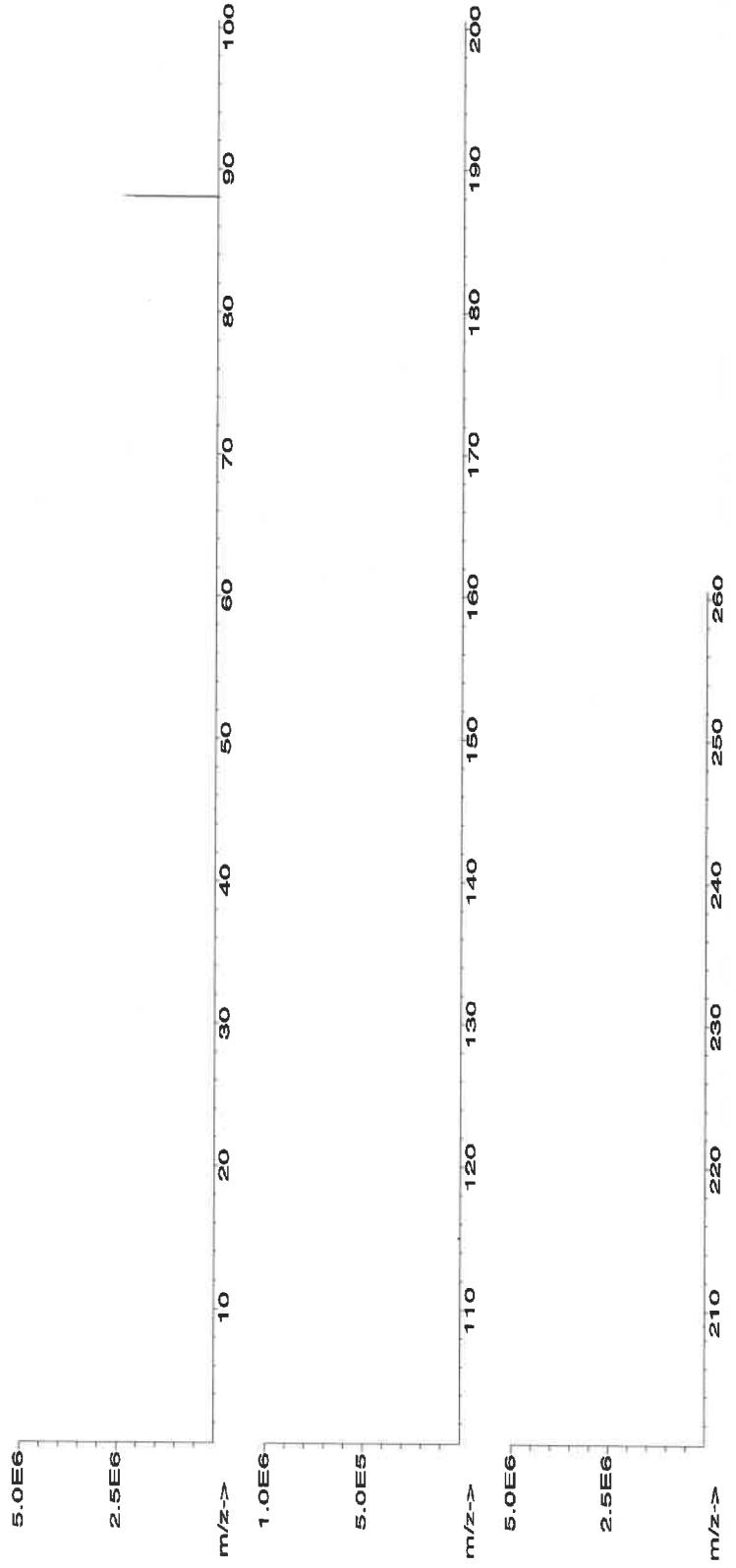
Formulated By:	Lawrence Barry	082922
Reviewed By:	Pedro L. Rentas	082922

SDS Information

Expanded Uncertainty +/- (µg/mL)	Actual Conc. (µg/mL)	Actual Weight (g)	Target Weight (g)	Assay (%)	Purity (%)	Nominal Conc. (µg/mL)	Lot Number	RM#	Compound
20.0	10000.1	24.2758	24.2756	41.2	0.10	99.997	10000	IN017	SrZr2O2018A1

1. Strontium nitrate (Sr) IN017 SRZr2O2018A1 10000 99.997 0.10 41.2 24.2756 24.2758 10000.1 20.0 10042-76-9 NA orl-rat >2000mg/kg 3153a

[1] Spectrum No.1 [14.495 sec]:58138.D# [Count] [Linear]





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

Trace Metals Verification by ICP-MS ($\mu\text{g/mL}$)

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	<0.2	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	<0.01	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	<0.02	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	T	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 certified (+/-) 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).



CERTIFIED WEIGHT REPORT:

Part Number: 57081
Lot Number: 062724
Description: Thallium (TI)

Lot #

Solvent: 24002546 Nitric Acid

2% 40.0 Nitric Acid (mL)

Expiration Date:

062727

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

Weight shown below was diluted to (mL): 2000.1

5E-05 Balance Uncertainty
0.10 Flask Uncertainty

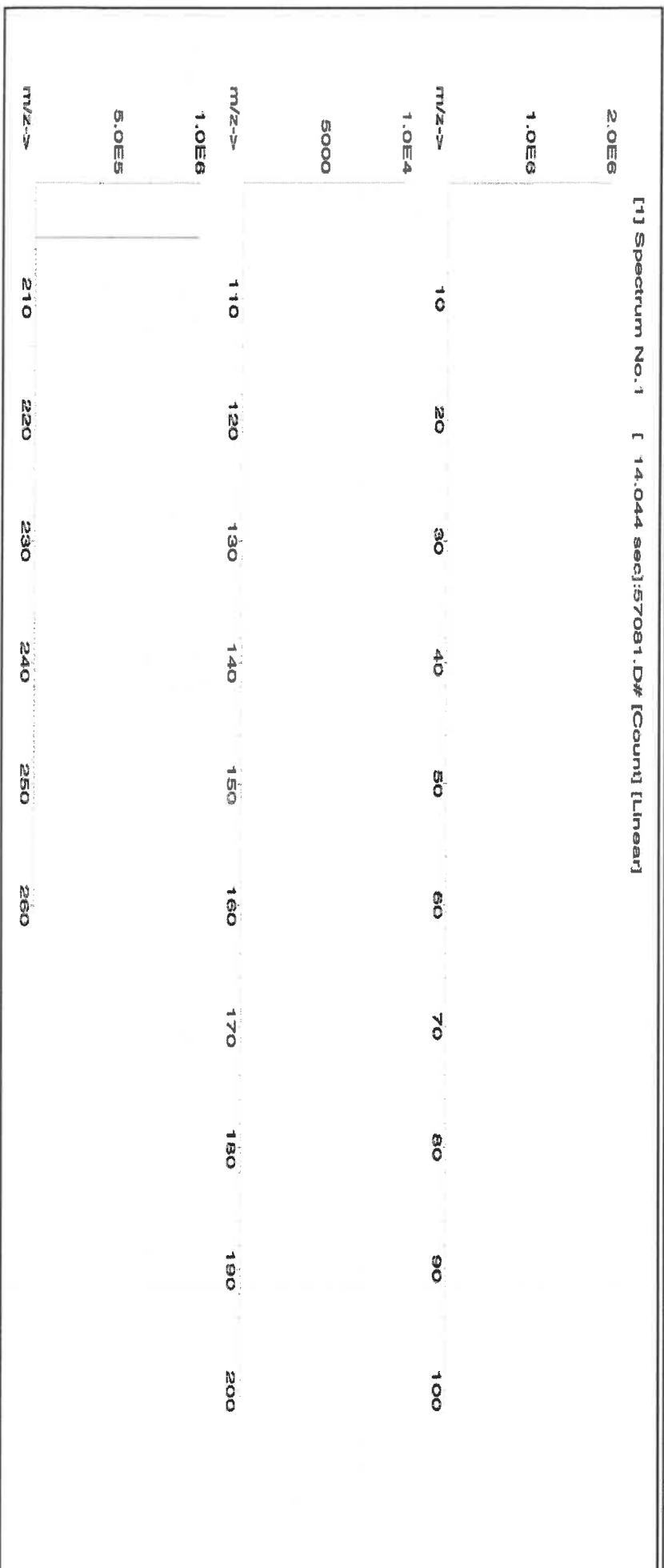
<i>Aleah O'Brady</i>	
Formulated By:	Aleah O'Brady
	062724
Reviewed By:	<i>Pedro L. Rendas</i>
	Pedro L. Rendas
	062724

SDS Information

Compound	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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1. Thallium nitrate (TI) IN037 BCCF4399 1000 99.999 0.10 77.0 2.5975 2.5977 1000.1 2.0 10102-45-1 0.1 mg/m3 or-mus 15mg/kg 3158

[1] Spectrum No.1 [14.044 sec]:57081.D# [Count] [Linear]





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	Pt	<0.02	Sc	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	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	<0.01	Os	<0.02	Rh	<0.02	Ag	<0.02	Tl	T	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	Tm	<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	Sn	<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	Ti	<0.02	Zn	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Se	<0.02	Ta	<0.02			Zr	<0.02

(T) = Target analyte

Physical Characterization:

Certified by:

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

- * 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 certified (+/-) 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).



Certified Reference Material CRM

M6021



ANAB ISO 17034 Accredited
AR-1539 Certificate Number
<https://absolutestandards.com>

CERTIFIED WEIGHT REPORT:

Part Number: **57023**
Lot Number: **062424**
Description: **Vanadium (V)**

Lot # **24002546**
Solvent: **Nitric Acid**

Aleah O'Brady	
Formulated By:	Aleah O'Brady
	062424
Reviewed By:	Pedro L. Rantas
	062424

Expiration Date: **062427**
Recommended Storage: **Ambient (20 °C)**
Nominal Concentration (µg/mL): **1000**
NIST Test Number: **6UTB**

Volume shown below was diluted to (mL): **2000.3**
0.06 Balance Uncertainty
Flask Uncertainty

Compound		Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
1. Ammonium metavanadate (V)		58123	021224	0.1000	200.0	0.084	1000	10000.3	1000.0	2.2	7803-55-6	0.05 mg/m3	or-at 58.1mg/kg	3165

[1] Spectrum No.1 [34.243 sec]:58023.D# [Count] [Linear]

2.0E6	m/z-->	10	20	30	40	50	60	70	80	90	100
1.0E6	m/z-->	10	20	30	40	50	60	70	80	90	100
2.0E7	m/z-->	10	20	30	40	50	60	70	80	90	100
1.0E7	m/z-->	10	20	30	40	50	60	70	80	90	100
5.0E8	m/z-->	110	120	130	140	150	160	170	180	190	200
2.5E8	m/z-->	110	120	130	140	150	160	170	180	190	200



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	Pt	<0.02	Se	<0.2
Sb	<0.02	Ca	<0.2	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02
As	<0.2	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.01	Os	<0.02	Rh	<0.02	Ag	<0.02
Ba	<0.02	Cs	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.02	Pd	<0.02	Ru	<0.02	Na	<0.2
Be	<0.01	Cr	<0.02	Ga	<0.02	Fe	<0.2	Hg	<0.2	P	<0.02	Sr	<0.02	S	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	Ta	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ti	<0.02
														Tb	<0.02
														Te	<0.02
														Tl	<0.02
														Th	<0.02
														Tm	<0.02
														Sn	<0.02
														Ti	<0.02
														W	<0.02
														U	<0.02
														V	T
														Yb	<0.02
														Y	<0.02
														Zn	<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 certified (+/-) 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).



SHIPPING DOCUMENTS

CLIENT INFORMATION

REPORT TO BE SENT TO:
COMPANY: Geac Inc
ADDRESS: 8 CARRAGE
CITY: Successville STATE: NJ ZIP: 07876
ATTENTION: GARY L
PHONE: _____ FAX: _____

CLIENT PROJECT INFORMATION

PROJECT NAME: Amsterdam
PROJECT NO.: _____ LOCATION: _____
PROJECT MANAGER: GL
e-mail: _____
PHONE: _____ FAX: _____

CLIENT BILLING INFORMATION

BILL TO: GenVironment PO#: _____
ADDRESS: 8 CARRAGE
CITY: Successville STATE: NJ ZIP: 07876
ATTENTION: _____ PHONE: _____

ANALYSIS

DATA TURNAROUND INFORMATION

FAX (RUSH) _____ DAYS*
HARDCOPY (DATA PACKAGE): Standard DAYS*
EDD: _____ DAYS*

*TO BE APPROVED BY CHEMTECH

STANDARD HARDCOPY TURNAROUND TIME IS 10 BUSINESS

DATA DELIVERABLE INFORMATION

☐ Level 1 (Results Only) ☐ Level 4 (QC + Full Raw Data)
☐ Level 2 (Results + QC) ☒ NJ Reduced ☐ US EPA CLP
☐ Level 3 (Results + QC) ☐ NYS ASP A ☐ NYS ASP B
☐ + Raw Data ☐ Other
☒ EDD FORMAT 100% full pdf excel

1. 2. 3. 4. 5. 6. 7. 8. 9.
TEL Volatiles
TAL Metals
Sulfate

PRESERVATIVES

COMMENTS

ALLIANCE SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		# OF BOTTLES										← Specify Preservatives A-HCl D-NaOH B-HNO3 E-ICE C-H2SO4 F-OTHER
			COMP	GRAB	DATE	TIME		A	B	E							
1.	<u>RW1</u>	<u>GW</u>			<u>2/11/25</u>	<u>1225</u>		<u>X</u>	<u>X</u>	<u>X</u>							
2.	<u>MW2</u>	<u>GW</u>			<u>2/11/25</u>	<u>1245</u>		<u>X</u>	<u>X</u>								
3.																	
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER: 1. [Signature] DATE/TIME: 2-11-25 RECEIVED BY: 1. [Signature] 1335
RELINQUISHED BY SAMPLER: 2. DATE/TIME: _____ RECEIVED BY: 2.
RELINQUISHED BY SAMPLER: 3. DATE/TIME: _____ RECEIVED BY: 3.

Conditions of bottles or coolers at receipt: ☐ COMPLIANT ☐ NON COMPLIANT ☐ COOLER TEMP 4.6 °C

Comments: _____

Page _____ of _____ CLIENT: ☐ Hand Delivered ☐ Other

Shipment Complete
☐ YES ☐ NO



284 Sheffield Street, Mountainside NJ 07092 (908)-789-8900 Fax : 908 789 8922

Laboratory Certification

Certified By	License No.
CAS EPA CLP Contract	68HERH20D0011
Connecticut	PH-0830
DOD ELAP (ANAB)	L2219
Maine	2024021
Maryland	296
New Hampshire	255424 Rev 1
New Jersey	20012
New York	11376
Pennsylvania	68-00548
Soil Permit	525-24-234-08441
Texas	T104704488

LOGIN REPORT/SAMPLE TRANSFER

Order ID : Q1355 GENV01

Order Date : 2/11/2025 1:38:32 PM

Project Mgr : Yazmeen

Client Name : G Environmental

Project Name : Amsterdam

Report Type : NJ Reduced

Client Contact : Gary Landis

Receive DateTime : 2/11/2025 1:35:00 PM

EDD Type : Excel NJ

Invoice Name : G Environmental

Purchase Order :

Hard Copy Date :

Invoice Contact : Gary Landis

Date Signoff : 2/11/2025 2:31:16 PM

LAB ID	CLIENT ID	MATRIX	SAMPLE DATE	SAMPLE TIME	TEST	TEST GROUP	METHOD	FAX DATE	DUE DATES
Q1355-01	RW1	Water	02/11/2025	12:25					
					VOCMS Group1		8260-Low	10 Bus. Days	
Q1355-02	MW2	Water	02/11/2025	12:45					
					VOCMS Group1		8260-Low	10 Bus. Days	

Relinquished By : 

Date / Time : 2/11/25 1440

Received By : 

Date / Time : 2/11/25 14:40

Storage Area : VOA Refridgerator Room