

SDG COVER PAGE

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
 Lab Code: ACE Case No.: 51921 MA No.: _____ SDG No.: GCPF7
 SOW No. : SFAM01.1

EPA Sample No.	Lab Sample Id	ICP-AES	Analysis Method		
			ICP-MS	Mercury	Cyanide
GCPF7	Q1041-01	X			
GCPF8	Q1041-02	X			
GCPF9	Q1041-03	X			
GCPG0	Q1041-04	X			
GCPG0D	Q1041-05	X			
GCPG0S	Q1041-06	X			
GCPG1	Q1041-07	X			
GCPG2	Q1041-08	X			
GCPG3	Q1041-09	X			
GCPG4	Q1041-10	X			
GCPG5	Q1041-11	X			
GCPG6	Q1041-12	X			
GCPG7	Q1041-13	X			
GCPG8	Q1041-14	X			
GCPG9	Q1041-15	X			
GCPH0	Q1041-16	X			
GCPH1	Q1041-17	X			
GCPH2	Q1041-18	X			
GCPH3	Q1041-19	X			
GCPH4	Q1041-20	X			
GCPH5	Q1041-21	X			

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the SDG Narrative. All edits and manual integrations have been peer-reviewed. Release of the data contained in this hardcopy Complete SDG File and in the electronic data submitted has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____ Name: _____
 Date: _____ Title: _____

68HERH20D0011

SDG # GCPF7

USEPA CLP Inorganics COC (LAB COPY)

DateShipped: 1/8/2025

CarrierName: FedEx

AirbillNo: 8176 1044 3362

Region 7 SCRIBE COC Record

Case #: 51921

Project Code: KMA7K201/2500007

No: 7-010725-131535-0000

Lab: Alliance Technical Group LLC (ACE)

Lab Contact: Sample Receipt

Lab Phone: (908) 789-8900

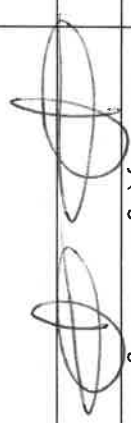
Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	For Lab Use Only
2500007-20	GCPF7	Soil/SET/	Grab	SoilMeisAES(21)	2500007020 (4°C) (1)	4565-G	11/22/2024 09:11	
2500007-21	GCPF8	Soil/SET/	Grab	SoilMeisAES(21)	2500007021 (4°C) (1)	4565-LS	11/22/2024 09:09	
2500007-22	GCPF9	Soil/SET/	Grab	SoilMeisAES(21)	2500007022 (4°C) (1)	4565-RE	11/22/2024 09:07	
2500007-23	GCPG0	Soil/SET/	Grab	SoilMeisAES(21)	2500007023 (4°C) (1)	4565-SAND	11/22/2024 09:05	
2500007-24	GCPG1	Soil/SET/	Grab	SoilMeisAES(21)	2500007024 (4°C) (1)	4872-C1	11/25/2024 10:00	
2500007-25	GCPG2	Soil/SET/	Grab	SoilMeisAES(21)	2500007025 (4°C) (1)	4872-C2	11/25/2024 10:02	
2500007-26	GCPG3	Soil/SET/	Grab	SoilMeisAES(21)	2500007026 (4°C) (1)	4872-C3	11/25/2024 10:04	
2500007-27	GCPG4	Soil/SET/	Grab	SoilMeisAES(21)	2500007027 (4°C) (1)	4872-C4	11/25/2024 10:06	
2500007-28	GCPG5	Soil/SET/	Grab	SoilMeisAES(21)	2500007028 (4°C) (1)	4872-C5	11/25/2024 10:08	
2500007-29	GCPG6	Soil/SET/	Grab	SoilMeisAES(21)	2500007029 (4°C) (1)	4872-C6	11/25/2024 10:10	
2500007-30	GCPG7	Soil/SET/	Grab	SoilMeisAES(21)	2500007030 (4°C) (1)	4872-DW	11/25/2024 10:12	
2500007-31	GCPG8	Soil/SET/	Grab	SoilMeisAES(21)	2500007031 (4°C) (1)	4872-FF	11/25/2024 10:14	
2500007-32	GCPG9	Soil/SET/	Grab	SoilMeisAES(21)	2500007032 (4°C) (1)	4872-SP	11/25/2024 10:16	
2500007-33	GCPH0	Soil/SET/	Grab	SoilMeisAES(21)	2500007033 (4°C) (1)	5327-C1	11/18/2024 13:55	
2500007-34	GCPH1	Soil/SET/	Grab	SoilMeisAES(21)	2500007034 (4°C) (1)	5327-C2	11/18/2024 13:57	
2500007-35	GCPH2	Soil/SET/	Grab	SoilMeisAES(21)	2500007035 (4°C) (1)	5327-C3	11/18/2024 13:59	
2500007-36	GCPH3	Soil/SET/	Grab	SoilMeisAES(21)	2500007036 (4°C) (1)	5327-C4	11/18/2024 14:01	
2500007-37	GCPH4	Soil/SET/	Grab	SoilMeisAES(21)	2500007037 (4°C) (1)	5327-C5	11/18/2024 14:03	
2500007-38	GCPH5	Soil/SET/	Grab	SoilMeisAES(21)	2500007038 (4°C) (1)	5327-C6	11/18/2024 14:05	

Sample(s) to be used for Lab QC: 2500007-23 Tag 2500007023 - Special Instructions: Soil metals by ICPAES will be collected in 1 Whirlpak or ziplock baggie for each sample, and will be enough for all analyses and the designated QCs=MS/MSDs at full volumes. EPA - Region 7 requesting that only As, Ba, Cd, Cr, Co & Pb soil metals by ICPAES analyses be analyzed/reported on all samples for this CASE and that %solids needed/required on all samples for this CASE. oil metals by ICPAES PT sample (with instructions & PT ID R03272403-24) will be included/packed/shipped with the above field samples. This case is shipped with case 51925 and will not include ice. The CLP lab should note the temperature on the case narrative and proceed with analysis.

Analysis Key: SoilMeisAES=SoilMeisbyICPAES

Shipment for Case Complete? Y

Samples Transferred From Chain of Custody #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
CLP Shipping & Analysis	KATELYN ORIGIES Digitally signed by KATELYN ORIGIES Date: 2025.01.08 07:54:14 -0800			0940 1-9-25	IR Gun #1 Temp 5.8°C
					Temp blank present
					Custody Seal intact

FORM DC-1
SAMPLE LOG-IN SHEET

Lab Name : Alliance Technical Group, LLC		Page <u>1</u> of <u>1</u>
Received By (Print Name) <u>GORSE</u>		Log-in Date 1/9/2025
Received By (Signature) <u>[Signature]</u>		
Case Number 51921	SDG No. GCPF7	MA No. N/A

Remarks:	
1. Custody Seal (s)	Present, Intact
2. Custody Seal Nos.	<u>n/a</u>
3. Traffic Reports/Chain Of Custody Records	Present
4. Airbill	Present
5. Airbill No. and Shipping Container ID No.	<u>817610443362</u> <u>1</u>
6. Shipping Container Temperature Indicator Bottle	Present
7. Shipping Container Temperature	<u>5.8</u> Degree C
8. Sample Condition	Intact
9. Sample Tags Sample Tag Numbers	Absent Listed on Traffic Report
10. Does information on Traffic Reports/Chain of Custody Records and Sample Tags agree ?	Yes
11. Date Received at Lab	<u>01/09/2025</u>
12. Time Received	<u>09:40</u>

	EPA Sample #	Aqueous/ Water Sample pH	Corresponding		Remarks: Condition of Sample Shipment, etc.
			Sample Tag #	Assigned Lab #	
1	GCPF7	N/A	2500007020	Q1041-01	Intact
2	GCPF8	N/A	2500007021	Q1041-02	Intact
3	GCPF9	N/A	2500007022	Q1041-03	Intact
4	GCPG0	N/A	2500007023	Q1041-04	Intact
5	GCPG0D	N/A	2500007023	Q1041-05	Intact
6	GCPG0S	N/A	2500007023	Q1041-06	Intact
7	GCPG1	N/A	2500007024	Q1041-07	Intact
8	GCPG2	N/A	2500007025	Q1041-08	Intact
9	GCPG3	N/A	2500007026	Q1041-09	Intact
10	GCPG4	N/A	2500007027	Q1041-10	Intact
11	GCPG5	N/A	2500007028	Q1041-11	Intact
12	GCPG6	N/A	2500007029	Q1041-12	Intact
13	GCPG7	N/A	2500007030	Q1041-13	Intact
14	GCPG8	N/A	2500007031	Q1041-14	Intact
15	GCPG9	N/A	2500007032	Q1041-15	Intact
16	GCPH0	N/A	2500007033	Q1041-16	Intact
17	GCPH1	N/A	2500007034	Q1041-17	Intact
18	GCPH2	N/A	2500007035	Q1041-18	Intact
19	GCPH3	N/A	2500007036	Q1041-19	Intact
20	GCPH4	N/A	2500007037	Q1041-20	Intact
21	GCPH5	N/A	2500007038	Q1041-21	Intact
22	N/A	N/A	N/A	N/A	N/A
23	N/A	N/A	N/A	N/A	N/A

* Contact SMO and attach record of resolution

Reviewed By <u>[Signature]</u>	Logbook No. N/A
Date <u>1/9/25</u>	Logbook Page No. N/A

FORM DC-2
COMPLETE SDG FILE (CSF) INVENTORY SHEET

LAB NAME	Alliance Technical Group, LLC		
LAB CODE	ACE		
CONTRACT NO.	68HERH20D0011		
CASE NO.	51921	SDG NO.	GCPF7
MA NO.		SOW NO.	SFAM01.1

All documents delivered in the Complete SDG File must be original documents where possible.
(Reference - Exhibit B Section 2.4)

	PAGE NOS:		CHECK	
	FROM	TO	LAB	REGION
1. SDG Cover Page	1	1	✓	
2. Traffic Report/Chain of Custody Record(s)	2	2	✓	
3. Sample Log-In Sheet (DC-1)	3	3	✓	
4. CSF Inventory Sheet (DC-2)	4	6	✓	
5. SDG Narrative	7	8	✓	
6. Communication Logs	NA	NA	✓	
7. Percent Solids Log	9	10	✓	

Analysis Forms and Data (ICP-AES)

8. Sample Analysis Data Forms (1A-OR, 1B-OR, and 1-IN) for each sample or sample analysis, laboratory QC as applicable	11	29	✓	
9. Instrument raw data by instrument in analysis order	30	177	✓	

Other Data

10. Standard and Reagent Preparation Logs	178	334	✓	
11. Original Preparation and Cleanup forms or copies of Preparation and Cleanup Logbooks	335	336	✓	
12. Original Analysis or Instrument Run forms or copies of Analysis or Instrument Logbooks	337	348	✓	
13. Performance Evaluation (PE)/Proficiency Testing (PT) Sample Instructions	NA	NA	✓	
14. Extraction Logs for TCLP and SPLP	NA	NA	✓	
15. Raw GPC Data	NA	NA	✓	
16. Raw Florisil Data	NA	NA	✓	

Analysis Forms and Data (ICP-MS)

17. Sample Analysis Data Forms (1A-OR, 1B-OR, and 1-IN) for each sample or sample analysis, laboratory QC as applicable	NA	NA	✓	
18. Instrument raw data by instrument in analysis order	NA	NA	✓	

Other Data

19. Standard and Reagent Preparation Logs	NA	NA	✓	
20. Original Preparation and Cleanup forms or copies of Preparation and Cleanup Logbooks	NA	NA	✓	
21. Original Analysis or Instrument Run forms or copies of Analysis or Instrument Logbooks	NA	NA	✓	
22. Performance Evaluation (PE)/Proficiency Testing (PT) Sample Instructions	NA	NA	✓	

- 23 . Extraction Logs for TCLP and SPLP
- 24 . Raw GPC Data
- 25 . Raw Florisil Data

PAGE NOS:		CHECK	
FROM	TO	LAB	REGION
NA	NA	✓	
NA	NA	✓	
NA	NA	✓	

Analysis Forms and Data (Mercury)

- 26 . Sample Analysis Data Forms (1A-OR, 1B-OR, and 1-IN) for each sample or sample analysis, laboratory QC as applicable
- 27 . Instrument raw data by instrument in analysis order

NA	NA	✓	
NA	NA	✓	

Other Data

- 28 . Standard and Reagent Preparation Logs
- 29 . Original Preparation and Cleanup forms or copies of Preparation and Cleanup Logbooks
- 30 . Original Analysis or Instrument Run forms or copies of Analysis or Instrument Logbooks
- 31 . Performance Evaluation (PE)/Proficiency Testing (PT) Sample Instructions
- 32 . Extraction Logs for TCLP and SPLP
- 33 . Raw GPC Data
- 34 . Raw Florisil Data

NA	NA	✓	
NA	NA	✓	
NA	NA	✓	
NA	NA	✓	
NA	NA	✓	
NA	NA	✓	
NA	NA	✓	

Analysis Forms and Data (Cyanide)

- 35 . Sample Analysis Data Forms (1A-OR, 1B-OR, and 1-IN) for each sample or sample analysis, laboratory QC as applicable
- 36 . Instrument raw data by instrument in analysis order

NA	NA	✓	
NA	NA	✓	

Other Data

- 37 . Standard and Reagent Preparation Logs
- 38 . Original Preparation and Cleanup forms or copies of Preparation and Cleanup Logbooks
- 39 . Original Analysis or Instrument Run forms or copies of Analysis or Instrument Logbooks
- 40 . Performance Evaluation (PE)/Proficiency Testing (PT) Sample Instructions
- 41 . Extraction Logs for TCLP and SPLP
- 42 . Raw GPC Data
- 43 . Raw Florisil Data

NA	NA	✓	
NA	NA	✓	
NA	NA	✓	
NA	NA	✓	
NA	NA	✓	
NA	NA	✓	
NA	NA	✓	

Additional

44. EPA Shipping/Receiving Documents

Airbill (No. of Shipments 1)

Sample Tags

Sample Log-In Sheet (Lab)

45. Misc. Shipping/Receiving Records (list all individual records)

46. Internal Lab Sample Transfer Records and Tracking Sheets
(describe or list)47. Other Records and related Communication Logs
(describe or list)

48. Comments:

Completed by:
(CLP Lab)Audited by:
(EPA)

Nimisha Pandya, Document Control Officer

(Signature)

(Print Name & Title)

(Date)

(Signature)

(Print Name & Title)

(Date)

PAGE NOs:		CHECK	
FROM	TO	LAB	REGION
349	349	✓	
NA	NA	✓	
350	351	✓	
NA	NA	✓	
352	352	✓	
NA	NA	✓	



**284 Sheffield Street
Mountainside, NJ 07092**

SDG NARRATIVE

USEPA

SDG # GCPF7

CASE # 51921

CONTRACT # 68HERH20D0011

SOW# SFAM01.1

LAB NAME: Alliance Technical Group, LLC

LAB CODE: ACE

LAB ORDER ID # Q1041

A. Number of Samples and Date of Receipt

19 Soil samples were delivered to the laboratory intact on 01/09/2025.

B. Parameters

Test requested for Metals CLP12 = Arsenic, Barium, Cadmium, Chromium, Cobalt, Lead.

C. Cooler Temp

Indicator Bottle: **Presence**/Absence

Cooler: 5.8°C

D. Analytical Techniques:

All analyses were based on CLP Methodology by method SFAM01.1.

Inter Element correction factors (IECs) are determined annually and correction factor are applied during ICP-AES analysis.

E. Calculation:

Calculation for ICP-AES Soil Sample:

Conversion of Results from mg/L or ppm to mg/kg (Dry Weight Basis):

$$\text{Concentration (mg/kg)} = C \times \frac{V_f}{W \times S} \times DF$$

Where,

C = Instrument value in ppm (The average of all replicate exposures)

Vf = Final digestion volume (mL)



**284 Sheffield Street
Mountainside, NJ 07092**

W = Initial aliquot amount (g) (Sample amount taken in prep)

S = % Solids / 100 (Fraction of Percent Solids)

DF = Dilution Factor

Example Calculation For Sample GCPF7 For Arsenic :

If C = 0.0550547 ppm

Vf = 100 ml

W = 1.25 g

S = 0.971(97.1/100)

DF = 1

$$\text{Concentration (mg/kg)} = 0.0550547 \times \frac{100}{1.25 \times 0.971} \times 1$$

$$= 4.535917 \text{ mg/kg}$$

$$= 4.5 \text{ mg/kg (Reported Result with Signification)}$$

F. QA/ QC

Calibrations met requirements. Interference check met requirements. Blank analyses did not indicate any presence of contamination. Laboratory Control sample was within control limits. Spike sample did meet requirements. Duplicate sample did meet requirements except for Chromium. Serial Dilution did meet requirements.

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 Director or his designee, as verified by the following signature.

Signature _____

Name: Nimisha Pandya

Date _____

Title: Document Control Officer

PERCENT SOLID

Supervisor: Iwona
Analyst: jignesh
Date: 1/10/2025

OVENTEMP IN Celsius(°C): 107
Time IN: 13:10
In Date: 01/09/2025
Weight Check 1.0g: 1.00
Weight Check 10g: 10.00
OvenID: M OVEN#1

OVENTEMP OUT Celsius(°C): 103
Time OUT: 07:37
Out Date: 01/10/2025
Weight Check 1.0g: 1.00
Weight Check 10g: 10.00
BalanceID: M SC-4
Thermometer ID: % SOLID- OVEN

QC:LB134211

Lab ID	Client SampleID	Dish #	Dish Wt(g) (A)	Sample Wt(g)	Dish + Sample Wt(g) (B)	Dish+Dry Sample Wt(g) (C)	% Solid	Comments
Q1041-01	GCPF7	1	1.18	8.34	9.52	9.28	97.1	
Q1041-02	GCPF8	2	1.15	8.41	9.56	8.48	87.2	
Q1041-03	GCPF9	3	1.17	8.46	9.63	8.98	92.3	
Q1041-04	GCPG0	4	1.18	8.71	9.89	9.85	99.5	
Q1041-05	GCPG0D	5	1.18	8.71	9.89	9.85	99.5	
Q1041-06	GCPG0S	6	1.18	8.71	9.89	9.85	99.5	
Q1041-07	GCPG1	7	1.16	8.44	9.6	9.33	96.8	
Q1041-08	GCPG2	8	1.19	8.45	9.64	9.33	96.3	
Q1041-09	GCPG3	9	1.17	8.75	9.92	9.17	91.4	
Q1041-10	GCPG4	10	1.18	8.38	9.56	9.07	94.2	
Q1041-11	GCPG5	11	1.15	8.59	9.74	9.33	95.2	
Q1041-12	GCPG6	12	1.15	8.48	9.63	8.52	86.9	
Q1041-13	GCPG7	13	1.17	8.81	9.98	9.9	99.1	
Q1041-14	GCPG8	14	1.16	8.80	9.96	9.65	96.5	
Q1041-15	GCPG9	15	1.16	8.53	9.69	9.67	99.8	
Q1041-16	GCPH0	16	1.18	8.50	9.68	9.41	96.8	
Q1041-17	GCPH1	17	1.17	8.37	9.54	9.36	97.8	
Q1041-18	GCPH2	18	1.16	8.35	9.51	9.3	97.5	
Q1041-19	GCPH3	19	1.14	8.69	9.83	9.67	98.2	
Q1041-20	GCPH4	20	1.16	8.41	9.57	9.41	98.1	
Q1041-21	GCPH5	21	1.17	8.57	9.74	9.57	98.0	

$$\% \text{ Solid} = \frac{(C-A) * 100}{(B-A)}$$

WORKLIST(Hardcopy Internal Chain)

134211

WorkList Name : %Q1041

WorkList ID : 186835

Department : Wet-Chemistry

Date : 01-09-2025 11:41:59

Sample	Customer Sample	Matrix	Test	Preservative	Customer	Raw Sample Storage Location	Collect Date	Method
Q1041-01	GCPF7	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/22/2024	Chemtech -SO
Q1041-02	GCPF8	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/22/2024	Chemtech -SO
Q1041-03	GCPF9	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/22/2024	Chemtech -SO
Q1041-04	GCPG0	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/22/2024	Chemtech -SO
Q1041-05	GCPG0D	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/22/2024	Chemtech -SO
Q1041-06	GCPG0S	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/22/2024	Chemtech -SO
Q1041-07	GCPG1	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/22/2024	Chemtech -SO
Q1041-08	GCPG2	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/25/2024	Chemtech -SO
Q1041-09	GCPG3	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/25/2024	Chemtech -SO
Q1041-10	GCPG4	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/25/2024	Chemtech -SO
Q1041-11	GCPG5	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/25/2024	Chemtech -SO
Q1041-12	GCPG6	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/25/2024	Chemtech -SO
Q1041-13	GCPG7	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/25/2024	Chemtech -SO
Q1041-14	GCPG8	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/25/2024	Chemtech -SO
Q1041-15	GCPG9	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/25/2024	Chemtech -SO
Q1041-16	GCPH0	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/25/2024	Chemtech -SO
Q1041-17	GCPH1	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/18/2024	Chemtech -SO
Q1041-18	GCPH2	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/18/2024	Chemtech -SO
Q1041-19	GCPH3	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/18/2024	Chemtech -SO
Q1041-20	GCPH4	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/18/2024	Chemtech -SO
Q1041-21	GCPH5	Solid	Percent Solids	Cool 4 deg C	USEP01	C11	11/18/2024	Chemtech -SO

Date/Time 01-09-25 12:37
 Raw Sample Received by: JG WOC
 Raw Sample Relinquished by: JTCsm

Date/Time

01-09-25

Raw Sample Received by:

JTCsm

Raw Sample Relinquished by:

JG WOC

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

GCPF7

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51921 MA No. : SDG No.: GCPF7
Matrix: SOIL Lab Sample ID: Q1041-01
% Solids: 97.1 Date Received: 01/09/2025
Analytical Method: ICP_AES
Concentration Units ($\mu\text{g/L}$, mg/L , mg/kg dry weight, μg , or $\mu\text{g/cm}^2$): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7440-38-2	Arsenic	4.5		01/23/2025	1443
7440-39-3	Barium	150		01/23/2025	1443
7440-43-9	Cadmium	0.40	J	01/23/2025	1443
7440-47-3	Chromium	9.0	*	01/23/2025	1443
7440-48-4	Cobalt	9.3		01/23/2025	1443
7439-92-1	Lead	23		01/23/2025	1443

NOTE: Hardness (total) is reported in mg/L

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

GCPF8

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51921 MA No. : SDG No.: GCPF7
Matrix: SOIL Lab Sample ID: Q1041-02
% Solids: 87.2 Date Received: 01/09/2025
Analytical Method: ICP_AES
Concentration Units ($\mu\text{g/L}$, mg/L , mg/kg dry weight, μg , or $\mu\text{g/cm}^2$): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7440-38-2	Arsenic	4.5		01/23/2025	1447
7440-39-3	Barium	190		01/23/2025	1447
7440-43-9	Cadmium	1.0		01/23/2025	1447
7440-47-3	Chromium	13	*	01/23/2025	1447
7440-48-4	Cobalt	5.8		01/23/2025	1447
7439-92-1	Lead	31		01/23/2025	1447

NOTE: Hardness (total) is reported in mg/L

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

GCPF9

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51921 MA No. : SDG No.: GCPF7
Matrix: SOIL Lab Sample ID: Q1041-03
% Solids: 92.3 Date Received: 01/09/2025
Analytical Method: ICP_AES
Concentration Units (µg/L, mg/L, mg/kg dry weight, µg, or µg/cm²): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7440-38-2	Arsenic	4.9		01/23/2025	1451
7440-39-3	Barium	1500		01/23/2025	1451
7440-43-9	Cadmium	0.76		01/23/2025	1451
7440-47-3	Chromium	11	*	01/23/2025	1451
7440-48-4	Cobalt	8.1		01/23/2025	1451
7439-92-1	Lead	63		01/23/2025	1451

NOTE: Hardness (total) is reported in mg/L

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

GCPG0

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011

Lab Code: ACE Case No.: 51921 MA No. : SDG No.: GCPF7

Matrix: SOIL Lab Sample ID: Q1041-04

% Solids: 99.5 Date Received: 01/09/2025

Analytical Method: ICP_AES

Concentration Units ($\mu\text{g/L}$, mg/L , mg/kg dry weight, μg , or $\mu\text{g/cm}^2$): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7440-38-2	Arsenic	1.1		01/23/2025	1455
7440-39-3	Barium	17	J	01/23/2025	1455
7440-43-9	Cadmium	0.11	J	01/23/2025	1455
7440-47-3	Chromium	3.7	*	01/23/2025	1455
7440-48-4	Cobalt	2.8	J	01/23/2025	1455
7439-92-1	Lead	2.1		01/23/2025	1455

NOTE: Hardness (total) is reported in mg/L

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

GCPG1

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011

Lab Code: ACE Case No.: 51921 MA No. : SDG No.: GCPF7

Matrix: SOIL Lab Sample ID: Q1041-07

% Solids: 96.8 Date Received: 01/09/2025

Analytical Method: ICP_AES

Concentration Units ($\mu\text{g/L}$, mg/L , mg/kg dry weight, μg , or $\mu\text{g/cm}^2$): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7440-38-2	Arsenic	13		01/23/2025	1519
7440-39-3	Barium	200		01/23/2025	1519
7440-43-9	Cadmium	0.89		01/23/2025	1519
7440-47-3	Chromium	19	*	01/23/2025	1519
7440-48-4	Cobalt	14		01/23/2025	1519
7439-92-1	Lead	62		01/23/2025	1519

NOTE: Hardness (total) is reported in mg/L

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
GCPG2

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51921 MA No. : SDG No.: GCPF7
Matrix: SOIL Lab Sample ID: Q1041-08
% Solids: 96.3 Date Received: 01/09/2025
Analytical Method: ICP_AES
Concentration Units (µg/L, mg/L, mg/kg dry weight, µg, or µg/cm²): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7440-38-2	Arsenic	10		01/23/2025	1523
7440-39-3	Barium	500		01/23/2025	1523
7440-43-9	Cadmium	0.55		01/23/2025	1523
7440-47-3	Chromium	15	*	01/23/2025	1523
7440-48-4	Cobalt	14		01/23/2025	1523
7439-92-1	Lead	45		01/23/2025	1523

NOTE: Hardness (total) is reported in mg/L

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

GCPG3

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51921 MA No. : SDG No.: GCPF7
Matrix: SOIL Lab Sample ID: Q1041-09
% Solids: 91.4 Date Received: 01/09/2025
Analytical Method: ICP_AES
Concentration Units ($\mu\text{g/L}$, mg/L , mg/kg dry weight, μg , or $\mu\text{g/cm}^2$): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7440-38-2	Arsenic	8.9		01/23/2025	1527
7440-39-3	Barium	300		01/23/2025	1527
7440-43-9	Cadmium	0.50		01/23/2025	1527
7440-47-3	Chromium	18	*	01/23/2025	1527
7440-48-4	Cobalt	14		01/23/2025	1527
7439-92-1	Lead	45		01/23/2025	1527

NOTE: Hardness (total) is reported in mg/L

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

GCPG4

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011

Lab Code: ACE Case No.: 51921 MA No. : SDG No.: GCPF7

Matrix: SOIL Lab Sample ID: Q1041-10

% Solids: 94.2 Date Received: 01/09/2025

Analytical Method: ICP_AES

Concentration Units ($\mu\text{g/L}$, mg/L , mg/kg dry weight, μg , or $\mu\text{g/cm}^2$): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7440-38-2	Arsenic	8.0		01/23/2025	1531
7440-39-3	Barium	610		01/23/2025	1531
7440-43-9	Cadmium	0.51		01/23/2025	1531
7440-47-3	Chromium	14	*	01/23/2025	1531
7440-48-4	Cobalt	9.7		01/23/2025	1531
7439-92-1	Lead	48		01/23/2025	1531

NOTE: Hardness (total) is reported in mg/L

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

GCPG5

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51921 MA No. : SDG No.: GCPF7
Matrix: SOIL Lab Sample ID: Q1041-11
% Solids: 95.2 Date Received: 01/09/2025
Analytical Method: ICP_AES
Concentration Units (µg/L, mg/L, mg/kg dry weight, µg, or µg/cm²): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7440-38-2	Arsenic	16		01/23/2025	1535
7440-39-3	Barium	160		01/23/2025	1535
7440-43-9	Cadmium	0.81		01/23/2025	1535
7440-47-3	Chromium	18	*	01/23/2025	1535
7440-48-4	Cobalt	17		01/23/2025	1535
7439-92-1	Lead	49		01/23/2025	1535

NOTE: Hardness (total) is reported in mg/L

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

GCPG6

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51921 MA No. : SDG No.: GCPF7
Matrix: SOIL Lab Sample ID: Q1041-12
% Solids: 86.9 Date Received: 01/09/2025
Analytical Method: ICP_AES
Concentration Units ($\mu\text{g/L}$, mg/L , mg/kg dry weight, μg , or $\mu\text{g/cm}^2$): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7440-38-2	Arsenic	11		01/23/2025	1539
7440-39-3	Barium	150		01/23/2025	1539
7440-43-9	Cadmium	0.60		01/23/2025	1539
7440-47-3	Chromium	18	*	01/23/2025	1539
7440-48-4	Cobalt	12		01/23/2025	1539
7439-92-1	Lead	47		01/23/2025	1539

NOTE: Hardness (total) is reported in mg/L

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

GCPG7

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51921 MA No. : SDG No.: GCPF7
Matrix: SOIL Lab Sample ID: Q1041-13
% Solids: 99.1 Date Received: 01/09/2025
Analytical Method: ICP_AES
Concentration Units ($\mu\text{g/L}$, mg/L , mg/kg dry weight, μg , or $\mu\text{g/cm}^2$): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7440-38-2	Arsenic	10		01/23/2025	1543
7440-39-3	Barium	720		01/23/2025	1543
7440-43-9	Cadmium	8.1		01/23/2025	1543
7440-47-3	Chromium	8.7	*	01/23/2025	1543
7440-48-4	Cobalt	5.7		01/23/2025	1543
7439-92-1	Lead	340		01/23/2025	1543

NOTE: Hardness (total) is reported in mg/L

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

GCPG8

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51921 MA No. : SDG No.: GCPF7
Matrix: SOIL Lab Sample ID: Q1041-14
% Solids: 96.5 Date Received: 01/09/2025
Analytical Method: ICP_AES
Concentration Units ($\mu\text{g/L}$, mg/L , mg/kg dry weight, μg , or $\mu\text{g/cm}^2$): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7440-38-2	Arsenic	14		01/23/2025	1547
7440-39-3	Barium	310		01/23/2025	1547
7440-43-9	Cadmium	0.60		01/23/2025	1547
7440-47-3	Chromium	19	*	01/23/2025	1547
7440-48-4	Cobalt	17		01/23/2025	1547
7439-92-1	Lead	49		01/23/2025	1547

NOTE: Hardness (total) is reported in mg/L

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

GCPG9

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51921 MA No. : SDG No.: GCPF7
Matrix: SOIL Lab Sample ID: Q1041-15
% Solids: 99.8 Date Received: 01/09/2025
Analytical Method: ICP_AES
Concentration Units (µg/L, mg/L, mg/kg dry weight, µg, or µg/cm²): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7440-38-2	Arsenic	6.8		01/23/2025	1551
7440-39-3	Barium	770		01/23/2025	1551
7440-43-9	Cadmium	7.1		01/23/2025	1551
7440-47-3	Chromium	1.8	*	01/23/2025	1551
7440-48-4	Cobalt	1.9	J	01/23/2025	1551
7439-92-1	Lead	290		01/23/2025	1551

NOTE: Hardness (total) is reported in mg/L

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

GCPH0

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51921 MA No. : SDG No.: GCPF7
Matrix: SOIL Lab Sample ID: Q1041-16
% Solids: 96.8 Date Received: 01/09/2025
Analytical Method: ICP_AES
Concentration Units (µg/L, mg/L, mg/kg dry weight, µg, or µg/cm²): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7440-38-2	Arsenic	4.3		01/23/2025	1556
7440-39-3	Barium	110		01/23/2025	1556
7440-43-9	Cadmium	0.40	J	01/23/2025	1556
7440-47-3	Chromium	10	*	01/23/2025	1556
7440-48-4	Cobalt	11		01/23/2025	1556
7439-92-1	Lead	32		01/23/2025	1556

NOTE: Hardness (total) is reported in mg/L

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

GCPH1

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51921 MA No. : SDG No.: GCPF7
Matrix: SOIL Lab Sample ID: Q1041-17
% Solids: 97.8 Date Received: 01/09/2025
Analytical Method: ICP_AES
Concentration Units ($\mu\text{g/L}$, mg/L , mg/kg dry weight, μg , or $\mu\text{g/cm}^2$): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7440-38-2	Arsenic	6.2		01/23/2025	1559
7440-39-3	Barium	85		01/23/2025	1559
7440-43-9	Cadmium	5.7		01/23/2025	1559
7440-47-3	Chromium	11	*	01/23/2025	1559
7440-48-4	Cobalt	11		01/23/2025	1559
7439-92-1	Lead	290		01/23/2025	1559

NOTE: Hardness (total) is reported in mg/L

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

GCPH2

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51921 MA No. : SDG No.: GCPF7
Matrix: SOIL Lab Sample ID: Q1041-18
% Solids: 97.5 Date Received: 01/09/2025
Analytical Method: ICP_AES
Concentration Units ($\mu\text{g/L}$, mg/L , mg/kg dry weight, μg , or $\mu\text{g/cm}^2$): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7440-38-2	Arsenic	7.2		01/23/2025	1603
7440-39-3	Barium	120		01/23/2025	1603
7440-43-9	Cadmium	0.55		01/23/2025	1603
7440-47-3	Chromium	12	*	01/23/2025	1603
7440-48-4	Cobalt	7.2		01/23/2025	1603
7439-92-1	Lead	110		01/23/2025	1603

NOTE: Hardness (total) is reported in mg/L

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

GCPH3

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51921 MA No. : SDG No.: GCPF7
Matrix: SOIL Lab Sample ID: Q1041-19
% Solids: 98.2 Date Received: 01/09/2025
Analytical Method: ICP_AES
Concentration Units ($\mu\text{g/L}$, mg/L , mg/kg dry weight, μg , or $\mu\text{g/cm}^2$): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7440-38-2	Arsenic	3.5		01/23/2025	1607
7440-39-3	Barium	110		01/23/2025	1607
7440-43-9	Cadmium	0.39		01/23/2025	1607
7440-47-3	Chromium	8.8	*	01/23/2025	1607
7440-48-4	Cobalt	12		01/23/2025	1607
7439-92-1	Lead	150		01/23/2025	1607

NOTE: Hardness (total) is reported in mg/L

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

GCPH4

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51921 MA No. : SDG No.: GCPF7
Matrix: SOIL Lab Sample ID: Q1041-20
% Solids: 98.1 Date Received: 01/09/2025
Analytical Method: ICP_AES
Concentration Units ($\mu\text{g/L}$, mg/L , mg/kg dry weight, μg , or $\mu\text{g/cm}^2$): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7440-38-2	Arsenic	4.5		01/23/2025	1611
7440-39-3	Barium	96		01/23/2025	1611
7440-43-9	Cadmium	0.35	J	01/23/2025	1611
7440-47-3	Chromium	12	*	01/23/2025	1611
7440-48-4	Cobalt	10		01/23/2025	1611
7439-92-1	Lead	67		01/23/2025	1611

NOTE: Hardness (total) is reported in mg/L

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

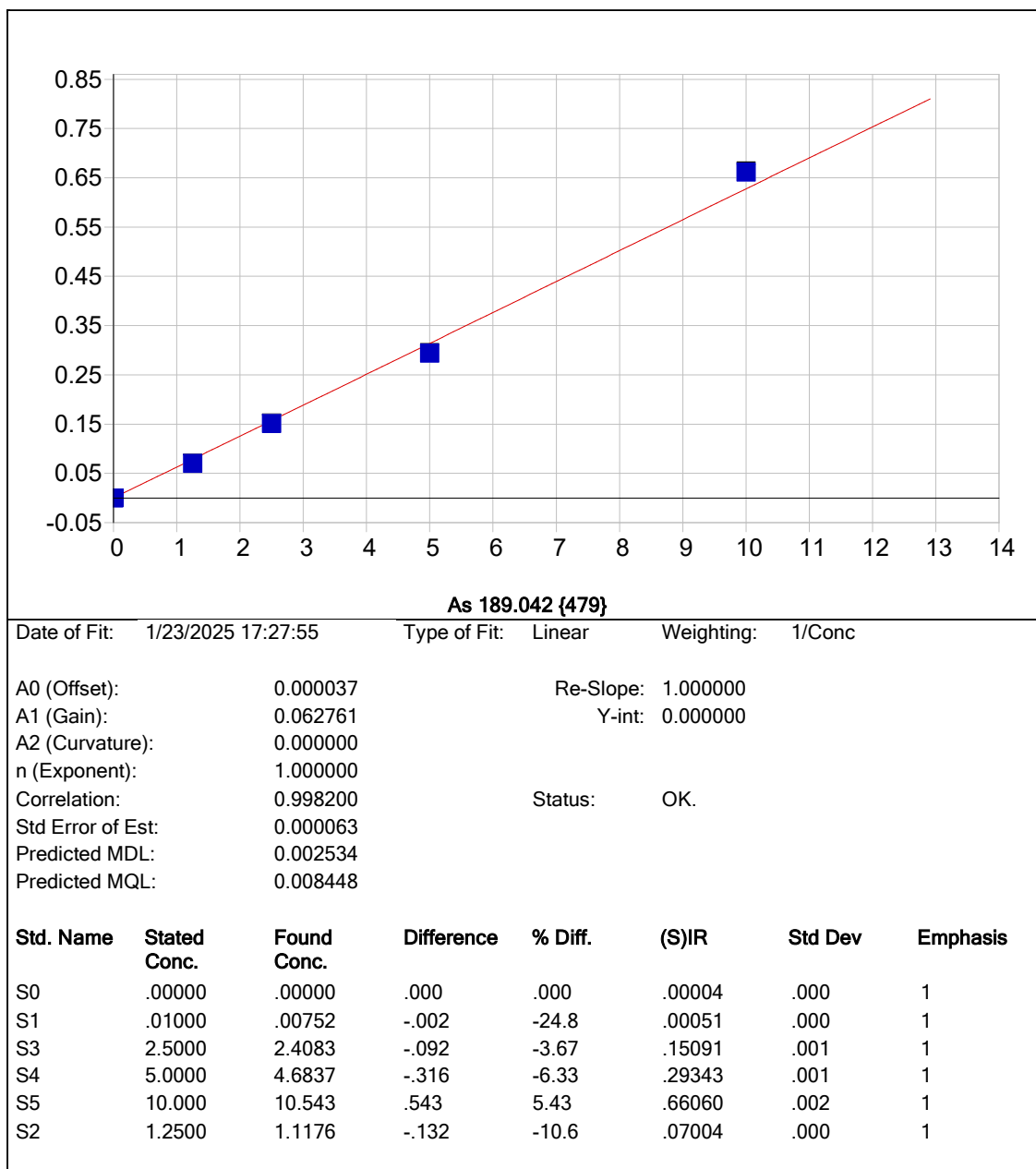
GCPH5

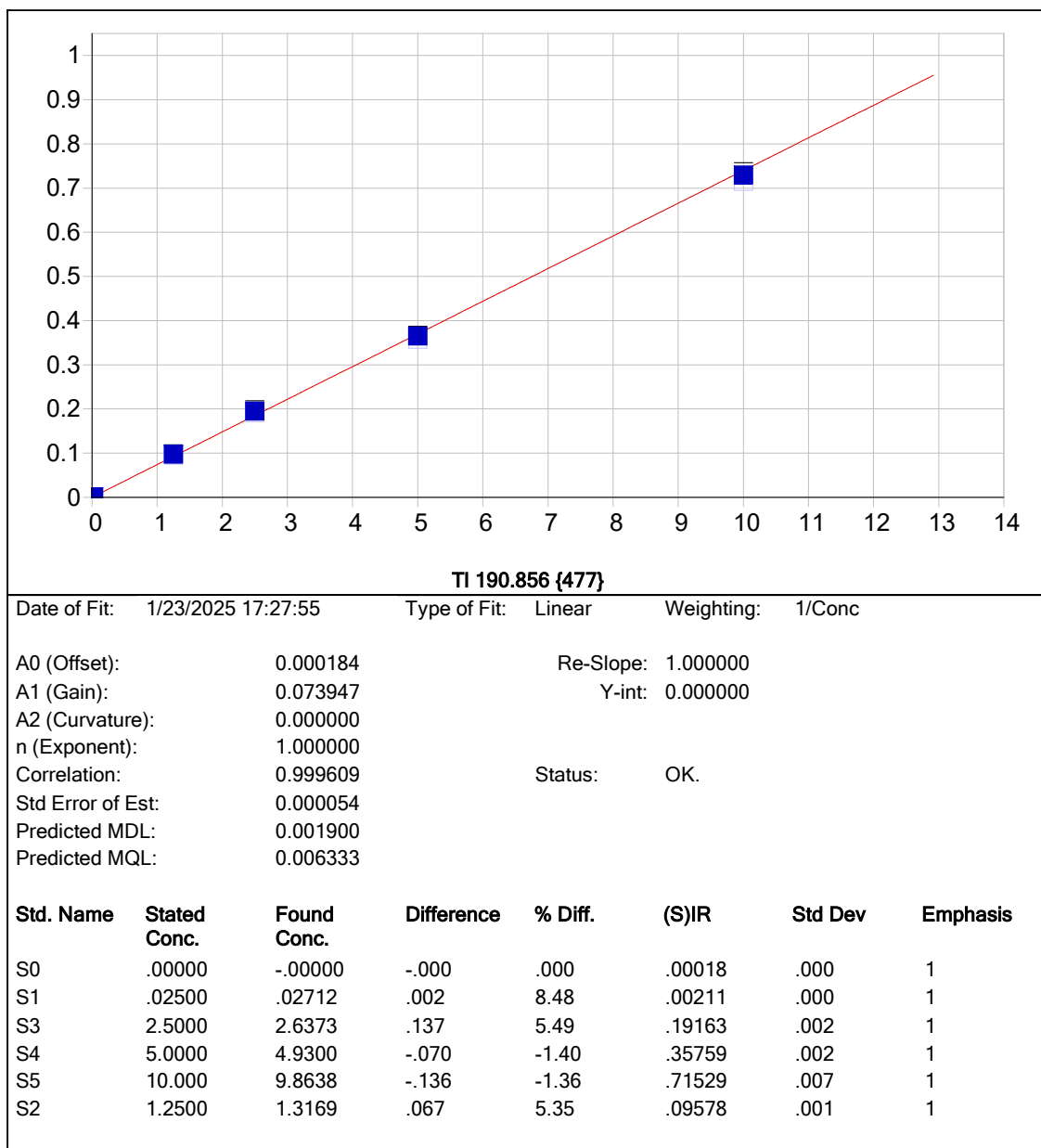
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Lab Code: ACE Case No.: 51921 MA No. : SDG No.: GCPF7
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% Solids: 98 Date Received: 01/09/2025
Analytical Method: ICP_AES
Concentration Units ($\mu\text{g/L}$, mg/L , mg/kg dry weight, μg , or $\mu\text{g/cm}^2$): mg/kg

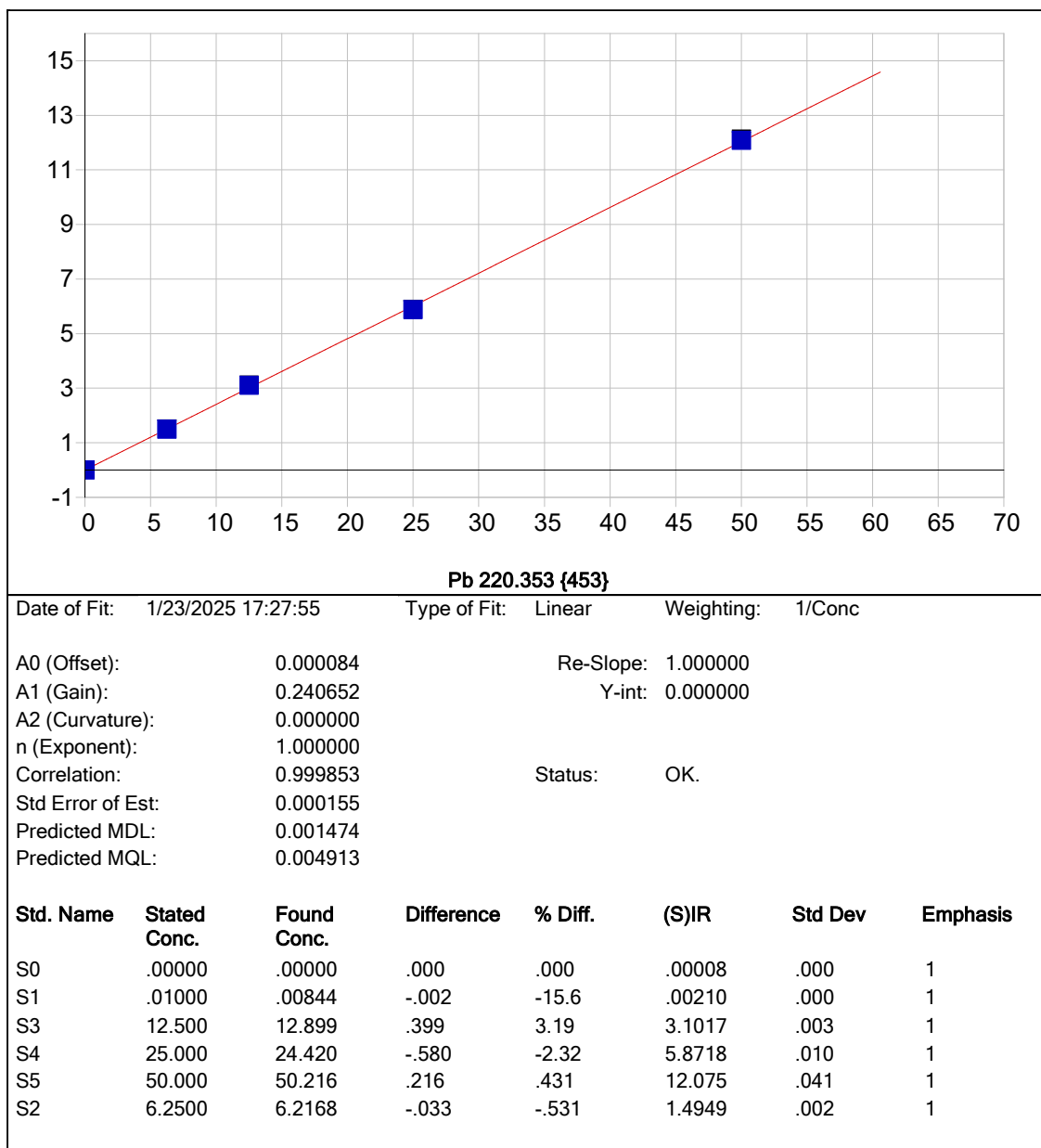
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7440-43-9	Cadmium	0.31	J	01/23/2025	1615
7440-47-3	Chromium	11	*	01/23/2025	1615
7440-48-4	Cobalt	13		01/23/2025	1615
7439-92-1	Lead	31		01/23/2025	1615

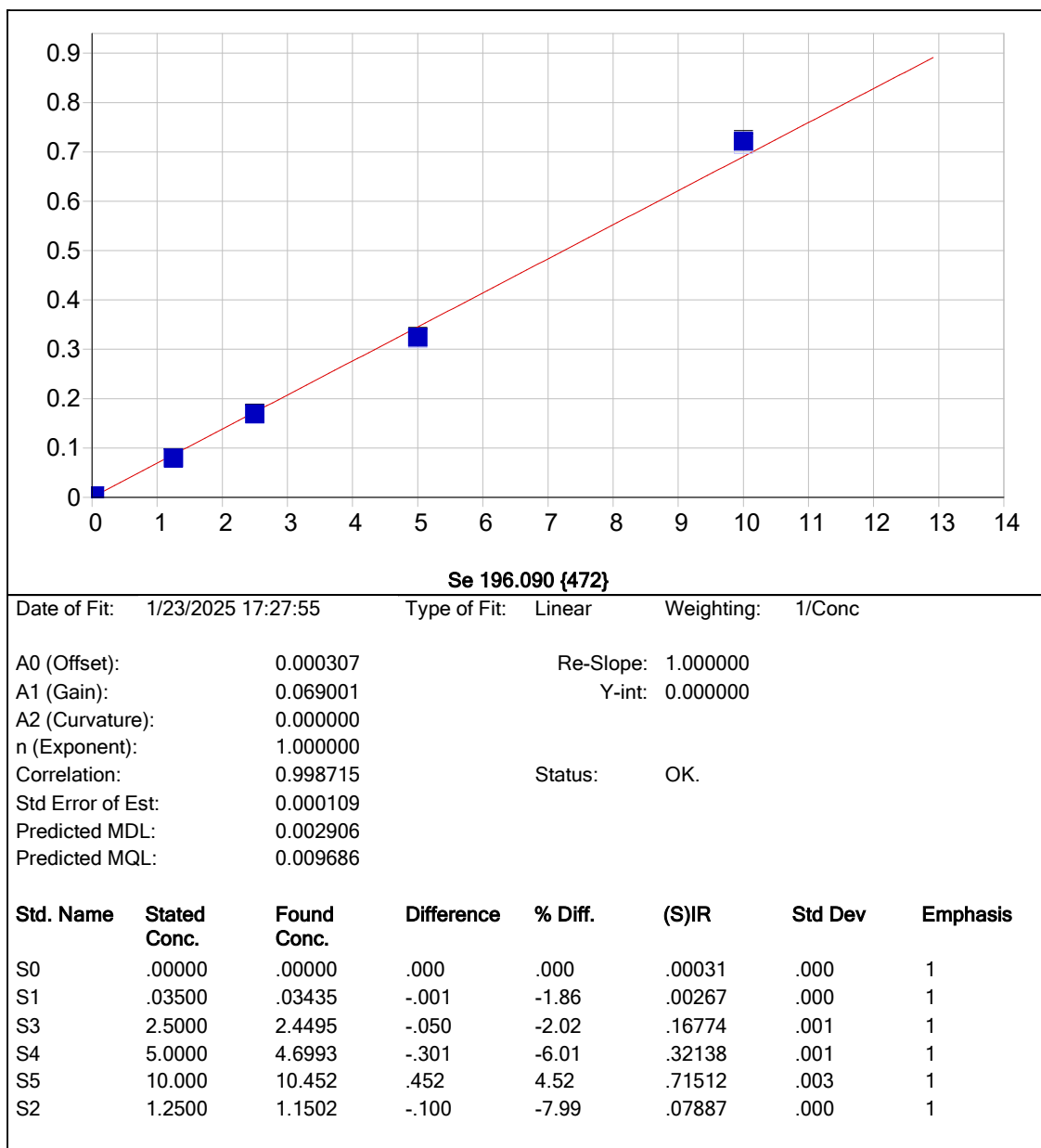
NOTE: Hardness (total) is reported in mg/L

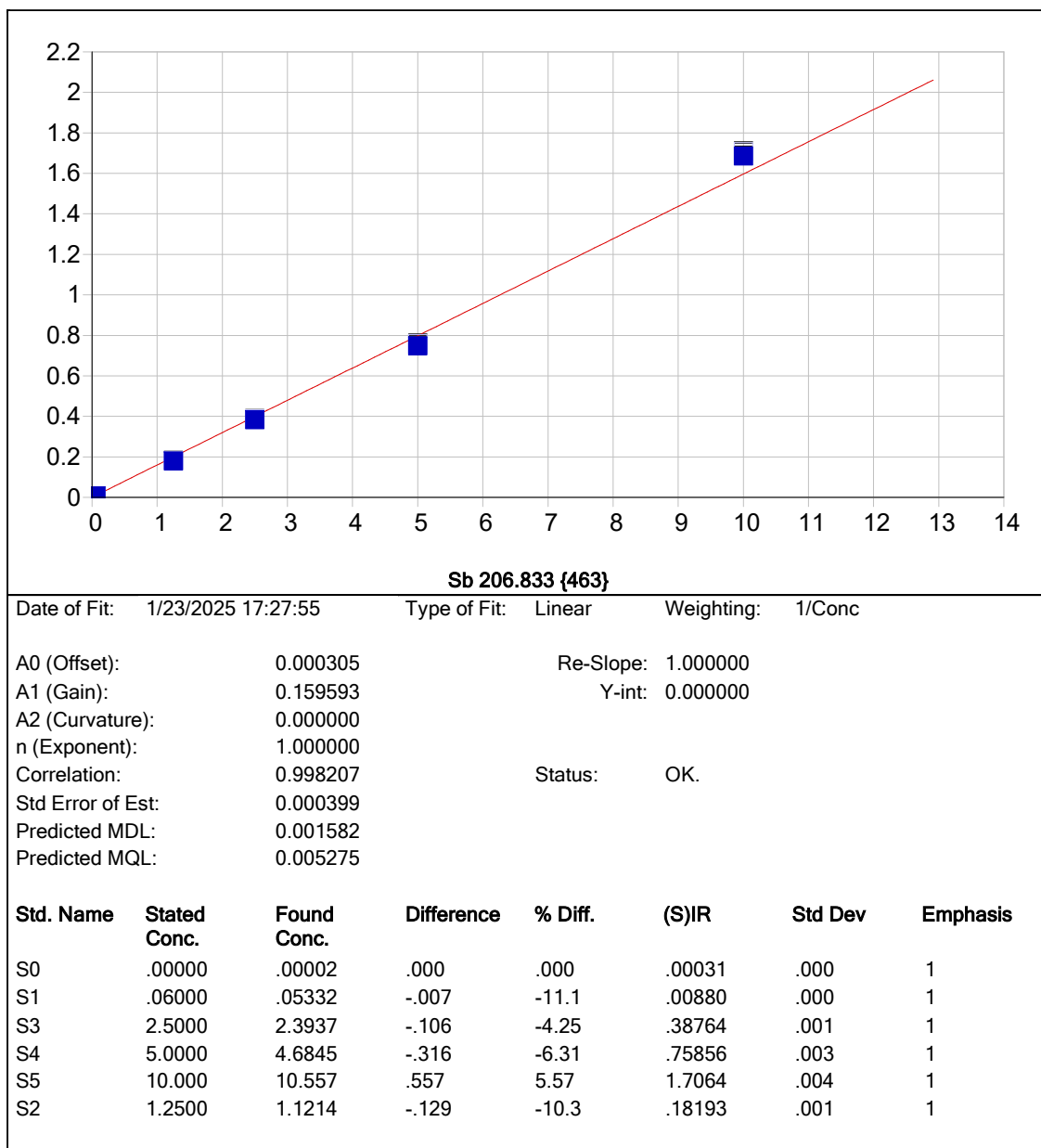
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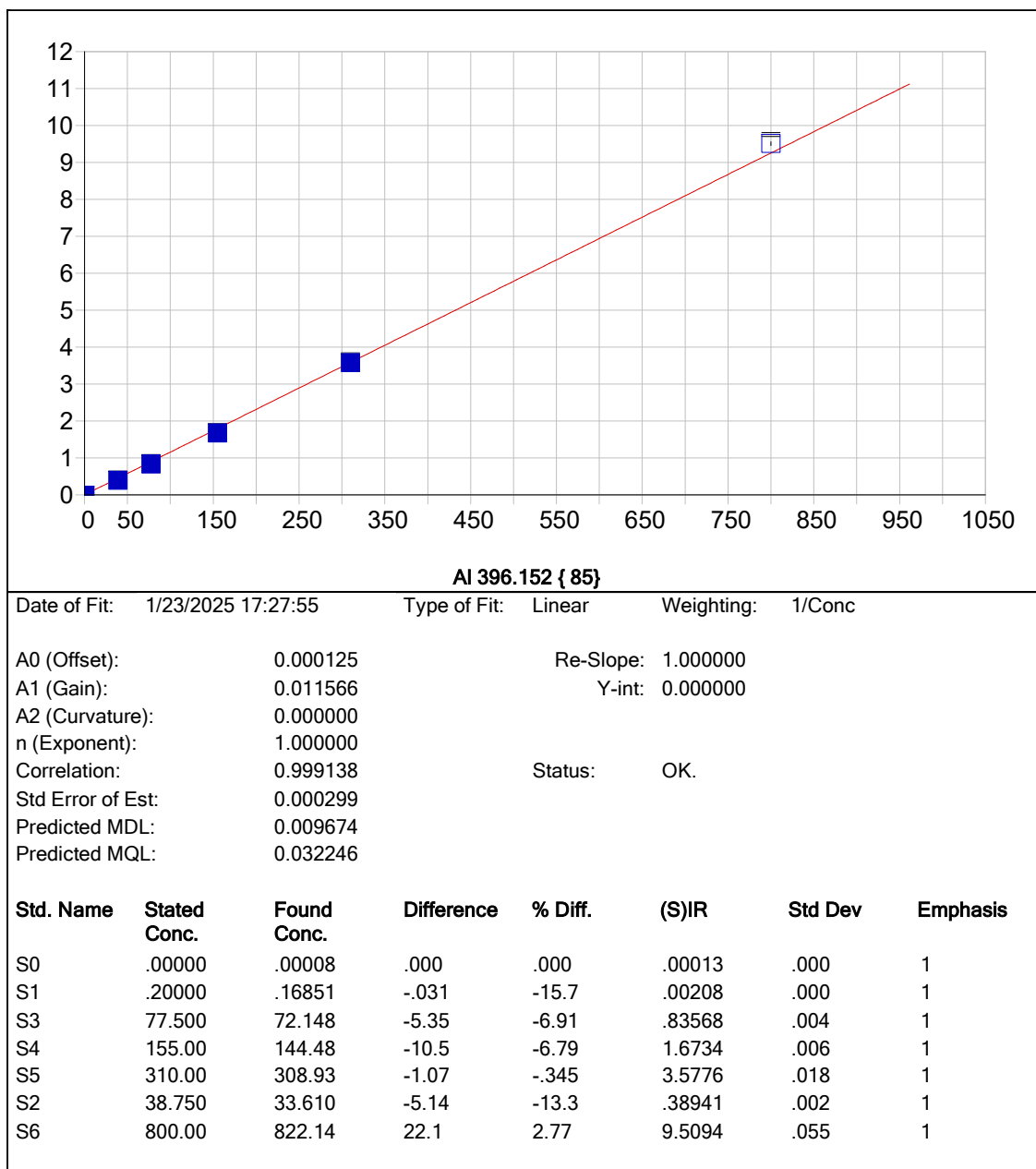


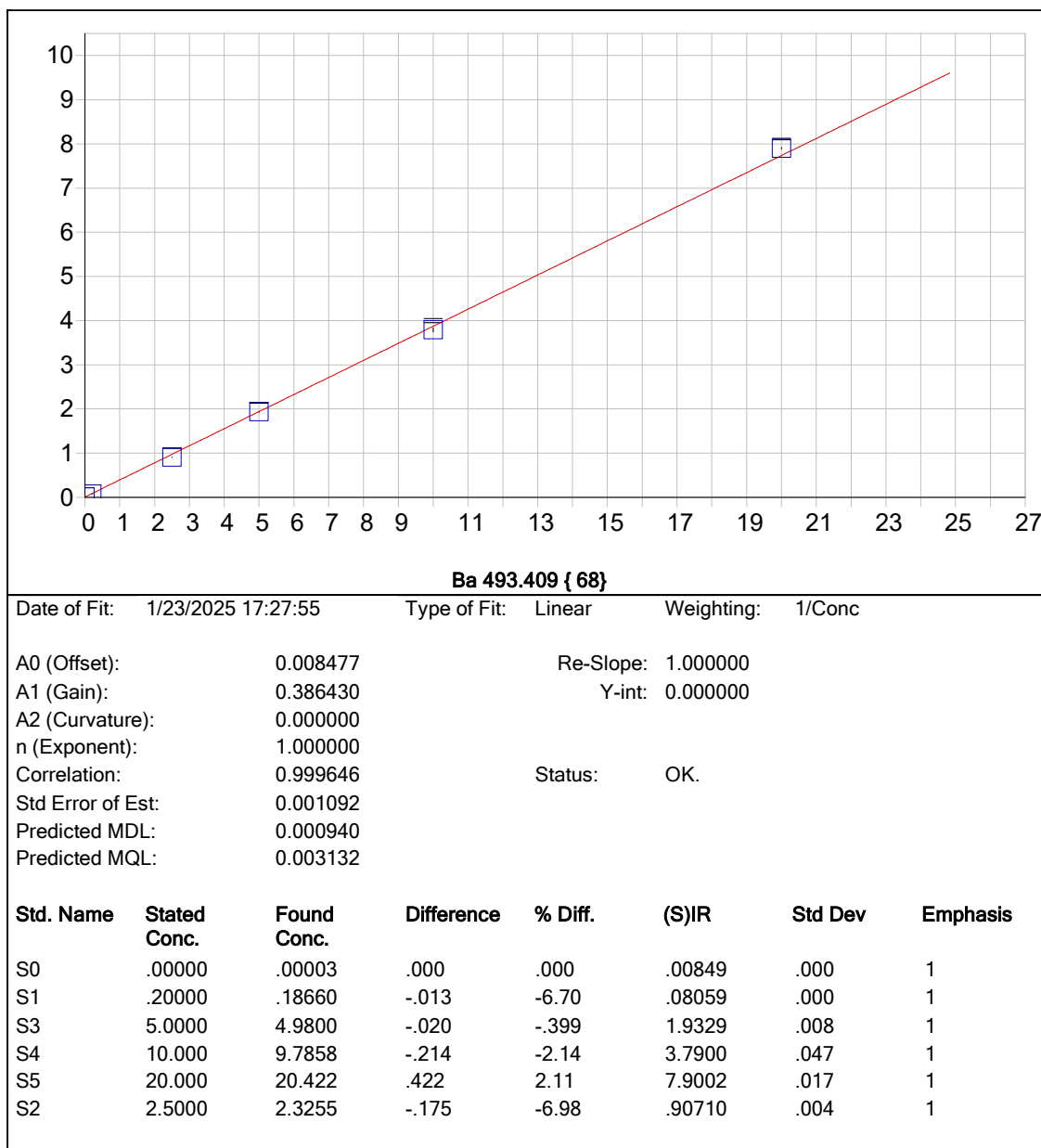


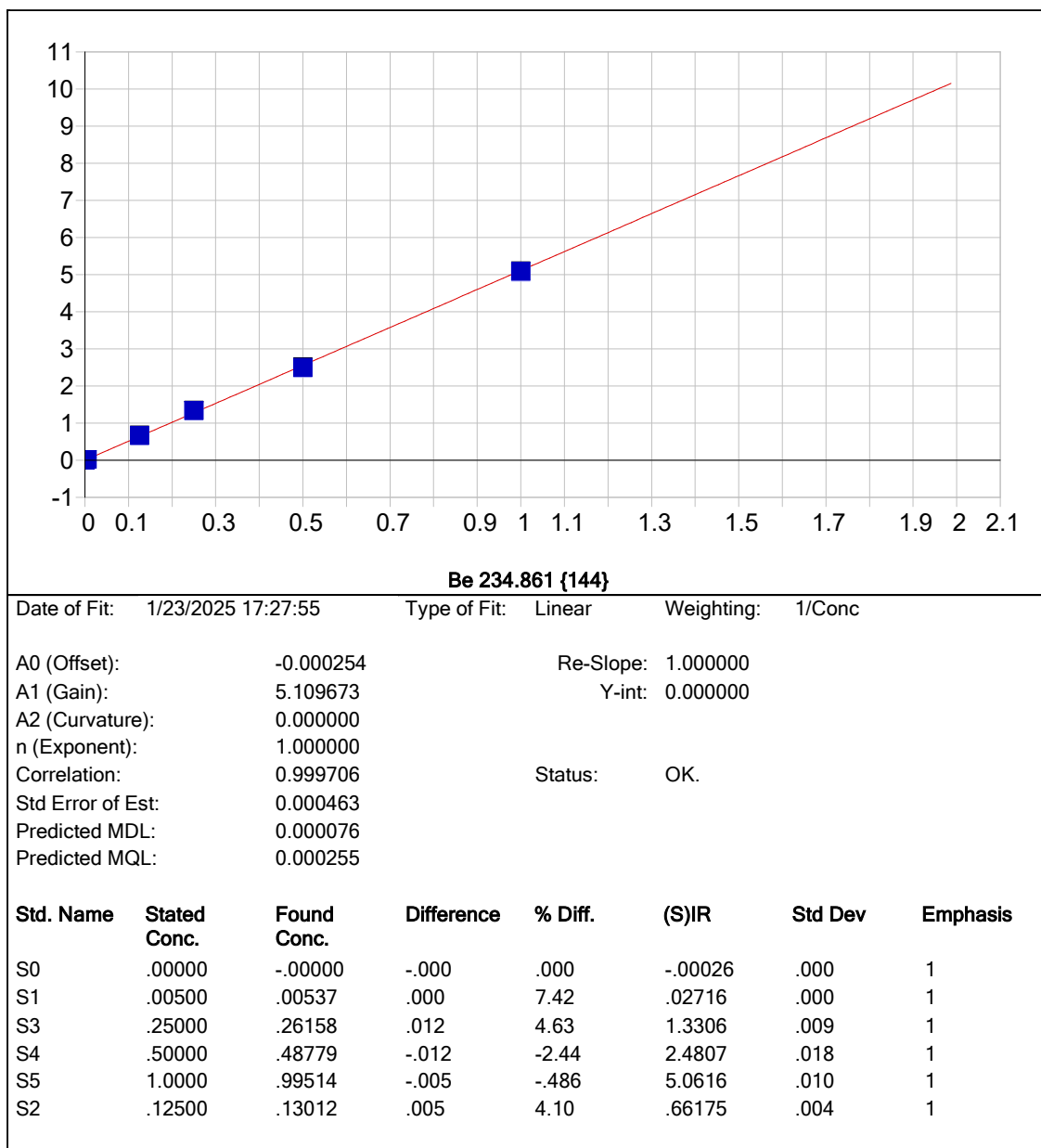


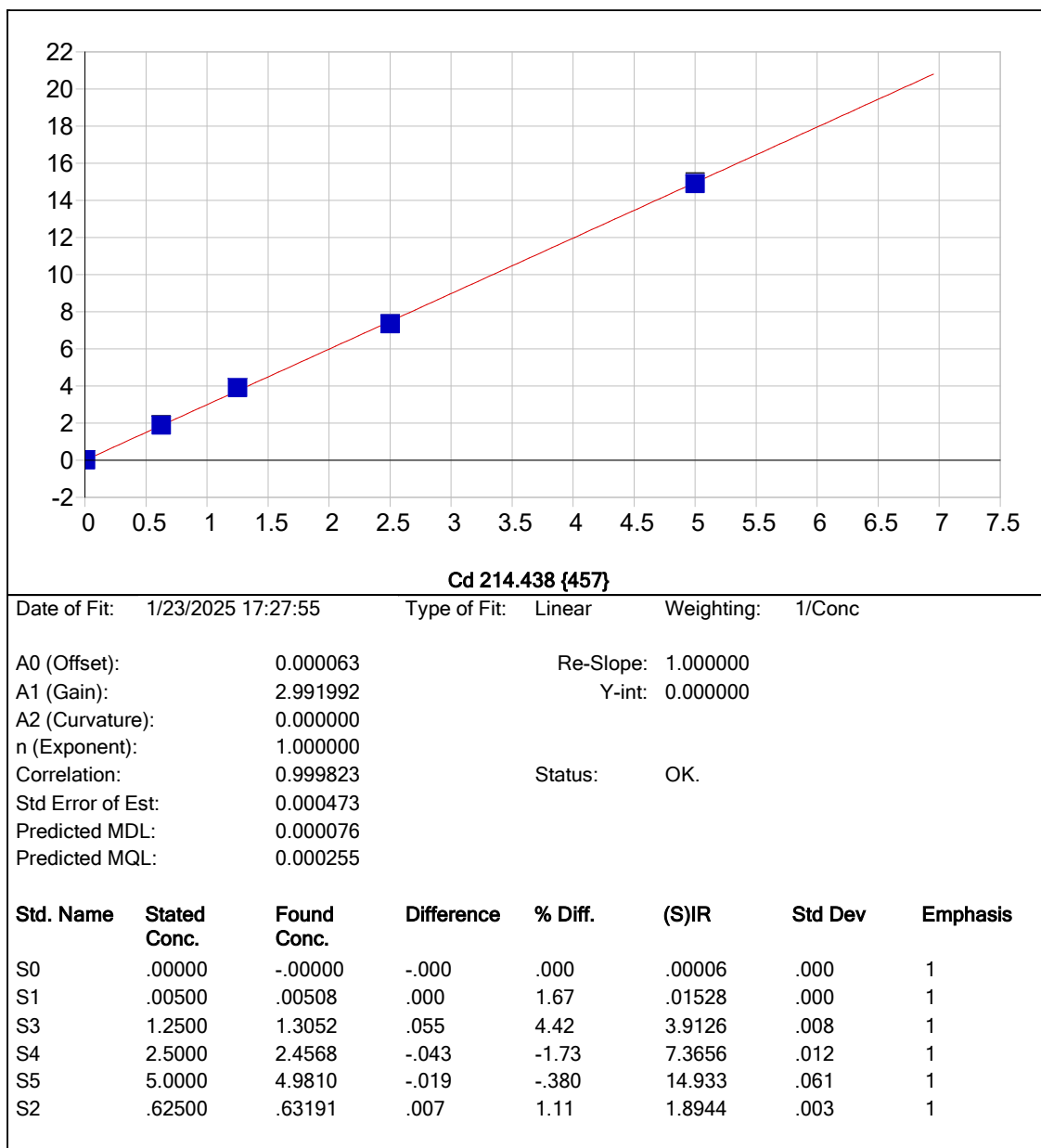


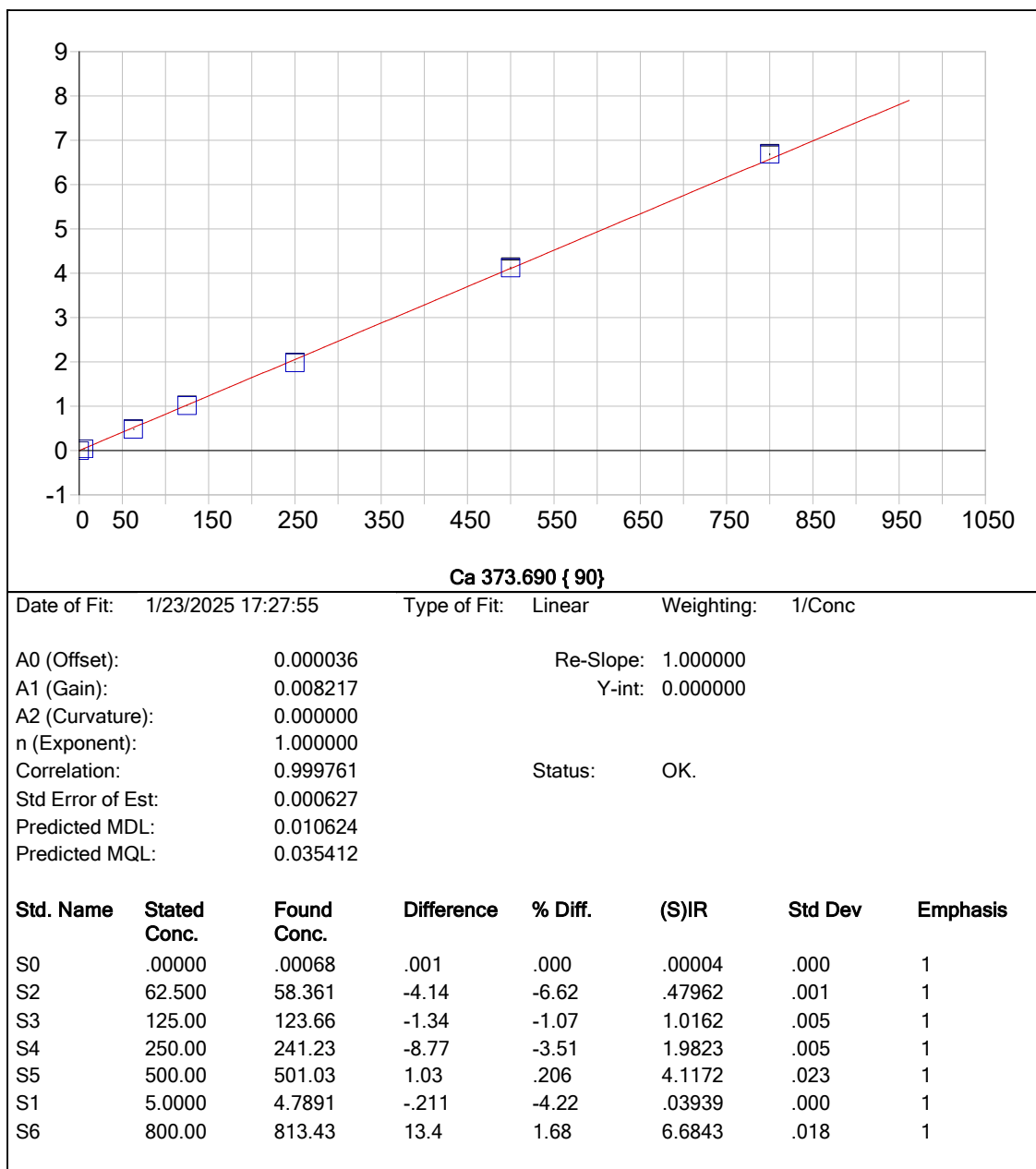


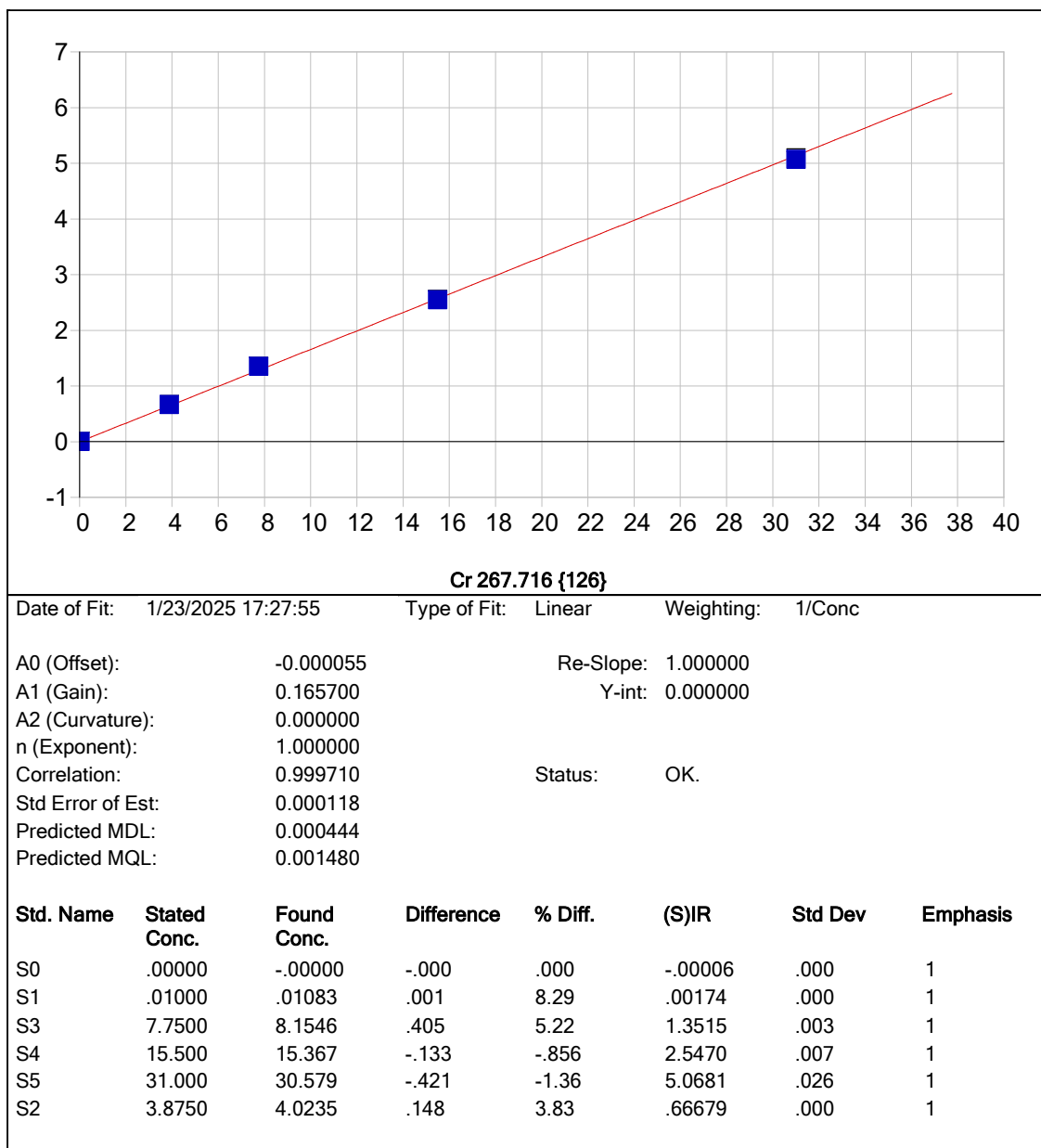


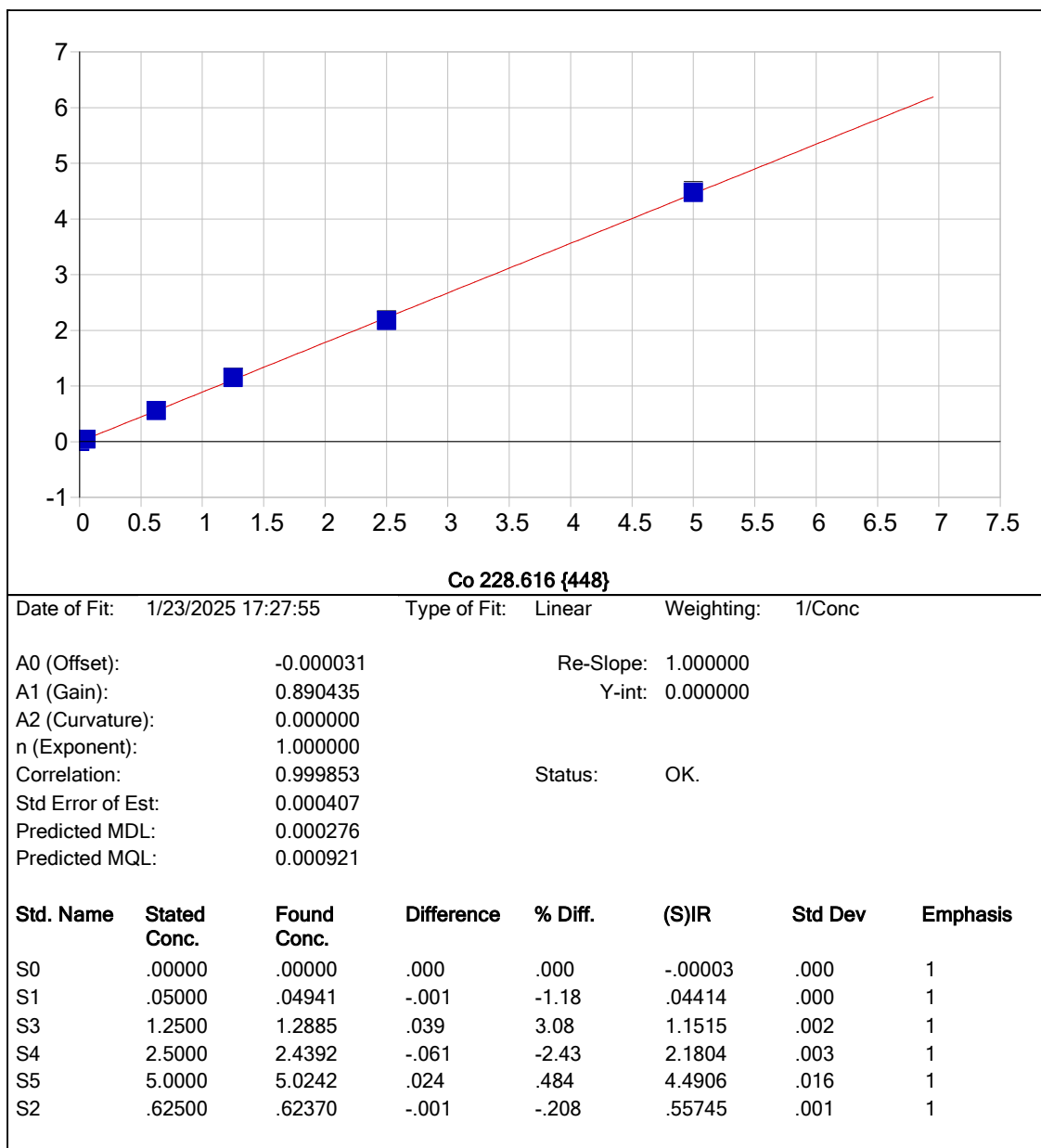


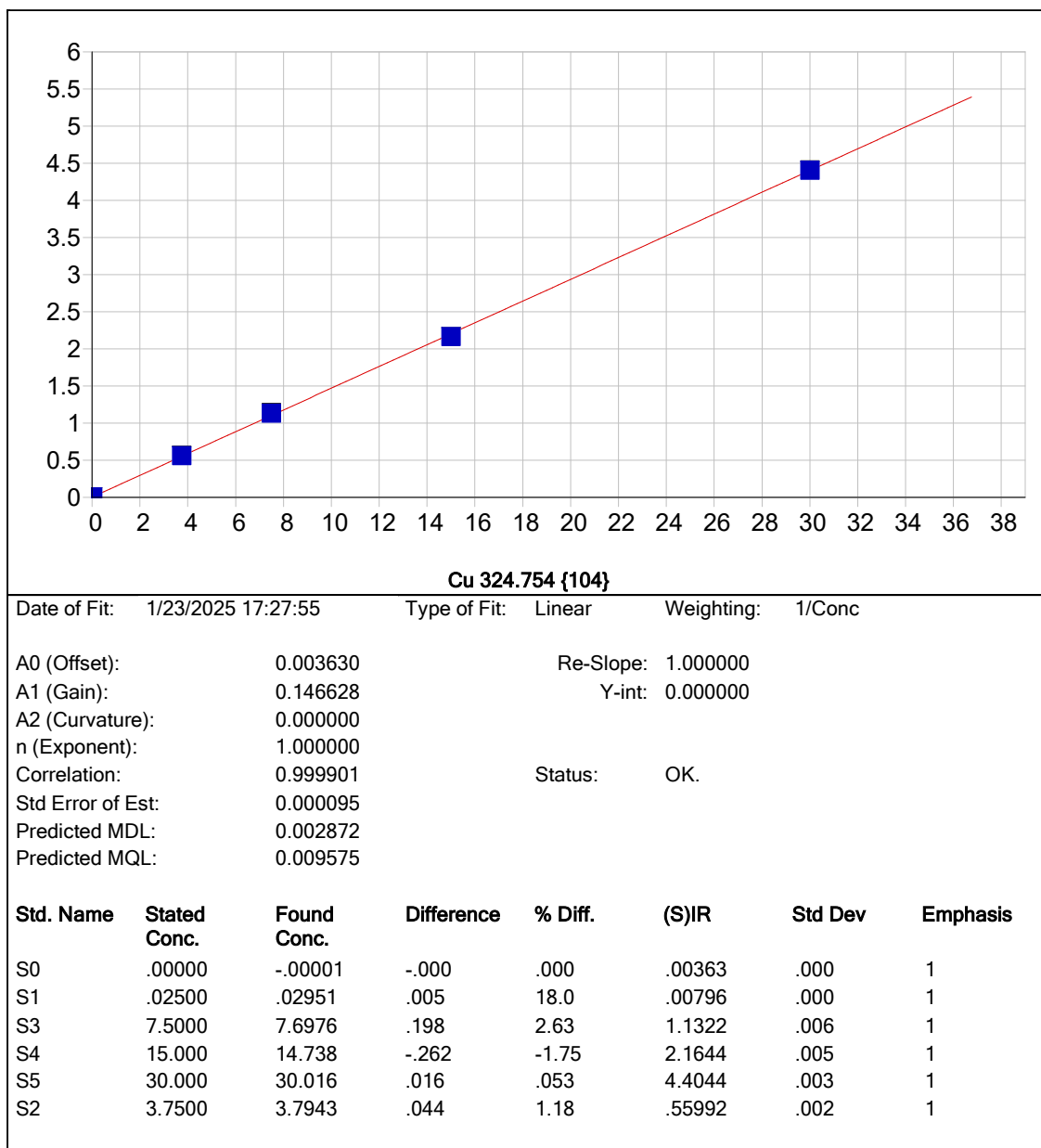


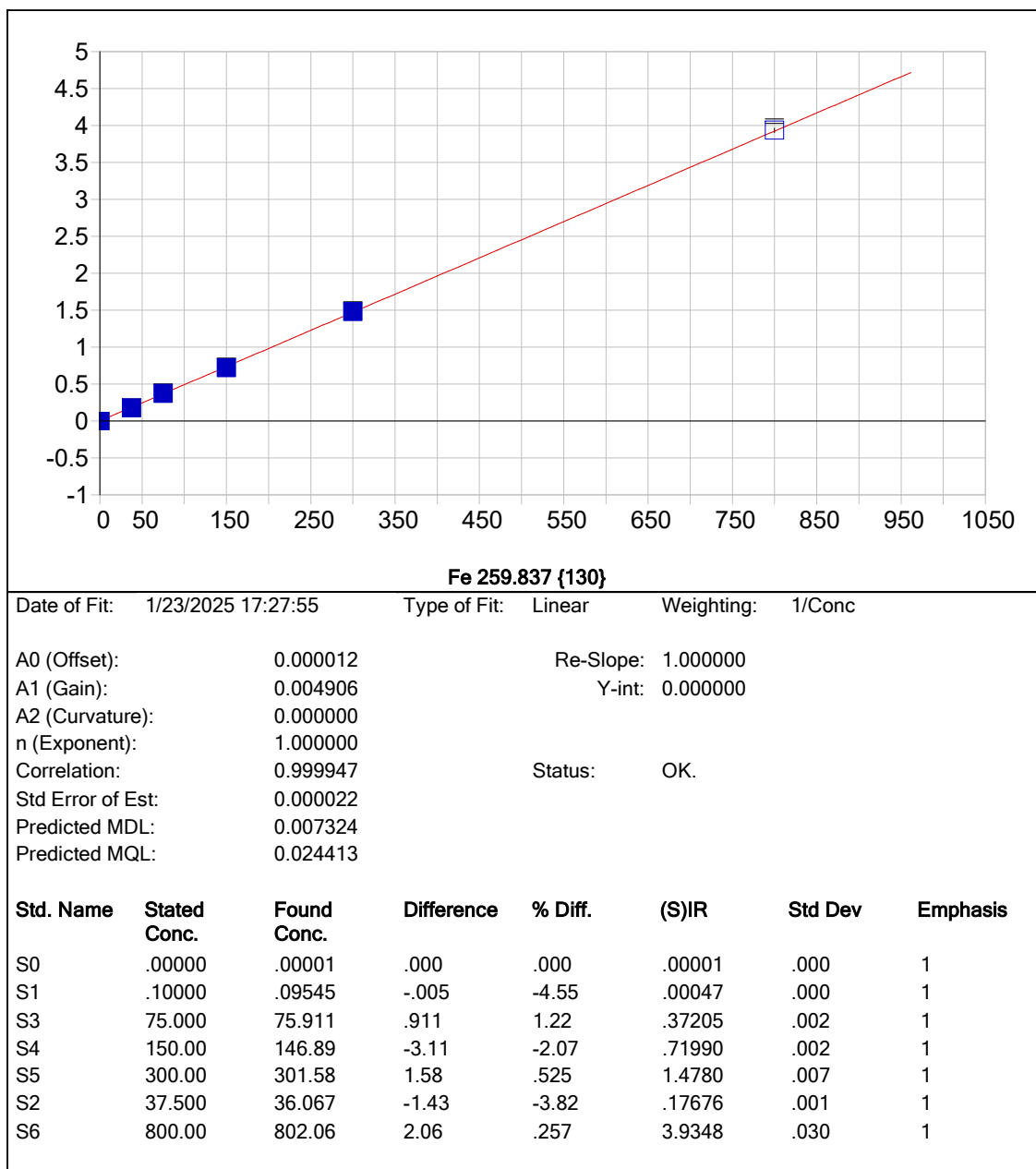


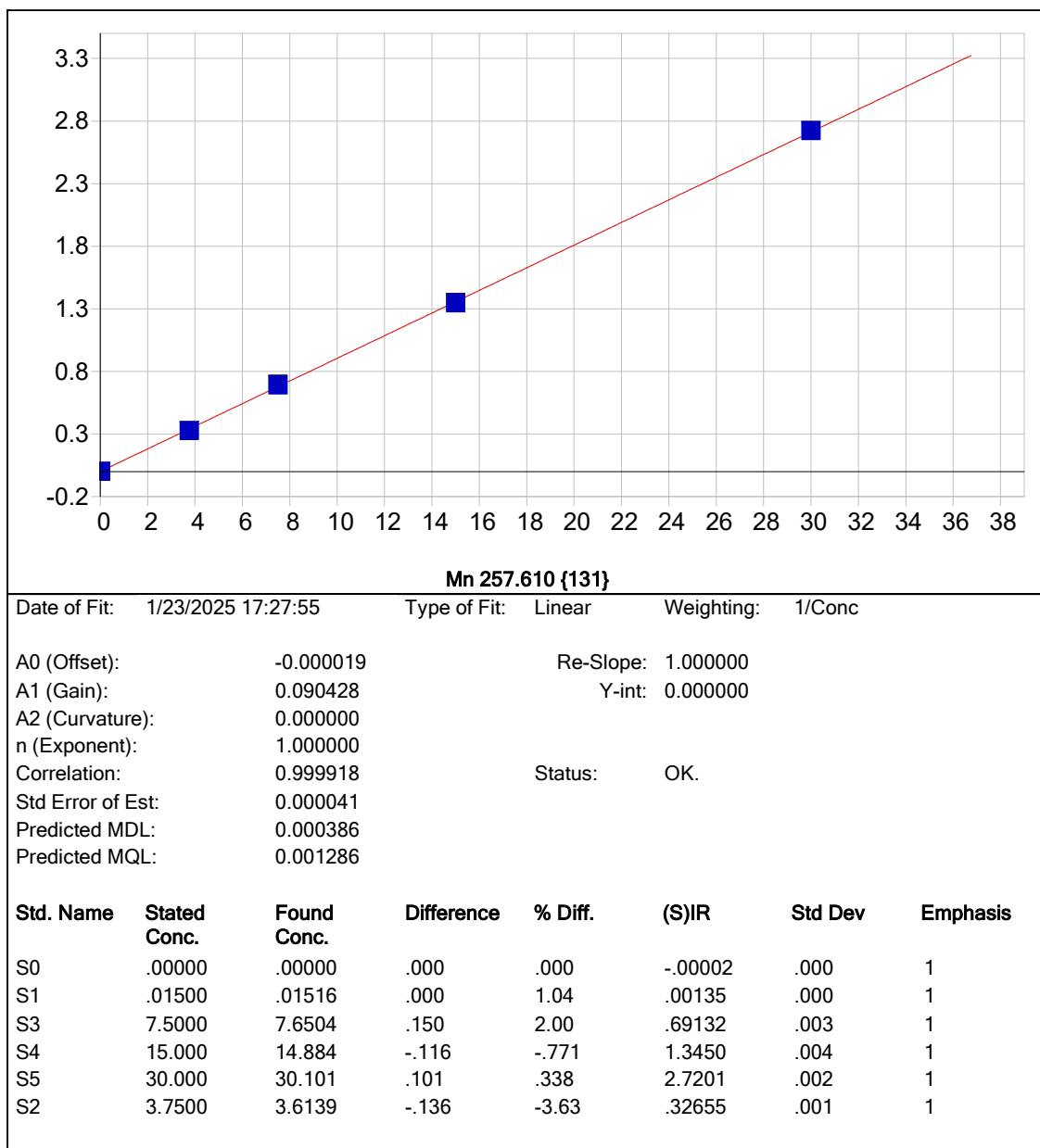


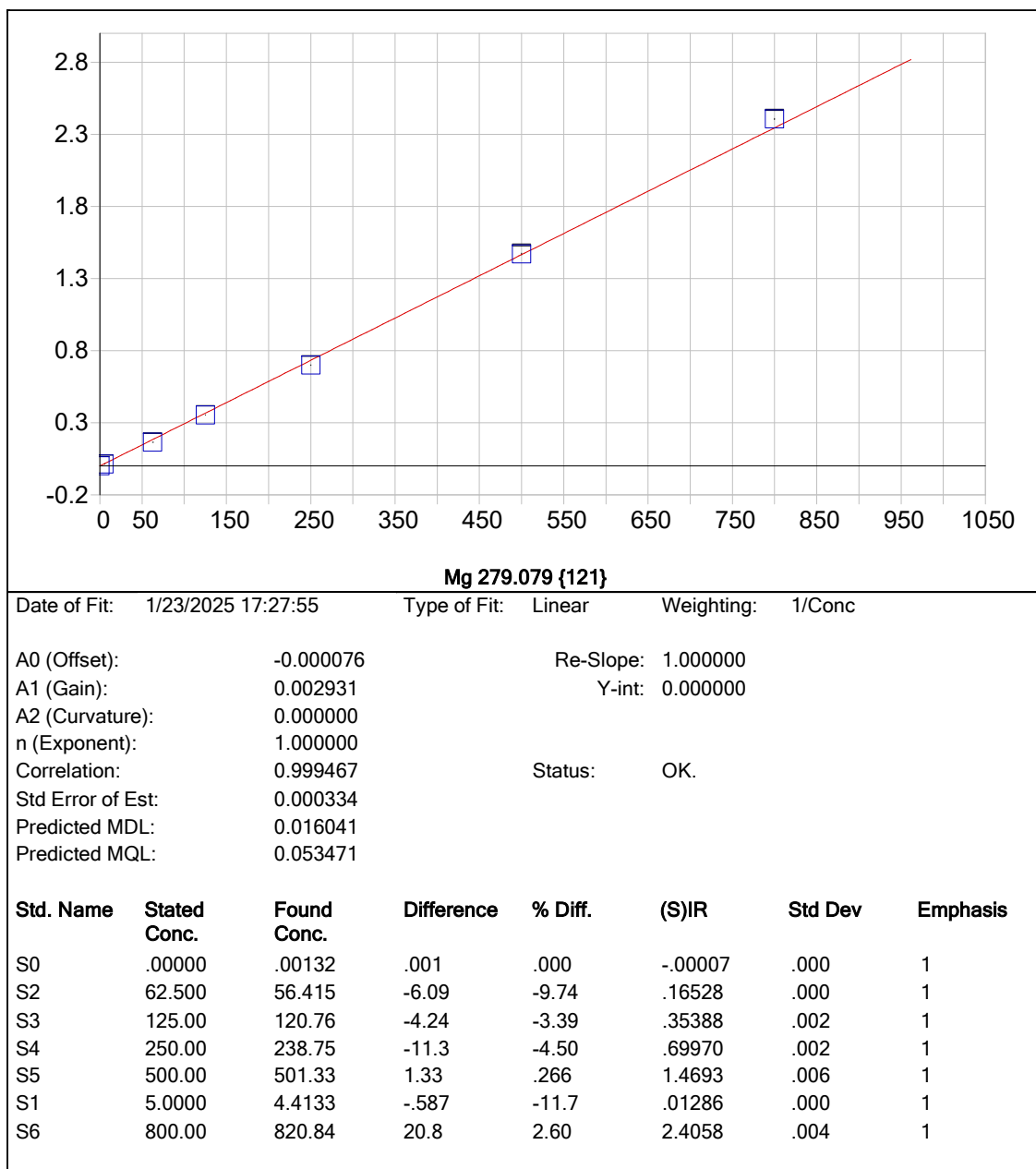


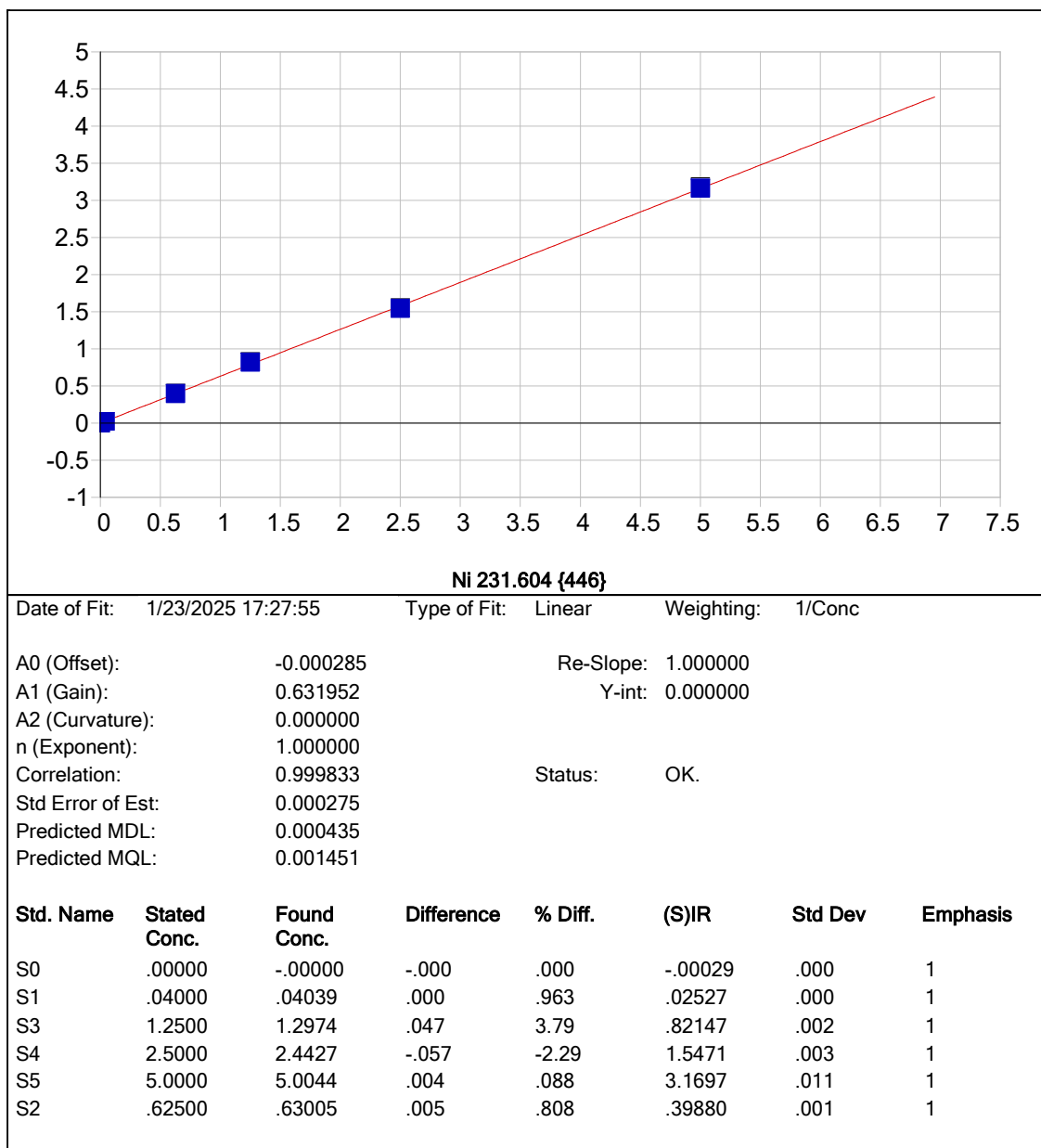


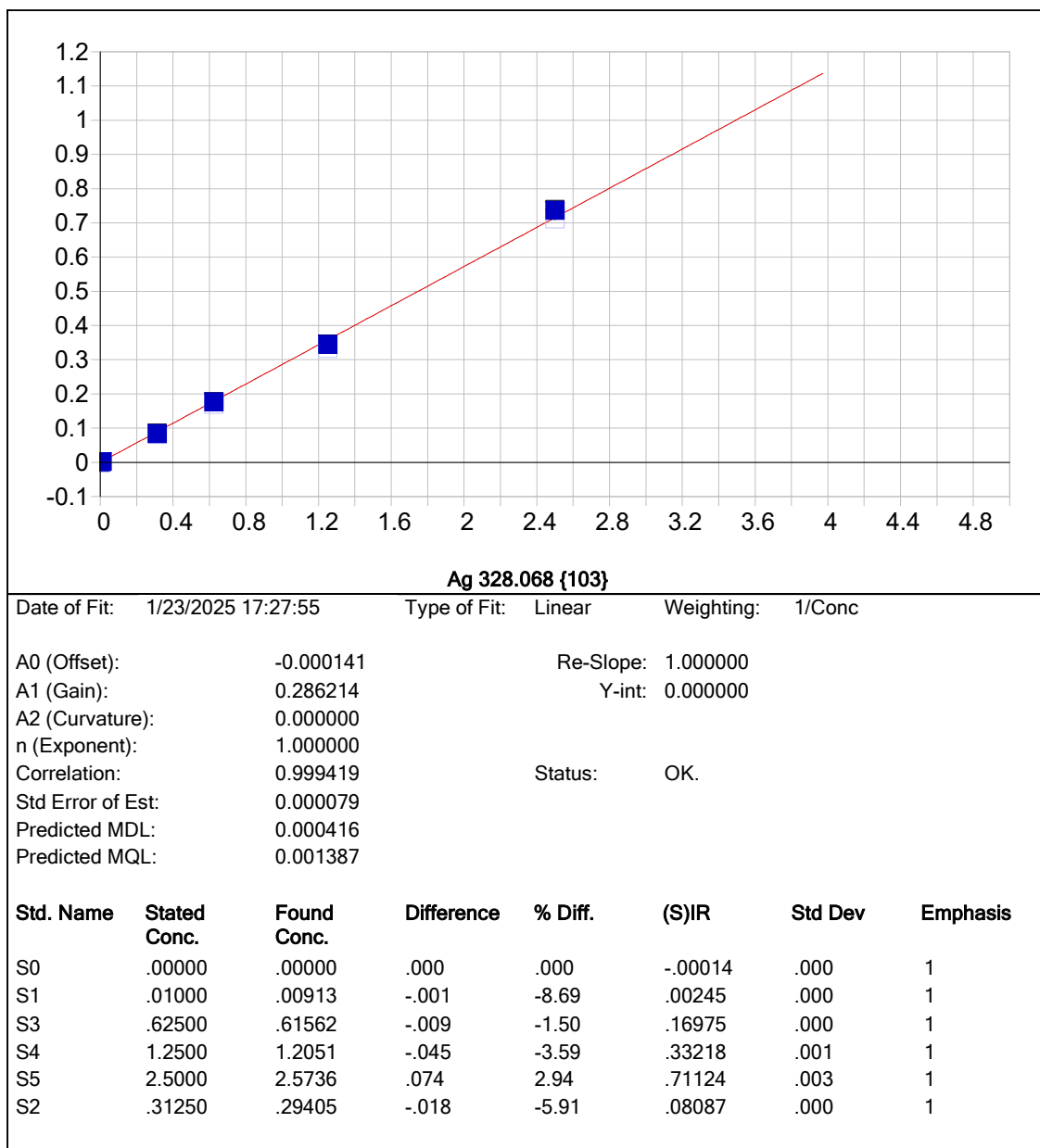


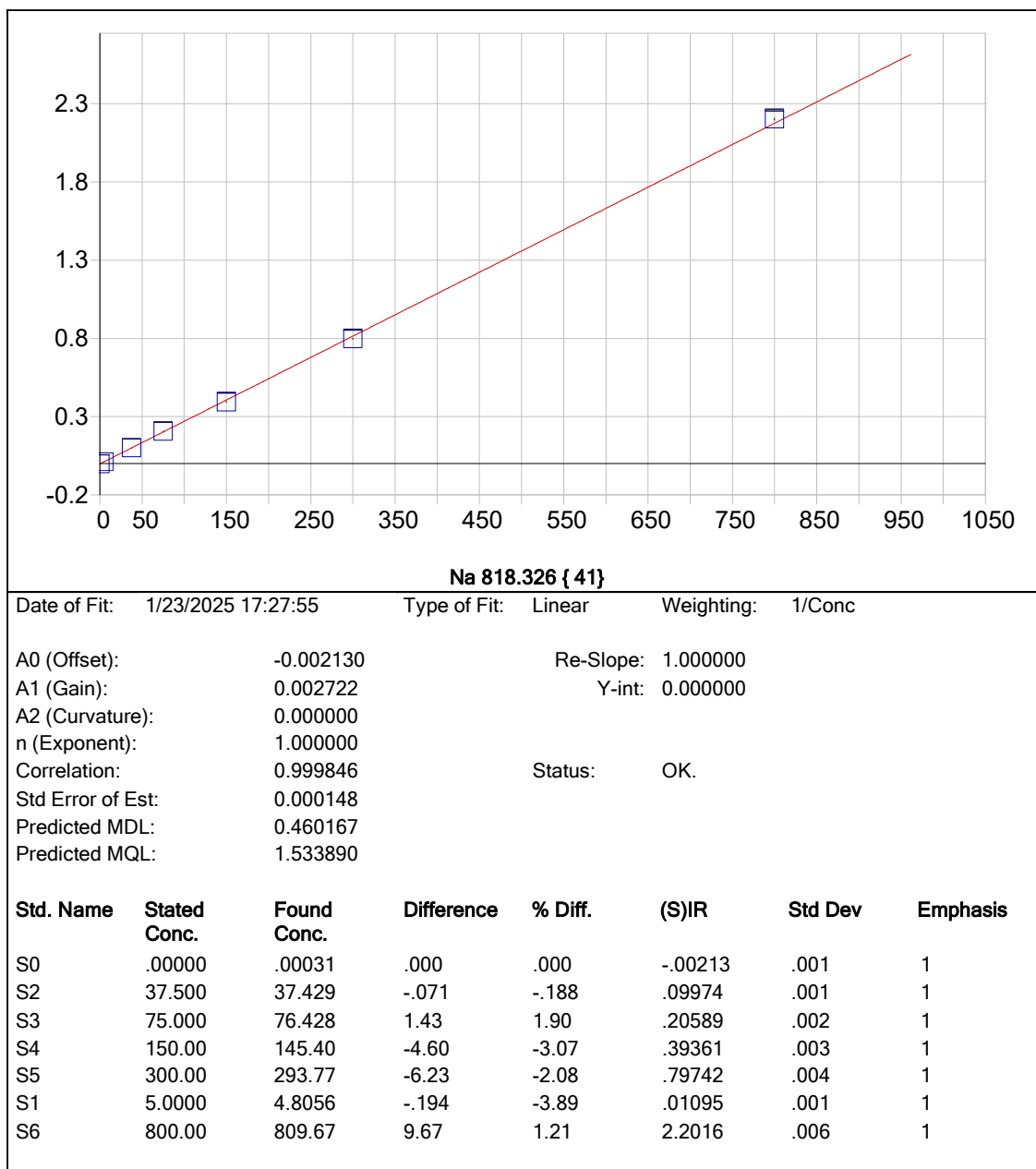


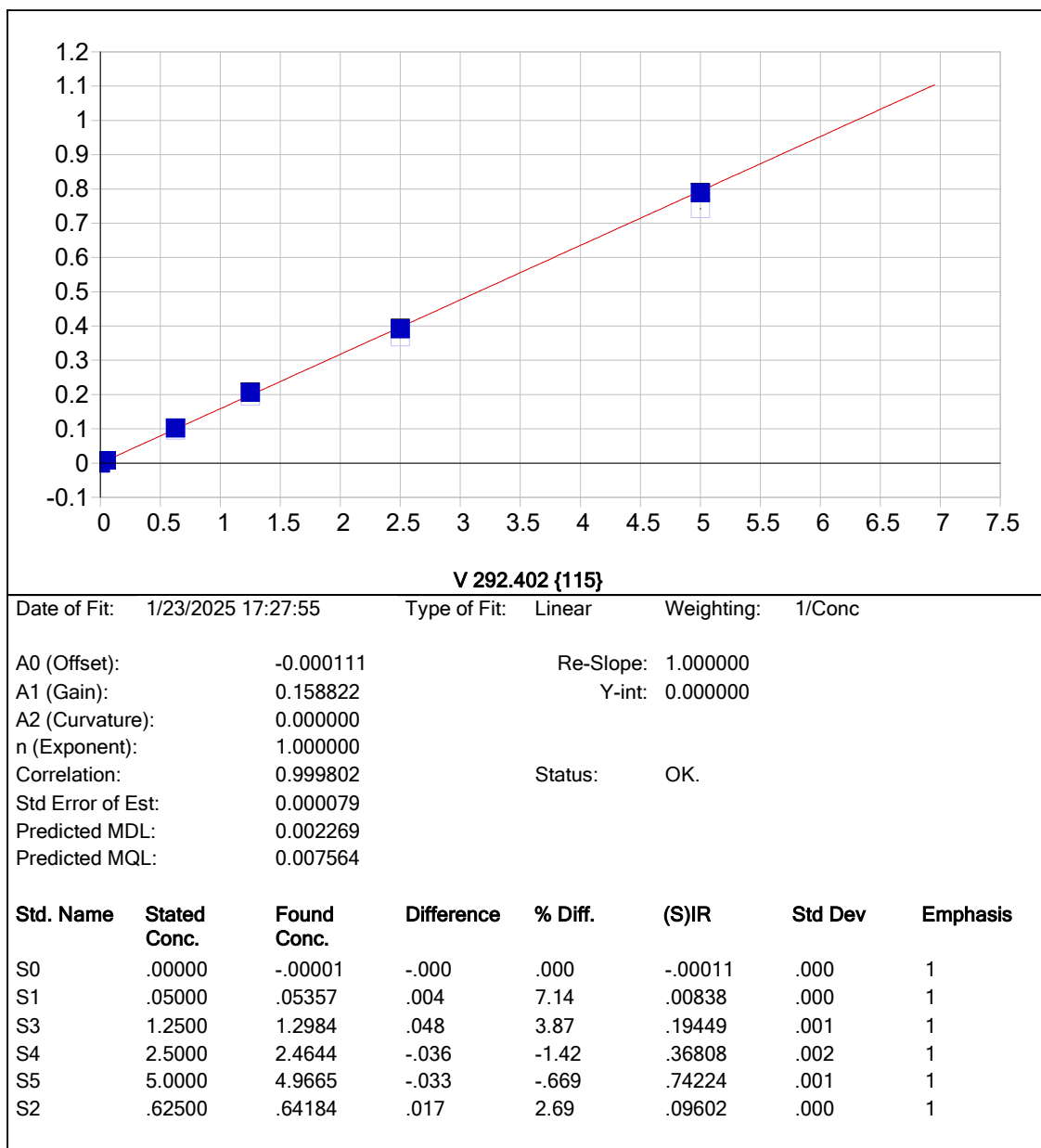


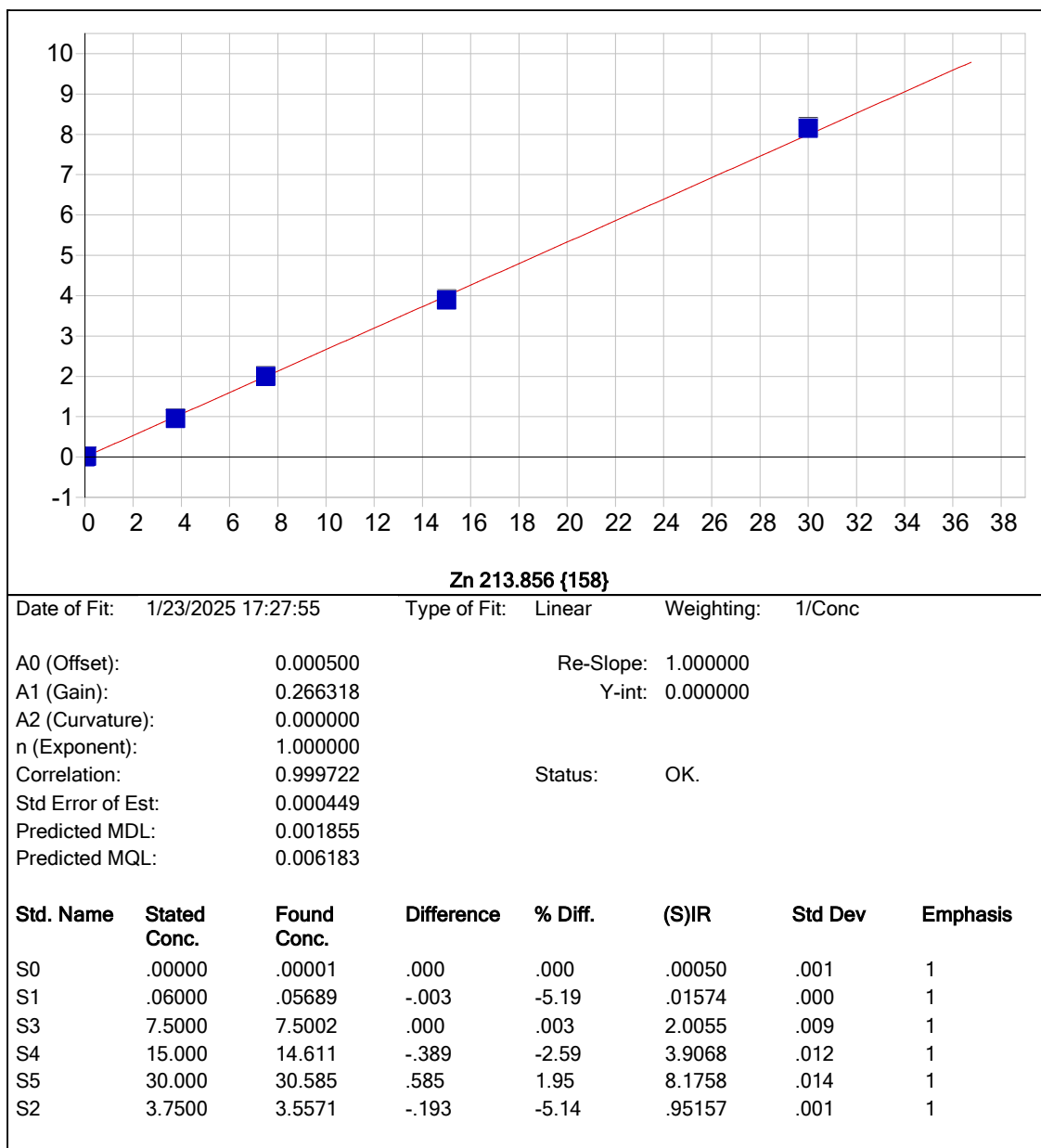


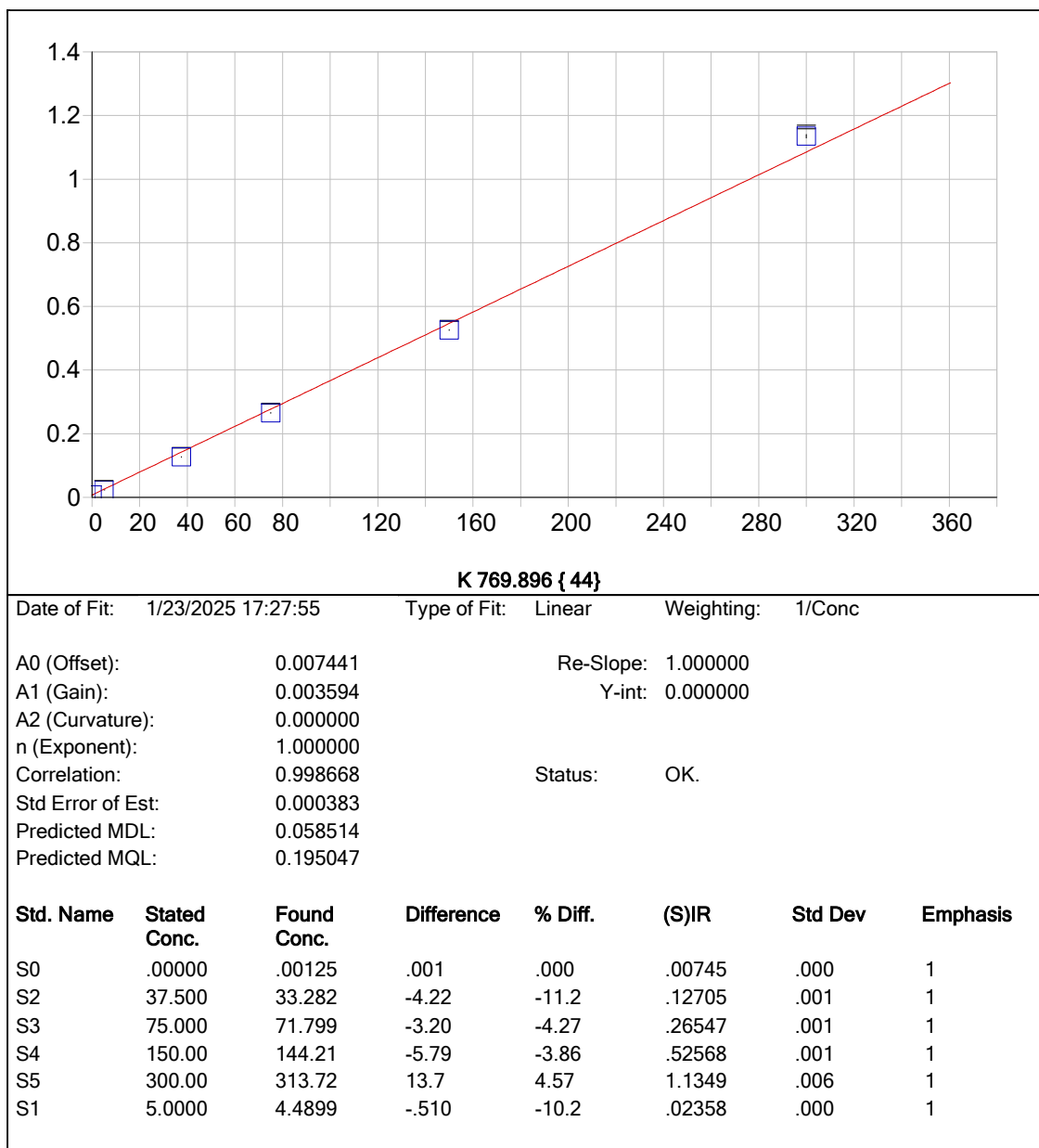


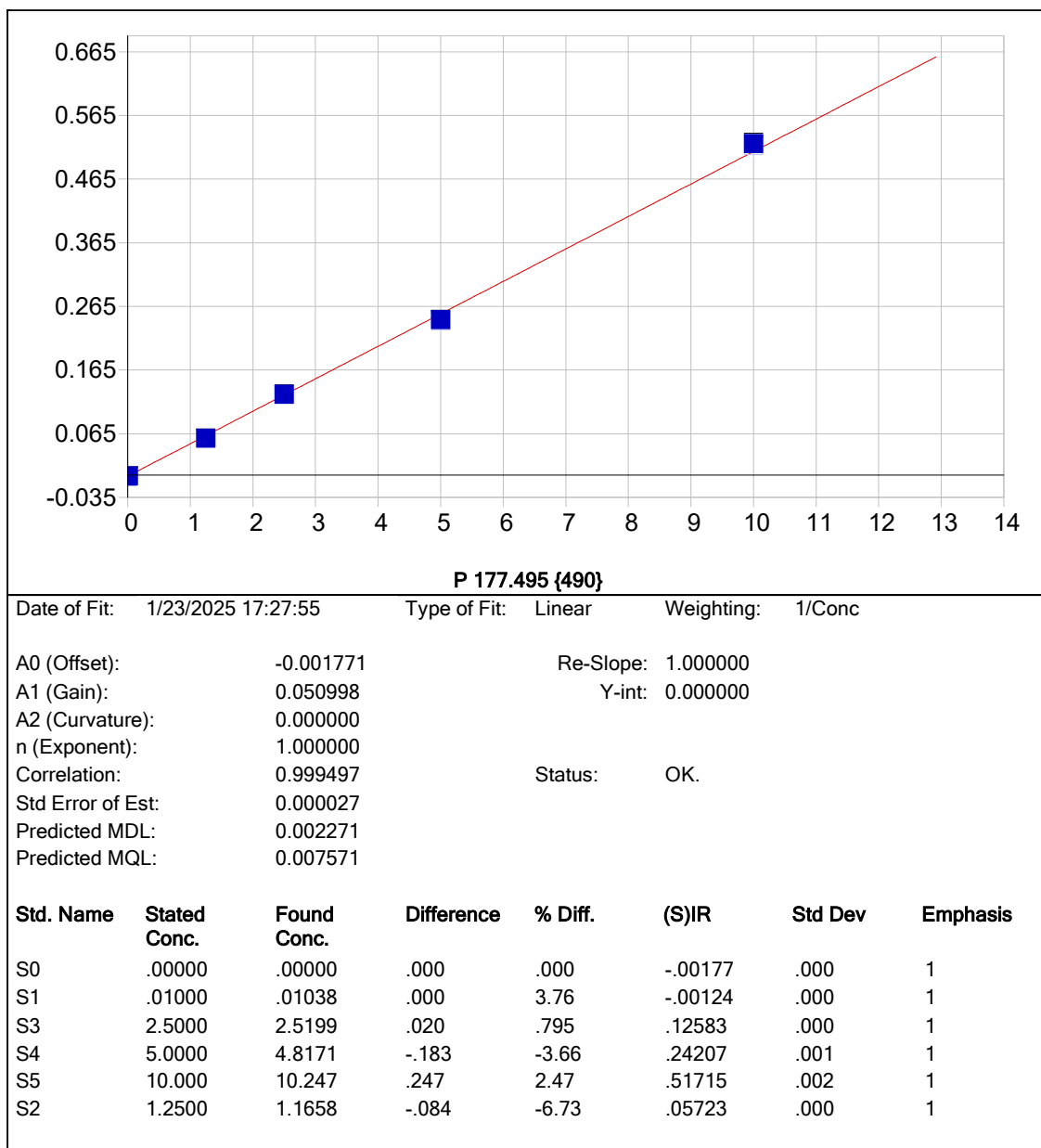


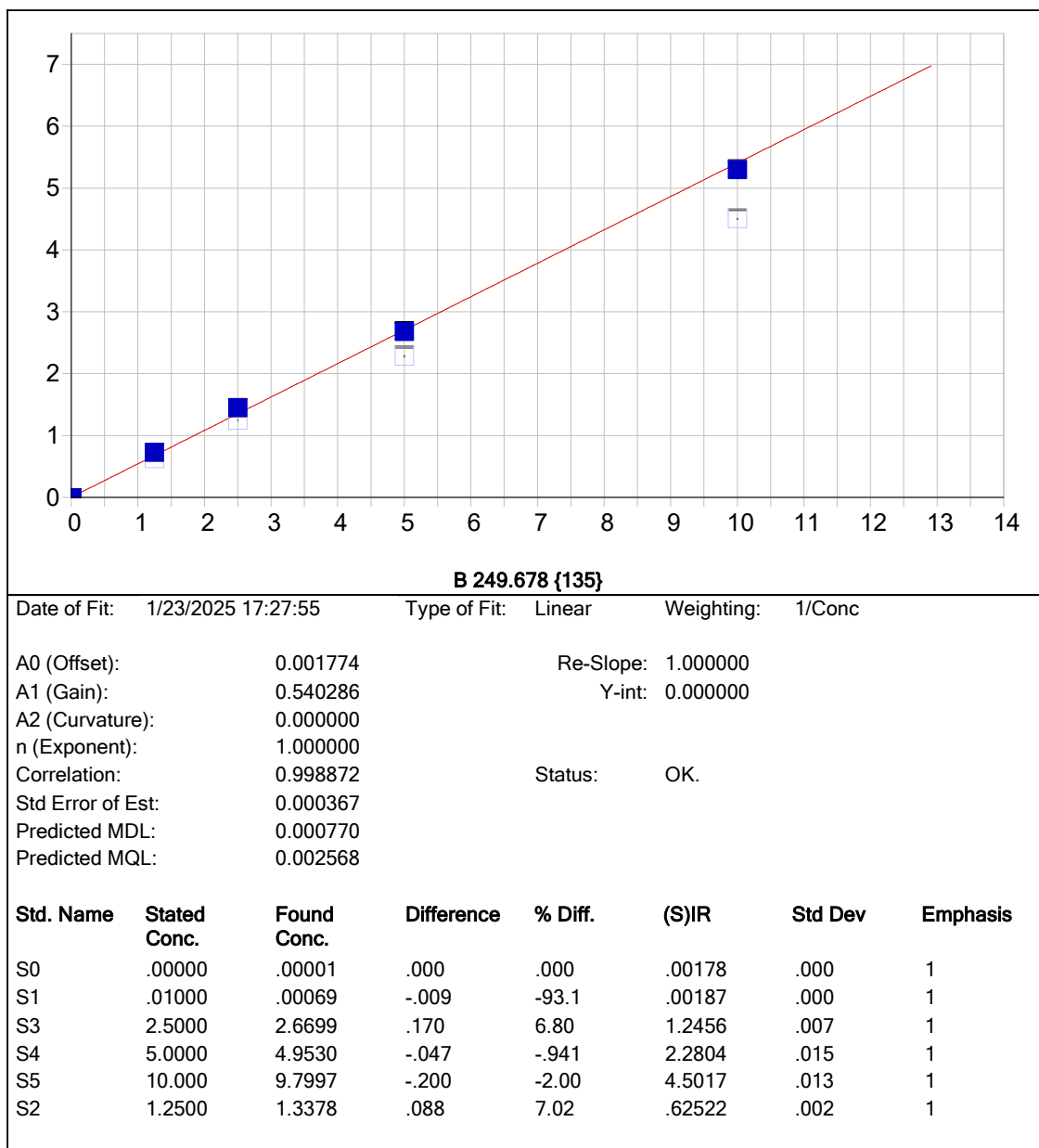


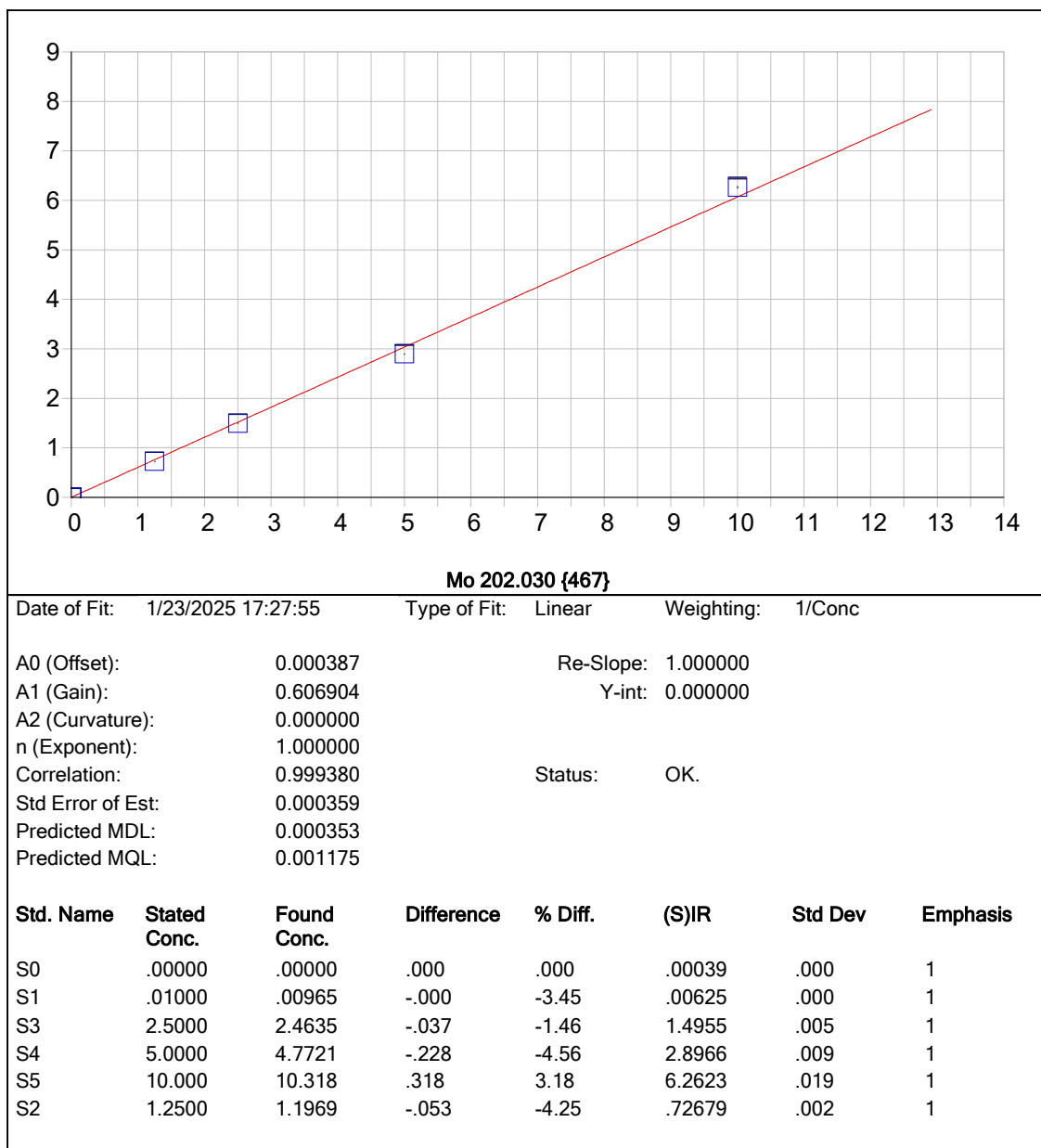


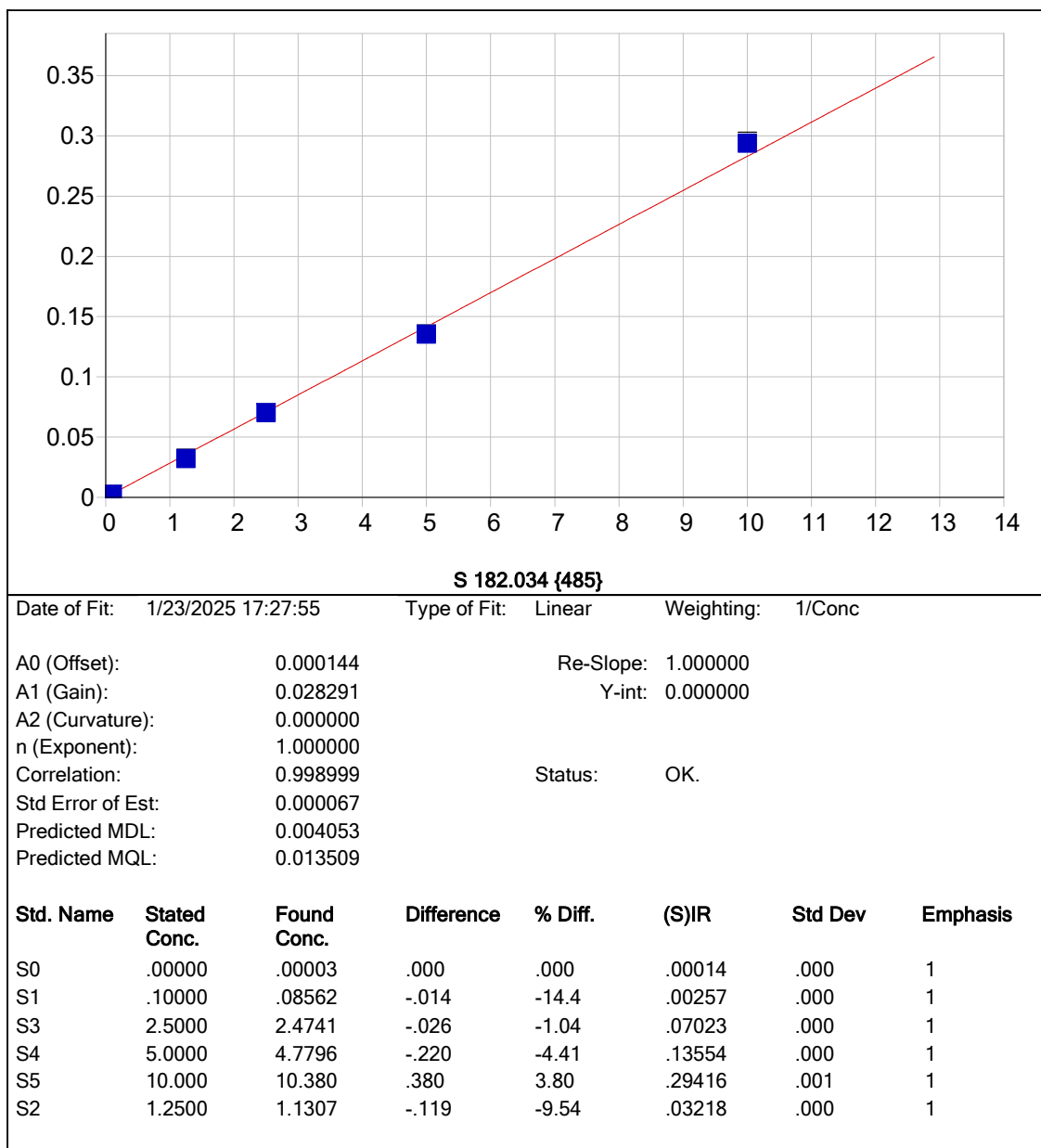


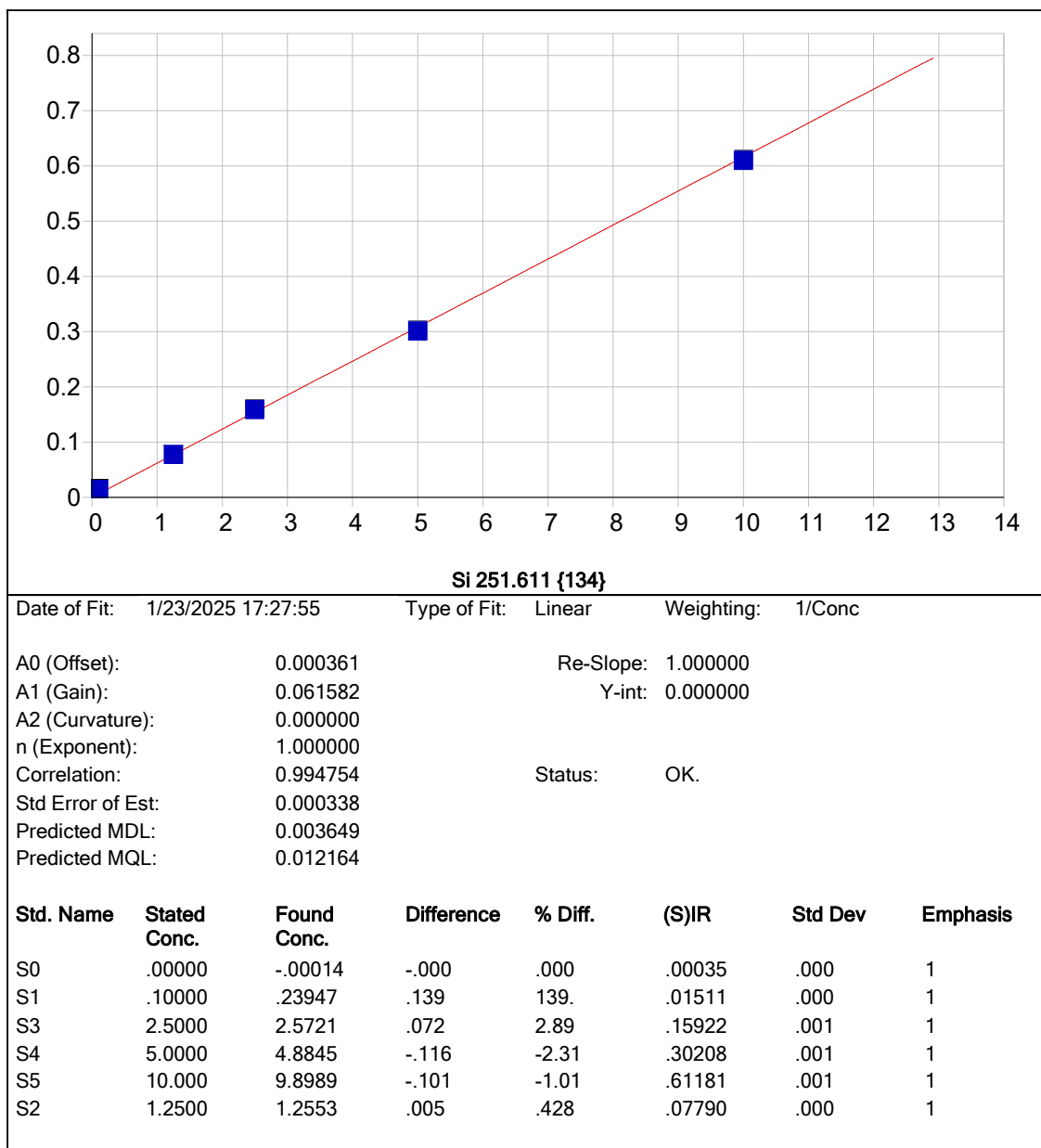


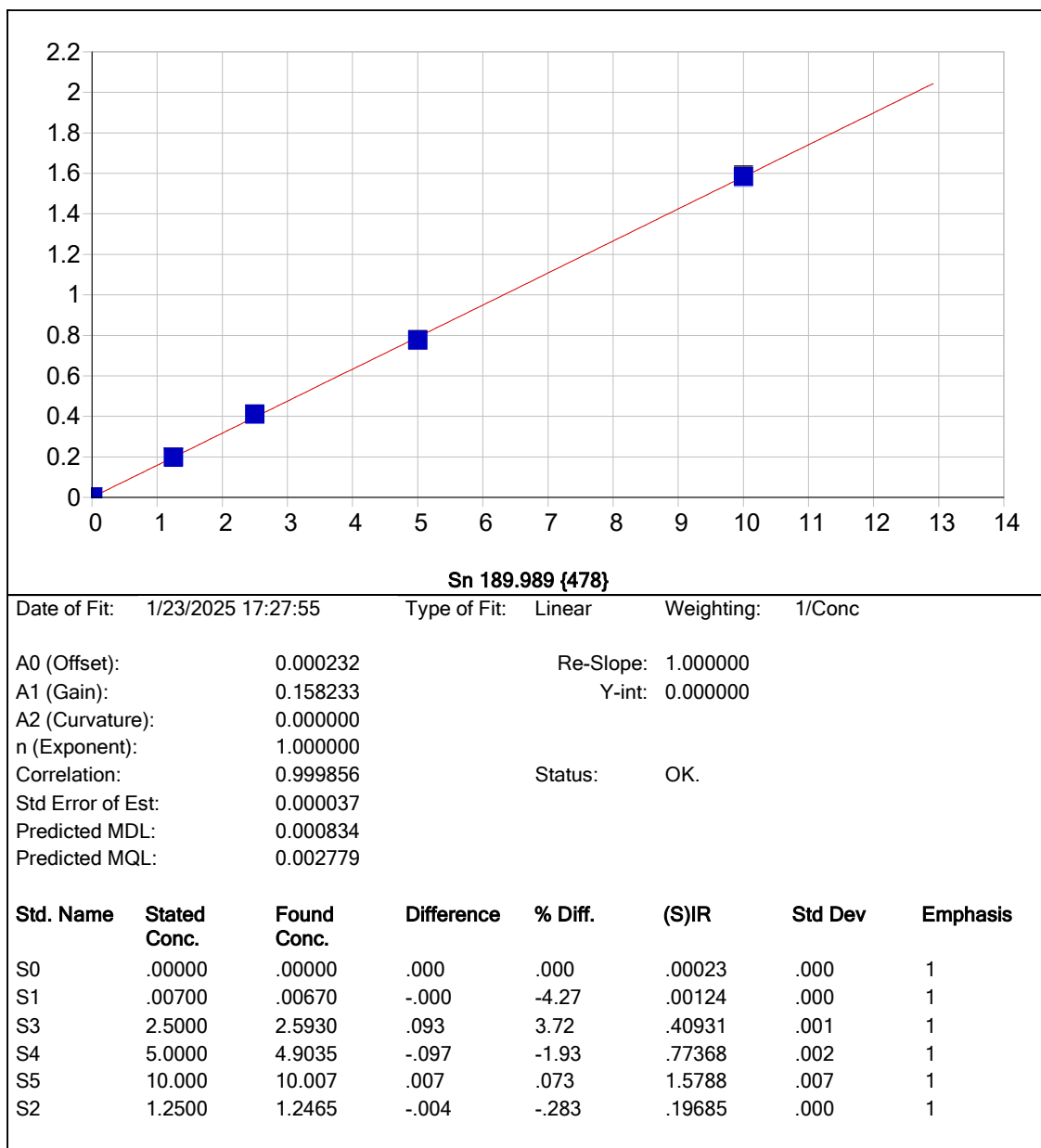


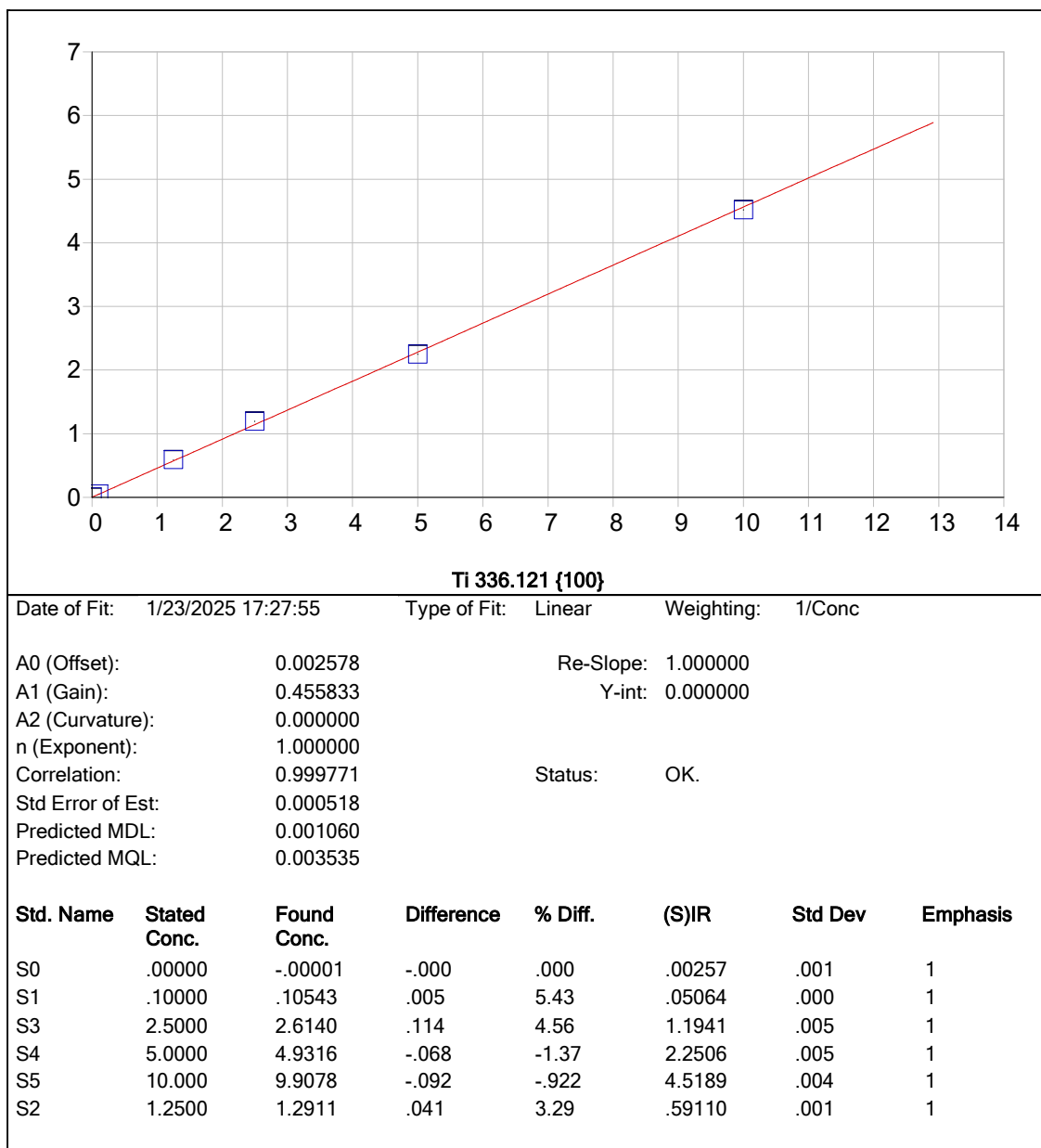


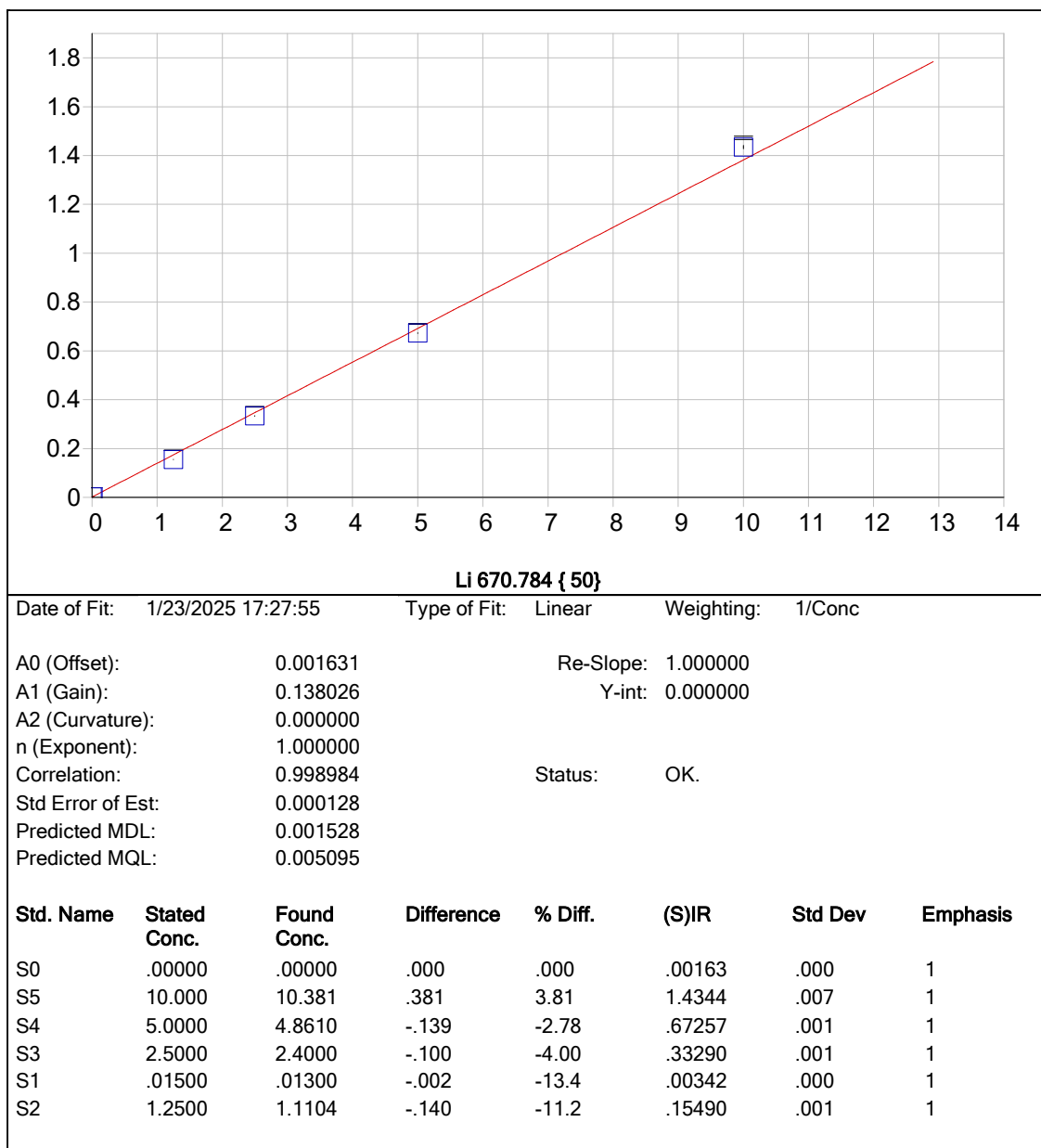


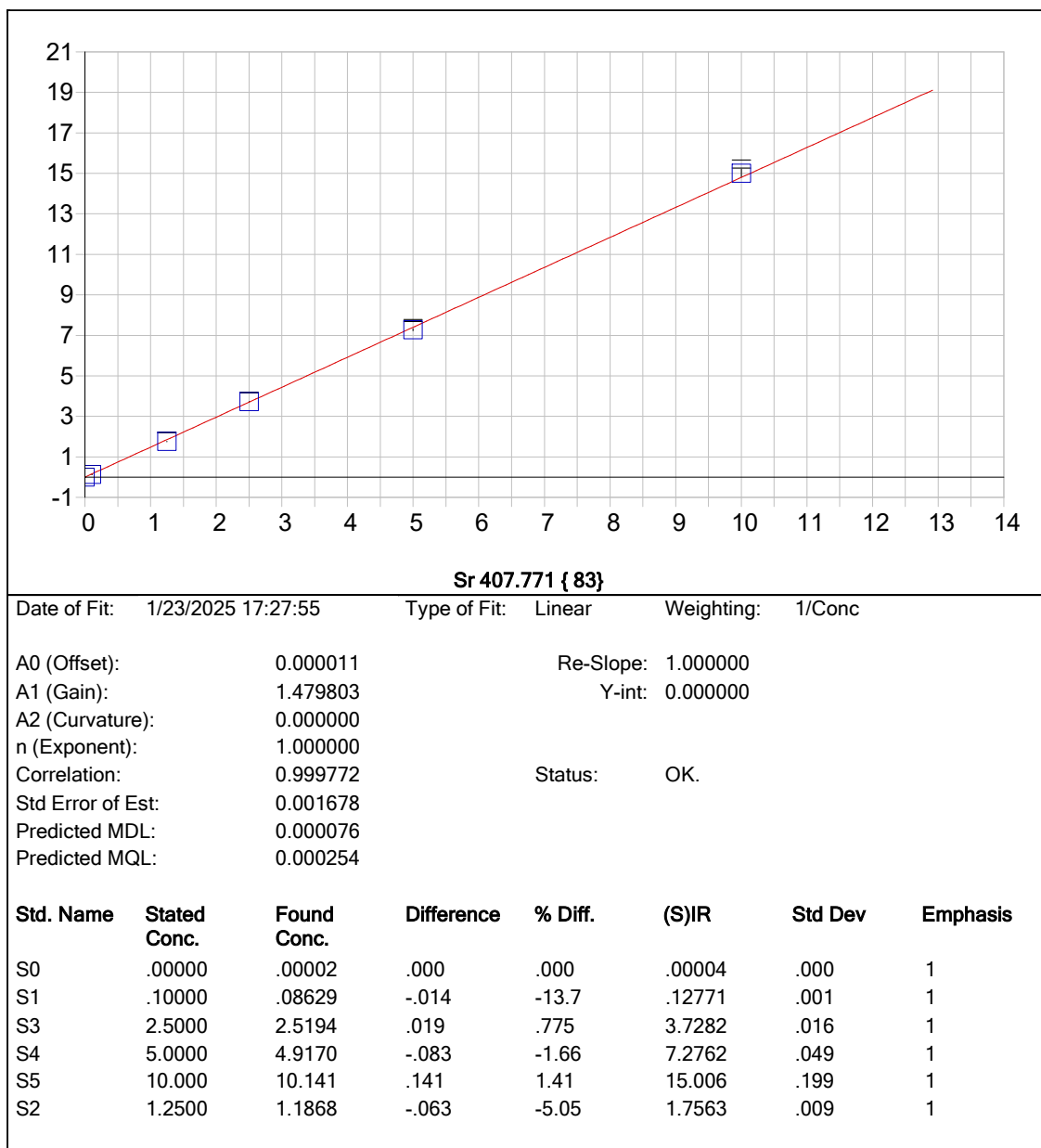


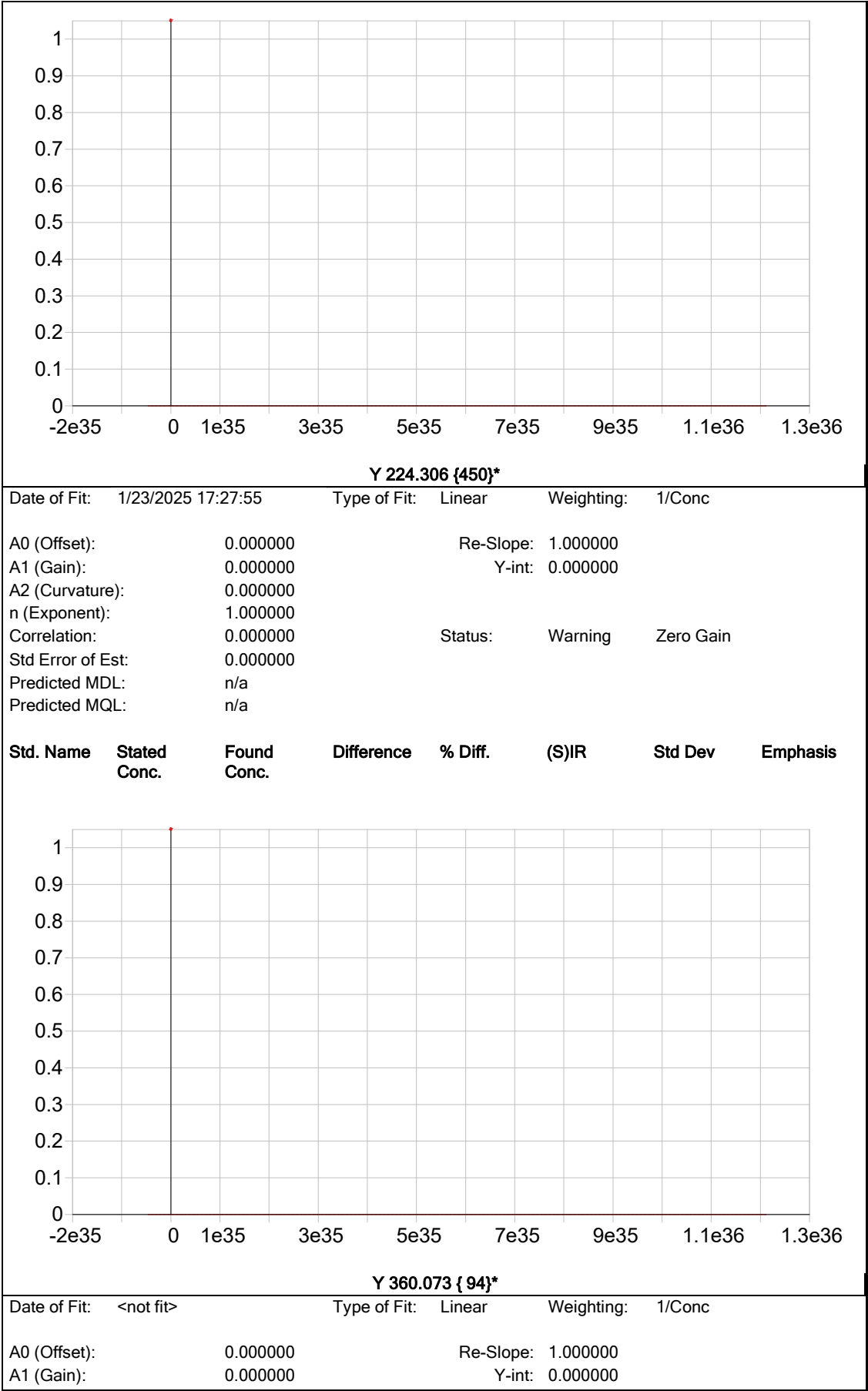


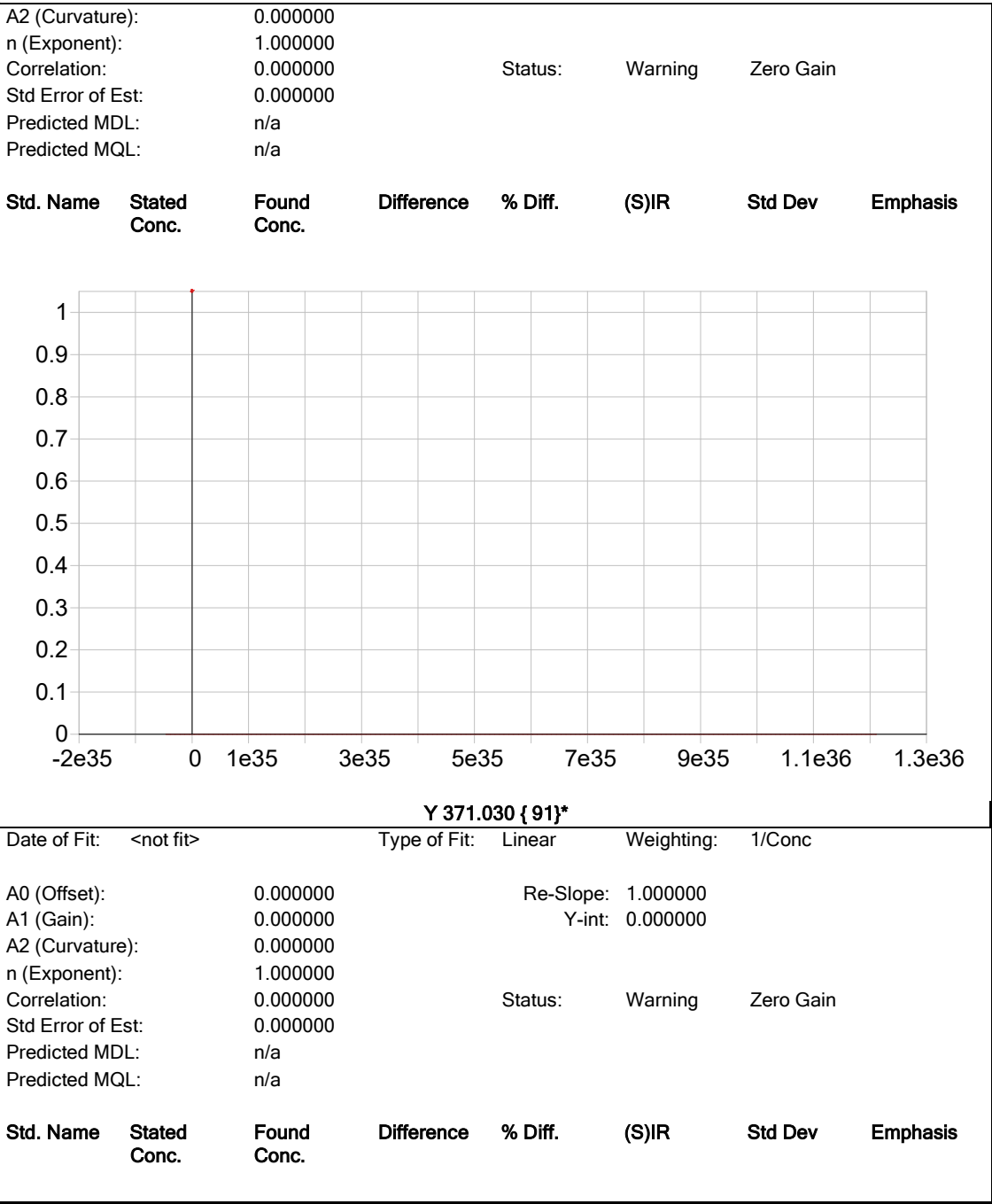


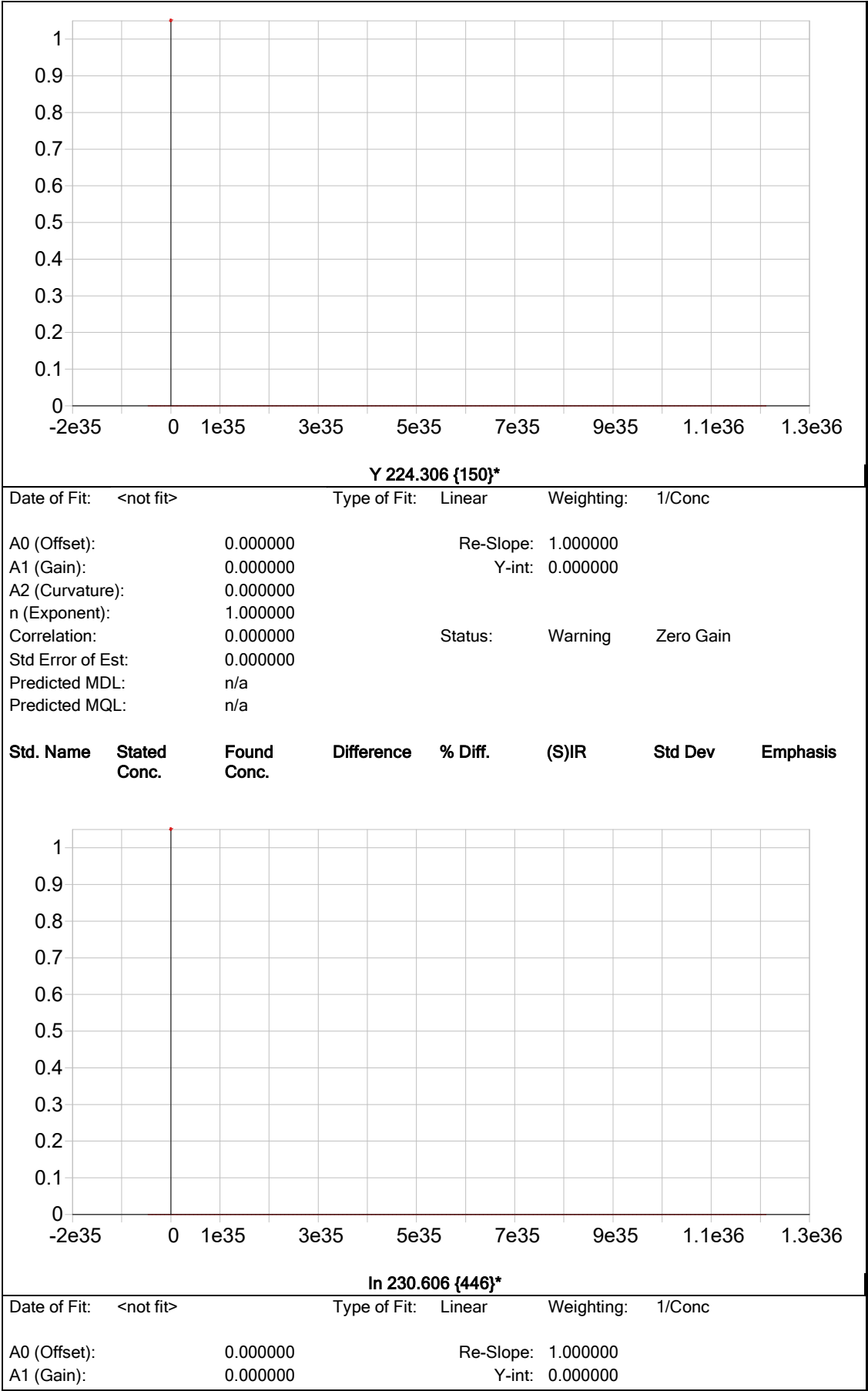












A2 (Curvature):		0.000000		Status:	Warning	Zero Gain	
n (Exponent):		1.000000					
Correlation:		0.000000					
Std Error of Est:		0.000000					
Predicted MDL:		n/a					
Predicted MQL:		n/a					
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis

Sample Name: S0 Acquired: 1/23/2025 11:45:02 Type: Cal
Method: EPA SFAM01.0(v52) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S0 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	.00004	.00018	.00008	.00031	.00031	.00013	.00849	-.00026
Stddev	.00006	.00004	.00040	.00009	.00014	.00000	.00036	.00025
%RSD	159.01	19.370	476.19	29.003	44.868	1.6720	4.2967	96.300
#1	.00005	.00016	.00024	.00024	.00028	.00012	.00820	.00003
#2	.00009	.00022	-.00037	.00027	.00019	.00013	.00837	-.00042
#3	-.00003	.00017	.00038	.00041	.00046	.00013	.00890	-.00038
Elem	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00006	.00004	-.00006	-.00003	.00363	.00001	-.00002	-.00007
Stddev	.00035	.00006	.00007	.00009	.00014	.00001	.00003	.00001
%RSD	565.27	134.57	121.95	299.16	3.7820	100.16	159.00	19.730
#1	-.00032	.00008	-.00002	-.00007	.00369	.00001	.00001	-.00006
#2	.00014	-.00002	-.00001	.00007	.00373	.00003	-.00004	-.00008
#3	.00037	.00006	-.00013	-.00010	.00347	.00000	-.00003	-.00008
Elem	Ni2316	Ag3280	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-.00029	-.00014	-.00213	-.00011	.00050	.00745	-.00177	.00178
Stddev	.00009	.00006	.00074	.00022	.00057	.00019	.00005	.00041
%RSD	31.680	39.639	34.573	192.84	113.13	2.5417	2.6092	22.959
#1	-.00019	-.00008	-.00181	.00001	-.00008	.00758	-.00172	.00182
#2	-.00031	-.00016	-.00297	.00001	.00054	.00753	-.00179	.00217
#3	-.00036	-.00018	-.00160	-.00036	.00105	.00723	-.00180	.00135
Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707	Sr4077	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	.00039	.00014	.00035	.00023	.00257	.00163	.00004	
Stddev	.00016	.00003	.00010	.00006	.00055	.00005	.00015	
%RSD	40.233	22.736	28.521	25.520	21.472	3.0950	402.16	
#1	.00044	.00014	.00025	.00030	.00321	.00163	.00017	
#2	.00051	.00018	.00045	.00020	.00228	.00158	-.00012	
#3	.00021	.00011	.00036	.00020	.00223	.00168	.00006	

Sample Name: S0 Acquired: 1/23/2025 11:45:02 Type: Cal
Method: EPA SFAM01.0(v52) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S0 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	3577.3	73221.	9778.9	2600.7	4441.0
Stddev	7.6	92.	59.0	9.0	12.6
%RSD	.21185	.12587	.60286	.34417	.28368
#1	3569.2	73327.	9716.7	2610.1	4426.5
#2	3584.2	73166.	9786.3	2599.6	4449.2
#3	3578.5	73169.	9833.9	2592.3	4447.4

Sample Name: S1 Acquired: 1/23/2025 11:49:18 Type: Cal
Method: EPA SFAM01.0(v52) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S01 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	.00051	.00211	.00210	.00267	.00880	.00208	.08059	.02716
Stddev	.00009	.00009	.00028	.00011	.00026	.00007	.00047	.00038
%RSD	18.251	4.4452	13.178	4.0857	2.9945	3.3760	.58058	1.4018

#1	.00041	.00212	.00221	.00280	.00880	.00201	.08039	.02702
#2	.00052	.00202	.00178	.00261	.00853	.00207	.08025	.02759
#3	.00060	.00220	.00230	.00260	.00906	.00215	.08112	.02687

Elem	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.01528	.03939	.00174	.04414	.00796	.00047	.00135	.01286
Stddev	.00025	.00005	.00001	.00017	.00040	.00004	.00002	.00004
%RSD	1.6356	.11807	.69916	.39450	4.9844	8.8501	1.1772	.31762

#1	.01524	.03941	.00173	.04401	.00841	.00048	.00137	.01291
#2	.01505	.03934	.00174	.04433	.00778	.00043	.00134	.01284
#3	.01555	.03943	.00175	.04407	.00768	.00051	.00134	.01284

Elem	Ni2316	Ag3280	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.02527	.00245	.01095	.00838	.01574	.02358	-.00124	.00187
Stddev	.00012	.00005	.00088	.00006	.00004	.00006	.00011	.00021
%RSD	.46720	2.1993	8.0029	.74075	.28475	.27468	8.8067	11.059

#1	.02539	.00239	.01083	.00831	.01574	.02359	-.00113	.00171
#2	.02515	.00247	.01188	.00842	.01579	.02351	-.00134	.00211
#3	.02526	.00249	.01014	.00841	.01570	.02363	-.00127	.00180

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707	Sr4077
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00625	.00257	.01511	.00124	.05064	.00342	.12771
Stddev	.00015	.00006	.00027	.00008	.00041	.00017	.00070
%RSD	2.4304	2.3759	1.7598	6.5570	.81812	4.9631	.54520

#1	.00641	.00263	.01531	.00130	.05066	.00358	.12732
#2	.00611	.00255	.01481	.00128	.05104	.00324	.12729
#3	.00622	.00251	.01522	.00115	.05021	.00346	.12851

Sample Name: S1 Acquired: 1/23/2025 11:49:18 Type: Cal
Method: EPA SFAM01.0(v52) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S01 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	3574.6	72310.	9768.3	2581.9	4393.5
Stddev	3.4	247.	45.9	6.1	6.2
%RSD	.09629	.34095	.46992	.23585	.14010
#1	3570.7	72584.	9776.0	2577.8	4387.0
#2	3576.3	72106.	9719.1	2588.9	4399.3
#3	3576.9	72241.	9809.9	2579.0	4394.0

Sample Name: S2 Acquired: 1/23/2025 11:53:33 Type: Cal
Method: EPA SFAM01.0(v52) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S02 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	.07004	.09578	1.4949	.07887	.18193	.38941	.90710	.66175
Stddev	.00009	.00060	.0024	.00039	.00053	.00182	.00434	.00394
%RSD	.12540	.62249	.15941	.49524	.29319	.46729	.47855	.59560

#1	.07013	.09620	1.4924	.07845	.18132	.38829	.90699	.66441
#2	.07003	.09604	1.4952	.07922	.18218	.38842	.90282	.66362
#3	.06996	.09510	1.4972	.07895	.18230	.39151	.91150	.65722

Elem	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1.8944	.47962	.66679	.55745	.55992	.17676	.32655	.16528
Stddev	.0029	.00109	.00036	.00130	.00239	.00072	.00139	.00036
%RSD	.15310	.22812	.05367	.23405	.42664	.40973	.42644	.21808

#1	1.8921	.47862	.66638	.55630	.56268	.17609	.32677	.16489
#2	1.8977	.47943	.66700	.55718	.55849	.17666	.32506	.16560
#3	1.8936	.48079	.66700	.55887	.55859	.17753	.32782	.16535

Elem	Ni2316	Ag3280	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.39880	.08087	.09974	.09602	.95157	.12705	.05723	.62522
Stddev	.00110	.00023	.00141	.00019	.00060	.00067	.00024	.00226
%RSD	.27476	.27925	1.4119	.19834	.06259	.52494	.41762	.36181

#1	.39769	.08096	.10112	.09624	.95168	.12651	.05704	.62751
#2	.39883	.08061	.09981	.09591	.95093	.12683	.05715	.62517
#3	.39988	.08103	.09830	.09591	.95211	.12779	.05750	.62299

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707	Sr4077
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.72679	.03218	.07790	.19685	.59110	.15490	1.7563
Stddev	.00189	.00024	.00026	.00034	.00134	.00082	.0087
%RSD	.25979	.73316	.32808	.17464	.22729	.53150	.49730

#1	.72615	.03244	.07819	.19693	.59265	.15442	1.7622
#2	.72530	.03199	.07777	.19715	.59042	.15443	1.7462
#3	.72891	.03211	.07773	.19647	.59024	.15585	1.7603

Sample Name: S2 Acquired: 1/23/2025 11:53:33 Type: Cal
Method: EPA SFAM01.0(v52) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S02 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	3427.4	70520.	9681.9	2497.6	4011.8
Stddev	13.5	49.	39.6	9.5	14.0
%RSD	.39384	.06904	.40877	.38121	.34870
#1	3434.9	70558.	9650.8	2488.0	4023.0
#2	3435.4	70535.	9668.5	2497.7	4016.2
#3	3411.8	70465.	9726.5	2507.0	3996.1

Sample Name: S3 Acquired: 1/23/2025 11:57:39 Type: Cal
Method: EPA SFAM01.0(v52) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S03 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	.15091	.19163	3.1017	.16774	.38764	.83568	1.9329	1.3306
Stddev	.00072	.00246	.0033	.00070	.00119	.00382	.0084	.0086
%RSD	.47990	1.2814	.10737	.41456	.30814	.45679	.43618	.64549
#1	.15038	.18929	3.1004	.16712	.38761	.83161	1.9233	1.3391
#2	.15061	.19141	3.0992	.16759	.38646	.83623	1.9391	1.3306
#3	.15173	.19419	3.1055	.16849	.38885	.83918	1.9364	1.3220
Elem	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3.9126	1.0162	1.3515	1.1515	1.1322	.37205	.69132	.35388
Stddev	.0077	.0047	.0025	.0019	.0058	.00216	.00292	.00172
%RSD	.19580	.45844	.18688	.16069	.50836	.58124	.42215	.48464
#1	3.9044	1.0109	1.3486	1.1508	1.1359	.36966	.68846	.35194
#2	3.9137	1.0182	1.3533	1.1501	1.1351	.37262	.69429	.35451
#3	3.9196	1.0196	1.3525	1.1536	1.1256	.37387	.69121	.35519
Elem	Ni2316	Ag3280	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.82147	.16975	.20589	.19449	2.0055	.26547	.12583	1.2456
Stddev	.00180	.00035	.00181	.00087	.0089	.00121	.00029	.0071
%RSD	.21866	.20749	.88126	.44580	.44385	.45464	.23174	.56796
#1	.82026	.16958	.20469	.19435	1.9956	.26408	.12558	1.2537
#2	.82061	.17016	.20797	.19542	2.0129	.26606	.12575	1.2423
#3	.82353	.16952	.20499	.19371	2.0079	.26626	.12615	1.2408
Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707	Sr4077	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	1.4955	.07023	.15922	.40931	1.1941	.33290	3.7282	
Stddev	.0047	.00007	.00050	.00053	.0050	.00135	.0163	
%RSD	.31473	.09586	.31528	.12968	.41678	.40649	.43649	
#1	1.4912	.07016	.15974	.40922	1.1946	.33134	3.7168	
#2	1.4948	.07023	.15874	.40883	1.1988	.33379	3.7468	
#3	1.5005	.07029	.15918	.40988	1.1889	.33356	3.7210	

Sample Name: S3 Acquired: 1/23/2025 11:57:39 Type: Cal
Method: EPA SFAM01.0(v52) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S03 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	3176.0	66813.	9589.6	2370.0	3683.3
Stddev	6.8	171.	45.2	8.8	2.8
%RSD	.21541	.25607	.47162	.37020	.07598
#1	3183.9	66990.	9553.7	2379.8	3683.9
#2	3171.9	66649.	9574.7	2367.7	3680.2
#3	3172.2	66801.	9640.4	2362.7	3685.7

Sample Name: S4 Acquired: 1/23/2025 12:01:42 Type: Cal
Method: EPA SFAM01.0(v52) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S04 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	.29343	.35759	5.8718	.32138	.75856	1.6734	3.7900	2.4807
Stddev	.00110	.00173	.0104	.00101	.00254	.0057	.0473	.0178
%RSD	.37613	.48463	.17697	.31341	.33433	.34388	1.2485	.71722

#1	.29348	.35588	5.8704	.32097	.75701	1.6777	3.8345	2.4864
#2	.29231	.35756	5.8622	.32064	.75719	1.6756	3.7953	2.4607
#3	.29451	.35934	5.8829	.32253	.76149	1.6668	3.7403	2.4949

Elem	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	7.3656	1.9823	2.5470	2.1804	2.1644	.71990	1.3450	.69970
Stddev	.0121	.0047	.0066	.0029	.0050	.00247	.0036	.00232
%RSD	.16372	.23793	.25710	.13227	.22889	.34244	.26361	.33124

#1	7.3628	1.9848	2.5530	2.1799	2.1677	.72124	1.3481	.70154
#2	7.3552	1.9853	2.5400	2.1777	2.1587	.72140	1.3458	.70046
#3	7.3788	1.9769	2.5478	2.1835	2.1667	.71705	1.3411	.69710

Elem	Ni2316	Ag3280	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1.5471	.33218	.39361	.36808	3.9068	.52568	.24207	2.2804
Stddev	.0032	.00053	.00286	.00152	.0120	.00134	.00062	.0150
%RSD	.20854	.15872	.72703	.41305	.30829	.25494	.25764	.65780

#1	1.5461	.33209	.39413	.36823	3.8976	.52659	.24136	2.2816
#2	1.5445	.33170	.39053	.36649	3.9204	.52631	.24229	2.2648
#3	1.5507	.33275	.39618	.36952	3.9023	.52414	.24255	2.2948

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707	Sr4077
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2.8966	.13554	.30208	.77368	2.2506	.67257	7.2762
Stddev	.0091	.00007	.00064	.00197	.0052	.00073	.0493
%RSD	.31518	.05408	.21165	.25480	.22988	.10874	.67746

#1	2.8921	.13548	.30226	.77288	2.2556	.67317	7.2627
#2	2.8906	.13553	.30137	.77223	2.2453	.67279	7.2350
#3	2.9071	.13562	.30261	.77592	2.2508	.67176	7.3308

Sample Name: S4 Acquired: 1/23/2025 12:01:42 Type: Cal
Method: EPA SFAM01.0(v52) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S04 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	3015.6	64305.	9577.3	2271.1	3515.1
Stddev	7.9	124.	44.2	3.4	7.4
%RSD	.26221	.19320	.46111	.14855	.21167
#1	3018.3	64163.	9565.2	2274.9	3516.4
#2	3021.8	64389.	9626.2	2269.4	3521.7
#3	3006.7	64364.	9540.4	2268.8	3507.0

Sample Name: S5 Acquired: 1/23/2025 12:05:53 Type: Cal
Method: EPA SFAM01.0(v52) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S05 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	.66060	.71529	12.075	.71512	1.7064	3.5776	7.9002	5.0616
Stddev	.00221	.00707	.041	.00280	.0042	.0179	.0169	.0104
%RSD	.33526	.98891	.34091	.39179	.24876	.50083	.21408	.20582
#1	.66061	.71071	12.061	.71547	1.7078	3.5972	7.8811	5.0561
#2	.65838	.71172	12.042	.71215	1.7017	3.5621	7.9132	5.0551
#3	.66281	.72343	12.121	.71772	1.7098	3.5735	7.9064	5.0736
Elem	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	14.933	4.1172	5.0681	4.4906	4.4044	1.4780	2.7201	1.4693
Stddev	.061	.0226	.0265	.0158	.0032	.0066	.0017	.0056
%RSD	.41095	.54792	.52229	.35237	.07221	.44774	.06246	.38044
#1	14.907	4.1433	5.0895	4.4855	4.4047	1.4853	2.7215	1.4757
#2	14.888	4.1044	5.0385	4.4780	4.4011	1.4725	2.7207	1.4651
#3	15.003	4.1041	5.0763	4.5084	4.4074	1.4761	2.7182	1.4673
Elem	Ni2316	Ag3280	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3.1697	.71124	.79742	.74224	8.1758	1.1349	.51715	4.5017
Stddev	.0109	.00266	.00370	.00090	.0144	.0059	.00182	.0132
%RSD	.34455	.37416	.46370	.12084	.17657	.52267	.35238	.29364
#1	3.1691	.71256	.79626	.74328	8.1632	1.1414	.51651	4.4889
#2	3.1590	.70817	.80155	.74167	8.1915	1.1299	.51574	4.5008
#3	3.1809	.71298	.79443	.74178	8.1727	1.1332	.51921	4.5153
Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707	Sr4077	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	6.2623	.29416	.61181	1.5788	4.5189	1.4344	15.006	
Stddev	.0191	.00140	.00076	.0072	.0042	.0065	.199	
%RSD	.30450	.47540	.12365	.45844	.09267	.45581	1.3247	
#1	6.2688	.29392	.61099	1.5742	4.5175	1.4416	15.208	
#2	6.2409	.29290	.61248	1.5750	4.5236	1.4288	14.811	
#3	6.2773	.29566	.61195	1.5872	4.5155	1.4329	14.999	

Sample Name: S5 Acquired: 1/23/2025 12:05:53 Type: Cal
Method: EPA SFAM01.0(v52) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S05 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	2601.9	60053.	9228.7	2079.9	3151.4
Stddev	4.2	257.	19.0	4.8	7.8
%RSD	.16331	.42766	.20628	.22971	.24670
#1	2599.2	59820.	9237.3	2077.6	3155.2
#2	2606.8	60328.	9241.9	2085.4	3156.5
#3	2599.7	60011.	9206.8	2076.7	3142.4

Sample Name: S6 Acquired: 1/23/2025 12:10:27 Type: Cal
Method: EPA SFAM01.0(v52) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S06 Custom ID2: Custom ID3:
Comment:

Elem	Al3961	Ca3736	Fe2598	Mg2790	Na8183
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	9.5094	6.6843	3.9348	2.4058	2.2016
Stddev	.0545	.0180	.0297	.0037	.0063
%RSD	.57324	.26972	.75485	.15572	.28688

#1	9.4642	6.6635	3.9109	2.4017	2.2088
#2	9.4940	6.6950	3.9254	2.4070	2.1988
#3	9.5699	6.6945	3.9680	2.4089	2.1971

Int. Std.	Y_3600	Y_3710
Units	Cts/S	Cts/S
Avg	56117.	8960.0
Stddev	86.	54.9
%RSD	.15366	.61312

#1	56022.	8897.1
#2	56190.	8984.4
#3	56139.	8998.5

Sample Name: ICV001 Acquired: 1/23/2025 12:36:38 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICV001 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.007508	1.056205	.9743454	1.061417	.9724914	2.523276
Stddev	.002037	.010363	.0033675	.006486	.0006370	.014806
%RSD	.2022212	.9811987	.3456164	.6110703	.0655043	.5867783
#1	1.005173	1.044673	.9711541	1.059260	.9718062	2.509548
#2	1.008425	1.059202	.9740169	1.056284	.9726022	2.521315
#3	1.008925	1.064740	.9778651	1.068707	.9730657	2.538965
Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5453292	.4825052	.4841564	10.18213	.5293949	.4737222
Stddev	.0042311	.0020994	.0016822	.05187	.0017423	.0010740
%RSD	.7758795	.4351132	.3474598	.5094696	.3291171	.2267116
#1	.5406581	.4836393	.4823595	10.13055	.5303987	.4728592
#2	.5464246	.4837937	.4844158	10.18154	.5273830	.4733823
#3	.5489049	.4800826	.4856939	10.23430	.5304030	.4749250
Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5502119	10.60016	.5511894	6.541684	.4889528	.2487321
Stddev	.0014583	.04986	.0037545	.036150	.0008844	.0003948
%RSD	.2650457	.4703373	.6811590	.5526079	.1808840	.1587437
#1	.5487428	10.54587	.5470936	6.503295	.4881795	.2491252
#2	.5516592	10.61072	.5520065	6.546684	.4887619	.2487356
#3	.5502339	10.64389	.5544680	6.575074	.4899172	.2483356
Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.726646	.4979998	1.072495	10.45073	4.935844	5.188170
Stddev	.095025	.0040928	.006390	.07734	.015983	.027092
%RSD	.9769513	.8218396	.5958193	.7400914	.3238213	.5221939
#1	9.665816	.4932804	1.065154	10.36464	4.919217	5.215727
#2	9.836146	.5005751	1.076809	10.47319	4.937220	5.187216
#3	9.677976	.5001439	1.075522	10.51436	4.951095	5.161567

Sample Name: ICV001 Acquired: 1/23/2025 12:36:38 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICV001 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.318601	4.796258	F .0047791	5.367198	5.382237	5.286302
Stddev	.013105	.018220	.0013198	.013257	.023832	.034753
%RSD	.2464064	.3798846	27.61599	.2469981	.4427968	.6574213

#1	5.309410	4.781443	.0041296	5.361938	5.355405	5.250635
#2	5.312785	4.790729	.0062978	5.357378	5.400948	5.288210
#3	5.333608	4.816602	.0039099	5.382277	5.390356	5.320063

Elem	Sr4077
Units	ppm
Avg	5.003630
Stddev	.014046
%RSD	.2807248

#1	5.019191
#2	4.991889
#3	4.999809

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3380.516	70875.27	10010.57	2449.646	4096.622
Stddev	2.593	147.04	38.99	11.164	3.480
%RSD	.0767034	.2074678	.3894777	.4557485	.0849601

#1	3382.789	70832.64	9974.25	2458.416	4100.520
#2	3381.069	71038.92	10005.69	2437.079	4095.520
#3	3377.692	70754.25	10051.77	2453.444	4093.825

Sample Name: ICB001 Acquired: 1/23/2025 12:49:25 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICB001 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.001954	.0007576	-.001397	.0011592	.0000117	-.008975	-.003369
Stddev	.001083	.0009497	.000372	.0024361	.0013311	.002067	.000637
%RSD	55.40605	125.3602	26.66171	210.1617	11402.82	23.03177	18.91710
#1	-.003175	-.000322	-.001698	.0038878	-.001346	-.006660	-.003154
#2	-.001110	.001463	-.001511	-.000797	.001314	-.009630	-.002867
#3	-.001577	.001132	-.000981	.000387	.000067	-.010636	-.004086
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000015	-.000028	.0000807	.0001880	-.000162	.0021425	.0006149
Stddev	.000132	.000006	.0056087	.0001266	.000175	.0019010	.0028517
%RSD	879.4581	20.60542	6951.911	67.30957	107.6747	88.73041	463.7742
#1	.000038	-.000030	.0064469	.0000842	-.000137	.0002947	-.001448
#2	-.000165	-.000022	-.004133	.0001508	-.000002	.0020402	.003869
#3	.000082	-.000033	-.002072	.0003290	-.000349	.0040926	-.000577
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002218	.0117227	-.000055	-.000243	-.218908	-.000989	.0012173
Stddev	.0000895	.0054109	.000149	.000219	.274555	.000742	.0009770
%RSD	40.37322	46.15774	269.3079	90.08752	125.4203	75.07495	80.26074
#1	.0003064	.0077207	.000100	-.000291	-.323073	-.000348	.0004672
#2	.0002307	.0095684	-.000197	-.000433	.092487	-.000816	.0023221
#3	.0001281	.0178789	-.000069	-.000004	-.426137	-.001803	.0008625
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.054035	-.000737	.0039160	-.000140	.0006459	.0022398	-.000528
Stddev	.010022	.000706	.0009405	.000086	.0003131	.0024815	.000621
%RSD	18.54771	95.67552	24.01607	61.14295	48.47333	110.7917	117.6057
#1	-.064394	-.001290	.0044576	-.000224	.0008908	.0050915	-.000557
#2	-.044387	.000057	.0044602	-.000053	.0002931	.0005719	-.001134
#3	-.053325	-.000979	.0028300	-.000144	.0007537	.0010560	.000107

Sample Name: ICB001 Acquired: 1/23/2025 12:49:25 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICB001 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	-.000487	-.002287	.0000263
Stddev	.000580	.001007	.0000534
%RSD	119.1775	44.03790	203.4712

#1	-.000061	-.003213	.0000793
#2	-.001148	-.002432	-.000028
#3	-.000252	-.001215	.000027

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3411.618	72648.05	9967.265	2493.233	4330.189
Stddev	2.240	1394.20	60.889	33.178	12.566
%RSD	.0656454	1.919114	.6108920	1.330730	.2902014

#1	3412.034	74253.56	10015.39	2530.719	4324.633
#2	3413.621	71742.58	9898.81	2467.643	4344.575
#3	3409.200	71948.01	9987.59	2481.338	4321.359

Sample Name: ICSA001 Acquired: 1/23/2025 13:08:35 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSA001 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000667	.0028375	.0034639	.0264925	.0076593	236.8295
Stddev	.002918	.0044781	.0012263	.0008461	.0025196	.7369
%RSD	437.4662	157.8187	35.40130	3.193678	32.89573	.3111505

#1	-.000096	.0005937	.0021176	.0274177	.0087739	237.5950
#2	.001923	.0079939	.0037573	.0263016	.0094294	236.7683
#3	-.003829	-.000075	.0045169	.0257582	.0047747	236.1250

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0030690	-.000685	.0014557	244.3977	.0610420	.0010145
Stddev	.0002509	.000085	.0001224	.6303	.0005902	.0001322
%RSD	8.175992	12.33755	8.408626	.2578852	.9667969	13.02993

#1	.0033105	-.000780	.0014795	245.0869	.0613979	.0010730
#2	.0030870	-.000658	.0013232	244.2554	.0613674	.0011074
#3	.0028096	-.000618	.0015645	243.8507	.0603608	.0008632

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.007580	102.0137	.0126633	239.7192	.0036649	.0030744
Stddev	.002441	.3349	.0002022	.3577	.0000758	.0002051
%RSD	32.19492	.3282712	1.596917	.1492005	2.068885	6.671846

#1	-.005286	102.3698	.0124580	240.0615	.0036442	.0028554
#2	-.010144	101.9661	.0128623	239.7482	.0036016	.0031056
#3	-.007311	101.7051	.0126696	239.3479	.0037489	.0032621

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.290889	-.004441	-.007031	-.090357	.0052797	F .4102032
Stddev	.138758	.000511	.002730	.038247	.0018018	.0025457
%RSD	47.70126	11.51507	38.83297	42.32876	34.12660	.6206082

#1	-.151146	-.004556	-.005112	-.079063	.0042072	.4129908
#2	-.292881	-.004885	-.010157	-.132980	.0073599	.4096173
#3	-.428639	-.003882	-.005824	-.059029	.0042721	.4080014

Sample Name: ICSA001 Acquired: 1/23/2025 13:08:35 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSA001 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000797	.0230679	.0037426	-.002902	-.003605	.0045075
Stddev	.000405	.0024484	.0031375	.000595	.000698	.0011283
%RSD	50.84201	10.61408	83.83012	20.51226	19.37473	25.03223

#1	-.000858	.0249910	.0038617	-.002217	-.002816	.0046237
#2	-.001168	.0239011	.0005473	-.003297	-.003853	.0055732
#3	-.000365	.0203116	.0068188	-.003191	-.004145	.0033256

Elem	Sr4077
Units	ppm
Avg	.0922856
Stddev	.0004400
%RSD	.4767352

#1	.0927411
#2	.0922527
#3	.0918630

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3066.278	63583.25	9664.174	2197.089	3547.751
Stddev	13.093	205.73	24.431	3.656	9.331
%RSD	.4270001	.3235640	.2527948	.1663917	.2630034

#1	3051.189	63689.15	9685.203	2195.978	3537.034
#2	3074.642	63346.14	9637.375	2194.118	3554.069
#3	3073.004	63714.46	9669.945	2201.172	3552.151

Sample Name: ICSAB001 Acquired: 1/23/2025 13:15:52 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSAB001 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0918198	.1098257	.0528339	.0647005	.5534514	227.9911
Stddev	.0020233	.0021457	.0024690	.0012526	.0035093	.4302
%RSD	2.203566	1.953757	4.673055	1.936038	.6340663	.1886844

#1	.0928618	.1079648	.0517330	.0647195	.5494215	227.5513
#2	.0931098	.1121728	.0556618	.0659436	.5550993	228.0111
#3	.0894879	.1093394	.0511069	.0634385	.5558334	228.4109

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.4749284	.5048580	.9729587	234.3466	.5991342	.4919130
Stddev	.0002778	.0011027	.0021930	.4266	.0017579	.0008793
%RSD	.0584902	.2184205	.2253958	.1820482	.2934039	.1787408

#1	.4748137	.5052396	.9712608	233.9267	.5991233	.4914646
#2	.4747263	.5057194	.9721808	234.7796	.6008975	.4913483
#3	.4752451	.5036152	.9754347	234.3335	.5973818	.4929260

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.4710609	97.77485	.4940111	229.0995	.9771576	.2029260
Stddev	.0051461	.14423	.0007656	.4426	.0021783	.0009210
%RSD	1.092457	.1475100	.1549732	.1931786	.2229214	.4538780

#1	.4708766	97.61326	.4932523	228.6256	.9772452	.2031902
#2	.4660095	97.89054	.4947833	229.5021	.9749368	.2036861
#3	.4762968	97.82076	.4939976	229.1708	.9792907	.2019017

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.341063	.4712411	.9656002	-.468326	.0054772	F .3871947
Stddev	.233776	.0019848	.0049414	.023720	.0003853	.0007042
%RSD	68.54347	.4211846	.5117430	5.064843	7.034378	.1818684

#1	-.467830	.4732672	.9669039	-.495407	.0059219	.3864001
#2	-.071284	.4711558	.9601377	-.451234	.0052660	.3877415
#3	-.484075	.4693003	.9697590	-.458339	.0052438	.3874426

Sample Name: ICSAB001 Acquired: 1/23/2025 13:15:52 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSAB001 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.001195	.0159721	.0039508	-.004014	-.004684	.0024809
Stddev	.000287	.0087316	.0030609	.000628	.001240	.0012736
%RSD	23.99108	54.66816	77.47655	15.63945	26.46200	51.33544

#1	-.000916	.0147035	.0072884	-.004529	-.006009	.0028352
#2	-.001489	.0252686	.0032893	-.003315	-.003553	.0035397
#3	-.001180	.0079441	.0012747	-.004197	-.004490	.0010677

Elem	Sr4077
Units	ppm
Avg	.0882112
Stddev	.0002754
%RSD	.3121494

#1	.0879300
#2	.0882234
#3	.0884803

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3137.789	63569.21	9440.399	2210.991	3646.544
Stddev	1.729	163.92	27.335	3.705	2.371
%RSD	.0551011	.2578621	.2895544	.1675637	.0650143

#1	3137.395	63556.48	9418.078	2207.449	3648.018
#2	3136.291	63412.02	9432.233	2214.840	3647.804
#3	3139.680	63739.12	9470.887	2210.685	3643.809

Sample Name: CCV001 Acquired: 1/23/2025 13:28:51 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV001 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.959269	4.948479	24.53406	4.998708	5.055975	419.8155
Stddev	.010902	.028607	.03998	.013263	.010027	.8660
%RSD	.2198341	.5780910	.1629417	.2653250	.1983266	.2062892

#1	4.947801	4.917261	24.53438	4.984287	5.046248	419.3417
#2	4.969499	4.954737	24.49392	5.001455	5.055399	419.2898
#3	4.960508	4.973438	24.57387	5.010383	5.066277	420.8151

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.44686	.4887662	2.475746	414.7822	15.79966	2.494841
Stddev	.09389	.0015877	.001915	.5987	.01238	.003735
%RSD	.8987499	.3248375	.0773368	.1443420	.0783705	.1497181

#1	10.53104	.4903682	2.476633	414.5312	15.81396	2.497817
#2	10.46394	.4871933	2.473549	414.3498	15.79256	2.490650
#3	10.34560	.4887371	2.477057	415.4655	15.79248	2.496058

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	14.79702	420.6141	15.51223	412.9021	2.488414	1.313454
Stddev	.02059	1.1135	.02592	.6303	.004104	.000643
%RSD	.1391539	.2647256	.1670698	.1526477	.1649199	.0489313

#1	14.80181	419.5591	15.48577	412.1846	2.491630	1.314192
#2	14.81479	421.7780	15.53757	413.3661	2.483792	1.313022
#3	14.77446	420.5053	15.51334	413.1558	2.489821	1.313147

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	389.7901	2.463543	16.00813	162.6031	4.980700	F 5.896645
Stddev	.4486	.007229	.04238	.6050	.006813	.005164
%RSD	.1150769	.2934386	.2647600	.3720694	.1367957	.0875704

#1	389.3936	2.456452	15.96625	161.9671	4.976878	5.901997
#2	390.2770	2.470902	16.05100	163.1714	4.976655	5.891692
#3	389.6996	2.463276	16.00715	162.6710	4.988567	5.896246

Sample Name: CCV001 Acquired: 1/23/2025 13:28:51 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV001 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.966958	5.038593	4.946768	4.946838	4.943762	5.337739
Stddev	.007213	.031784	.009875	.009354	.003343	.016372
%RSD	.1452225	.6308145	.1996335	.1890963	.0676287	.3067296

#1	4.958711	5.062468	4.958147	4.951280	4.944173	5.322945
#2	4.970072	5.002515	4.941721	4.936090	4.946880	5.355329
#3	4.972092	5.050795	4.940436	4.953142	4.940232	5.334942

Elem	Sr4077
Units	ppm
Avg	5.295587
Stddev	.044645
%RSD	.8430632

#1	5.265172
#2	5.274749
#3	5.346842

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2737.625	59158.20	9359.951	1997.687	3192.689
Stddev	2.622	1.10	17.811	3.317	3.514
%RSD	.0957849	.0018601	.1902878	.1660437	.1100527

#1	2740.342	59157.38	9339.846	2001.332	3190.873
#2	2735.109	59157.77	9373.753	1994.845	3196.739
#3	2737.425	59159.45	9366.255	1996.886	3190.455

Sample Name: CCB001 Acquired: 1/23/2025 13:33:09 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB001 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.002236	-.001103	-.000042	.0030579	.0002468	.0048564	-.002834
Stddev	.000717	.001328	.001060	.0023039	.0008091	.0019726	.000581
%RSD	32.07343	120.4030	2523.912	75.34482	327.8022	40.61881	20.50965
#1	-.002275	.000374	-.000527	.0005805	-.000161	.0026366	-.002445
#2	-.002933	-.002198	.001174	.0051362	-.000278	.0055242	-.003502
#3	-.001500	-.001483	-.000773	.0034568	.001179	.0064084	-.002556
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000200	.0000437	.0095938	.0003425	-.000056	.0057997	.0070983
Stddev	.0000807	.0000222	.0046519	.0002399	.000288	.0013910	.0010005
%RSD	403.1908	50.85127	48.48839	70.02611	518.1180	23.98473	14.09489
#1	.0000383	.0000603	.0107471	.0003229	-.000129	.0058758	.0065595
#2	-.000068	.0000524	.0135605	.0005916	-.000300	.0071511	.0064826
#3	.000090	.0000185	.0044737	.0001131	.000262	.0043722	.0082527
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0004116	.0159269	.0001469	-.000145	.1096728	.0004571	.0003431
Stddev	.0002737	.0270143	.0002001	.000284	.1808451	.0016470	.0008937
%RSD	66.49989	169.6142	136.2314	195.1489	164.8951	360.3479	260.5032
#1	.0002132	-.003230	.0003145	-.000252	.2382672	.0020861	-.000472
#2	.0007239	.046825	.0002007	-.000361	-.097111	-.001207	.001299
#3	.0002977	.004186	-.000075	.000176	.187863	.000492	.000203
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0495353	.0019191	.0059073	-.000015	.0012597	.0007045	-.000249
Stddev	.0078743	.0009484	.0002410	.000155	.0013838	.0030113	.000608
%RSD	15.89638	49.41871	4.079962	1023.897	109.8553	427.4384	244.3229
#1	.0585853	.0013015	.0060167	-.000095	.0026199	.0041293	.000321
#2	.0457711	.0014447	.0056310	.000164	.0013058	-.000487	-.000179
#3	.0442496	.0030110	.0060743	-.000114	-.000147	-.001529	-.000888

Sample Name: CCB001 Acquired: 1/23/2025 13:33:09 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB001 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0005603	-.001751	.0000889
Stddev	.0007359	.001288	.0000403
%RSD	131.3283	73.59963	45.33711

#1	.0004375	-.000316	.0001349
#2	.0013499	-.002809	.0000723
#3	-.000106	-.002127	.0000596

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3463.920	71869.20	9977.434	2451.366	4413.945
Stddev	15.723	246.22	20.204	13.774	20.089
%RSD	.4538973	.3425926	.2024944	.5618753	.4551229

#1	3446.409	71623.83	9954.167	2435.695	4391.359
#2	3476.826	71867.50	9987.595	2456.848	4429.818
#3	3468.525	72116.26	9990.540	2461.554	4420.658

Sample Name: PB166001BL Acquired: 1/23/2025 13:37:18 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS001 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.001768	-.000054	-.000416	.0000560	.0002856	-.007382	-.001765
Stddev	.001620	.000862	.001071	.0026706	.0003694	.004163	.000977
%RSD	91.60198	1585.518	257.6481	4768.203	129.3311	56.39637	55.36121
#1	-.003541	-.000140	-.001548	.0029775	-.000117	-.011969	-.001270
#2	-.000364	-.000870	.000581	-.000550	.000366	-.006333	-.002890
#3	-.001400	.000847	-.000280	-.002260	.000608	-.003843	-.001134
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000071	-.000044	.0067167	.0004608	-.000023	.0036982	-.004601
Stddev	.0000296	.000038	.0064630	.0003175	.000107	.0021008	.004599
%RSD	419.9400	85.92933	96.22364	68.89622	466.9758	56.80563	99.96543
#1	.0000252	-.000078	.0063866	.0005286	-.000115	.0028675	.000634
#2	-.000027	-.000050	.0133384	.0007390	-.000048	.0021398	-.006444
#3	.000023	-.000004	.0004250	.0001149	.000094	.0060874	-.007993
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0003295	.0141282	-.000135	-.000253	.0903481	.0014476	-.001600
Stddev	.0003120	.0089386	.000327	.000353	.1847607	.0015365	.003339
%RSD	94.70445	63.26774	242.4050	139.8837	204.4988	106.1426	208.7565
#1	.0005765	.0091122	.000044	-.000473	-.120882	-.000314	-.003815
#2	-.000021	.0244483	.000063	.000155	.221906	.002142	-.003226
#3	.000433	.0088241	-.000513	-.000440	.170020	.002514	.002241
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0310754	.0006236	.0032947	-.000174	.0020307	.0078591	.0000862
Stddev	.0746093	.0009594	.0005072	.000215	.0022338	.0010156	.0011120
%RSD	240.0916	153.8640	15.39525	123.6752	109.9988	12.92220	1289.893
#1	-.043559	.0015398	.0033395	-.000277	-.000138	.0085180	-.000881
#2	.031125	-.000374	.0037780	.000073	.004324	.0066895	.001301
#3	.105660	.000705	.0027665	-.000318	.001906	.0083697	-.000162

Sample Name: PB166001BL Acquired: 1/23/2025 13:37:18 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS001 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	-.000684	-.003048	.0000495
Stddev	.000540	.001278	.0000197
%RSD	78.90090	41.92348	39.73897

#1	-.001261	-.003858	.0000295
#2	-.000602	-.001575	.0000501
#3	-.000190	-.003712	.0000688

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3411.856	71127.71	9977.533	2445.054	4316.741
Stddev	4.668	148.51	42.597	10.483	3.354
%RSD	.1368044	.2087984	.4269279	.4287357	.0776996

#1	3406.562	70956.28	9979.300	2433.354	4315.260
#2	3415.379	71209.44	10019.22	2453.593	4320.581
#3	3413.628	71217.41	9934.08	2448.214	4314.383

Sample Name: PB166001BS Acquired: 1/23/2025 13:41:28 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS001 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0177942	.0561371	.0177729	.0674509	.1129643	.4071776	.3784476
Stddev	.0020121	.0008424	.0010323	.0025061	.0016513	.0088309	.0019352
%RSD	11.30778	1.500643	5.808313	3.715476	1.461814	2.168800	.5113480
#1	.0170006	.0557868	.0179757	.0690684	.1111036	.4124562	.3786429
#2	.0162999	.0555264	.0166542	.0645640	.1142556	.3969827	.3802777
#3	.0200821	.0570982	.0186888	.0687202	.1135337	.4120938	.3764222
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0104560	.0102156	9.861336	.0223233	.0994506	.0581587	.2093739
Stddev	.0000684	.0000477	.052059	.0003225	.0002735	.0034829	.0061616
%RSD	.6546444	.4671497	.5279125	1.444732	.2749563	5.988651	2.942856
#1	.0105283	.0102316	9.814079	.0225206	.0996767	.0566194	.2049725
#2	.0103921	.0101619	9.917139	.0219511	.0991466	.0621460	.2067336
#3	.0104475	.0102533	9.852789	.0224982	.0995284	.0557105	.2164157
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0312445	8.965041	.0810299	.0190708	10.06642	.1061480	.1249916
Stddev	.0004786	.041657	.0002696	.0001628	.23406	.0011292	.0001729
%RSD	1.531637	.4646627	.3327653	.8536185	2.325122	1.063830	.1383544
#1	.0306941	8.925682	.0810135	.0190948	9.86677	.1052497	.1249085
#2	.0315616	9.008668	.0807687	.0192203	10.32400	.1074157	.1251904
#3	.0314779	8.960772	.0813073	.0188974	10.00849	.1057788	.1248758
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.150262	.0207744	.0030283	.0203778	.1790906	.4704521	.0143981
Stddev	.052952	.0017712	.0007114	.0000269	.0056003	.0028193	.0011021
%RSD	.5786969	8.525706	23.49190	.1320880	3.127071	.5992806	7.654737
#1	9.090475	.0188156	.0028562	.0204063	.1832875	.4708302	.0141590
#2	9.169064	.0212444	.0024186	.0203529	.1727315	.4730633	.0134352
#3	9.191248	.0222631	.0038099	.0203741	.1812527	.4674628	.0156002

Sample Name: PB166001BS Acquired: 1/23/2025 13:41:28 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS001 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.2088677	.0251052	.1784047
Stddev	.0005928	.0014946	.0012129
%RSD	.2838246	5.953332	.6798338

#1	.2091747	.0234861	.1778504
#2	.2092442	.0264321	.1797956
#3	.2081844	.0253976	.1775680

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3421.040	70560.88	9970.185	2425.324	4235.853
Stddev	8.471	152.34	61.413	8.170	8.986
%RSD	.2476220	.2159053	.6159647	.3368517	.2121343

#1	3416.210	70562.70	9904.119	2419.427	4231.175
#2	3430.821	70407.64	10025.53	2421.896	4246.212
#3	3416.088	70712.31	9980.90	2434.650	4230.172

Sample Name: PB166002BL Acquired: 1/23/2025 13:45:35 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS002 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.001249	.0007499	-.000057	.0028455	.0000646	.0383812	-.003183
Stddev	.001047	.0008713	.000692	.0008034	.0012162	.0053380	.000362
%RSD	83.84288	116.1899	1211.067	28.23487	1883.747	13.90789	11.38434
#1	-.001572	.0014671	-.000266	.0035056	-.000953	.0353712	-.003592
#2	-.002098	-.000220	.000715	.0030799	.001412	.0352279	-.003054
#3	-.000079	.001002	-.000621	.0019509	-.000266	.0445444	-.002902
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000006	.0000095	.0218299	.0002583	-.000019	.0048387	-.001190
Stddev	.000042	.0000375	.0102316	.0002738	.000116	.0008919	.004201
%RSD	662.8759	395.6453	46.86969	106.0276	604.9723	18.43329	353.0739
#1	-.000009	.0000098	.0100709	.0000131	-.000153	.0040129	.002673
#2	.000037	-.000028	.0267196	.0005538	.000054	.0047186	-.000581
#3	-.000047	.000047	.0286992	.0002079	.000041	.0057846	-.005661
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0005585	.0183662	-.000122	-.000154	.1135086	-.000031	.0000174
Stddev	.0002659	.0070939	.000221	.000363	.1795320	.001110	.0003590
%RSD	47.61191	38.62476	180.8039	235.4840	158.1660	3588.704	2061.907
#1	.0002722	.0213047	.000109	-.000571	.0339194	.001208	-.000046
#2	.0007978	.0235187	-.000332	.000026	.3190768	-.000933	-.000306
#3	.0006055	.0102752	-.000144	.000083	-.012470	-.000368	.000404
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.046097	.0020846	.0013863	-.000343	-.000549	.0041453	.0002500
Stddev	.018890	.0008782	.0003544	.000346	.002075	.0004084	.0001809
%RSD	40.97861	42.12622	25.56599	100.6599	378.1529	9.852312	72.37725
#1	-.066727	.0010995	.0016066	-.000743	.000184	.0042120	.0004589
#2	-.041916	.0027855	.0009775	-.000136	.001060	.0045162	.0001438
#3	-.029648	.0023688	.0015749	-.000152	-.002890	.0037076	.0001473

Sample Name: PB166002BL Acquired: 1/23/2025 13:45:35 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS002 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0004016	-.003715	.0000232
Stddev	.0011842	.000694	.0000443
%RSD	294.8995	18.69156	191.2580

#1	-.000197	-.004470	.0000464
#2	-.000364	-.003570	.0000509
#3	.001766	-.003104	-.000028

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3453.792	71772.69	10047.35	2481.911	4374.928
Stddev	10.228	105.90	20.76	5.373	9.073
%RSD	.2961462	.1475431	.2066480	.2165060	.2073897

#1	3463.920	71651.90	10069.76	2478.927	4383.991
#2	3453.989	71849.55	10028.77	2488.114	4374.949
#3	3443.466	71816.62	10043.50	2478.692	4365.845

Sample Name: PB166002BS Acquired: 1/23/2025 13:49:44 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS002 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0176013	.0551235	.0198241	.0686019	.1139005	.4077236	.3810148
Stddev	.0021880	.0009308	.0002593	.0008273	.0004711	.0086604	.0003098
%RSD	12.43063	1.688618	1.308038	1.205883	.4136406	2.124082	.0813140
#1	.0155716	.0559888	.0201142	.0680582	.1140345	.3982272	.3808019
#2	.0199189	.0541387	.0197433	.0695539	.1133768	.4151857	.3813702
#3	.0173133	.0552429	.0196149	.0681935	.1142901	.4097580	.3808722
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0103976	.0103074	9.877801	.0223181	.1009395	.0565933	.2053867
Stddev	.0001007	.0000569	.023582	.0001900	.0004969	.0036678	.0106510
%RSD	.9686673	.5520450	.2387371	.8511037	.4923024	6.480915	5.185809
#1	.0103474	.0102513	9.857762	.0221009	.1005978	.0539043	.1930942
#2	.0105136	.0103651	9.871854	.0224004	.1007111	.0607714	.2118685
#3	.0103319	.0103059	9.903787	.0224531	.1015095	.0551041	.2111976
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0308483	8.884515	.0819676	.0189791	10.10063	.1082367	.1302781
Stddev	.0001926	.027549	.0004083	.0005370	.46656	.0025535	.0017613
%RSD	.6242304	.3100830	.4981859	2.829245	4.619111	2.359215	1.351928
#1	.0308550	8.856198	.0814972	.0185709	10.39094	.1065108	.1295595
#2	.0310374	8.886120	.0821750	.0187789	10.34849	.1070294	.1289898
#3	.0306524	8.911227	.0822307	.0195874	9.56245	.1111701	.1322851
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.078017	.0201316	.0014884	.0204076	.1782328	.4807525	.0149332
Stddev	.039408	.0016343	.0004535	.0003574	.0036560	.0035011	.0004776
%RSD	.4341068	8.118119	30.46925	1.751272	2.051255	.7282549	3.198033
#1	9.120940	.0206390	.0013028	.0206220	.1780366	.4843096	.0147485
#2	9.043471	.0214520	.0011572	.0206059	.1819829	.4773102	.0154755
#3	9.069639	.0183038	.0020053	.0199950	.1746788	.4806377	.0145755

Sample Name: PB166002BS Acquired: 1/23/2025 13:49:44 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS002 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.2139633	.0244425	.1783279
Stddev	.0004326	.0005050	.0003749
%RSD	.2021670	2.066095	.2102147

#1	.2136911	.0238605	.1779372
#2	.2144621	.0247025	.1786846
#3	.2137367	.0247646	.1783620

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3418.987	72110.45	9996.332	2455.674	4232.647
Stddev	10.824	197.77	29.236	12.945	9.781
%RSD	.3165795	.2742572	.2924710	.5271618	.2310880

#1	3418.413	72119.76	9992.058	2457.674	4236.470
#2	3430.086	72303.40	10027.47	2467.503	4239.939
#3	3408.461	71908.19	9969.47	2441.845	4221.532

Sample Name: PB166023BL Acquired: 1/23/2025 13:53:47 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS023 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.003192	.0006413	-.001559	.0028723	-.000222	.0794228	-.001613
Stddev	.001511	.0012716	.000641	.0032545	.001477	.0050661	.000321
%RSD	47.32599	198.2854	41.11859	113.3062	665.6563	6.378637	19.89180

#1	-.004312	.0013628	-.002104	.0032310	.000555	.0846675	-.001529
#2	-.001474	.0013880	-.001721	.0059327	-.001925	.0790443	-.001967
#3	-.003791	-.000827	-.000853	-.000547	.000705	.0745565	-.001342

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000464	.0000123	-.000060	.0004829	.0000522	.0030884	-.003555
Stddev	.0000292	.0000264	.010272	.0001639	.0000186	.0020286	.002649
%RSD	63.00558	214.1213	17171.19	33.94900	35.62739	65.68287	74.53285

#1	.0000760	.0000140	-.011843	.0005743	.0000368	.0054099	-.006519
#2	.0000175	.0000378	.004656	.0002936	.0000469	.0016573	-.001418
#3	.0000458	-.000015	.007008	.0005806	.0000728	.0021981	-.002726

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0004396	.0095058	-.000200	-.000291	.1804637	.0007353	.0006976
Stddev	.0000963	.0015910	.000220	.000298	.0776668	.0014411	.0007654
%RSD	21.91173	16.73725	109.9863	102.2232	43.03734	195.9786	109.7256

#1	.0003285	.0094252	-.000072	-.000176	.0965140	-.000812	.0006314
#2	.0004920	.0079566	-.000074	-.000630	.1951171	.000978	-.000033
#3	.0004985	.0111356	-.000454	-.000069	.2497601	.002040	.001494

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.034278	.0020864	-.000392	-.000316	.0018504	.0034660	.0002524
Stddev	.059560	.0011485	.000556	.000069	.0019908	.0022755	.0002377
%RSD	173.7524	55.04883	142.0819	21.77737	107.5887	65.65316	94.16500

#1	-.102713	.0008431	-.000591	-.000368	-.000263	.0054053	.0005069
#2	.005843	.0023082	-.000820	-.000342	.002124	.0009610	.0002138
#3	-.005966	.0031079	.000237	-.000238	.003690	.0040318	.0000364

Sample Name: PB166023BL Acquired: 1/23/2025 13:53:47 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS023 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	-.000277	-.003965	.0000500
Stddev	.000560	.000880	.0000650
%RSD	202.0126	22.19922	130.0346

#1	-.000063	-.003159	-.000002
#2	-.000913	-.003831	.000123
#3	.000144	-.004904	.000029

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3480.688	71502.79	10026.80	2465.179	4425.579
Stddev	7.237	315.63	23.59	7.228	5.834
%RSD	.2079076	.4414290	.2352240	.2932145	.1318282

#1	3482.097	71405.13	10001.95	2473.374	4429.832
#2	3487.116	71855.71	10048.87	2459.713	4427.978
#3	3472.850	71247.53	10029.57	2462.449	4418.928

Sample Name: PB166023BS Acquired: 1/23/2025 13:57:57 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS023 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0156160	.0571817	.0193528	.0693472	.1152326	.3783603	.3721695
Stddev	.0011665	.0021973	.0003271	.0022753	.0010979	.0103976	.0015861
%RSD	7.469837	3.842714	1.690018	3.281003	.9527473	2.748062	.4261745

#1	.0156800	.0597181	.0192626	.0713842	.1147184	.3689298	.3705176
#2	.0167492	.0558593	.0190803	.0668917	.1144862	.3766406	.3723105
#3	.0144188	.0559675	.0197155	.0697656	.1164932	.3895105	.3736804

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0106551	.0103003	9.767142	.0226636	.1010750	.0562001	.2081819
Stddev	.0001573	.0000531	.060017	.0002408	.0004312	.0025204	.0048976
%RSD	1.476341	.5152996	.6144830	1.062458	.4266197	4.484639	2.352540

#1	.0108229	.0103375	9.697846	.0229309	.1015545	.0591021	.2028460
#2	.0105110	.0102395	9.800967	.0225963	.1007191	.0549385	.2092272
#3	.0106314	.0103238	9.802612	.0224636	.1009513	.0545596	.2124723

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0304636	8.848362	.0821477	.0194335	9.609872	.1067915	.1205286
Stddev	.0003131	.098129	.0002312	.0003558	.037652	.0011526	.0012431
%RSD	1.027641	1.109008	.2814430	1.830743	.3918085	1.079268	1.031334

#1	.0301022	8.738729	.0824135	.0194218	9.643259	.1080791	.1205366
#2	.0306378	8.878382	.0819931	.0190837	9.617298	.1058563	.1217676
#3	.0306508	8.927974	.0820366	.0197949	9.569060	.1064390	.1192815

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.081753	.0197286	.0011761	.0204447	.1769924	.4714426	.0139073
Stddev	.060996	.0016523	.0001832	.0000696	.0066970	.0027324	.0004041
%RSD	.6716376	8.374961	15.57887	.3404844	3.783768	.5795911	2.905429

#1	9.036788	.0215610	.0011594	.0204005	.1773269	.4683696	.0135873
#2	9.057287	.0192726	.0013672	.0205250	.1701345	.4735987	.0143614
#3	9.151184	.0183523	.0010019	.0204087	.1835159	.4723594	.0137732

Sample Name: PB166023BS Acquired: 1/23/2025 13:57:57 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS023 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.2090108	.0247798	.1760272
Stddev	.0010547	.0009313	.0007775
%RSD	.5046190	3.758452	.4416856

#1	.2078011	.0237053	.1754695
#2	.2094937	.0252802	.1756968
#3	.2097376	.0253541	.1769153

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3407.106	70296.50	9820.680	2430.233	4222.992
Stddev	12.113	78.97	59.894	10.289	13.646
%RSD	.3555247	.1123388	.6098737	.4233597	.3231403

#1	3402.302	70373.97	9752.869	2431.544	4220.455
#2	3420.885	70216.11	9842.816	2419.351	4237.729
#3	3398.133	70299.41	9866.354	2439.803	4210.793

Sample Name: PB166022BL Acquired: 1/23/2025 14:02:01 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS022 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000055	.0000935	-.001365	.0005970	.0005426	.0007161	-.002285
Stddev	.0045307	.0014599	.001504	.0006208	.0004204	.0106675	.000878
%RSD	82705.28	1561.917	110.2305	103.9874	77.46366	1489.762	38.40292
#1	.0040847	.0007650	-.002179	.0013116	.0008599	.0129104	-.002910
#2	.0008025	-.001581	.000371	.0001912	.0000659	-.006888	-.002663
#3	-.004871	.001097	-.002287	.0002882	.0007022	-.003875	-.001282
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000021	-.000018	-.003995	.0005541	-.000055	.0026007	.0012225
Stddev	.000041	.000037	.004396	.0003467	.000221	.0021374	.0043057
%RSD	191.3966	201.9807	110.0202	62.56788	403.5667	82.18320	352.2093
#1	.000013	-.000008	-.007550	.0009403	.000018	.0035846	-.000490
#2	-.000066	-.000059	.000920	.0004522	.000121	.0001486	-.001963
#3	-.000010	.000012	-.005356	.0002697	-.000303	.0040690	.006121
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000253	.0090145	.0000565	-.000188	.0802748	.0003785	-.000273
Stddev	.0002026	.0057944	.0001862	.000187	.1524268	.0014047	.000975
%RSD	800.4214	64.27814	329.4457	99.43768	189.8813	371.1081	357.7268
#1	.0001411	.0038521	.0002709	-.000030	-.049257	.0002718	.000064
#2	.0001435	.0152817	-.000065	-.000395	.248240	.0018335	.000490
#3	-.000209	.0079098	-.000037	-.000141	.041842	-.000970	-.001372
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.024428	.0005066	.0000244	-.000347	-.000047	.0037189	.0002931
Stddev	.045063	.0005715	.0003047	.000118	.000941	.0028114	.0010229
%RSD	184.4738	112.8114	1248.914	34.11363	2020.630	75.59937	349.0230
#1	-.056894	.0000258	-.000327	-.000484	.000501	.0047742	.0008905
#2	-.043411	.0003556	.000220	-.000278	-.001134	.0005324	-.000888
#3	.027021	.0011384	.000180	-.000280	.000493	.0058499	.000877

Sample Name: PB166022BL Acquired: 1/23/2025 14:02:01 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS022 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0001685	-.003535	.0000103
Stddev	.0003219	.001385	.0000481
%RSD	191.0183	39.18470	468.6782

#1	.0004561	-.003092	.0000235
#2	.0002287	-.002426	-.000043
#3	-.000179	-.005088	.000050

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3421.262	71651.73	10087.16	2468.846	4330.028
Stddev	8.743	133.87	19.32	6.642	2.902
%RSD	.2555490	.1868277	.1914892	.2690282	.0670153

#1	3411.748	71516.00	10089.53	2464.153	4327.359
#2	3423.095	71655.53	10066.77	2476.446	4329.607
#3	3428.944	71783.65	10105.18	2465.940	4333.117

Sample Name: PB166022BS Acquired: 1/23/2025 14:06:11 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS022 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0169984	.0552613	.0174395	.0644293	.1104128	.3951891	.3670517
Stddev	.0013184	.0002808	.0008674	.0012418	.0016016	.0060380	.0020482
%RSD	7.755870	.5081181	4.973538	1.927427	1.450520	1.527888	.5580107
#1	.0176453	.0555649	.0174005	.0645151	.1089514	.3911820	.3667232
#2	.0154815	.0552080	.0165923	.0656261	.1101621	.3922515	.3651877
#3	.0178682	.0550110	.0183257	.0631469	.1121249	.4021339	.3692443
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0105550	.0099309	9.615971	.0221323	.0978655	.0568689	.1993078
Stddev	.0000285	.0000460	.041747	.0005462	.0001797	.0017638	.0073629
%RSD	.2701456	.4630371	.4341379	2.467824	.1836396	3.101472	3.694254
#1	.0105803	.0099810	9.643164	.0217026	.0978922	.0553485	.1984153
#2	.0105608	.0099210	9.567904	.0219475	.0976740	.0564556	.2070763
#3	.0105241	.0098907	9.636843	.0227470	.0980304	.0588026	.1924318
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0297912	8.708558	.0792468	.0191398	9.565364	.1035682	.1243604
Stddev	.0002716	.037591	.0002049	.0001021	.521375	.0021005	.0023960
%RSD	.9115214	.4316591	.2585779	.5335573	5.450655	2.028144	1.926681
#1	.0295403	8.713204	.0792594	.0191819	9.751726	.1011431	.1243867
#2	.0300795	8.668860	.0790359	.0192142	9.967949	.1047496	.1219513
#3	.0297538	8.743610	.0794451	.0190234	8.976417	.1048120	.1267431
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	8.842726	.0181553	.0007199	.0199249	.1679778	.4686574	.0132502
Stddev	.068131	.0012656	.0004191	.0002519	.0017313	.0009798	.0006814
%RSD	.7704727	6.970905	58.20863	1.264313	1.030651	.2090618	5.142691
#1	8.891801	.0182190	.0002585	.0202157	.1699748	.4694498	.0124658
#2	8.764939	.0168591	.0010769	.0197852	.1668998	.4675619	.0135892
#3	8.871438	.0193879	.0008243	.0197737	.1670589	.4689605	.0136956

Sample Name: PB166022BS Acquired: 1/23/2025 14:06:11 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS022 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.2066884	.0224123	.1731707
Stddev	.0007853	.0006332	.0008485
%RSD	.3799689	2.825270	.4899835

#1	.2075234	.0230023	.1736428
#2	.2065774	.0224913	.1721911
#3	.2059645	.0217433	.1736781

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3507.212	70837.78	9852.000	2465.686	4353.459
Stddev	4.883	166.61	37.666	4.580	5.626
%RSD	.1392184	.2351986	.3823228	.1857301	.1292222

#1	3503.174	70741.18	9825.160	2470.945	4349.563
#2	3505.823	71030.17	9835.781	2462.580	4350.906
#3	3512.639	70742.00	9895.059	2463.533	4359.909

Sample Name: PB166021BL Acquired: 1/23/2025 14:10:14 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS021 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.002657	.0006911	-.000393	.0023445	.0003437	.0452904	-.006094
Stddev	.001552	.0028030	.001202	.0017046	.0008585	.0038928	.000972
%RSD	58.39307	405.5819	306.1408	72.70694	249.7595	8.595264	15.95741
#1	-.001001	-.001986	.000130	.0031085	.0011875	.0408043	-.004973
#2	-.004076	.003605	.000460	.0035336	-.000529	.0477790	-.006715
#3	-.002895	.000454	-.001767	.0003916	.000372	.0472879	-.006594
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000059	.0000361	.0041740	.0003146	-.000148	.0038453	-.000374
Stddev	.000108	.0000889	.0146044	.0001070	.000190	.0004295	.006204
%RSD	181.9448	246.5719	349.8928	33.99707	128.4198	11.16877	1657.871
#1	.000053	-.000052	.0171349	.0004260	.000065	.0035035	.006782
#2	-.000161	.000035	-.011650	.0002127	-.000209	.0037051	-.004249
#3	-.000070	.000125	.007037	.0003052	-.000299	.0043274	-.003655
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0003361	.0059208	-.000087	-.000427	.2495450	.0009581	.0013429
Stddev	.0001908	.0054201	.000352	.000314	.0830578	.0020077	.0017153
%RSD	56.77769	91.54336	406.6833	73.51192	33.28370	209.5355	127.7337
#1	.0001807	-.000273	-.000493	-.000194	.1879708	-.000955	.0030770
#2	.0002785	.008238	.000098	-.000303	.3440115	.000781	-.000353
#3	.0005491	.009797	.000135	-.000785	.2166527	.003048	.001305
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.339617	.0024736	-.000604	-.000350	.0005534	.0064691	-.000280
Stddev	.009107	.0010583	.000263	.000119	.0019798	.0007323	.000431
%RSD	2.681681	42.78484	43.61408	34.05011	357.7753	11.32066	154.0698
#1	-.349623	.0015031	-.000742	-.000357	.0027381	.0061125	.000204
#2	-.331811	.0023157	-.000769	-.000227	-.001122	.0073114	-.000621
#3	-.337417	.0036020	-.000300	-.000465	.000044	.0059833	-.000422

Sample Name: PB166021BL Acquired: 1/23/2025 14:10:14 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS021 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	-.000246	-.004830	-.000026
Stddev	.000400	.001011	.000060
%RSD	162.5438	20.94131	229.7669

#1	-.000118	-.004301	-.000088
#2	.000074	-.005996	-.000022
#3	-.000694	-.004192	.000032

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3463.722	71866.38	9584.957	2474.268	4400.458
Stddev	8.132	22.27	38.446	5.429	8.664
%RSD	.2347639	.0309852	.4011114	.2194157	.1968934

#1	3461.730	71845.77	9550.448	2474.826	4401.941
#2	3472.664	71890.00	9578.025	2479.397	4408.286
#3	3456.771	71863.38	9626.398	2468.582	4391.149

Sample Name: PB166021BS Acquired: 1/23/2025 14:14:23 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS021 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0163858	.0535252	.0188896	.0658076	.1115390	.3697364	.3506167
Stddev	.0025535	.0016862	.0017663	.0041356	.0007801	.0106048	.0026423
%RSD	15.58393	3.150207	9.350444	6.284391	.6993987	2.868195	.7536167
#1	.0170711	.0526655	.0205998	.0705430	.1106553	.3583347	.3475684
#2	.0185268	.0524422	.0189968	.0639734	.1118296	.3715690	.3522519
#3	.0135595	.0554679	.0170722	.0629062	.1121320	.3793054	.3520300
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0103804	.0100167	9.324920	.0220062	.0980469	.0561280	.1972193
Stddev	.0001052	.0000400	.070405	.0002087	.0004107	.0009467	.0087648
%RSD	1.013722	.3996082	.7550253	.9484858	.4189230	1.686746	4.444188
#1	.0104470	.0099734	9.244497	.0222390	.0976032	.0562827	.1936219
#2	.0104352	.0100242	9.354835	.0219437	.0981238	.0569878	.1908255
#3	.0102591	.0100524	9.375428	.0218359	.0984138	.0551134	.2072104
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0286027	8.476212	.0799935	.0189241	9.348201	.1051250	.1144083
Stddev	.0003094	.027368	.0005303	.0004798	.319951	.0008158	.0003939
%RSD	1.081678	.3228831	.6629335	2.535323	3.422598	.7760157	.3442928
#1	.0284338	8.453279	.0795273	.0183711	9.226228	.1048905	.1144190
#2	.0284146	8.468849	.0798827	.0191717	9.711199	.1060324	.1147967
#3	.0289598	8.506509	.0805704	.0192295	9.107176	.1044522	.1140091
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	8.521557	.0182733	.0005969	.0202087	.1706830	.4550246	.0137949
Stddev	.094625	.0008143	.0002478	.0001572	.0034580	.0006580	.0006051
%RSD	1.110415	4.456294	41.51118	.7779871	2.025963	.1446034	4.386211
#1	8.422402	.0191822	.0004651	.0200443	.1668209	.4545768	.0131221
#2	8.610885	.0176103	.0004429	.0202241	.1734919	.4557800	.0142945
#3	8.531383	.0180273	.0008828	.0203576	.1717363	.4547170	.0139681

Sample Name: PB166021BS Acquired: 1/23/2025 14:14:23 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS021 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.2014118	.0219557	.1665185
Stddev	.0006653	.0006246	.0011179
%RSD	.3303389	2.844629	.6713464

#1	.2016910	.0226271	.1652577
#2	.2018920	.0213920	.1673888
#3	.2006523	.0218480	.1669090

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3413.722	71360.63	9793.788	2431.955	4238.212
Stddev	6.824	98.46	30.067	7.962	2.069
%RSD	.1998985	.1379749	.3070036	.3273739	.0488119

#1	3420.581	71391.09	9759.130	2436.853	4236.812
#2	3413.652	71440.26	9812.899	2436.244	4240.588
#3	3406.933	71250.54	9809.334	2422.769	4237.235

Sample Name: PB166017BL Acquired: 1/23/2025 14:18:27 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS017 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.002097	.0004760	-.001824	.0032180	-.000594	.0081967	-.002383
Stddev	.001114	.0016741	.000950	.0016496	.001765	.0037375	.000472
%RSD	53.15288	351.7220	52.07821	51.26050	297.2192	45.59788	19.79328
#1	-.001185	.0012965	-.002920	.0017013	.000198	.0038813	-.002511
#2	-.003339	.0015814	-.001318	.0049743	.000636	.0103945	-.002778
#3	-.001767	-.001450	-.001234	.0029786	-.002616	.0103144	-.001861
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000024	-.000060	.0041442	.0003181	-.000065	.0054508	.0033757
Stddev	.000082	.000073	.0055750	.0001818	.000252	.0037613	.0014565
%RSD	337.6213	121.9603	134.5246	57.16455	390.9078	69.00456	43.14489
#1	-.000054	.000009	.0105437	.0004339	.000184	.0026966	.0020610
#2	-.000088	-.000052	.0015494	.0001085	-.000056	.0039196	.0049413
#3	.000069	-.000137	.0003396	.0004118	-.000321	.0097362	.0031249
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002325	.0081933	-.000108	-.000401	-.229516	-.000179	.0000530
Stddev	.0000590	.0091803	.000273	.000232	.134681	.001561	.0008061
%RSD	25.40226	112.0463	252.7108	57.94695	58.68050	872.0985	1521.182
#1	.0001739	.0015825	-.000409	-.000309	-.259521	-.000405	-.000498
#2	.0002315	.0186752	-.000039	-.000228	-.346663	-.001614	-.000322
#3	.0002920	.0043223	.000124	-.000665	-.082363	.001482	.000978
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.225563	.0017915	-.000918	-.000044	.0013366	.0031128	.0002260
Stddev	.016177	.0012357	.000342	.000199	.0014611	.0024070	.0008939
%RSD	7.171632	68.97625	37.27065	452.5720	109.3162	77.32629	395.5902
#1	-.208449	.0004041	-.001077	-.000091	.0030121	.0057937	-.000736
#2	-.240602	.0021965	-.000525	-.000215	.0003275	.0024075	.001031
#3	-.227637	.0027738	-.001151	.000174	.0006701	.0011372	.000383

Sample Name: PB166017BL Acquired: 1/23/2025 14:18:27 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS017 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0005293	-.005058	.0000261
Stddev	.0008536	.001719	.0000442
%RSD	161.2621	33.99157	169.3079

#1	.0014877	-.007043	.0000045
#2	.0002497	-.004034	-.000003
#3	-.000149	-.004098	.000077

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3405.713	71239.75	9922.698	2424.728	4305.045
Stddev	4.382	301.80	75.694	8.288	7.545
%RSD	.1286668	.4236350	.7628380	.3418177	.1752566

#1	3403.882	70978.16	10001.39	2417.971	4298.091
#2	3410.714	71171.14	9916.28	2422.237	4313.067
#3	3402.544	71569.94	9850.41	2433.976	4303.978

Sample Name: PB166017BS Acquired: 1/23/2025 14:22:36 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS017 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0172776	.0561467	.0188350	.0699588	.1124003	.3755640	.3722948
Stddev	.0033053	.0008520	.0007150	.0006224	.0013448	.0095188	.0027698
%RSD	19.13079	1.517510	3.795920	.8896529	1.196438	2.534533	.7439880

#1	.0145878	.0558825	.0194126	.0692438	.1120174	.3755358	.3715194
#2	.0162775	.0570996	.0190571	.0703797	.1138950	.3850968	.3699952
#3	.0209675	.0554581	.0180354	.0702527	.1112885	.3660593	.3753696

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0105838	.0101136	9.774966	.0226366	.0996519	.0570336	.2084570
Stddev	.0000751	.0000498	.029181	.0002333	.0002607	.0015780	.0085136
%RSD	.7092251	.4922485	.2985259	1.030777	.2615605	2.766842	4.084106

#1	.0105354	.0100780	9.771181	.0224202	.0995309	.0588427	.2022804
#2	.0106703	.0101705	9.747863	.0228838	.0994738	.0559405	.2181687
#3	.0105457	.0100923	9.805855	.0226057	.0999511	.0563177	.2049220

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0304118	8.871448	.0806247	.0192386	9.787430	.1082988	.1195694
Stddev	.0003070	.037863	.0004911	.0001234	.188496	.0008432	.0052928
%RSD	1.009392	.4267963	.6090604	.6414991	1.925897	.7786049	4.426549

#1	.0304217	8.903483	.0800753	.0193810	9.749082	.1073435	.1150364
#2	.0301000	8.829664	.0807779	.0191626	9.621058	.1089397	.1182858
#3	.0307137	8.881198	.0810209	.0191721	9.992152	.1086131	.1253859

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.020726	.0207976	.0002936	.0205031	.1718021	.4722068	.0133745
Stddev	.058565	.0016542	.0003109	.0001716	.0031340	.0023334	.0001802
%RSD	.6492236	7.953619	105.9032	.8371274	1.824180	.4941417	1.347183

#1	9.028479	.0221463	.0005823	.0203084	.1723682	.4748481	.0134126
#2	8.958671	.0212946	.0003339	.0205683	.1746144	.4704254	.0131783
#3	9.075028	.0189519	-.000036	.0206326	.1684237	.4713469	.0135326

Sample Name: PB166017BS Acquired: 1/23/2025 14:22:36 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS017 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.2089675	.0228698	.1765612
Stddev	.0017266	.0007950	.0008458
%RSD	.8262309	3.476266	.4790556

#1	.2102032	.0220727	.1762587
#2	.2069948	.0236627	.1759083
#3	.2097046	.0228739	.1775167

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3479.986	70736.85	9863.955	2429.972	4329.761
Stddev	1.007	193.66	54.593	12.524	2.958
%RSD	.0289486	.2737687	.5534595	.5154032	.0683066

#1	3479.277	70553.82	9806.251	2419.485	4331.319
#2	3479.541	70939.62	9870.828	2443.839	4326.351
#3	3481.139	70717.10	9914.786	2426.591	4331.614

Sample Name: PB166016BL Acquired: 1/23/2025 14:26:39 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS016 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.003102	.0001301	-.001264	.0020449	-.000495	-.004461	-.004293
Stddev	.000606	.0015247	.000436	.0034918	.001461	.007946	.000858
%RSD	19.53831	1172.020	34.46664	170.7592	295.0857	178.1299	19.99725
#1	-.002990	.0011051	-.001491	.0060669	-.001549	.000898	-.004912
#2	-.003757	-.001627	-.001538	-.000211	-.001109	-.000690	-.003313
#3	-.002560	.000912	-.000761	.000279	.001172	-.013591	-.004653
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000037	-.000025	.0052332	.0005544	-.000059	.0028129	.0710544
Stddev	.000028	.000076	.0070019	.0001418	.000212	.0013113	.0071460
%RSD	75.92741	305.2073	133.7971	25.57864	356.9853	46.61907	10.05706
#1	-.000069	.000044	.0079981	.0006281	-.000124	.0033544	.0680561
#2	-.000029	-.000012	-.002729	.0006441	-.000231	.0037667	.0658960
#3	-.000015	-.000106	.010430	.0003909	.000177	.0013175	.0792110
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0004585	.0143345	-.000452	-.000376	-.076157	.0010381	.0012450
Stddev	.0001128	.0021681	.000248	.000116	.406863	.0006184	.0021534
%RSD	24.61194	15.12522	54.86450	30.93654	534.2402	59.56941	172.9726
#1	.0003981	.0124782	-.000168	-.000295	-.543021	.0016075	.0035339
#2	.0003887	.0138079	-.000564	-.000509	.202730	.0003802	.0009420
#3	.0005887	.0167174	-.000625	-.000323	.111820	.0011266	-.000741
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.246214	.0010119	-.001505	-.000266	.0017328	.0059196	.0004813
Stddev	.051488	.0003645	.000381	.000450	.0011582	.0042667	.0003869
%RSD	20.91169	36.02421	25.29973	169.2760	66.84158	72.07702	80.38699
#1	-.285594	.0006561	-.001718	-.000397	.0004826	.0054765	.0000823
#2	-.265097	.0009950	-.001066	-.000636	.0027693	.0103906	.0008549
#3	-.187951	.0013846	-.001732	.000235	.0019465	.0018918	.0005068

Sample Name: PB166016BL Acquired: 1/23/2025 14:26:39 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS016 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0002170	-.005109	.0000429
Stddev	.0008867	.001080	.0000037
%RSD	408.6510	21.13396	8.730894

#1	.0011225	-.004558	.0000411
#2	.0001780	-.006353	.0000403
#3	-.000650	-.004416	.0000472

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3434.716	71450.58	9787.099	2464.427	4327.177
Stddev	3.541	153.31	58.423	8.407	6.544
%RSD	.1030804	.2145615	.5969364	.3411420	.1512325

#1	3433.743	71416.38	9730.125	2456.553	4320.099
#2	3438.641	71317.27	9784.301	2463.447	4333.007
#3	3431.763	71618.10	9846.870	2473.281	4328.427

Sample Name: PB166016BS Acquired: 1/23/2025 14:30:49 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS016 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0194051	.0537599	.0189938	.0671803	.1116809	.3713594	.3723599
Stddev	.0010566	.0018539	.0005687	.0016991	.0006249	.0080897	.0015248
%RSD	5.445149	3.448476	2.994158	2.529163	.5595064	2.178406	.4095103
#1	.0206151	.0520060	.0183696	.0685156	.1112128	.3752980	.3720358
#2	.0186644	.0535740	.0194826	.0652678	.1123905	.3620546	.3710231
#3	.0189359	.0556998	.0191292	.0677574	.1114394	.3767256	.3740207
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0102948	.0101649	9.657610	.0221114	.0996117	.0554872	.2065137
Stddev	.0000730	.0000640	.044858	.0004293	.0004407	.0015009	.0063557
%RSD	.7089409	.6293174	.4644820	1.941592	.4424224	2.704850	3.077637
#1	.0103751	.0101171	9.627524	.0219762	.0997508	.0571845	.1991773
#2	.0102769	.0101401	9.636138	.0217660	.0991183	.0549417	.2103490
#3	.0102325	.0102376	9.709168	.0225921	.0999662	.0543354	.2100149
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0303376	8.802490	.0810574	.0188740	9.514111	.1075629	.1205364
Stddev	.0005575	.056480	.0003747	.0004495	.055866	.0002950	.0019887
%RSD	1.837503	.6416422	.4623226	2.381561	.5871937	.2742192	1.649860
#1	.0303071	8.801049	.0806407	.0185445	9.452715	.1072349	.1221761
#2	.0297960	8.746744	.0813669	.0193860	9.561953	.1078064	.1183243
#3	.0309096	8.859677	.0811646	.0186913	9.527665	.1076473	.1211089
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	8.905787	.0191517	-.000199	.0204080	.1840506	.4698952	.0145630
Stddev	.016967	.0006948	.000340	.0000815	.0030751	.0008950	.0008014
%RSD	.1905201	3.627895	171.4080	.3992852	1.670810	.1904647	5.502750
#1	8.900082	.0198242	.000069	.0204548	.1866606	.4700090	.0154452
#2	8.924872	.0184366	-.000581	.0203139	.1806606	.4689487	.0138800
#3	8.892408	.0191942	-.000084	.0204553	.1848305	.4707278	.0143639

Sample Name: PB166016BS Acquired: 1/23/2025 14:30:49 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS016 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.2068325	.0233864	.1747259
Stddev	.0010413	.0004585	.0006450
%RSD	.5034257	1.960517	.3691427

#1	.2075218	.0229518	.1749968
#2	.2056347	.0238655	.1739896
#3	.2073410	.0233420	.1751912

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3410.987	71898.38	9998.366	2459.913	4206.551
Stddev	1.798	37.62	47.819	6.070	6.375
%RSD	.0527068	.0523299	.4782667	.2467677	.1515466

#1	3409.133	71883.63	9994.163	2461.214	4213.234
#2	3412.723	71870.36	9952.788	2453.298	4205.882
#3	3411.106	71941.14	10048.15	2465.227	4200.537

Sample Name: PB166015BL Acquired: 1/23/2025 14:34:54 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS015 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.005471	.0012586	-.000916	.0017800	.0006760	.0043912	-.003102
Stddev	.000709	.0027042	.000557	.0019505	.0005988	.0083985	.001418
%RSD	12.96646	214.8469	60.80186	109.5797	88.58785	191.2576	45.71633
#1	-.006240	.0042501	-.000273	.0039733	-.000015	-.005300	-.002719
#2	-.004842	.0005379	-.001224	.0011266	.001032	.009556	-.001915
#3	-.005331	-.001012	-.001252	.0002401	.001011	.008917	-.004672
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000053	-.000010	.0134420	.0001630	-.000046	.0016266	.0078582
Stddev	.0000717	.000029	.0022206	.0004965	.000260	.0016953	.0035170
%RSD	1360.193	292.0183	16.52022	304.6420	569.0455	104.2247	44.75579
#1	.0000846	-.000014	.0158904	.0007319	-.000039	-.000010	.0071058
#2	-.000055	.000021	.0115581	-.000183	.000211	.003375	.0047783
#3	-.000014	-.000037	.0128774	-.000060	-.000309	.001515	.0116906
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002692	.0180144	.0001197	-.000436	.2226044	.0008853	.0012630
Stddev	.0003967	.0051549	.0002123	.000273	.1570845	.0010173	.0020749
%RSD	147.3478	28.61566	177.4117	62.61459	70.56665	114.9180	164.2780
#1	.0001145	.0229384	.0003449	-.000356	.1030909	.0014438	-.000034
#2	-.000027	.0126560	.0000911	-.000740	.1641964	-.000289	.000167
#3	.000720	.0184486	-.000077	-.000212	.4005260	.001501	.003656
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.057508	.0014114	-.001585	-.000125	.0042190	.0047456	-.000076
Stddev	.015122	.0025161	.000094	.000228	.0015720	.0022805	.000596
%RSD	26.29529	178.2680	5.902370	182.9825	37.25977	48.05513	783.6016
#1	-.040451	-.000917	-.001651	.000056	.0024390	.0035148	.000520
#2	-.062802	.001070	-.001478	-.000050	.0054170	.0033450	-.000077
#3	-.069273	.004081	-.001626	-.000381	.0048009	.0073771	-.000671

Sample Name: PB166015BL Acquired: 1/23/2025 14:34:54 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS015 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0001869	-.004659	.0000149
Stddev	.0004931	.001735	.0000713
%RSD	263.8584	37.24216	479.1031

#1	.0007120	-.005526	.0000933
#2	.0001152	-.005789	-.000003
#3	-.000266	-.002661	-.000046

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3414.467	71363.82	9956.623	2461.556	4310.847
Stddev	1.796	212.61	52.853	12.890	.871
%RSD	.0526016	.2979211	.5308321	.5236531	.0201960

#1	3413.240	71608.42	9898.150	2476.232	4310.288
#2	3413.633	71259.70	10001.00	2452.072	4310.402
#3	3416.529	71223.34	9970.72	2456.363	4311.850

Sample Name: PB166015BS Acquired: 1/23/2025 14:39:03 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS015 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0176078	.0547514	.0200529	.0698499	.1170946	.3819967	.3869166
Stddev	.0030026	.0016781	.0007699	.0027455	.0016555	.0084178	.0008230
%RSD	17.05239	3.065016	3.839305	3.930546	1.413820	2.203626	.2126978
#1	.0151078	.0530382	.0203419	.0673482	.1158027	.3786776	.3878668
#2	.0167775	.0563921	.0206365	.0727871	.1165204	.3915681	.3864519
#3	.0209381	.0548240	.0191803	.0694143	.1189608	.3757445	.3864310
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0107537	.0105375	10.09373	.0229856	.1027111	.0593015	.2102215
Stddev	.0000477	.0000631	.01799	.0001421	.0006634	.0019560	.0019654
%RSD	.4432266	.5985198	.1782384	.6181082	.6459066	3.298364	.9349078
#1	.0108077	.0104648	10.08874	.0231303	.1025554	.0586851	.2104403
#2	.0107172	.0105703	10.11369	.0228463	.1021394	.0577280	.2081558
#3	.0107363	.0105773	10.07876	.0229802	.1034385	.0614914	.2120683
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0315247	9.192203	.0837635	.0198879	10.23520	.1111610	.1265284
Stddev	.0002839	.042760	.0004738	.0004910	.23987	.0007909	.0026697
%RSD	.9007372	.4651802	.5656196	2.468836	2.343624	.7115009	2.109958
#1	.0318022	9.239183	.0835010	.0204105	10.27199	.1114528	.1234680
#2	.0315372	9.181872	.0834790	.0198170	10.45456	.1102657	.1283794
#3	.0312347	9.155556	.0843104	.0194362	9.97906	.1117646	.1277377
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.317957	.0199341	-.000043	.0207827	.1805460	.4846146	.0151881
Stddev	.085210	.0001998	.000616	.0000683	.0021114	.0019395	.0003695
%RSD	.9144708	1.002376	1437.095	.3285786	1.169466	.4002070	2.432725
#1	9.226396	.0197575	.000367	.0208438	.1825473	.4866391	.0150743
#2	9.394934	.0198939	-.000751	.0207954	.1783394	.4827731	.0148888
#3	9.332540	.0201510	.000255	.0207090	.1807514	.4844317	.0156011

Sample Name: PB166015BS Acquired: 1/23/2025 14:39:03 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS015 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.2152836	.0245774	.1824973
Stddev	.0011946	.0008095	.0006549
%RSD	.5549038	3.293734	.3588667

#1	.2166394	.0245138	.1822278
#2	.2148262	.0254168	.1832440
#3	.2143853	.0238016	.1820202

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3440.191	70901.41	9957.330	2444.725	4254.258
Stddev	6.607	246.58	73.572	10.278	10.792
%RSD	.1920570	.3477829	.7388734	.4204256	.2536720

#1	3445.205	70641.81	9874.850	2433.319	4265.144
#2	3442.663	70929.93	9980.942	2453.269	4254.068
#3	3432.704	71132.50	10016.20	2447.587	4243.563

Sample Name: Q1041-01 Acquired: 1/23/2025 14:43:04 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPF7 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0550547	-.004200	.2826993	.0311052	.0143010	59.17893	1.838108
Stddev	.0018017	.001255	.0010565	.0028684	.0004571	.01345	.003736
%RSD	3.272542	29.88180	.3737019	9.221681	3.196039	.0227301	.2032688

#1	.0536558	-.002943	.2828331	.0298916	.0140325	59.16533	1.833795
#2	.0570877	-.005454	.2836824	.0290431	.0140418	59.17925	1.840377
#3	.0544205	-.004204	.2815823	.0343810	.0148288	59.19222	1.840151

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0042016	.0048077	89.81482	.1093096	.1126033	.1331791	144.0879
Stddev	.0000230	.0001402	.16606	.0000657	.0002095	.0010006	.1770
%RSD	.5473551	2.916843	.1848957	.0601042	.1860453	.7512988	.1228582

#1	.0041752	.0048754	89.68769	.1092728	.1124694	.1341501	143.9340
#2	.0042175	.0049013	90.00271	.1093855	.1124957	.1332359	144.2813
#3	.0042119	.0046465	89.75406	.1092705	.1128447	.1321514	144.0483

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.099776	39.76832	.1000792	.0042144	-.326103	.2142272	.4972100
Stddev	.005727	.09816	.0008862	.0000920	.090199	.0021433	.0035612
%RSD	.1122921	.2468244	.8855361	2.183349	27.65950	1.000486	.7162334

#1	5.093178	39.65610	.1007382	.0042344	-.387685	.2117747	.5005869
#2	5.103455	39.83822	.1004278	.0041141	-.368056	.2157409	.4975535
#3	5.102696	39.81063	.0990717	.0042948	-.222570	.2151659	.4934895

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	7.631788	6.435597	.6042693	.0062168	2.156762	8.661281	.0065214
Stddev	.057139	.020521	.0014893	.0002050	.004966	.006620	.0008641
%RSD	.7487037	.3188744	.2464576	3.296838	.2302439	.0764363	13.24982

#1	7.638619	6.458258	.6032072	.0064526	2.158667	8.659810	.0063150
#2	7.571540	6.430266	.6059716	.0061159	2.151126	8.655520	.0074700
#3	7.685205	6.418267	.6036292	.0060818	2.160494	8.668513	.0057792

Sample Name: Q1041-01 Acquired: 1/23/2025 14:43:04 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPF7 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	1.209638	.0443825	.1596078
Stddev	.000919	.0002916	.0000898
%RSD	.0759408	.6571053	.0562655

#1	1.208691	.0442421	.1595080
#2	1.209700	.0447178	.1596333
#3	1.210525	.0441876	.1596821

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3521.619	72729.45	10827.14	2518.490	3957.091
Stddev	5.284	58.70	12.73	2.318	2.796
%RSD	.1500377	.0807150	.1175428	.0920234	.0706588

#1	3525.937	72748.77	10829.26	2518.301	3959.918
#2	3515.727	72663.52	10838.67	2520.896	3954.327
#3	3523.193	72776.06	10813.49	2516.272	3957.028

Sample Name: Q1041-02 Acquired: 1/23/2025 14:47:02 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPF8 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0478714	-.007655	.3299980	.0185788	.0120289	38.47510
Stddev	.0020431	.000955	.0041124	.0033946	.0007158	.08194
%RSD	4.267958	12.48013	1.246187	18.27168	5.950590	.2129569
#1	.0471761	-.008113	.3345221	.0218184	.0122933	38.55589
#2	.0462667	-.006556	.3289855	.0150478	.0112185	38.47735
#3	.0501714	-.008294	.3264864	.0188701	.0125748	38.39207
Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.004667	.0037614	.0107999	468.5310	.1430904	.0621335
Stddev	.007811	.0000768	.0002094	4.4551	.0007980	.0002835
%RSD	.3896501	2.043073	1.938614	.9508733	.5577116	.4562302
#1	1.997673	.0036740	.0110367	466.3717	.1426211	.0623886
#2	2.003232	.0037918	.0107238	465.5669	.1426382	.0621836
#3	2.013096	.0038184	.0106393	473.6543	.1440118	.0618283
Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3316986	96.14679	8.976019	51.11094	.1107375	.0035038
Stddev	.0013219	.34797	.026194	.09507	.0012923	.0000991
%RSD	.3985274	.3619190	.2918251	.1860039	1.166987	2.827926
#1	.3315246	96.37851	8.948902	51.16546	.1117966	.0035707
#2	.3304723	96.31522	8.977972	51.16621	.1111182	.0033900
#3	.3330989	95.74666	9.001182	51.00117	.1092976	.0035508
Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.037144	.1492158	1.407189	14.67366	F 30.65787	.5240787
Stddev	.454809	.0010165	.010536	.02398	.02920	.0016650
%RSD	1224.442	.6812012	.7487014	.1634082	.0952342	.3177007
#1	-.061003	.1503587	1.411356	14.68694	30.66892	.5251905
#2	-.479554	.1484132	1.415004	14.68807	30.67993	.5248811
#3	.429125	.1488754	1.395207	14.64598	30.62476	.5221644

Sample Name: Q1041-02 Acquired: 1/23/2025 14:47:02 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPF8 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0077300	F 13.35550	8.375033	.0103453	.9244439	.0315285
Stddev	.0007468	.04019	.026279	.0015113	.0002892	.0015205
%RSD	9.660555	.3009364	.3137721	14.60829	.0312844	4.822670

#1	.0070852	13.35031	8.352625	.0089633	.9243992	.0300737
#2	.0075565	13.39803	8.368518	.0119591	.9241797	.0331071
#3	.0085482	13.31816	8.403956	.0101135	.9247529	.0314048

Elem	Sr4077
Units	ppm
Avg	.7994720
Stddev	.0018525
%RSD	.2317125

#1	.7975927
#2	.7995268
#3	.8012965

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3321.472	70445.98	10639.69	2367.651	3622.190
Stddev	7.085	232.13	42.61	13.104	7.745
%RSD	.2133094	.3295079	.4004852	.5534804	.2138328

#1	3315.664	70222.62	10616.90	2352.761	3613.785
#2	3329.365	70685.98	10688.85	2372.763	3629.040
#3	3319.385	70429.34	10613.32	2377.429	3623.744

Sample Name: Q1041-03 Acquired: 1/23/2025 14:51:06 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPF9 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0631499	-.006673	.8174429	.0422818	.0414095	55.60346
Stddev	.0020812	.001749	.0053954	.0018112	.0019772	.47045
%RSD	3.295632	26.20278	.6600312	4.283706	4.774676	.8460856

#1	.0655143	-.007643	.8234836	.0438181	.0402763	55.51169
#2	.0615953	-.007721	.8157428	.0427426	.0402597	56.11303
#3	.0623402	-.004654	.8131023	.0402847	.0436925	55.18565

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	19.27154	.0047263	.0098552	100.2291	.1411923	.1049084
Stddev	.20063	.0000313	.0001700	.8039	.0012471	.0005730
%RSD	1.041089	.6628523	1.724546	.8020300	.8832732	.5461587

#1	19.39097	.0047191	.0099643	100.0576	.1404774	.1048590
#2	19.38375	.0046992	.0096593	101.1049	.1426324	.1055045
#3	19.03991	.0047606	.0099418	99.5249	.1404673	.1043617

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3003529	201.7417	5.764328	38.70866	.1333783	.0046396
Stddev	.0052417	1.7272	.043625	.36221	.0009621	.0003777
%RSD	1.745193	.8561351	.7568152	.9357457	.7213225	8.141120

#1	.3049556	201.4458	5.758835	38.52253	.1341001	.0049314
#2	.2946475	203.5977	5.810439	39.12609	.1337486	.0042130
#3	.3014555	200.1816	5.723709	38.47735	.1322860	.0047746

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3503730	.2658840	1.117946	8.934306	F 10.24930	.8378864
Stddev	.2156869	.0031337	.014319	.169604	.07284	.0100781
%RSD	61.55922	1.178586	1.280793	1.898350	.7106492	1.202806

#1	.5020123	.2676481	1.120007	8.858543	10.32668	.8372521
#2	.1034540	.2622659	1.131122	9.128586	10.23915	.8482668
#3	.4456527	.2677380	1.102708	8.815787	10.18207	.8281404

Sample Name: Q1041-03 Acquired: 1/23/2025 14:51:06 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPF9 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0107576	F 11.69708	7.671128	.0137520	1.148519	.0417966
Stddev	.0002494	.07007	.109552	.0010612	.019013	.0014712
%RSD	2.318561	.5990450	1.428111	7.717069	1.655452	3.520012
#1	.0108185	11.76958	7.724971	.0127021	1.161844	.0405737
#2	.0109710	11.69194	7.545073	.0137296	1.126745	.0434293
#3	.0104834	11.62972	7.743339	.0148243	1.156967	.0413867

Elem	Sr4077
Units	ppm
Avg	.2659727
Stddev	.0021413
%RSD	.8050815
#1	.2661830
#2	.2680011
#3	.2637341

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3703.745	78217.15	11745.40	2668.317	3852.720
Stddev	7.725	775.58	154.94	26.750	10.362
%RSD	.2085682	.9915772	1.319154	1.002497	.2689564
#1	3706.018	78740.20	11721.41	2676.210	3843.480
#2	3695.138	77326.07	11910.93	2638.509	3850.757
#3	3710.078	78585.18	11603.85	2690.233	3863.923

Sample Name: Q1041-04 Acquired: 1/23/2025 14:55:11 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG0 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0113041	-.000090	.0216292	.0133323	.0062716	10.85647	.1765500
Stddev	.0020789	.000215	.0008952	.0017965	.0005906	.05499	.0012524
%RSD	18.39034	238.4079	4.139005	13.47476	9.416400	.5064777	.7093595
#1	.0100699	-.000087	.0217651	.0113092	.0066748	10.91099	.1776676
#2	.0137043	.000124	.0206737	.0139467	.0055937	10.80103	.1767860
#3	.0101382	-.000307	.0224487	.0147409	.0065463	10.85739	.1751964
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0006210	.0011898	5.650783	.0388558	.0296146	.0127702	51.21041
Stddev	.0000791	.0001113	.027089	.0006273	.0001066	.0020038	.10889
%RSD	12.73122	9.351604	.4793760	1.614424	.3600163	15.69105	.2126336
#1	.0005390	.0012972	5.681056	.0382371	.0297080	.0133738	51.30736
#2	.0006272	.0011972	5.642463	.0394913	.0294984	.0144027	51.09260
#3	.0006967	.0010751	5.628831	.0388389	.0296374	.0105340	51.23128
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.096758	4.997155	.0696874	.0011134	.1140398	.0778758	.0830305
Stddev	.005459	.026681	.0006782	.0000852	.3511092	.0018222	.0029409
%RSD	.4977338	.5339149	.9731667	7.656437	307.8832	2.339923	3.542003
#1	1.102883	5.021234	.0702952	.0010203	.2068048	.0758030	.0802492
#2	1.094989	4.968472	.0698111	.0011876	.4094520	.0785990	.0861086
#3	1.092403	5.001761	.0689558	.0011324	-.274138	.0792254	.0827337
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.071937	.9685942	.2073834	.0008725	.1764379	1.917551	.0034527
Stddev	.046252	.0093790	.0005389	.0002471	.0016552	.011039	.0006620
%RSD	64.29538	.9683050	.2598579	28.31699	.9381045	.5757032	19.17444
#1	-.111386	.9793210	.2078913	.0006998	.1782868	1.906211	.0039327
#2	-.083390	.9645217	.2074409	.0011555	.1750941	1.928263	.0026974
#3	-.021034	.9619398	.2068181	.0007623	.1759329	1.918180	.0037279

Sample Name: Q1041-04 Acquired: 1/23/2025 14:55:11 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG0 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	1.042147	.0058917	.0187991
Stddev	.003316	.0020038	.0000896
%RSD	.3181608	34.01116	.4765256

#1	1.038383	.0069478	.0188618
#2	1.044635	.0071466	.0188390
#3	1.043424	.0035807	.0186965

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3586.810	72978.74	10371.39	2506.407	4376.825
Stddev	19.552	204.96	61.45	6.996	21.842
%RSD	.5451146	.2808466	.5925333	.2791357	.4990467

#1	3564.251	73139.68	10442.32	2511.457	4352.610
#2	3597.321	73048.56	10334.06	2509.344	4382.824
#3	3598.859	72748.00	10337.80	2498.421	4395.041

Sample Name: CCV002 Acquired: 1/23/2025 14:59:13 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV002 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.917210	4.883095	24.41683	4.925874	4.993375	404.9441
Stddev	.040311	.127852	.21411	.047874	.040996	2.4561
%RSD	.8197869	2.618259	.8769133	.9718922	.8210030	.6065172

#1	4.963749	5.030105	24.65730	4.980348	5.040625	402.3901
#2	4.893223	4.797876	24.24683	4.906781	4.972249	405.1535
#3	4.894658	4.821303	24.34638	4.890492	4.967252	407.2888

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.11869	.4867052	2.465952	402.6176	15.51464	2.472248
Stddev	.16201	.0033710	.025336	3.0946	.04169	.020316
%RSD	1.601049	.6926073	1.027443	.7686145	.2686971	.8217593

#1	9.95601	.4875697	2.494796	400.2465	15.47163	2.495589
#2	10.12007	.4829861	2.447295	406.1183	15.55487	2.458538
#3	10.28001	.4895596	2.455763	401.4881	15.51742	2.462618

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	14.64081	408.7349	15.11466	402.5095	2.467513	1.286772
Stddev	.03718	2.2110	.07459	2.1466	.021853	.000501
%RSD	.2539737	.5409331	.4934849	.5333059	.8856446	.0389256

#1	14.68302	407.6028	15.09731	400.8550	2.492110	1.287197
#2	14.61287	411.2827	15.19640	404.9351	2.450333	1.286220
#3	14.62656	407.3193	15.05028	401.7383	2.460097	1.286900

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	389.6309	2.444126	15.57422	157.5563	4.976466	F 5.826106
Stddev	1.6066	.006318	.04528	.8842	.039342	.013172
%RSD	.4123414	.2584866	.2907306	.5612047	.7905684	.2260775

#1	391.3184	2.446032	15.52206	157.2571	5.021853	5.827013
#2	388.1197	2.437075	15.60331	158.5513	4.955465	5.812504
#3	389.4548	2.449272	15.59730	156.8605	4.952080	5.838801

Sample Name: CCV002 Acquired: 1/23/2025 14:59:13 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV002 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.912942	4.990380	4.898158	4.960546	4.886607	5.205893
Stddev	.043048	.053529	.017088	.050108	.009239	.041156
%RSD	.8762260	1.072642	.3488611	1.010135	.1890746	.7905688

#1	4.962605	5.050841	4.905447	5.017324	4.895380	5.207598
#2	4.889951	4.949027	4.878634	4.922512	4.876963	5.246170
#3	4.886271	4.971271	4.910392	4.941803	4.887478	5.163911

Elem	Sr4077
Units	ppm
Avg	5.133935
Stddev	.023284
%RSD	.4535228

#1	5.107072
#2	5.148322
#3	5.146411

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2759.850	59946.05	9339.502	2043.408	3206.778
Stddev	17.642	143.47	59.420	8.846	24.790
%RSD	.6392317	.2393387	.6362206	.4329278	.7730459

#1	2739.559	60101.47	9338.769	2051.794	3179.148
#2	2771.552	59818.66	9399.285	2044.265	3227.072
#3	2768.440	59918.01	9280.453	2034.163	3214.114

Sample Name: CCB002 Acquired: 1/23/2025 15:03:32 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB002 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000410	.0004482	-.000657	.0003513	.0004431	.0065234	-.000222
Stddev	.000472	.0013636	.001256	.0011592	.0008543	.0020618	.000939
%RSD	115.2707	304.2808	190.9831	329.9712	192.7846	31.60557	421.9089
#1	-.000788	-.001090	-.002100	.0016859	-.000392	.0059051	.000462
#2	.000120	.000925	-.000058	-.000406	.001316	.0048415	.000164
#3	-.000561	.001510	.000186	-.000226	.000405	.0088235	-.001293
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000094	-.000012	.0089253	.0008321	.0001793	.0023334	.0120052
Stddev	.0000511	.000100	.0100207	.0002906	.0000421	.0022215	.0018571
%RSD	545.2002	811.3635	112.2736	34.92708	23.46903	95.20368	15.46892
#1	-.000023	.000049	.0177318	.0010705	.0002240	.0008284	.0130690
#2	.000068	-.000127	-.001978	.0009175	.0001404	.0012869	.0130858
#3	-.000017	.000042	.011022	.0005083	.0001735	.0048848	.0098609
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0009380	.0295530	.0001535	-.000596	.0737748	.0007069	.0013347
Stddev	.0002441	.0060693	.0002012	.000100	.4322862	.0009768	.0006670
%RSD	26.02475	20.53713	131.0650	16.71292	585.9538	138.1728	49.97258
#1	.0008468	.0262319	.0000401	-.000599	-.425148	.0017482	.0017097
#2	.0012146	.0258690	.0000346	-.000693	.336599	-.000189	.0005646
#3	.0007526	.0365581	.0003858	-.000494	.309873	.000562	.0017297
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1035004	.0005484	.0050323	.0000130	.0011975	.0029914	-.000002
Stddev	.0147446	.0016906	.0003971	.0003509	.0051496	.0022305	.000432
%RSD	14.24597	308.2929	7.890307	2706.100	430.0398	74.56209	17361.26
#1	.1201180	.0000367	.0054748	.0004179	-.002977	.0006525	-.000284
#2	.0919831	.0024357	.0047071	-.000202	-.000382	.0050948	.000495
#3	.0984000	-.000827	.0049151	-.000177	.006952	.0032270	-.000219

Sample Name: CCB002 Acquired: 1/23/2025 15:03:32 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB002 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	-.000272	-.001647	.0001756
Stddev	.000330	.001304	.0000129
%RSD	121.3569	79.13484	7.332142

#1	.000059	-.003086	.0001900
#2	-.000600	-.001312	.0001714
#3	-.000274	-.000544	.0001653

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3428.965	71009.78	9960.256	2417.021	4334.125
Stddev	2.647	284.24	42.777	8.175	1.403
%RSD	.0771846	.4002871	.4294768	.3382235	.0323605

#1	3426.812	70993.80	10008.23	2412.275	4333.051
#2	3431.920	71301.67	9926.09	2426.460	4335.712
#3	3428.162	70733.86	9946.44	2412.326	4333.612

Sample Name: Q1041-05 Acquired: 1/23/2025 15:07:41 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG0D Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0118228	-.001157	.0214319	.0109318	.0053832	11.28514	.1780185
Stddev	.0019592	.000880	.0009638	.0016955	.0005304	.15125	.0028563
%RSD	16.57175	76.07461	4.497084	15.50983	9.853050	1.340215	1.604511
#1	.0138484	-.002091	.0210856	.0116387	.0059439	11.12542	.1751087
#2	.0099374	-.000343	.0225210	.0121595	.0048894	11.30383	.1781287
#3	.0116826	-.001037	.0206891	.0089972	.0053164	11.42617	.1808181
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0005870	.0012195	5.679888	.0386562	.0294566	.0191234	50.82062
Stddev	.0000490	.0000661	.069851	.0002925	.0002634	.0006536	.64256
%RSD	8.347141	5.418142	1.229792	.7568076	.8943722	3.417960	1.264364
#1	.0006040	.0012225	5.600862	.0383412	.0297608	.0188149	50.12440
#2	.0005318	.0011520	5.705425	.0389195	.0293074	.0198742	50.94660
#3	.0006252	.0012840	5.733377	.0387079	.0293016	.0186811	51.39086
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.075420	5.101587	.0698054	.0011519	.1316619	.0761662	.0852894
Stddev	.009647	.062417	.0002947	.0001699	.0952775	.0016443	.0014523
%RSD	.8970842	1.223475	.4222067	14.74936	72.36530	2.158831	1.702843
#1	1.064306	5.034344	.0695704	.0011734	.2319994	.0780062	.0847111
#2	1.080317	5.112745	.0701361	.0013099	.1205714	.0756517	.0842152
#3	1.081637	5.157673	.0697097	.0009722	.0424150	.0748406	.0869418
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1263740	.9715464	.2098518	.0006584	.1747519	3.411359	.0038588
Stddev	.0313447	.0016945	.0037969	.0004130	.0043019	.021469	.0001364
%RSD	24.80307	.1744145	1.809323	62.72293	2.461720	.6293320	3.535260
#1	.0922137	.9723138	.2054715	.0002684	.1772165	3.388759	.0038376
#2	.1330962	.9727214	.2118791	.0006158	.1772548	3.431482	.0040046
#3	.1538123	.9696039	.2122047	.0010911	.1697846	3.413834	.0037343

Sample Name: Q1041-05 Acquired: 1/23/2025 15:07:41 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG0D Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	1.075466	.0067348	.0198086
Stddev	.001917	.0006015	.0001133
%RSD	.1782292	8.931342	.5720430

#1	1.074780	.0062145	.0196787
#2	1.077631	.0073934	.0198597
#3	1.073986	.0065965	.0198874

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3492.800	73399.57	10422.64	2460.878	4241.905
Stddev	2.598	524.50	71.67	14.245	4.338
%RSD	.0743710	.7145849	.6875986	.5788624	.1022768

#1	3495.213	74003.69	10375.00	2477.019	4245.253
#2	3493.137	73134.71	10387.86	2450.064	4243.458
#3	3490.050	73060.32	10505.06	2455.551	4237.004

Sample Name: Q1041-04LX5 Acquired: 1/23/2025 15:11:45 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG0L Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0003206	.0014058	.0041544	.0036671	.0012963	2.250145	.0342604
Stddev	.0015123	.0000400	.0009348	.0034315	.0006936	.003414	.0012231
%RSD	471.6763	2.843462	22.50183	93.57522	53.50964	.1517037	3.570007

#1	.0002961	.0013601	.0052182	.0020572	.0007078	2.247111	.0341760
#2	.0018450	.0014228	.0037815	.0013366	.0020610	2.253841	.0330817
#3	-.001179	.0014344	.0034636	.0076076	.0011201	2.249482	.0355235

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000657	.0002727	1.159105	.0081131	.0060593	.0063340	10.73933
Stddev	.0000485	.0000502	.001030	.0001423	.0001508	.0003209	.02180
%RSD	73.83681	18.40210	.0888543	1.753556	2.488280	5.066236	.2029972

#1	.0000176	.0002158	1.159346	.0080580	.0059948	.0064217	10.73580
#2	.0001146	.0002914	1.157975	.0080066	.0062316	.0066020	10.71951
#3	.0000649	.0003108	1.159992	.0082747	.0059515	.0059784	10.76268

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2263643	1.058836	.0140686	.0002411	-.182415	.0183690	.0185245
Stddev	.0015411	.019064	.0003411	.0002622	.059870	.0015163	.0016055
%RSD	.6807982	1.800503	2.424342	108.7383	32.82077	8.254647	8.666855

#1	.2248301	1.080577	.0144271	.0003958	-.121363	.0178873	.0175169
#2	.2263506	1.044978	.0137482	.0003892	-.241028	.0200676	.0176806
#3	.2279122	1.050952	.0140306	-.000062	-.184854	.0171521	.0203759

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.084810	.2014972	.0442635	-.000150	.0360486	.4068846	.0000091
Stddev	.048527	.0010259	.0002506	.000216	.0048527	.0025723	.0002056
%RSD	57.21885	.5091420	.5662381	143.7134	13.46150	.6322030	2269.433

#1	-.038468	.2007021	.0442791	.000076	.0304454	.4053103	-.000160
#2	-.135262	.2026553	.0445061	-.000172	.0388134	.4098530	-.000050
#3	-.080701	.2011344	.0440055	-.000354	.0388870	.4054905	.000238

Sample Name: Q1041-04LX5 Acquired: 1/23/2025 15:11:45 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG0L Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.2149489	-.002358	.0038919
Stddev	.0010704	.001084	.0000459
%RSD	.4979630	45.95051	1.180592

#1	.2153369	-.002305	.0038512
#2	.2137386	-.003467	.0039417
#3	.2157711	-.001302	.0038828

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3501.581	71143.87	10011.06	2414.680	4375.839
Stddev	6.639	22.28	7.85	3.401	5.357
%RSD	.1896015	.0313194	.0784203	.1408597	.1224173

#1	3497.357	71123.78	10013.08	2418.034	4373.954
#2	3509.234	71139.99	10002.40	2411.233	4381.883
#3	3498.154	71167.84	10017.70	2414.772	4371.679

Sample Name: Q1041-06 Acquired: 1/23/2025 15:15:50 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG0S Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0876566	.1088461	.0638317	.1892973	.1886037	14.20111	3.857711
Stddev	.0026913	.0016906	.0016978	.0028342	.0021490	.08348	.011209
%RSD	3.070274	1.553201	2.659752	1.497216	1.139433	.5878549	.2905635

#1	.0872889	.1075782	.0648006	.1912246	.1892775	14.17109	3.865562
#2	.0851680	.1081947	.0648232	.1860431	.1861985	14.13679	3.844874
#3	.0905128	.1107655	.0618713	.1906243	.1903351	14.29545	3.862696

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0990145	.1021720	5.530625	.4966029	1.039419	.4987831	52.45096
Stddev	.0001076	.0000934	.010132	.0010683	.001065	.0046760	.19605
%RSD	.1086723	.0914059	.1831935	.2151238	.1024385	.9374856	.3737759

#1	.0989261	.1020998	5.525128	.4957954	1.038988	.5035466	52.32583
#2	.0991343	.1022774	5.524429	.4961989	1.038637	.4941998	52.35015
#3	.0989830	.1021386	5.542317	.4978142	1.040632	.4986030	52.67690

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.997861	4.904674	1.090141	.0758705	-.291319	1.089045	1.032752
Stddev	.004591	.012716	.001115	.0001866	.400849	.001201	.002289
%RSD	.2297858	.2592606	.1023082	.2459376	137.5982	.1102583	.2216020

#1	1.999030	4.894424	1.089197	.0758035	-.431407	1.089882	1.032737
#2	1.992798	4.918904	1.089854	.0760813	-.603324	1.089584	1.030471
#3	2.001753	4.900693	1.091371	.0757266	.160775	1.087669	1.035048

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.081373	.9816315	.2166638	.0000410	.1755358	1.918449	.0040372
Stddev	.023842	.0041347	.0011233	.0001748	.0025099	.007568	.0003380
%RSD	29.29960	.4212030	.5184433	426.8041	1.429828	.3944929	8.372314

#1	-.058809	.9846369	.2162321	.0001297	.1729620	1.927187	.0041345
#2	-.078995	.9769162	.2158204	-.000160	.1756688	1.914158	.0036612
#3	-.106315	.9833415	.2179389	.000154	.1779765	1.914001	.0043158

Sample Name: Q1041-06 Acquired: 1/23/2025 15:15:50 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG0S Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	1.024793	.0063793	.0182437
Stddev	.001583	.0013442	.0000617
%RSD	.1544297	21.07165	.3380019

#1	1.026516	.0051402	.0182793
#2	1.023405	.0061892	.0181725
#3	1.024458	.0078084	.0182793

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3521.489	72781.04	10275.80	2457.316	4273.495
Stddev	6.975	66.38	21.73	3.604	2.365
%RSD	.1980660	.0912007	.2114809	.1466839	.0553504

#1	3518.756	72784.15	10270.48	2453.552	4276.184
#2	3529.416	72845.81	10257.22	2460.736	4271.734
#3	3516.294	72713.16	10299.70	2457.660	4272.568

Sample Name: Q1041-07 Acquired: 1/23/2025 15:19:46 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG1 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1655365	-.005564	.7904170	.0566816	.0292327	63.60740	2.603107
Stddev	.0003699	.002667	.0010234	.0031850	.0010382	.18416	.004775
%RSD	.2234386	47.92795	.1294703	5.619145	3.551367	.2895323	.1834350

#1	.1652334	-.002920	.7913259	.0578013	.0289437	63.67692	2.608431
#2	.1654275	-.005518	.7893086	.0591556	.0303847	63.39859	2.601685
#3	.1659486	-.008253	.7906164	.0530880	.0283697	63.74668	2.599204

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0070070	.0113197	34.94998	.2451716	.1725413	.1891602	247.8600
Stddev	.0000879	.0000165	.05499	.0005433	.0002204	.0022554	.8625
%RSD	1.253920	.1461271	.1573438	.2215796	.1277145	1.192345	.3479864

#1	.0069218	.0113383	34.95823	.2457988	.1722921	.1904008	247.6392
#2	.0070973	.0113067	34.89133	.2448491	.1727104	.1865568	247.1294
#3	.0070019	.0113139	35.00038	.2448669	.1726216	.1905230	248.8115

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	15.97743	14.19314	.1039185	.0083892	.5657088	.4017273	2.127888
Stddev	.03103	.06186	.0002752	.0005410	.1324701	.0029051	.004219
%RSD	.1941999	.4358345	.2648039	6.448221	23.41665	.7231572	.1982591

#1	16.00217	14.18686	.1041486	.0078356	.5531912	.4050794	2.132760
#2	15.94262	14.13466	.1039932	.0084154	.4399418	.3999397	2.125460
#3	15.98750	14.25790	.1036137	.0089166	.7039933	.4001627	2.125446

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.345741	8.885870	1.018249	.0109156	3.859494	8.360005	.0183725
Stddev	.018673	.024586	.005580	.0002814	.013549	.007598	.0008627
%RSD	.3493022	.2766906	.5480049	2.578303	.3510553	.0908876	4.695616

#1	5.338144	8.874748	1.018869	.0106298	3.863645	8.366603	.0183400
#2	5.332065	8.868809	1.012385	.0111925	3.844355	8.361713	.0175265
#3	5.367015	8.914052	1.023493	.0109245	3.870481	8.351698	.0192510

Sample Name: Q1041-07 Acquired: 1/23/2025 15:19:46 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG1 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	1.057621	.0268011	.0978152
Stddev	.003623	.0005560	.0001939
%RSD	.3425260	2.074413	.1982733

#1	1.060969	.0262289	.0980379
#2	1.058120	.0273393	.0977247
#3	1.053775	.0268352	.0976831

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3550.898	75215.29	10959.15	2522.804	3973.048
Stddev	4.173	118.43	26.57	6.380	6.327
%RSD	.1175101	.1574541	.2424313	.2528770	.1592505

#1	3555.411	75202.57	10965.13	2524.272	3980.353
#2	3550.103	75339.56	10930.10	2528.321	3969.488
#3	3547.180	75103.73	10982.22	2515.818	3969.303

Sample Name: Q1041-08 Acquired: 1/23/2025 15:23:41 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG2 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1292200	-.009093	.5809592	.0395058	.0248583	57.36507	6.437653
Stddev	.0027801	.001964	.0020259	.0035668	.0011583	.24969	.051876
%RSD	2.151428	21.59375	.3487245	9.028559	4.659646	.4352621	.8058202
#1	.1260978	-.011322	.5786256	.0436170	.0259671	57.07688	6.497523
#2	.1301346	-.007618	.5822680	.0372362	.0249516	57.51648	6.406050
#3	.1314275	-.008340	.5819840	.0376643	.0236561	57.50184	6.409385
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0071450	.0070605	220.1810	.1877304	.1804775	.3750863	192.4217
Stddev	.0001812	.0000110	.9698	.0010992	.0005949	.0003981	.7501
%RSD	2.536098	.1554706	.4404352	.5855113	.3296186	.1061421	.3898037
#1	.0073457	.0070720	219.2738	.1873763	.1801746	.3754591	191.5995
#2	.0069935	.0070594	221.2031	.1889631	.1800950	.3746669	193.0687
#3	.0070959	.0070501	220.0663	.1868520	.1811628	.3751328	192.5969
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	14.21933	76.57405	.1193112	.0055575	.2472298	.2855097	1.246445
Stddev	.07819	.18805	.0006102	.0001746	.2611698	.0012778	.011956
%RSD	.5498977	.2455836	.5114193	3.142209	105.6385	.4475562	.9591736
#1	14.15276	76.37514	.1198968	.0054344	.3225198	.2868434	1.233653
#2	14.30544	76.74894	.1193577	.0057574	-.043315	.2842963	1.257337
#3	14.19979	76.59807	.1186791	.0054808	.462484	.2853895	1.248344
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	7.726396	7.852858	.8231161	.0087822	7.887768	8.192415	.0093236
Stddev	.029480	.003360	.0041919	.0001917	.019053	.044729	.0005881
%RSD	.3815525	.0427814	.5092691	2.182335	.2415528	.5459801	6.307504
#1	7.710590	7.848990	.8184071	.0089033	7.905317	8.208478	.0093488
#2	7.760409	7.855047	.8264408	.0085612	7.890483	8.226895	.0087234
#3	7.708190	7.854537	.8245003	.0088821	7.867502	8.141873	.0098987

Sample Name: Q1041-08 Acquired: 1/23/2025 15:23:41 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG2 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.9482095	.0334407	.2326359
Stddev	.0042504	.0005903	.0013626
%RSD	.4482547	1.765344	.5857199

#1	.9510778	.0337017	.2311180
#2	.9502243	.0338555	.2337535
#3	.9433263	.0327648	.2330361

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3424.398	71772.54	10835.17	2434.039	3722.470
Stddev	4.071	184.49	70.81	5.879	6.571
%RSD	.1188943	.2570434	.6535603	.2415200	.1765135

#1	3425.334	71879.20	10764.30	2439.080	3726.678
#2	3427.920	71559.51	10835.29	2427.582	3725.834
#3	3419.940	71878.91	10905.92	2435.457	3714.899

Sample Name: Q1041-09 Acquired: 1/23/2025 15:27:45 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG3 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0931536	-.004818	.4748293	.0362724	.0177612	47.27765
Stddev	.0028458	.000879	.0033207	.0009204	.0024754	.23185
%RSD	3.055000	18.24598	.6993573	2.537342	13.93702	.4903979

#1	.0960631	-.003955	.4728090	.0373095	.0165156	47.39840
#2	.0930217	-.005712	.4786619	.0355529	.0206120	47.01034
#3	.0903760	-.004786	.4730170	.0359547	.0161561	47.42419

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	3.154099	.0066635	.0052293	54.89145	.1860484	.1424539
Stddev	.006662	.0000567	.0000036	.10919	.0003518	.0003911
%RSD	.2112303	.8506047	.0688673	.1989283	.1891089	.2745317

#1	3.161515	.0066767	.0052257	54.97436	.1863816	.1429024
#2	3.148619	.0067125	.0052292	54.76772	.1860829	.1421842
#3	3.152163	.0066014	.0052329	54.93225	.1856805	.1422751

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1505666	155.3928	16.15531	13.90121	.0826310	.0061106
Stddev	.0021075	.5525	.00190	.04830	.0002766	.0004709
%RSD	1.399723	.3555315	.0117880	.3474581	.3347686	7.707010

#1	.1487865	155.5708	16.15751	13.93372	.0829498	.0058609
#2	.1500196	154.7732	16.15428	13.84571	.0824543	.0066538
#3	.1528936	155.8343	16.15414	13.92420	.0824890	.0058171

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1215729	.2479257	1.149960	7.284977	F 12.72928	.6545165
Stddev	.1462564	.0005554	.003128	.035745	.02345	.0029352
%RSD	120.3034	.2240026	.2719770	.4906629	.1842465	.4484549

#1	-.022379	.2472845	1.151499	7.324867	12.72686	.6561780
#2	.270030	.2482428	1.146362	7.274211	12.70713	.6511274
#3	.117068	.2482500	1.152020	7.255853	12.75385	.6562440

Sample Name: Q1041-09 Acquired: 1/23/2025 15:27:45 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG3 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0080960	6.913244	6.723973	.0066804	.9178696	.0221864
Stddev	.0004232	.024699	.026525	.0013512	.0015766	.0010612
%RSD	5.227084	.3572716	.3944773	20.22555	.1717661	4.783267

#1	.0078584	6.909827	6.724188	.0053081	.9160877	.0210258
#2	.0078449	6.890431	6.750390	.0080094	.9190834	.0231072
#3	.0085845	6.939473	6.697342	.0067239	.9184377	.0224263

Elem	Sr4077
Units	ppm
Avg	.1216841
Stddev	.0004743
%RSD	.3898023

#1	.1217523
#2	.1211794
#3	.1221207

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3542.048	74029.24	10935.12	2509.151	4001.053
Stddev	4.477	137.65	27.81	7.226	5.532
%RSD	.1263894	.1859361	.2542951	.2879900	.1382560

#1	3537.968	74023.21	10955.06	2516.386	3997.089
#2	3546.837	74169.80	10903.36	2509.132	4007.372
#3	3541.338	73894.70	10946.94	2501.934	3998.697

Sample Name: Q1041-10 Acquired: 1/23/2025 15:31:41 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG4 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0831386	-.005706	.4995695	.0295005	.0151970	41.05372	6.396130
Stddev	.0032692	.000855	.0012530	.0050621	.0007501	.22332	.055647
%RSD	3.932177	14.99001	.2508151	17.15927	4.935521	.5439747	.8700048
#1	.0834729	-.006680	.5008046	.0293477	.0156721	41.01759	6.354337
#2	.0797151	-.005360	.4982994	.0245166	.0155866	40.85066	6.459294
#3	.0862278	-.005078	.4996046	.0346373	.0143323	41.29290	6.374758
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0057598	.0053109	50.41654	.1417069	.1010823	.1050403	127.2865
Stddev	.0000669	.0000570	.18672	.0004134	.0003341	.0031712	.4698
%RSD	1.161481	1.074202	.3703506	.2917648	.3305588	3.019009	.3691195
#1	.0058068	.0053124	50.37855	.1416616	.1014668	.1077917	126.9827
#2	.0057894	.0053672	50.25173	.1421412	.1009177	.1015721	127.0492
#3	.0056832	.0052531	50.61933	.1413180	.1008625	.1057572	127.8277
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.27601	15.36587	.0707799	.0026662	.1849980	.2053973	.9088899
Stddev	.06541	.06634	.0004506	.0001010	.2845227	.0029712	.0037746
%RSD	.6364945	.4317311	.6365759	3.786783	153.7977	1.446576	.4152972
#1	10.27973	15.28944	.0702952	.0026445	.5117364	.2021553	.9084165
#2	10.20882	15.39964	.0711859	.0027762	.0513716	.2060462	.9053744
#3	10.33947	15.40853	.0708586	.0025778	-.008114	.2079905	.9128789
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	3.841997	6.062165	.5269623	.0065307	4.998732	6.334966	.0076106
Stddev	.024113	.013641	.0025944	.0002824	.002539	.011852	.0004020
%RSD	.6276039	.2250219	.4923214	4.323897	.0507864	.1870895	5.281566
#1	3.869683	6.073975	.5255772	.0067376	5.001654	6.344607	.0072550
#2	3.825601	6.065285	.5253545	.0062090	4.997068	6.338557	.0075300
#3	3.830705	6.047234	.5299552	.0066456	4.997475	6.321733	.0080467

Sample Name: Q1041-10 Acquired: 1/23/2025 15:31:41 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG4 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.9089066	.0173966	.1464860
Stddev	.0027609	.0000947	.0011853
%RSD	.3037622	.5442988	.8091185

#1	.9089476	.0174128	.1466709
#2	.9061254	.0172949	.1452191
#3	.9116468	.0174822	.1475679

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3523.048	74491.34	10424.49	2531.111	4000.927
Stddev	6.789	137.47	50.36	.432	5.387
%RSD	.1927139	.1845385	.4830971	.0170750	.1346526

#1	3530.180	74389.98	10391.05	2531.486	4000.130
#2	3516.662	74647.81	10400.01	2531.208	3995.983
#3	3522.302	74436.21	10482.41	2530.638	4006.669

Sample Name: Q1041-11 Acquired: 1/23/2025 15:35:46 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG5 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1829563	-.007736	.5594750	.0560251	.0285731	68.46550	1.817045
Stddev	.0029348	.002420	.0004589	.0026086	.0016501	.21228	.005773
%RSD	1.604120	31.28290	.0820251	4.656056	5.774920	.3100599	.3177403
#1	.1817246	-.009955	.5592430	.0579986	.0266860	68.22111	1.811634
#2	.1808380	-.005156	.5591784	.0570091	.0292885	68.60411	1.823123
#3	.1863063	-.008097	.5600036	.0530677	.0297447	68.57129	1.816378
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0109199	.0092056	59.02964	.2059379	.1962379	.2167061	261.3199
Stddev	.0000493	.0000489	.11924	.0000699	.0003135	.0004228	.4278
%RSD	.4517306	.5317346	.2020049	.0339443	.1597685	.1951141	.1636974
#1	.0109748	.0091548	58.90070	.2059733	.1961627	.2170652	260.8287
#2	.0109057	.0092094	59.13594	.2059831	.1959688	.2162401	261.6105
#3	.0108793	.0092525	59.05229	.2058574	.1965822	.2168129	261.5206
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	11.80434	31.98451	.1952249	.0078277	.0906823	.3535290	.5637724
Stddev	.02413	.02013	.0000447	.0003022	.3457509	.0028719	.0031514
%RSD	.2044305	.0629410	.0228878	3.861116	381.2771	.8123497	.5589892
#1	11.78137	31.96645	.1951901	.0074834	-.279551	.3503932	.5601952
#2	11.82949	32.00622	.1952094	.0080493	.405179	.3541626	.5661390
#3	11.80218	31.98087	.1952753	.0079504	.146419	.3560312	.5649831
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	3.773797	3.176088	1.075265	.0073484	2.159409	9.385111	.0105515
Stddev	.044270	.009430	.002222	.0005611	.001726	.018303	.0003966
%RSD	1.173088	.2969019	.2066257	7.635496	.0799212	.1950248	3.758703
#1	3.772918	3.175941	1.072699	.0077370	2.161347	9.364125	.0107316
#2	3.729974	3.166732	1.076525	.0067052	2.158037	9.393432	.0100968
#3	3.818500	3.185590	1.076569	.0076032	2.158844	9.397775	.0108261

Sample Name: Q1041-11 Acquired: 1/23/2025 15:35:46 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG5 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.9308188	.0204553	.0973701
Stddev	.0019874	.0007363	.0003445
%RSD	.2135133	3.599499	.3538082

#1	.9285935	.0199937	.0969863
#2	.9314457	.0213044	.0976527
#3	.9324171	.0200677	.0974713

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	4012.682	84014.29	12553.86	2873.774	3863.738
Stddev	2.261	139.36	14.72	12.707	2.537
%RSD	.0563455	.1658722	.1172633	.4421816	.0656534

#1	4010.478	84145.40	12548.90	2888.236	3861.802
#2	4012.571	84029.54	12570.42	2868.689	3862.802
#3	4014.996	83867.94	12542.26	2864.397	3866.610

Sample Name: Q1041-12 Acquired: 1/23/2025 15:39:41 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG6 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1184577	-.005822	.5067109	.0412977	.0203197	46.87148	1.546489
Stddev	.0027750	.001281	.0001496	.0017263	.0002038	.19380	.008161
%RSD	2.342600	22.00048	.0295147	4.180057	1.003001	.4134631	.5276798

#1	.1162498	-.005463	.5067220	.0432165	.0202368	46.65246	1.538624
#2	.1215727	-.007245	.5065562	.0398708	.0201704	46.94124	1.545926
#3	.1175504	-.004760	.5068547	.0408059	.0205519	47.02074	1.554916

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0072146	.0064125	22.92140	.1922911	.1301233	.0813872	180.1356
Stddev	.0000195	.0001013	.03001	.0001586	.0006131	.0015772	.6650
%RSD	.2698601	1.579562	.1309442	.0824533	.4711823	1.937881	.3691686

#1	.0072078	.0064304	22.89183	.1924740	.1294586	.0818699	179.4386
#2	.0071994	.0065036	22.92054	.1921922	.1306668	.0796251	180.2051
#3	.0072365	.0063034	22.95184	.1922071	.1302445	.0826666	180.7632

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	14.44141	7.286407	.0791845	.0055937	.0831193	.2890687	.8577245
Stddev	.06439	.031297	.0004614	.0002319	.2204819	.0019253	.0041744
%RSD	.4458778	.4295228	.5826281	4.145899	265.2597	.6660535	.4866800

#1	14.39388	7.257224	.0793871	.0055216	-.127765	.2912201	.8584993
#2	14.41566	7.282540	.0795099	.0054065	.065037	.2875077	.8532170
#3	14.51469	7.319458	.0786565	.0058532	.312086	.2884783	.8614572

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.902380	3.824332	.7381251	.0080396	3.316126	6.787705	.0076222
Stddev	.018992	.016699	.0030701	.0000686	.014306	.037026	.0000651
%RSD	.6543549	.4366595	.4159377	.8528422	.4314094	.5454879	.8537462

#1	2.912863	3.816218	.7353096	.0079604	3.303814	6.827761	.0076468
#2	2.913820	3.843538	.7376673	.0080808	3.331820	6.754733	.0075485
#3	2.880457	3.813241	.7413984	.0080775	3.312746	6.780621	.0076714

Sample Name: Q1041-12 Acquired: 1/23/2025 15:39:41 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG6 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	1.012903	.0200308	.0799871
Stddev	.001651	.0010448	.0005255
%RSD	.1630158	5.216195	.6570351

#1	1.012282	.0191692	.0793995
#2	1.011652	.0197301	.0801492
#3	1.014774	.0211930	.0804124

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3728.008	78047.96	11162.15	2610.543	4149.327
Stddev	14.524	133.31	58.57	10.930	13.997
%RSD	.3895894	.1708033	.5246827	.4186917	.3373400

#1	3716.514	78106.92	11094.53	2611.483	4151.849
#2	3723.178	78141.63	11196.73	2620.973	4134.240
#3	3744.331	77895.34	11195.19	2599.174	4161.891

Sample Name: Q1041-13 Acquired: 1/23/2025 15:43:38 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG7 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1479802	-.010208	4.991527	.0279740	.0472582	23.15570
Stddev	.0025262	.000261	.008068	.0038240	.0012771	.11969
%RSD	1.707107	2.555273	.1616379	13.67002	2.702373	.5168732

#1	.1485946	-.009935	5.000732	.0260175	.0459382	23.05218
#2	.1452034	-.010236	4.985684	.0323804	.0473489	23.28675
#3	.1501424	-.010454	4.988163	.0255241	.0484875	23.12816

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.53135	.0022624	.1174599	F 1608.859	.1265004	.0836233
Stddev	.07761	.0001527	.0004785	16.373	.0002171	.0007022
%RSD	.7369450	6.748336	.4073704	1.017685	.1716179	.8397423

#1	10.45394	.0021205	.1177631	1605.175	.1262855	.0828446
#2	10.53095	.0022427	.1169082	1626.760	.1264963	.0838166
#3	10.60916	.0024240	.1177082	1594.642	.1267196	.0842085

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5181916	233.3588	6.563555	F 894.0007	.1478203	.0087178
Stddev	.0025550	1.2909	.031361	5.5561	.0004244	.0003281
%RSD	.4930694	.5531935	.4778058	.6214865	.2870843	3.764083

#1	.5205559	232.2019	6.546032	888.5817	.1476143	.0084162
#2	.5185377	234.7513	6.599761	899.6845	.1475383	.0090673
#3	.5154811	233.1232	6.544871	893.7360	.1483083	.0086701

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.097202	.2300267	F 54.74087	1.927524	3.435283	1.018196
Stddev	.215952	.0010343	.45655	.035376	.010370	.008258
%RSD	222.1684	.4496253	.8340275	1.835333	.3018767	.8110374

#1	-.147113	.2310849	54.50006	1.889269	3.439104	1.011128
#2	.139335	.2299771	55.26742	1.959057	3.423544	1.027273
#3	-.283828	.2290181	54.45514	1.934247	3.443200	1.016188

Sample Name: Q1041-13 Acquired: 1/23/2025 15:43:38 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG7 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0042882	F 108.6698	5.413327	.0187168	.7850584	.0529118
Stddev	.0001936	.2883	.011418	.0013916	.0021104	.0010682
%RSD	4.515634	.2653262	.2109300	7.434850	.2688147	2.018771
#1	.0045049	108.7402	5.423515	.0173877	.7826380	.0528098
#2	.0041321	108.3528	5.400985	.0201633	.7865132	.0540272
#3	.0042277	108.9164	5.415482	.0185993	.7860240	.0518982

Elem	Sr4077
Units	ppm
Avg	.7816603
Stddev	.0041074
%RSD	.5254721
#1	.7813346
#2	.7859209
#3	.7777255

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2790.892	58897.01	9368.492	1936.697	3003.039
Stddev	5.599	326.39	32.282	15.053	8.351
%RSD	.2006187	.5541642	.3445852	.7772428	.2780891
#1	2788.785	59213.83	9391.425	1943.997	2994.891
#2	2797.239	58561.83	9382.475	1919.386	3011.579
#3	2786.652	58915.37	9331.575	1946.708	3002.646

Sample Name: Q1041-14 Acquired: 1/23/2025 15:47:48 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG8 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1812643	-.008421	.6279546	.0588849	.0267924	70.92708	4.000858
Stddev	.0005518	.000717	.0008984	.0017608	.0014671	.12106	.011497
%RSD	.3044409	8.508940	.1430734	2.990261	5.475944	.1706890	.2873662

#1	.1812141	-.009172	.6282658	.0573500	.0255130	70.78833	3.993103
#2	.1818396	-.007745	.6269419	.0608071	.0264704	71.01122	4.014067
#3	.1807393	-.008347	.6286561	.0584976	.0283938	70.98168	3.995403

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0075565	.0076439	51.60415	.2494020	.2139148	.1631333	268.9060
Stddev	.0001090	.0000864	.15056	.0006228	.0000982	.0019264	.5925
%RSD	1.442578	1.129930	.2917686	.2497257	.0459172	1.180863	.2203330

#1	.0076717	.0076270	51.43300	.2496136	.2138433	.1619018	268.2732
#2	.0074550	.0077375	51.66323	.2498914	.2138743	.1621448	268.9971
#3	.0075427	.0075673	51.71621	.2487010	.2140268	.1653533	269.4476

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	14.02185	21.33790	.0989513	.0081922	.4080168	.3907543	1.597705
Stddev	.02867	.10041	.0005825	.0003566	.1646261	.0011656	.009574
%RSD	.2044889	.4705538	.5887109	4.353159	40.34787	.2982971	.5992153

#1	13.98921	21.30869	.0989933	.0080548	.3436465	.3915248	1.592768
#2	14.03338	21.25534	.0995117	.0079246	.5951023	.3894134	1.591608
#3	14.04297	21.44968	.0983489	.0085970	.2853018	.3913248	1.608740

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.106686	3.175856	1.104393	.0101252	3.108656	8.632816	.0106681
Stddev	.016917	.013030	.003009	.0006323	.007968	.008379	.0016588
%RSD	.4119394	.4102681	.2724244	6.244302	.2563061	.0970637	15.54961

#1	4.119891	3.182174	1.100936	.0101406	3.110768	8.635228	.0089510
#2	4.087617	3.184522	1.105831	.0094854	3.099846	8.639724	.0107916
#3	4.112551	3.160872	1.106413	.0107496	3.115355	8.623495	.0122618

Sample Name: Q1041-14 Acquired: 1/23/2025 15:47:48 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG8 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	1.055225	.0265606	.1135394
Stddev	.002812	.0007018	.0003133
%RSD	.2664652	2.642449	.2759498

#1	1.056174	.0272257	.1132401
#2	1.057439	.0258271	.1138650
#3	1.052061	.0266291	.1135132

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3635.364	74581.85	11151.11	2527.571	4003.607
Stddev	2.090	75.20	37.84	10.397	4.963
%RSD	.0574827	.1008244	.3393117	.4113351	.1239580

#1	3637.392	74495.78	11111.88	2528.041	4002.502
#2	3635.482	74614.95	11154.08	2537.725	4009.029
#3	3633.218	74634.82	11187.38	2516.947	3999.290

Sample Name: Q1041-15 Acquired: 1/23/2025 15:51:44 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG9 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0880696	-.003566	3.784734	.0057858	.0284676	1.690266
Stddev	.0055980	.003281	.009085	.0033202	.0006427	.028395
%RSD	6.356319	92.02094	.2400383	57.38494	2.257578	1.679908

#1	.0944772	.000012	3.776419	.0084502	.0281854	1.657546
#2	.0841275	-.006435	3.783352	.0020663	.0280143	1.704792
#3	.0856042	-.004275	3.794430	.0068408	.0292031	1.708459

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.00484	-.000320	.0922511	F 2041.973	.0226766	.0249589
Stddev	.02865	.000043	.0000692	9.914	.0005245	.0002811
%RSD	.2863989	13.56218	.0749590	.4854999	2.313055	1.126428

#1	10.02114	-.000349	.0922712	2032.084	.0226342	.0250943
#2	9.97175	-.000341	.0923079	2041.925	.0232211	.0246357
#3	10.02162	-.000270	.0921741	2051.911	.0221746	.0251468

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.4950844	118.3793	1.569649	F 1162.576	.1254657	.0031767
Stddev	.0030662	.2108	.009838	1.410	.0006852	.0002390
%RSD	.6193216	.1780797	.6267553	.1212965	.5461159	7.523203

#1	.4954432	118.3218	1.567427	1162.610	.1246750	.0030610
#2	.4918547	118.2032	1.561113	1161.149	.1258366	.0034515
#3	.4979555	118.6129	1.580408	1163.968	.1258854	.0030176

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F -1.42840	.0780108	F 33.24031	-.885928	.7994147	.5189259
Stddev	.14758	.0023927	.05010	.039278	.0052147	.0011580
%RSD	10.33174	3.067111	.1507171	4.433566	.6523136	.2231438

#1	-1.26577	.0805675	33.18391	-.883027	.7936984	.5191394
#2	-1.55380	.0758256	33.27966	-.926577	.8006338	.5176761
#3	-1.46564	.0776392	33.25735	-.848181	.8039118	.5199623

Sample Name: Q1041-15 Acquired: 1/23/2025 15:51:44 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPG9 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.001760	F 116.3405	.8428797	-.001202	.0026875	.0553379
Stddev	.000782	.2902	.0082345	.001175	.0009104	.0010494
%RSD	44.45113	.2494215	.9769449	97.74867	33.87498	1.896284

#1	-.002592	116.0758	.8386212	-.002522	.0033689	.0564689
#2	-.001039	116.2949	.8376465	-.000811	.0030401	.0543959
#3	-.001648	116.6507	.8523713	-.000272	.0016536	.0551489

Elem	Sr4077
Units	ppm
Avg	.8131332
Stddev	.0053847
%RSD	.6622166

#1	.8127923
#2	.8079270
#3	.8186802

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2609.150	55212.92	9012.803	1817.189	2888.991
Stddev	2.271	94.37	42.479	9.396	1.470
%RSD	.0870312	.1709213	.4713147	.5170523	.0508866

#1	2610.914	55312.08	9051.958	1820.072	2888.981
#2	2609.946	55124.21	8967.641	1806.689	2890.466
#3	2606.588	55202.46	9018.810	1824.805	2887.526

Sample Name: Q1041-16 Acquired: 1/23/2025 15:56:00 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPH0 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0465036	-.002067	.3459408	.0261059	.0161403	48.25733	1.204238
Stddev	.0011659	.001899	.0006544	.0035632	.0020142	.05074	.003401
%RSD	2.507163	91.86395	.1891720	13.64894	12.47947	.1051504	.2824061
#1	.0457629	.000101	.3466905	.0300704	.0184477	48.26942	1.206969
#2	.0478476	-.002870	.3454840	.0231705	.0147339	48.20163	1.205317
#3	.0459003	-.003433	.3456477	.0250769	.0152392	48.30093	1.200429
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0038216	.0042552	54.49462	.1079261	.1133962	.1086176	110.2258
Stddev	.0000085	.0000736	.20034	.0007229	.0006809	.0028220	.2703
%RSD	.2224140	1.728598	.3676406	.6698409	.6004572	2.598104	.2452267
#1	.0038259	.0043240	54.68888	.1086024	.1141777	.1056517	110.4306
#2	.0038118	.0041776	54.28870	.1071642	.1129308	.1089318	109.9194
#3	.0038270	.0042640	54.50629	.1080118	.1130801	.1112694	110.3275
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.599784	18.45683	.0793077	.0032954	.1271581	.1791448	2.621138
Stddev	.014139	.09954	.0004687	.0001868	.3387309	.0023239	.005177
%RSD	.3073838	.5393286	.5909733	5.668580	266.3856	1.297238	.1974912
#1	4.615710	18.51430	.0798379	.0034712	-.035822	.1818064	2.618456
#2	4.588710	18.34189	.0789483	.0033156	-.099275	.1775184	2.627105
#3	4.594933	18.51431	.0791370	.0030993	.516571	.1781095	2.617853
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.844510	5.040733	.4633245	.0062695	3.863815	8.383687	.0081311
Stddev	.036202	.018223	.0015329	.0002730	.019085	.032940	.0008896
%RSD	.6194160	.3615102	.3308454	4.354398	.4939470	.3929023	10.94063
#1	5.884203	5.052671	.4633298	.0060143	3.879623	8.417071	.0073895
#2	5.836016	5.049770	.4617890	.0065574	3.869208	8.351211	.0091174
#3	5.813310	5.019758	.4648547	.0062366	3.842613	8.382779	.0078863

Sample Name: Q1041-16 Acquired: 1/23/2025 15:56:00 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPH0 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	1.356992	.0249828	.1164550
Stddev	.004704	.0003477	.0002412
%RSD	.3466691	1.391865	.2071311

#1	1.362114	.0246568	.1166293
#2	1.355998	.0249426	.1165560
#3	1.352865	.0253488	.1161797

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3507.722	72804.11	10768.11	2454.042	4015.034
Stddev	7.981	487.80	65.84	8.929	7.501
%RSD	.2275340	.6700218	.6114680	.3638335	.1868212

#1	3499.774	72467.96	10707.88	2448.891	4007.175
#2	3507.655	73363.60	10838.40	2464.351	4015.812
#3	3515.736	72580.77	10758.05	2448.883	4022.116

Sample Name: Q1041-17 Acquired: 1/23/2025 15:59:56 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPH1 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0692724	-.003624	3.193830	.0185148	.0166885	35.98708	.9518504
Stddev	.0029880	.001689	.000778	.0005595	.0023267	.27133	.0085269
%RSD	4.313335	46.59613	.0243613	3.021762	13.94161	.7539608	.8958261

#1	.0671917	-.005505	3.194634	.0182777	.0173076	35.87096	.9472079
#2	.0679294	-.002240	3.193081	.0191537	.0141150	36.29714	.9616912
#3	.0726962	-.003127	3.193774	.0181129	.0186430	35.79314	.9466522

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0044465	.0632016	164.0788	.1251751	.1220627	.1676837	119.4300
Stddev	.0000892	.0000294	1.1392	.0002263	.0002246	.0031573	.7064
%RSD	2.006384	.0464715	.6943126	.1807545	.1839668	1.882863	.5914627

#1	.0045242	.0631804	163.3494	.1249770	.1218036	.1679895	118.9708
#2	.0043491	.0632351	165.3915	.1254217	.1222016	.1706770	120.2434
#3	.0044662	.0631892	163.4954	.1251266	.1221829	.1643848	119.0757

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	6.629171	77.29601	.0954835	.0033388	-.056437	.1697907	4.615483
Stddev	.049217	.44062	.0001622	.0003463	.228164	.0030104	.020203
%RSD	.7424336	.5700444	.1698859	10.37290	404.2814	1.773003	.4377150

#1	6.603349	77.14911	.0955982	.0029752	.102146	.1682036	4.593240
#2	6.685926	77.79131	.0952979	.0036648	-.317929	.1732626	4.632694
#3	6.598239	76.94760	.0955544	.0033763	.046473	.1679060	4.620514

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.097356	3.669335	.4873869	.0052516	4.069854	7.371274	.0273535
Stddev	.054330	.009772	.0039535	.0001864	.004670	.015182	.0003300
%RSD	1.065849	.2663122	.8111706	3.548610	.1147481	.2059605	1.206331

#1	5.111070	3.680309	.4841669	.0052438	4.067319	7.383385	.0277328
#2	5.143514	3.661576	.4917994	.0054417	4.067000	7.376194	.0271329
#3	5.037482	3.666119	.4861944	.0050692	4.075243	7.354242	.0271947

Sample Name: Q1041-17 Acquired: 1/23/2025 15:59:56 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPH1 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	1.086756	.0199245	.0943746
Stddev	.001309	.0002297	.0007069
%RSD	.1204048	1.152880	.7490502

#1	1.086698	.0196815	.0940046
#2	1.088093	.0201380	.0951897
#3	1.085478	.0199539	.0939295

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3433.890	70995.28	9494.570	2411.705	3837.828
Stddev	.773	240.22	26.797	10.674	5.557
%RSD	.0225211	.3383637	.2822385	.4425956	.1447914

#1	3434.768	71185.20	9483.639	2423.982	3843.746
#2	3433.311	70725.23	9525.105	2404.621	3832.721
#3	3433.591	71075.40	9474.965	2406.512	3837.017

Sample Name: Q1041-18 Acquired: 1/23/2025 16:03:50 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPH2 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0773283	-.002086	1.157319	.0320645	.0176275	48.87792	1.266236
Stddev	.0029846	.001579	.002576	.0017565	.0001331	.06495	.003399
%RSD	3.859703	75.69525	.2225794	5.478037	.7552785	.1328841	.2684468
#1	.0741763	-.001905	1.154714	.0318706	.0175690	48.80466	1.264215
#2	.0801113	-.000606	1.157377	.0339100	.0177799	48.92846	1.264332
#3	.0776974	-.003749	1.159865	.0304131	.0175337	48.90063	1.270160
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0028531	.0059437	38.50782	.1235821	.0768738	.1650119	135.9741
Stddev	.0000420	.0000246	.06676	.0008127	.0003996	.0021778	.4877
%RSD	1.471570	.4146963	.1733659	.6576343	.5197789	1.319764	.3586527
#1	.0028268	.0059337	38.43229	.1240280	.0765759	.1624973	135.4110
#2	.0028310	.0059256	38.55891	.1240743	.0767176	.1662546	136.2629
#3	.0029015	.0059718	38.53227	.1226440	.0773279	.1662838	136.2483
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.958077	15.42734	.0800588	.0028478	.2393906	.2124415	1.829722
Stddev	.007306	.03352	.0005521	.0006750	.3621788	.0003892	.003863
%RSD	.2469961	.2172840	.6895802	23.70316	151.2920	.1832027	.2111032
#1	2.950230	15.39277	.0796605	.0020842	.3752394	.2128680	1.828037
#2	2.959320	15.45970	.0798270	.0033649	.5140043	.2121056	1.834141
#3	2.964683	15.42954	.0806890	.0030945	-.171072	.2123508	1.826989
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	6.713966	6.296194	.5832380	.0074695	4.292399	8.164654	.0214912
Stddev	.021810	.020390	.0031472	.0002048	.019829	.018994	.0006830
%RSD	.3248429	.3238497	.5396142	2.741378	.4619521	.2326379	3.178121
#1	6.729073	6.281778	.5796524	.0075972	4.276221	8.161403	.0218973
#2	6.688962	6.287279	.5845181	.0072333	4.286455	8.147496	.0218737
#3	6.723863	6.319523	.5855434	.0075780	4.314519	8.185064	.0207026

Sample Name: Q1041-18 Acquired: 1/23/2025 16:03:50 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPH2 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	1.305792	.0236034	.0857789
Stddev	.003056	.0006933	.0002309
%RSD	.2340068	2.937419	.2692261

#1	1.307906	.0244017	.0856600
#2	1.307182	.0232568	.0856317
#3	1.302288	.0231517	.0860451

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3559.264	73185.51	10518.77	2491.132	4144.986
Stddev	4.314	200.83	10.40	3.653	4.210
%RSD	.1212100	.2744116	.0988999	.1466347	.1015574

#1	3562.898	73395.19	10519.85	2489.382	4148.002
#2	3560.398	72994.89	10507.87	2488.684	4146.779
#3	3554.496	73166.46	10528.59	2495.331	4140.177

Sample Name: Q1041-19 Acquired: 1/23/2025 16:07:46 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPH3 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0467850	-.000971	2.092633	.0234272	.0149197	47.42496	1.422783
Stddev	.0024051	.002248	.001151	.0013878	.0004125	.22442	.004516
%RSD	5.140704	231.4499	.0549946	5.923820	2.764513	.4732004	.3174188
#1	.0481931	-.000131	2.091334	.0249716	.0146166	47.29332	1.422566
#2	.0440080	-.003518	2.093038	.0230254	.0153894	47.68408	1.427404
#3	.0481540	.000735	2.093526	.0222847	.0147530	47.29748	1.418379
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0052449	.0052232	18.12671	.1190009	.1633839	.1148684	108.4571
Stddev	.0001345	.0000142	.04353	.0005222	.0004728	.0003509	.4713
%RSD	2.563902	.2717952	.2401687	.4388006	.2893919	.3055187	.4345120
#1	.0053915	.0052100	18.10653	.1196003	.1629425	.1152605	108.2737
#2	.0051272	.0052214	18.17667	.1186446	.1633262	.1145837	108.9925
#3	.0052160	.0052382	18.09692	.1187579	.1638829	.1147610	108.1051
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	7.723017	7.650051	.0811622	.0035788	-.006228	.1789129	1.302789
Stddev	.012255	.025743	.0006671	.0002674	.203475	.0022332	.015025
%RSD	.1586762	.3365057	.8219673	7.472937	3267.004	1.248230	1.153279
#1	7.730870	7.657920	.0811730	.0037771	-.134786	.1814899	1.312531
#2	7.729284	7.670940	.0818238	.0036848	-.112262	.1775425	1.285486
#3	7.708896	7.621292	.0804897	.0032746	.228364	.1777063	1.310351
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.994142	4.077842	.4510651	.0050598	2.734653	7.033600	.0136820
Stddev	.054023	.015728	.0019527	.0004806	.013698	.052826	.0003881
%RSD	1.081736	.3856898	.4329087	9.498948	.5009138	.7510451	2.836828
#1	4.978005	4.088324	.4495434	.0050524	2.750468	7.090782	.0141295
#2	5.054395	4.059757	.4532669	.0055440	2.726970	6.986619	.0134789
#3	4.950026	4.085445	.4503850	.0045828	2.726521	7.023399	.0134375

Sample Name: Q1041-19 Acquired: 1/23/2025 16:07:46 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPH3 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	1.142599	.0238350	.0768736
Stddev	.003086	.0008143	.0002830
%RSD	.2700421	3.416380	.3681682

#1	1.144242	.0238942	.0770259
#2	1.139040	.0246181	.0770478
#3	1.144516	.0229927	.0765470

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3744.325	75217.88	10911.84	2540.104	4274.846
Stddev	5.186	248.19	83.72	19.385	6.211
%RSD	.1384988	.3299672	.7672740	.7631651	.1452975

#1	3742.899	74934.46	10846.22	2526.256	4275.261
#2	3740.001	75396.45	11006.13	2562.258	4268.437
#3	3750.075	75322.72	10883.17	2531.798	4280.839

Sample Name: Q1041-20 Acquired: 1/23/2025 16:11:42 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPH4 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0556074	-.001999	.8366462	.0267497	.0152542	45.20242	1.190015
Stddev	.0004458	.001438	.0018074	.0027137	.0012418	.19137	.009964
%RSD	.8017170	71.95352	.2160318	10.14494	8.140353	.4233669	.8373409
#1	.0554549	-.001830	.8382382	.0285633	.0138249	45.30313	1.195983
#2	.0561094	-.003515	.8346815	.0236299	.0160677	45.32241	1.195550
#3	.0552578	-.000653	.8370189	.0280560	.0158701	44.98172	1.178512
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0052258	.0043040	15.43560	.1535576	.1279686	.0707103	113.9895
Stddev	.0000670	.0001117	.08305	.0000654	.0002544	.0011011	.3995
%RSD	1.282425	2.595165	.5380402	.0426010	.1987655	1.557246	.3504725
#1	.0053025	.0044306	15.49298	.1535695	.1279704	.0703370	114.1479
#2	.0051970	.0042623	15.47345	.1536162	.1277133	.0698443	114.2856
#3	.0051780	.0042192	15.34037	.1534870	.1282220	.0719495	113.5351
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	6.475657	8.524883	.0797860	.0030457	-.041713	.1914272	.6966937
Stddev	.045922	.024523	.0005037	.0005690	.225267	.0021559	.0008876
%RSD	.7091407	.2876679	.6313417	18.68036	540.0368	1.126220	.1274009
#1	6.496369	8.548455	.0798882	.0029260	.218378	.1937128	.6962850
#2	6.507574	8.526686	.0792390	.0036650	-.174883	.1911388	.6960841
#3	6.423027	8.499508	.0802308	.0025462	-.168635	.1894301	.6977120
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	6.410729	3.624177	.4661868	.0066106	2.824380	7.881785	.0151174
Stddev	.046303	.004052	.0020227	.0002242	.003863	.082250	.0004565
%RSD	.7222737	.1118157	.4338713	3.392092	.1367574	1.043547	3.019972
#1	6.428967	3.623599	.4677020	.0067989	2.826738	7.856461	.0156313
#2	6.445135	3.628487	.4669684	.0066703	2.826480	7.973719	.0147588
#3	6.358084	3.620444	.4638900	.0063625	2.819923	7.815174	.0149620

Sample Name: Q1041-20 Acquired: 1/23/2025 16:11:42 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPH4 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	1.312431	.0227216	.0681155
Stddev	.012816	.0012784	.0006011
%RSD	.9764773	5.626400	.8825071

#1	1.309642	.0241447	.0684113
#2	1.326411	.0223496	.0685114
#3	1.301239	.0216705	.0674238

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3529.827	73252.43	10379.42	2460.183	4058.578
Stddev	2.585	187.26	63.13	10.909	2.624
%RSD	.0732316	.2556423	.6082062	.4434291	.0646510

#1	3529.459	73040.63	10425.27	2454.228	4058.526
#2	3527.446	73320.58	10307.42	2472.773	4055.979
#3	3532.577	73396.07	10405.58	2453.546	4061.226

Sample Name: Q1041-21 Acquired: 1/23/2025 16:15:39 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPH5 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0565798	-.001574	.3781258	.0295569	.0124903	50.83696	1.442842
Stddev	.0024577	.000746	.0001711	.0044381	.0008075	.40472	.013313
%RSD	4.343688	47.38591	.0452580	15.01555	6.465169	.7961228	.9226835

#1	.0574860	-.000983	.3783226	.0304854	.0132177	50.81822	1.439959
#2	.0584557	-.001327	.3780120	.0247280	.0116214	51.25072	1.457361
#3	.0537977	-.002412	.3780429	.0334574	.0126317	50.44192	1.431207

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0049486	.0037562	13.26304	.1374554	.1571568	.0669181	124.8393
Stddev	.0000199	.0000742	.05392	.0006398	.0003272	.0013072	.7233
%RSD	.4030139	1.975916	.4065605	.4654460	.2082240	1.953404	.5793892

#1	.0049689	.0037812	13.23353	.1381604	.1574307	.0684142	124.7313
#2	.0049290	.0038147	13.32528	.1372941	.1572453	.0663432	125.6106
#3	.0049479	.0036727	13.23032	.1369118	.1567944	.0659968	124.1761

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	7.027477	9.555415	.0840859	.0039594	.1357963	.2137320	.4043023
Stddev	.044889	.029204	.0000403	.0000532	.0740011	.0017551	.0032324
%RSD	.6387675	.3056325	.0479799	1.343963	54.49423	.8211659	.7994979

#1	7.005195	9.533312	.0841152	.0039149	.2201439	.2117416	.4023968
#2	7.079148	9.588523	.0840398	.0040184	.0817786	.2143966	.4024756
#3	6.998088	9.544409	.0841025	.0039450	.1054663	.2150577	.4080344

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.805352	2.440311	.5138609	.0061722	2.113951	8.369593	.0153748
Stddev	.055619	.006588	.0034455	.0003166	.000919	.015217	.0001752
%RSD	1.157429	.2699641	.6705103	5.129340	.0434887	.1818147	1.139369

#1	4.803441	2.447332	.5136192	.0063607	2.113583	8.361190	.0151866
#2	4.861901	2.434264	.5174209	.0063493	2.114998	8.360429	.0155331
#3	4.750713	2.439339	.5105426	.0058067	2.113273	8.387158	.0154047

Sample Name: Q1041-21 Acquired: 1/23/2025 16:15:39 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPH5 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	1.467460	.0281343	.0998893
Stddev	.002618	.0011737	.0008151
%RSD	.1784131	4.171753	.8159663

#1	1.466430	.0289149	.0996897
#2	1.470437	.0267845	.1007856
#3	1.465515	.0287034	.0991926

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3576.148	74286.27	10818.00	2507.128	4049.363
Stddev	6.944	112.91	83.30	11.357	6.968
%RSD	.1941657	.1519884	.7700442	.4529852	.1720827

#1	3582.376	74157.89	10802.60	2494.029	4046.863
#2	3577.407	74370.11	10907.92	2513.137	4057.237
#3	3568.661	74330.82	10743.46	2514.218	4043.990

Sample Name: Q1039-01 Acquired: 1/23/2025 16:19:37 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPD8 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0823601	-.004995	1.308866	.0284591	.0128289	50.07158	1.864408
Stddev	.0015209	.000438	.001244	.0027096	.0015223	.47113	.027536
%RSD	1.846660	8.773863	.0950150	9.521034	11.86593	.9409123	1.476931
#1	.0807190	-.004795	1.307508	.0261080	.0136374	50.61533	1.895921
#2	.0826389	-.004693	1.309948	.0314224	.0137764	49.81432	1.844987
#3	.0837222	-.005498	1.309144	.0278468	.0110730	49.78507	1.852316
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0051845	.0048002	28.44275	.1315471	.1829945	.0908640	129.4875
Stddev	.0000692	.0000709	.27648	.0002286	.0006016	.0013684	1.2268
%RSD	1.334838	1.477722	.9720659	.1737676	.3287460	1.505953	.9474094
#1	.0051046	.0048116	28.76150	.1315519	.1824366	.0908464	130.8895
#2	.0052274	.0048647	28.29885	.1317732	.1829149	.0895045	128.6113
#3	.0052214	.0047242	28.26790	.1313161	.1836319	.0922411	128.9616
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.66511	12.47350	.0743985	.0042347	.4041684	.2270945	.5146151
Stddev	.12910	.08601	.0006109	.0003361	.1930678	.0025025	.0092090
%RSD	1.210525	.6895079	.8210473	7.937787	47.76916	1.101975	1.789487
#1	10.81251	12.57052	.0742051	.0045773	.4943705	.2264171	.5252486
#2	10.57208	12.40662	.0739077	.0042214	.5356257	.2250003	.5092603
#3	10.61075	12.44335	.0750826	.0039054	.1825089	.2298659	.5093365
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.997998	3.217779	.5371073	.0079323	2.139509	6.614028	.0101582
Stddev	.090283	.005537	.0074685	.0003176	.010661	.019770	.0000798
%RSD	3.011452	.1720854	1.390512	4.004007	.4982692	.2989028	.7857131
#1	3.093024	3.217014	.5456650	.0079837	2.135439	6.628471	.0100672
#2	2.913355	3.223659	.5319046	.0082211	2.131483	6.591497	.0101908
#3	2.987613	3.212664	.5337522	.0075922	2.151605	6.622117	.0102165

Sample Name: Q1039-01 Acquired: 1/23/2025 16:19:37 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPD8 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.9982407	.0283085	.0591934
Stddev	.0026478	.0006965	.0008477
%RSD	.2652472	2.460251	1.432004

#1	1.001164	.0288410	.0601626
#2	.996004	.0275204	.0585905
#3	.997554	.0285643	.0588271

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3568.004	74693.41	10856.72	2525.115	4052.188
Stddev	4.319	335.27	69.61	8.203	3.503
%RSD	.1210399	.4488556	.6411420	.3248452	.0864496

#1	3568.559	74329.69	10932.38	2515.681	4055.957
#2	3563.435	74760.43	10795.40	2530.566	4049.031
#3	3572.019	74990.10	10842.38	2529.098	4051.575

Sample Name: Q1039-02 Acquired: 1/23/2025 16:23:35 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPD9 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0472132	-.002861	1.035347	.0225010	.0111752	42.20560	1.177489
Stddev	.0023369	.000365	.003966	.0005594	.0012769	.04949	.003376
%RSD	4.949608	12.75247	.3830300	2.485979	11.42649	.1172634	.2866724

#1	.0455220	-.002840	1.031840	.0231280	.0099066	42.21269	1.181297
#2	.0462379	-.002508	1.034551	.0220531	.0111586	42.25116	1.174865
#3	.0498797	-.003236	1.039651	.0223220	.0124603	42.15294	1.176306

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0052914	.0031495	43.23937	.1093952	.1481219	.0579831	100.9003
Stddev	.0000407	.0000467	.02876	.0002935	.0000935	.0019716	.2083
%RSD	.7687218	1.483337	.0665150	.2683193	.0631452	3.400253	.2064397

#1	.0052503	.0031447	43.26860	.1090771	.1480613	.0595732	100.7505
#2	.0052923	.0031053	43.23840	.1096556	.1482296	.0557771	101.1382
#3	.0053317	.0031984	43.21111	.1094528	.1480748	.0585990	100.8124

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	11.07334	19.61199	.0680549	.0022427	.2666028	.1892152	.2854806
Stddev	.03423	.05482	.0002670	.0002792	.1328506	.0011244	.0047389
%RSD	.3091206	.2795193	.3922750	12.44755	49.83092	.5942425	1.659979

#1	11.11285	19.61146	.0677532	.0020475	.2129548	.1879873	.2890991
#2	11.05242	19.66708	.0682605	.0025625	.4178884	.1901946	.2872262
#3	11.05476	19.55744	.0681510	.0021182	.1689650	.1894637	.2801165

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.289830	2.970351	.4153462	.0059768	3.082061	6.588557	.0063596
Stddev	.025909	.007870	.0013290	.0001103	.010549	.004666	.0010854
%RSD	1.131493	.2649561	.3199805	1.845299	.3422661	.0708240	17.06674

#1	2.294770	2.964244	.4142906	.0058556	3.070935	6.589487	.0072170
#2	2.261807	2.967577	.4168386	.0060713	3.091918	6.592689	.0051393
#3	2.312914	2.979232	.4149092	.0060034	3.083329	6.583496	.0067225

Sample Name: Q1039-02 Acquired: 1/23/2025 16:23:35 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: GCPD9 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.8775207	.0230002	.0538572
Stddev	.0023536	.0005776	.0002279
%RSD	.2682098	2.511518	.4230982

#1	.8799861	.0236109	.0541194
#2	.8752976	.0229273	.0537448
#3	.8772783	.0224625	.0537074

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3573.404	73210.07	10372.33	2474.537	4105.618
Stddev	3.000	260.11	39.53	12.035	7.620
%RSD	.0839497	.3552901	.3811507	.4863622	.1856056

#1	3576.338	73487.35	10416.64	2487.916	4113.538
#2	3573.533	72971.46	10340.68	2471.104	4104.978
#3	3570.342	73171.38	10359.65	2464.592	4098.337

Sample Name: CCV003 Acquired: 1/23/2025 16:27:31 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV003 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.952371	4.818726	24.48731	4.960811	5.022315	412.4374
Stddev	.004132	.013242	.04298	.009094	.008724	4.2690
%RSD	.0834281	.2748063	.1755210	.1833152	.1737050	1.035063

#1	4.948838	4.828993	24.45697	4.971069	5.032388	411.5602
#2	4.956914	4.823405	24.46846	4.957625	5.017427	417.0768
#3	4.951360	4.803780	24.53649	4.953739	5.017132	408.6751

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.05673	4.828576	2.475804	405.5872	15.77896	2.476722
Stddev	.03415	.0008313	.002991	1.5597	.02993	.003920
%RSD	.3395851	.1721562	.1208155	.3845470	.1896770	.1582876

#1	10.02483	4.818978	2.473771	406.5737	15.75782	2.472239
#2	10.05260	4.833453	2.474401	406.3988	15.76585	2.478415
#3	10.09275	4.833298	2.479238	403.7891	15.81321	2.479511

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	14.22653	416.4523	15.02198	407.2115	2.473269	1.294812
Stddev	.03928	.4605	.01961	.3336	.003536	.002167
%RSD	.2760873	.1105809	.1305358	.0819232	.1429532	.1673216

#1	14.22089	416.8744	15.01696	407.5961	2.470112	1.294019
#2	14.26832	416.5213	15.04361	407.0382	2.472608	1.297263
#3	14.19038	415.9611	15.00537	407.0003	2.477089	1.293153

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	373.3495	2.430734	15.70855	160.2794	4.939517	F 5.826338
Stddev	2.1907	.003624	.00636	.1324	.009981	.002468
%RSD	.5867623	.1490953	.0405175	.0826153	.2020679	.0423604

#1	373.1111	2.432363	15.70532	160.4241	4.936854	5.828030
#2	375.6496	2.433258	15.71588	160.2497	4.950559	5.827478
#3	371.2878	2.426581	15.70445	160.1644	4.931137	5.823506

Sample Name: CCV003 Acquired: 1/23/2025 16:27:31 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV003 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.908940	5.015501	4.779911	4.995819	4.814270	5.128893
Stddev	.004520	.009536	.003269	.003691	.009870	.012866
%RSD	.0920741	.1901349	.0683954	.0738757	.2050130	.2508591

#1	4.913907	5.008288	4.776799	4.992273	4.817212	5.135787
#2	4.907844	5.026313	4.783318	4.995545	4.822333	5.136843
#3	4.905069	5.011903	4.779617	4.999639	4.803263	5.114048

Elem	Sr4077
Units	ppm
Avg	5.116494
Stddev	.040419
%RSD	.7899807

#1	5.133188
#2	5.070402
#3	5.145893

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2765.352	59668.20	9457.832	2000.874	3208.294
Stddev	4.331	52.48	4.562	.869	3.943
%RSD	.1565996	.0879524	.0482361	.0434140	.1228870

#1	2760.763	59696.97	9462.822	2000.527	3211.012
#2	2769.366	59700.01	9456.802	2001.863	3210.097
#3	2765.928	59607.63	9453.874	2000.233	3203.772

Sample Name: CCB003 Acquired: 1/23/2025 16:31:49 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB003 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.002080	.0009103	.0000676	-.001026	.0004583	.0024915	-.001178
Stddev	.000627	.0004448	.0007082	.002704	.0010017	.0087579	.000029
%RSD	30.12928	48.86901	1047.800	263.6180	218.5688	351.5105	2.470203

#1	-.001785	.0004109	-.000733	.000220	.0010627	.0118333	-.001202
#2	-.002800	.0012640	.000323	-.004128	.0010102	.0011745	-.001186
#3	-.001656	.0010559	.000613	.000831	-.000698	-.005533	-.001145

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000440	-.000005	.0180588	.0009067	.0001305	.0032238	.0121256
Stddev	.0000080	.000046	.0049086	.0001365	.0002246	.0026827	.0034363
%RSD	18.25168	842.8335	27.18126	15.05741	172.1107	83.21697	28.33911

#1	.0000427	-.000046	.0149342	.0009079	.0002291	.0003035	.0106504
#2	.0000367	.000044	.0155257	.0010426	-.000127	.0037888	.0160531
#3	.0000526	-.000014	.0237165	.0007695	.000289	.0055790	.0096732

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002191	.0188867	.0000889	-.000525	.0873099	.0011161	-.000538
Stddev	.0001829	.0084093	.0003810	.000276	.4808723	.0013167	.000502
%RSD	83.45699	44.52494	428.4437	52.52993	550.7647	117.9733	93.16931

#1	.0001136	.0248754	.0000087	-.000837	.3015353	-.000345	-.001105
#2	.0001135	.0225119	-.000246	-.000422	-.463445	.002211	-.000359
#3	.0004303	.0092729	.000504	-.000315	.423840	.001483	-.000151

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.097296	.0021651	.0041492	-.000001	.0041101	.0027828	-.000120
Stddev	.032585	.0011114	.0005085	.000154	.0036894	.0008966	.000508
%RSD	33.49054	51.33293	12.25651	11667.60	89.76377	32.22043	422.0422

#1	-.117378	.0012622	.0046803	-.000035	.0066155	.0021719	-.000689
#2	-.059699	.0018267	.0041005	-.000136	.0058413	.0023643	.000289
#3	-.114810	.0034063	.0036667	.000167	-.000127	.0038121	.000039

Sample Name: CCB003 Acquired: 1/23/2025 16:31:49 Type: Unk
Method: EPA SFAM01.0(v52) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB003 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0005491	-.003315	.0001055
Stddev	.0005136	.000492	.0000352
%RSD	93.53682	14.85680	33.31653

#1	-.000044	-.002818	.0000810
#2	.000835	-.003803	.0001458
#3	.000856	-.003322	.0000898

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3525.331	71567.22	10063.34	2440.539	4449.086
Stddev	4.682	291.97	45.64	15.755	5.110
%RSD	.1327989	.4079695	.4535700	.6455368	.1148440

#1	3530.644	71473.95	10039.59	2441.411	4454.281
#2	3523.535	71333.28	10034.47	2424.367	4444.066
#3	3521.813	71894.43	10115.96	2455.840	4448.910

Prep Standard - Chemical Standard Summary

Order ID : Q1041
Test : Metals CLP12
Prepbatch ID : PB166002,
Sequence ID/Qc Batch ID: LB134392,

Standard ID :
MP83498,MP83500,MP83506,MP83512,MP83935,MP84058,MP84059,MP84060,MP84061,MP84062,MP84063,MP84064,MP84065,MP84066,MP84067,MP84068,MP84071,MP84072,

Chemical ID :
M5130,M5218,M5223,M5289,M5295,M5296,M5298,M5390,M5393,M5429,M5472,M5473,M5476,M5496,M5497,M5498,M5513,M5515,M5516,M5519,M5658,M5697,M5698,M5769,M5798,M5799,M5800,M5801,M5802,M5806,M5815,M5816,M5817,M5818,M5819,M5820,M5875,M5942,M5959,M5960,M5961,M5962,M5970,M5976,M5978,M5985,M5990,M5999,M6021,M6023,M6025,M6028,M6030,M6032,M6121,M6125,M6126,M6127,M6128,W 3112,

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>
169	1:1HNO3	MP83498	12/09/2024	01/16/2025	Janvi Patel	None	None	Sarabjit Jaswal
								12/09/2024

FROM 1250.00000ml of M6126 + 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>
902	ICP AES CAL BLK (SO/ICB/CCB)	MP83500	12/06/2024	01/24/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								12/09/2024

FROM 125.00000ml of M6121 + 2350.00000ml of W3112 + 25.00000ml of M6126 = Final Quantity: 2500.000 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>
994	ICPAES ISM01.2 S1 (CONC.)	MP83506	12/09/2024	01/13/2025	Kareem Khairalla	None	None	Sarabjit Jaswal 12/09/2024

FROM 0.02000ml of M5815 + 0.03000ml of M5429 + 0.10000ml of M5798 + 0.10000ml of M6028 + 0.14000ml of M5799 + 0.20000ml of M5473 + 0.20000ml of M5515 + 0.20000ml of M5658 + 0.20000ml of M5801 + 0.20000ml of M5817 + 0.20000ml of M5976 + 0.20000ml of M6025 + 0.20000ml of M6030 + 0.30000ml of M5698 + 0.40000ml of M5496 + 0.50000ml of M5697 + 0.50000ml of M6023 + 0.70000ml of M5962 + 0.80000ml of M5960 + 1.00000ml of M5800 + 1.00000ml of M6021 + 1.20000ml of M5802 + 1.20000ml of M5819 + 10.00000ml of M5498 + 10.00000ml of M5519 + 10.00000ml of M5769 + 10.00000ml of M5806 + 10.00000ml of M5818 + 2.00000ml of M5978 + 4.00000ml of M5390 + 99.50000ml of MP83500 = 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>
921	ICPAES SPIKE SOL#6	MP83512	12/09/2024	01/13/2025	Kareem Khairalla	None	None	Sarabjit Jaswal 12/09/2024

FROM 2.50000ml of M5962 + 50.00000ml of M5990 + 50.00000ml of M5999 + 147.50000ml of MP83500 = Final Quantity: 250.000 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>
514	CAL BLK (S0/ICB/CCB)	MP83935	01/07/2025	02/07/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/09/2025

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>
2480	ICP AES STD 6 ISM01.3	MP84058	01/14/2025	02/14/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/16/2025

FROM 4.00000ml of M5289 + 4.00000ml of M5298 + 4.00000ml of M5497 + 4.00000ml of M5806 + 4.00000ml of M6127 + 30.00000ml of MP83500 = Final Quantity: 50.000 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>
1004	ICPAES ISM01.2 (S5)	MP84059	01/14/2025	02/14/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
FROM 0.25000ml of M5798 + 0.50000ml of M5429 + 0.50000ml of M5476 + 0.50000ml of M5815 + 0.50000ml of M5817 + 12.50000ml of M5519 + 12.50000ml of M5806 + 12.50000ml of M5819 + 12.50000ml of M6128 + 13.75000ml of M5697 + 14.50000ml of M5298 + 14.50000ml of M5496 + 14.50000ml of M5658 + 2.00000ml of M5513 + 22.50000ml of M5497 + 22.50000ml of M6127 + 5.00000ml of M5296 + 5.00000ml of M5393 + 5.00000ml of M5802 + 5.00000ml of M5875 + 303.50000ml of MP83500 = 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>
1005	ICPAES ISM01.2(S4)	MP84060	01/14/2025	02/14/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
FROM 250.00000ml of MP83500 + 250.00000ml of MP84059 = 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>
1007	ICPAES ISM01.2(S3)	MP84061	01/14/2025	02/14/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/16/2025

FROM 25.00000ml of MP84059 + 75.00000ml of MP83500 = 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>
1008	ICPAES ISM01.2(S2)	MP84062	01/14/2025	02/14/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/16/2025

FROM 12.50000ml of MP84059 + 87.50000ml of MP83500 = 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>
994	ICPAES ISM01.2 S1 (CONC.)	MP84063	01/14/2025	02/14/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
FROM 0.02000ml of M5815 + 0.03000ml of M5429 + 0.10000ml of M5798 + 0.10000ml of M6028 + 0.14000ml of M5799 + 0.20000ml of M5298 + 0.20000ml of M5476 + 0.20000ml of M5658 + 0.20000ml of M5801 + 0.20000ml of M5817 + 0.20000ml of M5976 + 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 M5802 + 1.20000ml of M5819 + 10.00000ml of M5497 + 10.00000ml of M5519 + 10.00000ml of M5806 + 10.00000ml of M6127 + 2.00000ml of M5942 + 4.00000ml of M6032 + 34.24000ml of MP83500 = 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>
1003	ICPAES ISM01.2 S1	MP84064	01/14/2025	02/14/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
FROM 0.50000ml of MP84063 + 99.50000ml of MP83500 = 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>
2054	ICV-ICPAES	MP84065	01/14/2025	02/14/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
FROM 0.50000ml of M5218 + 0.50000ml of M5472 + 0.50000ml of M5816 + 0.50000ml of M5820 + 0.50000ml of M5970 + 10.00000ml of M5295 + 87.50000ml of MP83500 = 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	MP84066	01/14/2025	02/14/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
FROM 25.00000ml of M5130 + 225.00000ml of MP83500 = Final Quantity: 250.000 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>
905	ICP AES ICSAB SOLN	MP84067	01/14/2025	02/14/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/16/2025

FROM 25.00000ml of M5130 + 25.00000ml of M5223 + 200.00000ml of MP83500 = 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>
1119	ICPAES ISM01.2(CCV)	MP84068	01/14/2025	02/14/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/16/2025

FROM 0.75000ml of M5497 + 0.75000ml of M6127 + 1.22500ml of M5496 + 1.25000ml of M5298 + 1.25000ml of M5516 + 19.77500ml of MP83500 + 25.00000ml of MP84059 = Final Quantity: 50.000 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>
919	ICP AES INTERNAL STD	MP84071	01/14/2025	02/14/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/16/2025

FROM 1.00000ml of M5959 + 10.00000ml of M5985 + 1969.00000ml of W3112 + 20.00000ml of M6126 = Final Quantity: 2000.000 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>
903	ICP AES RINSE SOLN	MP84072	01/14/2025	02/14/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/16/2025

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

CHEMICAL RECEIPT LOG BOOK

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 / jaswal	04/20/2021 / bin	M5130

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 / jaswal	04/20/2021 / bin	M5223

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58113 / Aluminum (Al) 10,000PPM	070622	07/06/2025	09/02/2022 / jaswal	07/12/2022 / jaswal	M5289

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
EPA	ICV-1 / ICV (ICP/ICPMS) STOCK SOLN	ICV-1014	02/05/2025	08/07/2024 / jaswal	04/20/2021 / bin	M5295

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	Z9651Q / CHEM-CLP-4/.25L	S2-MEB711673	11/02/2026	09/19/2022 / jaswal	08/20/2022 / jaswal	M5296

CHEMICAL RECEIPT LOG BOOK

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 #
Absolute Standards, Inc.	57056 / Ba, 1000 PPM, 125 ml	072122	07/21/2025	08/07/2024 / jaswal	09/18/2022 / bin	M5390

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.	57038 / Sr, 1000 PPM, 125 ml	082922	08/29/2025	01/14/2025 / Jaswal	03/16/2023 / jaswal	M5472

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	03/16/2023 / jaswal	03/16/2023 / jaswal	M5473

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 / jaswal	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.	57182 / Pb, 10000 PPM, 125 ml	061522	06/15/2025	03/19/2023 / bin	03/17/2023 / bin	M5513

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	092122	09/21/2025	08/01/2024 / Jaswal	03/17/2023 / bin	M5515

CHEMICAL RECEIPT LOG BOOK

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	022123	11/06/2025	11/06/2024 / kareem	03/17/2023 / bin	M5516

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 #
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.	58025 / Mn, 1000 PPM, 500 ml	102623	10/26/2026	04/18/2024 / jaswal	10/27/2023 / jaswal	M5698

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	091823	09/18/2026	05/24/2024 / Jaswal	01/03/2024 / bin	M5769

CHEMICAL RECEIPT LOG BOOK

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

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.	58111 / Na, 10000 PPM, 500 ml	122223	12/22/2026	08/01/2024 / Jaswal	01/03/2024 / jaswal	M5806

CHEMICAL RECEIPT LOG BOOK

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

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.	57014 / Si, 1000 PPM, 125 ml	122023	12/20/2026	03/06/2024 / jaswal	02/09/2024 / jaswal	M5818

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

CHEMICAL RECEIPT LOG BOOK

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 #
Inorganic Ventures	CGT11-1 / TITANIUM 125mL 1000ug/mL	T2-TI719972	06/17/2027	06/18/2024 / Jaswal	02/22/2024 / Jaswal	M5942

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	07/03/2024 / kareem	06/11/2024 / kareem	M5960

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

CHEMICAL RECEIPT LOG BOOK

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	08/07/2024 / jaswal	02/22/2024 / Jaswal	M5976

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

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	CLPP-SPK-5 / CLP Spike Standard 5	V2-MEB742037	03/12/2029	10/04/2024 / Jaswal	02/22/2024 / Jaswal	M5990

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	CLPP-SPK-1 / SOIL/WATER SPIKE SOLN 1, 125mL	T2-MEB721963	07/27/2027	09/04/2024 / Jaswal	02/22/2024 / kareem	M5999

CHEMICAL RECEIPT LOG BOOK

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

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

CHEMICAL RECEIPT LOG BOOK

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 #
PCI Scientific Supply, Inc.	1403 / Hydrogen Peroxide, 30% 1 gal	820803	05/25/2025	11/26/2024 / Eman	11/22/2024 / Eman	M6125

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

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 #
Seidler Chemical	DIW / DI Water	Daily Lab-Certified	07/03/2029	07/03/2024 / lwona	07/03/2024 / lwona	W3112

Certificate of Analysis

R: 02/22/24 M5986, M5987, M5988, M5989, M5990

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1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
 Catalog Number: CLPP-SPK-5
 Lot Number: V2-MEB742037
 Matrix: 5% (v/v) HNO₃
 Value / Analyte(s):
 100 µg/mL ea:
 Antimony,
 50 µg/mL ea:
 Selenium, Thallium,
 Cadmium,
 40 µg/mL ea:
 Arsenic,
 20 µg/mL ea:
 Lead

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Antimony, Sb	100.0 ± 0.7 µg/mL	Arsenic, As	40.00 ± 0.26 µg/mL
Cadmium, Cd	49.99 ± 0.22 µg/mL	Lead, Pb	19.99 ± 0.09 µg/mL
Selenium, Se	50.00 ± 0.23 µg/mL	Thallium, Tl	50.00 ± 0.22 µg/mL

Density: 1.025 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
Cd	Calculated		See Sec. 4.2
Pb	ICP Assay	3128	101026
Pb	EDTA	928	928
Pb	Calculated		See Sec. 4.2
Sb	ICP Assay	3102a	140911
Se	ICP Assay	3149	100901
Se	Calculated		See Sec. 4.2
Tl	ICP Assay	3158	151215
Tl	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:

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

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

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)

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

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 12, 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

- **March 12, 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





CERTIFIED WEIGHT REPORT:

Part Number: 57056
Lot Number: 010924
Description: Barium (Ba)

Solvent: Nitric Acid
Lot #

Expiration Date: 01/09/27

2% 40.0 (mL) Nitric Acid

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL): 1000

NIST Test Number: 6UTB

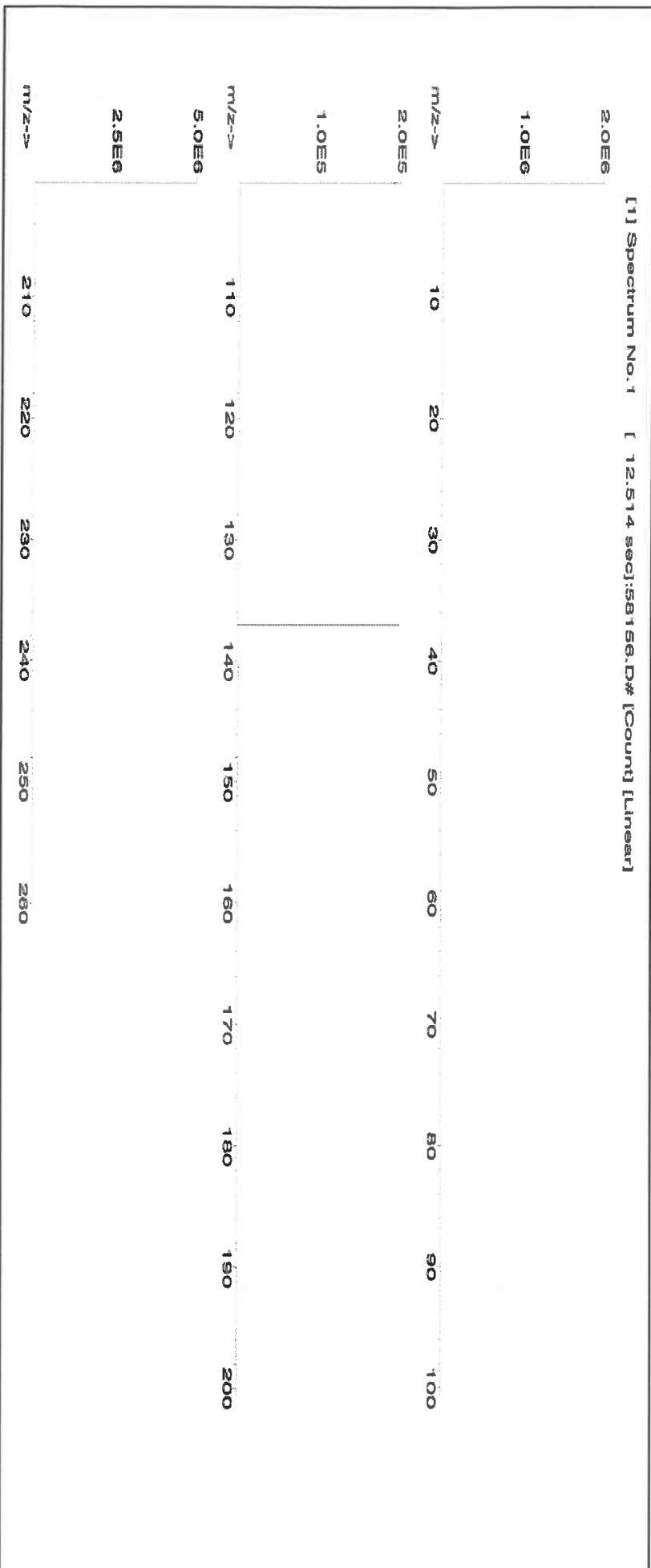
5E-05 Balance Uncertainty

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

Giovanni Caporaso	
Formulated By:	Giovanni Esposito
	010924
Reviewed By:	Pedro L. Renteria
	010924

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. 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/mL 3 0.1 µg/mL 355 mg/kg 3104a





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

203

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:

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:
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

Weight shown below was diluted to (mL):

2000.07

SE-05 Balance Uncertainty
0.100 Flask Uncertainty

<i>Aleah O'Brady</i>	
Formulated By:	Aleah O'Brady
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

SDS Information

1. Cadmium nitrate tetrahydrate (Cd)

IN024 CDM09221A1

1000

99.999

0.10

36.5

5.4797

5.4804

1000.1

2.0

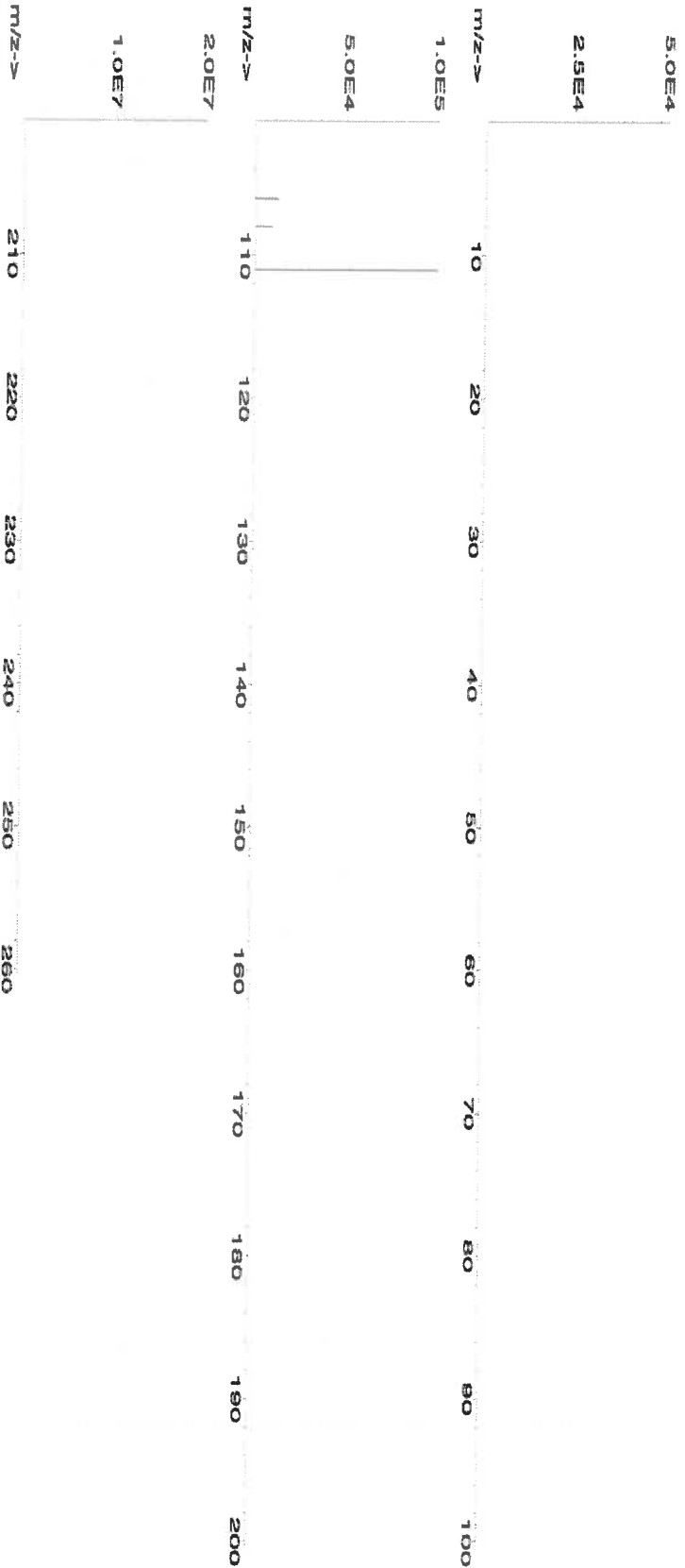
10022-68-1

0.01 mg/m3

or-rat 60.2mg/kg

3108

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





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

205

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:

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).

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 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-CLP-4
 Lot Number: S2-MEB711673
 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 ± 6 µg/mL	Molybdenum, Mo	1 000 ± 6 µg/mL
Silicon, Si	1 000 ± 7 µg/mL	Tin, Sn	1 000 ± 6 µg/mL
Titanium, Ti	1 000 ± 7 µg/mL		

Density: 1.030 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

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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



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

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

u_{ts} = transport stability standard uncertainty

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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

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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

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

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 Reference Material CRM



CERTIFIED WEIGHT REPORT:

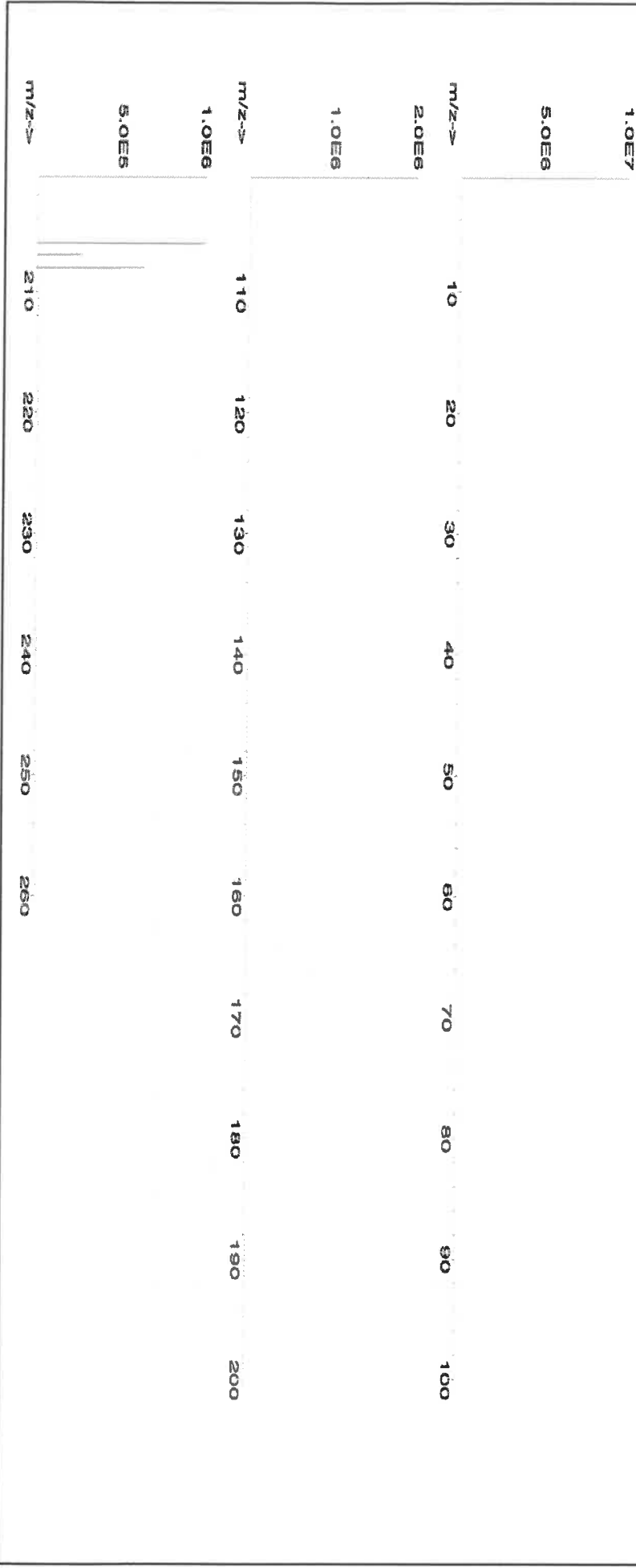
Part Number: 57182
Lot Number: 110923
Description: Lead (Pb)
Solvent: 24002546 Nitric Acid
Lot #

Expiration Date: 110926
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

Formulated By:	Lawrence Barry
Reviewed By:	Pedro L. Rentas
110923	

SDS Information									
Compound	Lot	Nominal	Purity	Uncertainty	Assay	Target	Actual	Actual	Expanded
	Number	Conc. (µg/mL)	(%)	Purity (%)	(%)	Weight (g)	Weight (g)	Conc. (µg/mL)	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
									inhalant 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):

217

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

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: 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

Certificate of Analysis

300 Technology Drive
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1.0 ACCREDITATION / REGISTRATION

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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

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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



M5289 R: 07/12/22
Certified Reference Material CRM

(34)



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

CERTIFIED WEIGHT REPORT:

Part Number: 58113
Lot Number: 070622
Description: Aluminum (Al)

Lot #
Solvent: 20370011 Nitric Acid

Expiration Date: 070625
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 10000
NIST Test Number: 6UTB

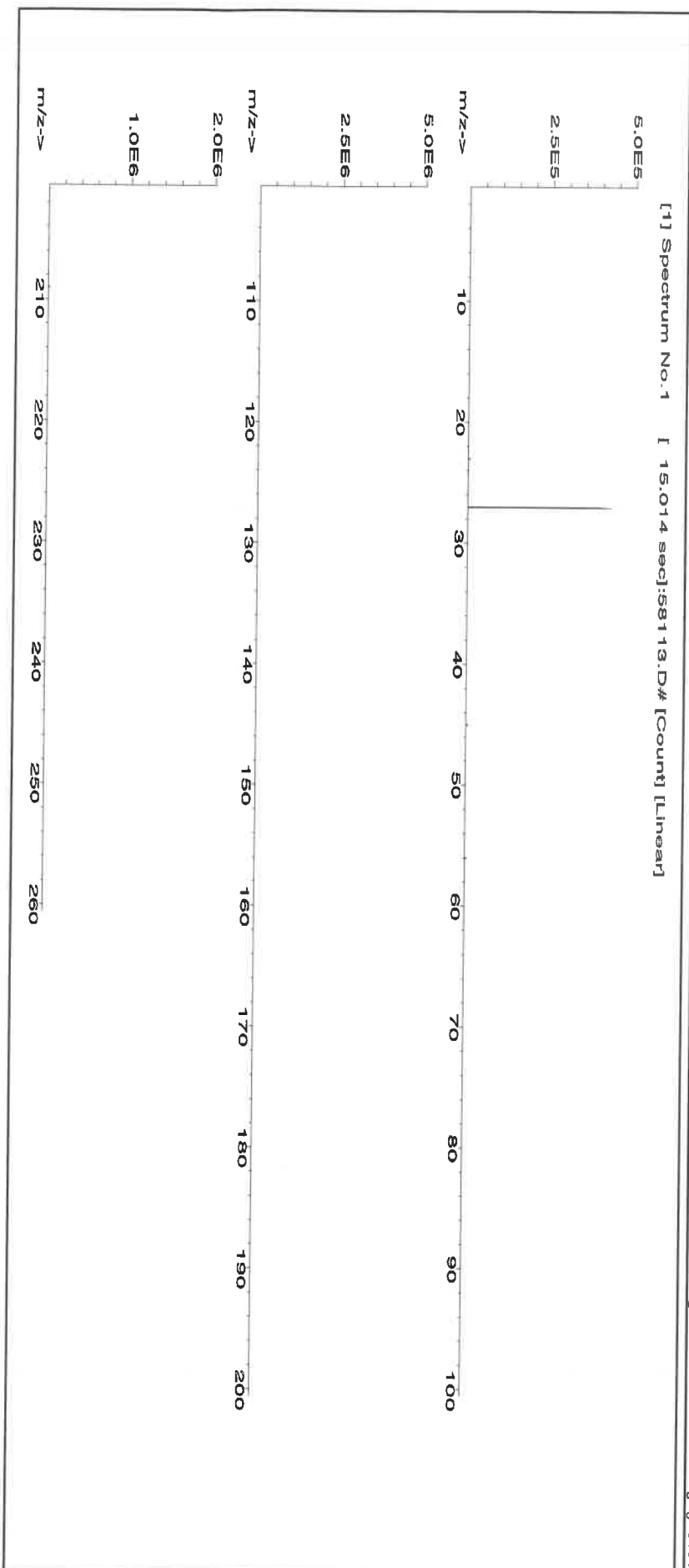
2% 40.0 (mL) Nitric Acid

Weight shown below was diluted to (mL): 2000.02 0.058 Balance Uncertainty
5E-05 Flask Uncertainty

Formulated By:	Lawrence Barry
	070622
Reviewed By:	Pedro L. Rientas
	070622

Compound	SDS Information										NIST SRM	
	Solvent Safety Info. On Attached pg.)							Expanded Uncertainty		CAS#		
	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	+/- (µg/mL)			
RM#											OSHA PEL (TWA)	LD50

1. Aluminum nitrate nonahydrate (Al) IN022 ALD012021A1 10000 99.999 0.10 7.10 281.6956 281.6977 10000.1 20.0 7784-27-2 2 mg/m3 or-tal 3671 mg/kg 3101a





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

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

Al	T	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	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	Ti	<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: 4/20/21

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.

Contains Metals in Dilute Acidic or
Cyanide in Basic Aqueous Solutions
HAZARDOUS MATERIAL

Safety Data Sheets
Available Upon Request

M5291
M5292
M5293
M5294
M5295

(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.





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) $K_2Cr_2O_7$ 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 $K_3Fe(CN)_6$, 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 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

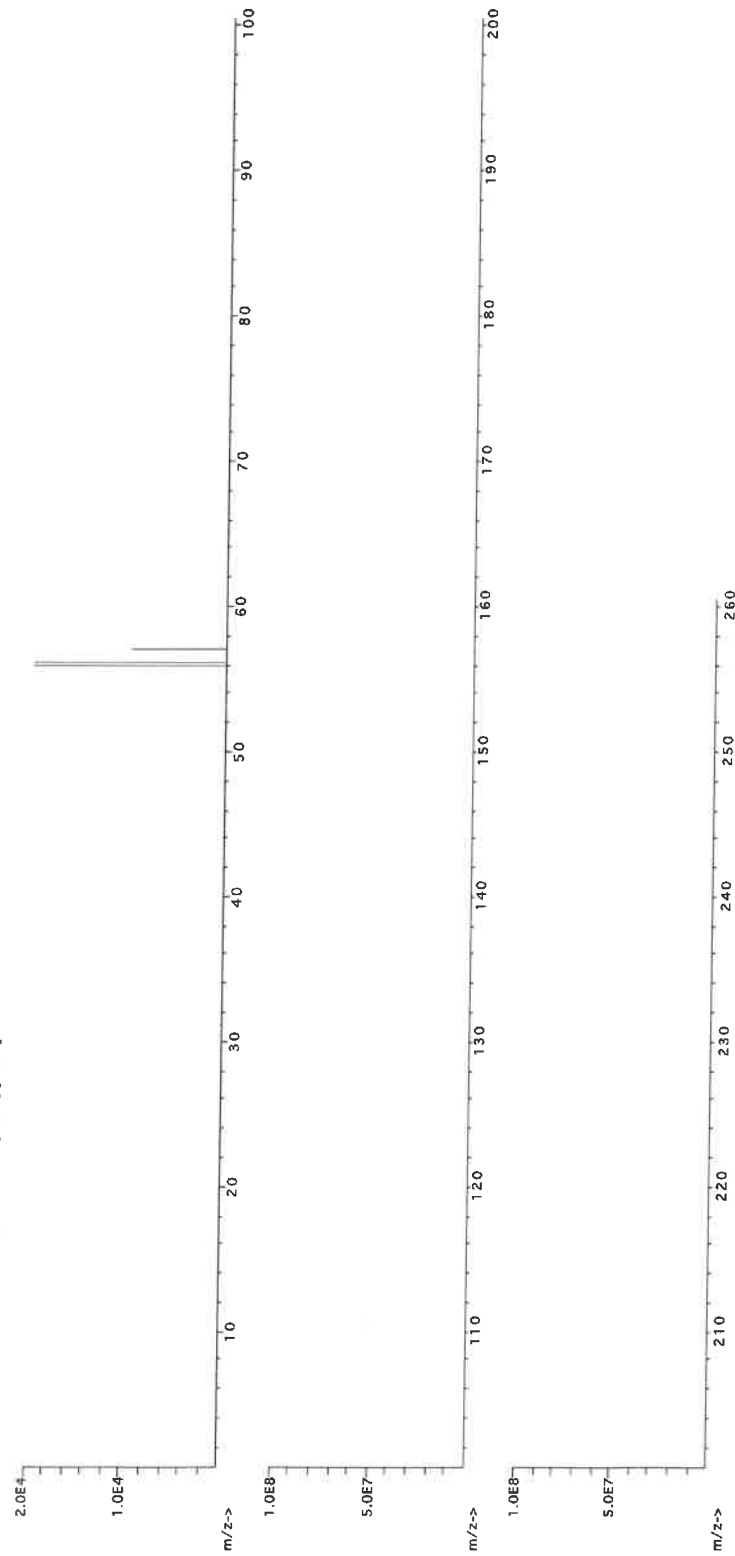
5.0%
150.0
(mL)
Nitric Acid

Weight shown below was diluted to (mL): 3000.41

<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito 020422
<i>Pedro L. Rentas</i>	
Reviewed By:	Pedro L. Rentas 020422

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.)	
1. Iron(III) nitrate nonahydrate (Fe)	IN346	221035107	10000	99.999	0.10	100.0	30.0044	30.0090	10001.5	20.0	7782-61-8	5 mg/m3
											OSHA PEL (TWA)	LD50
												or-hat 7500mg/kg 3126a

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



229

57 6/15/22





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	<0.01	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	<0.10	Mn	<0.02	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	<0.02	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).



R-09/18/22 **(RTH)**

Certified Reference Material CRM

CERTIFIED WEIGHT REPORT:

Part Number: 57056
Lot Number: 072122
Description: Barium (Ba)

Solvent: 20510011 Nitric Acid

Lot #

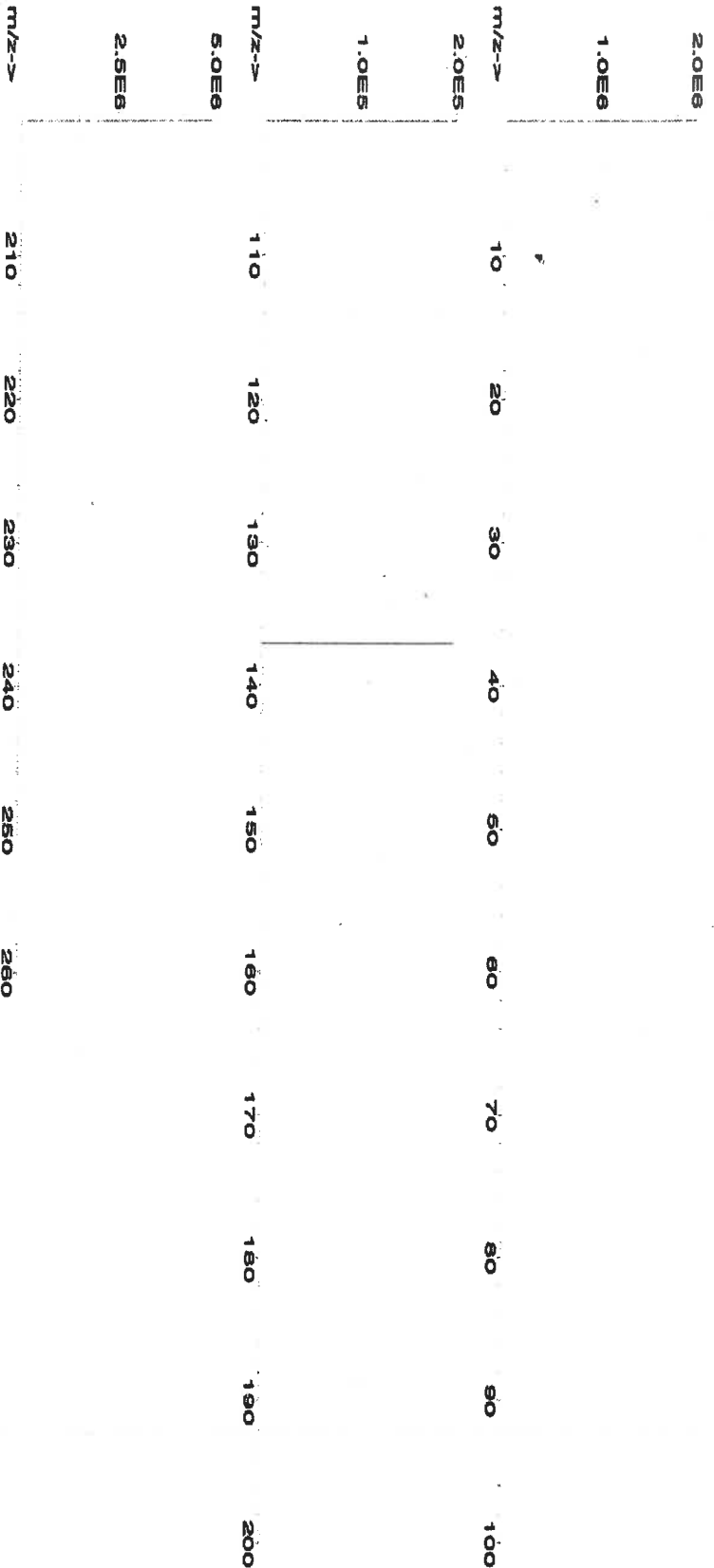
Expiration Date: 072125
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Weight shown below was diluted to (mL): 2000.02
Balance Uncertainty: 5E-05
Flask Uncertainty: 0.058

2% 40.0 (mL) Nitric Acid

<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito
Reviewed By:	<i>Pedro L. Renteria</i>
	072122

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)
1. Barium nitrate (Ba)	IN023 BA022019A1	1000	99.999	0.10	52.3	3.82417	3.82426	1000.0	2.0
									10022-31-8
									0.5 mg/m3
									or:at 355 mg/kg
									31046

[1] Spectrum No. 1 [12.514 sec]:58156.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	<0.02	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	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	<0.02	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	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.02	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:

Ben. P. R.

* 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 by a NIST-recognized laboratory.

* 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
Reviewed By:	Pedro L. Rentas

070622

070622

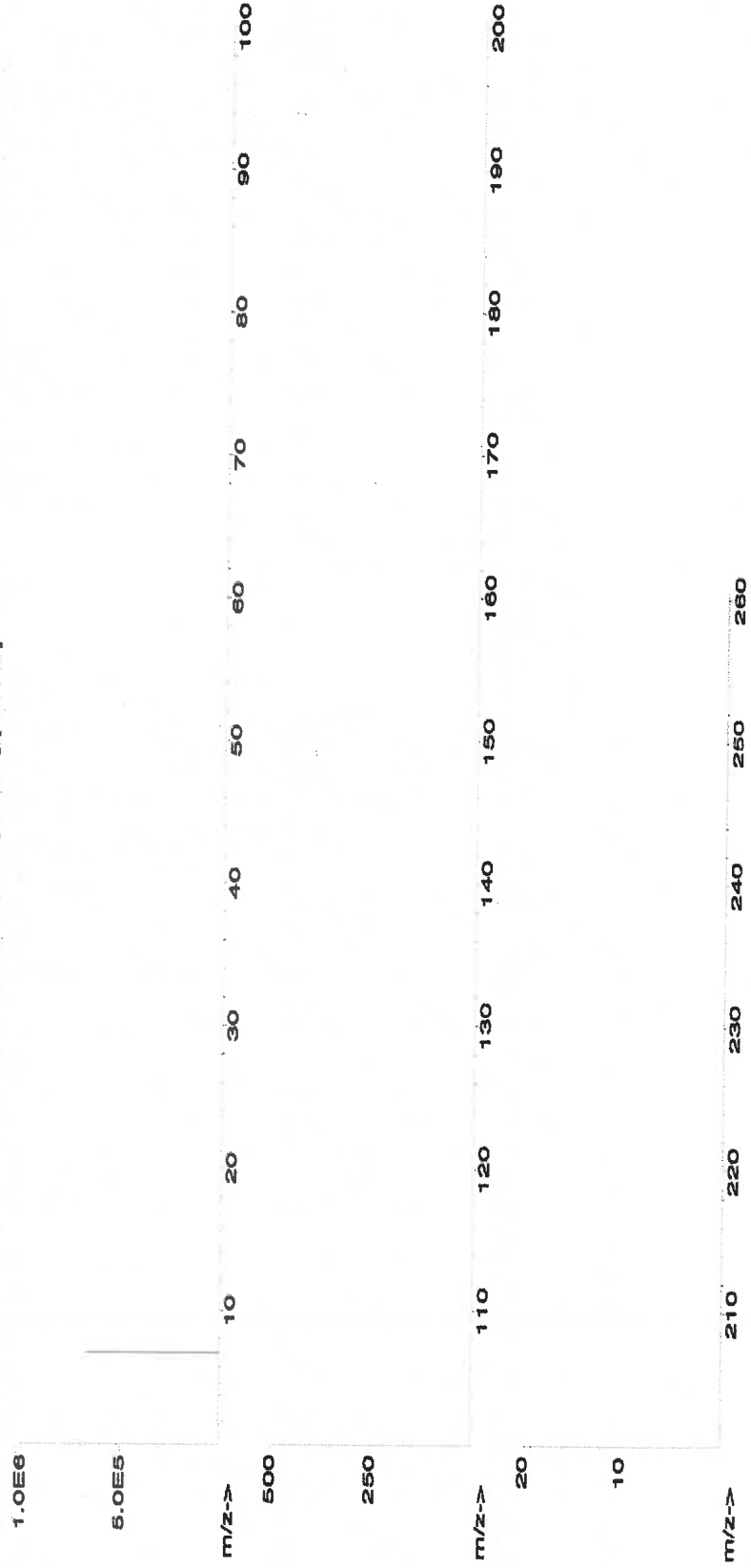
Compound	RM#	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Assay		Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty		(Solvent Safety Info. On Attached pg.)	NIST SRM
					Purity (%)	Assay (%)				Actual	Uncertainty		

1. Lithium nitrate (Li)	IN019	L2042019A1	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
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SDS Information

(Solvent Safety Info. On Attached pg.)
CAS# OSHA PEL (TWA) LD50

[1] Spectrum No.1 [9.619 sec]:58103.D# [Count] [Linear]



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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	<0.2	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).



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 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

2%
60.0
(mL)
Nitric Acid

Weight shown below was diluted to (mL): 3000.41
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

<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 (%)

Purity
(%)

Nominal
Conc. (µg/mL)

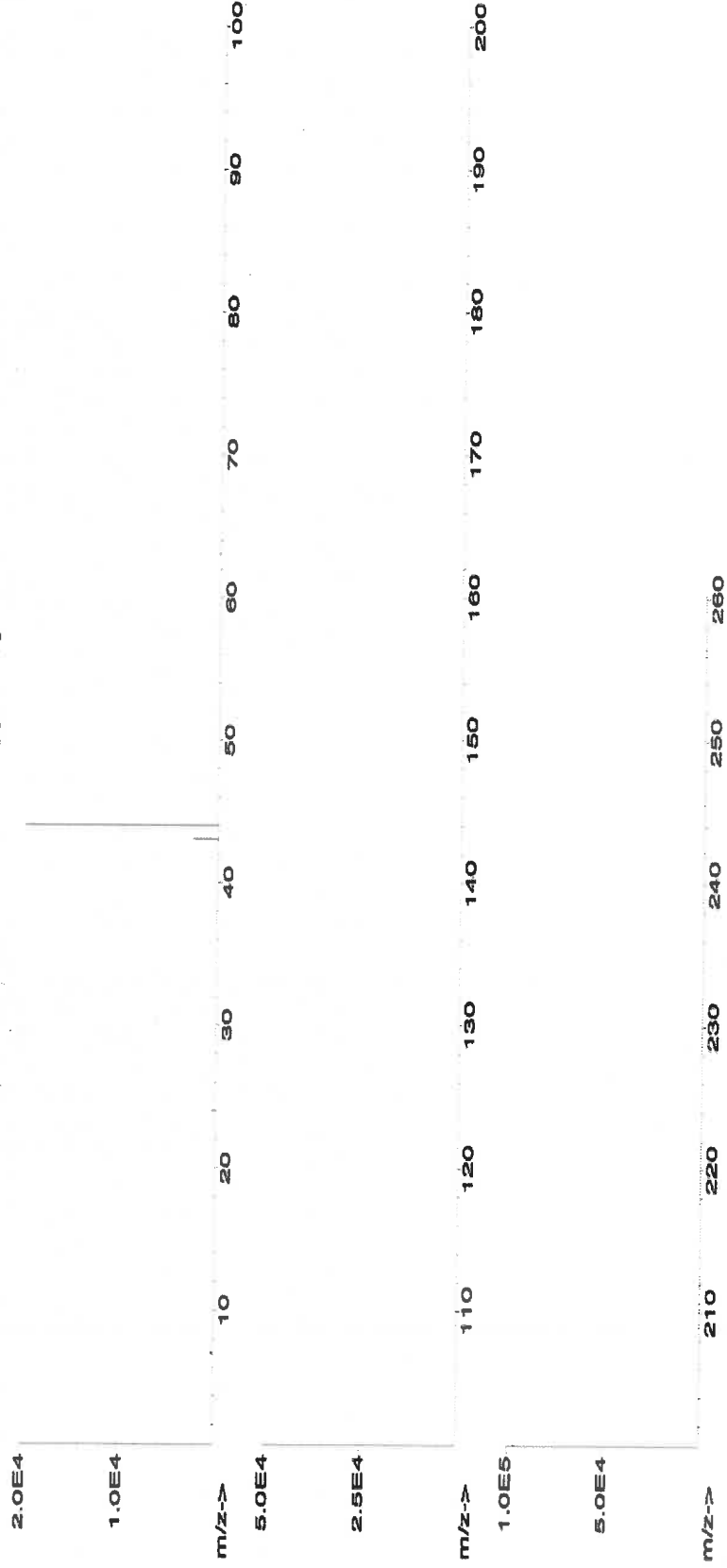
Lot
Number

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]



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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 WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57182
061522
Lead (Pb)

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

061525
Ambient (20 °C)
10000
6UTB

Weight shown below was diluted to (mL):

2000.02

5E-05 Balance Uncertainty

0.058 Flask Uncertainty

Solvent:

20510011 Nitric Acid

2% 40.0 Nitric Acid

(mL)

Lot #

20510011

Nitric Acid

Formulated By:

Giovanni Esposito

Reviewed By:

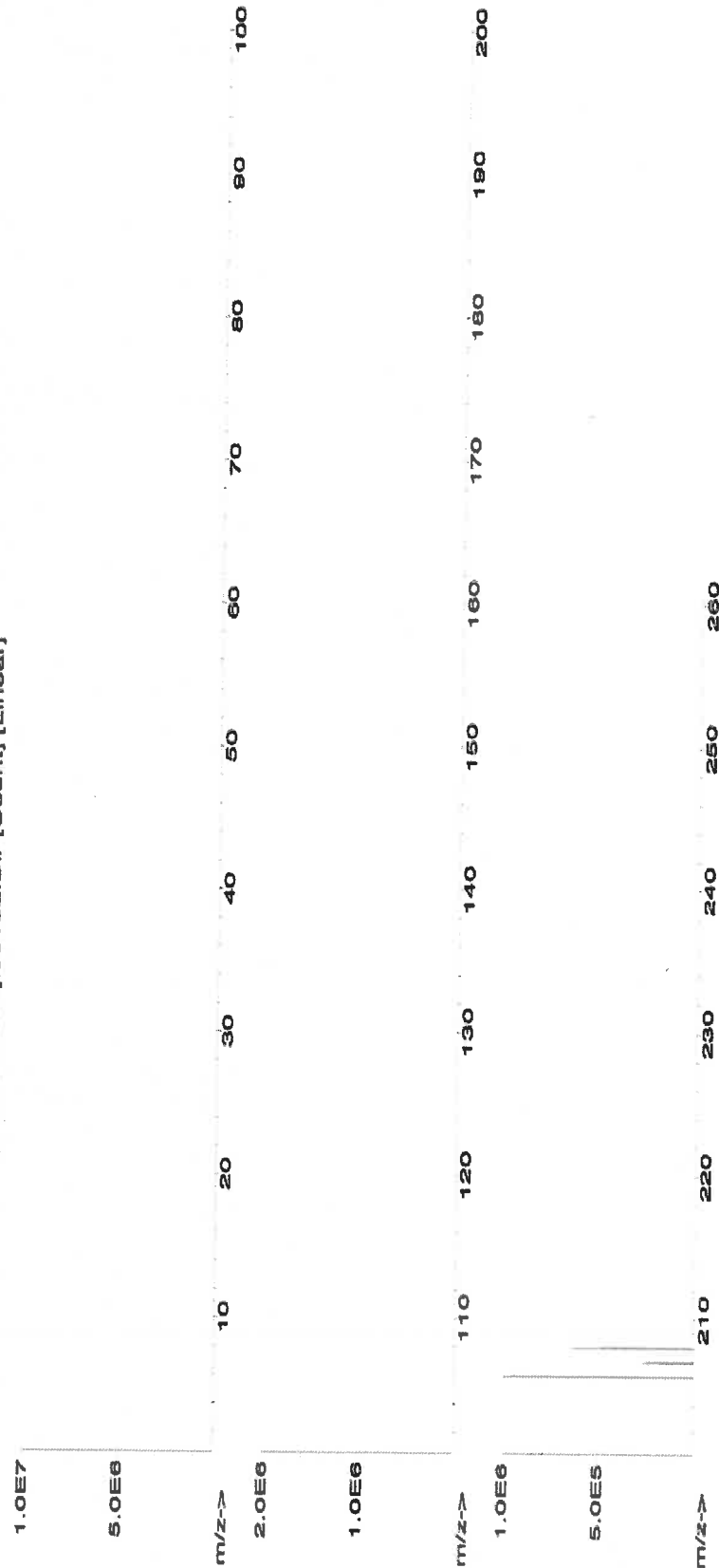
Pedro L. Rentas

061522

061522

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.)	NIST SRM
1. Lead(II) nitrate (Pb)	IN029	PBD12201641	10000	99.999	0.10	82.5	32.0006	32.0041	10001.1	20.0	10098-74-8 0.05 mg/m3 inh-via-rat 88 mg/kg	3128

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



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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	<0.02	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	<0.01	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	<0.2	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	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:

Ben P. Sha

- * 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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- * 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).

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CERTIFIED WEIGHT REPORT:

M5514, M5515
Lot #

R: 03/12/23

Part Number:
Lot Number:
Description:

58126
092122
Iron (Fe)

Solvent: 20510011 Nitric Acid

Expiration Date:

092125

7.0%

350.0 (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

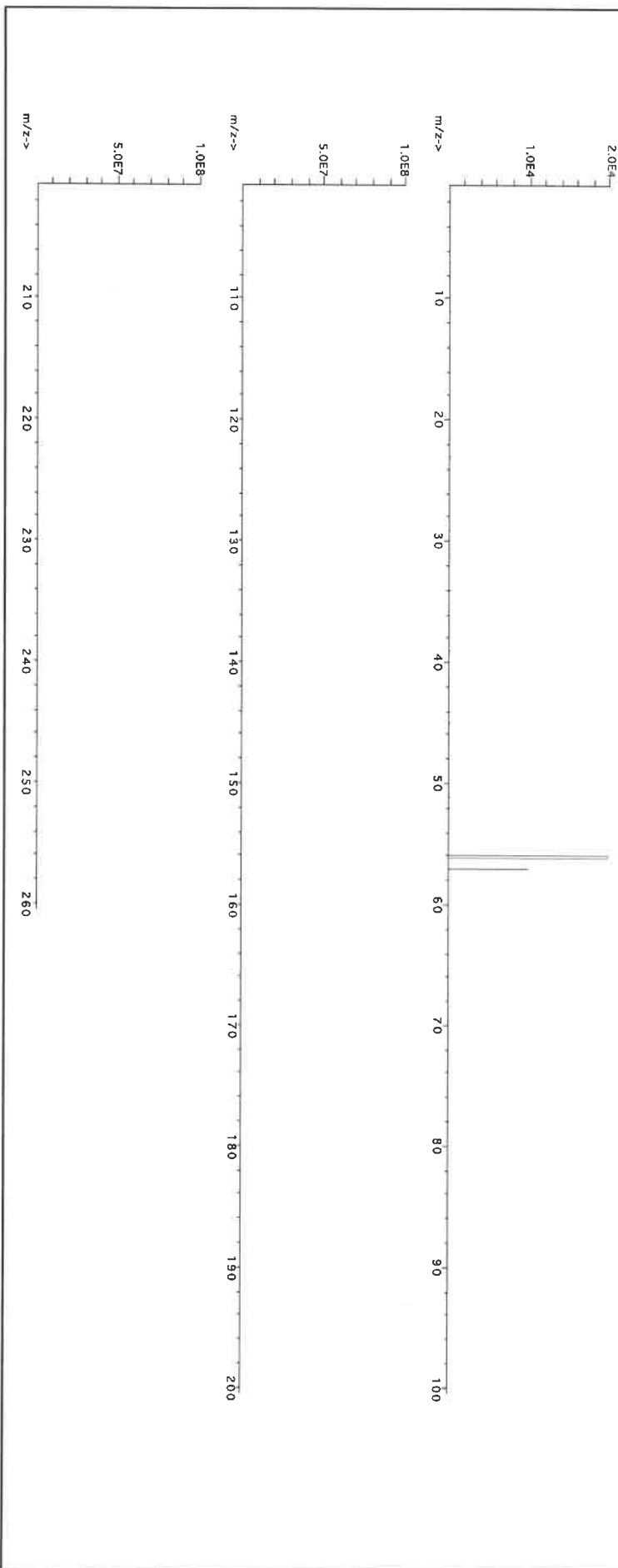
<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito
Reviewed By:	<i>Pedro L. Rentas</i>
	Pedro L. Rentas
	092122

SDS Information

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	NIST SRM
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1. Iron (Fe) IN346 2224912-500 10000 99.995 0.10 100.0 50.0034 50.0111 10001.5 20.0 7439-89-6 5 mg/m3 or-hal 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	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	<0.02	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	<0.05	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	<0.05
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.
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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).

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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	Tc	<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	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	T	Th	<0.02	Yb	<0.02
Be	<0.01	Cr	<0.02	Ga	<0.02	Fe	<0.02	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	<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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Certified Reference Material CRM

CERTIFIED WEIGHT REPORT:

Part Number: **58119**
Lot Number: **120822**
Description: **Potassium (K)**

Solvent: 20510011 Nitric Acid

Lot #

Giovanni Esposito

Formulated By: Giovanni Esposito 120822

Expiration Date: 120825
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 10000
NIST Test Number: 6UTB

2% 60.0 (mL) Nitric Acid

Pedro L. Renteria

Reviewed By: Pedro L. Renteria 120822

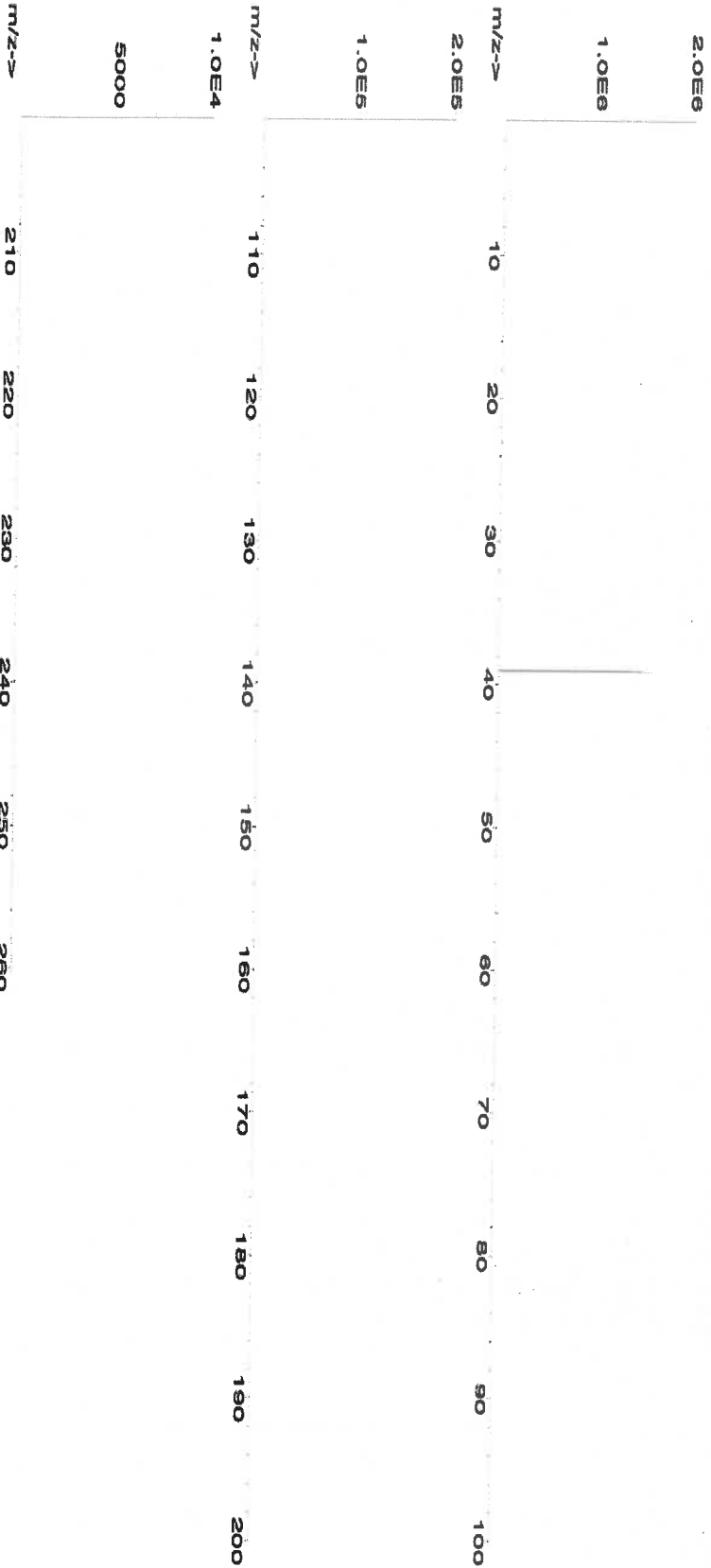
Weight shown below was diluted to (mL): 3000.4 0.06 Flask Uncertainty

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. 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 or/air 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):

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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:

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.
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CERTIFIED WEIGHT REPORT:

Part Number: 58024
Lot Number: 060523
Description: Chromium (Cr)

Lot #
21110221
Solvent: Nitric Acid

2.0%

40.0 (mL)

Nitric Acid

Formulated By: Lawrence Barry

060523

060523

Reviewed By:	Pedro L. Renteria
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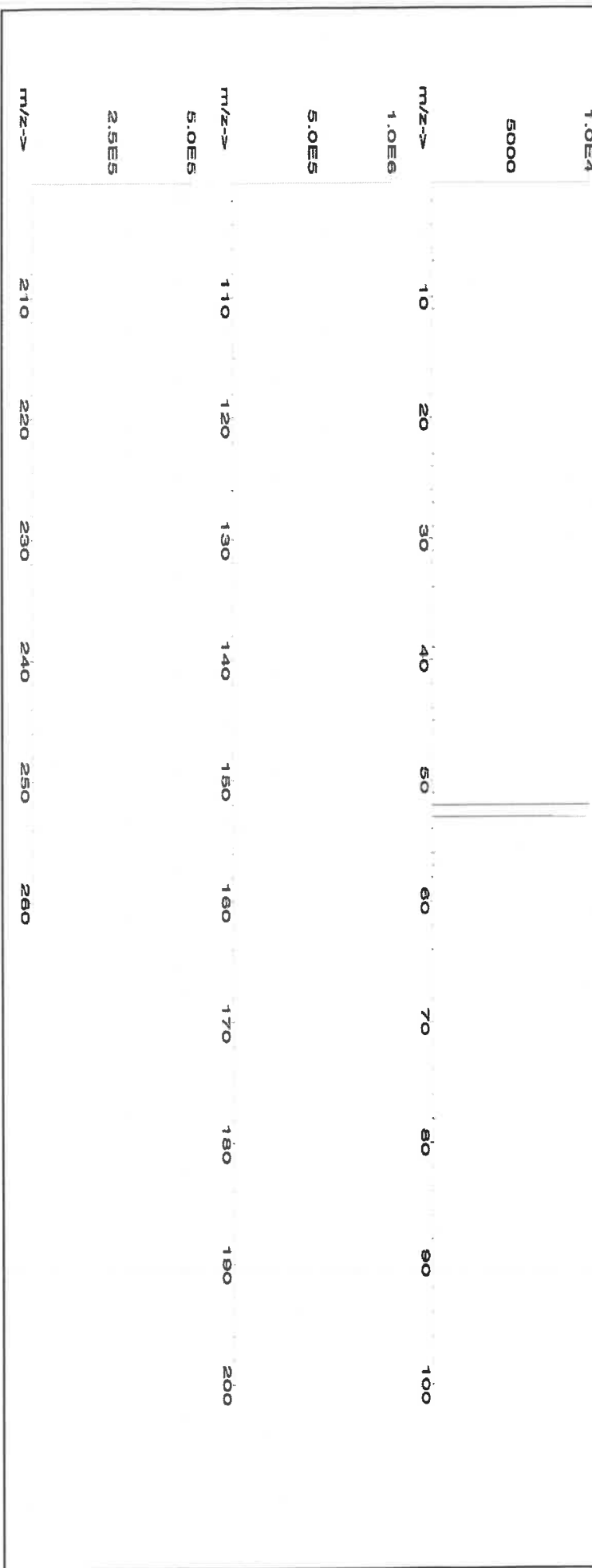
Expiration Date: 060526
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Volume shown below was diluted to (mL): 2000.02
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

SDS Information

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):

248

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:

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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CERTIFIED WEIGHT REPORT:

Part Number: 58029
Lot Number: 102523
Description: Copper (Cu)

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

5E-05 Balance Uncertainty

Volume shown below was diluted to (mL): 2000.02

0.058 Flask Uncertainty

Formulated By: Benson Chan 102523

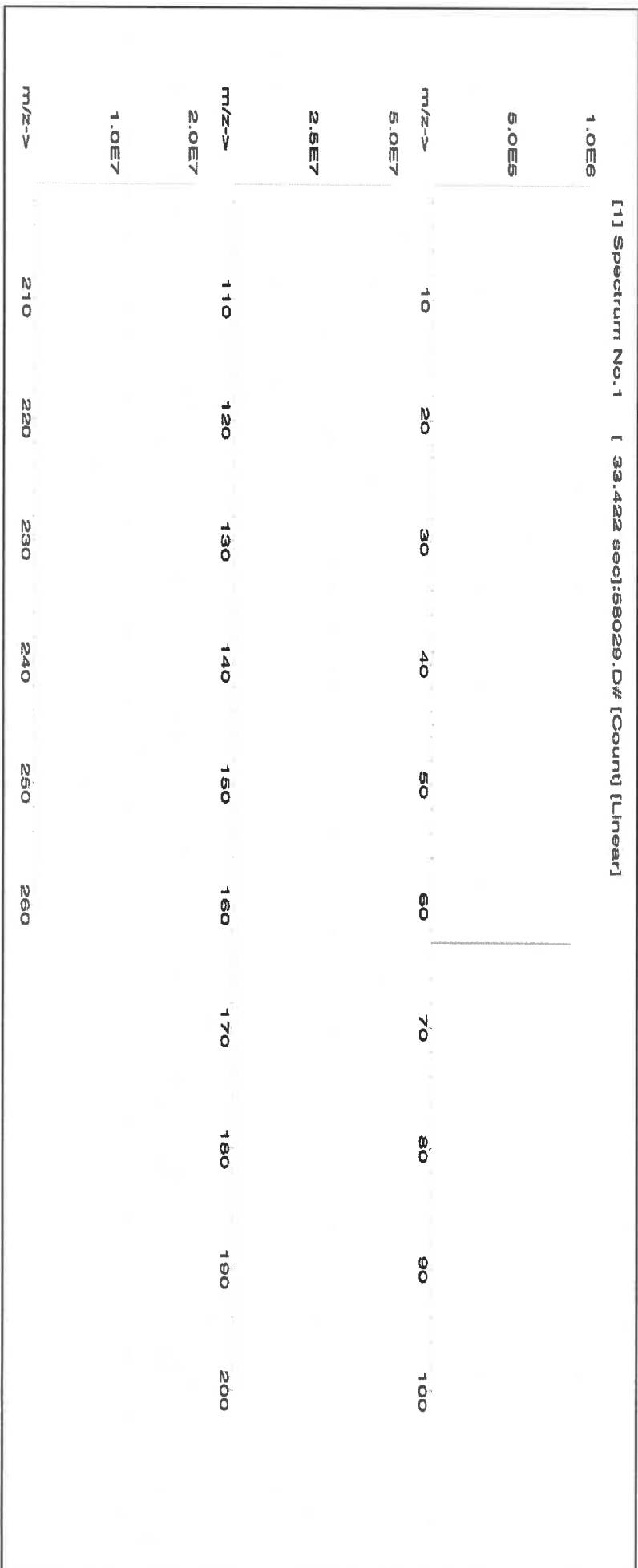
Reviewed By: Pedro L. Rentas 102523

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. 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 or-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	<0.01	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	T	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:

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:
Lot Number:
Description:

58025
102623
Manganese (Mn)

Lot #
Solvent:

24002546
Nitric Acid

Expiration Date:

102626

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

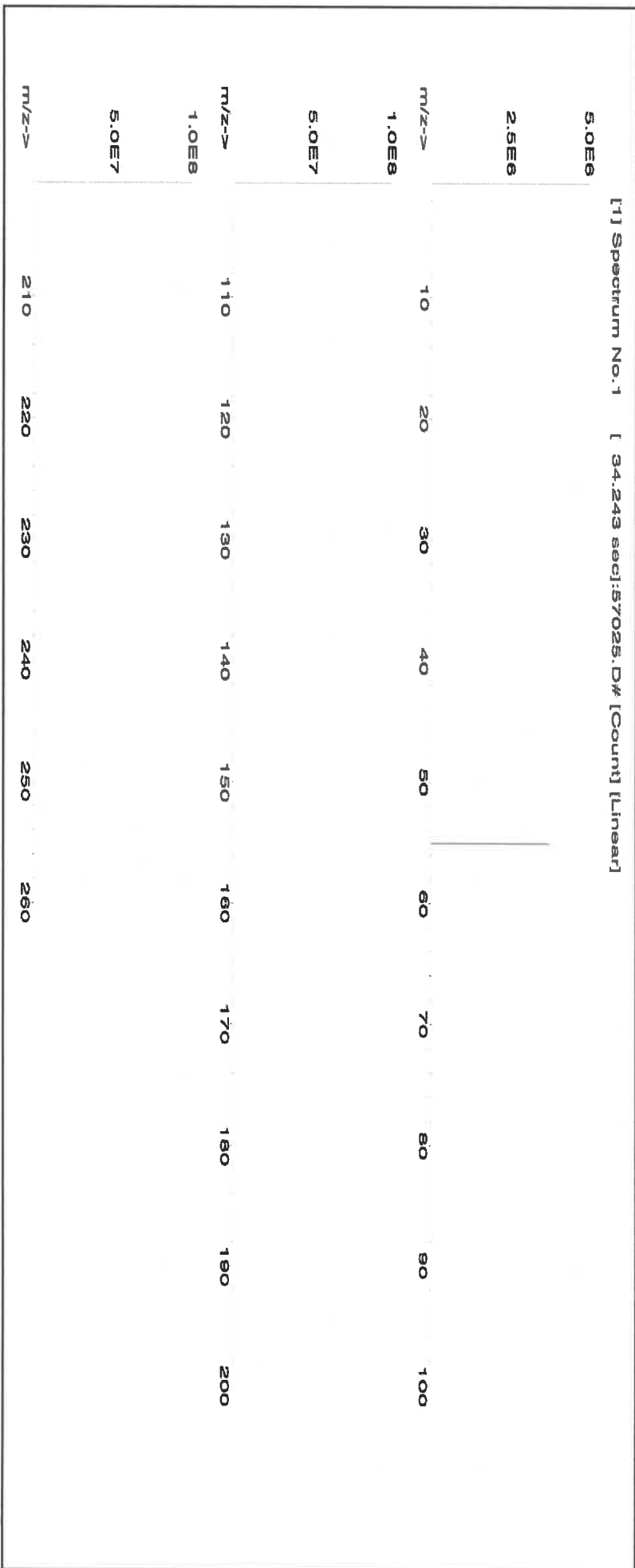
Formulated By:	Benson Chan	102623
Reviewed By:	Pedro L. Ruelas	102623

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)	SDS Information (Solvent Safety Info. On Attached pg.)	NIST SRM
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1. Manganese(II) nitrate tetrahydrate (Mn) 58125 071123 0.1000 300.0 0.084 1000 10000.1 1000.0 2.1 20694-39-7 5 mg/m3 or-rel >300mg/kg 3132

[1] Spectrum No.1 [34.243 sec]:57025.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	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 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).



M5768 M5769
Certified Reference Material CRM
R: 1/13/24



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

CERTIFIED WEIGHT REPORT:

Part Number: 58112
Lot Number: 091823
Description: Magnesium (Mg)

Solvent: 24002546 Nitric Acid

Lot #

Expiration Date: 091826

2% 40.0 (mL) Nitric Acid

Recommended Storage: Ambient (20 °C)

M5768 M5769

Nominal Concentration (µg/mL): 10000

6UTB

5E-05 Balance Uncertainty

R: 1/13/24

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

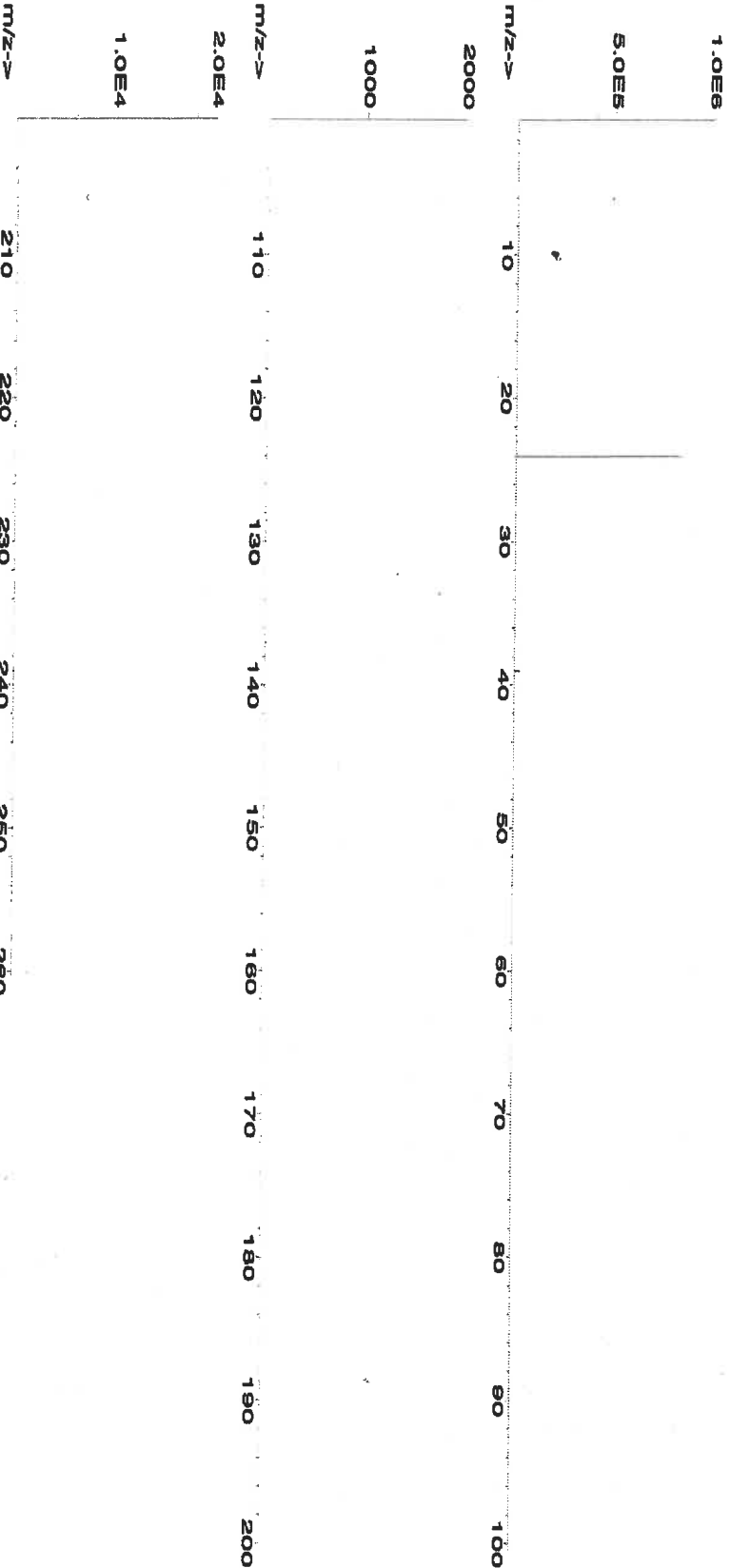
<i>Lawrence Barry</i>	
Formulated By:	Lawrence Barry
Reviewed By:	Pedro L. Rentas
	091823

Compound

Lot	Nominal	Purity	Uncertainty	Assay	Target	Actual	Actual	Expanded	SDS Information	NIST
RW#	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 M500222A1 10000 99.999 0.10 8.51 234.9118 234.9126 10000.0 20.0 13446-18-9 NA or-rat 5440 mg/kg 3131a

[1] Spectrum No. 1 [19.923 sec]:58112.D# [Count] [Linear]





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

254

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	T	Os	<0.02	Rh	<0.02	Ag	<0.02	Tl	<0.02	V	<0.02
Ba	<0.02	Cs	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.02	Pd	<0.02	Rb	<0.02	Na	<0.2	Th	<0.02	Yb	<0.02
Be	<0.01	Cr	<0.02	Ga	<0.02	Fe	<0.2	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	<0.02	Tm	<0.02	Y	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	Sn	<0.02	Zn	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	Ti	<0.02	Zr	<0.02

(T) = Target analyte

Physical Characterization:

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

Certified by:

- * The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- * Purified acids, 18.2 megohm deionized water, calibrated Class A glassware and the highest purity raw materials are used in the preparation of all standards.
- * All standard containers are meticulously cleaned prior to use.
- * Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- * Standards are 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): 2000.02

5E-05 Balance Uncertainty

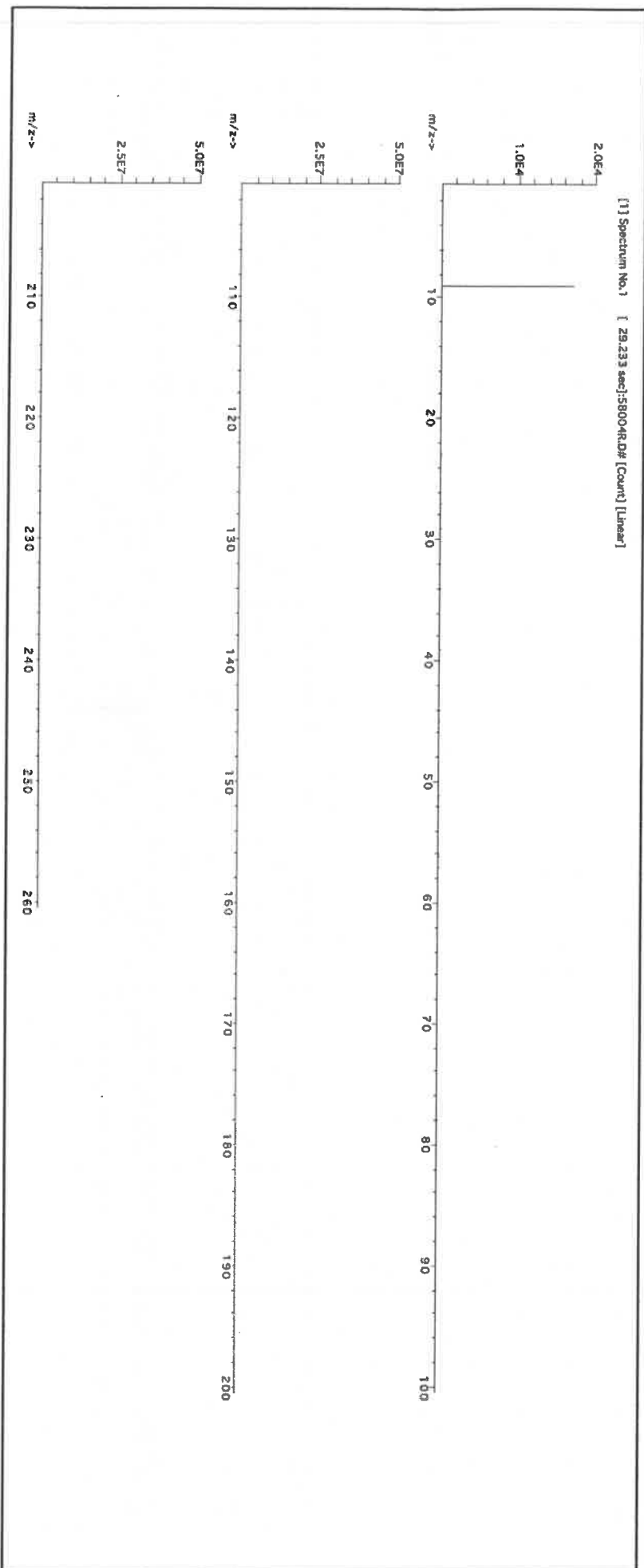
0.058 Flask Uncertainty

Formulated By:	Benson Chan	102523
Reviewed By:	Pedro L. Rentas	102523

SDS Information

Compound	Part Number	Lot	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	intrins-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 (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	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	Ta	<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.
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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

CERTIFIED WEIGHT REPORT:

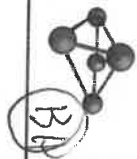
Part Number: 57050
Lot Number: 071123
Description: Tin (Sn)

Solvents: 21110221 Nitric Acid
22D0562008 Hydrochloric acid

Lot #

R-02509124

M599



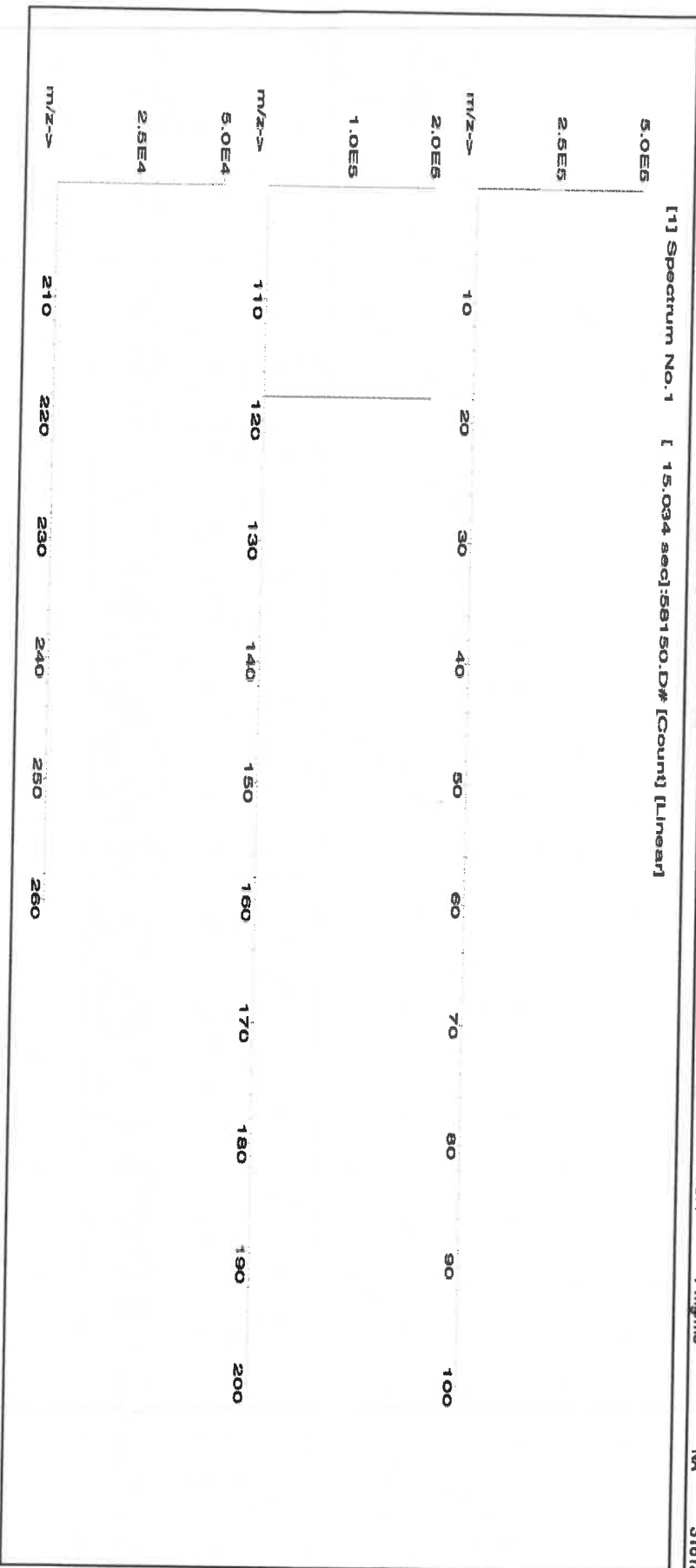
Expiration Date: 071126
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Weight shown below was diluted to (mL): 499.93
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

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):

258

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	Ti	<0.02	Zr	<0.02

(T) = Target analyte

Physical Characterization:

Certified by:

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

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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).



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)

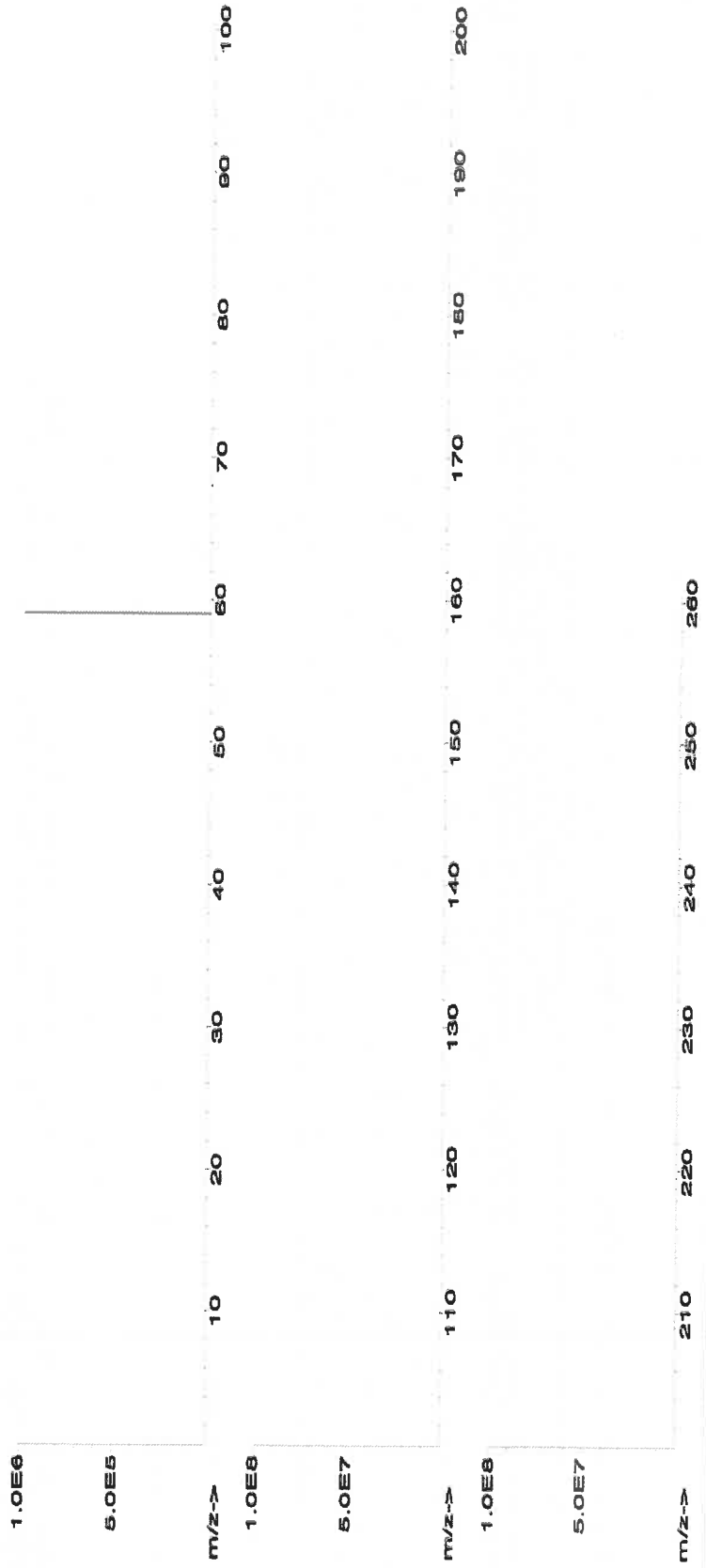
Formulated By:	Lawrence Barry
Reviewed By:	Pedro L. Rentas

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

[1] Spectrum No.1 [34.243 sec]:58027.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	<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).



AR: 02/09/24

M5801

BA



CERTIFIED WEIGHT REPORT:

Part Number: 57033
Lot Number: 111323
Description: Arsenic (As)

Lot # 24002546
Solvent: Nitric Acid

Expiration Date: 111326

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL): 1000

NIST Test Number: 6LUTB

Volume shown below was diluted to (mL): 4000.0

Balance Uncertainty: 5E-05
Flask Uncertainty: 0.06

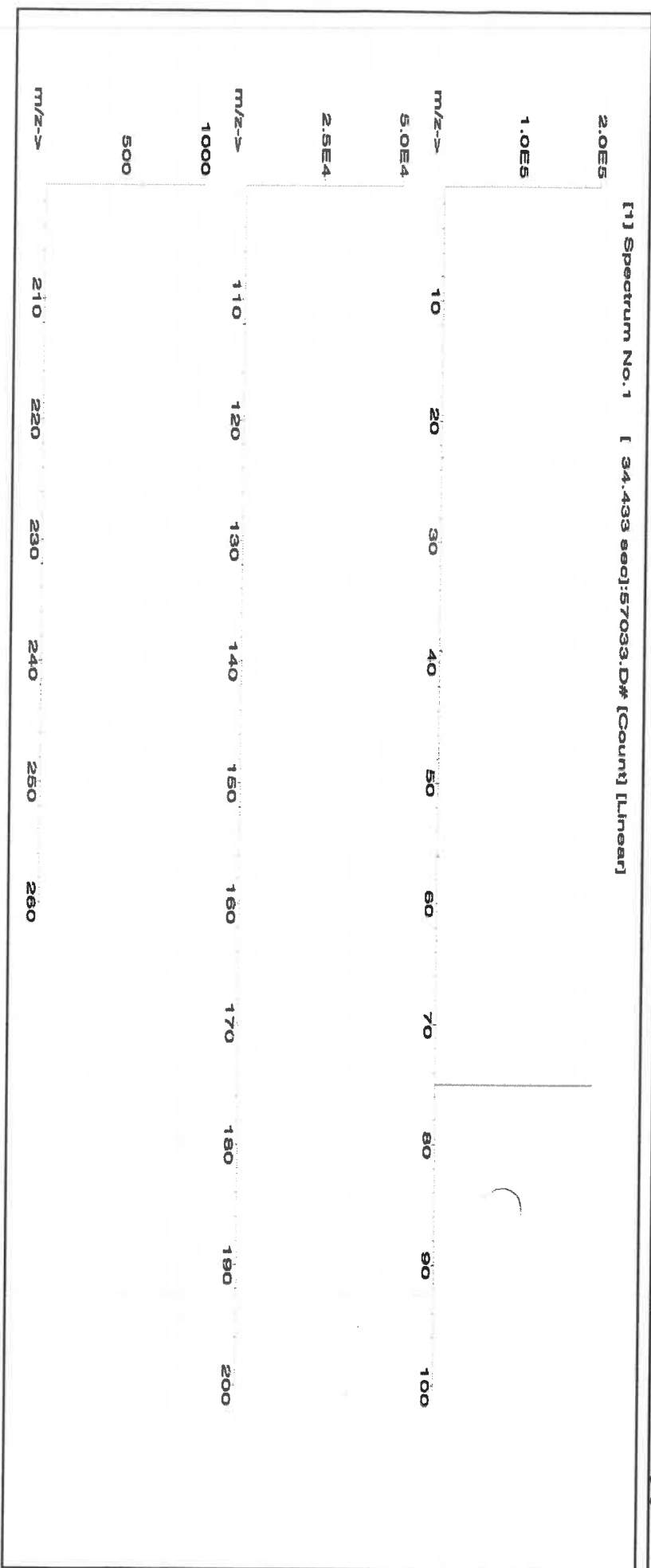
2.0%

80.0 (mL)

Nitric Acid

Formulated By:	Lawrence Barry	111323
Reviewed By:	Pedro L. Rendas	111323

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)
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





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	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 ₂	<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	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.
- * 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: 57115
Lot Number: 041723
Description: Phosphorous (P)

Solvent: 21110221 Nitric Acid

Lot #

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 0.056 Balance Uncertainty Flask Uncertainty

Formulated By:	Lawrence Barry	041723
Reviewed By:	Pedro L. Rentas	041723

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 P082019A1 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

Reviewed By: Pedro L. Rentas

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

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

or-rel 4250mg/kg

3181

[1] Spectrum No. 1 [33.603 sec]:57016.D# [Count] [Linear]





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

266

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:

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: **57116**
Lot Number: **071123**
Description: **Sulfur (S)**

Solvent: **071123** Lot # **071123**
ASTM Type 1 Water

<i>Lawrence Barry</i>	
Formulated By:	Lawrence Barry
071123	
<i>Pedro L. Rentas</i>	
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

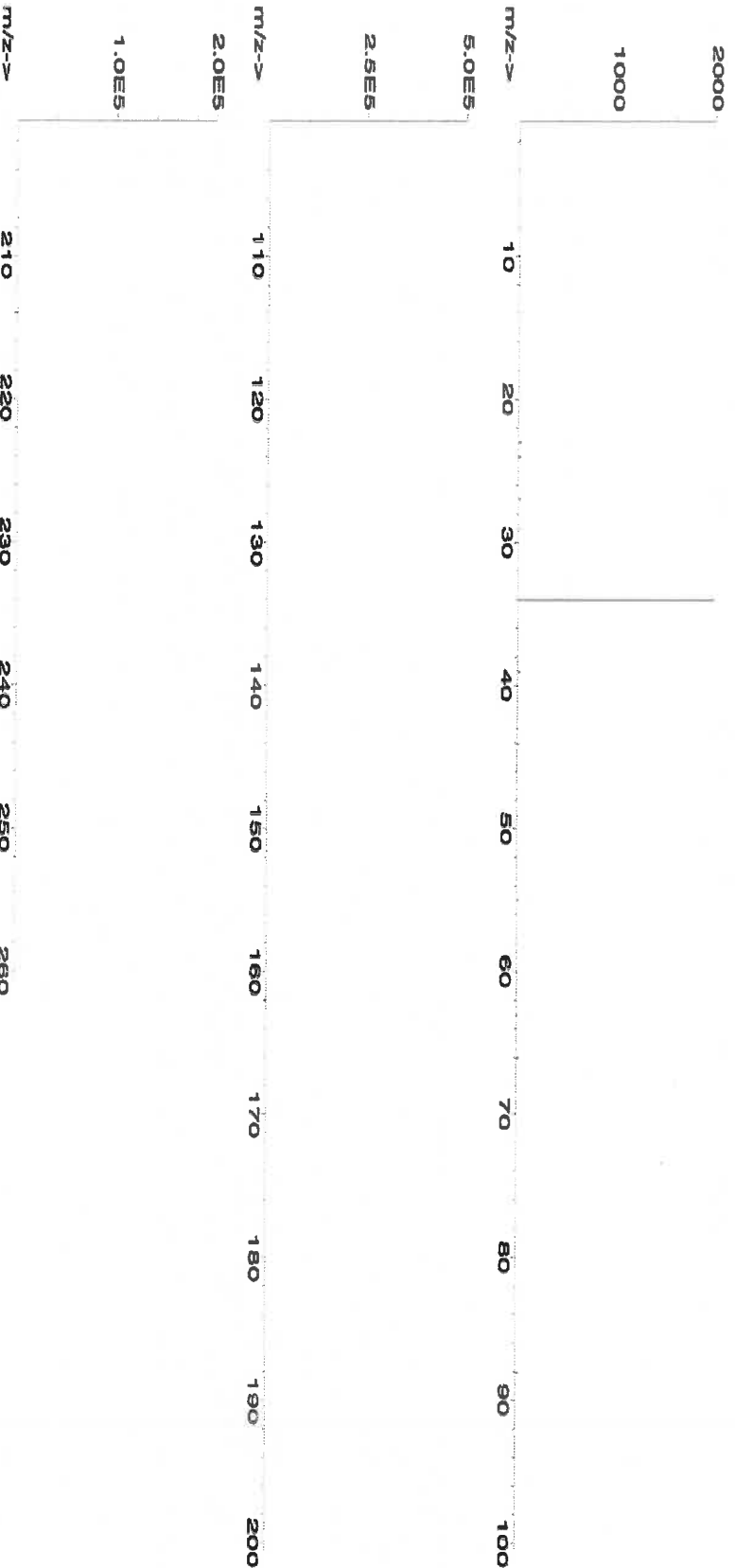
Compound

1. Ammonium sulfate (S) IN117 SLBR725V 10000 99.9 0.10 24.3 82.4675 82.4692 10000.1 20.0 7783-20-2 NA oral-4250mg/kg 3181

SDS Information

Expanded Uncertainty (Solvent Safety Info. On Attached pg.) CAS# OSHA PEL (TWA) LD50 SRM

[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	Ti	<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: **57014**
Lot Number: **122023**
Description: **Silicon (Si)**

Solvent: **24002546 Nitric Acid**

Lot #

Aleah O Brady

Formulated By: **Aleah O Brady**

122023

2% 40.0 (mL) Nitric Acid

Reviewed By:

Pedro L. Rantas

Pedro L. Rantas

122023

Expiration Date: **122026**
Recommended Storage: **Ambient (20 °C)**
Nominal Concentration (µg/mL): **1000**
NIST Test Number: **6UTB**

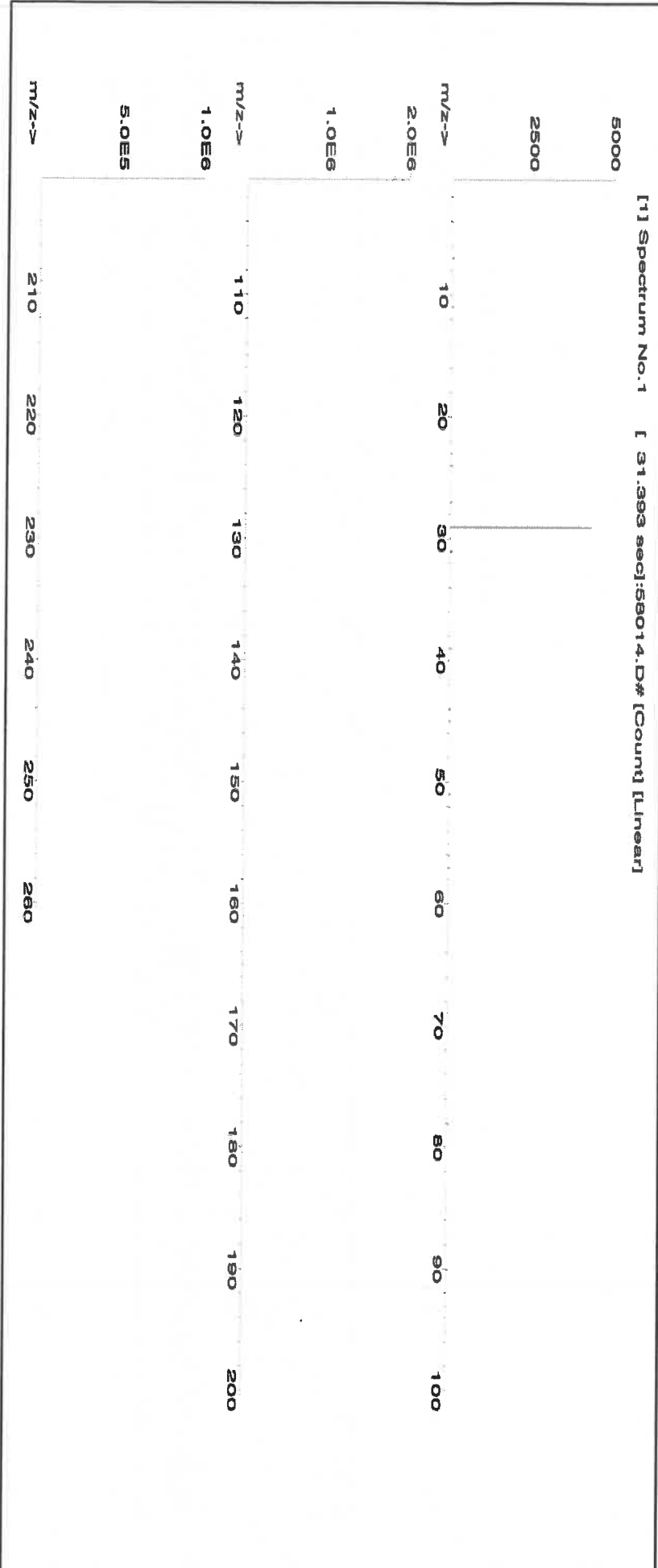
Weight shown below was diluted to (mL): **1999.48** 5E-05 Balance Uncertainty 0.058 Flask Uncertainty

SDS Information

Compound	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty (%)	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 hexafluorosilicate (Si) IN009 S1D08022A1 1000 99.999 0.10 14.4 13.8854 13.8855 1000.0 2.0 18919-19-0 2.5 mg/m3 off-mus 70 mg/kg NA

[1] Spectrum No. 1 [31.393 sec; 158014.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	T	Te	<0.02	U	<0.02
As	<0.2	Ce	<0.02	Bu	<0.02	In	<0.02	Mg	<0.01	Os	<0.02	Ru	<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	<0.02	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	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 WEIGHT REPORT:

Part Number: 58030
Lot Number: 111623
Description: Zinc (Zn)

Solvent: 24002546 Nitric Acid

Lot # R: 02109124 MS819

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

5E-05 Balance Uncertainty

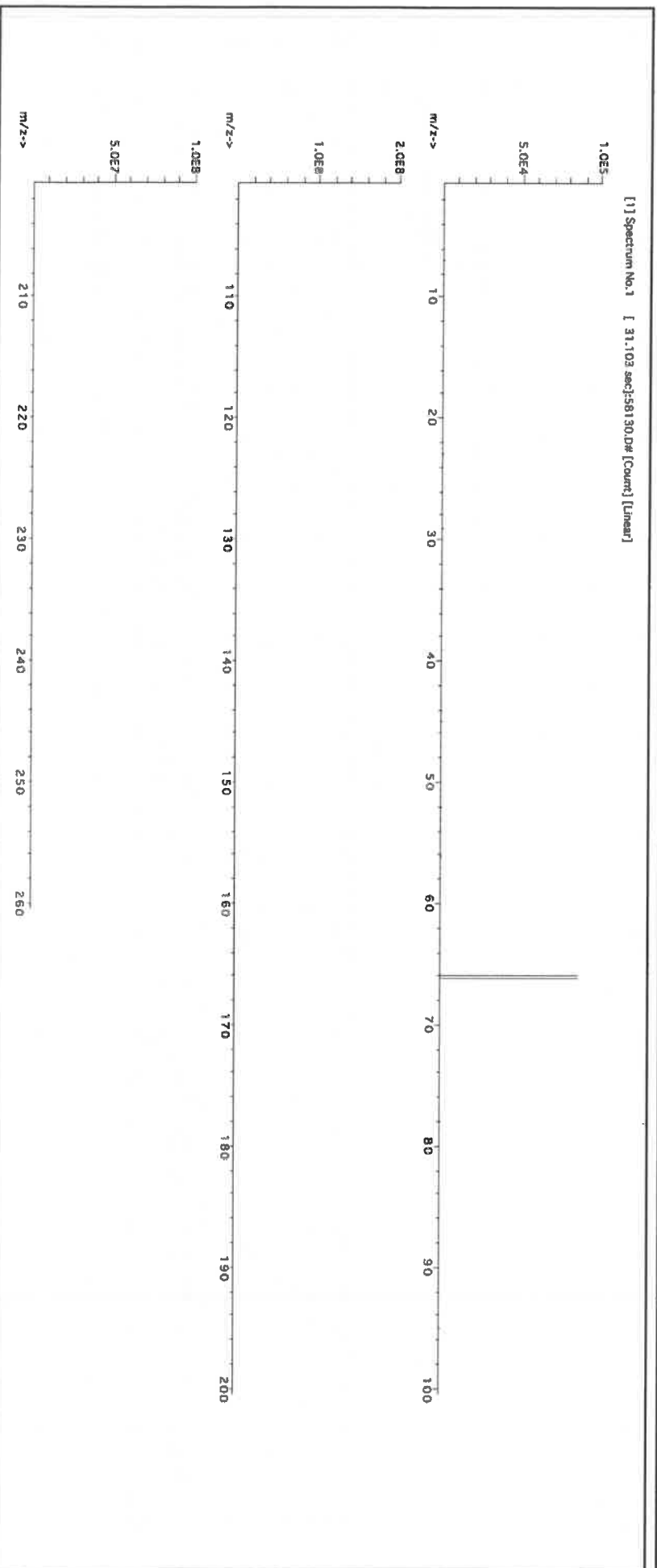
0.06 Flask Uncertainty

Formulated By:	Benson Chan	111623
Reviewed By:	Pedro L. Rientas	111623

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)	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 10196-18-6 1 mg/mL 3168 on-rat 1190mg/kg





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 #

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

091123

2% 40.0 (mL) Nitric Acid

273

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 0.058 Balance Uncertainty Flask Uncertainty

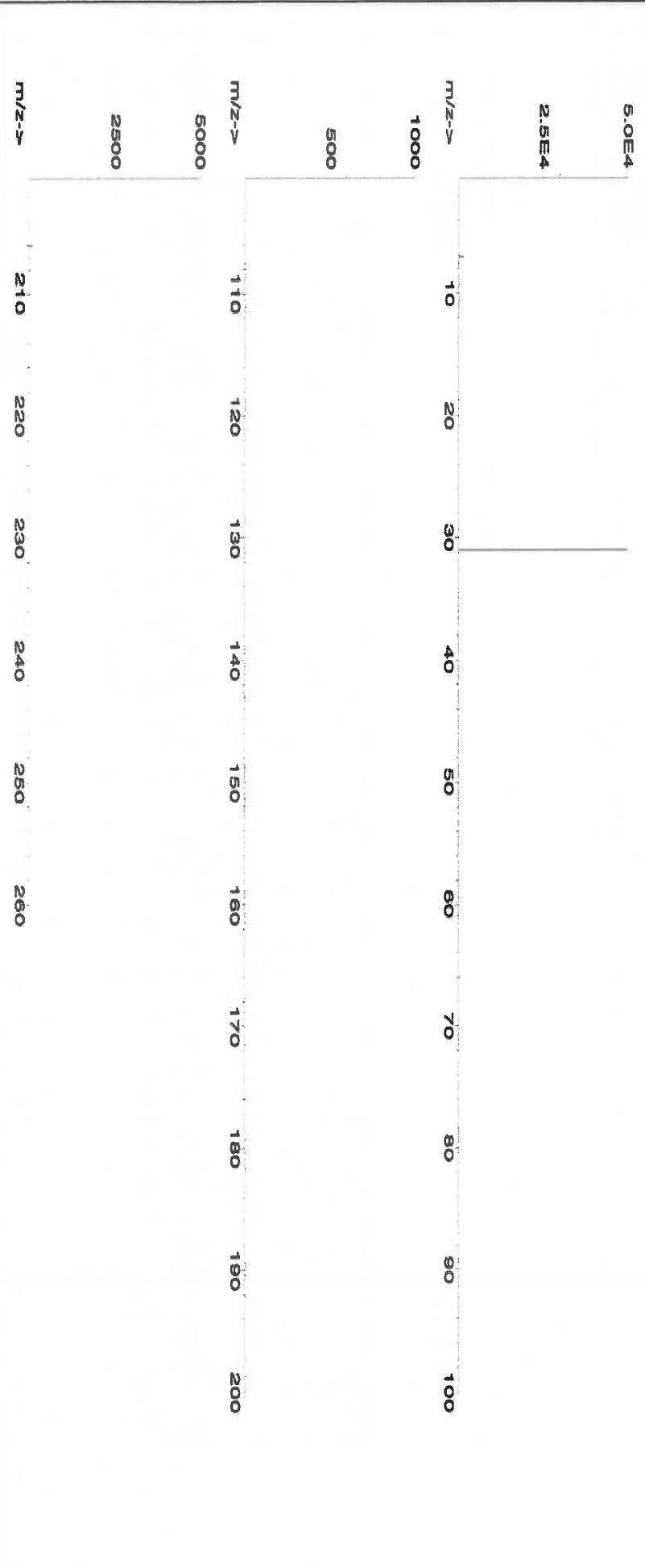
Compound

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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SDS Information

1. Ammonium dihydrogen phosphate (P) IN008 PVO62019A1 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 (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	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).

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F: 540-585-3012
info@inorganicventures.com

R: 02/22/24 M.5942

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: CGT11
Lot Number: T2-TI719972
Matrix: 2% (v/v) HNO₃
tr. HF
Value / Analyte(s): 1 000 µg/mL ea:
Titanium
Starting Material: Ti Metal
Starting Material Lot#: 2094
Starting Material Purity: 99.9975%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1002 ± 5 µg/mL
Density: 1.012 g/mL (measured at 20 ± 4 °C)

Assay Information:

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:

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

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	<	0.000536	M	Eu	<	0.000268	O	Na	<	0.032670	M	Se		0.001204	O	Zn	<	0.003267
O	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		0.000096				
O	B	<	0.008929	M	Ge	<	0.002146	M	Os	<	0.000269	O	Sr		0.000096				
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	Te	<	0.001341				
O	Ca		0.000676	M	In	<	0.002683	M	Pr	<	0.000268	M	Th	<	0.053663				
M	Cd	<	0.000268	M	Ir	<	0.000269	M	Pt	<	0.000536	s	Ti	<					
M	Ce	<	0.000268	M	K		0.001172	M	Rb	<	0.000268	M	Tl	<	0.000268				
M	Co	<	0.004293	M	La	<	0.000268	M	Re	<	0.000268	M	Tm	<	0.000268				
M	Cr		0.000752	O	Li	<	0.027225	M	Rh	<	0.000268	M	U	<	0.000268				
M	Cs	<	0.000268	M	Lu	<	0.000268	M	Ru	<	0.000269	M	V	<	0.019855				
O	Cu	<	0.010890	O	Mg	<	0.005445	i	S	<		M	W		0.000473				
M	Dy	<	0.000268	O	Mn	<	0.003267	M	Sb	<	0.006976	M	Y	<	0.002146				
M	Er	<	0.000268	M	Mo		0.000774	O	Sc	<	0.004900	M	Yb	<	0.000536				

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 - 47.87 +4 6 Ti(F)6-2

Chemical Compatibility - 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); Oxide - high temperature history (~800EC) brookite (fuse in Pt0 with K2S2O7); Ores (fuse in Pt0 with KF + K2S2O7 - no KF if silica not present); Organic Matrices (Dry ash at 450EC in Pt0 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 crystalline form).

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 48 amu	14 ppt	N/A	32S16O, 32S14N, 14N16O18O, 14N17N2, 36Ar12C, 48Ca, [96X=2 (where X = Zr, Mo, Ru)]
ICP-OES 323.452 nm	0.0054 / 0.00092 µg/mL	1	Ce, Ar, Ni
ICP-OES 334.941 nm	0.0038 / 0.000028 µg/mL	1	Nb, Ta, Cr, U
ICP-OES 336.121 nm	0.0053 / 0.000034 µg/mL	1	W, Mo, Co

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

June 17, 2022

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

11.2 Lot Expiration Date

- June 17, 2027

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



M5959 R: 6/14/24

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1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte 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 Reference Material CRM

M5960

KK R. 6/11/24



CERTIFIED WEIGHT REPORT:

Part Number:

57028

Lot Number:

041124

Description:

Nickel (Ni)

Expiration Date:

041127

Recommended Storage:

Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

5E-05 Balance Uncertainty

0.002 Flask Uncertainty

Weight shown below was diluted to (mL):

249.85

Lot #

Solvent: 24002546 Nitric Acid

2%

Nitric Acid

5.0

(mL)

SDS Information

Expanded

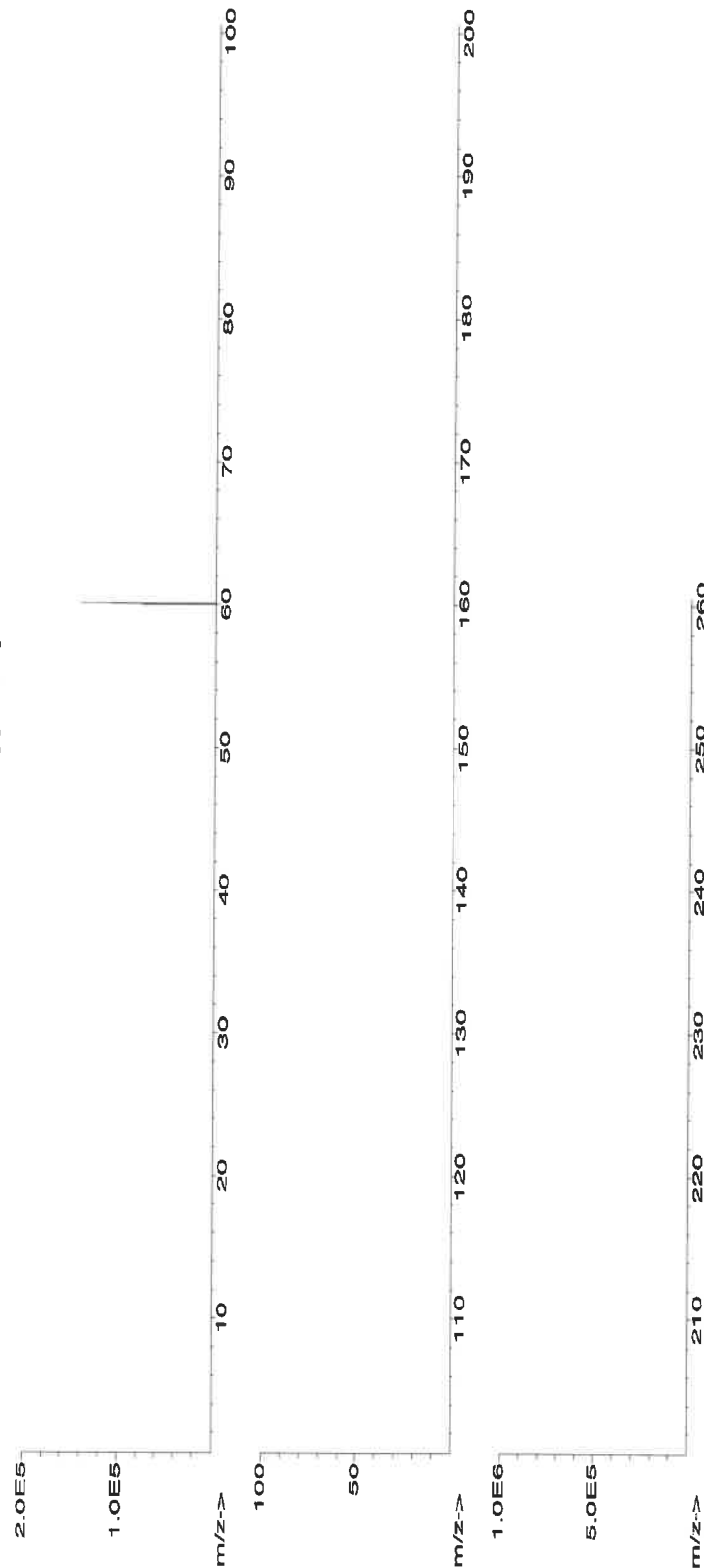
Formulated By:	Reviewed By:	Uncertainty	(Solvent Safety Info, On Attached pg.)	NIST
Brian Geddes	Pedro L. Rentas	+/- (µg/mL)	CAS# OSHA PEL (TWA) LD50	SRM

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	or-rat	mg/kg	3136
IN033	NIM052023A1	1000	99.999	0.10	20.2	1.2369	1.2369	1000.0	2.0	13478-00-7	1 mg/m3				

1. Nickel(II) nitrate hexahydrate (Ni)

[1] Spectrum No.1 [12.374 sec]:58128.D# [Count] [Linear]



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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	Pr	<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	<0.02	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	<0.02	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	Se	<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:

MS961 R-1 6/11/24

Part Number:

Solvent: 24002546 Nitric Acid

Lot Number:

Lot #

Description:

Nickel (NI)

Expiration Date:

041127

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

2% 5.0 (mL) Nitric Acid

Formulated By:	Brian Geddes	041124
Reviewed By:	Pedro L. Rentas	041124

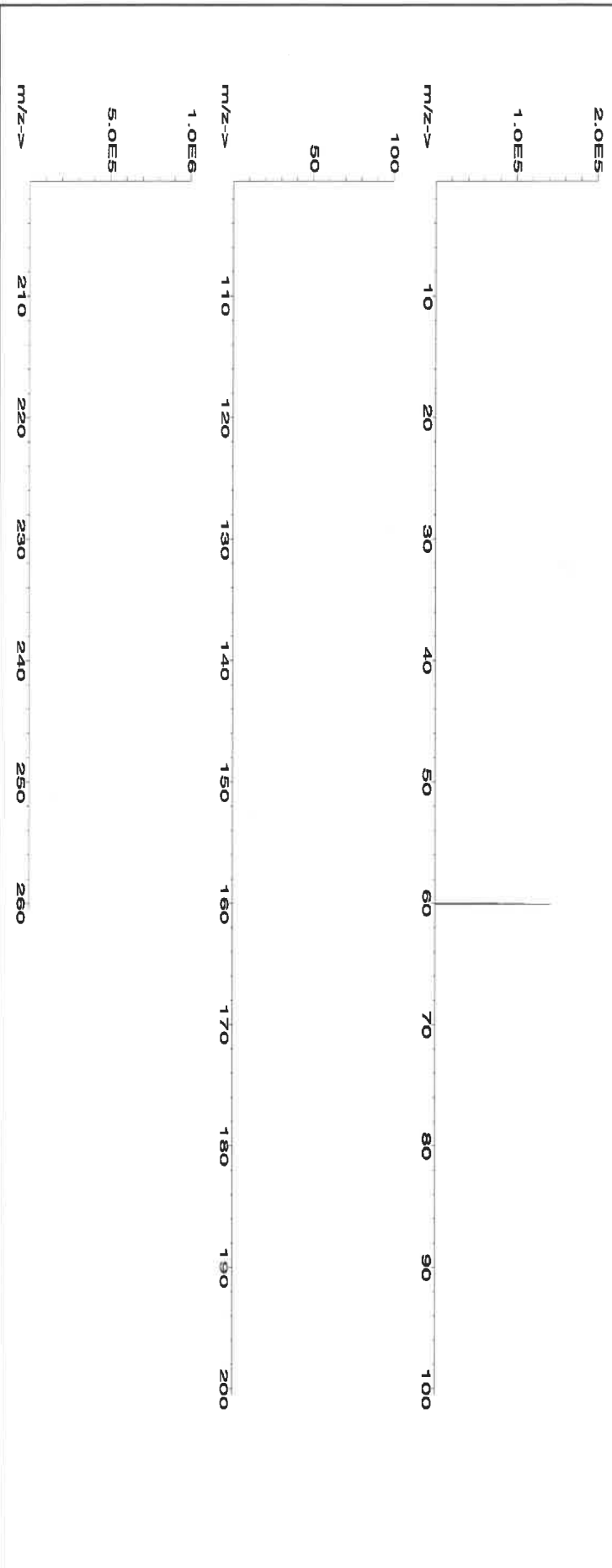
SDS Information

Compound

RM#	Lot	Nominal	Purity	Uncertainty	Assay	Target	Actual	Actual	Uncertainty	(Solvent Safety Info. On Attached pg.)				NIST
Number		Conc. (µg/mL)	(%)	Purity (%)	(%)	Weight (g)	Weight (g)	Conc. (µg/mL)	+/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	SRM	

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	<0.02	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	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	Rh	<0.02	Ag	<0.02	Tl	<0.02	V	<0.02
Ba	<0.02	Cs	<0.02	Ba	<0.02	Ir	<0.02	Mn	<0.02	Pd	<0.02	Rb	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	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	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	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: 06/14/29



Lot # **Solvent:**

Nitric Acid

Selenium (Se)

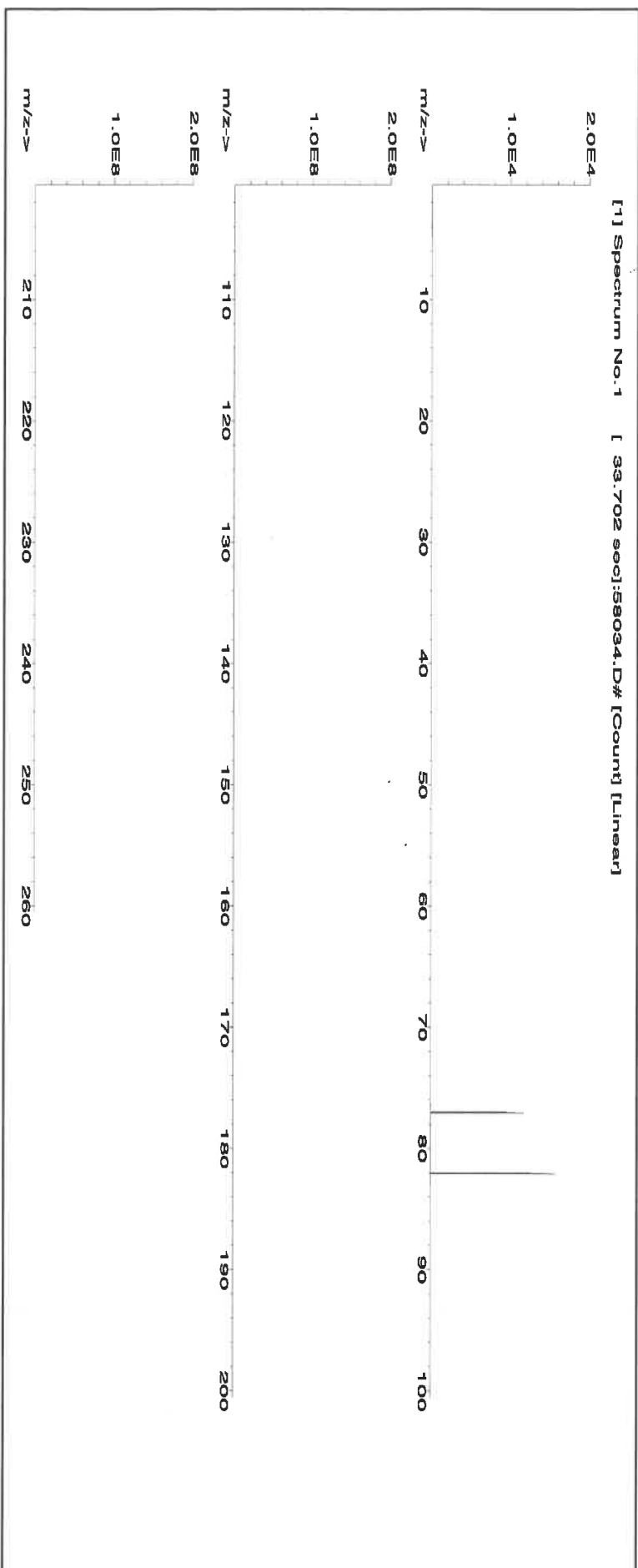
Nitric Acid

5E-05	Balance Uncertainty
0.100	Flask Uncertainty

	Formulated By:		Reviewed By:
	Benson Chan		Pedro L. Feritas
0506224		0506224	

Compound

Compound	Part	Lot	Dilution	Initial	Uncertainty	Nominal	Initial	Final	Uncertainty	(Solvent safety info. On Attached pg.)	CAS#	OSHA PEL (TWA)	LD50	SRM
	Number	Number	Factor	Vol. (mL)	Pipette (mL)	Conc. (µg/mL)	Conc. (µg/mL)	Conc. (µg/mL)	+/- (µg/mL)					
1. Selenium (Se)	58134	071223	0.1000	200.0	0.084	1000	1000±2.5	1000.0	2.2	7782-48-2	0.2 mg/m3	oral rat 6700 mg/kg	31498	





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	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	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	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	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	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	Zn	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02			Ti	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:

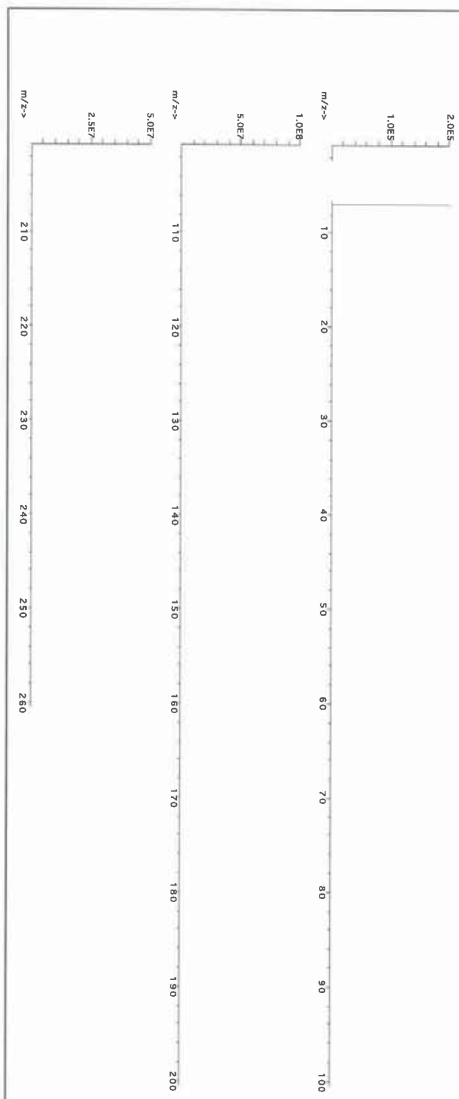
Part Number: 57003
Lot Number: 062124
Description: Lithium (Li)
Expiration Date: 06/12/27
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Volume shown below was diluted to (mL): 250.11
SE-05 Balance Uncertainty: 0.016
Fisk Uncertainty:

Microvite Capable	
Formulated By:	062124
Giovanni Episcopo	
Reviewed By: <i>[Signature]</i>	
Petro L. Parias	062124

Compound	SDS Information															
	Part		Lot		Dilution		Expanded		Exposed							
	Number	Factor	Initial	Uncertainty	Normal	Initial	Final	Uncertainty	(Solvent Safety Info. Or Attached pg.)							
			Vol. (mL)	Pipette (mL)	Conc. (µg/mL)	Conc. (µg/mL)	Conc. (µg/mL)	Conc. (µg/mL)	± (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	SN	NST		

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
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[1] Spectrum No. 1 [32.093 sec; 15000.0Hz [Count [Time]]



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800-368-1131
www.absolutestandards.com



Certified Reference Material CRM



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

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	Ti	<0.02	Ni	<0.02	Pr	<0.02	Se	<0.02	Tb	<0.02
Sb	<0.02	Ce	<0.02	Er	<0.02	In	<0.02	Mg	<0.02	Os	<0.02	Nb	<0.02	Rh	<0.02	Si	<0.02	Te	<0.02
As	<0.2	Co	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.02	Pd	<0.02	Pt	<0.02	Ru	<0.02	Ag	<0.02	Tl	<0.02
Ba	<0.02	Cr	<0.02	Ga	<0.02	La	<0.02	Hg	<0.02	P	<0.02	Bi	<0.02	Sn	<0.02	Nd	<0.02	Tm	<0.02
Be	<0.01	Cu	<0.02	Ge	<0.02	Ta	<0.02	K	<0.02	Fe	<0.02	Sr	<0.02	S	<0.02	Th	<0.02	Y	<0.02
Bi	<0.02	Mo	<0.02	Au	<0.02	Nb	<0.02	Na	<0.02	Sc	<0.02	Se	<0.02	Te	<0.02	Ta	<0.02	Zn	<0.02
B	<0.02	Ca	<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



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

Starting Material: 1 000 µg/mL ea.

Starting Material: Titanium

Starting Material: Ti Metal

Starting Material Lot#: 2094

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1002 ± 5 µg/mL

Density: 1.012 g/mL (measured at 20 ± 4 °C)

Assay Information:

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:

$$X_{CRM/RM} = \sum w_i x_i / \sum w_i$$

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

$$w_i = 1 / (u_{CRM/RM,i}^2)$$

$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

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$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

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$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

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$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

$$u_{CRM/RM} = \sqrt{u_{CRM/RM,1}^2 + u_{CRM/RM,2}^2 + \dots + u_{CRM/RM,n}^2}$$

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	<	0.000268			
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	<	0.004900	M Yb	<	0.000536			

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 - 47.87 ± 4.6 Ti(F)₆-2 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); K₂SiO₇ - no KF if silica not present); Organic Matrices (Dry ash at 450EC 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.	Order	Interferences (underlined indicates severe)
ICP-MS 48 amu	14 ppt	N/A	32S16O, 32S14N,
ICP-OES 323.452 nm	0.0054 / 0.00092 µg/mL	1	14N17N ₂ , 36Ar12C,
ICP-OES 334.941 nm	0.0038 / 0.00028 µg/mL	1	48Ca, [96X=2
ICP-OES 336.121 nm	0.0053 / 0.00034 µg/mL	1	W, Mo, Co
			Nb, Ta, Cr, U
			Ce, Ar, Ni
			Ru]]
			(where X = Zr, Mo,

8.0

HAZARDOUS INFORMATION

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

9.0

HOMOGENEITY

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

10.0

QUALITY STANDARD DOCUMENTATION

- 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.

10.1 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"

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY
Inorganic Ventures, 300 Technology Drive, Chesapeake, VA 24073, USA; Telephone: 800.868.6786; 540.565.3030; Fax: 540.565.3012; info@inorganicventures.com

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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.

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:

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

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

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_{Its} = 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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{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)

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



Certificate of Analysis

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

R: 2/22/2024
M5999

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-SPK-1
Lot Number: T2-MEB721963
Matrix: 7% (v/v) HNO₃
Value / Analyte(s):
2 000 µg/mL ea: Aluminum, Barium,
1 000 µg/mL ea: Iron,
500 µg/mL ea: Manganese, Nickel,
Vanadium, Zinc,
Cobalt,
250 µg/mL ea: Copper,
200 µg/mL ea: Chromium,
50 µg/mL ea: Beryllium, Silver

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	Chromium, Cr	200.0 ± 1.1 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	Manganese, Mn	500.0 ± 2.0 µg/mL
Nickel, Ni	500.0 ± 2.2 µg/mL	Silver, Ag	50.00 ± 0.22 µg/mL
Vanadium, V	500.0 ± 2.2 µg/mL	Zinc, Zn	500.0 ± 2.2 µg/mL

Density: 1.070 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
Ba	ICP Assay	3104a	140909
Ba	Gravimetric		See Sec. 4.2
Be	ICP Assay	3105a	090514
Be	Calculated		See Sec. 4.2
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
Mn	ICP Assay	3132	050429
Mn	EDTA	928	928
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:

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

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

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_{tts} = 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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{tts} = 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

July 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

- July 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



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

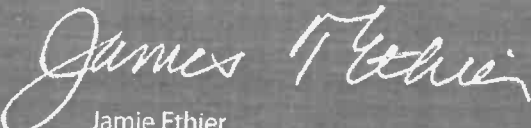
100 Matsonford Rd, Suite 200, Radnor, PA 19087. U.S.A. Phone: 610.386.1700

307

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

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M612 S

Receive → 11/22/24

CORCO CHEMICAL CORPORATION

Manufacturers of ACS Reagents and Semiconductor Grade Chemicals

Office and Plant
299 Cedar Lane
Fairless Hills, PA 19030

Phone: 215-295-5006
Fax: 215-295-0781

Hydrogen Peroxide 30%, ACS Reagent Grade

SPECIFICATION

MAXIMUM LIMITS

Appearance	Colorless and free from suspended matter or sediment
Assay	29-32%
Color (APHA)	10
Residue after Evaporation	0.002%
Titrateable Acid	0.0006 meq/g
Chloride (Cl)	3 ppm
Nitrate (NO ₃)	2 ppm
Phosphate	2 ppm
Sulfate (SO ₄)	5 ppm
Ammonium (NH ₄)	5 ppm
Heavy Metals (as Pb)	1 ppm
Iron (Fe)	0.5 ppm

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

312



CERTIFIED WEIGHT REPORT:

Part Number: 58112
Lot # 112124
Description: Magnesium (Mg)
Solvent: Nitric Acid

Expiration Date: 11/21/27
Recommended Storage: Ambient (20 °C)
Nitric Acid 2% (40.0 mL)

Nominal Concentration (µg/mL): 10000

NIST Test Number: 6LUB

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

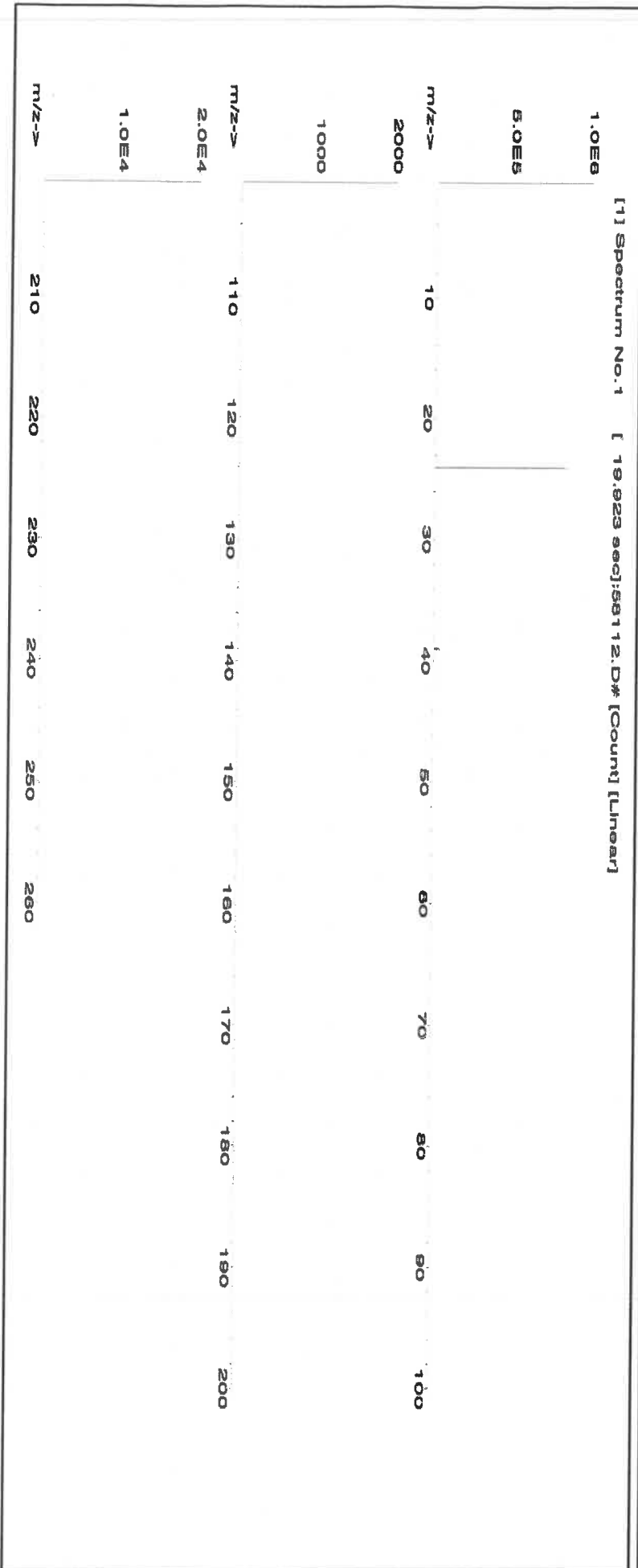
<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito
Reviewed By:	Pedro L. Rentas
	112124

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)	(Solvent Safety Info. On Attached pg.)	SRM
								± (µg/mL)	CAS# OSHA PEL (TWA) LD50	

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	Tm	<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	Sn	<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	Ti	<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			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)

Lot #
Solvent: Nitric Acid

24002546
80.0 (mL)
Nitric Acid

Giovanni Esposito
Formulated By: Giovanni Esposito
101124

Pedro L. Renteria
Reviewed By: Pedro L. Renteria
101124

Expiration Date: 101127
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Weight shown below was diluted to (mL): 4000.2
5E-05 Balance Uncertainty
0.10 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. Manganese(II) nitrate hydrate (Mn) IN031 MMN02020A1 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	m/z->	10	20	30	40	50	60	70	80	90	100
2.5E6	m/z->	110	120	130	140	150	160	170	180	190	200
1.0E6	m/z->	210	220	230	240	250	260				
5.0E7	m/z->										



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

316

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:

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: 58111
Lot Number: 122223
Description: Sodium (Na)

Solvent: 24002546 Nitric Acid

Lot #

Expiration Date: 122226

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL): 10000

NIST Test Number: 6UTB

Weight shown below was diluted to (mL): 3000.4 0.06 Flask Uncertainty

2% 60.0 (mL) Nitric Acid

<i>Aleah O Brady</i>	
Formulated By:	Aleah O Brady
Reviewed By:	Pedro L. Rentas
	122223

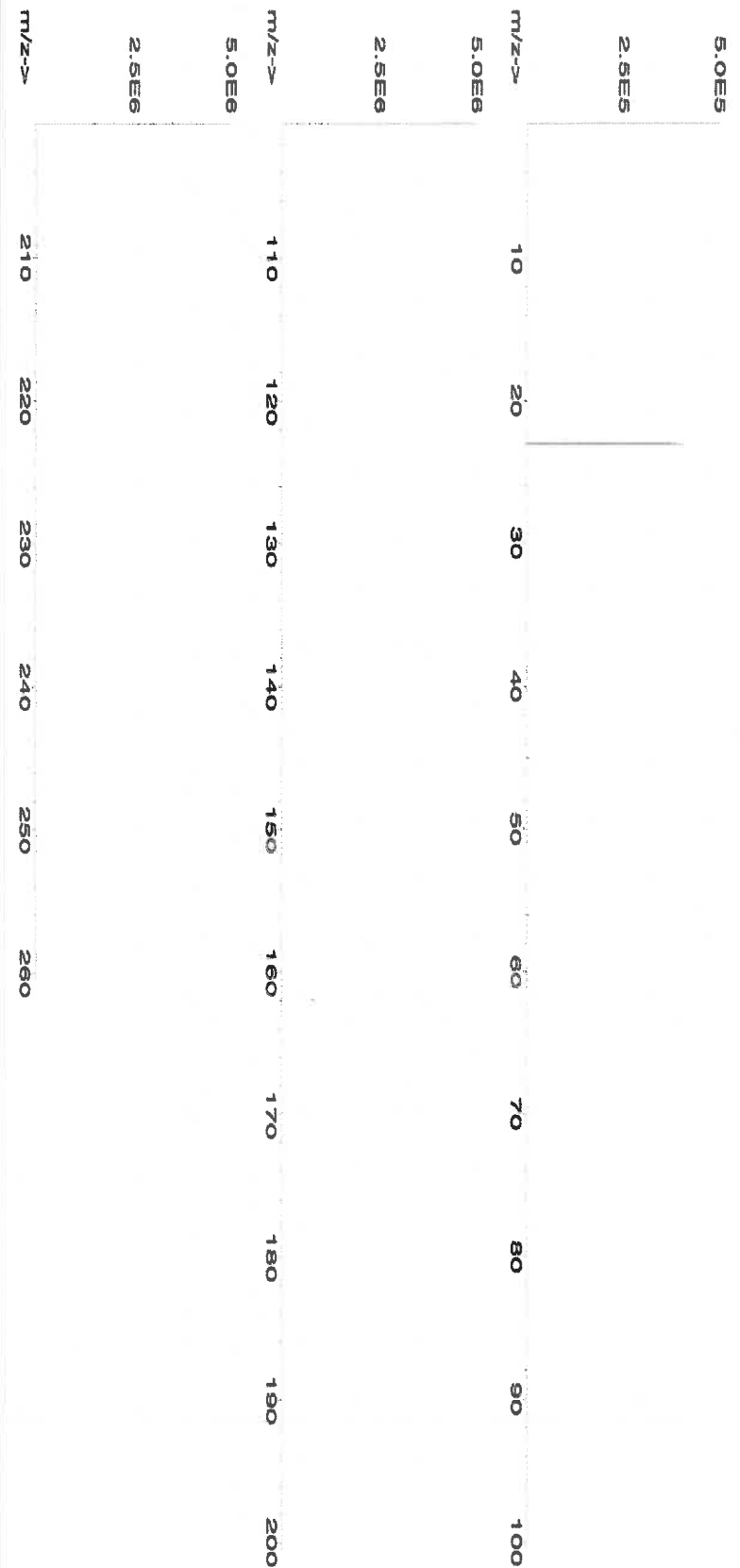
Expanded

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
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1. Sodium nitrate (Na) IN036 NAV01201511 10000 99.999 0.10 26.9 111.5406 111.5479 10000.7 20.0 7631-99-4 5 mg/m3 or-trat 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	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	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	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	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	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	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	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:

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

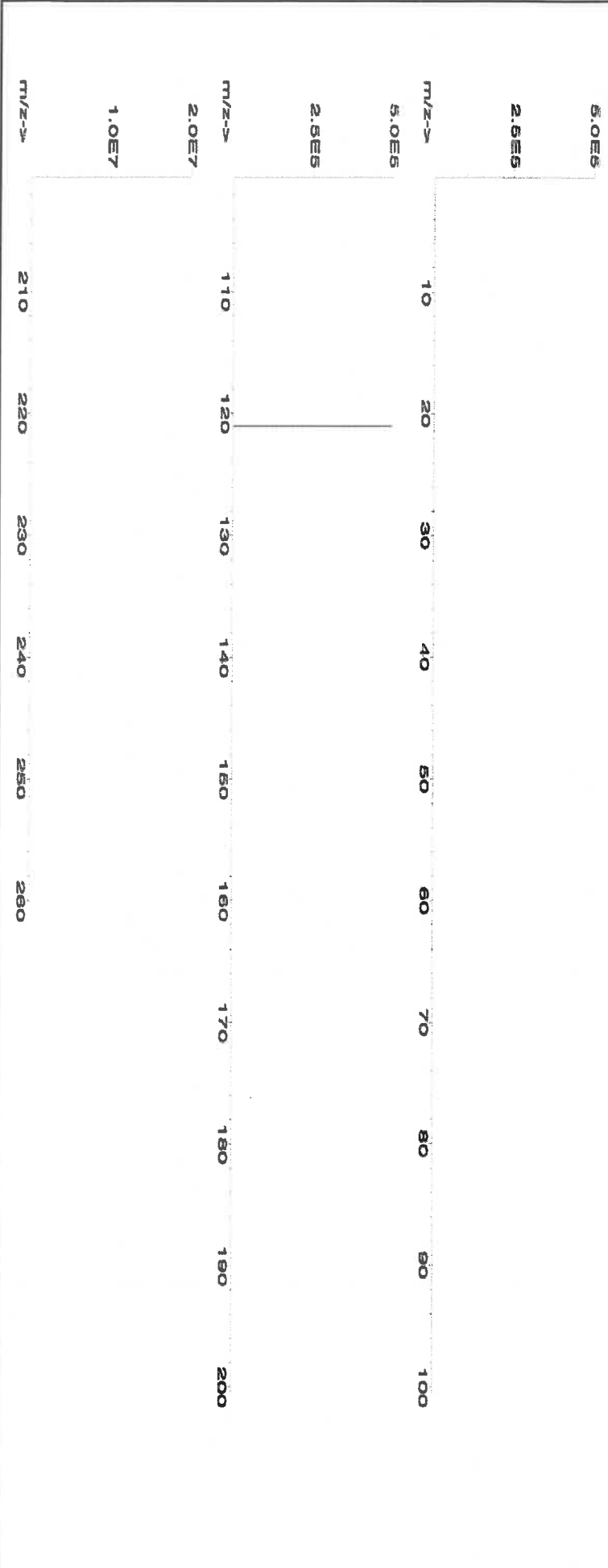
Formulated By:	Lawrence Barry	120523
Reviewed By:	Pedro L. Renteria	120523

SDS Information

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty (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
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[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 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**

2% **80.0** **Nitric Acid**
(mL)

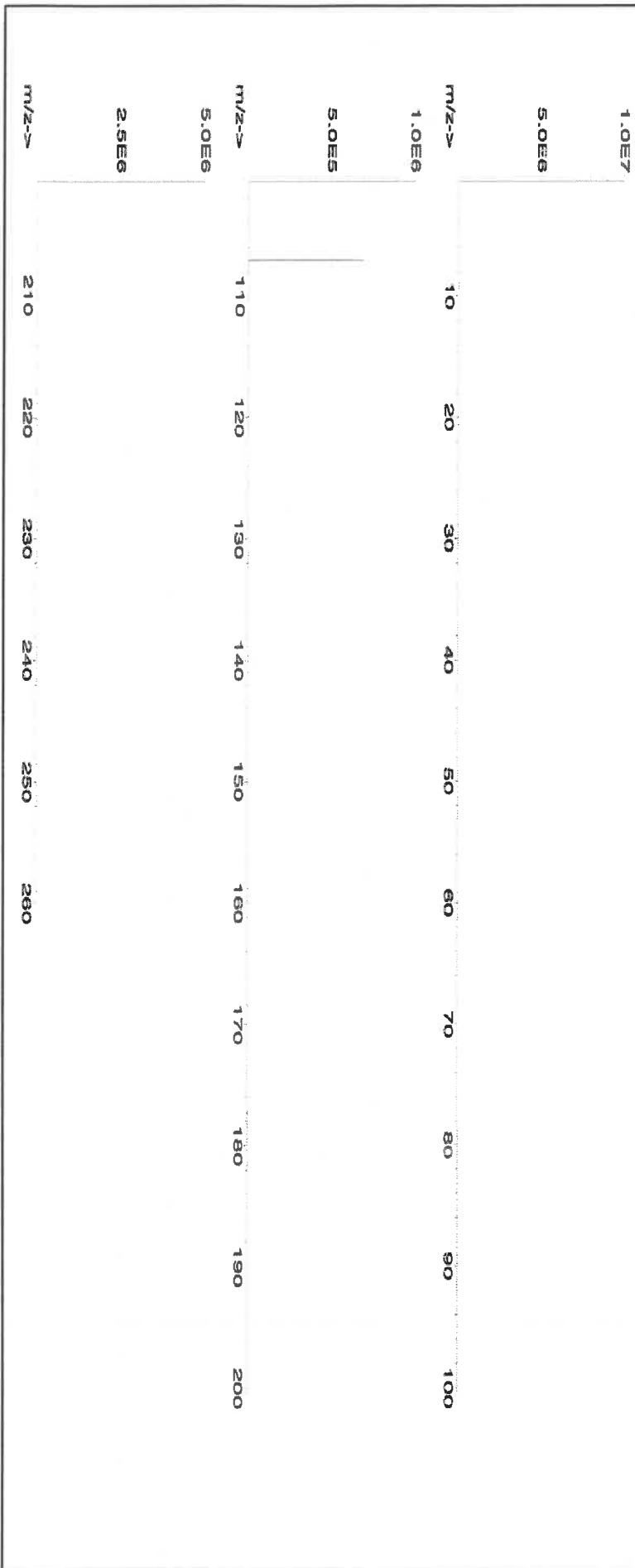
Weight shown below was diluted to (mL): **4000.30** **5E-05** **Balance Uncertainty**
0.058 **Flask Uncertainty**

Formulated By:	Benson Chan
Reviewed By:	
	Pedro L. Rentas
	122823

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

1. Silver nitrate (Ag) IN035 J0612AGA1 1000.0 99.999 0.10 63.7 6.27992 6.27998 1000.0 2.0 7761-88-8 10 µg/m³ NA 3151

[1] Spectrum No. 1 [14.044 sec]:58147.D# [Count] [Linear]





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

322

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

Physical Characterization:

(T)= Target analyte

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.
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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).

R: 8/5/24

M6019

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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:

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

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

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	<	0.001980	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



CERTIFIED WEIGHT REPORT:

R: 03/16/23 MS473 MS474 MS475 MS476

Part Number: 56138
Lot Number: 082922
Description: Strontium (Sr)

Solvent: 20510011 Nitric Acid

Lot #

Expiration Date: 082925
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 10000
NIST Test Number: 6UTB

2% Nitric Acid (mL)

Weight shown below was diluted to (mL): 1000.12 0.058 Balance Uncertainty
Flask Uncertainty

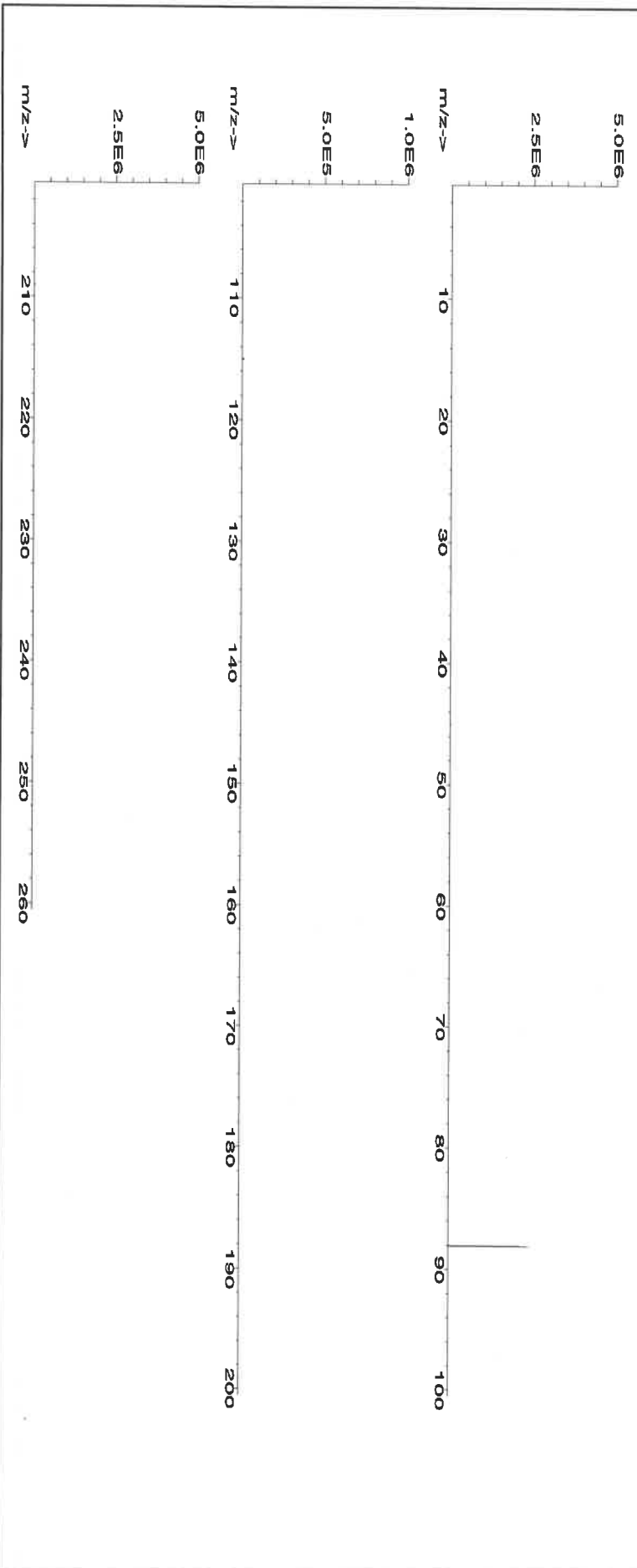
Formulated By:	Lawrence Barry	082922
Reviewed By:	Pedro L. Renteria	082922

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. Strontium nitrate (Sr) IN017 SR2022018A1 10000 99.997 0.10 41.2 24.2756 24.2758 10000.1 20.0 10042-76-9 NA or-rat >2000mg/kg 3153a

[1] Spectrum No. 1 [14.495 sec]: 56138.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	<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	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 Reference Material CRM

CERTIFIED WEIGHT REPORT:

R: 03/16/23 MS473 MS474 MS475 MS476

Lot #

Part Number:

Solvent: 20510011 Nitric Acid

Lot Number:

2% 20.0 Nitric Acid

Description:

2% 20.0 Nitric Acid

Expiration Date:

2% 20.0 Nitric Acid

Recommended Storage:

2% 20.0 Nitric Acid

Nominal Concentration (µg/mL):

2% 20.0 Nitric Acid

NIST Test Number:

2% 20.0 Nitric Acid

Weight shown below was diluted to (mL):

5E-05 Balance Uncertainty
0.058 Flask Uncertainty

Formulated By:	Lawrence Barry	082922
Reviewed By:	Pedro L. Renteria	082922

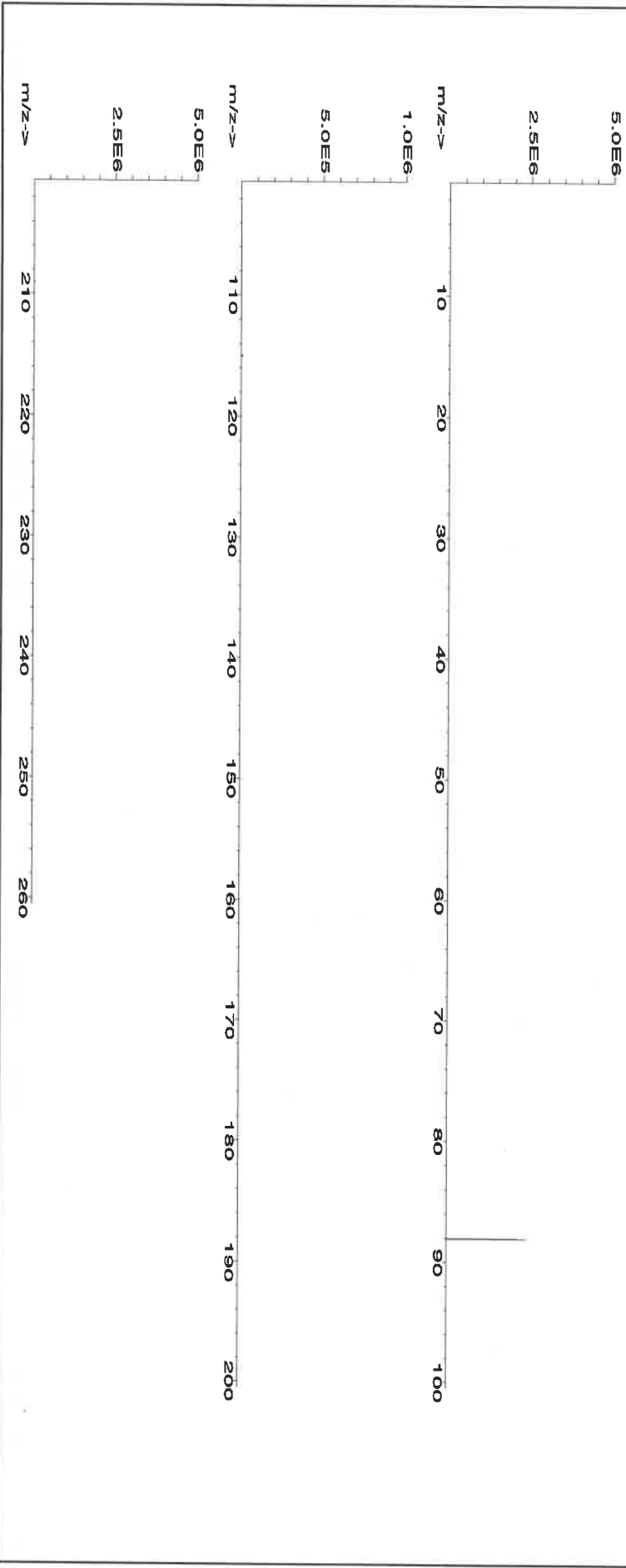
SDS Information

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. Strontium nitrate (Sr) IN017 SR2022018A1 10000 99.997 0.10 41.2 24.2756 24.2758 10000.1 20.0 10042-76-9 NA or-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 (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	<0.02	Ga	<0.02	Fe	<0.2	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.
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CERTIFIED WEIGHT REPORT:

Part Number: 57081
Lot Number: 062724
Description: Thallium (TI)

Solvent: 24002546 Nitric Acid

Lot #

Aleah O'Brady
Formulated By: Aleah O'Brady 062724

Pedro L. Renteria
Reviewed By: Pedro L. Renterias 062724

Expiration Date: 062727

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL): 1000

NIST Test Number: 6UTB

5E-05 Balance Uncertainty

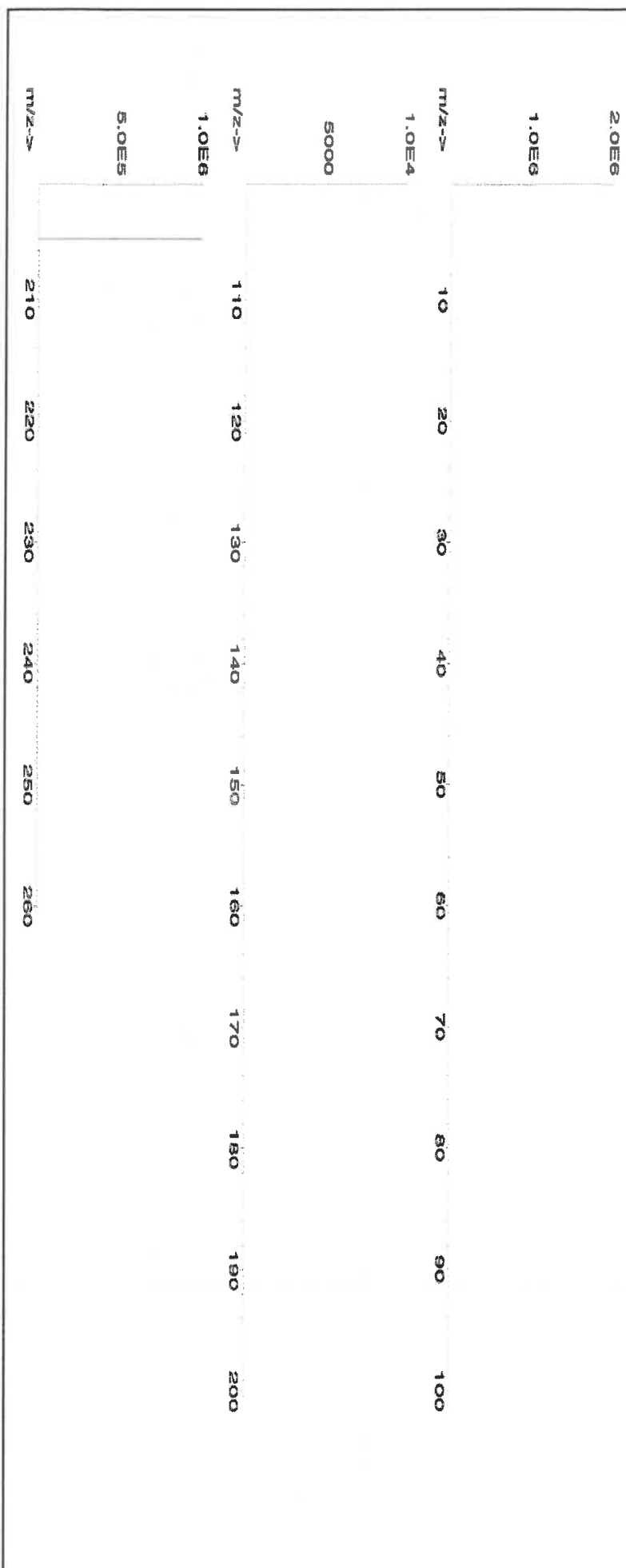
Weight shown below was diluted to (mL): 2000.1 0.10 Flask Uncertainty

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. 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 orl-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):

332

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.
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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 Reference Material CRM

M6021



CERTIFIED WEIGHT REPORT:

Part Number: **57023**
Lot Number: **062424**
Description: **Vanadium (V)**

Lot # **24002546**
Solvent: **Nitric Acid**

2.0%

40.0 (mL)

Nitric Acid

Aleah O'Brady
Formulated By: **Aleah O'Brady**

062424

Expiration Date: **062427**
Recommended Storage: **Ambient (20 °C)**

Nominal Concentration (µg/mL): **1000**

NIST Test Number: **6UTB**

5E-05 Balance Uncertainty

Volume shown below was diluted to (mL): **2000.3**

0.06 Flask Uncertainty

Pedro L. Rentas
Reviewed By: **Pedro L. Rentas**

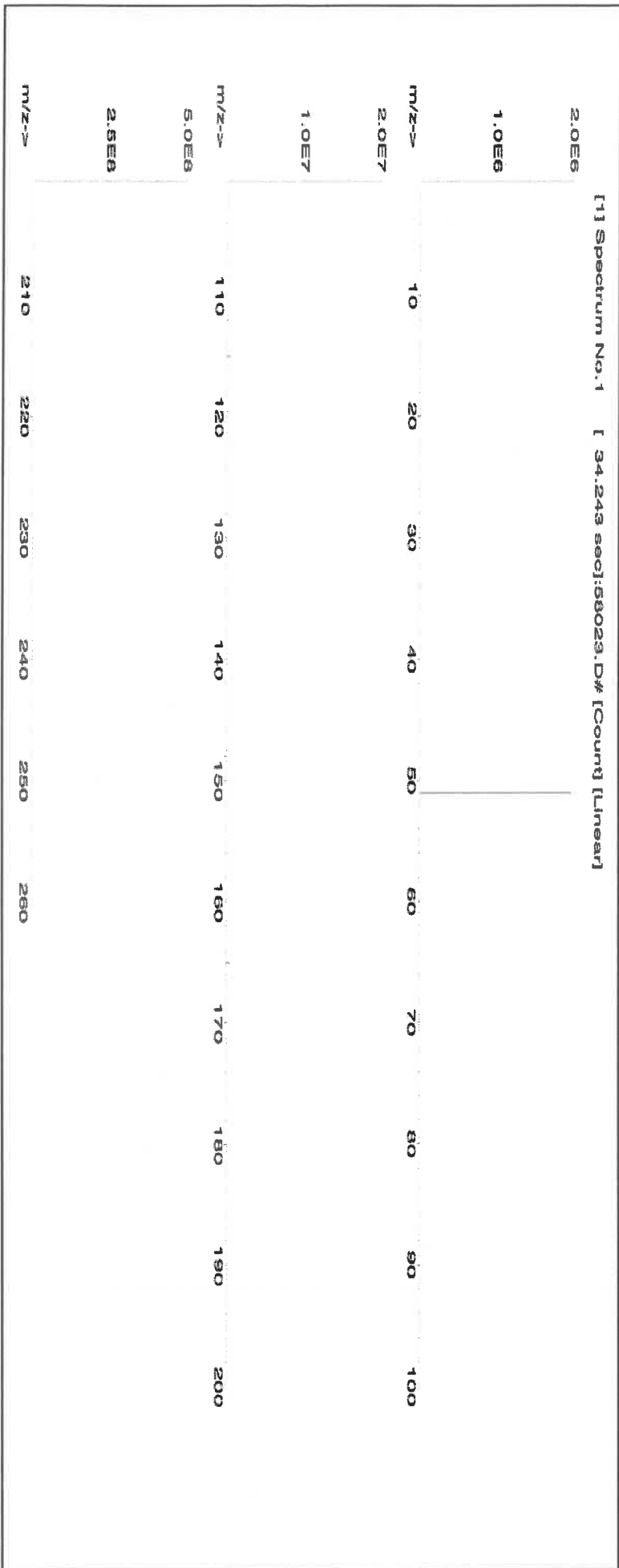
062424

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.)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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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]





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

334

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	T
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.
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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).

SOP ID : M3050B-Digestion-20, MSFAM01.1-Trace Metals-2

SDG No : GCPF7

Start Digest Date: 01/09/2025 **Time :** 13:40 **Temp :** 96 °C

Matrix : SOIL

End Digest Date: 01/09/2025 **Time :** 15:45 **Temp :** 96 °C

Pipette ID: ICP A

Digestion tube ID: M6054

Balance ID : M SC-2

Block thermometer ID: MET-DIG. #3

Filter paper ID : N/A

Dig Technician Signature: *SKG*

pH Strip ID : N/A

Supervisor Signature: *SO*

Hood ID : #3

Temp : 1. 96°C 2. N/A

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

Standardized Name	MLS USED	STD REF. # FROM LOG
LCSS	1.00	MP83506
Spike Sol 6	1.00	MP83512
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
1:1 HNO3	10.00	MP83498
Conc. HNO3	5.00	M6126
30% H2O2	3.00	M6125
Conc. HCL	10.00	M6121
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 #3 CELL #35 : 96 C

Date / Time	Prepped Sample Relinquished By/Location	Received By/Location
01/09/25 16:45	<i>SKG. met digestion</i>	<i>SKG (Analysis Lab)</i>
	Preparation Group	Analysis Group

Lab Sample ID	Client Sample ID	pH	Initial Weight (g)	Final Vol (ml)	Color Before	Color After	Texture	Artifact	Comment	Prep Pos
PB166002BL	PBS002	N/A	1.00	100	Colorless	Colorless	Fine	N/A	N/A	1
PB166002BS	LCS002	N/A	1.00	100	Colorless	Colorless	Fine	N/A	MP83506	2
Q1041-01	GCPF7	N/A	1.25	100	Brown	Yellow	Medium	N/A	N/A	3
Q1041-02	GCPF8	N/A	1.23	100	Brown	Yellow	Medium	N/A	N/A	4
Q1041-03	GCPF9	N/A	1.41	100	Brown	Yellow	Medium	N/A	N/A	5
Q1041-04	GCPG0	N/A	1.06	100	Brown	Yellow	Medium	N/A	N/A	6
Q1041-05	GCPG0D	N/A	1.40	100	Brown	Yellow	Medium	N/A	N/A	7
Q1041-06	GCPG0S	N/A	1.23	100	Brown	Yellow	Medium	N/A	MP83512	8
Q1041-07	GCPG1	N/A	1.32	100	Brown	Yellow	Medium	N/A	N/A	9
Q1041-08	GCPG2	N/A	1.33	100	Brown	Yellow	Medium	N/A	N/A	10
Q1041-09	GCPG3	N/A	1.15	100	Brown	Yellow	Medium	N/A	N/A	11
Q1041-10	GCPG4	N/A	1.11	100	Brown	Yellow	Medium	N/A	N/A	12
Q1041-11	GCPG5	N/A	1.19	100	Brown	Yellow	Medium	N/A	N/A	13
Q1041-12	GCPG6	N/A	1.23	100	Brown	Yellow	Medium	N/A	N/A	14
Q1041-13	GCPG7	N/A	1.47	100	Brown	Yellow	Medium	N/A	N/A	15
Q1041-14	GCPG8	N/A	1.33	100	Brown	Yellow	Medium	N/A	N/A	16
Q1041-15	GCPG9	N/A	1.30	100	White	Yellow	Medium	N/A	N/A	17
Q1041-16	GCPH0	N/A	1.11	100	Brown	Yellow	Medium	N/A	N/A	18
Q1041-17	GCPH1	N/A	1.14	100	Brown	Yellow	Medium	N/A	N/A	19
Q1041-18	GCPH2	N/A	1.10	100	Brown	Yellow	Medium	N/A	N/A	20
Q1041-19	GCPH3	N/A	1.38	100	Brown	Yellow	Medium	N/A	N/A	21
Q1041-20	GCPH4	N/A	1.27	100	Brown	Yellow	Medium	N/A	N/A	22
Q1041-21	GCPH5	N/A	1.25	100	Brown	Yellow	Medium	N/A	N/A	23

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134392

Review By	Mohan Bera	Review On	1/24/2025 7:52:38 AM
Supervise By	Kareem Khairalla	Supervise On	1/24/2025 4:41:08 PM

STD. NAME	STD REF.#
ICAL Standard	MP83500,MP84064,MP84062,MP84061,MP84060,MP84059,MP84058
ICV Standard	MP84065
CCV Standard	MP84069
ICSA Standard	MP84066,MP84067
CRI Standard	
LCS Standard	MP83506
Chk Standard	MP84071,MP84072

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	S0	S0	CAL1	01/23/25 11:45		Kareem	OK
2	S1	S01	CAL2	01/23/25 11:49		Kareem	OK
3	S2	S02	CAL3	01/23/25 11:53		Kareem	OK
4	S3	S03	CAL4	01/23/25 11:57		Kareem	OK
5	S4	S04	CAL5	01/23/25 12:01		Kareem	OK
6	S5	S05	CAL6	01/23/25 12:05		Kareem	OK
7	S6	S06	CAL7	01/23/25 12:10		Kareem	OK
8	ICV001	ICV001	ICV	01/23/25 12:36	Inst. paused for calibration review	Kareem	OK
9	ICB001	ICB001	ICB	01/23/25 12:49	Inst. paused for review	Kareem	OK
10	ICSA001	ICSA001	ICSA	01/23/25 13:08	Inst. paused for review	Kareem	OK
11	ICSAB001	ICSAB001	ICSAB	01/23/25 13:15	Inst. paused for review	Kareem	OK
12	CCV001	CCV001	CCV	01/23/25 13:28	Inst. paused for review	Kareem	OK
13	CCB001	CCB001	CCB	01/23/25 13:33		Kareem	OK
14	PB166001BL	PBS001	MB	01/23/25 13:37		Kareem	OK
15	PB166001BS	LCS001	LCS	01/23/25 13:41		Kareem	OK
16	PB166002BL	PBS002	MB	01/23/25 13:45		Kareem	OK
17	PB166002BS	LCS002	LCS	01/23/25 13:49		Kareem	OK
18	PB166023BL	PBS023	MB	01/23/25 13:53		Kareem	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134392

Review By	Mohan Bera	Review On	1/24/2025 7:52:38 AM
Supervise By	Kareem Khairalla	Supervise On	1/24/2025 4:41:08 PM
STD. NAME	STD REF.#		
ICAL Standard	MP83500,MP84064,MP84062,MP84061,MP84060,MP84059,MP84058		
ICV Standard	MP84065		
CCV Standard	MP84069		
ICSA Standard	MP84066,MP84067		
CRI Standard			
LCS Standard	MP83506		
Chk Standard	MP84071,MP84072		

19	PB166023BS	LCS023	LCS	01/23/25 13:57		Kareem	OK
20	PB166022BL	PBS022	MB	01/23/25 14:02		Kareem	OK
21	PB166022BS	LCS022	LCS	01/23/25 14:06		Kareem	OK
22	PB166021BL	PBS021	MB	01/23/25 14:10		Kareem	OK
23	PB166021BS	LCS021	LCS	01/23/25 14:14		Kareem	OK
24	PB166017BL	PBS017	MB	01/23/25 14:18		Kareem	OK
25	PB166017BS	LCS017	LCS	01/23/25 14:22		Kareem	OK
26	PB166016BL	PBS016	MB	01/23/25 14:26		Kareem	OK
27	PB166016BS	LCS016	LCS	01/23/25 14:30		Kareem	OK
28	PB166015BL	PBS015	MB	01/23/25 14:34		Kareem	OK
29	PB166015BS	LCS015	LCS	01/23/25 14:39		Kareem	OK
30	Q1041-01	GCPF7	SAM	01/23/25 14:43		Kareem	OK
31	Q1041-02	GCPF8	SAM	01/23/25 14:47		Kareem	OK
32	Q1041-03	GCPF9	SAM	01/23/25 14:51		Kareem	OK
33	Q1041-04	GCPG0	SAM	01/23/25 14:55		Kareem	OK
34	CCV002	CCV002	CCV	01/23/25 14:59		Kareem	OK
35	CCB002	CCB002	CCB	01/23/25 15:03		Kareem	OK
36	Q1041-05	GCPG0D	DUP	01/23/25 15:07		Kareem	OK
37	Q1041-04L	GCPG0L	SD	01/23/25 15:11		Kareem	OK
38	Q1041-06	GCPG0S	MS	01/23/25 15:15		Kareem	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134392

Review By	Mohan Bera	Review On	1/24/2025 7:52:38 AM
Supervise By	Kareem Khairalla	Supervise On	1/24/2025 4:41:08 PM

STD. NAME	STD REF.#
ICAL Standard	MP83500,MP84064,MP84062,MP84061,MP84060,MP84059,MP84058
ICV Standard	MP84065
CCV Standard	MP84069
ICSA Standard	MP84066,MP84067
CRI Standard	
LCS Standard	MP83506
Chk Standard	MP84071,MP84072

39	Q1041-07	GCPG1	SAM	01/23/25 15:19		Kareem	OK
40	Q1041-08	GCPG2	SAM	01/23/25 15:23		Kareem	OK
41	Q1041-09	GCPG3	SAM	01/23/25 15:27		Kareem	OK
42	Q1041-10	GCPG4	SAM	01/23/25 15:31		Kareem	OK
43	Q1041-11	GCPG5	SAM	01/23/25 15:35		Kareem	OK
44	Q1041-12	GCPG6	SAM	01/23/25 15:39		Kareem	OK
45	Q1041-13	GCPG7	SAM	01/23/25 15:43		Kareem	OK
46	Q1041-14	GCPG8	SAM	01/23/25 15:47		Kareem	OK
47	Q1041-15	GCPG9	SAM	01/23/25 15:51		Kareem	OK
48	Q1041-16	GCPH0	SAM	01/23/25 15:56		Kareem	OK
49	Q1041-17	GCPH1	SAM	01/23/25 15:59		Kareem	OK
50	Q1041-18	GCPH2	SAM	01/23/25 16:03		Kareem	OK
51	Q1041-19	GCPH3	SAM	01/23/25 16:07		Kareem	OK
52	Q1041-20	GCPH4	SAM	01/23/25 16:11		Kareem	OK
53	Q1041-21	GCPH5	SAM	01/23/25 16:15		Kareem	OK
54	Q1039-01	GCPD8	SAM	01/23/25 16:19		Kareem	OK
55	Q1039-02	GCPD9	SAM	01/23/25 16:23		Kareem	OK
56	CCV003	CCV003	CCV	01/23/25 16:27		Kareem	OK
57	CCB003	CCB003	CCB	01/23/25 16:31		Kareem	OK
58	Q1039-03	GCPE0	SAM	01/23/25 16:35		Kareem	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134392

Review By	Mohan Bera	Review On	1/24/2025 7:52:38 AM
Supervise By	Kareem Khairalla	Supervise On	1/24/2025 4:41:08 PM

STD. NAME	STD REF.#
ICAL Standard	MP83500,MP84064,MP84062,MP84061,MP84060,MP84059,MP84058
ICV Standard	MP84065
CCV Standard	MP84069
ICSA Standard	MP84066,MP84067
CRI Standard	
LCS Standard	MP83506
Chk Standard	MP84071,MP84072

59	Q1039-04	GCPE0D	DUP	01/23/25 16:39		Kareem	OK
60	Q1039-03L	GCPE0L	SD	01/23/25 16:43		Kareem	OK
61	Q1039-05	GCPE0S	MS	01/23/25 16:47		Kareem	OK
62	Q1039-06	GCPE1	SAM	01/23/25 16:51		Kareem	OK
63	Q1039-07	GCPE2	SAM	01/23/25 16:55		Kareem	OK
64	Q1039-08	GCPE3	SAM	01/23/25 16:59		Kareem	OK
65	Q1039-09	GCPE4	SAM	01/23/25 17:03		Kareem	OK
66	Q1039-10	GCPE5	SAM	01/23/25 17:07	Ba high	Kareem	Dilution
67	Q1039-11	GCPE6	SAM	01/23/25 17:12		Kareem	OK
68	Q1039-12	GCPE7	SAM	01/23/25 17:16		Kareem	OK
69	Q1039-13	GCPE8	SAM	01/23/25 17:20		Kareem	OK
70	Q1039-14	GCPE9	SAM	01/23/25 17:24		Kareem	OK
71	Q1039-15	GCPF0	SAM	01/23/25 17:27		Kareem	OK
72	Q1039-16	GCPF1	SAM	01/23/25 17:31		Kareem	OK
73	Q1039-17	GCPF2	SAM	01/23/25 17:36		Kareem	OK
74	Q1039-18	GCPF3	SAM	01/23/25 17:40		Kareem	OK
75	Q1039-19	GCPF4	SAM	01/23/25 17:43		Kareem	OK
76	Q1039-20	GCPF5	SAM	01/23/25 17:48		Kareem	OK
77	Q1039-21	GCPF6	SAM	01/23/25 17:51		Kareem	OK
78	CCV004	CCV004	CCV	01/23/25 17:55		Kareem	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134392

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STD. NAME	STD REF.#		
ICAL Standard	MP83500,MP84064,MP84062,MP84061,MP84060,MP84059,MP84058		
ICV Standard	MP84065		
CCV Standard	MP84069		
ICSA Standard	MP84066,MP84067		
CRI Standard			
LCS Standard	MP83506		
Chk Standard	MP84071,MP84072		

79	CCB004	CCB004	CCB	01/23/25 18:00		Kareem	OK
80	Q1047-01	GCQ38	SAM	01/23/25 18:04		Kareem	OK
81	Q1047-02	GCQ39	SAM	01/23/25 18:08		Kareem	OK
82	Q1047-03	GCQ40	SAM	01/23/25 18:12		Kareem	OK
83	Q1047-04	GCQ41	SAM	01/23/25 18:16	Ba high	Kareem	Dilution
84	Q1047-05	GCQ41D	DUP	01/23/25 18:20	Ba high	Kareem	Dilution
85	Q1047-04L	GCQ41L	SD	01/23/25 18:25	Ba high	Kareem	Dilution
86	Q1047-06	GCQ41S	MS	01/23/25 18:29	Ba high	Kareem	Dilution
87	Q1047-07	GCQ42	SAM	01/23/25 18:33	Ba high	Kareem	Dilution
88	Q1047-08	GCQ43	SAM	01/23/25 18:37	Ba high	Kareem	Dilution
89	Q1047-09	GCQ44	SAM	01/23/25 18:41	Ba high	Kareem	Dilution
90	Q1047-10	GCQ45	SAM	01/23/25 18:45	Ba high	Kareem	Dilution
91	Q1047-11	GCQ46	SAM	01/23/25 18:49	Ba high	Kareem	Dilution
92	Q1047-12	GCQ47	SAM	01/23/25 18:53	Ba high	Kareem	Dilution
93	Q1047-13	GCQ48	SAM	01/23/25 18:58	Ba high	Kareem	Dilution
94	Q1047-14	GCQ49	SAM	01/23/25 19:02	Ba high	Kareem	Dilution
95	Q1047-15	GCQ50	SAM	01/23/25 19:06	Ba high	Kareem	Dilution
96	Q1047-16	GCQ51	SAM	01/23/25 19:10		Kareem	OK
97	Q1047-17	GCQ52	SAM	01/23/25 19:14	Ba high	Kareem	Dilution
98	Q1047-18	GCQ53	SAM	01/23/25 19:18	Ba high	Kareem	Dilution

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134392

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STD. NAME	STD REF.#		
ICAL Standard	MP83500,MP84064,MP84062,MP84061,MP84060,MP84059,MP84058		
ICV Standard	MP84065		
CCV Standard	MP84069		
ICSA Standard	MP84066,MP84067		
CRI Standard			
LCS Standard	MP83506		
Chk Standard	MP84071,MP84072		

99	Q1047-19	GCQ54	SAM	01/23/25 19:22	Ba high	Kareem	Dilution
100	CCV005	CCV005	CCV	01/23/25 19:26		Kareem	OK
101	CCB005	CCB005	CCB	01/23/25 19:30		Kareem	OK
102	Q1047-20	GCQ55	SAM	01/23/25 19:34	Ba high	Kareem	Dilution
103	Q1047-21	GCQ56	SAM	01/23/25 19:38		Kareem	OK
104	Q1045-01	GCPZ8	SAM	01/23/25 19:42	Ba high	Kareem	Dilution
105	Q1045-02	GCPZ9	SAM	01/23/25 19:47		Kareem	OK
106	Q1045-03	GCQ00	SAM	01/23/25 19:51	Ba high	Kareem	Dilution
107	Q1045-04	GCQ01	SAM	01/23/25 19:55	Ba high	Kareem	Dilution
108	Q1045-05	GCQ02	SAM	01/23/25 19:59	Ba high	Kareem	Dilution
109	Q1045-06	GCQ03	SAM	01/23/25 20:03		Kareem	OK
110	Q1045-07	GCQ04	SAM	01/23/25 20:08	Ba high	Kareem	Dilution
111	Q1045-08	GCQ04D	DUP	01/23/25 20:12	Ba high	Kareem	Dilution
112	Q1045-07L	GCQ04L	SD	01/23/25 20:16	Ba high	Kareem	Dilution
113	Q1045-09	GCQ04S	MS	01/23/25 20:20	Ba high	Kareem	Dilution
114	Q1045-10	GCQ05	SAM	01/23/25 20:24	Ba high	Kareem	Dilution
115	Q1045-11	GCQ06	SAM	01/23/25 20:28	Ba high	Kareem	Dilution
116	Q1045-12	GCQ07	SAM	01/23/25 20:32		Kareem	OK
117	Q1045-13	GCQ08	SAM	01/23/25 20:37	Ba high	Kareem	Dilution
118	Q1045-14	GCQ09	SAM	01/23/25 20:41		Kareem	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134392

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Supervise By	Kareem Khairalla	Supervise On	1/24/2025 4:41:08 PM
STD. NAME	STD REF.#		
ICAL Standard	MP83500,MP84064,MP84062,MP84061,MP84060,MP84059,MP84058		
ICV Standard	MP84065		
CCV Standard	MP84069		
ICSA Standard	MP84066,MP84067		
CRI Standard			
LCS Standard	MP83506		
Chk Standard	MP84071,MP84072		

119	Q1045-15	GCQ10	SAM	01/23/25 20:45		Kareem	OK
120	Q1045-16	GCQ11	SAM	01/23/25 20:49	Ba high	Kareem	Dilution
121	Q1045-17	GCQ12	SAM	01/23/25 20:53	Ba high	Kareem	Dilution
122	CCV006	CCV006	CCV	01/23/25 20:57		Kareem	OK
123	CCB006	CCB006	CCB	01/23/25 21:01		Kareem	OK
124	Q1045-18	GCQ13	SAM	01/23/25 21:06	Ba high	Kareem	Dilution
125	Q1045-19	GCQ14	SAM	01/23/25 21:10		Kareem	OK
126	Q1045-20	GCQ15	SAM	01/23/25 21:14	Ba high	Kareem	Dilution
127	Q1045-21	GCQ16	SAM	01/23/25 21:18		Kareem	OK
128	Q1045-22	GCQ17	SAM	01/23/25 21:22	Ba high	Kareem	Dilution
129	Q1042-01	GCPH6	SAM	01/23/25 21:26		Kareem	OK
130	Q1042-02	GCPH7	SAM	01/23/25 21:30		Kareem	OK
131	Q1042-03	GCPH8	SAM	01/23/25 21:34		Kareem	OK
132	Q1042-04	GCPH9	SAM	01/23/25 21:38		Kareem	OK
133	Q1042-05	GCPH9D	DUP	01/23/25 21:42		Kareem	OK
134	Q1042-04L	GCPH9L	SD	01/23/25 21:46		Kareem	OK
135	Q1042-06	GCPH9S	MS	01/23/25 21:50		Kareem	OK
136	Q1042-07	GCPJ0	SAM	01/23/25 21:54		Kareem	OK
137	Q1042-08	GCPJ1	SAM	01/23/25 21:58		Kareem	OK
138	Q1042-09	GCPJ2	SAM	01/23/25 22:02	Ba high	Kareem	Dilution

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134392

Review By	Mohan Bera	Review On	1/24/2025 7:52:38 AM
Supervise By	Kareem Khairalla	Supervise On	1/24/2025 4:41:08 PM
STD. NAME	STD REF.#		
ICAL Standard	MP83500,MP84064,MP84062,MP84061,MP84060,MP84059,MP84058		
ICV Standard	MP84065		
CCV Standard	MP84069		
ICSA Standard	MP84066,MP84067		
CRI Standard			
LCS Standard	MP83506		
Chk Standard	MP84071,MP84072		

139	Q1042-10	GCPJ3	SAM	01/23/25 22:06		Kareem	OK
140	Q1042-11	GCPJ4	SAM	01/23/25 22:10		Kareem	OK
141	Q1042-12	GCPJ5	SAM	01/23/25 22:14		Kareem	OK
142	Q1042-13	GCPJ6	SAM	01/23/25 22:18		Kareem	OK
143	Q1042-14	GCPJ7	SAM	01/23/25 22:22		Kareem	OK
144	CCV007	CCV007	CCV	01/23/25 22:26		Kareem	OK
145	CCB007	CCB007	CCB	01/23/25 22:31		Kareem	OK
146	Q1042-15	GCPJ8	SAM	01/23/25 22:35		Kareem	OK
147	Q1042-16	GCPJ9	SAM	01/23/25 22:39		Kareem	OK
148	Q1042-17	GCPK0	SAM	01/23/25 22:43		Kareem	OK
149	Q1042-18	GCPK1	SAM	01/23/25 22:47		Kareem	OK
150	Q1042-19	GCPK2	SAM	01/23/25 22:50		Kareem	OK
151	Q1042-20	GCPK3	SAM	01/23/25 22:54		Kareem	OK
152	Q1042-21	GCPK4	SAM	01/23/25 22:58		Kareem	OK
153	Q1043-01	GCPK5	SAM	01/23/25 23:02		Kareem	OK
154	Q1043-02	GCPK6	SAM	01/23/25 23:06		Kareem	OK
155	Q1043-03	GCPK7	SAM	01/23/25 23:10		Kareem	OK
156	Q1043-04	GCPK8	SAM	01/23/25 23:14		Kareem	OK
157	Q1043-05	GCPK9	SAM	01/23/25 23:18		Kareem	OK
158	Q1043-06	GCPL0	SAM	01/23/25 23:22		Kareem	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134392

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Supervise By	Kareem Khairalla	Supervise On	1/24/2025 4:41:08 PM

STD. NAME	STD REF.#
ICAL Standard	MP83500,MP84064,MP84062,MP84061,MP84060,MP84059,MP84058
ICV Standard	MP84065
CCV Standard	MP84069
ICSA Standard	MP84066,MP84067
CRI Standard	
LCS Standard	MP83506
Chk Standard	MP84071,MP84072

159	Q1043-07	GCPL1	SAM	01/23/25 23:26		Kareem	OK
160	Q1043-08	GCPL2	SAM	01/23/25 23:30		Kareem	OK
161	Q1043-09	GCPL2D	DUP	01/23/25 23:34		Kareem	OK
162	Q1043-08L	GCPL2L	SD	01/23/25 23:38		Kareem	OK
163	Q1043-10	GCPL2S	MS	01/23/25 23:42		Kareem	OK
164	Q1043-11	GCPL3	SAM	01/23/25 23:46		Kareem	OK
165	Q1043-12	GCPL4	SAM	01/23/25 23:50		Kareem	OK
166	CCV008	CCV008	CCV	01/23/25 23:55		Kareem	OK
167	CCB008	CCB008	CCB	01/23/25 23:59		Kareem	OK
168	Q1043-13	GCPL5	SAM	01/24/25 00:03		Kareem	OK
169	Q1043-14	GCPL6	SAM	01/24/25 00:07		Kareem	OK
170	Q1043-15	GCPL7	SAM	01/24/25 00:11		Kareem	OK
171	Q1044-01	GCPX8	SAM	01/24/25 00:15		Kareem	OK
172	Q1044-02	GCPX9	SAM	01/24/25 00:19		Kareem	OK
173	Q1044-03	GCPX9D	DUP	01/24/25 00:23		Kareem	OK
174	Q1044-02L	GCPX9L	SD	01/24/25 00:27		Kareem	OK
175	Q1044-04	GCPX9S	MS	01/24/25 00:31		Kareem	OK
176	Q1044-05	GCPY0	SAM	01/24/25 00:35		Kareem	OK
177	Q1044-06	GCPY1	SAM	01/24/25 00:39		Kareem	OK
178	Q1044-07	GCPY2	SAM	01/24/25 00:43		Kareem	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134392

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Supervise By	Kareem Khairalla	Supervise On	1/24/2025 4:41:08 PM
STD. NAME	STD REF.#		
ICAL Standard	MP83500,MP84064,MP84062,MP84061,MP84060,MP84059,MP84058		
ICV Standard	MP84065		
CCV Standard	MP84069		
ICSA Standard	MP84066,MP84067		
CRI Standard			
LCS Standard	MP83506		
Chk Standard	MP84071,MP84072		

179	Q1044-08	GCPY3	SAM	01/24/25 00:47		Kareem	OK
180	Q1044-09	GCPY4	SAM	01/24/25 00:51		Kareem	OK
181	Q1044-10	GCPY5	SAM	01/24/25 00:58		Kareem	OK
182	Q1044-11	GCPY6	SAM	01/24/25 01:02		Kareem	OK
183	Q1044-12	GCPY7	SAM	01/24/25 01:06		Kareem	OK
184	Q1044-13	GCPY8	SAM	01/24/25 01:10	Ba high	Kareem	Dilution
185	Q1044-14	GCPY9	SAM	01/24/25 01:14		Kareem	OK
186	Q1044-15	GCPZ0	SAM	01/24/25 01:18		Kareem	OK
187	Q1044-16	GCPZ1	SAM	01/24/25 01:22	Ba high	Kareem	Dilution
188	CCV009	CCV009	CCV	01/24/25 01:26		Kareem	OK
189	CCB009	CCB009	CCB	01/24/25 01:31		Kareem	OK
190	Q1044-17	GCPZ2	SAM	01/24/25 01:35		Kareem	OK
191	Q1044-18	GCPZ3	SAM	01/24/25 01:39	Ba high	Kareem	Dilution
192	Q1044-19	GCPZ4	SAM	01/24/25 01:43	Ba high	Kareem	Dilution
193	Q1044-20	GCPZ5	SAM	01/24/25 01:47	Ba high	Kareem	Dilution
194	Q1044-21	GCPZ6	SAM	01/24/25 01:51	Ba high	Kareem	Dilution
195	Q1044-22	GCPZ7	SAM	01/24/25 01:55		Kareem	OK
196	Q1046-01	GCQ18	SAM	01/24/25 02:00	Ba high	Kareem	Dilution
197	Q1046-02	GCQ19	SAM	01/24/25 02:04	NOT USE	Kareem	Not Ok
198	Q1046-03	GCQ19D	DUP	01/24/25 02:08	NOT USE	Kareem	Not Ok

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134392

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STD. NAME	STD REF.#		
ICAL Standard	MP83500,MP84064,MP84062,MP84061,MP84060,MP84059,MP84058		
ICV Standard	MP84065		
CCV Standard	MP84069		
ICSA Standard	MP84066,MP84067		
CRI Standard			
LCS Standard	MP83506		
Chk Standard	MP84071,MP84072		

199	Q1046-02L	GCQ19L	SD	01/24/25 02:12	NOT USE	Kareem	Not Ok
200	Q1046-04	GCQ19S	MS	01/24/25 02:16	NOT USE	Kareem	Not Ok
201	Q1046-05	GCQ20	SAM	01/24/25 02:20		Kareem	OK
202	Q1046-06	GCQ21	SAM	01/24/25 02:24		Kareem	OK
203	Q1046-07	GCQ22	SAM	01/24/25 02:28		Kareem	OK
204	Q1046-08	GCQ23	SAM	01/24/25 02:32		Kareem	OK
205	Q1046-09	GCQ24	SAM	01/24/25 02:36		Kareem	OK
206	Q1046-10	GCQ25	SAM	01/24/25 02:40	Ba high	Kareem	Dilution
207	Q1046-11	GCQ26	SAM	01/24/25 02:44	Ba high	Kareem	Dilution
208	Q1046-12	GCQ27	SAM	01/24/25 02:49		Kareem	OK
209	Q1046-13	GCQ28	SAM	01/24/25 02:53		Kareem	OK
210	CCV010	CCV010	CCV	01/24/25 02:57		Kareem	OK
211	CCB010	CCB010	CCB	01/24/25 03:01		Kareem	OK
212	Q1046-14	GCQ29	SAM	01/24/25 03:06		Kareem	OK
213	Q1046-15	GCQ30	SAM	01/24/25 03:10		Kareem	OK
214	Q1046-16	GCQ31	SAM	01/24/25 03:14		Kareem	OK
215	Q1046-17	GCQ32	SAM	01/24/25 03:18		Kareem	OK
216	Q1046-18	GCQ33	SAM	01/24/25 03:22		Kareem	OK
217	Q1046-19	GCQ34	SAM	01/24/25 03:26		Kareem	OK
218	Q1046-20	GCQ35	SAM	01/24/25 03:30		Kareem	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134392

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ICV Standard	MP84065
CCV Standard	MP84069
ICSA Standard	MP84066,MP84067
CRI Standard	
LCS Standard	MP83506
Chk Standard	MP84071,MP84072

219	Q1046-21	GCQ36	SAM	01/24/25 03:34		Kareem	OK
220	Q1046-22	GCQ37	SAM	01/24/25 03:38		Kareem	OK
221	Q1039-10DL	GCPE5	SAM	01/24/25 03:42	NOT USE	Kareem	Not Ok
222	Q1047-04DL	GCQ41	SAM	01/24/25 03:47	2x for Ba	Kareem	Confirms
223	Q1047-05DL	GCQ41D	DUP	01/24/25 03:51	2x for Ba	Kareem	Confirms
224	Q1047-04LDL	GCQ41L	SD	01/24/25 03:55	10x for Ba	Kareem	Confirms
225	Q1047-06DL	GCQ41S	MS	01/24/25 03:59	2x for Ba	Kareem	Confirms
226	CCV011	CCV011	CCV	01/24/25 04:03		Kareem	OK
227	CCB011	CCB011	CCB	01/24/25 04:08		Kareem	OK

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Login Summary Report

Order ID :	Q1041	Order Date :	1/9/2025 9:40:00 AM	Project Mgr :	Deepak
Client :	USEPA CLP SMO	Project :	51921	Report Type :	USEPA CLP
Contact :	Anita Kapadia	Receive Date :	1/9/2025 9:40:00 AM	EDD Type :	EPA CLP
Date Sign Off :	1/9/2025 11:36:18 AM				

Sample ID	Client ID	Matrix	Sampling Date	Test	Test Group	Method	TAT Days	Fax Due Date	HC Due Date
Q1041-01	GCPF7	Solid	11/22/2024						
				Metals CLP12		SFAM_AES	15	01/30/2025	01/30/2025
				Percent Solids		Chemtech -SOP	15	01/30/2025	01/30/2025
Q1041-02	GCPF8	Solid	11/22/2024						
				Metals CLP12		SFAM_AES	15	01/30/2025	01/30/2025
				Percent Solids		Chemtech -SOP	15	01/30/2025	01/30/2025
Q1041-03	GCPF9	Solid	11/22/2024						
				Metals CLP12		SFAM_AES	15	01/30/2025	01/30/2025
				Percent Solids		Chemtech -SOP	15	01/30/2025	01/30/2025
Q1041-04	GCPG0	Solid	11/22/2024						
				Metals CLP12		SFAM_AES	15	01/30/2025	01/30/2025
				Percent Solids		Chemtech -SOP	15	01/30/2025	01/30/2025
Q1041-05	GCPG0D	Solid	11/22/2024						
				Metals CLP12		SFAM_AES	15	01/30/2025	01/30/2025
				Percent Solids		Chemtech -SOP	15	01/30/2025	01/30/2025
Q1041-06	GCPG0S	Solid	11/22/2024						
				Metals CLP12		SFAM_AES	15	01/30/2025	01/30/2025
				Percent Solids		Chemtech -SOP	15	01/30/2025	01/30/2025
Q1041-07	GCPG1	Solid	11/25/2024						
				Metals CLP12		SFAM_AES	15	01/30/2025	01/30/2025
				Percent Solids		Chemtech -SOP	15	01/30/2025	01/30/2025
Q1041-08	GCPG2	Solid	11/25/2024						
				Metals CLP12		SFAM_AES	15	01/30/2025	01/30/2025
				Percent Solids		Chemtech -SOP	15	01/30/2025	01/30/2025
Q1041-09	GCPG3	Solid	11/25/2024						
				Metals CLP12		SFAM_AES	15	01/30/2025	01/30/2025
				Percent Solids		Chemtech -SOP	15	01/30/2025	01/30/2025
Q1041-10	GCPG4	Solid	11/25/2024						
				Metals CLP12		SFAM_AES	15	01/30/2025	01/30/2025
				Percent Solids		Chemtech -SOP	15	01/30/2025	01/30/2025

Q1041-11	GCPG5	Solid	11/25/2024		
				Metals CLP12	SFAM_AES 15 01/30/2025 01/30/2025
				Percent Solids	Chemtech -SOP 15 01/30/2025 01/30/2025
Q1041-12	GCPG6	Solid	11/25/2024		
				Metals CLP12	SFAM_AES 15 01/30/2025 01/30/2025
				Percent Solids	Chemtech -SOP 15 01/30/2025 01/30/2025
Q1041-13	GCPG7	Solid	11/25/2024		
				Metals CLP12	SFAM_AES 15 01/30/2025 01/30/2025
				Percent Solids	Chemtech -SOP 15 01/30/2025 01/30/2025
Q1041-14	GCPG8	Solid	11/25/2024		
				Metals CLP12	SFAM_AES 15 01/30/2025 01/30/2025
				Percent Solids	Chemtech -SOP 15 01/30/2025 01/30/2025
Q1041-15	GCPG9	Solid	11/25/2024		
				Metals CLP12	SFAM_AES 15 01/30/2025 01/30/2025
				Percent Solids	Chemtech -SOP 15 01/30/2025 01/30/2025
Q1041-16	GCPH0	Solid	11/18/2024		
				Metals CLP12	SFAM_AES 15 01/30/2025 01/30/2025
				Percent Solids	Chemtech -SOP 15 01/30/2025 01/30/2025
Q1041-17	GCPH1	Solid	11/18/2024		
				Metals CLP12	SFAM_AES 15 01/30/2025 01/30/2025
				Percent Solids	Chemtech -SOP 15 01/30/2025 01/30/2025
Q1041-18	GCPH2	Solid	11/18/2024		
				Metals CLP12	SFAM_AES 15 01/30/2025 01/30/2025
				Percent Solids	Chemtech -SOP 15 01/30/2025 01/30/2025
Q1041-19	GCPH3	Solid	11/18/2024		
				Metals CLP12	SFAM_AES 15 01/30/2025 01/30/2025
				Percent Solids	Chemtech -SOP 15 01/30/2025 01/30/2025
Q1041-20	GCPH4	Solid	11/18/2024		
				Metals CLP12	SFAM_AES 15 01/30/2025 01/30/2025
				Percent Solids	Chemtech -SOP 15 01/30/2025 01/30/2025
Q1041-21	GCPH5	Solid	11/18/2024		
				Metals CLP12	SFAM_AES 15 01/30/2025 01/30/2025
				Percent Solids	Chemtech -SOP 15 01/30/2025 01/30/2025

WORKLIST(Hardcopy Internal Chain)

Worklist Name : PB166002

Worklist ID : 186841

Department : Digestion

Date : 01-09-2025 12:55:29

Sample	Customer Sample	Matrix	Test	Preservative	Customer	Raw Sample Storage Location	Collect Date	Method
Q1041-01	GCPF7	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/22/2024	SFAM_AES
Q1041-02	GCPF8	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/22/2024	SFAM_AES
Q1041-03	GCPF9	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/22/2024	SFAM_AES
Q1041-04	GCPG0	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/22/2024	SFAM_AES
Q1041-05	GCPG0D	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/22/2024	SFAM_AES
Q1041-06	GCPG0S	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/22/2024	SFAM_AES
Q1041-07	GCPG1	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/22/2024	SFAM_AES
Q1041-08	GCPG2	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/25/2024	SFAM_AES
Q1041-09	GCPG3	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/25/2024	SFAM_AES
Q1041-10	GCPG4	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/25/2024	SFAM_AES
Q1041-11	GCPG5	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/25/2024	SFAM_AES
Q1041-12	GCPG6	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/25/2024	SFAM_AES
Q1041-13	GCPG7	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/25/2024	SFAM_AES
Q1041-14	GCPG8	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/25/2024	SFAM_AES
Q1041-15	GCPG9	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/25/2024	SFAM_AES
Q1041-16	GCPH0	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/25/2024	SFAM_AES
Q1041-17	GCPH1	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/18/2024	SFAM_AES
Q1041-18	GCPH2	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/18/2024	SFAM_AES
Q1041-19	GCPH3	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/18/2024	SFAM_AES
Q1041-20	GCPH4	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/18/2024	SFAM_AES
Q1041-21	GCPH5	Solid	Metals CLP12	Cool 4 deg C	USEP01	C11	11/18/2024	SFAM_AES

Date/Time 01/09/25 13:20

Raw Sample Received by: S.B. mehdostan

Raw Sample Relinquished by: [Signature]

Date/Time 01/09/25 14:20

Raw Sample Received by: [Signature]

Raw Sample Relinquished by: [Signature]