

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

A6301

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51952 MA No. : SDG No.: A6301
Matrix: SOIL Lab Sample ID: Q1223-01
% Solids: 26.4 Date Received: 01/30/2025
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
7429-90-5	Aluminum	8200		02/02/2025	1305
7440-70-2	Calcium	6500		02/02/2025	1305
7439-89-6	Iron	34000		02/02/2025	1305
7439-95-4	Magnesium	800		02/02/2025	1305
7440-09-7	Potassium	260	J	02/02/2025	1305
7440-23-5	Sodium	110	J	02/02/2025	1305

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

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

A6302

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51952 MA No. : SDG No.: A6301
Matrix: SOIL Lab Sample ID: Q1223-02
% Solids: 23.8 Date Received: 01/30/2025
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
7429-90-5	Aluminum	5100		02/02/2025	1309
7440-70-2	Calcium	12000		02/02/2025	1309
7439-89-6	Iron	31000		02/02/2025	1309
7439-95-4	Magnesium	680		02/02/2025	1309
7440-09-7	Potassium	480		02/02/2025	1309
7440-23-5	Sodium	150	J	02/02/2025	1309

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

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

A6303

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51952 MA No. : SDG No.: A6301
Matrix: SOIL Lab Sample ID: Q1223-03
% Solids: 52.2 Date Received: 01/30/2025
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
7429-90-5	Aluminum	5500		02/02/2025	1313
7440-70-2	Calcium	1700		02/02/2025	1313
7439-89-6	Iron	14000		02/02/2025	1313
7439-95-4	Magnesium	1700		02/02/2025	1313
7440-09-7	Potassium	240	J	02/02/2025	1313
7440-23-5	Sodium	730	U	02/02/2025	1313

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

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

A6304

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51952 MA No. : SDG No.: A6301
Matrix: SOIL Lab Sample ID: Q1223-04
% Solids: 50.8 Date Received: 01/30/2025
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
7429-90-5	Aluminum	5700		02/02/2025	1317
7440-70-2	Calcium	1600		02/02/2025	1317
7439-89-6	Iron	15000		02/02/2025	1317
7439-95-4	Magnesium	1800		02/02/2025	1317
7440-09-7	Potassium	210	J	02/02/2025	1317
7440-23-5	Sodium	850	U	02/02/2025	1317

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

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

A6305

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51952 MA No. : SDG No.: A6301
Matrix: SOIL Lab Sample ID: Q1223-05
% Solids: 24.3 Date Received: 01/30/2025
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
7429-90-5	Aluminum	14000		02/02/2025	1234
7440-70-2	Calcium	11000		02/02/2025	1234
7439-89-6	Iron	27000		02/02/2025	1234
7439-95-4	Magnesium	2400		02/02/2025	1234
7440-09-7	Potassium	710		02/02/2025	1234
7440-23-5	Sodium	1700		02/02/2025	1234

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

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

A6307

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51952 MA No. : SDG No.: A6301
Matrix: SOIL Lab Sample ID: Q1223-09
% Solids: 24.7 Date Received: 01/30/2025
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
7429-90-5	Aluminum	8500		02/02/2025	1325
7440-70-2	Calcium	840		02/02/2025	1325
7439-89-6	Iron	10000		02/02/2025	1325
7439-95-4	Magnesium	940		02/02/2025	1325
7440-09-7	Potassium	210	J	02/02/2025	1325
7440-23-5	Sodium	150	J	02/02/2025	1325

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

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

A6308

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51952 MA No. : SDG No.: A6301
Matrix: SOIL Lab Sample ID: Q1223-10
% Solids: 44.2 Date Received: 01/30/2025
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
7429-90-5	Aluminum	3600		02/02/2025	1329
7440-70-2	Calcium	1200		02/02/2025	1329
7439-89-6	Iron	20000		02/02/2025	1329
7439-95-4	Magnesium	990	J	02/02/2025	1329
7440-09-7	Potassium	560	J	02/02/2025	1329
7440-23-5	Sodium	1000	U	02/02/2025	1329

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

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

A6309

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51952 MA No. : SDG No.: A6301
Matrix: SOIL Lab Sample ID: Q1223-11
% Solids: 64.9 Date Received: 01/30/2025
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
7429-90-5	Aluminum	4000		02/02/2025	1333
7440-70-2	Calcium	1300		02/02/2025	1333
7439-89-6	Iron	11000		02/02/2025	1333
7439-95-4	Magnesium	1700		02/02/2025	1333
7440-09-7	Potassium	370	J	02/02/2025	1333
7440-23-5	Sodium	220	J	02/02/2025	1333

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

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

A6320

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51952 MA No. : SDG No.: A6301
Matrix: SOIL Lab Sample ID: Q1223-12
% Solids: 84 Date Received: 01/30/2025
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
7429-90-5	Aluminum	6400		02/02/2025	1346
7440-70-2	Calcium	720		02/02/2025	1346
7439-89-6	Iron	5800		02/02/2025	1346
7439-95-4	Magnesium	1700		02/02/2025	1346
7440-09-7	Potassium	290	J	02/02/2025	1346
7440-23-5	Sodium	73	J	02/02/2025	1346

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

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

A6321

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51952 MA No. : SDG No.: A6301
Matrix: SOIL Lab Sample ID: Q1223-13
% Solids: 47.9 Date Received: 01/30/2025
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
7429-90-5	Aluminum	10000		02/02/2025	1350
7440-70-2	Calcium	1900		02/02/2025	1350
7439-89-6	Iron	12000		02/02/2025	1350
7439-95-4	Magnesium	2700		02/02/2025	1350
7440-09-7	Potassium	940		02/02/2025	1350
7440-23-5	Sodium	230	J	02/02/2025	1350

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

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

A6322

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51952 MA No. : SDG No.: A6301
Matrix: SOIL Lab Sample ID: Q1223-14
% Solids: 12.9 Date Received: 01/30/2025
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
7429-90-5	Aluminum	11000		02/02/2025	1354
7440-70-2	Calcium	6600		02/02/2025	1354
7439-89-6	Iron	84000	D	02/02/2025	1513
7439-95-4	Magnesium	2600		02/02/2025	1354
7440-09-7	Potassium	1200		02/02/2025	1354
7440-23-5	Sodium	830		02/02/2025	1354

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

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

A6323

Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51952 MA No. : SDG No.: A6301
Matrix: SOIL Lab Sample ID: Q1223-15
% Solids: 28.3 Date Received: 01/30/2025
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
7429-90-5	Aluminum	5200		02/02/2025	1358
7440-70-2	Calcium	1200		02/02/2025	1358
7439-89-6	Iron	7400		02/02/2025	1358
7439-95-4	Magnesium	1200		02/02/2025	1358
7440-09-7	Potassium	340	J	02/02/2025	1358
7440-23-5	Sodium	170	J	02/02/2025	1358

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

Comments:

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

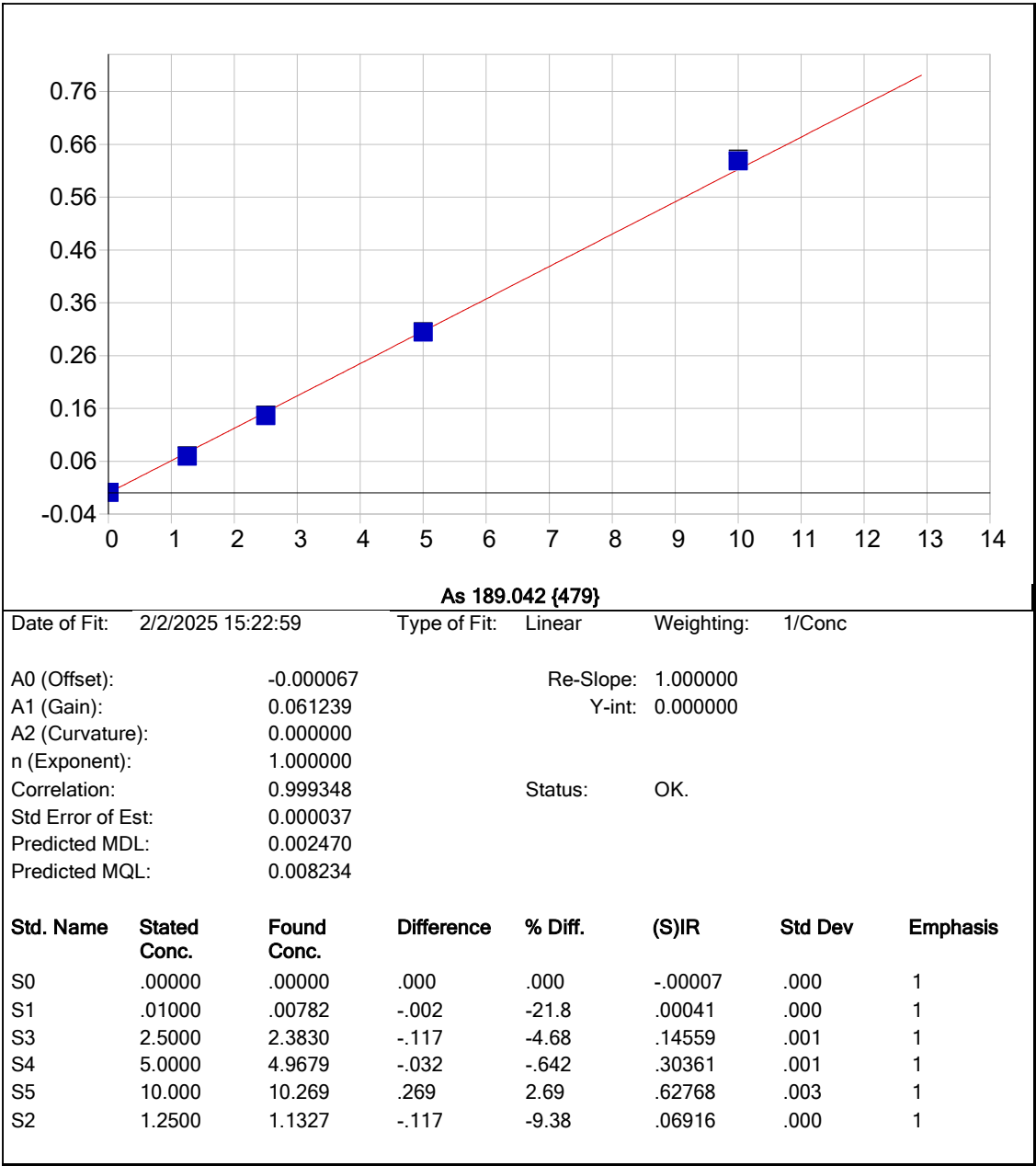
A6324

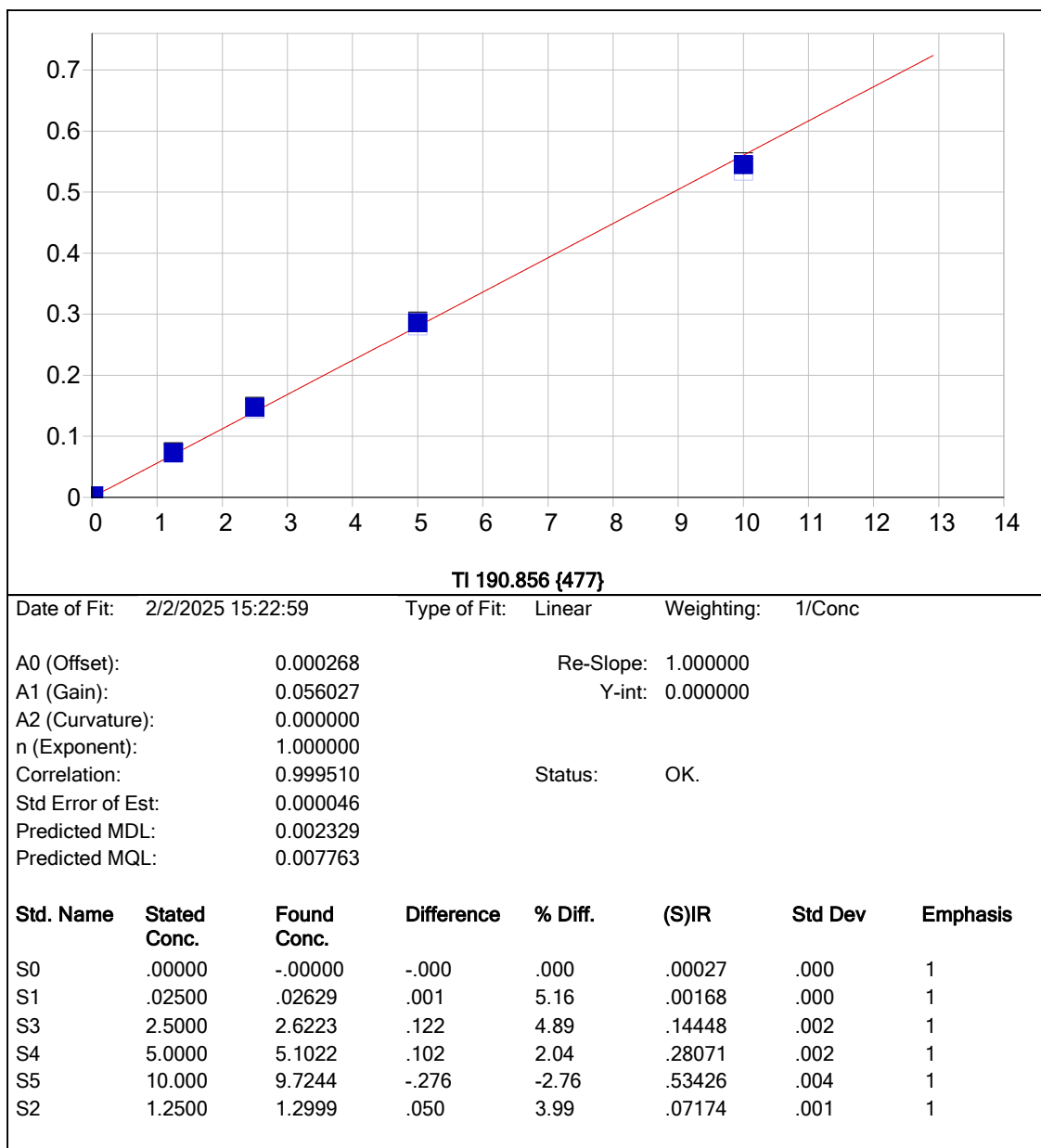
Lab Name: Alliance Technical Group, LLC Contract: 68HERH20D0011
Lab Code: ACE Case No.: 51952 MA No. : SDG No.: A6301
Matrix: SOIL Lab Sample ID: Q1223-16
% Solids: 25.5 Date Received: 01/30/2025
Analytical Method: ICP_AES
Concentration Units ($\mu\text{g/L}$, mg/L , mg/kg dry weight, μg , or $\mu\text{g/cm}^2$): mg/kg

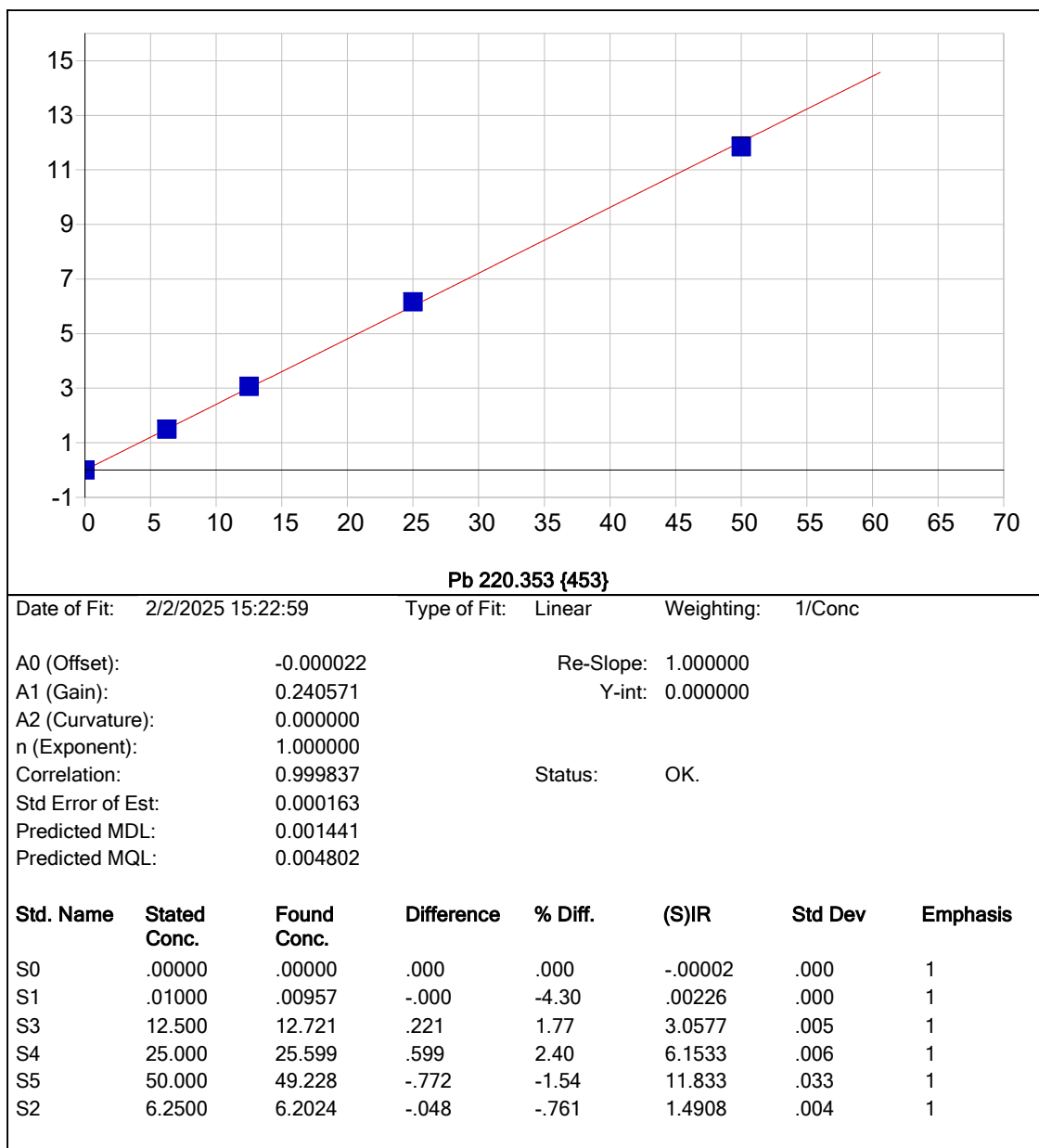
CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7429-90-5	Aluminum	7500		02/02/2025	1402
7440-70-2	Calcium	10000		02/02/2025	1402
7439-89-6	Iron	9600		02/02/2025	1402
7439-95-4	Magnesium	2100		02/02/2025	1402
7440-09-7	Potassium	470		02/02/2025	1402
7440-23-5	Sodium	610		02/02/2025	1402

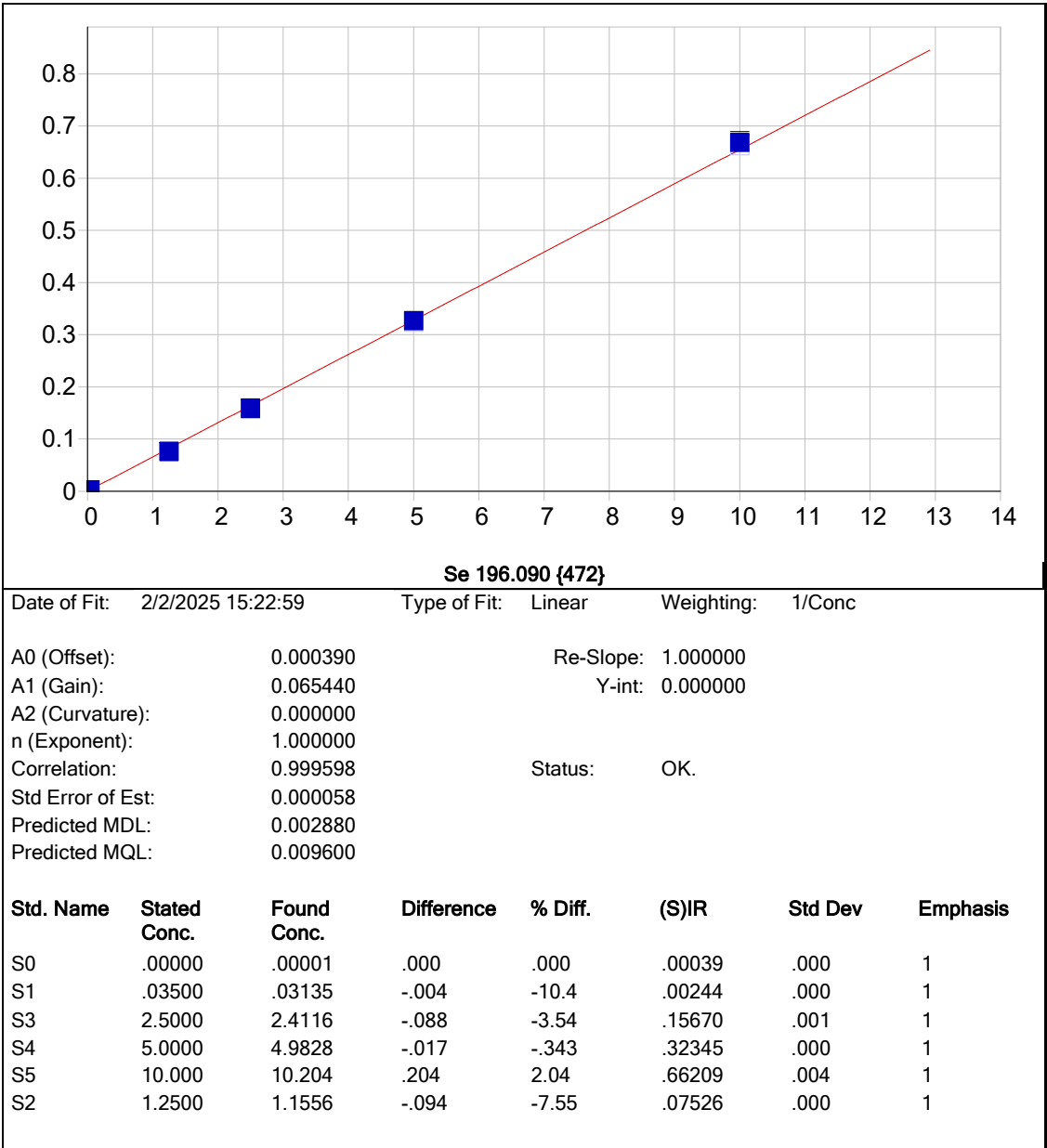
NOTE: Hardness (total) is reported in mg/L

Comments:



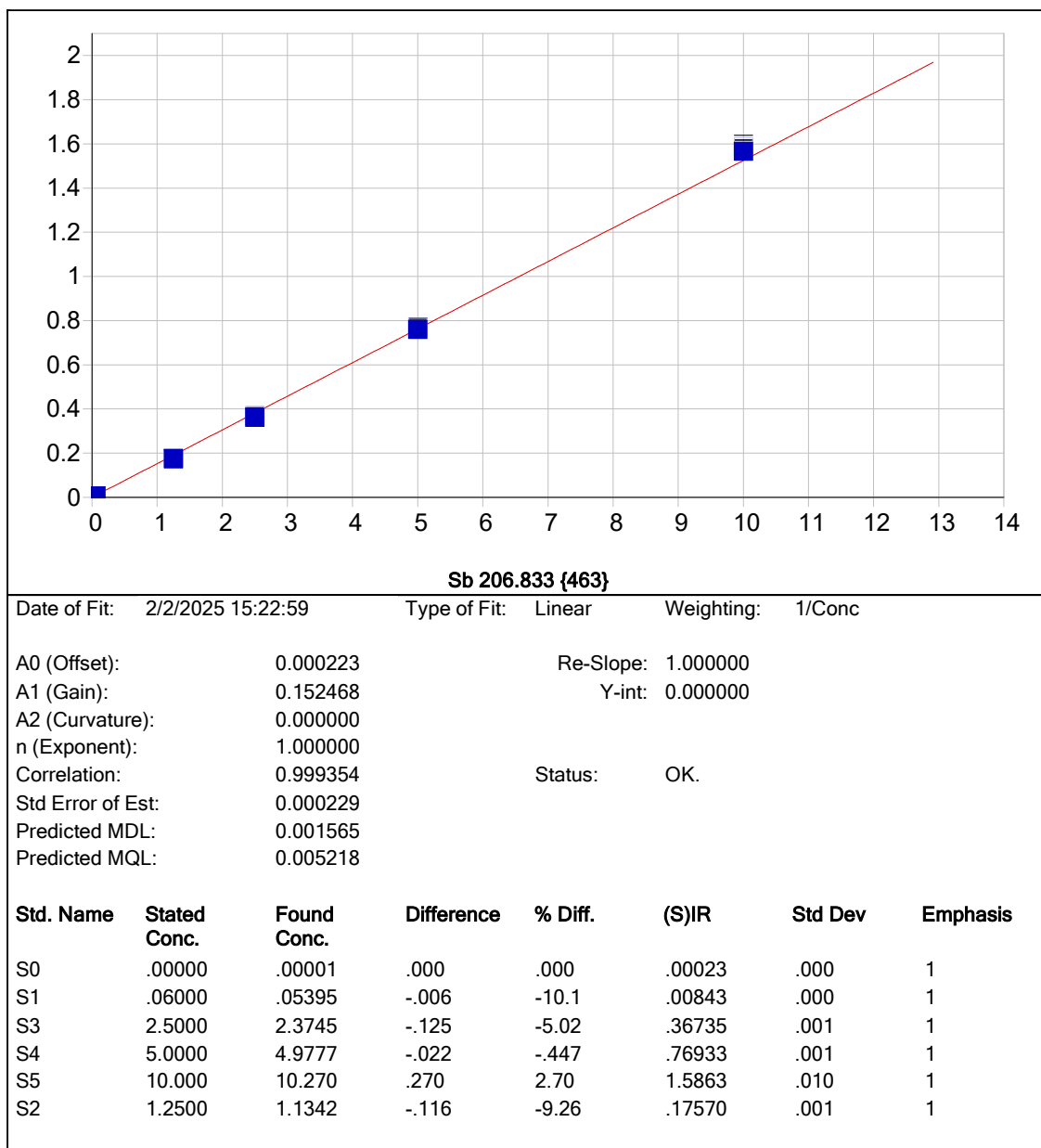


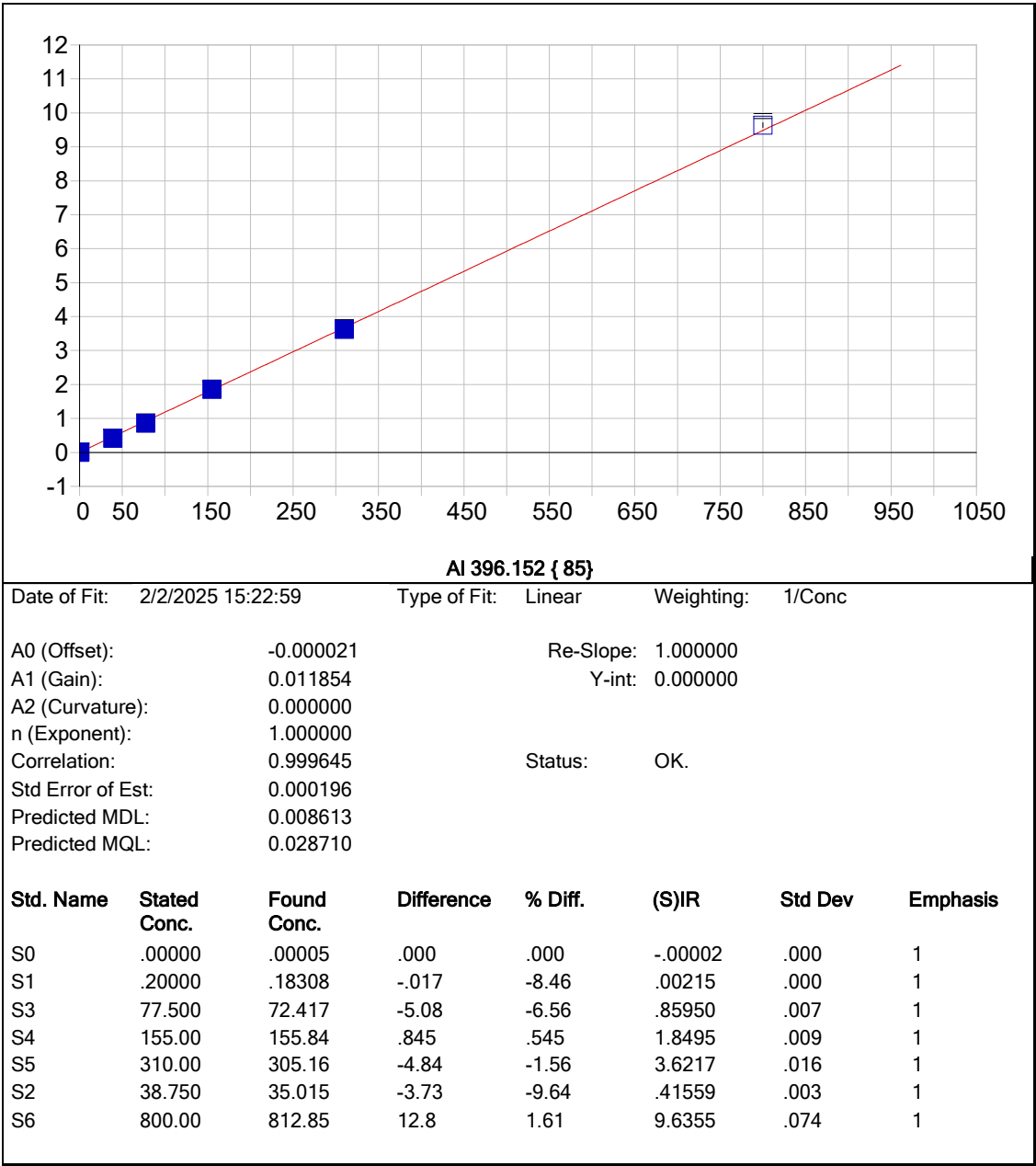


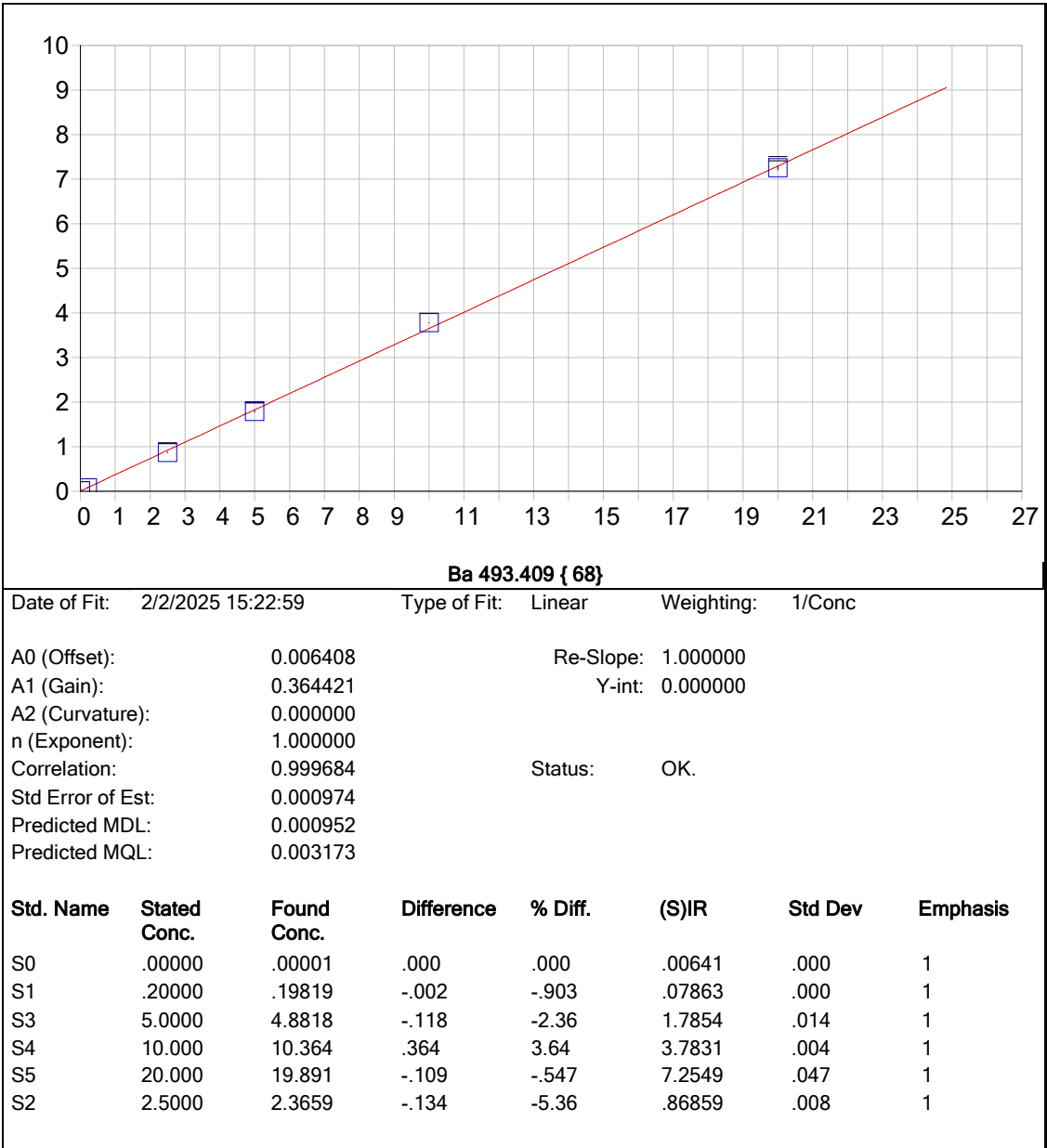


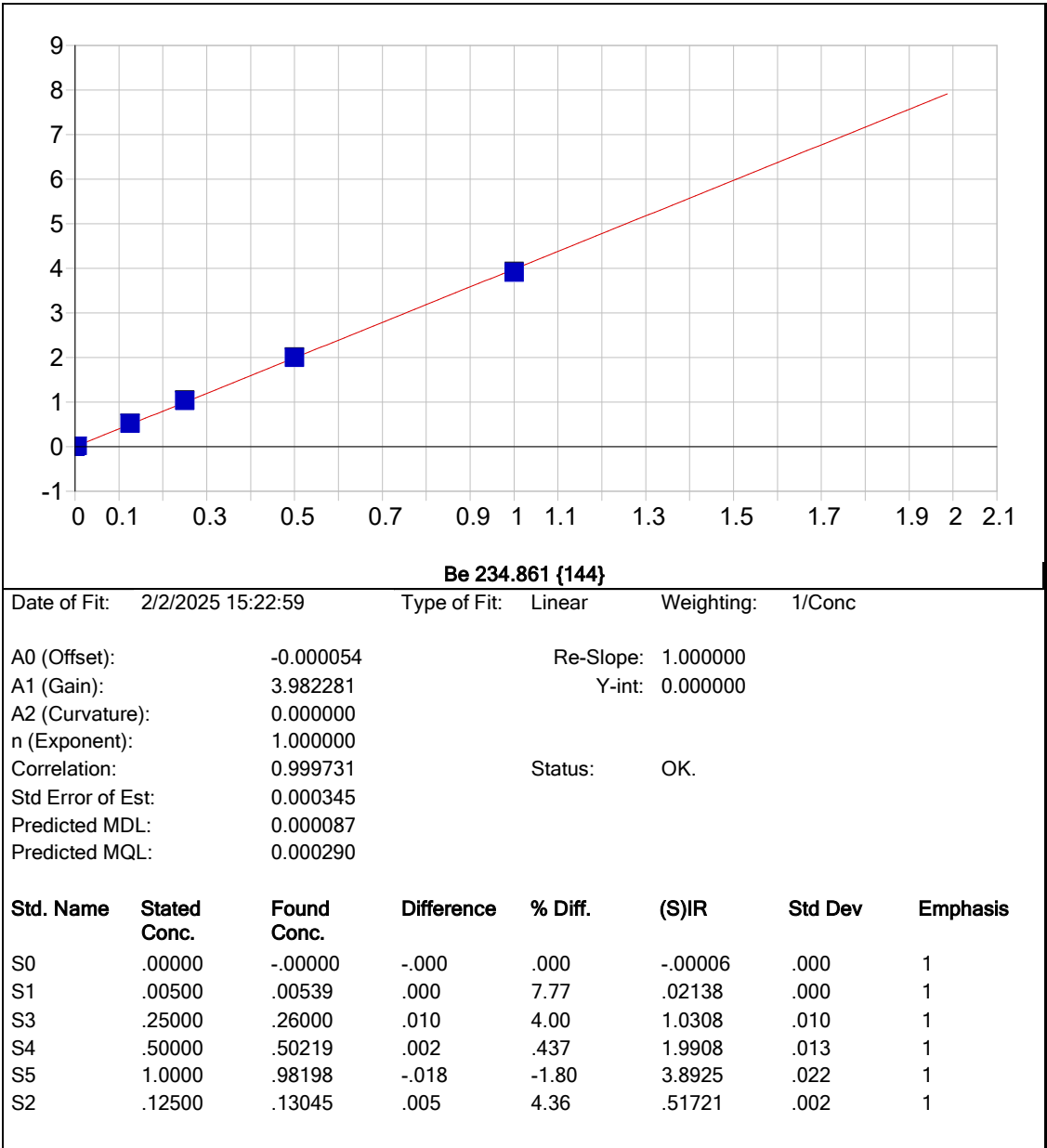
Date of Fit: 2/2/2025 15:22:59 Type of Fit: Linear Weighting: 1/Conc

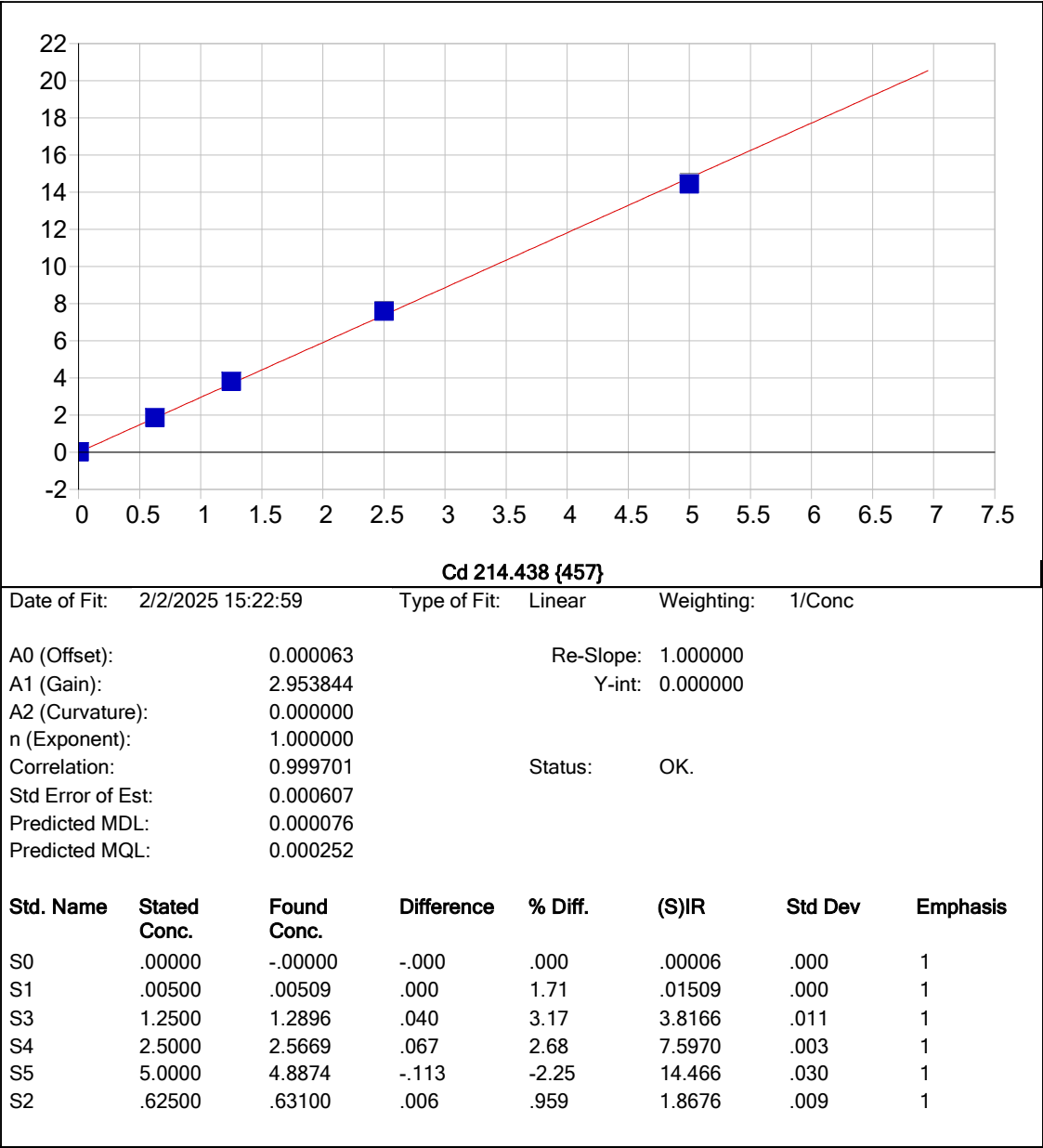
A0 (Offset): 0.000390 Re-Slope: 1.000000
A1 (Gain): 0.065440 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999598 Status: OK.
Std Error of Est: 0.000058
Predicted MDL: 0.002880
Predicted MQL: 0.009600

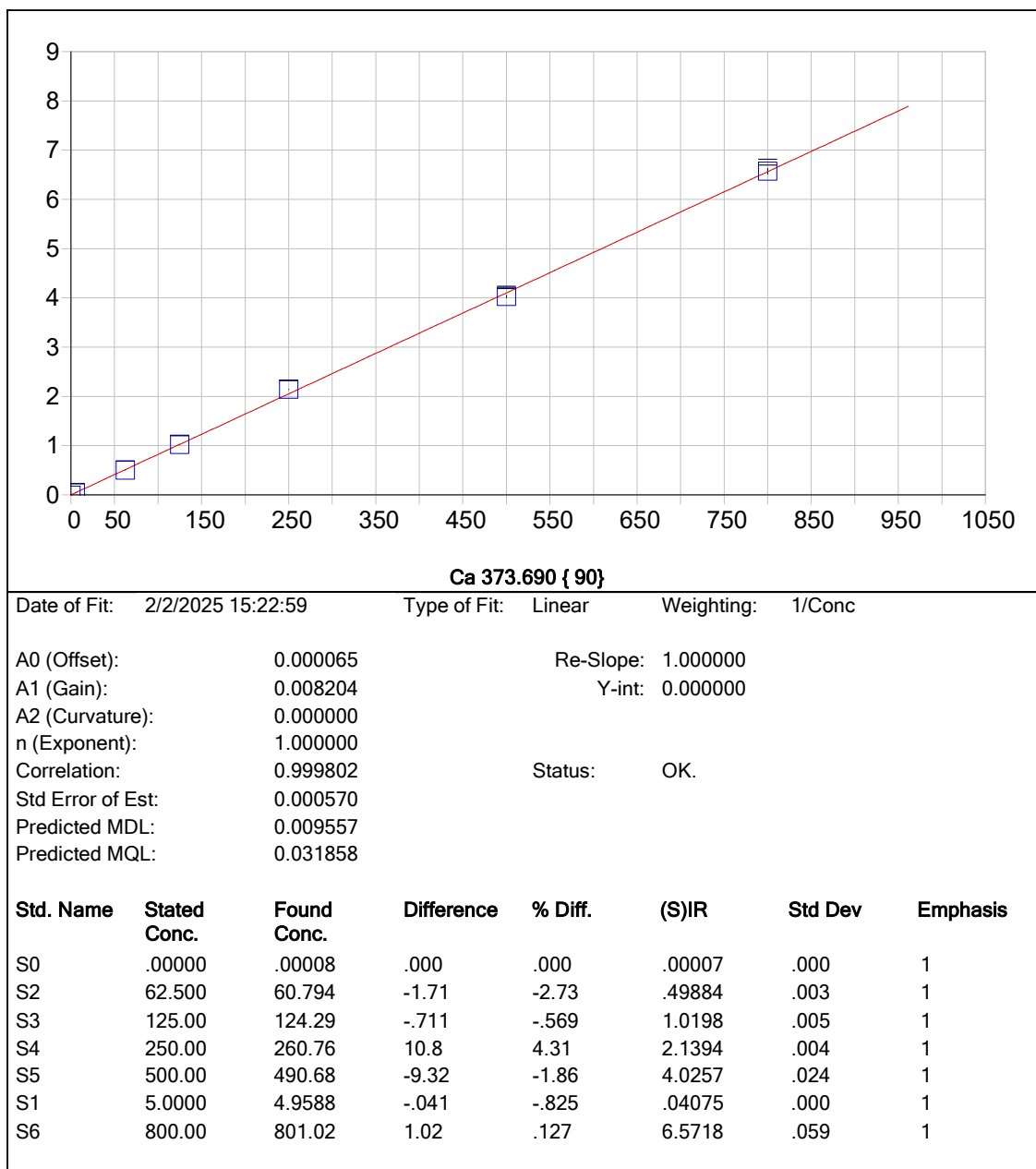


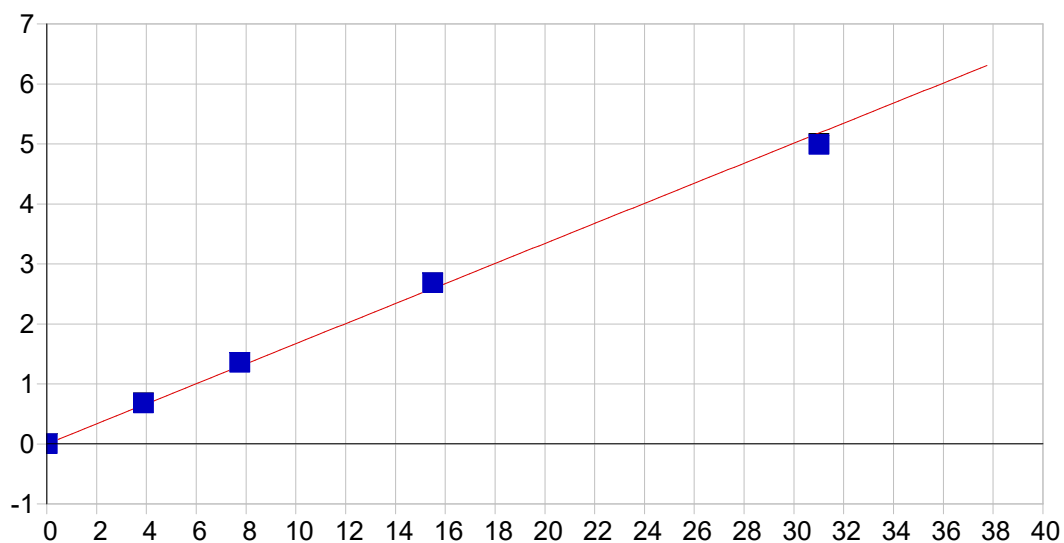










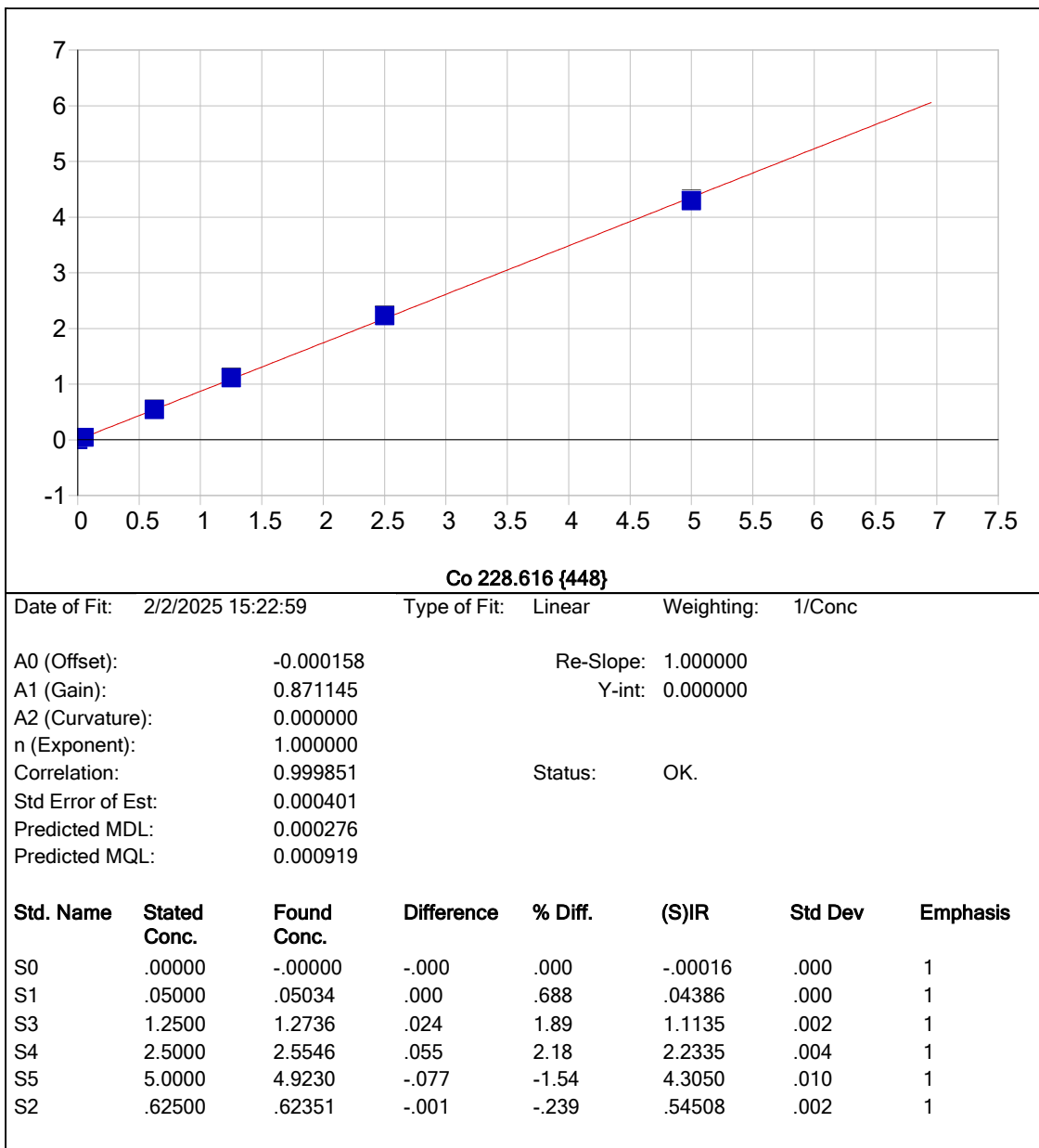


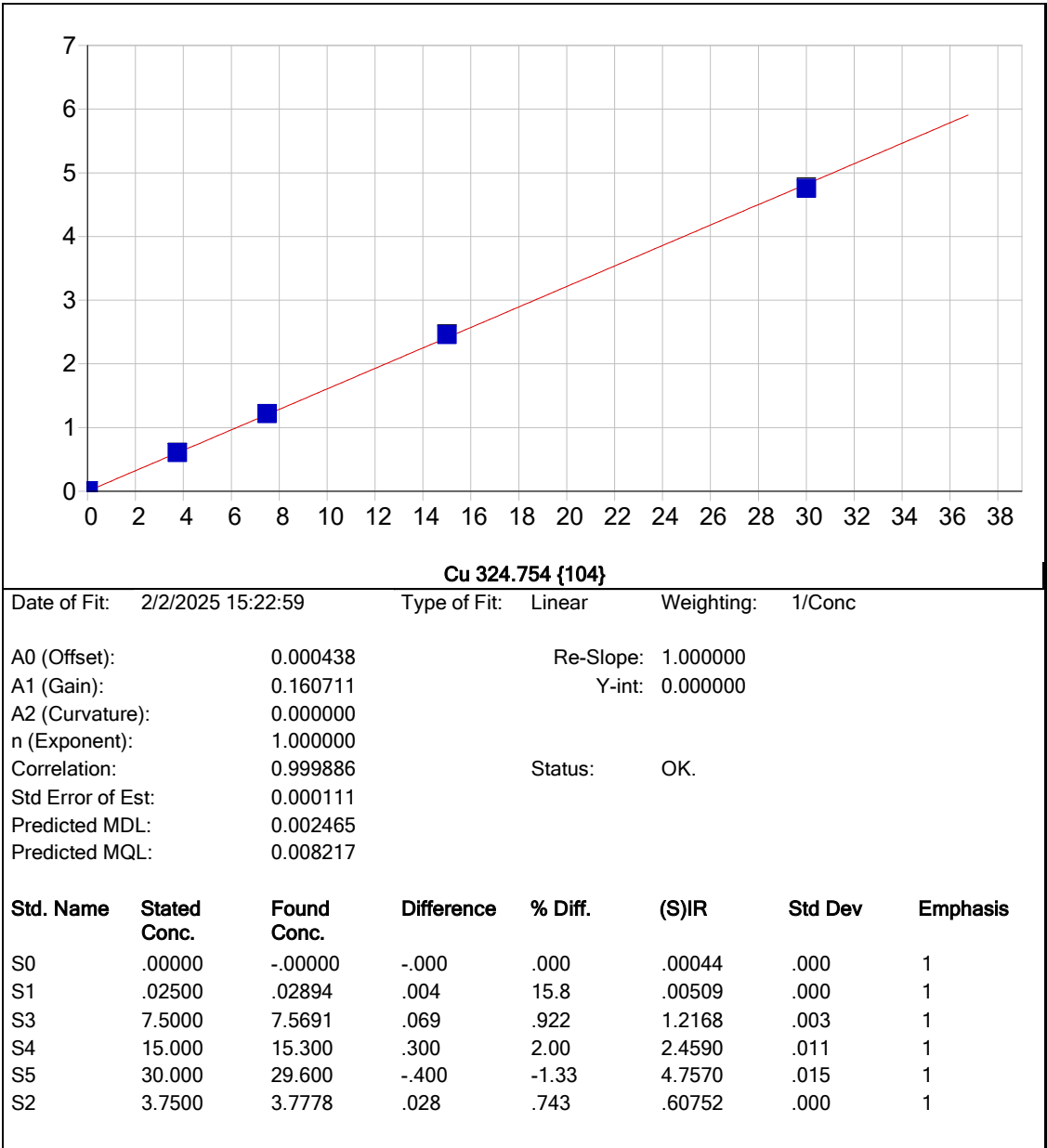
Cr 267.716 {126}

Date of Fit: 2/2/2025 15:22:59 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.000036 Re-Slope: 1.000000
A1 (Gain): 0.167061 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999236 Status: OK.
Std Error of Est: 0.000193
Predicted MDL: 0.000440
Predicted MQL: 0.001466

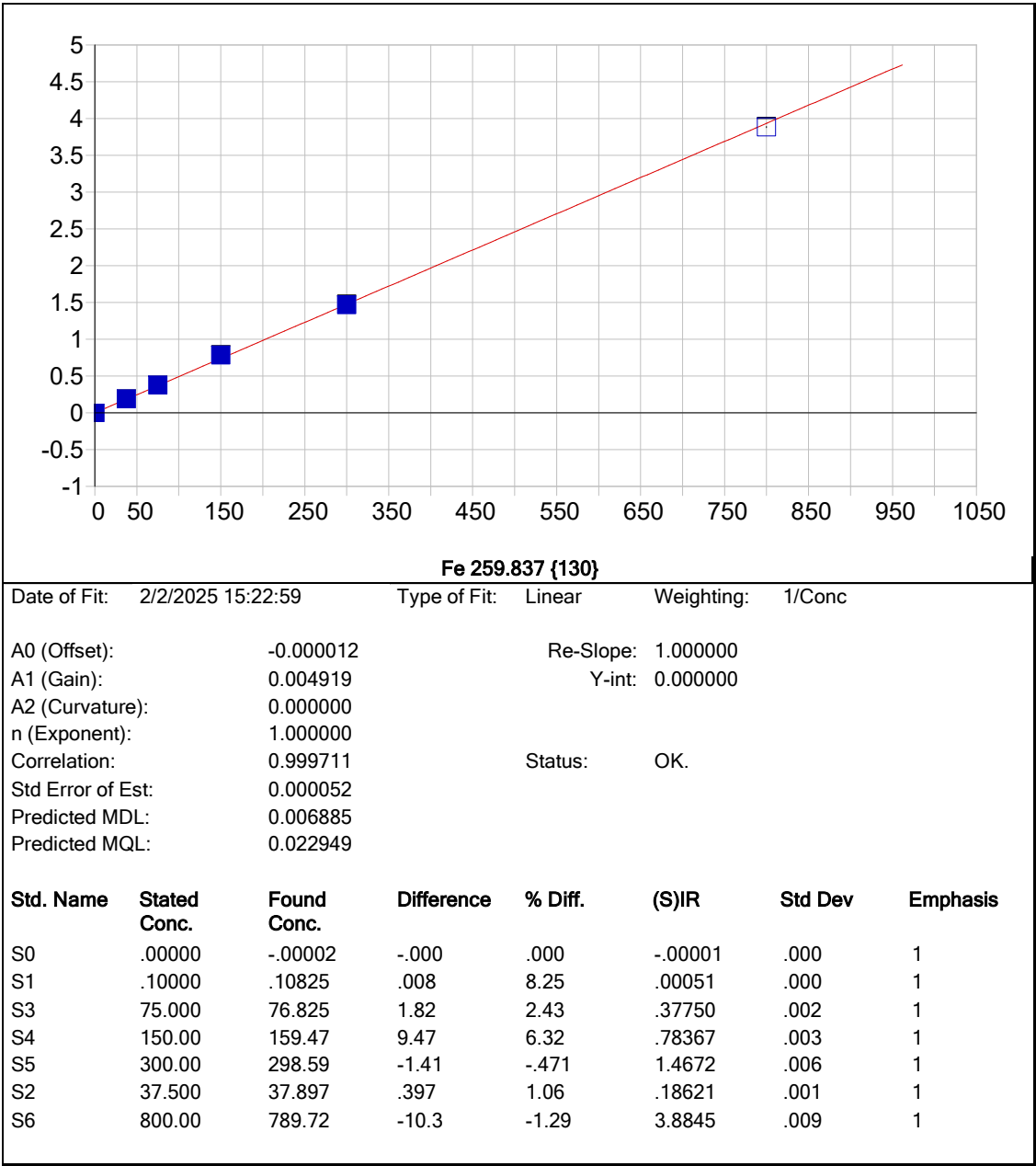
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	-.00004	.000	1
S1	.01000	.01107	.001	10.7	.00181	.000	1
S3	7.7500	8.1120	.362	4.67	1.3555	.001	1
S4	15.500	16.069	.569	3.67	2.6851	.004	1
S5	31.000	29.871	-1.13	-3.64	4.9916	.013	1
S2	3.8750	4.0715	.196	5.07	.68031	.001	1





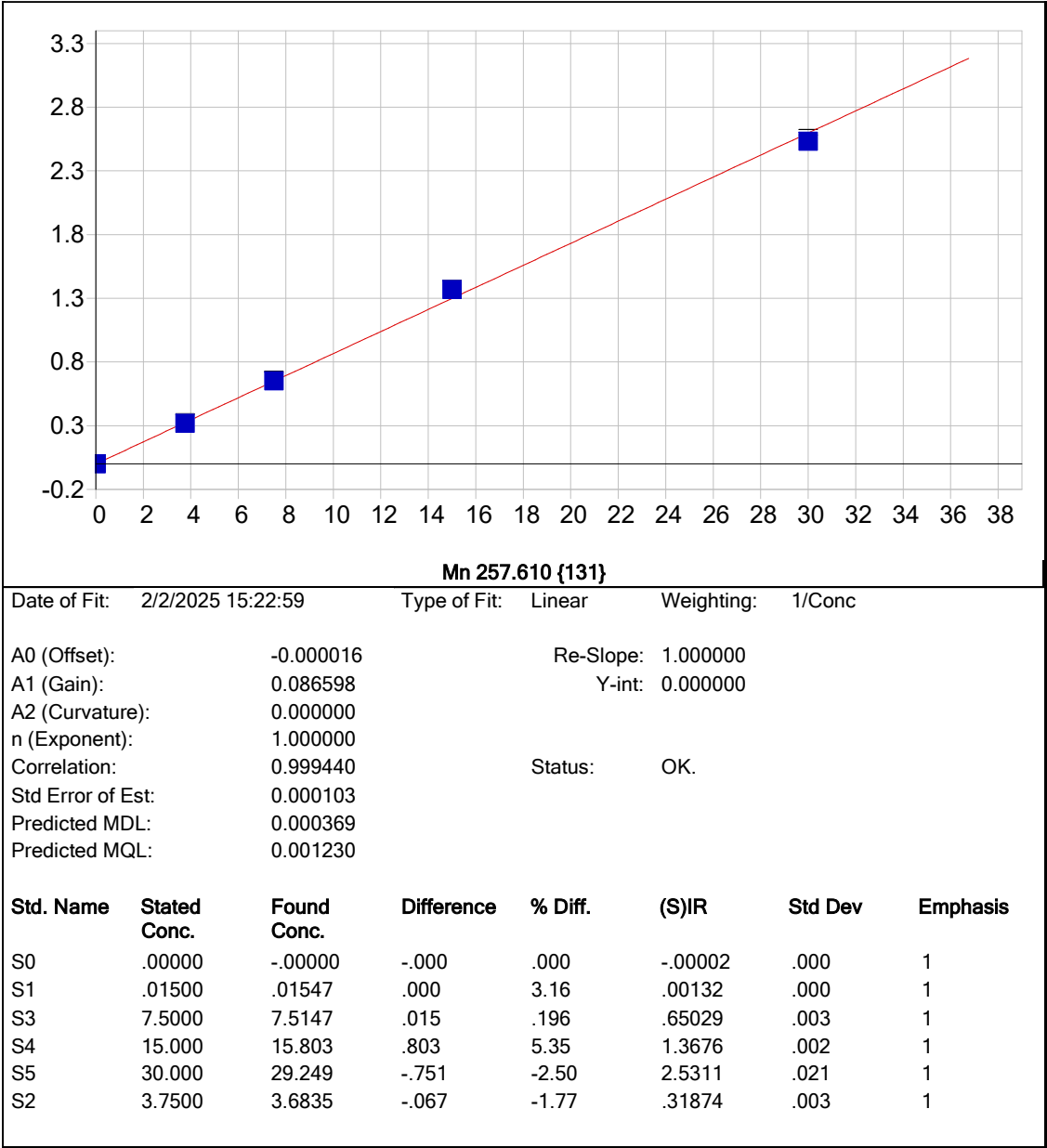
Date of Fit: 2/2/2025 15:22:59 Type of Fit: Linear Weighting: 1/Conc

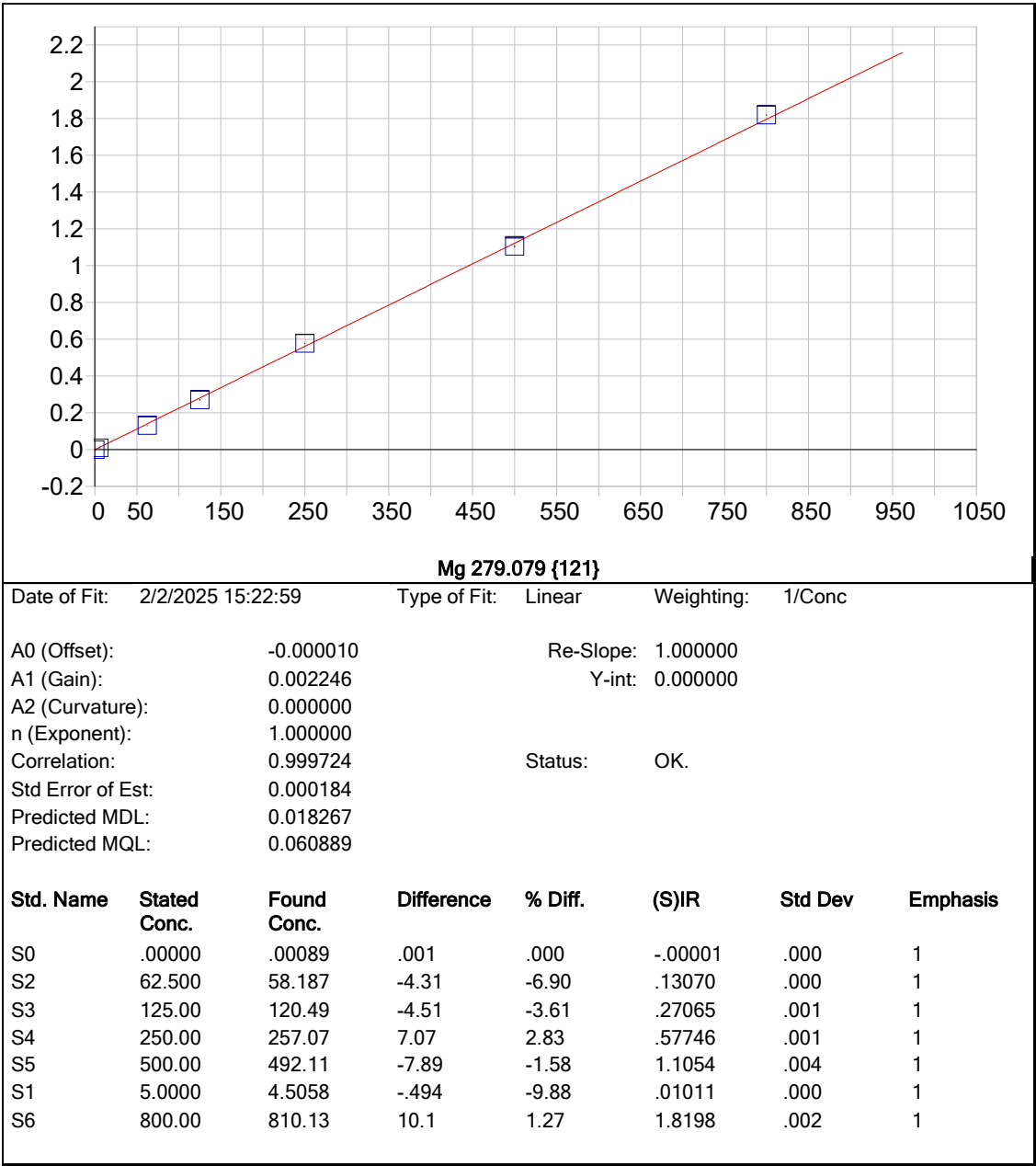
A0 (Offset): 0.000438 Re-Slope: 1.000000
A1 (Gain): 0.160711 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999886 Status: OK.
Std Error of Est: 0.000111
Predicted MDL: 0.002465
Predicted MQL: 0.008217



Date of Fit: 2/2/2025 15:22:59 Type of Fit: Linear Weighting: 1/Conc

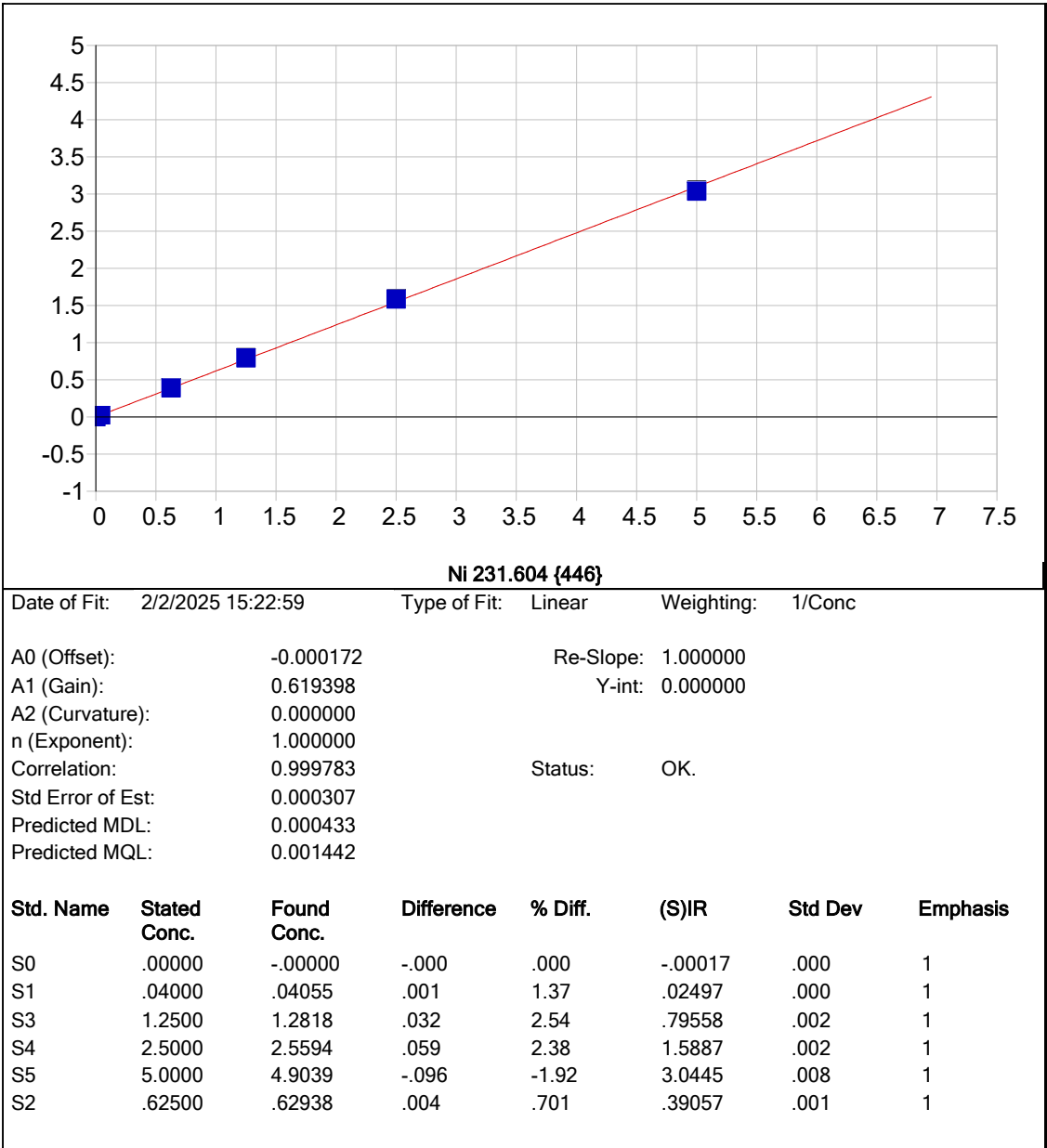
A0 (Offset): -0.000012 Re-Slope: 1.000000
A1 (Gain): 0.004919 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999711 Status: OK.
Std Error of Est: 0.000052
Predicted MDL: 0.006885
Predicted MQL: 0.022949

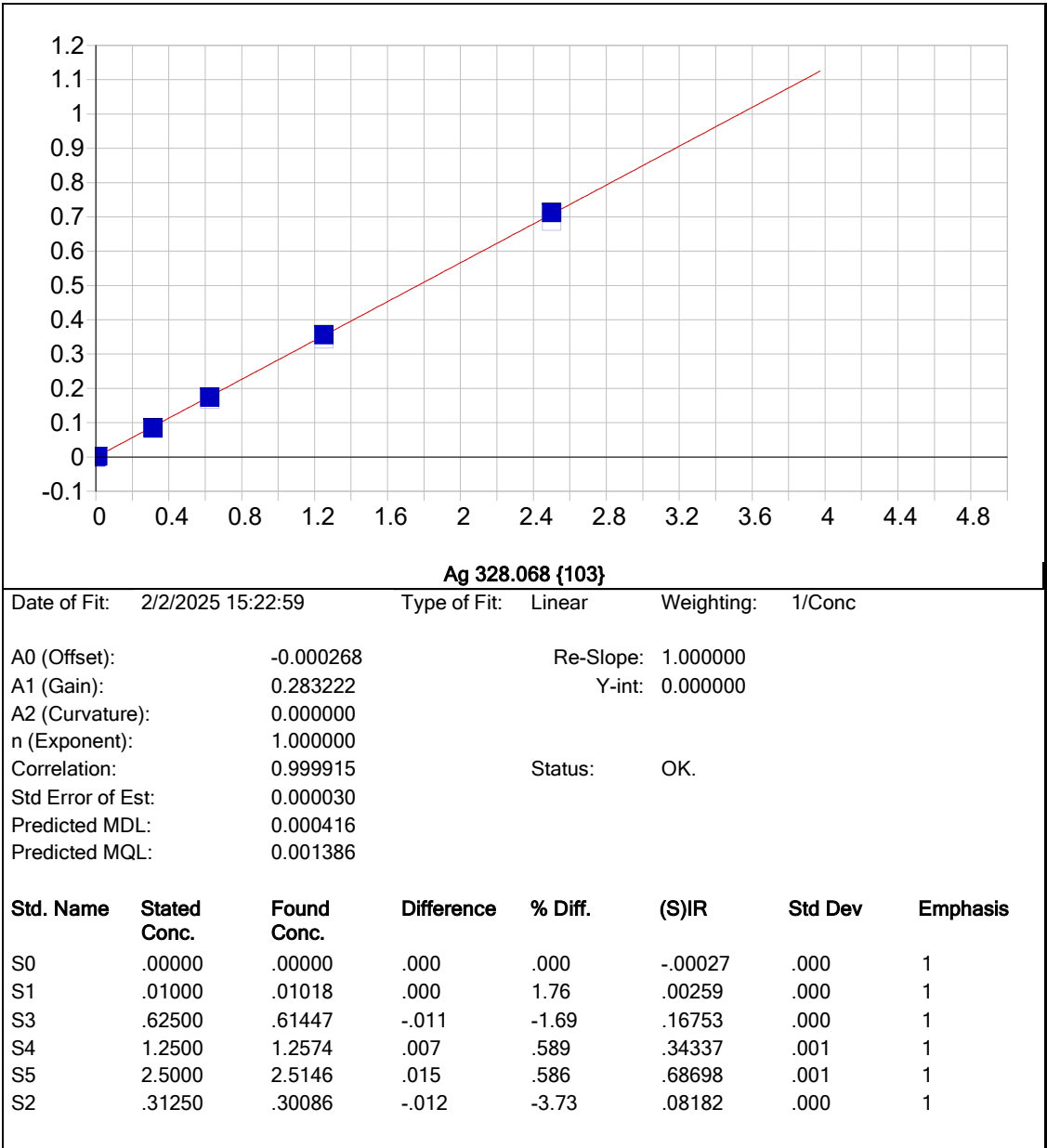




Date of Fit: 2/2/2025 15:22:59 Type of Fit: Linear Weighting: 1/Conc

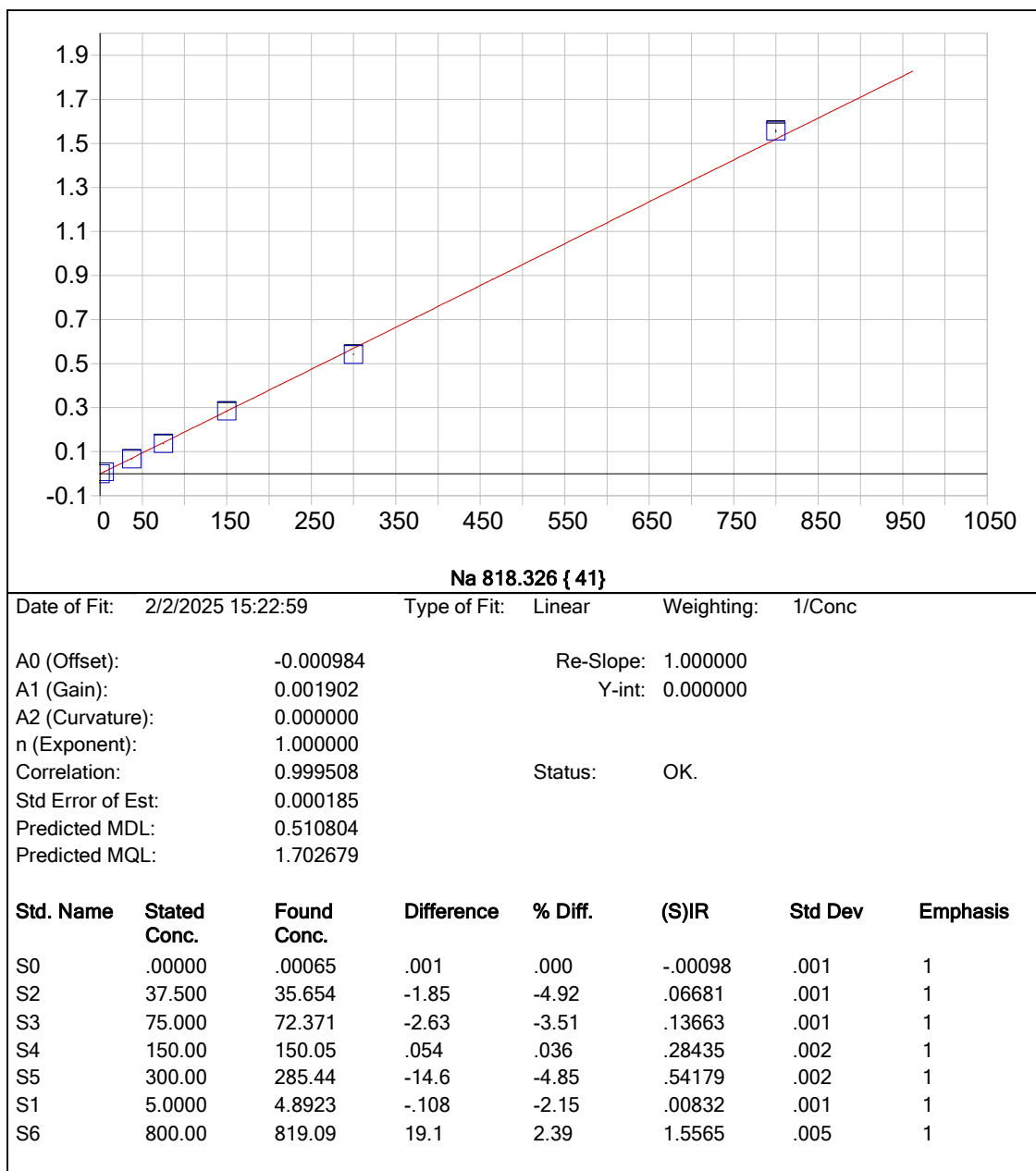
A0 (Offset): -0.000010 Re-Slope: 1.000000
A1 (Gain): 0.002246 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999724 Status: OK.
Std Error of Est: 0.000184
Predicted MDL: 0.018267
Predicted MQL: 0.060889

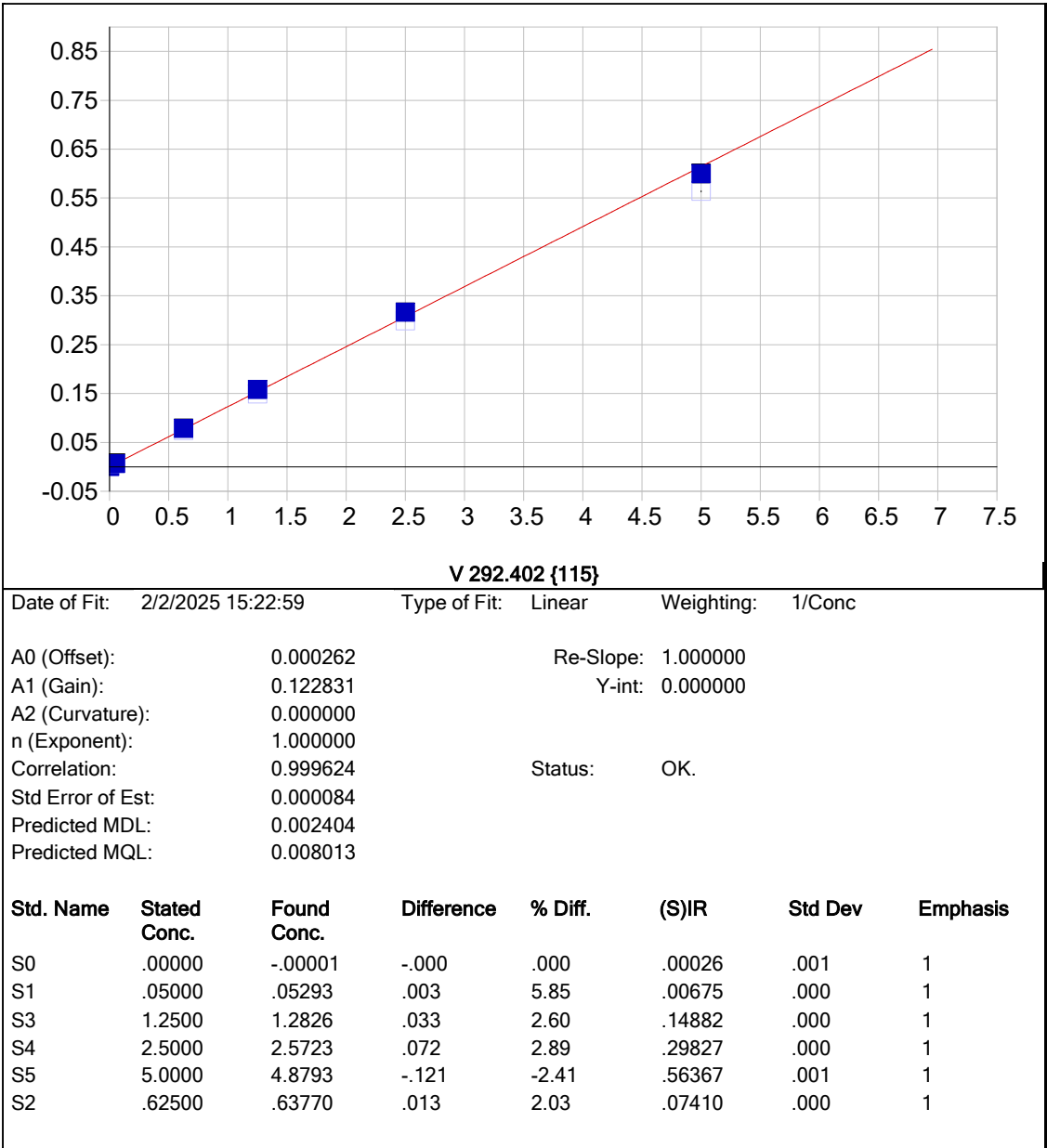


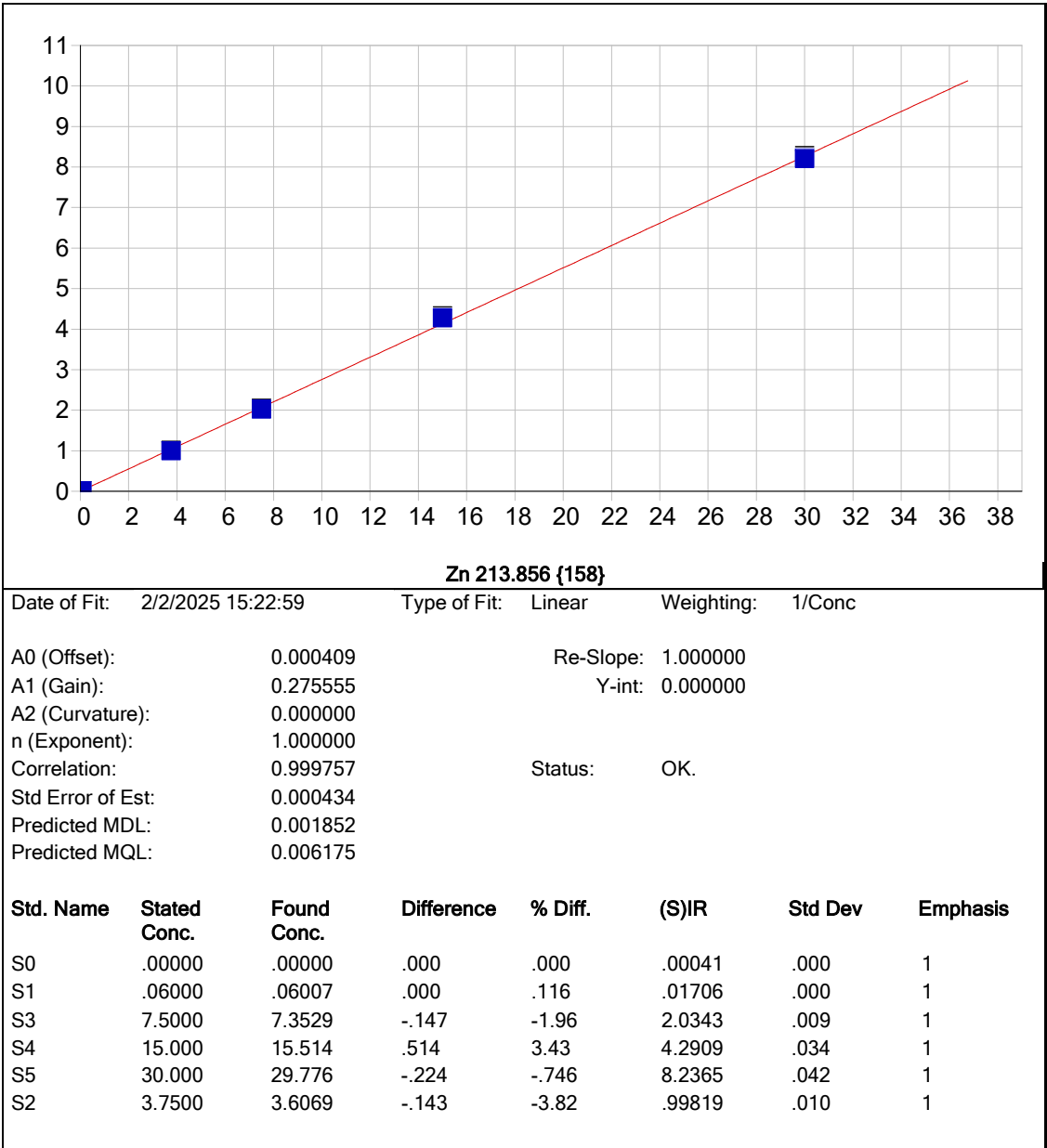


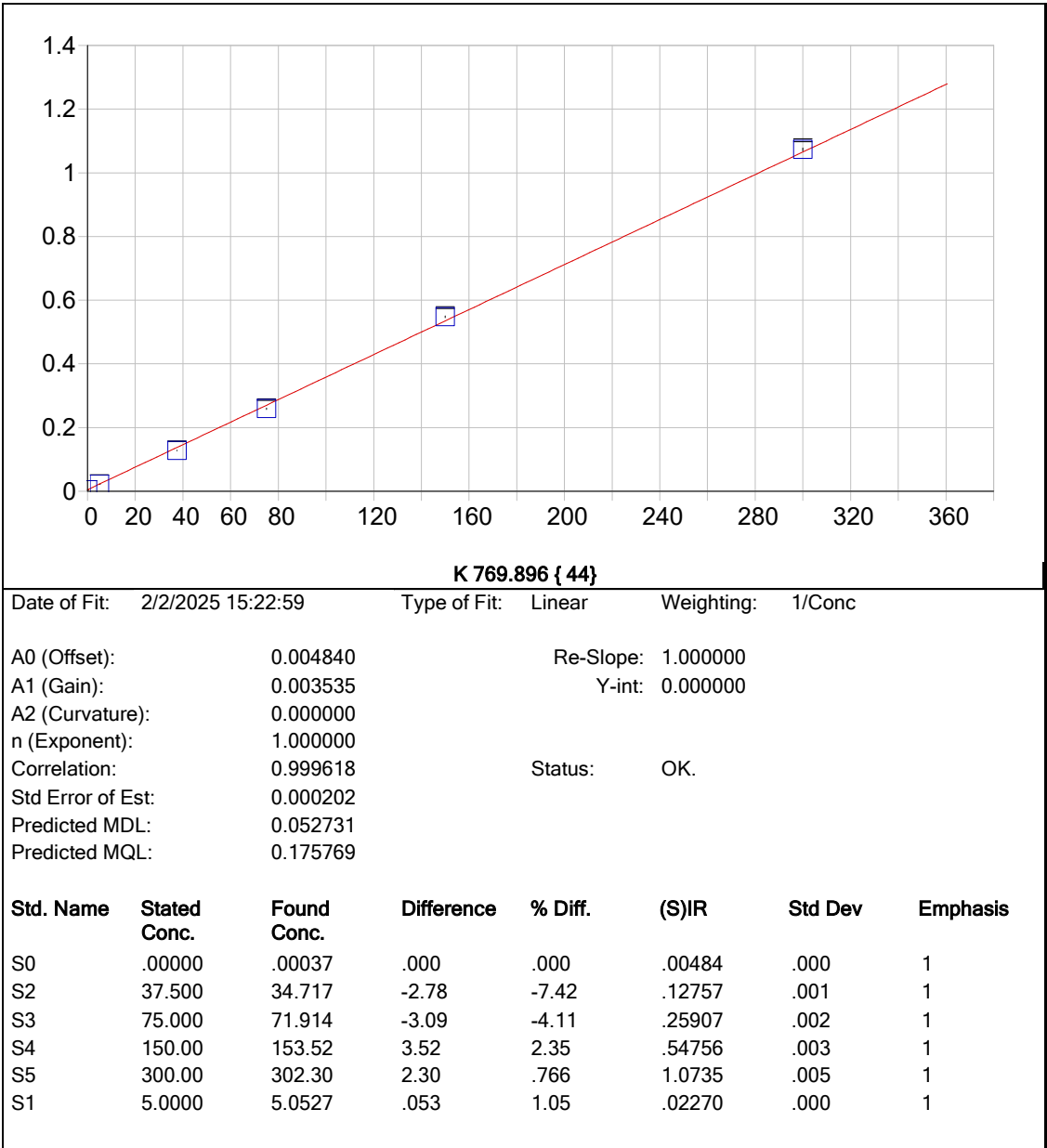
Date of Fit: 2/2/2025 15:22:59 Type of Fit: Linear Weighting: 1/Conc

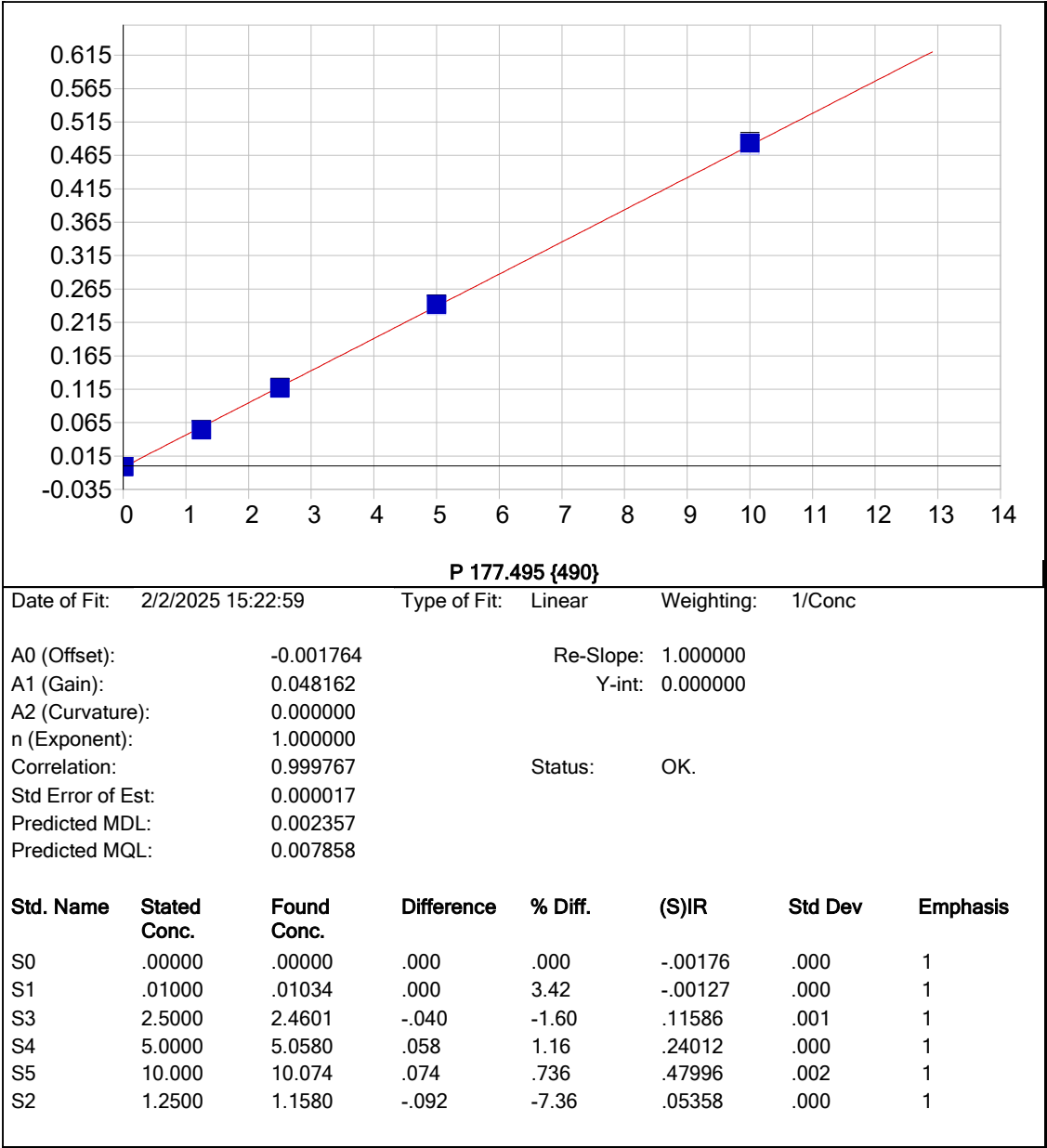
A0 (Offset): -0.000268 Re-Slope: 1.000000
A1 (Gain): 0.283222 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999915 Status: OK.
Std Error of Est: 0.000030
Predicted MDL: 0.000416
Predicted MQL: 0.001386

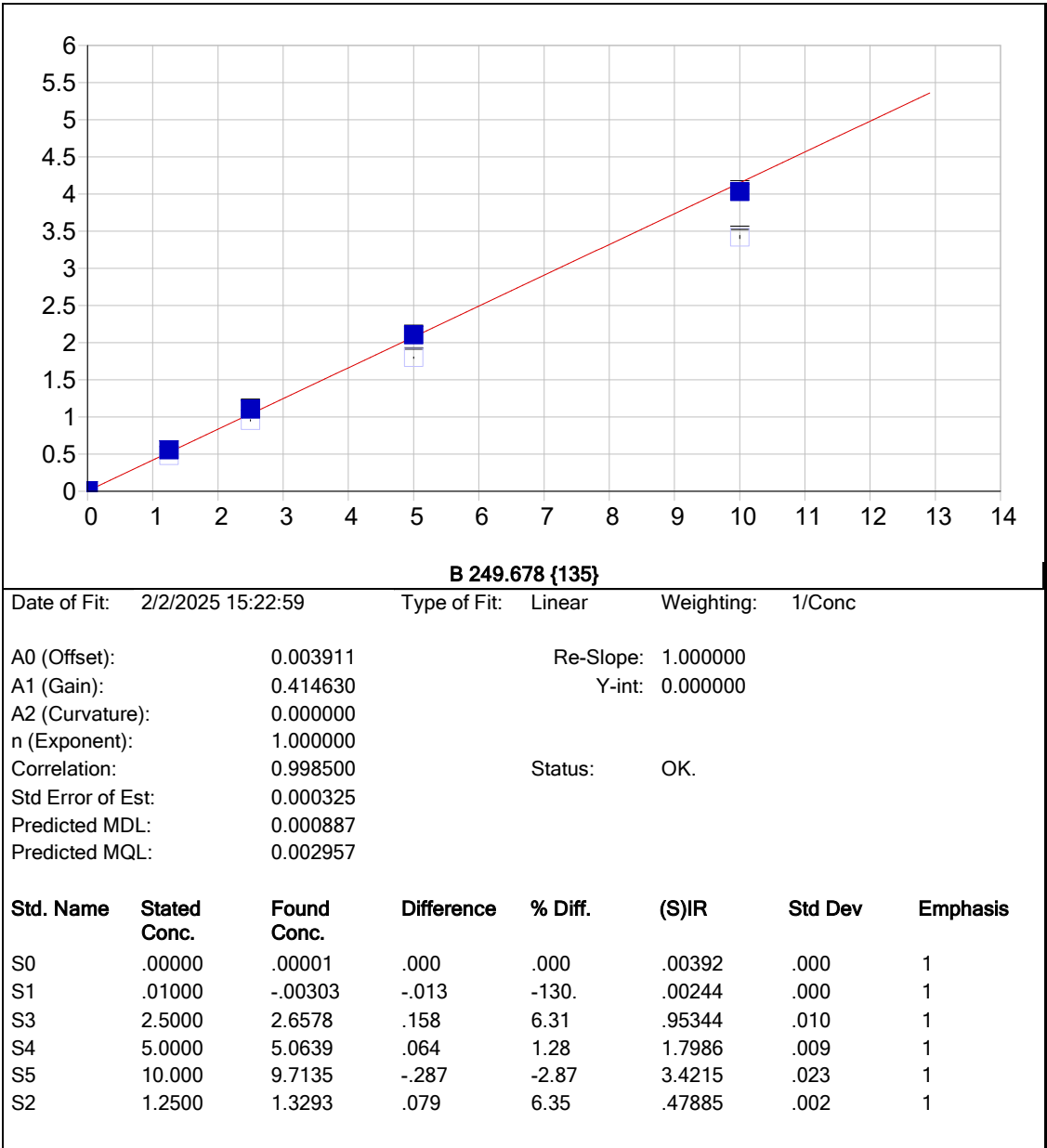


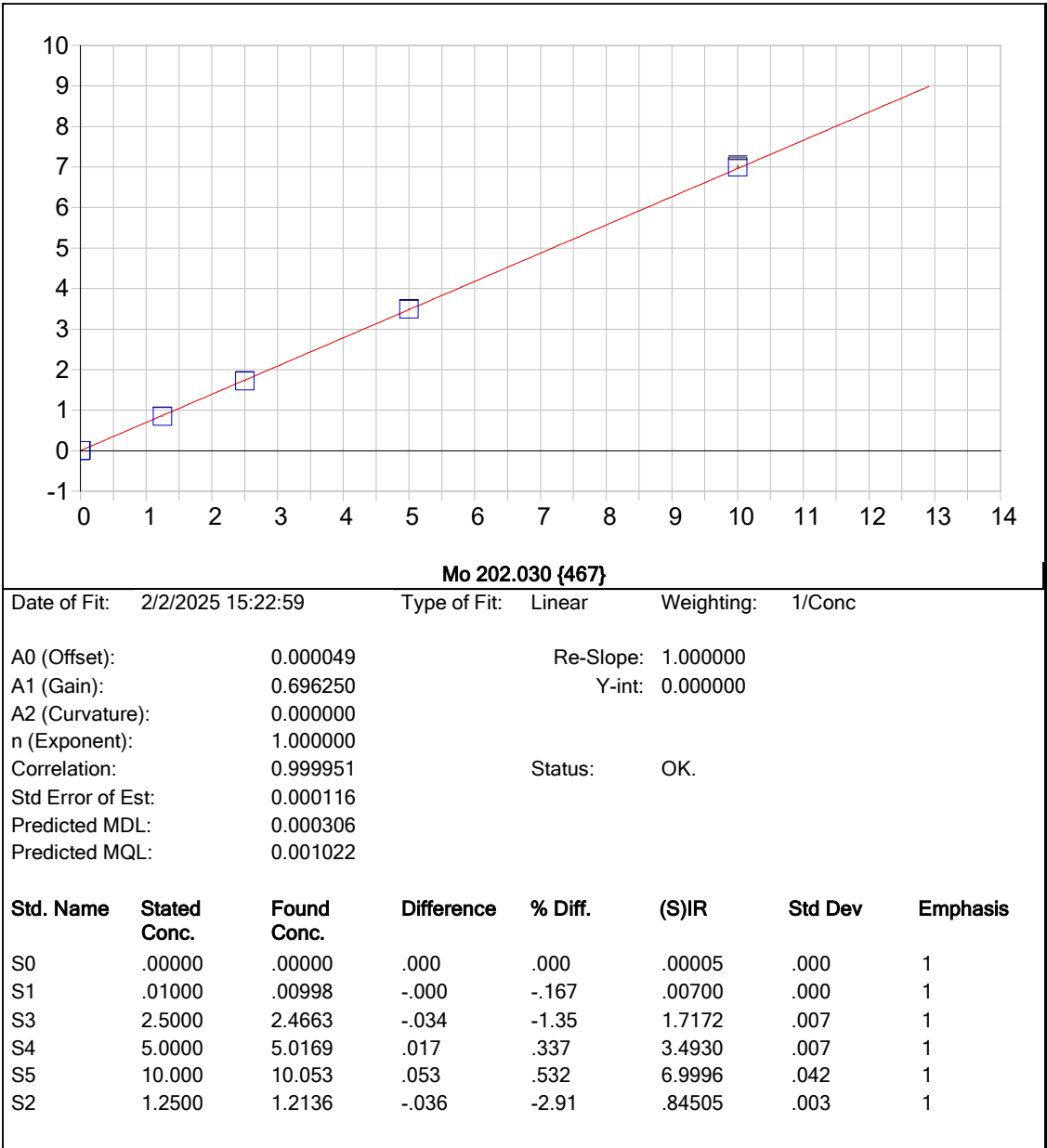


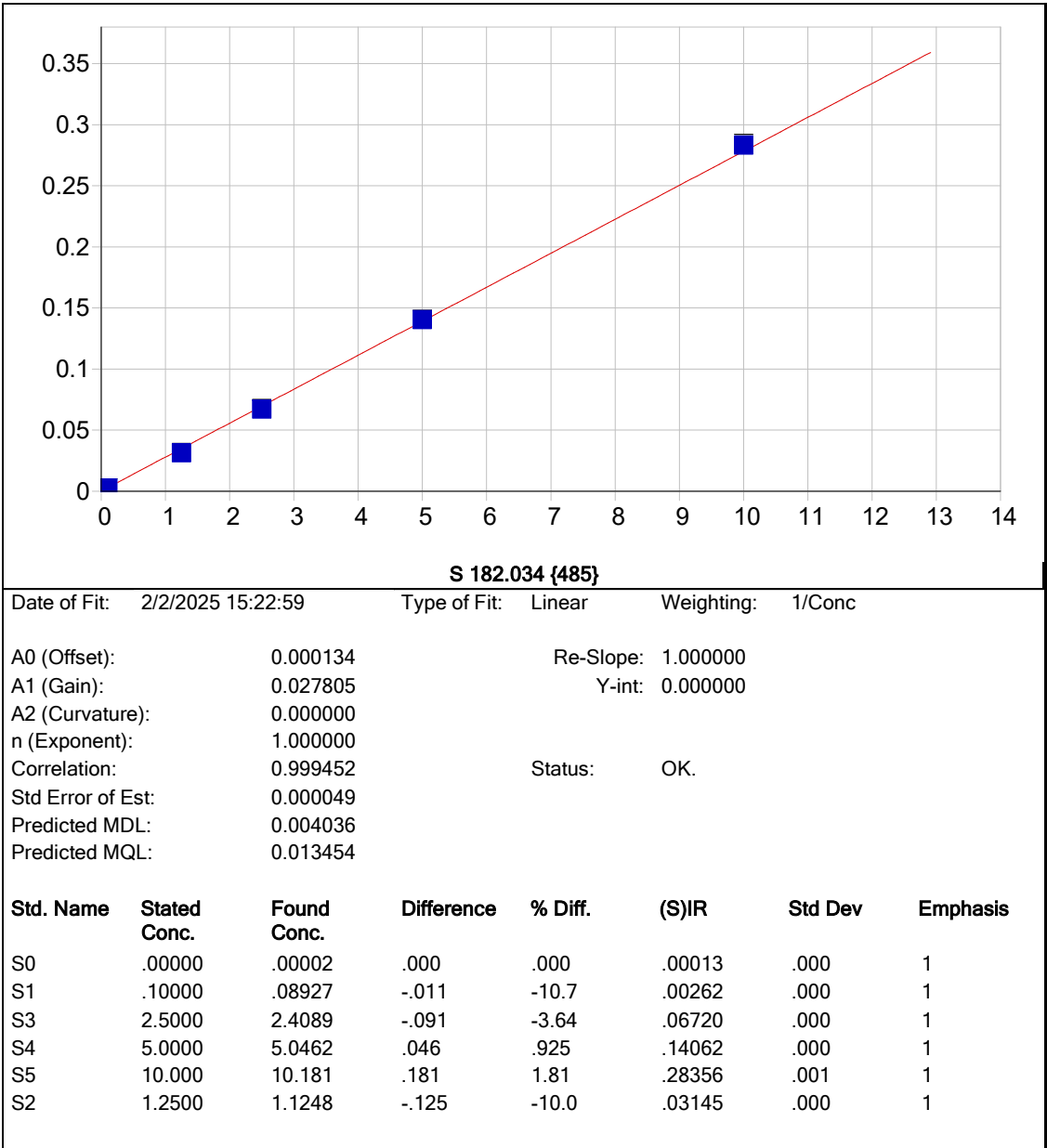




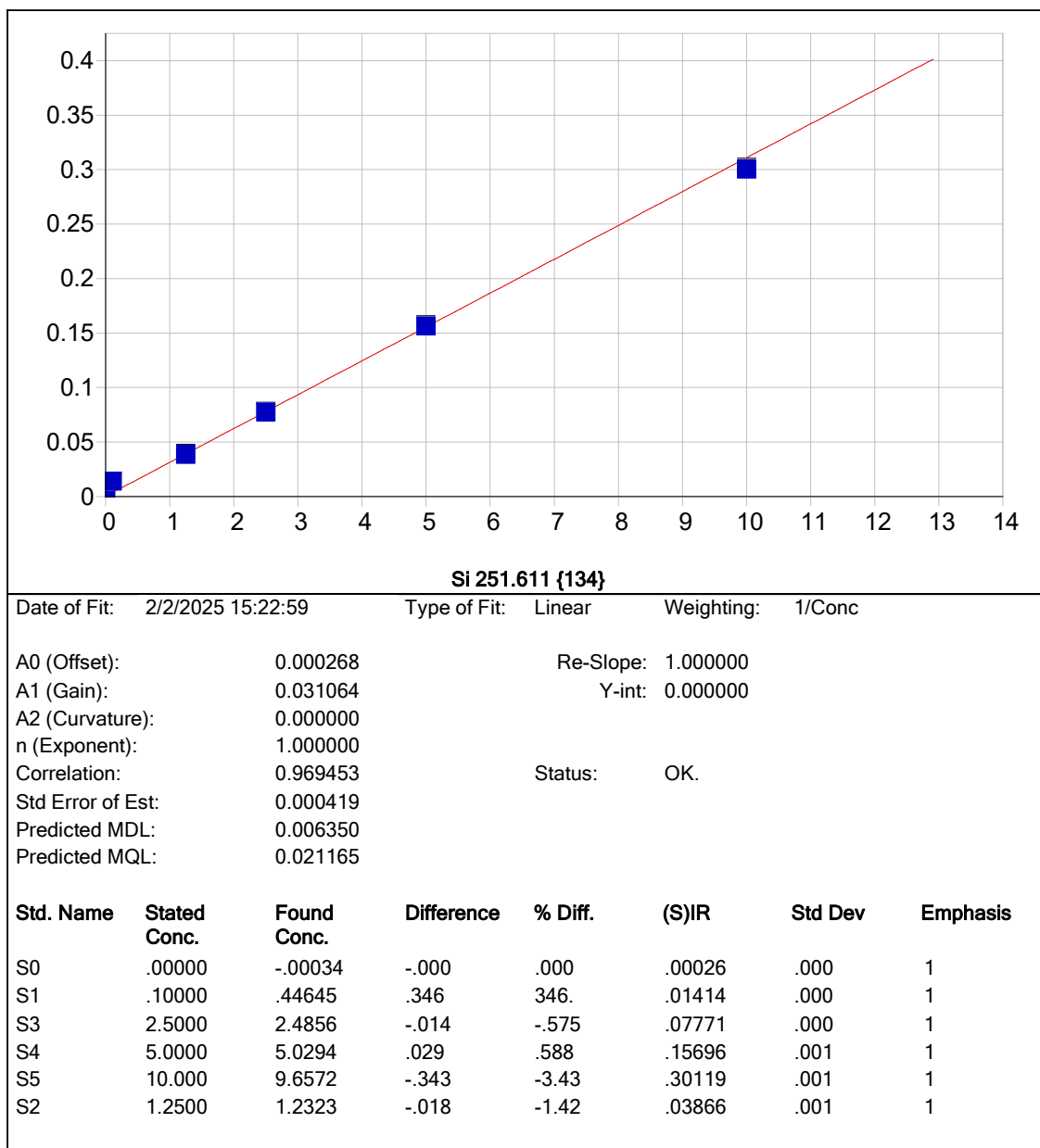


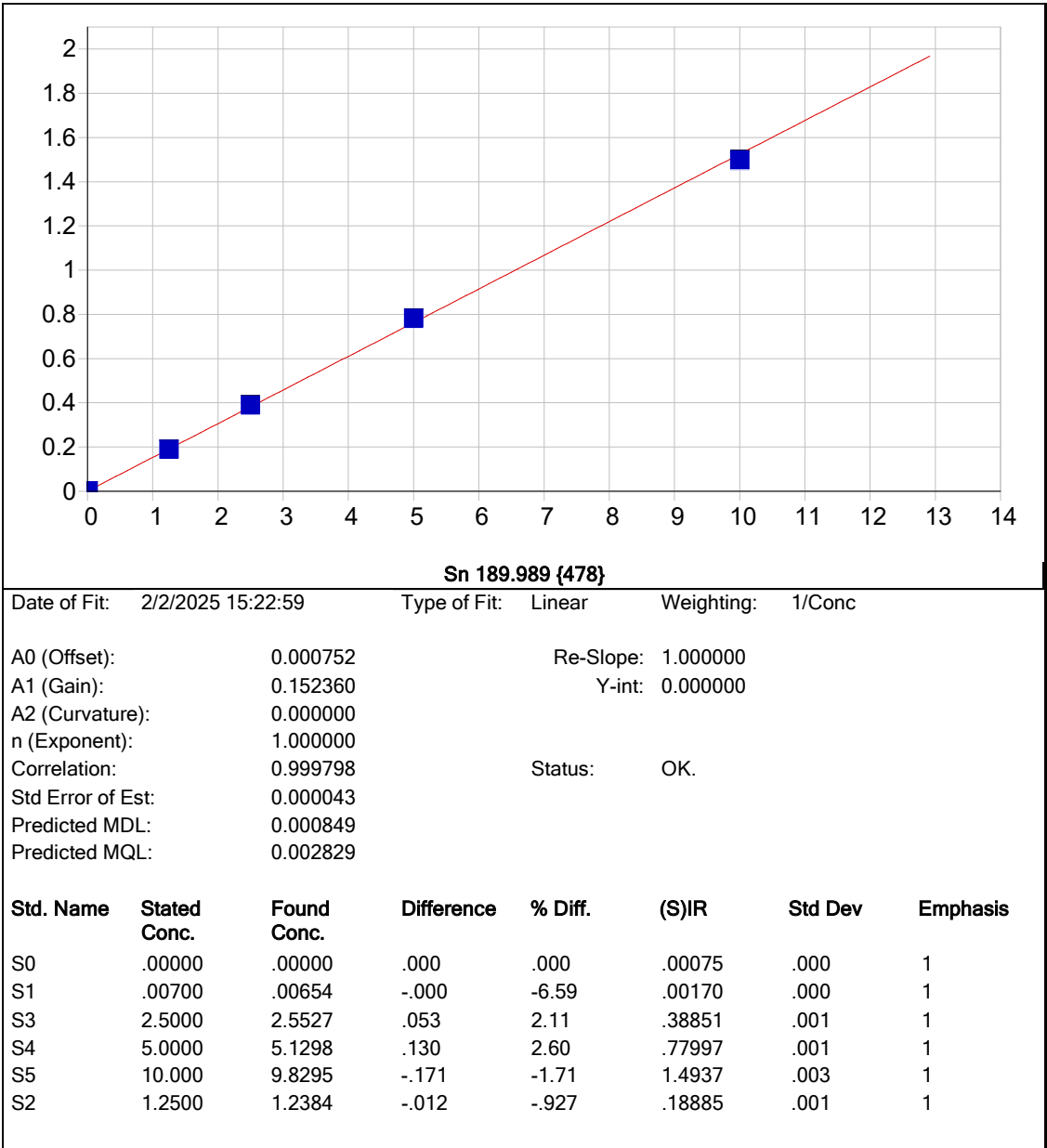


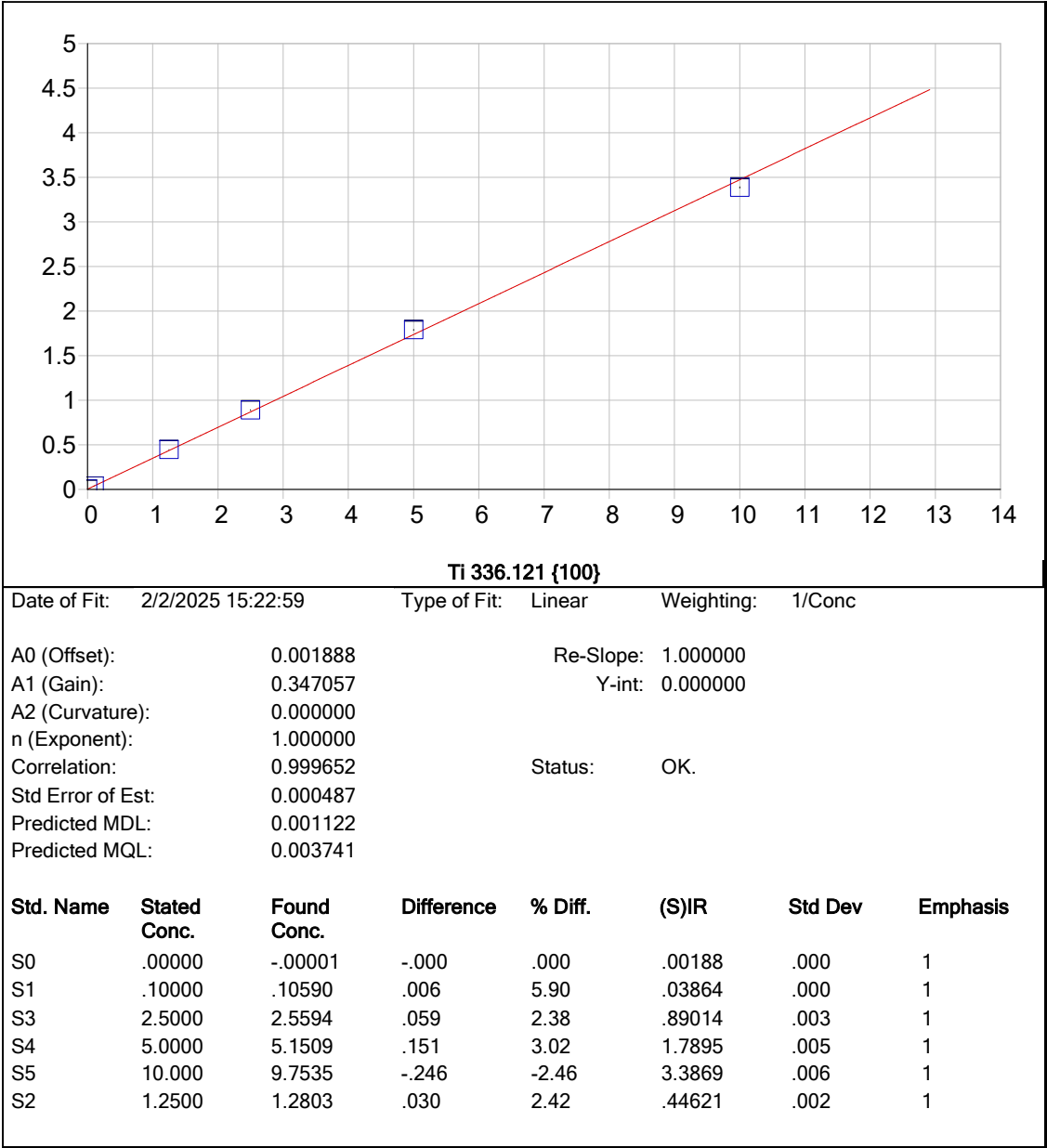


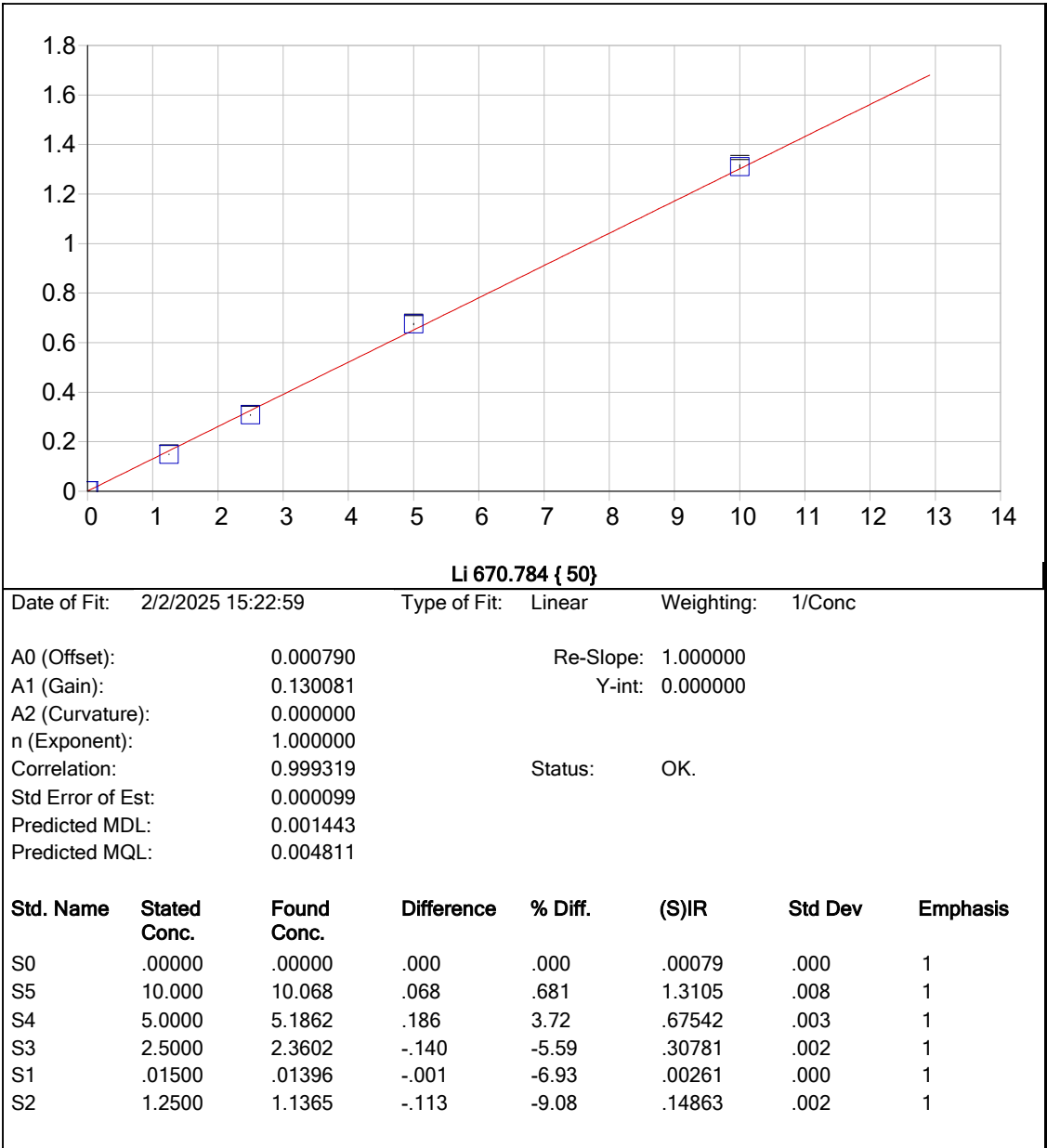


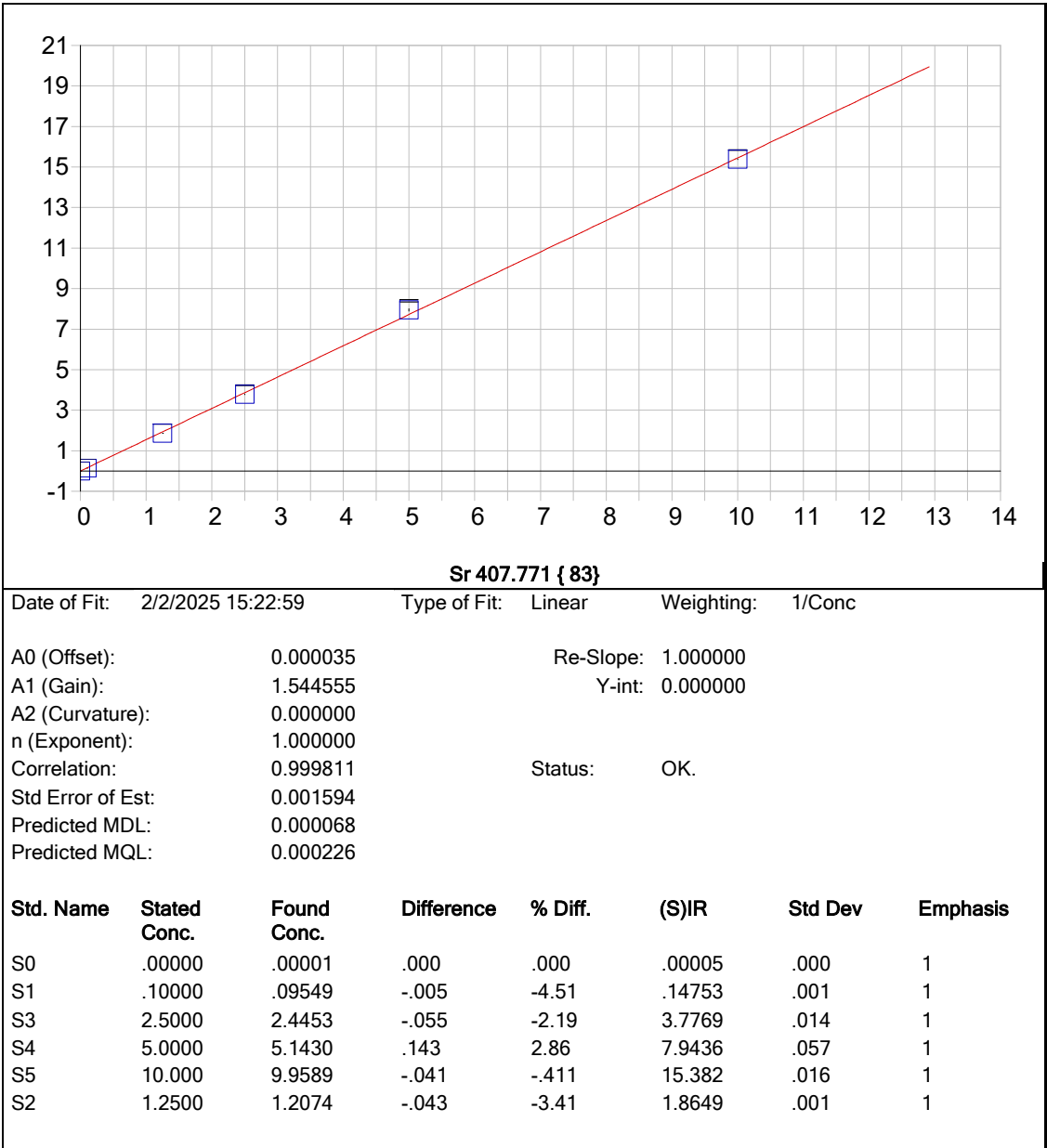
Date of Fit:	2/2/2025 15:22:59	Type of Fit:	Linear	Weighting:	1/Conc
A0 (Offset):	0.000134	Re-Slope:	1.000000		
A1 (Gain):	0.027805	Y-int:	0.000000		
A2 (Curvature):	0.000000				
n (Exponent):	1.000000				
Correlation:	0.999452	Status:	OK.		
Std Error of Est:	0.000049				
Predicted MDL:	0.004036				
Predicted MQL:	0.013454				



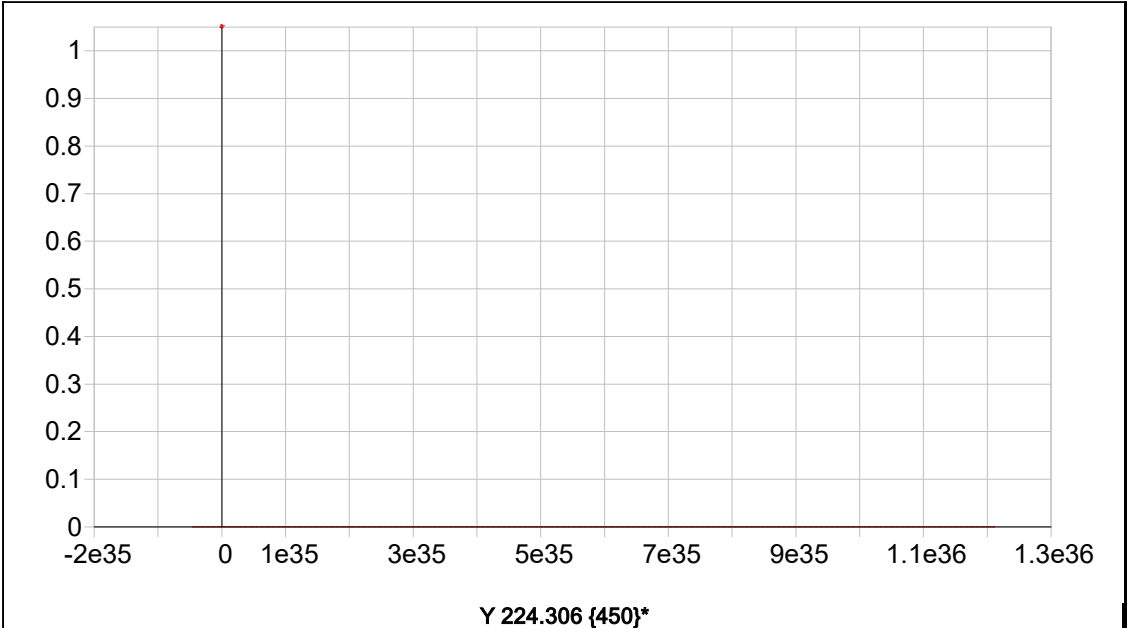








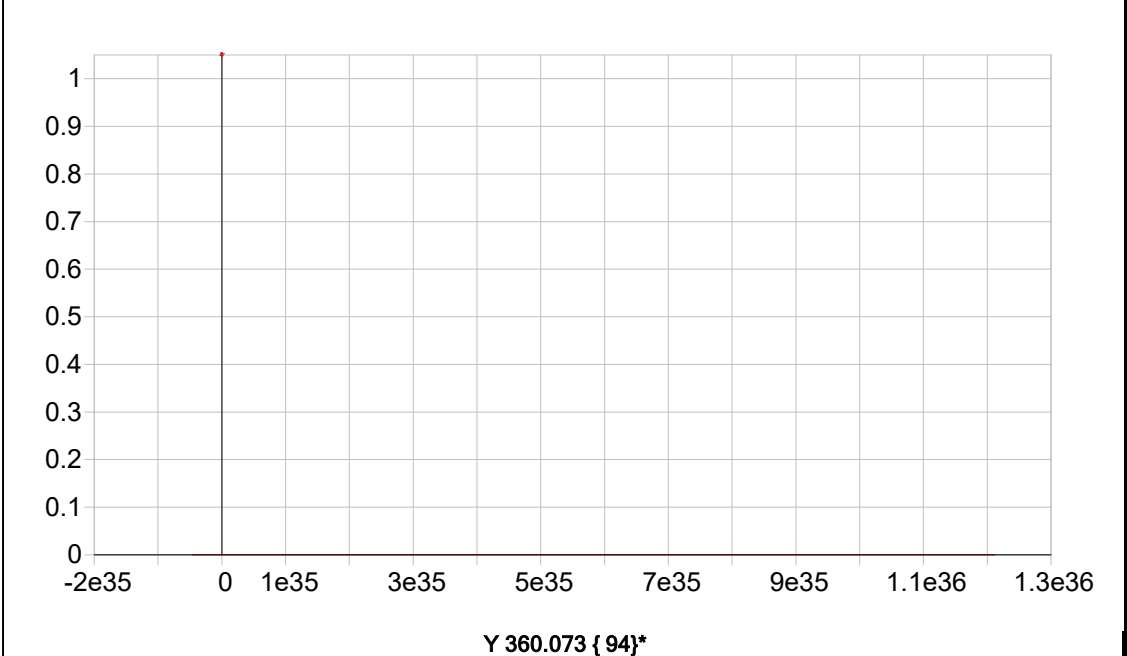
Date of Fit: 2/2/2025 15:22:59		Type of Fit: Linear	Weighting: 1/Conc
A0 (Offset):	0.000035	Re-Slope:	1.000000
A1 (Gain):	1.544555	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999811	Status:	OK.
Std Error of Est:	0.001594		
Predicted MDL:	0.000068		
Predicted MQL:	0.000226		



Date of Fit: 2/2/2025 15:22:59 Type of Fit: Linear Weighting: 1/Conc

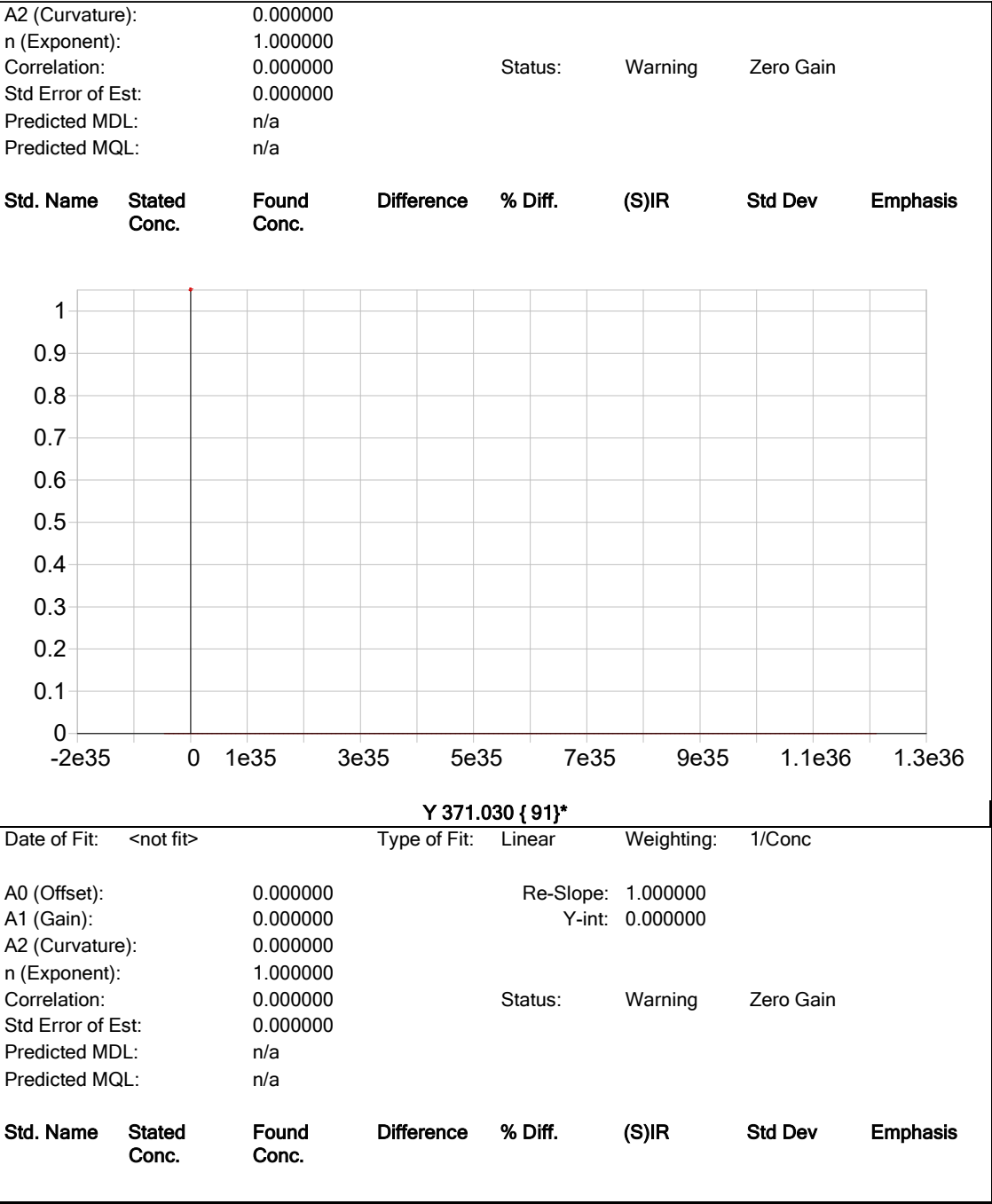
A0 (Offset): 0.000000 Re-Slope: 1.000000
A1 (Gain): 0.000000 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.000000 Status: Warning Zero Gain
Std Error of Est: 0.000000
Predicted MDL: n/a
Predicted MQL: n/a

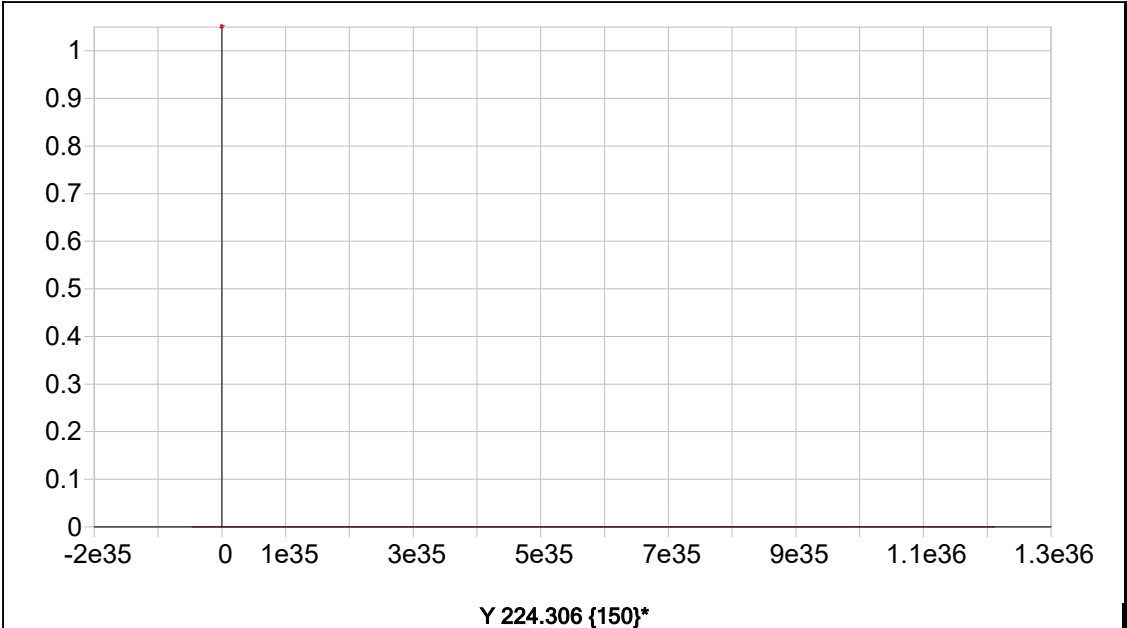
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
-----------	--------------	-------------	------------	---------	-------	---------	----------



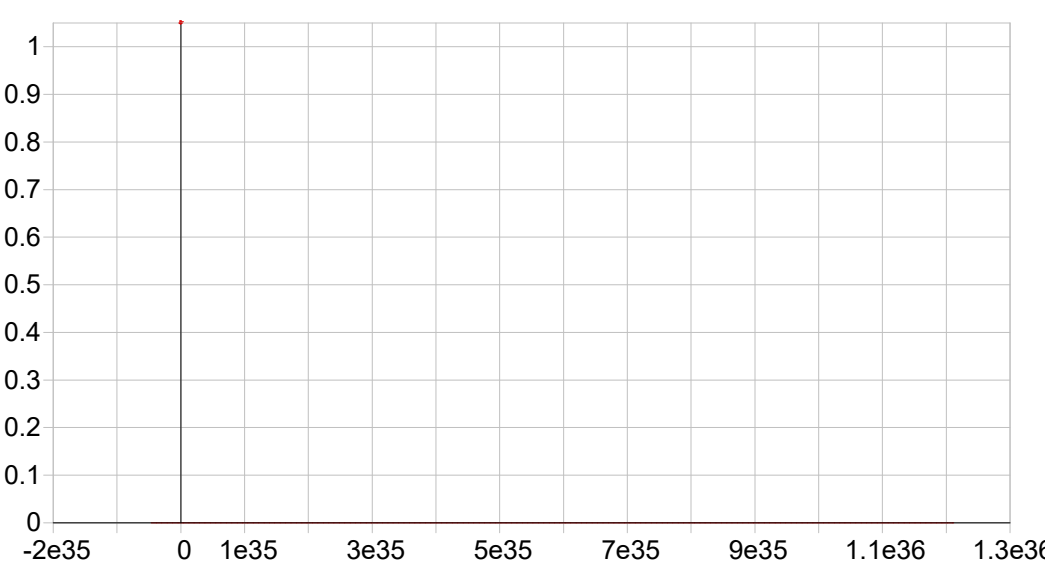
Date of Fit: <not fit> Type of Fit: Linear Weighting: 1/Conc

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





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

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
							
ln 230.606 {446}*							
Date of Fit:	<not fit>		Type of Fit:	Linear	Weighting:	1/Conc	
A0 (Offset):	0.000000		Re-Slope:	1.000000			
A1 (Gain):	0.000000		Y-int:	0.000000			

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

Sample Name: S0 Acquired: 2/2/2025 10:59:42 Type: Cal
Method: EPA SFAM01.0(v61) 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	-.00007	.00027	-.00002	.00039	.00023	-.00002	.00641	-.00006
Stddev	.00005	.00007	.00016	.00003	.00018	.00003	.00037	.00012
%RSD	71.838	26.784	718.75	6.9116	81.732	173.31	5.7727	216.03
#1	-.00003	.00022	-.00018	.00038	.00019	.00001	.00600	-.00004
#2	-.00012	.00035	-.00003	.00037	.00006	-.00006	.00654	-.00019
#3	-.00005	.00024	.00014	.00042	.00043	-.00001	.00670	.00006
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	.00007	-.00004	-.00016	.00044	-.00001	-.00002	-.00001
Stddev	.00014	.00005	.00006	.00022	.00024	.00001	.00004	.00002
%RSD	227.51	74.526	179.36	136.33	54.317	48.381	262.62	311.81
#1	-.00005	.00006	-.00010	-.00033	.00058	-.00001	-.00001	-.00003
#2	.00022	.00012	.00003	-.00023	.00057	-.00002	.00002	.00001
#3	.00001	.00002	-.00004	.00008	.00016	-.00002	-.00006	.00000
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	-.00017	-.00027	-.00098	.00026	.00041	.00484	-.00176	.00392
Stddev	.00020	.00004	.00090	.00054	.00034	.00010	.00012	.00019
%RSD	117.21	14.952	91.993	208.00	82.439	2.1044	6.8856	4.7873
#1	-.00038	-.00031	-.00042	-.00014	.00080	.00494	-.00189	.00383
#2	-.00017	-.00026	-.00050	.00005	.00018	.00485	-.00165	.00413
#3	.00003	-.00023	-.00203	.00088	.00025	.00474	-.00176	.00379
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	.00005	.00013	.00026	.00075	.00188	.00079	.00005	
Stddev	.00005	.00003	.00022	.00004	.00046	.00011	.00006	
%RSD	104.27	24.245	85.140	5.9267	24.514	14.035	125.66	
#1	-.00000	.00011	.00009	.00079	.00141	.00072	.00004	
#2	.00005	.00012	.00050	.00076	.00233	.00073	-.00001	
#3	.00010	.00017	.00018	.00071	.00191	.00092	.00011	

Sample Name: S0 Acquired: 2/2/2025 10:59:42 Type: Cal
Method: EPA SFAM01.0(v61) 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	3728.5	72695.	11101.	2471.9	4477.8
Stddev	11.6	203.	44.	16.6	15.8
%RSD	.31143	.27914	.39386	.66969	.35275
#1	3715.3	72488.	11056.	2455.6	4459.6
#2	3733.1	72705.	11104.	2488.7	4487.9
#3	3737.2	72893.	11143.	2471.4	4485.8

Sample Name: S1 Acquired: 2/2/2025 11:03:56 Type: Cal
Method: EPA SFAM01.0(v61) 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	.00041	.00168	.00226	.00244	.00843	.00215	.07863	.02138
Stddev	.00012	.00015	.00029	.00008	.00021	.00017	.00006	.00021
%RSD	29.276	9.1422	12.904	3.4680	2.4499	7.7149	.07265	.99996

#1	.00034	.00158	.00213	.00238	.00861	.00228	.07862	.02161
#2	.00055	.00186	.00206	.00253	.00821	.00222	.07870	.02135
#3	.00035	.00160	.00260	.00240	.00848	.00196	.07859	.02118

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	.01509	.04075	.00181	.04386	.00509	.00051	.00132	.01011
Stddev	.00017	.00018	.00006	.00004	.00021	.00003	.00004	.00003
%RSD	1.1509	.44616	3.1425	.09427	4.1262	5.7120	2.8544	.28270

#1	.01528	.04062	.00188	.04391	.00521	.00054	.00129	.01008
#2	.01493	.04096	.00180	.04384	.00485	.00052	.00136	.01013
#3	.01507	.04067	.00177	.04385	.00521	.00048	.00132	.01012

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	.02497	.00259	.00832	.00675	.01706	.02270	-.00127	.00244
Stddev	.00026	.00003	.00089	.00016	.00013	.00004	.00006	.00024
%RSD	1.0604	1.1254	10.696	2.4345	.78900	.17746	4.9801	9.9375

#1	.02517	.00257	.00887	.00687	.01711	.02268	-.00134	.00218
#2	.02467	.00259	.00880	.00681	.01716	.02268	-.00124	.00266
#3	.02507	.00263	.00729	.00656	.01691	.02275	-.00122	.00248

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	.00700	.00262	.01414	.00170	.03864	.00261	.14753
Stddev	.00028	.00005	.00004	.00005	.00038	.00022	.00076
%RSD	4.0417	1.7859	.27444	2.6798	.98209	8.4421	.51454

#1	.00707	.00266	.01411	.00166	.03833	.00251	.14681
#2	.00669	.00257	.01412	.00170	.03852	.00245	.14832
#3	.00724	.00262	.01418	.00175	.03907	.00286	.14745

Sample Name: S1 Acquired: 2/2/2025 11:03:56 Type: Cal
Method: EPA SFAM01.0(v61) 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	3721.5	72067.	12812.	2445.5	4417.0
Stddev	5.5	366.	75.	17.0	5.5
%RSD	.14753	.50721	.58818	.69559	.12470
#1	3725.7	71678.	12726.	2426.0	4422.8
#2	3723.4	72121.	12867.	2453.7	4416.2
#3	3715.3	72403.	12844.	2456.9	4411.8

Sample Name: S2 Acquired: 2/2/2025 11:08:08 Type: Cal
Method: EPA SFAM01.0(v61) 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	.06916	.07174	1.4908	.07526	.17570	.41559	.86859	.51721
Stddev	.00037	.00127	.0042	.00035	.00094	.00255	.00822	.00167
%RSD	.53436	1.7738	.28255	.46781	.53684	.61311	.94609	.32208

#1	.06907	.07069	1.4883	.07495	.17476	.41660	.86675	.51590
#2	.06885	.07137	1.4885	.07519	.17570	.41749	.87757	.51664
#3	.06957	.07316	1.4957	.07564	.17665	.41270	.86145	.51908

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	1.8676	.49884	.68031	.54508	.60752	.18621	.31874	.13070
Stddev	.0094	.00282	.00117	.00216	.00049	.00054	.00263	.00028
%RSD	.50403	.56542	.17193	.39542	.08114	.29258	.82507	.21284

#1	1.8613	.49844	.68009	.54450	.60737	.18624	.31719	.13053
#2	1.8630	.50184	.68157	.54327	.60807	.18674	.32178	.13102
#3	1.8784	.49624	.67927	.54746	.60713	.18565	.31726	.13054

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	.39057	.08182	.06681	.07410	.99819	.12757	.05358	.47885
Stddev	.00145	.00018	.00115	.00048	.00983	.00086	.00032	.00162
%RSD	.37034	.21827	1.7265	.64840	.98440	.67513	.60261	.33738

#1	.39023	.08199	.06701	.07355	.98695	.12763	.05343	.47911
#2	.38933	.08185	.06786	.07434	1.0051	.12840	.05336	.47712
#3	.39216	.08163	.06557	.07441	1.0025	.12668	.05395	.48031

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	.84505	.03145	.03866	.18885	.44621	.14863	1.8649
Stddev	.00294	.00026	.00054	.00059	.00162	.00155	.0010
%RSD	.34768	.81146	1.3876	.31343	.36359	1.0431	.05637

#1	.84385	.03120	.03807	.18846	.44439	.14844	1.8642
#2	.84290	.03171	.03879	.18855	.44751	.15026	1.8661
#3	.84840	.03145	.03912	.18953	.44674	.14718	1.8644

Sample Name: S2 Acquired: 2/2/2025 11:08:08 Type: Cal
Method: EPA SFAM01.0(v61) 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	3557.7	68716.	12473.	2312.8	4014.5
Stddev	5.5	207.	22.	3.8	8.0
%RSD	.15380	.30127	.17497	.16285	.19896
#1	3551.9	68655.	12493.	2315.4	4013.1
#2	3562.8	68547.	12476.	2308.4	4023.1
#3	3558.5	68947.	12449.	2314.5	4007.4

Sample Name: S3 Acquired: 2/2/2025 11:12:05 Type: Cal
Method: EPA SFAM01.0(v61) 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	.14559	.14448	3.0577	.15670	.36735	.85950	1.7854	1.0308
Stddev	.00089	.00192	.0049	.00125	.00110	.00714	.0136	.0103
%RSD	.61035	1.3271	.15866	.79654	.30069	.83116	.75870	1.0006

#1	.14514	.14335	3.0575	.15691	.36739	.85284	1.7738	1.0394
#2	.14501	.14340	3.0531	.15536	.36623	.85860	1.7821	1.0337
#3	.14661	.14669	3.0627	.15783	.36844	.86705	1.8003	1.0194

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	3.8166	1.0198	1.3555	1.1135	1.2168	.37750	.65029	.27065
Stddev	.0108	.0052	.0014	.0023	.0029	.00241	.00285	.00122
%RSD	.28198	.50504	.10727	.20858	.23616	.63972	.43895	.45017

#1	3.8170	1.0150	1.3569	1.1132	1.2200	.37548	.64791	.26945
#2	3.8056	1.0190	1.3540	1.1113	1.2145	.37686	.64952	.27062
#3	3.8271	1.0253	1.3555	1.1159	1.2158	.38018	.65346	.27188

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	.79558	.16753	.13663	.14882	2.0343	.25907	.11586	.95344
Stddev	.00235	.00022	.00073	.00023	.0091	.00213	.00070	.00975
%RSD	.29531	.13226	.53329	.15288	.44477	.82399	.60688	1.0221

#1	.79638	.16776	.13647	.14899	2.0239	.25733	.11557	.96318
#2	.79294	.16749	.13743	.14892	2.0394	.25843	.11535	.95345
#3	.79743	.16732	.13600	.14856	2.0397	.26146	.11666	.94369

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	1.7172	.06720	.07771	.38851	.89014	.30781	3.7769
Stddev	.0068	.00037	.00025	.00113	.00329	.00216	.0138
%RSD	.39420	.54924	.32722	.29213	.37015	.70313	.36680

#1	1.7163	.06715	.07792	.38826	.89255	.30620	3.7719
#2	1.7109	.06687	.07779	.38752	.89150	.30695	3.7662
#3	1.7244	.06760	.07743	.38975	.88639	.31027	3.7925

Sample Name: S3 Acquired: 2/2/2025 11:12:05 Type: Cal
Method: EPA SFAM01.0(v61) 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	3343.3	66476.	12314.	2237.0	3726.1
Stddev	8.8	69.	121.	5.1	6.6
%RSD	.26311	.10410	.98591	.22669	.17739
#1	3343.1	66511.	12219.	2234.6	3723.3
#2	3352.2	66397.	12271.	2233.6	3733.6
#3	3334.6	66522.	12451.	2242.9	3721.3

Sample Name: S4 Acquired: 2/2/2025 11:15:58 Type: Cal
Method: EPA SFAM01.0(v61) 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	.30361	.28071	6.1533	.32345	.76933	1.8495	3.7831	1.9908
Stddev	.00057	.00232	.0063	.00032	.00142	.0091	.0035	.0131
%RSD	.18723	.82496	.10160	.09940	.18455	.49391	.09352	.65608

#1	.30349	.28162	6.1561	.32344	.76869	1.8392	3.7842	2.0030
#2	.30312	.28244	6.1461	.32314	.76835	1.8527	3.7860	1.9925
#3	.30423	.27808	6.1576	.32378	.77096	1.8566	3.7792	1.9770

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	7.5970	2.1394	2.6851	2.2335	2.4590	.78367	1.3676	.57746
Stddev	.0031	.0036	.0040	.0039	.0109	.00262	.0025	.00113
%RSD	.04072	.16994	.14978	.17413	.44485	.33386	.18108	.19528

#1	7.5985	2.1353	2.6894	2.2326	2.4464	.78091	1.3649	.57618
#2	7.5991	2.1417	2.6846	2.2301	2.4661	.78400	1.3698	.57794
#3	7.5934	2.1413	2.6814	2.2378	2.4646	.78611	1.3679	.57828

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	1.5887	.34337	.28435	.29827	4.2909	.54756	.24012	1.7986
Stddev	.0018	.00122	.00186	.00014	.0341	.00286	.00016	.0088
%RSD	.11376	.35573	.65555	.04810	.79415	.52190	.06870	.48906

#1	1.5898	.34478	.28389	.29813	4.2594	.54431	.24010	1.8047
#2	1.5867	.34261	.28640	.29841	4.3271	.54873	.24029	1.8025
#3	1.5898	.34271	.28275	.29826	4.2861	.54965	.23996	1.7885

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	3.4930	.14062	.15696	.77997	1.7895	.67542	7.9436	
Stddev	.0066	.00029	.00057	.00091	.0051	.00298	.0566	
%RSD	.18810	.20904	.36100	.11726	.28400	.44138	.71184	

#1	3.4860	.14088	.15704	.77899	1.7872	.67198	7.8812	
#2	3.4940	.14030	.15749	.78080	1.7954	.67715	7.9582	
#3	3.4991	.14068	.15637	.78011	1.7860	.67713	7.9914	

Sample Name: S4 Acquired: 2/2/2025 11:15:58 Type: Cal
Method: EPA SFAM01.0(v61) 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	3087.6	63323.	12315.	2103.5	3452.8
Stddev	3.7	129.	71.	13.9	3.7
%RSD	.12031	.20377	.57961	.66027	.10669
#1	3090.2	63223.	12258.	2112.1	3450.7
#2	3089.2	63276.	12291.	2087.5	3457.1
#3	3083.3	63468.	12395.	2110.9	3450.7

Sample Name: S5 Acquired: 2/2/2025 11:19:59 Type: Cal
Method: EPA SFAM01.0(v61) 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	.62768	.53426	11.833	.66209	1.5863	3.6217	7.2549	3.8925
Stddev	.00336	.00439	.033	.00371	.0102	.0157	.0475	.0218
%RSD	.53510	.82189	.27712	.56093	.64407	.43347	.65456	.56019

#1	.62552	.52940	11.813	.65864	1.5796	3.6393	7.2035	3.8765
#2	.62597	.53793	11.814	.66161	1.5813	3.6091	7.2972	3.8837
#3	.63155	.53544	11.871	.66602	1.5981	3.6167	7.2641	3.9174

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	14.466	4.0257	4.9916	4.3050	4.7570	1.4672	2.5311	1.1054
Stddev	.030	.0235	.0131	.0099	.0149	.0064	.0213	.0045
%RSD	.20928	.58408	.26271	.22926	.31381	.43565	.84229	.40370

#1	14.438	4.0523	5.0019	4.2996	4.7486	1.4706	2.5472	1.1082
#2	14.462	4.0175	4.9961	4.2990	4.7481	1.4711	2.5391	1.1078
#3	14.498	4.0075	4.9769	4.3164	4.7742	1.4598	2.5069	1.1003

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	3.0445	.68698	.54179	.56367	8.2365	1.0735	.47996	3.4215
Stddev	.0075	.00120	.00172	.00095	.0419	.0049	.00197	.0232
%RSD	.24756	.17521	.31702	.16832	.50896	.45429	.41047	.67772

#1	3.0382	.68832	.54076	.56259	8.2192	1.0753	.47894	3.4093
#2	3.0425	.68665	.54377	.56411	8.2843	1.0773	.47871	3.4070
#3	3.0529	.68598	.54084	.56433	8.2061	1.0680	.48223	3.4482

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	6.9996	.28356	.30119	1.4937	3.3869	1.3105	15.382	
Stddev	.0417	.00098	.00092	.0031	.0063	.0081	.016	
%RSD	.59555	.34671	.30642	.20605	.18494	.61557	.10559	

#1	6.9709	.28244	.30012	1.4915	3.3797	1.3130	15.392	
#2	6.9805	.28395	.30169	1.4923	3.3901	1.3170	15.363	
#3	7.0474	.28429	.30175	1.4972	3.3910	1.3014	15.391	

Sample Name: S5 Acquired: 2/2/2025 11:19:59 Type: Cal
Method: EPA SFAM01.0(v61) 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	2763.4	60813.	11839.	1987.2	3177.3
Stddev	16.4	195.	47.	8.7	8.2
%RSD	.59366	.32096	.39524	.43539	.25878
#1	2773.9	60729.	11884.	1993.4	3182.6
#2	2771.9	60674.	11841.	1977.3	3181.5
#3	2744.5	61036.	11791.	1991.0	3167.8

Sample Name: S6 Acquired: 2/2/2025 11:24:34 Type: Cal
Method: EPA SFAM01.0(v61) 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	9.6355	6.5718	3.8845	1.8198	1.5565
Stddev	.0738	.0589	.0086	.0021	.0050
%RSD	.76632	.89560	.22117	.11676	.31951
#1	9.5907	6.6019	3.8746	1.8189	1.5599
#2	9.7207	6.6096	3.8894	1.8222	1.5589
#3	9.5950	6.5040	3.8895	1.8183	1.5508
Int. Std.	Y_3600	Y_3710			
Units	Cts/S	Cts/S			
Avg	57185.	11362.			
Stddev	88.	48.			
%RSD	.15433	.42421			
#1	57087.	11308.			
#2	57211.	11400.			
#3	57258.	11379.			

Sample Name: ICV007 Acquired: 2/2/2025 11:52:50 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICV007 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F .8906478	1.077177	.9910018	.9498537	.9048143	2.474920
Stddev	.0061384	.007424	.0053981	.0018666	.0033119	.007404
%RSD	.6892042	.6892033	.5447135	.1965160	.3660272	.2991529

#1	.8859290	1.068620	.9885105	.9493279	.9047175	2.481765
#2	.8884269	1.081014	.9872992	.9483064	.9015519	2.475933
#3	.8975875	1.081897	.9971956	.9519269	.9081736	2.467062

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F .4275946	F .5634942	.5009176	9.967470	.5649134	.5057399
Stddev	.0030877	.0019168	.0014907	.050277	.0006233	.0016801
%RSD	.7221020	.3401545	.2976000	.5044131	.1103336	.3321998

#1	.4311268	.5613487	.4997028	10.02540	.5656199	.5043631
#2	.4262483	.5640966	.5004688	9.94188	.5646787	.5052447
#3	.4254086	.5650375	.5025811	9.93514	.5644415	.5076119

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5299868	9.360202	F .4599122	6.260393	.5118281	.2384998
Stddev	.0016505	.056277	.0014644	.004080	.0022016	.0003372
%RSD	.3114214	.6012381	.3184041	.0651721	.4301440	.1413679

#1	.5281271	9.423474	.4613165	6.264252	.5106491	.2387763
#2	.5312776	9.341393	.4600259	6.256123	.5104671	.2381242
#3	.5305557	9.315738	.4583943	6.260805	.5143681	.2385989

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.37106	.5119524	F .8764566	9.364688	F -.000533	F .0322575
Stddev	.23208	.0035200	.0087717	.074425	.001014	.0003106
%RSD	2.237738	.6875592	1.000816	.7947418	190.1643	.9628180

#1	10.36631	.5155923	.8864953	9.449981	-.001373	.0321329
#2	10.60548	.5116987	.8726034	9.331150	-.000820	.0326110
#3	10.14139	.5085661	.8702709	9.312934	.000593	.0320285

Sample Name: ICV007 Acquired: 2/2/2025 11:52:50 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICV007 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F -.000334	F .0041728	F .0046273	F -.002747	F -.000764	F -.000419
Stddev	.000138	.0009592	.0034791	.000321	.000696	.000682
%RSD	41.29714	22.98753	75.18486	11.68950	91.09320	162.8281

#1	-.000223	.0030762	.0008353	-.003105	-.001124	-.001104
#2	-.000292	.0045858	.0076718	-.002650	.000038	.000260
#3	-.000489	.0048563	.0053749	-.002485	-.001206	-.000413

Elem	Sr4077
Units	ppm
Avg	F .0011690
Stddev	.0000699
%RSD	5.977857

#1	.0010905
#2	.0012245
#3	.0011920

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3641.164	70406.10	11631.42	2349.836	4311.423
Stddev	11.120	71.71	48.56	1.496	11.035
%RSD	.3054001	.1018454	.4175152	.0636784	.2559577

#1	3650.650	70438.72	11684.57	2348.552	4321.351
#2	3643.916	70455.70	11620.34	2349.477	4313.378
#3	3628.927	70323.89	11589.36	2351.479	4299.541

Sample Name: ICB007 Acquired: 2/2/2025 11:56:46 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICB007 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0008691	-.001810	-.000548	-.001354	-.000412	-.003763	.0031043
Stddev	.0011440	.002280	.000878	.002998	.000613	.005280	.0008743
%RSD	131.6248	125.9970	160.2605	221.3592	148.9215	140.3181	28.16479

#1	-.000334	.000727	-.001355	.001312	-.001062	-.009350	.0031422
#2	.001943	-.003690	-.000676	-.000775	-.000330	.001145	.0022116
#3	.000998	-.002466	.000387	-.004599	.000157	-.003084	.0039591

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000008	.0000323	-.005303	-.000252	.0000874	.0011333	.0031441
Stddev	.000047	.0000707	.004995	.000486	.0000923	.0021164	.0012735
%RSD	557.7741	218.7130	94.18925	192.3964	105.5331	186.7436	40.50547

#1	.000033	.0000631	.000327	.000281	.0000053	.0001022	.0039126
#2	-.000060	-.000049	-.007034	-.000670	.0001873	.0035676	.0016741
#3	.000002	.000082	-.009203	-.000368	.0000698	-.000270	.0038456

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002788	.0034802	-.000153	.0004881	.2446233	-.002037	.0003674
Stddev	.0001339	.0104745	.000153	.0002391	.2363940	.000999	.0017800
%RSD	48.03497	300.9685	99.75522	48.97770	96.63591	49.04072	484.5253

#1	.0002915	.0139625	-.000026	.0002132	-.028339	-.003167	.0003113
#2	.0001389	.0034646	-.000323	.0006477	.382014	-.001274	-.001384
#3	.0004058	-.006986	-.000110	.0006033	.380195	-.001668	.002175

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2189123	.0002491	-.004914	-.000149	-.000309	.0052579	-.003722
Stddev	.0652281	.0024568	.000062	.000270	.002206	.0017117	.000556
%RSD	29.79645	986.2282	1.253516	180.7888	714.5925	32.55484	14.92510

#1	.2933010	.0022186	-.004948	-.000301	.002123	.0052404	-.003092
#2	.1714978	.0010327	-.004843	-.000310	-.002183	.0035551	-.003934
#3	.1919383	-.002504	-.004952	.000162	-.000866	.0069784	-.004141

Sample Name: ICB007 Acquired: 2/2/2025 11:56:46 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICB007 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0005730	-.002909	-.000025
Stddev	.0006205	.001726	.000031
%RSD	108.2987	59.33610	123.6990

#1	.0012894	-.000938	-.000011
#2	.0002019	-.003640	-.000061
#3	.0002277	-.004150	-.000004

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3642.224	70583.64	11890.22	2358.086	4397.196
Stddev	4.181	96.71	21.38	5.984	3.411
%RSD	.1148010	.1370116	.1797799	.2537834	.0775752

#1	3642.646	70526.62	11875.01	2358.291	4397.425
#2	3646.179	70695.30	11880.99	2363.966	4400.487
#3	3637.848	70529.00	11914.66	2352.002	4393.676

Sample Name: ICSA007 Acquired: 2/2/2025 12:00:55 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSA007 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.005328	-.001124	-.000903	.0223970	.0107178	216.9201
Stddev	.003220	.003514	.001550	.0070328	.0010064	1.1993
%RSD	60.43830	312.7680	171.5703	31.40053	9.390109	.5528660

#1	-.006979	.002795	-.001996	.0287245	.0113327	215.6929
#2	-.001617	-.003997	-.001585	.0236414	.0112643	216.9779
#3	-.007388	-.002169	.000871	.0148251	.0095563	218.0894

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0066539	-.000530	.0014560	227.4857	.0610879	.0009769
Stddev	.0009806	.000047	.0001155	1.1833	.0001228	.0002922
%RSD	14.73712	8.876630	7.930480	.5201567	.2009771	29.91386

#1	.0065000	-.000521	.0013227	226.2773	.0611378	.0009517
#2	.0077023	-.000580	.0015193	227.5378	.0609480	.0012810
#3	.0057593	-.000487	.0015260	228.6421	.0611779	.0006981

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.011955	94.97197	.0123428	222.6221	.0034151	.0019241
Stddev	.001766	.53807	.0000279	1.0699	.0002590	.0002532
%RSD	14.77440	.5665595	.2259998	.4805773	7.583676	13.16163

#1	-.013984	94.42557	.0123742	221.6107	.0031161	.0016420
#2	-.011125	94.98904	.0123332	222.5134	.0035608	.0019986
#3	-.010757	95.50131	.0123209	223.7422	.0035685	.0021318

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.385874	-.005802	-.006219	.1106352	.0037792	F .3567518
Stddev	.325553	.001539	.000615	.0109632	.0008633	.0031207
%RSD	84.36751	26.53058	9.892497	9.909353	22.84383	.8747636

#1	-.232354	-.006657	-.005520	.0981137	.0033764	.3545944
#2	-.165468	-.004025	-.006462	.1185091	.0047703	.3553309
#3	-.759801	-.006725	-.006677	.1152828	.0031908	.3603302

Sample Name: ICSA007 Acquired: 2/2/2025 12:00:55 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSA007 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0008675	.0185537	.0014948	F -.007747	-.002498	.0027122
Stddev	.0003376	.0035755	.0063382	.001953	.000705	.0004462
%RSD	38.92266	19.27112	424.0295	25.20445	28.20702	16.45121

#1	.0005007	.0148748	.0033275	-.005645	-.003100	.0022042
#2	.0009365	.0220159	-.005558	-.008090	-.002670	.0030409
#3	.0011653	.0187703	.006715	-.009505	-.001723	.0028914

Elem	Sr4077
Units	ppm
Avg	.0961217
Stddev	.0006172
%RSD	.6420819

#1	.0955943
#2	.0959702
#3	.0968005

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3277.910	64192.88	11395.30	2141.455	3580.624
Stddev	2.794	109.94	68.25	8.252	6.319
%RSD	.0852339	.1712699	.5989545	.3853686	.1764820

#1	3277.931	64316.40	11345.45	2147.864	3583.839
#2	3280.693	64105.72	11367.36	2144.358	3584.689
#3	3275.106	64156.54	11473.09	2132.143	3573.344

Sample Name: ICSAB007 Acquired: 2/2/2025 12:05:00 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSAB007 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0919046	.1028944	.0512488	.0671569	.5583795	222.9248
Stddev	.0008356	.0002538	.0005033	.0024930	.0027020	.7962
%RSD	.9091797	.2466124	.9819756	3.712220	.4838935	.3571473

#1	.0911196	.1028185	.0510702	.0651062	.5562161	223.2971
#2	.0927829	.1026873	.0518169	.0699319	.5575144	222.0107
#3	.0918113	.1031775	.0508591	.0664326	.5614081	223.4666

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.4746010	.5254716	1.002088	232.7891	.5999298	.5074029
Stddev	.0028341	.0010059	.002277	.8300	.0013804	.0005345
%RSD	.5971514	.1914271	.2271938	.3565329	.2300935	.1053382

#1	.4762167	.5245180	1.001257	233.5161	.5998504	.5072726
#2	.4713286	.5265227	1.000344	231.8848	.5985909	.5069455
#3	.4762577	.5253741	1.004664	232.9665	.6013483	.5079904

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5052719	97.41026	.4904144	228.3146	1.010255	.2026789
Stddev	.0013508	.38596	.0028418	.9258	.000915	.0007777
%RSD	.2673347	.3962207	.5794658	.4054799	.0905646	.3836965

#1	.5053692	97.66514	.4929672	229.0907	1.009246	.2021372
#2	.5065713	96.96621	.4873525	227.2899	1.010489	.2023295
#3	.5038751	97.59943	.4909235	228.5631	1.011031	.2035700

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.546954	.4899338	.9500353	.0610833	.0045090	F .3724076
Stddev	.426481	.0019495	.0119496	.0229350	.0021791	.0017120
%RSD	77.97386	.3979149	1.257805	37.54712	48.32752	.4597131

#1	-.723035	.4921606	.9585565	.0673290	.0048634	.3739449
#2	-.857200	.4891059	.9363761	.0356724	.0064892	.3705626
#3	-.060626	.4885348	.9551734	.0802486	.0021744	.3727153

Sample Name: ICSAB007 Acquired: 2/2/2025 12:05:00 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSAB007 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002806	.0208619	.0122597	F -.007103	-.004677	.0023138
Stddev	.0003973	.0020861	.0075899	.000719	.001483	.0015828
%RSD	141.5661	9.999346	61.90967	10.12398	31.71500	68.40652

#1	.0006971	.0226083	.0130120	-.007496	-.004735	.0007996
#2	-.000094	.0214255	.0043216	-.006273	-.003165	.0039572
#3	.000239	.0185520	.0194455	-.007539	-.006129	.0021845

Elem	Sr4077
Units	ppm
Avg	.0983416
Stddev	.0002259
%RSD	.2297611

#1	.0984238
#2	.0980861
#3	.0985151

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3290.169	64518.56	11761.78	2134.011	3606.553
Stddev	2.394	206.37	12.14	13.588	4.433
%RSD	.0727579	.3198670	.1031885	.6367306	.1229068

#1	3291.398	64326.73	11754.36	2123.019	3608.860
#2	3291.700	64736.92	11755.20	2149.203	3609.357
#3	3287.411	64492.04	11775.79	2129.811	3601.443

Sample Name: CCV033 Acquired: 2/2/2025 12:08:56 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV033 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.964030	4.957115	24.56970	5.014988	5.026607	373.4154
Stddev	.004015	.085996	.04265	.007916	.013596	2.3173
%RSD	.0808836	1.734794	.1735702	.1578498	.2704893	.6205821

#1	4.968630	5.009239	24.61676	5.023993	5.020109	376.0270
#2	4.962231	5.004248	24.55870	5.009126	5.017480	372.6144
#3	4.961229	4.857857	24.53362	5.011846	5.042234	371.6048

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.234133	.5355758	2.484085	376.2711	15.42642	2.489869
Stddev	.020869	.0006450	.008269	.7347	.03862	.003279
%RSD	.2259968	.1204286	.3328690	.1952548	.2503274	.1316874

#1	9.211137	.5354925	2.490657	375.7837	15.46551	2.493273
#2	9.239395	.5362585	2.486798	377.1161	15.42546	2.486731
#3	9.251868	.5349766	2.474801	375.9134	15.38829	2.489604

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	15.27551	377.1581	13.90230	370.1047	2.488443	1.273736
Stddev	.01356	.5766	.01797	.7418	.005305	.001032
%RSD	.0887897	.1528925	.1292284	.2004354	.2131812	.0809838

#1	15.29069	377.7928	13.91952	370.8582	2.494385	1.273485
#2	15.26459	377.0151	13.88367	370.0809	2.486761	1.272854
#3	15.27123	376.6664	13.90370	369.3751	2.484183	1.274870

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	379.0829	2.458083	14.40334	144.2494	5.046469	F 6.068614
Stddev	.1260	.011834	.03293	.2648	.025378	.002161
%RSD	.0332387	.4814371	.2286051	.1835794	.5028932	.0356024

#1	378.9407	2.471732	14.38267	144.4844	5.062362	6.067378
#2	379.1806	2.450690	14.44131	144.3013	5.059844	6.071109
#3	379.1275	2.451828	14.38603	143.9625	5.017201	6.067356

Sample Name: CCV033 Acquired: 2/2/2025 12:08:56 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV033 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.899378	5.104339	4.864817	4.963141	4.952673	4.654700
Stddev	.008070	.011448	.028966	.011717	.004113	.013277
%RSD	.1647144	.2242771	.5954134	.2360901	.0830421	.2852477

#1	4.901647	5.116765	4.833479	4.974113	4.956002	4.666885
#2	4.890416	5.094221	4.870366	4.964510	4.948075	4.640549
#3	4.906070	5.102029	4.890607	4.950798	4.953942	4.656664

Elem	Sr4077
Units	ppm
Avg	4.822472
Stddev	.023543
%RSD	.4881906

#1	4.796149
#2	4.841514
#3	4.829754

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2880.563	60657.72	10869.16	1967.411	3184.940
Stddev	8.881	161.25	13.16	5.718	2.103
%RSD	.3082959	.2658422	.1210803	.2906577	.0660382

#1	2884.352	60476.30	10856.05	1966.564	3185.617
#2	2886.920	60712.09	10869.06	1962.164	3186.621
#3	2870.416	60784.75	10882.37	1973.506	3182.582

Sample Name: CCB033 Acquired: 2/2/2025 12:13:14 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB033 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000074	-.000110	-.000230	.0004036	-.000163	.0012568	-.000230
Stddev	.000824	.000759	.000824	.0028310	.001230	.0035654	.000584
%RSD	1121.352	692.2382	358.0512	701.4925	755.5880	283.6914	253.7350

#1	-.001012	-.000273	.000346	.0021749	.001137	-.002860	.000419
#2	.000257	.000717	-.001174	-.002862	-.000316	.003374	-.000396
#3	.000534	-.000773	.000138	.001897	-.001309	.003256	-.000714

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000054	.0000102	.0010686	.0001521	.0000783	.0009939	.0065883
Stddev	.000042	.0000142	.0121345	.0001765	.0002609	.0015447	.0040515
%RSD	77.62052	139.4967	1135.570	116.0296	333.0011	155.4107	61.49559

#1	-.000072	-.000006	.0141875	.0002265	-.000168	.0010219	.0026282
#2	-.000006	.000021	-.009753	-.000049	.000352	.0025244	.0107255
#3	-.000085	.000015	-.001229	.000279	.000051	-.000565	.0064112

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000055	.0024668	.0000783	.0003792	.0649616	-.002154	.0009698
Stddev	.000315	.0060024	.0001276	.0002519	.2265997	.001096	.0004235
%RSD	572.3116	243.3263	163.0015	66.40797	348.8212	50.89284	43.66757

#1	-.000070	.0074269	.0002113	.0000993	-.181032	-.003241	.0011069
#2	-.000362	-.004206	-.000043	.0005874	.110740	-.002172	.0004948
#3	.000267	.004179	.000067	.0004510	.265177	-.001049	.0013079

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0548638	.0000821	.0009813	.0001044	-.000412	.0027586	-.003218
Stddev	.0240105	.0008033	.0004730	.0001609	.003772	.0061041	.000351
%RSD	43.76376	978.6600	48.20487	154.0568	914.6783	221.2763	10.90494

#1	.0705064	.0006937	.0004351	-.000075	.001122	.0095538	-.003591
#2	.0272187	.0003801	.0012536	.000235	.002351	-.002260	-.002895
#3	.0668663	-.000828	.0012553	.000154	-.004710	.000982	-.003168

Sample Name: CCB033 Acquired: 2/2/2025 12:13:14 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB033 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	-.000129	-.002442	.0000806
Stddev	.000506	.000533	.0000560
%RSD	391.8363	21.84357	69.48412

#1	-.000241	-.001988	.0000183
#2	-.000569	-.003029	.0000967
#3	.000423	-.002308	.0001269

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3660.842	71513.93	11644.41	2378.391	4419.600
Stddev	1.122	246.69	85.85	9.835	6.116
%RSD	.0306605	.3449529	.7372206	.4135036	.1383904

#1	3661.053	71750.54	11567.98	2387.706	4417.682
#2	3661.844	71532.99	11737.29	2379.358	4426.445
#3	3659.629	71258.26	11627.98	2368.108	4414.672

Sample Name: PB166472BL Acquired: 2/2/2025 12:17:49 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS472 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.002278	-.000430	-.000772	.0000893	-.000109	.0041036	.0040201
Stddev	.001112	.001086	.000570	.0005196	.001385	.0081279	.0008195
%RSD	48.79888	252.2055	73.81449	581.7520	1273.066	198.0688	20.38474

#1	-.003002	-.001339	-.001225	-.000067	-.001679	.0134757	.0049396
#2	-.002835	.000772	-.000958	-.000334	.000940	-.000154	.0037538
#3	-.000998	-.000724	-.000132	.000669	.000413	-.001012	.0033669

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000259	-.000041	.0002698	.0000086	.0001854	.0020502	.0079434
Stddev	.0000752	.000017	.0036038	.0004080	.0001714	.0015235	.0011226
%RSD	290.5759	41.02725	1335.819	4763.817	92.47754	74.31223	14.13297

#1	.0000613	-.000039	-.002990	.0001930	.0000185	.0003560	.0082150
#2	.0000769	-.000058	-.000340	.0002918	.0003611	.0024867	.0089052
#3	-.000061	-.000025	.004140	-.000459	.0001766	.0033078	.0067098

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000138	-.009582	-.000284	.0005262	.2000317	-.002540	-.000148
Stddev	.0003736	.008718	.000227	.0000965	.2004835	.002319	.002202
%RSD	2702.722	90.98671	80.00546	18.33388	100.2259	91.28297	1490.379

#1	.0000527	-.005837	-.000052	.0004816	-.003353	-.001368	-.002625
#2	.0003664	-.003361	-.000506	.0006369	.205966	-.001042	.000592
#3	-.000378	-.019546	-.000292	.0004602	.397482	-.005211	.001589

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2967913	-.000457	-.002821	.0000016	.0001243	.0053077	-.000094
Stddev	.0175934	.001203	.000475	.0003543	.0047550	.0065392	.000115
%RSD	5.927855	263.4943	16.82767	22042.60	3824.005	123.2023	123.1035

#1	.2816403	-.001180	-.003262	.0002650	.0020179	.0086036	.000029
#2	.3160869	.000932	-.002882	.0001411	-.005286	.0095432	-.000200
#3	.2926465	-.001122	-.002319	-.000401	.003641	-.002224	-.000110

Sample Name: PB166472BL Acquired: 2/2/2025 12:17:49 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS472 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0009243	-.004061	.0000586
Stddev	.0005644	.002008	.0000604
%RSD	61.06063	49.45375	103.1473
#1	.0014401	-.003716	.0001268
#2	.0010113	-.002248	.0000120
#3	.0003215	-.006220	.0000369

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3619.889	71513.16	12520.77	2368.923	4356.377
Stddev	5.536	240.36	50.52	11.362	9.161
%RSD	.1529339	.3361027	.4034991	.4796300	.2102932
#1	3625.076	71267.47	12516.12	2356.679	4363.246
#2	3620.531	71747.80	12472.73	2370.963	4359.910
#3	3614.060	71524.22	12573.45	2379.126	4345.976

Sample Name: PB166472BS Acquired: 2/2/2025 12:21:59 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS472 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0160291	.0506580	.0180991	.0644651	.1080407	.3599850	.3649855
Stddev	.0009996	.0006411	.0014246	.0020091	.0012785	.0049601	.0028821
%RSD	6.235981	1.265625	7.871120	3.116511	1.183367	1.377866	.7896578

#1	.0151310	.0512070	.0193798	.0665851	.1081218	.3549920	.3616973
#2	.0171060	.0499534	.0165647	.0625892	.1092767	.3649116	.3661855
#3	.0158503	.0508135	.0183528	.0642210	.1067235	.3600515	.3670738

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0105277	.0099569	9.473884	.0215220	.0976729	.0566495	.1923871
Stddev	.0000249	.0001366	.039892	.0002202	.0003413	.0023753	.0065752
%RSD	.2362559	1.371604	.4210750	1.023032	.3494409	4.192940	3.417694

#1	.0105519	.0099623	9.432404	.0217716	.0973220	.0592748	.1891708
#2	.0105290	.0098178	9.477275	.0214391	.0980037	.0546492	.1880392
#3	.0105022	.0100907	9.511972	.0213553	.0976931	.0560244	.1999513

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0293834	8.596292	.0795502	.0195485	9.564362	.1022642	.1184195
Stddev	.0000724	.058514	.0001838	.0004525	.083167	.0003298	.0014927
%RSD	.2463966	.6806924	.2310766	2.314923	.8695486	.3224737	1.260540

#1	.0293604	8.557163	.0796519	.0194044	9.500984	.1026049	.1167348
#2	.0293252	8.568153	.0796606	.0191856	9.533568	.1022412	.1189464
#3	.0294645	8.663560	.0793380	.0200555	9.658534	.1019465	.1195774

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.174298	.0183476	-.003637	.0201152	.1733911	.8531773	.0125506
Stddev	.075871	.0009194	.000253	.0003896	.0043405	.0077053	.0004432
%RSD	.8269943	5.010923	6.945800	1.936641	2.503300	.9031257	3.530966

#1	9.094215	.0189266	-.003696	.0204733	.1696455	.8582791	.0126523
#2	9.183575	.0172875	-.003855	.0201718	.1781480	.8569390	.0129341
#3	9.245104	.0188287	-.003360	.0197004	.1723798	.8443137	.0120655

Sample Name: PB166472BS Acquired: 2/2/2025 12:21:59 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS472 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.2028010	.0233332	.1905202
Stddev	.0007631	.0011270	.0013597
%RSD	.3762803	4.829951	.7136759

#1	.2035701	.0222815	.1891120
#2	.2027888	.0245228	.1906232
#3	.2020440	.0231955	.1918255

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3617.673	70212.05	12426.34	2332.747	4282.034
Stddev	3.189	265.88	60.56	13.114	5.609
%RSD	.0881593	.3786836	.4873452	.5621605	.1309955

#1	3616.818	70519.01	12366.62	2345.532	4287.903
#2	3621.203	70053.92	12424.69	2333.382	4281.475
#3	3614.999	70063.20	12487.70	2319.328	4276.726

Sample Name: PB166385BL Acquired: 2/2/2025 12:26:02 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS385 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000951	-.001657	-.000760	.0008127	-.001087	-.004604	.0030346
Stddev	.003176	.001921	.001434	.0013816	.000959	.002528	.0000807
%RSD	334.0634	115.9361	188.7349	170.0112	88.22891	54.91261	2.660473

#1	-.003905	.000535	.000882	-.000326	-.000469	-.003915	.0030103
#2	-.001355	-.002457	-.001394	.002350	-.002192	-.007406	.0031247
#3	.002408	-.003048	-.001768	.000414	-.000601	-.002492	.0029689

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000018	.0000038	-.006547	.0000883	.0002358	.0020299	.0045621
Stddev	.000014	.0000348	.009017	.0001957	.0002113	.0025448	.0042147
%RSD	74.95413	920.1790	137.7146	221.5364	89.62511	125.3639	92.38549

#1	-.000019	-.000028	.002606	-.000125	.0004673	-.000019	.0009154
#2	-.000004	-.000002	-.006828	.000260	.0000531	.001230	.0091765
#3	-.000032	.000041	-.015420	.000130	.0001871	.004879	.0035943

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000093	-.009162	-.000464	.0002703	.1080133	-.000990	-.000174
Stddev	.000262	.018992	.000244	.0002548	.1456527	.000021	.002259
%RSD	281.8193	207.2915	52.60095	94.26427	134.8469	2.121186	1296.410

#1	.000094	.003912	-.000676	.0003478	-.038558	-.000984	.001521
#2	-.000392	-.000451	-.000518	.0004772	.252730	-.000972	-.002738
#3	.000020	-.030947	-.000197	-.000014	.109869	-.001013	.000695

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2571957	.0000825	-.005058	-.000071	.0026891	.0030523	-.000345
Stddev	.0243964	.0005682	.000725	.000171	.0016707	.0026295	.000232
%RSD	9.485522	688.6255	14.33414	239.0643	62.12879	86.14921	67.14366

#1	.2633721	-.000310	-.005815	.000102	.0017502	.0058160	-.000207
#2	.2779103	.000734	-.004370	-.000239	.0016990	.0005815	-.000216
#3	.2303048	-.000177	-.004990	-.000077	.0046180	.0027594	-.000613

Sample Name: PB166385BL Acquired: 2/2/2025 12:26:02 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS385 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0002773	-.003057	.0000349
Stddev	.0008563	.000372	.0000251
%RSD	308.8024	12.17281	71.85649
#1	-.000611	-.002691	.0000530
#2	.001097	-.003046	.0000454
#3	.000346	-.003435	.0000063

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3608.129	71510.05	12407.78	2367.403	4346.140
Stddev	10.338	103.42	37.08	10.264	7.856
%RSD	.2865261	.1446255	.2988468	.4335463	.1807553
#1	3603.494	71626.36	12364.97	2361.897	4342.357
#2	3619.974	71428.45	12429.62	2361.066	4355.172
#3	3600.919	71475.35	12428.76	2379.245	4340.891

Sample Name: PB166385BS Acquired: 2/2/2025 12:30:11 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS385 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0171800	.0530533	.0190424	.0675580	.1120941	.3743670	.3952545
Stddev	.0033288	.0008115	.0004188	.0021000	.0027365	.0083157	.0009845
%RSD	19.37597	1.529632	2.199124	3.108430	2.441276	2.221280	.2490831

#1	.0138820	.0522647	.0189478	.0699090	.1091037	.3660335	.3945043
#2	.0205388	.0530093	.0186790	.0668967	.1127053	.3744026	.3963693
#3	.0171194	.0538860	.0195003	.0658682	.1144734	.3826649	.3948900

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0105623	.0103334	10.11374	.0222257	.1011015	.0603431	.2208433
Stddev	.0001023	.0000826	.03989	.0001903	.0005391	.0006420	.0011526
%RSD	.9681183	.7989782	.3944466	.8564434	.5332240	1.063846	.5219286

#1	.0106754	.0104259	10.09406	.0221719	.1017020	.0610303	.2220493
#2	.0105350	.0103071	10.15965	.0224372	.1009434	.0597588	.2197527
#3	.0104764	.0102672	10.08752	.0220680	.1006592	.0602402	.2207279

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0311908	9.172145	.0820260	.0199019	10.02035	.1074791	.1253364
Stddev	.0006529	.036154	.0003742	.0003264	.41680	.0012189	.0013930
%RSD	2.093277	.3941665	.4561538	1.639827	4.159516	1.134060	1.111388

#1	.0317984	9.148311	.0822192	.0199794	10.29388	.1071597	.1268966
#2	.0312734	9.213744	.0815947	.0195438	10.22653	.1088258	.1242178
#3	.0305005	9.154379	.0822641	.0201826	9.54065	.1064517	.1248946

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.855321	.0174173	-.003611	.0204495	.1813954	.8794746	.0135191
Stddev	.037301	.0014741	.000409	.0002890	.0012069	.0094440	.0010378
%RSD	.3784887	8.463219	11.33507	1.413276	.6653425	1.073824	7.676277

#1	9.823697	.0157484	-.003151	.0206393	.1819676	.8831269	.0143195
#2	9.845808	.0185413	-.003934	.0205923	.1822098	.8687499	.0138912
#3	9.896458	.0179622	-.003748	.0201169	.1800088	.8865471	.0123466

Sample Name: PB166385BS Acquired: 2/2/2025 12:30:11 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS385 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.2115719	.0251776	.1991544
Stddev	.0017621	.0007243	.0006684
%RSD	.8328489	2.876616	.3356013
#1	.2096141	.0254382	.1984554
#2	.2120712	.0257355	.1997872
#3	.2130305	.0243591	.1992206

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3577.804	69830.52	12767.73	2325.842	4216.023
Stddev	6.789	156.86	54.08	6.473	8.805
%RSD	.1897498	.2246271	.4235616	.2783221	.2088361
#1	3570.919	69715.06	12706.73	2321.406	4207.312
#2	3584.493	69767.39	12809.79	2322.849	4224.919
#3	3578.000	70009.11	12786.66	2333.270	4215.837

Sample Name: Q1223-05 Acquired: 2/2/2025 12:34:14 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6305 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.8127924	-.029912	3.103565	.0800229	.0089475	170.7293
Stddev	.0047880	.001444	.008174	.0067479	.0022173	.5089
%RSD	.5890750	4.828437	.2633651	8.432469	24.78173	.2980645

#1	.8079159	-.031229	3.107258	.0830024	.0077529	171.1515
#2	.8174866	-.030141	3.109241	.0847682	.0075836	170.8723
#3	.8129747	-.028367	3.094197	.0722980	.0115060	170.1643

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.189431	.0212970	.0170341	142.1209	6.393485	.1034926
Stddev	.004930	.0001690	.0002252	.3593	.008380	.0003703
%RSD	.4144534	.7935231	1.321943	.2527821	.1310715	.3578015

#1	1.195034	.0212819	.0172874	142.5009	6.383825	.1035747
#2	1.187501	.0211360	.0168566	142.0750	6.398805	.1038150
#3	1.185758	.0214730	.0169583	141.7868	6.397825	.1030882

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.924972	340.1805	13.86367	30.08704	1.027669	.0269345
Stddev	.004664	.7243	.03521	.12358	.000706	.0004541
%RSD	.0469948	.2129236	.2539612	.4107363	.0686730	1.685783

#1	9.922705	340.6308	13.90348	30.13557	1.028351	.0274063
#2	9.930337	340.5656	13.85093	30.17900	1.027715	.0268965
#3	9.921876	339.3449	13.83661	29.94657	1.026941	.0265006

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	21.06807	.1862860	1.181463	8.905568	F 11.86210	1.444679
Stddev	.17404	.0008457	.008528	.053797	.06030	.003648
%RSD	.8260884	.4539632	.7218577	.6040819	.5083579	.2525352

#1	21.10437	.1865056	1.190961	8.967536	11.93132	1.446378
#2	20.87875	.1870002	1.178967	8.870839	11.83397	1.447167
#3	21.22111	.1853522	1.174461	8.878327	11.82099	1.440491

Sample Name: Q1223-05 Acquired: 2/2/2025 12:34:14 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6305 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0241429	F 26.78337	F 15.22459	6.648740	3.680041	.4328680
Stddev	.0000812	.03104	.07350	.014798	.005875	.0002531
%RSD	.3362311	.1159077	.4827389	.2225739	.1596417	.0584717

#1	.0240619	26.80926	15.14664	6.665650	3.684144	.4330868
#2	.0241424	26.74895	15.23451	6.638159	3.673311	.4329263
#3	.0242243	26.79190	15.29262	6.642411	3.682668	.4325908

Elem	Sr4077
Units	ppm
Avg	1.179513
Stddev	.013480
%RSD	1.142830

#1	1.179757
#2	1.192869
#3	1.165913

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3474.948	71298.48	13378.83	2315.501	3806.209
Stddev	9.846	129.58	28.68	1.754	8.962
%RSD	.2833528	.1817417	.2143865	.0757676	.2354621

#1	3475.979	71353.98	13411.91	2315.475	3806.204
#2	3464.627	71150.39	13363.74	2313.760	3797.250
#3	3484.238	71391.06	13360.84	2317.269	3815.174

Sample Name: Q1223-06 Acquired: 2/2/2025 12:38:12 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6305D Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.8029825	-.027748	3.074448	.0811713	.0072723	170.3813
Stddev	.0035744	.004484	.009268	.0021060	.0024793	1.6464
%RSD	.4451351	16.16128	.3014449	2.594447	34.09266	.9663066

#1	.7997668	-.024014	3.065116	.0792169	.0048402	172.2778
#2	.8068310	-.032722	3.083650	.0808953	.0097963	169.3187
#3	.8023497	-.026507	3.074578	.0834016	.0071804	169.5473

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.194690	.0216420	.0167496	142.6790	6.337958	.1020916
Stddev	.011344	.0005594	.0001042	1.0995	.018712	.0008729
%RSD	.9495279	2.584748	.6220194	.7706253	.2952340	.8550440

#1	1.207195	.0222879	.0167309	143.8807	6.358787	.1012637
#2	1.185062	.0213227	.0168618	141.7234	6.322569	.1030035
#3	1.191812	.0213153	.0166560	142.4329	6.332517	.1020075

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.999892	339.9348	13.94914	30.17501	1.016445	.0277787
Stddev	.213048	2.6444	.11280	.17938	.002234	.0008377
%RSD	2.130501	.7779265	.8086163	.5944526	.2198115	3.015599

#1	10.24581	342.8734	14.06638	30.35995	1.014371	.0283172
#2	9.87122	337.7468	13.84139	30.00177	1.018811	.0268136
#3	9.88265	339.1842	13.93965	30.16330	1.016154	.0282053

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	21.51854	.1903973	1.183044	8.808390	F 11.66209	1.439020
Stddev	.50534	.0044679	.015963	.035968	.02040	.009408
%RSD	2.348383	2.346603	1.349343	.4083369	.1749061	.6538059

#1	22.09622	.1954661	1.200131	8.849916	11.63908	1.449483
#2	21.15842	.1870310	1.168512	8.788199	11.67794	1.431256
#3	21.30099	.1886948	1.180489	8.787053	11.66926	1.436321

Sample Name: Q1223-06 Acquired: 2/2/2025 12:38:12 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6305D Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0239254	F 26.27002	F 15.97926	6.565655	3.748903	.4338390
Stddev	.0002108	.08864	.23360	.018810	.079602	.0048019
%RSD	.8809612	.3374003	1.461899	.2864858	2.123337	1.106833
#1	.0237639	26.18710	16.24789	6.544397	3.839457	.4392710
#2	.0241638	26.36344	15.82382	6.580141	3.689970	.4301594
#3	.0238484	26.25952	15.86606	6.572428	3.717283	.4320867

Elem	Sr4077
Units	ppm
Avg	1.170921
Stddev	.017207
%RSD	1.469544
#1	1.184117
#2	1.151459
#3	1.177186

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3500.467	71491.73	13226.67	2329.243	3839.264
Stddev	11.543	271.46	187.67	11.998	9.605
%RSD	.3297526	.3797076	1.418868	.5151064	.2501684
#1	3510.911	71262.51	13013.47	2315.905	3848.444
#2	3488.074	71791.50	13366.88	2339.155	3829.284
#3	3502.417	71421.18	13299.66	2332.670	3840.063

Sample Name: Q1223-05LX5 Acquired: 2/2/2025 12:42:13 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6305L Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1560754	-.004694	.6447735	.0181803	-.000122	35.05881	.2483678
Stddev	.0017874	.002969	.0027201	.0003565	.000784	.33903	.0022590
%RSD	1.145212	63.25113	.4218696	1.960803	644.7161	.9670284	.9095466

#1	.1581237	-.008016	.6420849	.0183577	.000650	35.40969	.2497002
#2	.1548314	-.003766	.6447116	.0177699	-.000097	35.03372	.2496438
#3	.1552713	-.002300	.6475240	.0184132	-.000917	34.73303	.2457595

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0045113	.0029752	30.18613	1.360803	.0208782	2.112958	73.79639
Stddev	.0000793	.0001080	.28503	.024388	.0001194	.048461	.70919
%RSD	1.758652	3.630704	.9442412	1.792180	.5717724	2.293517	.9610061

#1	.0045665	.0028638	30.44487	1.372424	.0209644	2.118716	74.47917
#2	.0044204	.0030795	30.23293	1.377207	.0209281	2.061876	73.84653
#3	.0045471	.0029821	29.88060	1.332777	.0207419	2.158283	73.06346

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.965854	6.504538	.2072597	.0067374	4.754917	.0390363	.2443712
Stddev	.027768	.085492	.0008360	.0002101	.289135	.0022825	.0050105
%RSD	.9362624	1.314348	.4033811	3.118593	6.080760	5.847253	2.050371

#1	2.991582	6.487734	.2065622	.0067367	5.029084	.0371166	.2466663
#2	2.969561	6.597185	.2081865	.0065277	4.452838	.0384321	.2478232
#3	2.936418	6.428696	.2070306	.0069479	4.782828	.0415601	.2386243

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.056318	2.294164	.3105181	.0046569	5.218245	3.261893	1.353018
Stddev	.048881	.004544	.0037916	.0002524	.013635	.067509	.003345
%RSD	2.377102	.1980547	1.221042	5.419165	.2612858	2.069634	.2472390

#1	2.041267	2.295973	.3135755	.0045554	5.230438	3.272762	1.349786
#2	2.110954	2.297525	.3117032	.0044711	5.220774	3.189609	1.356466
#3	2.016732	2.288994	.3062755	.0049442	5.203523	3.323309	1.352802

Sample Name: Q1223-05LX5 Acquired: 2/2/2025 12:42:13 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6305L Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.7986699	.0862171	.2369098
Stddev	.0183016	.0004853	.0020330
%RSD	2.291503	.5628518	.8581405

#1	.8020843	.0861498	.2390026
#2	.7789017	.0857690	.2367846
#3	.8150239	.0867325	.2349423

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3653.909	72262.92	13261.29	2386.349	4247.229
Stddev	9.519	1125.40	182.12	34.780	4.005
%RSD	.2605156	1.557371	1.373296	1.457462	.0942957

#1	3642.964	71675.12	13241.74	2365.924	4249.332
#2	3658.500	71553.13	13452.40	2366.616	4249.744
#3	3660.262	73560.51	13089.74	2426.508	4242.610

Sample Name: Q1223-07 Acquired: 2/2/2025 12:46:09 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6305S Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.8612000	.0649709	3.071147	.2650041	.1797636	165.0879
Stddev	.0057716	.0025722	.015728	.0037961	.0011645	1.2279
%RSD	.6701822	3.959070	.5121113	1.432467	.6478091	.7437961

#1	.8630104	.0622313	3.088941	.2644018	.1797056	164.2260
#2	.8658493	.0653468	3.059107	.2690654	.1786292	164.5439
#3	.8547402	.0673344	3.065392	.2615452	.1809561	166.4939

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.672143	.1171972	.1117777	135.1847	6.716897	1.072698
Stddev	.039499	.0010442	.0007082	1.0787	.086055	.004704
%RSD	.8454119	.8909883	.6335906	.7979232	1.281166	.4385554

#1	4.635535	.1169511	.1125943	134.3445	6.665137	1.078112
#2	4.666887	.1162979	.1113306	134.8085	6.669318	1.070370
#3	4.714006	.1183424	.1114083	136.4011	6.816235	1.069611

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.31542	324.8426	14.04672	28.62961	1.967327	.0947240
Stddev	.00992	2.5705	.09880	.18194	.007988	.0005712
%RSD	.0961789	.7913150	.7033741	.6354851	.4060499	.6030334

#1	10.31634	323.0722	13.96532	28.55576	1.976531	.0946513
#2	10.30507	323.6646	14.01818	28.49621	1.962200	.0941926
#3	10.32485	327.7910	14.15664	28.83686	1.963249	.0953281

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	20.44560	1.122770	2.023533	8.363098	F 11.51217	1.364005
Stddev	.33215	.005784	.024506	.096415	.06208	.011429
%RSD	1.624557	.5151872	1.211046	1.152861	.5392794	.8379075

#1	20.07386	1.116974	1.998408	8.283704	11.58084	1.357704
#2	20.71321	1.122794	2.024822	8.335207	11.46000	1.357113
#3	20.54974	1.128543	2.047369	8.470384	11.49568	1.377198

Sample Name: Q1223-07 Acquired: 2/2/2025 12:46:09 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6305S Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0233509	F 26.00221	F 15.32888	6.501887	3.647746	.4063067
Stddev	.0001886	.16608	.04149	.030166	.005636	.0045566
%RSD	.8074994	.6387139	.2706971	.4639635	.1545055	1.121477

#1	.0233211	26.18074	15.34650	6.536577	3.654246	.4022479
#2	.0235526	25.85231	15.28149	6.487273	3.644215	.4054364
#3	.0231791	25.97356	15.35866	6.481811	3.644777	.4112357

Elem	Sr4077
Units	ppm
Avg	1.115103
Stddev	.008317
%RSD	.7458318

#1	1.108318
#2	1.112610
#3	1.124381

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3505.728	71978.19	12882.83	2313.432	3850.221
Stddev	7.400	755.97	50.03	23.216	8.216
%RSD	.2110806	1.050276	.3883237	1.003539	.2134007

#1	3501.871	72480.11	12895.53	2331.151	3840.744
#2	3501.053	72345.74	12925.28	2321.995	3854.565
#3	3514.259	71108.73	12827.67	2287.151	3855.353

Sample Name: Q1246-09 Acquired: 2/2/2025 12:50:02 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6342 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0443019	-.003688	1.071638	.0124558	.0050259	54.72222	.2013144
Stddev	.0016044	.001060	.003449	.0008038	.0007643	.44724	.0024296
%RSD	3.621453	28.75135	.3218125	6.453545	15.20639	.8172826	1.206859

#1	.0456655	-.004499	1.071582	.0133839	.0058905	55.12830	.2038264
#2	.0425341	-.002488	1.068218	.0120021	.0044407	54.24288	.1989766
#3	.0447060	-.004077	1.075115	.0119813	.0047465	54.79548	.2011402

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0036166	.0019790	7.389594	.1598293	.0260142	.0463668	52.26772
Stddev	.0001186	.0001019	.054217	.0012784	.0001057	.0018607	.38202
%RSD	3.279512	5.149817	.7336935	.7998315	.4064077	4.012945	.7308841

#1	.0034802	.0020386	7.430781	.1609045	.0259065	.0475167	52.58715
#2	.0036954	.0020371	7.328169	.1584158	.0261178	.0473637	51.84455
#3	.0036743	.0018613	7.409832	.1601675	.0260182	.0442201	52.37147

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.6467963	14.75515	.0901152	.0007185	1.419631	.1278432	.1876210
Stddev	.0053213	.08938	.0008269	.0002833	.086292	.0019095	.0012499
%RSD	.8227197	.6057800	.9175844	39.43464	6.078445	1.493612	.6662036

#1	.6513253	14.79996	.0896450	.0010088	1.519215	.1263558	.1872772
#2	.6409356	14.65222	.0896305	.0007037	1.366923	.1271773	.1890069
#3	.6481281	14.81326	.0910699	.0004428	1.372756	.1299965	.1865789

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	3.642161	2.386601	.1907574	.0028359	4.787194	6.425653	.0136184
Stddev	.041974	.004999	.0023051	.0003046	.027360	.065896	.0011043
%RSD	1.152457	.2094529	1.208395	10.73891	.5715153	1.025509	8.108485

#1	3.670135	2.386128	.1924862	.0026891	4.778397	6.423488	.0134744
#2	3.593897	2.381856	.1881403	.0026326	4.765315	6.492605	.0125933
#3	3.662451	2.391820	.1916458	.0031861	4.817869	6.360867	.0147876

Sample Name: Q1246-09 Acquired: 2/2/2025 12:50:02 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6342 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	3.069422	.1163114	.0446652
Stddev	.015748	.0007970	.0003252
%RSD	.5130602	.6852550	.7280127
#1	3.053837	.1172314	.0449636
#2	3.069101	.1158287	.0443186
#3	3.085328	.1158742	.0447133

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3737.028	74675.68	12218.96	2471.446	4199.594
Stddev	13.812	411.41	128.79	9.836	16.059
%RSD	.3695960	.5509301	1.054000	.3979691	.3823932
#1	3737.750	74488.15	12360.21	2464.952	4201.778
#2	3750.465	75147.44	12188.63	2482.762	4214.449
#3	3722.870	74391.44	12108.05	2466.624	4182.555

Sample Name: Q1246-10 Acquired: 2/2/2025 12:53:59 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6342D Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0434302	-.001427	1.075616	.0134126	.0071411	59.53043	.2276363
Stddev	.0011509	.001138	.003840	.0047361	.0012064	.07786	.0004863
%RSD	2.650101	79.79665	.3569779	35.31061	16.89323	.1307870	.2136486
#1	.0421433	-.002457	1.073903	.0079443	.0078264	59.61239	.2275885
#2	.0443610	-.000204	1.072931	.0160885	.0057482	59.52145	.2281449
#3	.0437862	-.001619	1.080014	.0162050	.0078487	59.45745	.2271757
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0031304	.0017073	7.937168	.1593824	.0256769	.0449014	56.94960
Stddev	.0000556	.0000890	.026194	.0005443	.0000921	.0021220	.11558
%RSD	1.775549	5.215080	.3300158	.3415194	.3588566	4.725877	.2029486
#1	.0031932	.0018094	7.944026	.1594015	.0256938	.0465942	57.06602
#2	.0031104	.0016455	7.959250	.1588287	.0255774	.0425208	56.94790
#3	.0030876	.0016671	7.908227	.1599169	.0257594	.0455890	56.83488
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.6973706	16.14236	.0902213	.0019170	1.074814	.1286481	.1983379
Stddev	.0008409	.03103	.0003778	.0002035	.345160	.0021643	.0022061
%RSD	.1205829	.1922333	.4187284	10.61488	32.11344	1.682351	1.112274
#1	.6972777	16.17739	.0900023	.0020075	1.043396	.1309181	.2008852
#2	.6982540	16.11831	.0900041	.0020594	.746438	.1266077	.1970711
#3	.6965799	16.13138	.0906575	.0016839	1.434609	.1284187	.1970574
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.216361	2.387541	.2176298	.0026815	4.791597	6.662520	.0127092
Stddev	.089362	.014396	.0008069	.0002778	.017781	.044743	.0007449
%RSD	2.119408	.6029527	.3707575	10.36116	.3710875	.6715610	5.861397
#1	4.286349	2.382592	.2176673	.0023627	4.780692	6.711755	.0129205
#2	4.247031	2.376273	.2184172	.0028103	4.781984	6.651459	.0118814
#3	4.115702	2.403759	.2168048	.0028716	4.812115	6.624344	.0133256

Sample Name: Q1246-10 Acquired: 2/2/2025 12:53:59 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6342D Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	3.070337	.1281417	.0477948
Stddev	.003500	.0002335	.0000697
%RSD	.1140080	.1822153	.1457753

#1	3.074161	.1279134	.0477599
#2	3.067290	.1281315	.0477495
#3	3.069561	.1283801	.0478751

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3709.669	75533.14	13447.01	2471.564	4175.585
Stddev	7.494	270.80	19.42	13.867	13.041
%RSD	.2020172	.3585190	.1444380	.5610697	.3123253

#1	3717.857	75349.77	13426.05	2459.650	4188.394
#2	3708.001	75405.48	13450.55	2468.256	4176.038
#3	3703.150	75844.18	13464.41	2486.786	4162.323

Sample Name: Q1246-09LX5 Acquired: 2/2/2025 12:57:58 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6342L Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0094350	-.002451	.2143237	.0027123	.0011902	12.19057	.0481968
Stddev	.0018897	.002422	.0014118	.0033815	.0005905	.16045	.0005701
%RSD	20.02824	98.81637	.6587105	124.6722	49.61486	1.316172	1.182870

#1	.0109939	-.000070	.2155018	-.001167	.0017527	12.25564	.0485288
#2	.0099779	-.004912	.2127588	.004271	.0005751	12.30827	.0485231
#3	.0073333	-.002372	.2147104	.005033	.0012429	12.00781	.0475385

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0006731	.0002982	1.628811	.0330648	.0051139	.0108817	11.92858
Stddev	.0000453	.0000394	.018198	.0011584	.0001550	.0006808	.13141
%RSD	6.730427	13.21556	1.117286	3.503312	3.030603	6.256305	1.101657

#1	.0006661	.0003364	1.641849	.0334027	.0049443	.0114970	11.96215
#2	.0007215	.0002577	1.636564	.0340166	.0052482	.0109977	12.03995
#3	.0006318	.0003006	1.608020	.0317750	.0051493	.0101503	11.78364

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1445987	3.310273	.0175669	.0008136	.2017775	.0268578	.0398882
Stddev	.0009012	.042200	.0002787	.0003108	.1778411	.0016393	.0022561
%RSD	.6232510	1.274814	1.586252	38.20416	88.13721	6.103515	5.656067

#1	.1452397	3.312091	.0174922	.0007929	-.003432	.0275316	.0424440
#2	.1449881	3.351534	.0173332	.0011343	.311039	.0249890	.0390469
#3	.1435683	3.267193	.0178753	.0005136	.297725	.0280528	.0381735

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.062736	.4659456	.0397507	.0003884	.9220709	1.347082	.0026840
Stddev	.010229	.0030127	.0005680	.0000936	.0053939	.026635	.0004502
%RSD	.9624754	.6465767	1.428882	24.09717	.5849796	1.977241	16.77444

#1	1.056193	.4673843	.0403908	.0002908	.9162674	1.327892	.0031886
#2	1.057492	.4624833	.0395543	.0003969	.9269308	1.377491	.0023234
#3	1.074523	.4679692	.0393069	.0004774	.9230145	1.335861	.0025401

Sample Name: Q1246-09LX5 Acquired: 2/2/2025 12:57:58 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6342L Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.6389072	.0234776	.0098483
Stddev	.0121974	.0005912	.0000914
%RSD	1.909100	2.518078	.9280238
#1	.6272146	.0233338	.0099127
#2	.6515534	.0241275	.0098884
#3	.6379537	.0229716	.0097436

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3644.151	72638.01	12816.67	2404.964	4298.371
Stddev	8.535	909.25	216.36	40.388	10.745
%RSD	.2342016	1.251753	1.688107	1.679359	.2499686
#1	3654.002	72164.27	13031.13	2384.030	4309.195
#2	3639.476	72063.44	12598.46	2379.341	4287.707
#3	3638.975	73686.30	12820.42	2451.522	4298.212

Sample Name: Q1246-11 Acquired: 2/2/2025 13:02:04 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6342S Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1144916	.0986935	1.100248	.2040510	.1869423	57.60310	3.539936
Stddev	.0013902	.0020340	.002883	.0012892	.0020085	.71831	.048863
%RSD	1.214275	2.060974	.2620313	.6318061	1.074398	1.246997	1.380344

#1	.1160906	.1010402	1.103577	.2050290	.1891953	58.10167	3.587127
#2	.1138151	.0974369	1.098537	.2025900	.1862921	56.77976	3.489557
#3	.1135690	.0976033	1.098632	.2045340	.1853394	57.92787	3.543123

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1145245	.1015620	7.366153	.5820005	1.022274	.5496728	53.85040
Stddev	.0003587	.0003569	.108457	.0056422	.002206	.0010647	.65662
%RSD	.3131969	.3514217	1.472371	.9694445	.2157953	.1936873	1.219334

#1	.1145401	.1019203	7.465119	.5859865	1.024196	.5485807	54.31698
#2	.1148752	.1015592	7.250208	.5755446	1.022761	.5497299	53.09954
#3	.1141583	.1012065	7.383133	.5844705	1.019865	.5507077	54.13467

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.487760	14.70508	1.098040	.0752842	.7629034	1.107456	1.032681
Stddev	.016501	.18911	.001833	.0005614	.0828975	.004257	.013284
%RSD	1.109122	1.286044	.1669169	.7457129	10.86605	.3843784	1.286391

#1	1.502950	14.78850	1.100033	.0756537	.8522662	1.112351	1.044281
#2	1.470203	14.48860	1.097660	.0746382	.6885115	1.104619	1.018189
#3	1.490127	14.83814	1.096427	.0755608	.7479325	1.105398	1.035574

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	3.630791	2.355541	.1986711	.0024649	4.708721	6.615246	.0127209
Stddev	.038792	.009356	.0030677	.0001468	.010999	.058724	.0010462
%RSD	1.068427	.3971708	1.544094	5.953995	.2335883	.8877099	8.224282

#1	3.658115	2.364298	.1994766	.0023046	4.721422	6.682910	.0117570
#2	3.586390	2.356643	.1952811	.0024974	4.702387	6.577571	.0138335
#3	3.647869	2.345684	.2012557	.0025926	4.702355	6.585259	.0125723

Sample Name: Q1246-11 Acquired: 2/2/2025 13:02:04 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6342S Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	3.031336	.1164496	.0444411
Stddev	.018214	.0017288	.0005739
%RSD	.6008580	1.484595	1.291342

#1	3.051425	.1184321	.0447999
#2	3.026684	.1156609	.0437792
#3	3.015899	.1152558	.0447441

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3719.724	73831.48	12187.67	2446.981	4196.469
Stddev	3.305	601.56	27.18	23.141	3.649
%RSD	.0888440	.8147722	.2230005	.9457030	.0869601

#1	3720.147	73451.79	12197.03	2428.860	4192.823
#2	3716.227	74525.06	12157.05	2473.048	4196.463
#3	3722.796	73517.58	12208.93	2439.034	4200.122

Sample Name: Q1223-01 Acquired: 2/2/2025 13:05:56 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6301 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.254088	-.026239	.5585754	.1076703	.0521579	105.7095
Stddev	.004382	.001660	.0026256	.0051481	.0025136	1.1721
%RSD	.1943973	6.326135	.4700524	4.781347	4.819278	1.108817

#1	2.254371	-.026152	.5607256	.1030216	.0493999	104.3578
#2	2.249571	-.024624	.5556493	.1067862	.0543200	106.4450
#3	2.258321	-.027941	.5593512	.1132032	.0527539	106.3256

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.4141430	.0171802	.0193362	83.02756	4.400415	.0388840
Stddev	.0039181	.0003558	.0003624	.75947	.048828	.0002896
%RSD	.9460857	2.070848	1.874001	.9147210	1.109612	.7447724

#1	.4096267	.0173882	.0196066	82.15060	4.344776	.0385590
#2	.4161683	.0167694	.0189245	83.46631	4.436128	.0389781
#3	.4166340	.0173830	.0194775	83.46577	4.420343	.0391148

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	15.38934	441.4064	1.645555	10.24357	1.267286	.0637569
Stddev	.12756	6.8419	.015116	.06523	.003882	.0014515
%RSD	.8288750	1.550029	.9185916	.6367410	.3063332	2.276673

#1	15.43993	433.9416	1.628165	10.16946	1.270887	.0626285
#2	15.24425	447.3793	1.655543	10.26899	1.263173	.0653944
#3	15.48384	442.8984	1.652957	10.29225	1.267798	.0632478

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.361178	.1317862	6.477604	3.293429	F 12.89394	1.861528
Stddev	.154668	.0024869	.059685	.090928	.03897	.032482
%RSD	11.36281	1.887030	.9214065	2.760905	.3022653	1.744932

#1	1.508546	.1345917	6.418364	3.192008	12.88438	1.826330
#2	1.200120	.1298531	6.476722	3.367661	12.86064	1.890350
#3	1.374867	.1309138	6.537725	3.320618	12.93681	1.867904

Sample Name: Q1223-01 Acquired: 2/2/2025 13:05:56 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6301 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0323666	F 43.97328	5.486196	1.553759	1.460793	.0460920
Stddev	.0004173	.13885	.037161	.006407	.011932	.0008224
%RSD	1.289293	.3157538	.6773604	.4123687	.8168192	1.784255

#1	.0319575	43.96102	5.485311	1.560196	1.469778	.0452540
#2	.0323505	43.84097	5.449484	1.547382	1.447255	.0461240
#3	.0327917	44.11785	5.523791	1.553699	1.465345	.0468979

Elem	Sr4077
Units	ppm
Avg	.4972730
Stddev	.0055498
%RSD	1.116049

#1	.4909104
#2	.5011163
#3	.4997923

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3454.675	71842.24	13632.54	2308.403	3956.825
Stddev	5.533	696.60	147.29	20.277	8.657
%RSD	.1601665	.9696190	1.080458	.8783888	.2187907

#1	3451.580	72646.09	13569.46	2328.397	3948.521
#2	3461.063	71465.10	13800.87	2308.957	3965.797
#3	3451.381	71415.54	13527.30	2287.855	3956.155

Sample Name: Q1223-02 Acquired: 2/2/2025 13:09:55 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6302 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1134526	-.070273	.3511087	.0802245	.0444058	61.50344
Stddev	.0025478	.001198	.0029213	.0015890	.0023879	.42804
%RSD	2.245660	1.704853	.8320091	1.980633	5.377408	.6959560

#1	.1149872	-.071634	.3504282	.0813597	.0471056	61.19194
#2	.1148589	-.069804	.3543101	.0809051	.0425706	61.99152
#3	.1105116	-.069380	.3485877	.0784086	.0435414	61.32687

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.335453	.0142021	.0130278	145.7155	3.582719	.9400697
Stddev	.004502	.0000586	.0001576	.9352	.019107	.0072302
%RSD	.3371209	.4126826	1.209508	.6418093	.5333029	.7691119

#1	1.331132	.0142420	.0129344	145.1458	3.574501	.9371131
#2	1.340116	.0141348	.0132097	146.7948	3.604560	.9483096
#3	1.335112	.0142294	.0129393	145.2058	3.569096	.9347864

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	7.266927	372.2706	F 98.95473	8.235729	2.467957	.0422281
Stddev	.023106	2.3628	1.30026	.008201	.023181	.0003195
%RSD	.3179553	.6346999	1.313994	.0995830	.9392733	.7567069

#1	7.247366	370.7759	99.54065	8.230167	2.456809	.0421435
#2	7.260995	374.9946	99.85894	8.245148	2.494606	.0425814
#3	7.292420	371.0413	97.46461	8.231874	2.452456	.0419593

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.818112	.0458510	.7428192	5.820345	8.933866	1.591060
Stddev	.230114	.0010882	.0041348	.071597	.092742	.011599
%RSD	12.65674	2.373392	.5566309	1.230116	1.038097	.7290248

#1	1.658881	.0469603	.7439237	5.799352	8.914478	1.584262
#2	2.081946	.0447852	.7462895	5.900092	9.034770	1.604453
#3	1.713510	.0458075	.7382443	5.761591	8.852350	1.584464

Sample Name: Q1223-02 Acquired: 2/2/2025 13:09:55 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6302 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0139243	F 16.36898	6.557993	.2951805	.9789643	.0426266
Stddev	.0006245	.13914	.046335	.0027382	.0048925	.0001365
%RSD	4.485334	.8500022	.7065404	.9276544	.4997600	.3203144

#1	.0140032	16.34105	6.565671	.2932390	.9776907	.0427285
#2	.0145057	16.51996	6.508299	.2983125	.9748347	.0424714
#3	.0132641	16.24593	6.600009	.2939900	.9843677	.0426798

Elem	Sr4077
Units	ppm
Avg	.7940727
Stddev	.0055907
%RSD	.7040585

#1	.7906590
#2	.8005246
#3	.7910343

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3634.091	73505.54	14415.83	2382.170	3905.133
Stddev	30.554	462.16	69.14	12.430	35.155
%RSD	.8407636	.6287406	.4795918	.5217778	.9002327

#1	3639.127	73843.65	14446.29	2386.312	3919.014
#2	3601.332	72978.92	14464.51	2368.199	3865.157
#3	3661.815	73694.05	14336.70	2392.001	3931.229

Sample Name: Q1223-03 Acquired: 2/2/2025 13:13:57 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6303 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2020761	-.010762	.2587639	.0236059	.0120626	37.75991	.1513429
Stddev	.0012260	.002069	.0023355	.0013500	.0014503	.15975	.0019315
%RSD	.6067199	19.22320	.9025541	5.718863	12.02329	.4230626	1.276253

#1	.2034611	-.010369	.2567152	.0222284	.0121092	37.93404	.1535298
#2	.2016374	-.008918	.2582694	.0249266	.0105896	37.62013	.1498703
#3	.2011297	-.013000	.2613070	.0236628	.0134891	37.72558	.1506284

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0020244	.0036389	11.67855	1.144334	.0638099	.3999728	97.73445
Stddev	.0000649	.0000768	.03609	.000954	.0001908	.0052334	.44192
%RSD	3.205616	2.110052	.3090357	.0833821	.2989695	1.308452	.4521635

#1	.0020965	.0036004	11.72008	1.145143	.0636782	.4059593	98.13584
#2	.0019707	.0037273	11.65479	1.144577	.0637228	.3962652	97.26088
#3	.0020059	.0035890	11.66078	1.143281	.0640286	.3976938	97.80663

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.420557	11.61886	.1702730	.0036731	.3170749	.1006360	.3127219
Stddev	.011086	.04442	.0003381	.0000134	.2197397	.0015710	.0023638
%RSD	.4579805	.3823078	.1985515	.3654529	69.30215	1.561072	.7558893

#1	2.431398	11.66091	.1703933	.0036849	.5609540	.1022922	.3145750
#2	2.409242	11.57240	.1698912	.0036760	.2557798	.0991669	.3100598
#3	2.421030	11.62329	.1705344	.0036585	.1344908	.1004490	.3135309

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.651165	2.328081	.3889443	.0178504	2.748171	5.099009	.0645403
Stddev	.036634	.005861	.0014784	.0001067	.016032	.082709	.0007546
%RSD	2.218667	.2517368	.3801053	.5979315	.5833575	1.622056	1.169135

#1	1.621999	2.323605	.3901596	.0179373	2.740616	5.194337	.0652553
#2	1.639214	2.325924	.3872984	.0178825	2.737312	5.056350	.0637516
#3	1.692282	2.334714	.3893749	.0177313	2.766584	5.046338	.0646141

Sample Name: Q1223-03 Acquired: 2/2/2025 13:13:57 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6303 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	2.202746	.0627270	.0738272
Stddev	.033938	.0018345	.0003878
%RSD	1.540719	2.924623	.5252668
#1	2.241672	.0627306	.0742223
#2	2.187207	.0645597	.0734471
#3	2.179360	.0608907	.0738121

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3695.475	74771.00	13033.08	2420.877	4223.966
Stddev	10.878	114.63	140.39	10.083	13.541
%RSD	.2943593	.1533092	1.077220	.4165172	.3205799
#1	3704.470	74811.43	12874.86	2411.267	4236.336
#2	3698.569	74859.93	13081.59	2419.989	4226.063
#3	3683.385	74641.63	13142.78	2431.375	4209.499

Sample Name: Q1223-04 Acquired: 2/2/2025 13:17:55 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6304 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1929726	-.008570	.2577881	.0215400	.0102191	33.63821	.1277518
Stddev	.0015282	.001792	.0004352	.0039272	.0019003	.19432	.0012667
%RSD	.7919022	20.90529	.1688216	18.23215	18.59580	.5776900	.9915143

#1	.1930551	-.007931	.2582745	.0230375	.0080311	33.45588	.1263709
#2	.1914049	-.007185	.2576544	.0170843	.0111685	33.61611	.1280247
#3	.1944578	-.010594	.2574355	.0244981	.0114575	33.84264	.1288597

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0018620	.0030968	9.313530	.9616867	.0591047	.3976705	86.46554
Stddev	.0000722	.0000721	.075340	.0022275	.0001840	.0038151	.53017
%RSD	3.877200	2.328845	.8089356	.2316188	.3112467	.9593700	.6131546

#1	.0018738	.0031685	9.234505	.9629050	.0593015	.3947445	85.93425
#2	.0019276	.0030243	9.321539	.9591158	.0590753	.4019856	86.46779
#3	.0017846	.0030977	9.384546	.9630392	.0589371	.3962815	86.99458

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.005436	10.47801	.1489182	.0022933	-.117817	.0957390	.2541380
Stddev	.015949	.06756	.0004547	.0003029	.486521	.0006009	.0023866
%RSD	.7953122	.6448030	.3053561	13.20622	412.9470	.6276413	.9391007

#1	1.989521	10.44672	.1493020	.0019762	-.382851	.0961804	.2558259
#2	2.005369	10.43176	.1490366	.0023240	.443676	.0950547	.2514075
#3	2.021419	10.55554	.1484159	.0025795	-.414276	.0959819	.2551806

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.237273	2.123728	.3389396	.0140964	2.472949	5.021236	.0678678
Stddev	.049888	.004384	.0028843	.0003985	.009161	.035620	.0005360
%RSD	4.032107	.2064097	.8509807	2.826843	.3704374	.7093841	.7897417

#1	1.183830	2.127487	.3362091	.0143744	2.479175	4.981039	.0684401
#2	1.245374	2.118913	.3386534	.0136398	2.462430	5.048878	.0677859
#3	1.282615	2.124783	.3419564	.0142749	2.477242	5.033792	.0673775

Sample Name: Q1223-04 Acquired: 2/2/2025 13:17:55 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6304 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	2.140457	.0504554	.0605047
Stddev	.007961	.0010604	.0003106
%RSD	.3719147	2.101620	.5133724
#1	2.133060	.0501995	.0602787
#2	2.148881	.0495465	.0603764
#3	2.139428	.0516204	.0608588

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3676.823	72834.66	12288.11	2380.125	4220.117
Stddev	5.566	165.99	67.68	12.903	6.756
%RSD	.1513894	.2278949	.5507705	.5421109	.1600873
#1	3679.153	72951.67	12271.05	2367.635	4218.212
#2	3670.471	72907.62	12230.59	2393.405	4214.517
#3	3680.846	72644.69	12362.69	2379.335	4227.620

Sample Name: Q1223-08 Acquired: 2/2/2025 13:21:55 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6306 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1607158	-.004362	1.659721	.0247516	-.037974	53.66747	.2262236
Stddev	.0047156	.003967	.004184	.0018770	.001749	.31736	.0022127
%RSD	2.934151	90.94608	.2520725	7.583242	4.605494	.5913441	.9781098

#1	.1614144	-.006559	1.660797	.0250789	-.039991	53.33474	.2251352
#2	.1556899	.000218	1.655104	.0264433	-.037050	53.96682	.2287697
#3	.1650432	-.006745	1.663261	.0227325	-.036880	53.70085	.2247659

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0020669	.0020756	6.377031	7.457907	.0299469	5.357684	110.1579
Stddev	.0000208	.0000358	.049351	.012859	.0005062	.031002	.6365
%RSD	1.007300	1.723459	.7738894	.1724225	1.690169	.5786377	.5778099

#1	.0020441	.0021168	6.342706	7.449364	.0295460	5.352732	109.4822
#2	.0020849	.0020525	6.433587	7.472696	.0297789	5.329456	110.7462
#3	.0020716	.0020575	6.354798	7.451660	.0305156	5.390863	110.2454

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.051796	16.01426	.1642973	.0232456	-.217800	.1337081	.2090355
Stddev	.004906	.11690	.0002319	.0003050	.186879	.0025446	.0013896
%RSD	.4664641	.7300019	.1411391	1.312124	85.80276	1.903075	.6647444

#1	1.048548	15.89423	.1645213	.0229525	-.079918	.1333463	.2074750
#2	1.057440	16.12777	.1640582	.0232230	-.430495	.1364142	.2101391
#3	1.049401	16.02077	.1643123	.0235613	-.142988	.1313639	.2094923

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.062726	4.519498	.4524325	.0094038	2.141773	6.373156	9.863783
Stddev	.108364	.009594	.0040868	.0002509	.005841	.009024	.032518
%RSD	2.140425	.2122695	.9033027	2.668105	.2727293	.1415882	.3296698

#1	4.937987	4.515558	.4478741	.0095457	2.146951	6.376000	9.896475
#2	5.133628	4.512502	.4557691	.0091141	2.135441	6.380415	9.831443
#3	5.116564	4.530434	.4536544	.0095516	2.142927	6.363053	9.863431

Sample Name: Q1223-08 Acquired: 2/2/2025 13:21:55 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6306 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	3.368150	.0894685	.0263987
Stddev	.003587	.0008865	.0000978
%RSD	.1065000	.9908285	.3704221
#1	3.368721	.0889542	.0262864
#2	3.371418	.0904922	.0264447
#3	3.364312	.0889593	.0264651

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3650.781	74525.78	13735.56	2409.883	4244.480
Stddev	7.806	240.20	63.07	8.583	10.629
%RSD	.2138274	.3223102	.4591584	.3561561	.2504242
#1	3642.562	74774.11	13691.67	2417.057	4232.276
#2	3658.096	74294.62	13807.83	2412.218	4251.713
#3	3651.685	74508.62	13707.19	2400.375	4249.452

Sample Name: Q1223-09 Acquired: 2/2/2025 13:25:52 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6307 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3509497	-.017644	.6258822	.0418017	.0176193	109.9248
Stddev	.0009662	.002324	.0023812	.0002598	.0011336	1.4238
%RSD	.2753256	13.17117	.3804561	.6214621	6.433863	1.295239

#1	.3505044	-.016518	.6259150	.0420365	.0185205	111.5689
#2	.3502864	-.016098	.6234848	.0415226	.0163465	109.1035
#3	.3520583	-.020317	.6282469	.0418461	.0179907	109.1021

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1809780	.0098723	.0068444	10.88483	.3049824	.2034065
Stddev	.0017378	.0001340	.0001732	.09658	.0040899	.0006364
%RSD	.9602144	1.357178	2.529763	.8872783	1.341022	.3128534

#1	.1829742	.0099776	.0068284	10.99628	.3096777	.2037756
#2	.1801565	.0097215	.0066799	10.82565	.3021955	.2026717
#3	.1798032	.0099178	.0070250	10.83255	.3030740	.2037722

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1021366	130.9209	1.967994	12.20124	.1558033	.0029842
Stddev	.0014680	1.7182	.022684	.16571	.0004339	.0007169
%RSD	1.437238	1.312425	1.152631	1.358176	.2785110	24.02244

#1	.1006586	132.9045	1.994092	12.39177	.1562232	.0031563
#2	.1021569	129.8907	1.956873	12.12133	.1553566	.0035994
#3	.1035943	129.9676	1.953016	12.09063	.1558299	.0021970

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.939727	.2038918	.1797948	2.771965	9.918692	.5032270
Stddev	.203681	.0018527	.0029477	.068255	.034376	.0091170
%RSD	10.50051	.9086680	1.639487	2.462332	.3465750	1.811713

#1	1.741192	.2029453	.1818356	2.836882	9.954451	.5136853
#2	1.929797	.2060265	.1811336	2.700802	9.885891	.4990414
#3	2.148192	.2027035	.1764153	2.778210	9.915735	.4969544

Sample Name: Q1223-09 Acquired: 2/2/2025 13:25:52 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6307 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0157958	F 18.44637	5.180971	.0683250	2.253814	.1173399
Stddev	.0003047	.04973	.006595	.0006504	.005342	.0014706
%RSD	1.928963	.2696093	.1272934	.9519576	.2370112	1.253248

#1	.0158772	18.48974	5.174372	.0689932	2.252014	.1189079
#2	.0154587	18.39209	5.180979	.0676939	2.249604	.1159915
#3	.0160516	18.45728	5.187562	.0682881	2.259823	.1171202

Elem	Sr4077
Units	ppm
Avg	.0841791
Stddev	.0009879
%RSD	1.173517

#1	.0853189
#2	.0836466
#3	.0835717

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	4505.048	90080.36	14985.91	2910.666	4101.070
Stddev	2.638	973.78	59.64	39.901	2.982
%RSD	.0585485	1.081009	.3979905	1.370843	.0727180

#1	4508.059	88963.19	15029.77	2864.776	4097.967
#2	4503.941	90749.40	15009.97	2937.160	4103.915
#3	4503.145	90528.48	14918.00	2930.063	4101.327

Sample Name: Q1223-10 Acquired: 2/2/2025 13:29:48 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6308 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5080831	.0077605	2.909058	.0202002	-.491144	17.99816
Stddev	.0019867	.0009057	.002995	.0016139	.002253	.14894
%RSD	.3910105	11.67071	.1029591	7.989553	.4587949	.8275469

#1	.5057896	.0072147	2.912414	.0213229	-.490974	18.05838
#2	.5092744	.0088059	2.908104	.0183507	-.488980	17.82853
#3	.5091852	.0072607	2.906656	.0209270	-.493478	18.10756

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1690440	-.000093	.0019989	5.809733	F 46.00585	.0150404
Stddev	.0015134	.000032	.0000517	.060713	.16360	.0002851
%RSD	.8952756	34.11197	2.586217	1.045018	.3556104	1.895584

#1	.1697955	-.000107	.0020070	5.817496	46.10591	.0147252
#2	.1673019	-.000116	.0020461	5.745512	45.81705	.0151159
#3	.1700345	-.000057	.0019436	5.866191	46.09458	.0152802

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.717806	99.62737	.4286299	4.879565	.0606376	.0754498
Stddev	.004006	.77719	.0053485	.051914	.0006165	.0007624
%RSD	.2331863	.7801012	1.247810	1.063905	1.016739	1.010446

#1	1.720098	100.0076	.4311315	4.928668	.0611773	.0758461
#2	1.720139	98.7333	.4224890	4.825236	.0599657	.0745709
#3	1.713180	100.1412	.4322691	4.884792	.0607697	.0759324

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0770323	.1872981	-.040669	2.763263	8.093262	.3911595
Stddev	.4397879	.0006056	.002297	.022807	.011325	.0039011
%RSD	570.9135	.3233257	5.648200	.8253654	.1399368	.9973295

#1	-.417230	.1866100	-.039089	2.780830	8.105268	.3923175
#2	.425120	.1875342	-.043305	2.737488	8.082770	.3868104
#3	.223207	.1877501	-.039615	2.771473	8.091749	.3943504

Sample Name: Q1223-10 Acquired: 2/2/2025 13:29:48 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6308 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0464547	6.192775	4.895689	F 65.40243	2.663689	.0175381
Stddev	.0001012	.014346	.024485	.09031	.012950	.0013536
%RSD	.2178028	.2316505	.5001317	.1380861	.4861541	7.717785

#1	.0465714	6.191130	4.916495	65.47751	2.677145	.0160611
#2	.0464001	6.179322	4.868708	65.42758	2.651314	.0178338
#3	.0463925	6.207872	4.901864	65.30221	2.662608	.0187193

Elem	Sr4077
Units	ppm
Avg	.0369641
Stddev	.0002584
%RSD	.6991387

#1	.0369426
#2	.0367171
#3	.0372326

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3018.502	72125.36	12215.05	2306.942	4214.874
Stddev	.717	352.19	106.62	7.272	5.064
%RSD	.0237586	.4883030	.8728544	.3152096	.1201495

#1	3019.129	71726.43	12138.19	2299.340	4210.967
#2	3018.657	72393.21	12170.20	2313.831	4213.060
#3	3017.720	72256.45	12336.77	2307.653	4220.596

Sample Name: Q1223-11 Acquired: 2/2/2025 13:33:51 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6309 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0934782	-.009001	.1719255	.0264652	.0120565	36.52707	.2287916
Stddev	.0013881	.000986	.0039441	.0021453	.0015470	.09660	.0004393
%RSD	1.484922	10.95354	2.294066	8.106200	12.83146	.2644603	.1920174

#1	.0919119	-.009966	.1713663	.0240832	.0122039	36.63831	.2282845
#2	.0939666	-.009042	.1682908	.0282451	.0104411	36.46439	.2290332
#3	.0945560	-.007996	.1761193	.0270672	.0135246	36.47850	.2290570

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0018612	.0038460	12.15055	.2370191	.0495649	.2161514	103.7182
Stddev	.0001038	.0000549	.02706	.0009163	.0003779	.0031299	.1551
%RSD	5.578598	1.428039	.2227355	.3866027	.7624746	1.448019	.1495838

#1	.0018620	.0038850	12.16225	.2363194	.0495747	.2174624	103.8588
#2	.0017570	.0037832	12.16980	.2366815	.0491821	.2184126	103.5518
#3	.0019646	.0038698	12.11961	.2380563	.0499378	.2125791	103.7441

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.047139	15.79114	.1535771	.0058371	1.980507	.1019004	.6181084
Stddev	.001497	.02808	.0005609	.0001289	.126189	.0012741	.0072459
%RSD	.1429843	.1778389	.3652358	2.208575	6.371526	1.250305	1.172270

#1	1.046780	15.76323	.1540059	.0057659	2.114980	.1030654	.6106702
#2	1.045854	15.79078	.1529423	.0059859	1.864677	.1020958	.6251452
#3	1.048783	15.81939	.1537832	.0057595	1.961866	.1005399	.6185098

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	3.372685	3.125618	.4038725	.0056058	2.493411	5.910042	.0446222
Stddev	.033455	.011824	.0003535	.0002260	.012641	.016616	.0004839
%RSD	.9919260	.3782772	.0875199	4.032297	.5069591	.2811477	1.084511

#1	3.409213	3.120012	.4035709	.0054241	2.484422	5.927202	.0446181
#2	3.343536	3.117640	.4037851	.0058589	2.487948	5.894030	.0441404
#3	3.365307	3.139202	.4042614	.0055343	2.507865	5.908894	.0451082

Sample Name: Q1223-11 Acquired: 2/2/2025 13:33:51 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6309 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	2.102175	.0782712	.0699303
Stddev	.001917	.0007495	.0002481
%RSD	.0911982	.9575644	.3548155
#1	2.103857	.0790889	.0702137
#2	2.102581	.0781079	.0697519
#3	2.100087	.0776169	.0698253

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3619.445	71871.28	12989.10	2349.020	4097.867
Stddev	11.903	145.92	33.99	11.697	13.233
%RSD	.3288557	.2030260	.2616940	.4979507	.3229127
#1	3617.993	72036.02	13027.97	2361.462	4099.686
#2	3632.008	71758.31	12964.95	2338.248	4110.095
#3	3608.336	71819.50	12974.37	2347.349	4083.819

Sample Name: CCV034 Acquired: 2/2/2025 13:37:51 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV034 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.921747	4.981659	24.33898	4.997848	5.041212	404.4308
Stddev	.032449	.029431	.15288	.018786	.029043	2.0708
%RSD	.6593053	.5907936	.6281169	.3758798	.5761038	.5120252

#1	4.884608	5.006665	24.16949	4.977617	5.010458	402.8549
#2	4.936021	4.949226	24.38097	5.001186	5.045008	403.6613
#3	4.944613	4.989087	24.46647	5.014741	5.068170	406.7762

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.657770	.5099421	2.463532	394.3942	15.75206	2.474011
Stddev	.167168	.0081661	.012530	3.0185	.02761	.016759
%RSD	1.730913	1.601382	.5086236	.7653588	.1752631	.6774007

#1	9.466155	.5008575	2.449610	396.2940	15.76466	2.454951
#2	9.773766	.5166725	2.467082	395.9750	15.72040	2.480646
#3	9.733390	.5122964	2.473904	390.9135	15.77111	2.486437

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	15.39304	403.1097	14.47217	391.8630	2.469800	1.305841
Stddev	.31759	1.8506	.06243	1.7420	.015581	.001868
%RSD	2.063223	.4590742	.4313989	.4445414	.6308660	.1430601

#1	15.02845	401.2570	14.40898	390.0064	2.452358	1.305675
#2	15.60956	403.1139	14.47372	392.1209	2.474698	1.304061
#3	15.54112	404.9581	14.53382	393.4616	2.482343	1.307787

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	361.6978	2.410923	15.04749	154.8377	4.912665	F 5.964300
Stddev	7.0751	.044035	.06053	.7946	.023834	.070892
%RSD	1.956092	1.826460	.4022665	.5131957	.4851541	1.188603

#1	353.5284	2.361746	15.11601	154.1272	4.885696	5.884238
#2	365.8374	2.446703	15.00129	154.6901	4.921401	6.019101
#3	365.7276	2.424320	15.02516	155.6957	4.930899	5.989562

Sample Name: CCV034 Acquired: 2/2/2025 13:37:51 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV034 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.918861	5.011543	4.681072	4.920614	4.836183	4.937876
Stddev	.029257	.017246	.088589	.022432	.095879	.027732
%RSD	.5947955	.3441216	1.892485	.4558758	1.982544	.5616126

#1	4.885950	4.991630	4.582372	4.895657	4.726153	4.921569
#2	4.928709	5.021366	4.753697	4.927090	4.901822	4.922163
#3	4.941923	5.021633	4.707147	4.939096	4.880575	4.969896

Elem	Sr4077
Units	ppm
Avg	5.268229
Stddev	.014026
%RSD	.2662323

#1	5.279658
#2	5.272452
#3	5.252577

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2864.656	58230.29	11293.78	1867.942	3175.764
Stddev	15.049	56.32	201.64	8.714	16.609
%RSD	.5253161	.0967167	1.785452	.4664824	.5230012

#1	2881.500	58276.84	11517.64	1858.228	3194.839
#2	2859.933	58246.33	11126.39	1870.527	3167.955
#3	2852.536	58167.69	11237.31	1875.070	3164.499

Sample Name: CCB034 Acquired: 2/2/2025 13:42:09 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB034 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0010395	-.002304	.0002317	-.000099	.0001363	.0164156	.0035599
Stddev	.0010180	.001142	.0006462	.001317	.0012269	.0072862	.0006921
%RSD	97.93572	49.58296	278.8720	1328.275	900.3986	44.38586	19.44153

#1	.0019979	-.003397	.0008291	-.001000	-.001054	.0214633	.0029333
#2	-.000029	-.001118	.0003203	-.000711	.001396	.0197210	.0043028
#3	.001150	-.002396	-.000454	.001413	.000067	.0080626	.0034436

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000516	.0001123	.0096780	.0006641	.0000904	.0008667	.0181655
Stddev	.0000448	.0000120	.0047449	.0002914	.0002082	.0004455	.0079764
%RSD	86.77577	10.68015	49.02725	43.87963	230.3447	51.40278	43.90968

#1	.0000260	.0001018	.0086966	.0004103	-.000107	.0003529	.0164836
#2	.0001034	.0001253	.0055006	.0009823	.000071	.0011020	.0111642
#3	.0000255	.0001097	.0148369	.0005996	.000308	.0011452	.0268488

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0004495	-.007866	.0000972	.0007172	-.395996	-.002566	.0012746
Stddev	.0001506	.010901	.0002129	.0003379	.255349	.000380	.0028767
%RSD	33.49377	138.5826	219.1813	47.11432	64.48285	14.82248	225.6874

#1	.0005945	-.011461	.0001754	.0007062	-.141338	-.002174	.0003293
#2	.0002940	.004378	.0002599	.0010604	-.394619	-.002591	-.001010
#3	.0004599	-.016516	-.000144	.0003849	-.652031	-.002933	.004505

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2910594	.0000174	-.001634	.0002258	.0000211	.0032833	.0002848
Stddev	.0367695	.0015361	.000263	.0000465	.0030240	.0008858	.0007048
%RSD	12.63299	8827.542	16.08605	20.59956	14349.15	26.97824	247.5187

#1	.2878013	-.001272	-.001352	.0002525	-.001099	.0023119	.0001302
#2	.2560274	-.000392	-.001678	.0001721	.003445	.0040463	-.000330
#3	.3293495	.001717	-.001871	.0002529	-.002283	.0034916	.001054

Sample Name: CCB034 Acquired: 2/2/2025 13:42:09 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB034 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0022268	-.003972	.0001973
Stddev	.0002760	.000096	.0000618
%RSD	12.39491	2.425287	31.32753
#1	.0020861	-.004047	.0001592
#2	.0020495	-.003863	.0001640
#3	.0025448	-.004007	.0002686

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3592.512	70844.52	12466.43	2286.533	4350.448
Stddev	3.749	260.32	76.91	5.995	8.598
%RSD	.1043660	.3674479	.6169520	.2621770	.1976379
#1	3588.745	70546.19	12554.93	2283.494	4346.343
#2	3596.244	70961.83	12415.71	2282.666	4360.329
#3	3592.545	71025.54	12428.66	2293.438	4344.671

Sample Name: Q1223-12 Acquired: 2/2/2025 13:46:19 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6320 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0249554	-.005010	.0495504	.0151032	.0076898	69.82286	.1968092
Stddev	.0026937	.001313	.0014339	.0026005	.0013225	.69424	.0016692
%RSD	10.79414	26.21543	2.893755	17.21805	17.19753	.9942912	.8481368

#1	.0255052	-.003856	.0508766	.0166069	.0072673	70.34501	.1983006
#2	.0220292	-.004734	.0497457	.0121004	.0066302	70.08855	.1971208
#3	.0273318	-.006439	.0480288	.0166023	.0091719	69.03501	.1950061

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0029433	.0010279	7.890302	.1876444	.0367235	.0467424	62.88416
Stddev	.0000473	.0000932	.104038	.0016450	.0001034	.0019692	.63538
%RSD	1.606801	9.065037	1.318560	.8766575	.2816239	4.212828	1.010390

#1	.0029283	.0011156	7.966348	.1881068	.0366155	.0455746	63.33187
#2	.0029053	.0009300	7.932820	.1890087	.0367335	.0490159	63.16367
#3	.0029962	.0010382	7.771739	.1858177	.0368216	.0456366	62.15695

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5205809	18.16642	.1138944	.0022866	.8011477	.1076113	.1598842
Stddev	.0066279	.12453	.0004851	.0000530	.3037847	.0008816	.0020519
%RSD	1.273172	.6855089	.4259603	2.316879	37.91869	.8192707	1.283397

#1	.5245278	18.22462	.1135236	.0022610	.6740870	.1066966	.1622512
#2	.5242859	18.25119	.1137161	.0022514	.5815229	.1084556	.1587913
#3	.5129289	18.02344	.1144434	.0023476	1.147833	.1076815	.1586099

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	3.166622	2.141585	.2384352	.0011601	.9989709	8.861436	.0115033
Stddev	.065377	.008021	.0036820	.0000990	.0071148	.062409	.0007654
%RSD	2.064577	.3745525	1.544233	8.537194	.7122145	.7042753	6.653854

#1	3.206939	2.132616	.2415611	.0012744	.9938016	8.801086	.0116046
#2	3.201736	2.144066	.2393679	.0010992	1.007085	8.925718	.0106922
#3	3.091190	2.148073	.2343765	.0011067	.996026	8.857505	.0122129

Sample Name: Q1223-12 Acquired: 2/2/2025 13:46:19 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6320 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	3.423285	.1596575	.0446005
Stddev	.013127	.0031145	.0004873
%RSD	.3834609	1.950735	1.092683
#1	3.408144	.1624927	.0448903
#2	3.430235	.1601560	.0448734
#3	3.431475	.1563238	.0440379

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3621.728	71712.96	12410.09	2383.437	4087.287
Stddev	6.192	592.47	100.66	28.721	12.885
%RSD	.1709747	.8261683	.8111528	1.205015	.3152373
#1	3621.329	71538.63	12525.59	2384.348	4094.293
#2	3628.110	71227.21	12341.05	2354.272	4095.151
#3	3615.745	72373.04	12363.62	2411.692	4072.418

Sample Name: Q1223-13 Acquired: 2/2/2025 13:50:18 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6321 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2791437	.0006983	1.351080	.0220811	.0293090	70.67161
Stddev	.0048644	.0005732	.017110	.0024110	.0039612	.21997
%RSD	1.742609	82.08971	1.266359	10.91895	13.51515	.3112629

#1	.2840360	.0012221	1.369811	.0205885	.0325363	70.42913
#2	.2743077	.0000860	1.336275	.0207921	.0248884	70.72736
#3	.2790875	.0007867	1.347153	.0248626	.0305023	70.85835

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.4551214	.0036267	.0032919	13.20934	28.38670	.0453774
Stddev	.0027923	.0001686	.0001512	.05884	.19999	.0006361
%RSD	.6135239	4.650006	4.591884	.4454292	.7045108	1.401789

#1	.4520452	.0038201	.0034663	13.14471	28.59726	.0459003
#2	.4558233	.0035499	.0031987	13.22350	28.36351	.0446692
#3	.4574958	.0035102	.0032106	13.25981	28.19931	.0455626

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	14.85834	86.29759	1.316318	18.63056	.4115356	.0390777
Stddev	.10959	.26730	.006380	.00819	.0045521	.0004148
%RSD	.7375380	.3097385	.4846617	.0439538	1.106124	1.061386

#1	14.93619	86.02429	1.309010	18.62533	.4166040	.0392253
#2	14.90581	86.31004	1.320774	18.64000	.4077952	.0386094
#3	14.73303	86.55845	1.319171	18.62636	.4102076	.0393985

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.614557	.2039936	.3964094	6.565378	5.333115	.3438736
Stddev	.373583	.0028757	.0037184	.027919	.069972	.0012680
%RSD	23.13843	1.409692	.9380068	.4252421	1.312029	.3687450

#1	1.279231	.2072177	.3947041	6.533783	5.413047	.3428452
#2	2.017234	.2016934	.3938496	6.575628	5.282942	.3434853
#3	1.547206	.2030697	.4006745	6.586724	5.303355	.3452904

Sample Name: Q1223-13 Acquired: 2/2/2025 13:50:18 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6321 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0157638	F 11.90763	F 10.26254	F 12.25142	3.448267	.2189505
Stddev	.0005575	.14428	.04562	.14980	.018758	.0013549
%RSD	3.536286	1.211621	.4445571	1.222742	.5439927	.6187942
#1	.0162549	12.06584	10.25991	12.41566	3.450696	.2178857
#2	.0151579	11.78333	10.30942	12.12229	3.465692	.2184905
#3	.0158787	11.87372	10.21829	12.21632	3.428412	.2204755

Elem	Sr4077
Units	ppm
Avg	.1133499
Stddev	.0004035
%RSD	.3559506
#1	.1129051
#2	.1134523
#3	.1136924

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3386.564	72933.44	12428.71	2378.304	4115.413
Stddev	35.281	149.17	127.78	3.206	43.359
%RSD	1.041800	.2045299	1.028111	.1347909	1.053575
#1	3347.776	72761.52	12313.07	2379.163	4068.107
#2	3416.747	73028.63	12407.18	2374.756	4153.266
#3	3395.167	73010.17	12565.89	2380.993	4124.865

Sample Name: Q1223-14 Acquired: 2/2/2025 13:54:22 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6322 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.753212	-.093312	1.276025	.1922804	.1328287	121.0171
Stddev	.005407	.005383	.006167	.0073326	.0027693	1.6654
%RSD	.3084009	5.769174	.4832869	3.813514	2.084840	1.376210

#1	1.754255	-.098892	1.268930	.2003103	.1305635	122.4951
#2	1.747360	-.088149	1.279041	.1859399	.1359159	119.2126
#3	1.758022	-.092894	1.280103	.1905911	.1320065	121.3436

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.450935	.0128372	.0459000	74.24944	16.50228	.2103315
Stddev	.018843	.0002215	.0007537	.93716	.26578	.0013195
%RSD	1.298670	1.725247	1.642007	1.262175	1.610561	.6273460

#1	1.465283	.0130650	.0450729	75.05882	16.72595	.2090608
#2	1.429596	.0128239	.0465479	73.22270	16.20846	.2102388
#3	1.457925	.0126226	.0460792	74.46681	16.57243	.2116949

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	7.967469	F 863.4941	9.705753	29.29543	.7630990	.0319626
Stddev	.120556	13.8024	.122891	.42868	.0016509	.0004350
%RSD	1.513109	1.598440	1.266165	1.463302	.2163380	1.360961

#1	8.065983	877.6897	9.811690	29.63104	.7611932	.0324452
#2	8.003389	850.1217	9.571021	28.81252	.7640869	.0318418
#3	7.833035	862.6710	9.734548	29.44274	.7640171	.0316007

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.298854	.3715194	2.325703	12.98695	F 18.82624	3.271530
Stddev	.472172	.0040985	.039651	.12636	.04492	.062355
%RSD	5.077740	1.103171	1.704886	.9730075	.2385812	1.905980

#1	9.716904	.3752138	2.361299	13.08969	18.77640	3.329287
#2	8.786726	.3722337	2.282968	12.84585	18.83875	3.205420
#3	9.392931	.3671107	2.332842	13.02531	18.86358	3.279884

Sample Name: Q1223-14 Acquired: 2/2/2025 13:54:22 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6322 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0308717	F 42.92173	F 19.26516	2.926761	4.593640	.2666998
Stddev	.0005512	.08691	.24162	.009538	.072316	.0039868
%RSD	1.785493	.2024932	1.254160	.3258990	1.574272	1.494867
#1	.0306654	42.82137	19.42574	2.916252	4.647183	.2699599
#2	.0304534	42.97169	19.38244	2.934870	4.622363	.2622549
#3	.0314963	42.97213	18.98728	2.929161	4.511375	.2678846

Elem	Sr4077
Units	ppm
Avg	.5275231
Stddev	.0078407
%RSD	1.486318
#1	.5349269
#2	.5193086
#3	.5283338

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3522.264	74125.00	13371.70	2349.824	3778.682
Stddev	8.377	924.35	183.47	38.879	7.590
%RSD	.2378380	1.247019	1.372098	1.654568	.2008659
#1	3522.128	73343.32	13249.39	2310.071	3785.231
#2	3513.956	75145.25	13283.04	2387.766	3770.364
#3	3530.709	73886.42	13582.66	2351.635	3780.452

Sample Name: Q1223-15 Acquired: 2/2/2025 13:58:19 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6323 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2239451	-.000590	7.264617	.0185514	-.057008	53.22239
Stddev	.0022007	.001640	.054241	.0023159	.002008	.69175
%RSD	.9826835	277.9484	.7466514	12.48379	3.522256	1.299729

#1	.2257675	-.002181	7.284977	.0197424	-.059276	53.99155
#2	.2215002	.001095	7.203141	.0200294	-.055457	53.02436
#3	.2245675	-.000683	7.305732	.0158823	-.056291	52.65125

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3596653	.0033151	.0073312	11.99477	17.38216	.0462098
Stddev	.0057996	.0000875	.0000765	.17988	.12378	.0005325
%RSD	1.612493	2.638578	1.043477	1.499627	.7121246	1.152384

#1	.3663618	.0033760	.0072586	12.20067	17.51376	.0463913
#2	.3562662	.0033545	.0073241	11.91545	17.36466	.0456103
#3	.3563679	.0032149	.0074111	11.86818	17.26806	.0466279

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 72.91043	75.78990	.6704123	11.95497	2.610205	.1041070
Stddev	.21264	.92132	.0103904	.10850	.021593	.0005252
%RSD	.2916492	1.215622	1.549847	.9076111	.8272474	.5044538

#1	73.10217	76.80526	.6823707	12.07102	2.618251	.1047054
#2	72.94739	75.55721	.6652745	11.93785	2.585744	.1037230
#3	72.68173	75.00724	.6635918	11.85605	2.626619	.1038924

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.676541	.1261604	9.027226	3.492253	5.583975	.3205676
Stddev	.243835	.0004029	.089301	.019181	.058955	.0042552
%RSD	14.54394	.3193388	.9892436	.5492307	1.055791	1.327382

#1	1.401642	.1257375	9.128060	3.513470	5.595912	.3252321
#2	1.866703	.1262040	8.995492	3.487147	5.519965	.3195729
#3	1.761278	.1265397	8.958126	3.476142	5.636049	.3168980

Sample Name: Q1223-15 Acquired: 2/2/2025 13:58:19 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6323 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0158339	F 50.22781	7.648569	F 16.36857	2.521682	.1479670
Stddev	.0002307	.48717	.052636	.15496	.014207	.0032232
%RSD	1.457165	.9699139	.6881787	.9467214	.5633875	2.178348

#1	.0158147	50.37503	7.698918	16.41059	2.537816	.1516877
#2	.0160737	49.68401	7.652878	16.19693	2.516186	.1461872
#3	.0156134	50.62439	7.593911	16.49819	2.511045	.1460260

Elem	Sr4077
Units	ppm
Avg	.1030754
Stddev	.0010849
%RSD	1.052545

#1	.1042895
#2	.1027356
#3	.1022010

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3457.330	74142.52	13590.51	2360.536	4120.110
Stddev	21.025	677.69	38.48	11.750	29.053
%RSD	.6081391	.9140386	.2831229	.4977514	.7051410

#1	3448.513	73434.48	13608.90	2351.249	4113.609
#2	3481.329	74207.96	13546.28	2356.614	4151.863
#3	3442.150	74785.12	13616.33	2373.744	4094.859

Sample Name: Q1223-16 Acquired: 2/2/2025 14:02:18 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6324 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3408121	-.011471	.4597397	.0455063	.0159366	91.40988
Stddev	.0016668	.004456	.0019766	.0015308	.0013208	.59121
%RSD	.4890563	38.84360	.4299501	3.363888	8.287777	.6467630

#1	.3427280	-.016599	.4605199	.0471632	.0145012	91.61793
#2	.3400126	-.009265	.4574920	.0452110	.0171006	91.86893
#3	.3396957	-.008548	.4612072	.0441446	.0162079	90.74277

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9634252	.0073537	.0087356	122.9709	.2388997	.0604717
Stddev	.0067497	.0001858	.0000523	.7988	.0021194	.0001638
%RSD	.7005892	2.526471	.5982752	.6496158	.8871446	.2708504

#1	.9658569	.0074924	.0087958	123.2151	.2402176	.0606397
#2	.9686220	.0071426	.0087010	123.6191	.2400265	.0603125
#3	.9557966	.0074261	.0087102	122.0785	.2364549	.0604629

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1318646	116.7820	1.022861	25.60172	.3246920	.0039180
Stddev	.0025730	.8812	.007158	.12070	.0015382	.0003213
%RSD	1.951224	.7545896	.6998367	.4714333	.4737346	8.201122

#1	.1291500	117.0091	1.024962	25.62452	.3264546	.0035752
#2	.1321763	117.5274	1.028733	25.70938	.3236216	.0039663
#3	.1342675	115.8094	1.014887	25.47124	.3239997	.0042124

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	7.411438	.2670909	.4051687	5.771401	7.618010	.5277440
Stddev	.196600	.0012696	.0064737	.043524	.032114	.0059714
%RSD	2.652653	.4753467	1.597782	.7541366	.4215584	1.131504

#1	7.369656	.2662595	.4093431	5.789454	7.648802	.5301939
#2	7.239087	.2685523	.4084518	5.802994	7.584719	.5321008
#3	7.625570	.2664610	.3977113	5.721755	7.620507	.5209372

Sample Name: Q1223-16 Acquired: 2/2/2025 14:02:18 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6324 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0225140	F 40.31654	6.546166	.0193333	3.389586	.3570025
Stddev	.0003990	.15564	.047613	.0007236	.018211	.0018309
%RSD	1.772166	.3860428	.7273440	3.742514	.5372686	.5128426
#1	.0223225	40.47860	6.491189	.0199675	3.369333	.3582488
#2	.0222468	40.16824	6.574111	.0185452	3.394810	.3578583
#3	.0229726	40.30277	6.573197	.0194873	3.404613	.3549005

Elem	Sr4077
Units	ppm
Avg	.9335838
Stddev	.0055180
%RSD	.5910587
#1	.9354654
#2	.9379150
#3	.9273711

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3897.436	77959.44	13828.44	2485.698	3861.412
Stddev	7.159	449.34	84.40	18.013	11.905
%RSD	.1836753	.5763759	.6103019	.7246729	.3083186
#1	3890.141	77868.24	13922.54	2482.709	3849.523
#2	3904.450	77562.70	13803.34	2469.367	3873.334
#3	3897.716	78447.38	13759.45	2505.019	3861.377

Sample Name: Q1246-01 Acquired: 2/2/2025 14:06:14 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6313 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.953971	2.309383	1.842259	1.071940	1.214998	52.67088
Stddev	.014620	.024290	.003609	.005310	.003839	.28377
%RSD	.7482036	1.051806	.1958805	.4953753	.3159835	.5387572

#1	1.954821	2.281695	1.840720	1.071876	1.211982	52.51792
#2	1.938945	2.319346	1.839675	1.066663	1.213692	52.49641
#3	1.968147	2.327107	1.846382	1.077282	1.219320	52.99831

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	3.786145	F 1.818478	1.338038	58.11561	2.978325	2.146446
Stddev	.019222	.008571	.004279	.34122	.034056	.002563
%RSD	.5076881	.4713549	.3197892	.5871411	1.143453	.1194033

#1	3.769566	1.813173	1.334907	57.82140	2.965332	2.145051
#2	3.781655	1.813893	1.336294	58.03574	2.952678	2.144884
#3	3.807215	1.828366	1.342914	58.48967	3.016964	2.149404

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.500339	75.79142	4.380981	16.89819	1.408071	.5381419
Stddev	.007356	.37739	.024764	.12316	.002868	.0054494
%RSD	.4902768	.4979329	.5652627	.7288362	.2036582	1.012642

#1	1.502017	75.51277	4.356749	16.89534	1.406888	.5375857
#2	1.506710	75.64060	4.379950	16.77648	1.405983	.5329919
#3	1.492289	76.22090	4.406245	17.02275	1.411341	.5438481

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.248050	1.353655	4.071146	12.81745	2.748775	2.773711
Stddev	.277829	.002344	.028991	.04934	.004607	.017392
%RSD	6.540152	.1731571	.7121032	.3849334	.1676162	.6270123

#1	4.514536	1.352441	4.038294	12.77789	2.744387	2.766834
#2	3.960121	1.356357	4.082002	12.80173	2.748362	2.760809
#3	4.269493	1.352166	4.093141	12.87274	2.753574	2.793489

Sample Name: Q1246-01 Acquired: 2/2/2025 14:06:14 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6313 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5864562	.6692642	9.371130	1.244103	2.726062	1.193268
Stddev	.0001928	.0028087	.043556	.004997	.018205	.004084
%RSD	.0328815	.4196720	.4647932	.4016282	.6678240	.3422688

#1	.5863065	.6668430	9.321025	1.239961	2.710094	1.191467
#2	.5863882	.6686061	9.399958	1.242695	2.745887	1.190393
#3	.5866738	.6723435	9.392409	1.249653	2.722204	1.197943

Elem	Sr4077
Units	ppm
Avg	2.508493
Stddev	.042466
%RSD	1.692902

#1	2.489631
#2	2.478725
#3	2.557123

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3733.368	75102.67	13346.92	2417.756	3950.815
Stddev	4.698	524.03	43.87	21.457	6.407
%RSD	.1258385	.6977450	.3286763	.8874754	.1621637

#1	3736.056	75411.65	13397.13	2437.304	3958.201
#2	3736.104	75398.74	13316.03	2421.165	3946.757
#3	3727.943	74497.63	13327.59	2394.798	3947.487

Sample Name: Q1246-02 Acquired: 2/2/2025 14:10:10 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6314 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.641479	1.374298	3.006002	1.863683	1.244577	53.91202
Stddev	.005715	.018371	.007591	.002383	.003321	.04465
%RSD	.3481489	1.336761	.2525159	.1278887	.2668248	.0828152

#1	1.636462	1.357096	3.011474	1.864075	1.240760	53.87387
#2	1.647700	1.372148	2.997337	1.861127	1.246174	53.90105
#3	1.640274	1.393649	3.009197	1.865846	1.246798	53.96112

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	3.427895	F 1.578339	1.648186	54.90350	2.030945	2.051761
Stddev	.006763	.004816	.002208	.06676	.003317	.001187
%RSD	.1972936	.3051296	.1339952	.1215886	.1633191	.0578643

#1	3.434018	1.577497	1.646841	54.97882	2.034426	2.050399
#2	3.420636	1.583520	1.646982	54.85164	2.030586	2.052581
#3	3.429031	1.573999	1.650735	54.88004	2.027822	2.052303

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	3.155799	80.72951	4.740936	17.67114	2.352567	1.022519
Stddev	.003698	.05731	.009923	.06969	.001152	.000992
%RSD	.1171904	.0709918	.2092995	.3943829	.0489567	.0970441

#1	3.158038	80.73998	4.750419	17.68470	2.351238	1.023624
#2	3.157828	80.66769	4.730625	17.59567	2.353206	1.022228
#3	3.151530	80.78086	4.741764	17.73306	2.353259	1.021705

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.745542	2.057071	2.235190	12.82073	2.994876	2.251855
Stddev	.094509	.004057	.010793	.04312	.007135	.002770
%RSD	1.991532	.1972172	.4828779	.3363133	.2382536	.1230302

#1	4.853639	2.052784	2.224526	12.79031	2.986637	2.252794
#2	4.704461	2.060850	2.246108	12.80180	2.998942	2.254033
#3	4.678525	2.057578	2.234937	12.87007	2.999049	2.248737

Sample Name: Q1246-02 Acquired: 2/2/2025 14:10:10 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6314 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.483069	.6193991	7.562482	1.609954	3.791712	1.083585
Stddev	.004149	.0065257	.016113	.002351	.007432	.000930
%RSD	.2797478	1.053545	.2130683	.1460232	.1959992	.0858624

#1	1.478303	.6150681	7.574594	1.612347	3.794071	1.084544
#2	1.485870	.6162246	7.544195	1.609866	3.797678	1.082686
#3	1.485035	.6269046	7.568658	1.607648	3.783387	1.083526

Elem	Sr4077
Units	ppm
Avg	1.085726
Stddev	.012440
%RSD	1.145817

#1	1.093546
#2	1.092252
#3	1.071381

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3813.936	74107.48	12313.69	2423.282	4020.935
Stddev	7.342	97.81	40.42	13.214	3.999
%RSD	.1925108	.1319851	.3282586	.5453105	.0994513

#1	3822.156	74046.33	12313.51	2435.047	4025.452
#2	3808.029	74055.81	12273.37	2408.985	4017.849
#3	3811.624	74220.29	12354.21	2425.814	4019.502

Sample Name: Q1246-03 Acquired: 2/2/2025 14:21:38 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6325 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0484263	-.004061	.9420884	.0259047	.0112207	85.18294
Stddev	.0024385	.004689	.0013869	.0028696	.0017257	.46391
%RSD	5.035584	115.4760	.1472137	11.07745	15.37968	.5445990

#1	.0479069	.001277	.9404883	.0226209	.0127140	84.80280
#2	.0510827	-.007516	.9428319	.0271638	.0116166	85.69986
#3	.0462893	-.005944	.9429450	.0279296	.0093314	85.04617

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5325400	.0122818	.0044428	67.04002	.1939265	.0219170
Stddev	.0037620	.0001134	.0000398	.31987	.0007236	.0001656
%RSD	.7064358	.9234285	.8967817	.4771310	.3731334	.7557254

#1	.5294697	.0123628	.0044884	66.77052	.1931567	.0220188
#2	.5367365	.0121522	.0044255	67.39350	.1940300	.0220063
#3	.5314138	.0123305	.0044145	66.95604	.1945927	.0217259

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2168380	56.31286	.6821914	8.391609	.0975876	.0032447
Stddev	.0015146	.25432	.0042122	.058883	.0000593	.0001943
%RSD	.6985134	.4516138	.6174538	.7016844	.0607680	5.988295

#1	.2183430	56.04915	.6779220	8.364075	.0975296	.0034205
#2	.2168570	56.55661	.6863440	8.459214	.0976481	.0030361
#3	.2153139	56.33282	.6823083	8.351537	.0975852	.0032776

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.328255	.1352558	.3365408	3.881634	F 12.78516	.2395399
Stddev	.380728	.0005415	.0018625	.047323	.02292	.0009695
%RSD	28.66376	.4003487	.5534386	1.219164	.1793068	.4047261

#1	1.767481	.1352969	.3382918	3.827313	12.77090	.2387017
#2	1.092395	.1357756	.3367467	3.903656	12.77298	.2406016
#3	1.124889	.1346949	.3345839	3.913933	12.81161	.2393163

Sample Name: Q1246-03 Acquired: 2/2/2025 14:21:38 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6325 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0098064	F 19.78984	6.795438	.0224592	1.612978	.0665650
Stddev	.0000617	.06452	.044594	.0004033	.008045	.0001611
%RSD	.6293101	.3260258	.6562391	1.795860	.4987890	.2420429

#1	.0098757	19.75099	6.830172	.0223443	1.618399	.0663807
#2	.0097859	19.75422	6.810991	.0221258	1.616800	.0666357
#3	.0097575	19.86432	6.745149	.0229075	1.603734	.0666787

Elem	Sr4077
Units	ppm
Avg	.6220117
Stddev	.0044874
%RSD	.7214313

#1	.6178139
#2	.6267412
#3	.6214799

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3871.851	78044.70	13793.28	2516.240	4019.074
Stddev	2.855	231.15	60.21	12.854	3.767
%RSD	.0737495	.2961820	.4364933	.5108388	.0937271

#1	3870.836	78311.61	13723.91	2527.540	4015.864
#2	3875.076	77911.08	13831.95	2502.256	4023.221
#3	3869.643	77911.40	13823.98	2518.924	4018.137

Sample Name: Q1246-04 Acquired: 2/2/2025 14:25:37 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6326 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0097733	-.001854	.0851397	.0149902	.0014453	39.41588	.2432093
Stddev	.0011613	.000557	.0012503	.0026048	.0011659	.13159	.0011393
%RSD	11.88256	30.04428	1.468562	17.37684	80.66675	.3338602	.4684318

#1	.0091884	-.002293	.0842382	.0176771	.0010088	39.53343	.2427699
#2	.0111108	-.001227	.0865671	.0124760	.0005607	39.27372	.2423552
#3	.0090207	-.002040	.0846138	.0148176	.0027665	39.44048	.2445028

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0047696	.0017203	12.38049	.0968871	.0128698	.0214976	18.88803
Stddev	.0000359	.0000668	.02334	.0015171	.0001872	.0014887	.09004
%RSD	.7535860	3.885745	.1884967	1.565831	1.454240	6.924996	.4767205

#1	.0047613	.0016701	12.40727	.0985492	.0130001	.0231954	18.97384
#2	.0048090	.0016947	12.36451	.0955768	.0126553	.0204153	18.79428
#3	.0047385	.0017962	12.36968	.0965354	.0129540	.0208822	18.89598

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.7510869	4.069868	.0455489	.0020956	.2508933	.0351436	.0817547
Stddev	.0015623	.022774	.0003982	.0002046	.2884223	.0012029	.0015012
%RSD	.2080119	.5595879	.8742073	9.763645	114.9582	3.422761	1.836186

#1	.7528188	4.084218	.0451667	.0023309	-.037342	.0364862	.0833445
#2	.7506583	4.081777	.0455186	.0019596	.539502	.0341640	.0803615
#3	.7497836	4.043608	.0459613	.0019963	.250519	.0347807	.0815582

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.413907	3.652194	.0740259	.0019964	4.073683	7.222191	.0045123
Stddev	.044778	.005747	.0001308	.0003915	.010391	.052760	.0010758
%RSD	1.855009	.1573473	.1766439	19.60810	.2550845	.7305321	23.84222

#1	2.446025	3.653566	.0739255	.0022012	4.070696	7.281238	.0036030
#2	2.362757	3.645886	.0739786	.0015451	4.065113	7.179678	.0042341
#3	2.432940	3.657131	.0741738	.0022431	4.085241	7.205655	.0057000

Sample Name: Q1246-04 Acquired: 2/2/2025 14:25:37 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6326 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.9252465	.0367964	.0886428
Stddev	.0027548	.0013063	.0004259
%RSD	.2977407	3.550186	.4804975
#1	.9281553	.0383010	.0887786
#2	.9249073	.0361373	.0881655
#3	.9226770	.0359509	.0889843

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3830.030	74735.13	13745.54	2442.388	4373.399
Stddev	8.369	262.79	63.52	7.328	6.929
%RSD	.2185001	.3516276	.4621318	.3000493	.1584387
#1	3829.241	74439.11	13693.74	2434.150	4379.614
#2	3838.764	74940.90	13726.46	2448.182	4374.655
#3	3822.083	74825.39	13816.41	2444.832	4365.927

Sample Name: Q1246-05 Acquired: 2/2/2025 14:29:39 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6331 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1655440	-.013341	.3492179	.0543676	.0202854	91.98951
Stddev	.0012321	.002790	.0015228	.0025017	.0015397	.55293
%RSD	.7442545	20.91338	.4360558	4.601489	7.589953	.6010764

#1	.1648445	-.010681	.3506284	.0527029	.0217922	91.49507
#2	.1669666	-.016245	.3494218	.0572445	.0203493	92.58655
#3	.1648208	-.013097	.3476034	.0531555	.0187149	91.88690

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.4585569	.0053699	.0089515	126.6596	.2092574	.0764592
Stddev	.0015732	.0000415	.0000674	.7204	.0020216	.0006359
%RSD	.3430804	.7731068	.7524775	.5687481	.9660719	.8316626

#1	.4576751	.0053850	.0090279	126.0279	.2080789	.0771721
#2	.4603733	.0054018	.0089006	127.4441	.2115917	.0759504
#3	.4576224	.0053230	.0089262	126.5068	.2081017	.0762552

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1036411	149.5554	2.228977	30.11662	.2425099	.0082047
Stddev	.0017963	.8962	.012603	.20291	.0002189	.0004480
%RSD	1.733210	.5992534	.5654034	.6737425	.0902469	5.459785

#1	.1018496	148.6462	2.219112	29.88924	.2423745	.0077405
#2	.1036316	150.4380	2.243175	30.27925	.2423927	.0082392
#3	.1054422	149.5820	2.224646	30.18137	.2427624	.0086345

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.7738864	.1960798	.6959233	6.466659	7.643282	.6295476
Stddev	.2984106	.0013640	.0031824	.072734	.021893	.0042204
%RSD	38.55999	.6956482	.4572855	1.124747	.2864324	.6703909

#1	1.109245	.1950051	.6983239	6.474397	7.631936	.6256854
#2	.674760	.1976143	.6971323	6.535214	7.629391	.6340525
#3	.537654	.1956200	.6923136	6.390366	7.668519	.6289050

Sample Name: Q1246-05 Acquired: 2/2/2025 14:29:39 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6331 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0030616	F 28.98404	5.732268	.0168753	3.458683	.1971014
Stddev	.0002336	.04051	.030606	.0008905	.016763	.0018345
%RSD	7.628999	.1397577	.5339272	5.276693	.4846705	.9307583

#1	.0028184	29.02948	5.697135	.0178889	3.449068	.1982633
#2	.0032842	28.95172	5.746516	.0165178	3.448941	.1980544
#3	.0030822	28.97093	5.753153	.0162191	3.478039	.1949865

Elem	Sr4077
Units	ppm
Avg	.5531174
Stddev	.0036345
%RSD	.6570992

#1	.5497790
#2	.5569891
#3	.5525839

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3758.179	75478.78	14591.66	2428.840	3887.148
Stddev	13.366	632.44	65.50	9.837	9.888
%RSD	.3556637	.8379093	.4489033	.4049959	.2543675

#1	3742.776	75870.34	14666.98	2430.237	3876.228
#2	3765.026	74749.15	14559.89	2418.380	3889.723
#3	3766.735	75816.85	14548.09	2437.904	3895.494

Sample Name: Q1246-06 Acquired: 2/2/2025 14:33:36 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6332 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3564367	-.011921	.1589450	.0379693	.0184192	83.15598	.2303750
Stddev	.0016466	.000964	.0005947	.0032748	.0013962	.56969	.0024051
%RSD	.4619512	8.088134	.3741391	8.624775	7.579947	.6850819	1.044000

#1	.3561971	-.011424	.1583385	.0341958	.0191241	83.65807	.2326810
#2	.3581899	-.013032	.1595271	.0400674	.0193224	83.27300	.2305623
#3	.3549231	-.011306	.1589692	.0396446	.0168111	82.53687	.2278817

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0037040	.0049857	21.75375	.2664511	.0721505	.0424447	153.3860
Stddev	.0000279	.0000304	.10461	.0021130	.0004054	.0016697	.8205
%RSD	.7526498	.6094372	.4808596	.7930299	.5619211	3.933724	.5349032

#1	.0036813	.0050190	21.84903	.2666850	.0716824	.0421412	154.0169
#2	.0037351	.0049594	21.77042	.2684374	.0723846	.0442453	153.6828
#3	.0036956	.0049788	21.64182	.2642308	.0723846	.0409477	152.4585

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.635389	27.20670	.2264751	.0051257	.5140625	.1957368	.2873567
Stddev	.011470	.17401	.0010536	.0004746	.0917845	.0017236	.0049144
%RSD	.7013353	.6395869	.4652042	9.259915	17.85473	.8805838	1.710196

#1	1.646288	27.28510	.2256743	.0055497	.4411559	.1972174	.2930134
#2	1.636454	27.32771	.2276686	.0046130	.4838985	.1938447	.2849186
#3	1.623424	27.00728	.2260823	.0052144	.6171331	.1961484	.2841380

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.027816	3.791898	.5937383	.0082480	4.777873	6.482182	.0160070
Stddev	.029560	.014375	.0043288	.0002210	.011948	.037585	.0005428
%RSD	1.457718	.3790933	.7290763	2.679378	.2500756	.5798224	3.391127

#1	2.060173	3.776116	.5976577	.0079962	4.766906	6.524824	.0153812
#2	2.021045	3.804243	.5944652	.0084098	4.790606	6.453867	.0162893
#3	2.002229	3.795335	.5890921	.0083381	4.776107	6.467855	.0163505

Sample Name: Q1246-06 Acquired: 2/2/2025 14:33:36 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6332 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	4.368893	.2478966	.1326563
Stddev	.037940	.0034991	.0009736
%RSD	.8684080	1.411529	.7339242
#1	4.412238	.2511141	.1335058
#2	4.352727	.2484043	.1328693
#3	4.341714	.2441713	.1315939

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3739.184	75612.47	13387.51	2476.787	4026.718
Stddev	15.823	467.89	57.01	6.029	15.503
%RSD	.4231684	.6188044	.4258250	.2434240	.3850149
#1	3757.374	75553.62	13341.72	2472.925	4043.457
#2	3731.568	75176.79	13369.46	2473.701	4012.852
#3	3728.609	76107.01	13451.36	2483.734	4023.845

Sample Name: Q1246-07 Acquired: 2/2/2025 14:37:33 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6333 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5307844	-.035676	.7099690	.0920573	.0411305	193.4167
Stddev	.0059140	.002739	.0060833	.0035079	.0006298	1.9164
%RSD	1.114206	7.677505	.8568448	3.810566	1.531244	.9908319

#1	.5339413	-.036913	.7042019	.0920154	.0405889	191.5519
#2	.5239618	-.037578	.7093795	.0885705	.0418216	193.3171
#3	.5344501	-.032537	.7163257	.0955859	.0409811	195.3809

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.7115788	.0085568	.0182931	85.17562	.5184943	.1957280
Stddev	.0037616	.0000961	.0000556	.38231	.0007422	.0005168
%RSD	.5286336	1.122725	.3041218	.4488512	.1431468	.2640249

#1	.7102270	.0084504	.0182664	84.92352	.5177282	.1953545
#2	.7158295	.0085827	.0182559	85.61551	.5185448	.1955117
#3	.7086799	.0086372	.0183571	84.98783	.5192100	.1963178

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1187332	314.7641	5.951382	52.68401	.5708308	.0112307
Stddev	.0005347	1.3519	.026755	.17512	.0026668	.0003592
%RSD	.4503262	.4295093	.4495585	.3324002	.4671790	3.198113

#1	.1192478	313.7170	5.936270	52.53920	.5692003	.0108369
#2	.1181805	316.2904	5.982273	52.87864	.5693838	.0113150
#3	.1187713	314.2850	5.935601	52.63419	.5739083	.0115403

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.931573	.3680524	.8501469	4.835672	F 17.95319	1.254689
Stddev	.178631	.0014848	.0082878	.002335	.09871	.007526
%RSD	9.247957	.4034097	.9748719	.0482872	.5498322	.5998240

#1	1.959723	.3663735	.8433158	4.833313	17.87750	1.250732
#2	1.740538	.3685911	.8593668	4.837982	17.91724	1.263368
#3	2.094457	.3691926	.8477581	4.835720	18.06484	1.249967

Sample Name: Q1246-07 Acquired: 2/2/2025 14:37:33 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6333 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0142294	F 34.80835	6.478447	.0320825	6.086199	.5163831
Stddev	.0004750	.20392	.014048	.0007881	.014488	.0013009
%RSD	3.337945	.5858361	.2168381	2.456597	.2380477	.2519290

#1	.0138438	34.68088	6.481296	.0313667	6.069553	.5165453
#2	.0140844	34.70063	6.490852	.0319537	6.093077	.5175953
#3	.0147599	35.04354	6.463193	.0329271	6.095966	.5150087

Elem	Sr4077
Units	ppm
Avg	.4938513
Stddev	.0021480
%RSD	.4349515

#1	.4917421
#2	.4960361
#3	.4937757

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	4302.029	85680.61	15913.93	2809.445	3783.081
Stddev	13.050	196.88	46.90	15.410	14.256
%RSD	.3033414	.2297816	.2946973	.5485022	.3768313

#1	4314.575	85771.56	15919.08	2819.561	3795.387
#2	4302.985	85454.70	15958.04	2791.710	3786.396
#3	4288.528	85815.58	15864.67	2817.064	3767.460

Sample Name: Q1246-08 Acquired: 2/2/2025 14:41:36 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6334 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.4992884	-.039598	.6895051	.0749685	.0339740	170.0618
Stddev	.0020557	.003589	.0031549	.0036487	.0009174	1.5794
%RSD	.4117296	9.063879	.4575650	4.866923	2.700448	.9287396

#1	.4971957	-.035455	.6919331	.0775003	.0349702	168.2508
#2	.5013050	-.041741	.6859390	.0707862	.0331638	171.1540
#3	.4993646	-.041599	.6906432	.0766189	.0337879	170.7806

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5966787	.0104741	.0184971	73.55236	.5122776	.1863816
Stddev	.0068615	.0000365	.0001796	.80747	.0056612	.0010050
%RSD	1.149954	.3487348	.9708948	1.097811	1.105097	.5392074

#1	.5891052	.0105090	.0186334	72.68948	.5057947	.1860985
#2	.6024809	.0104771	.0182936	74.28971	.5162457	.1855485
#3	.5984501	.0104361	.0185643	73.67789	.5147923	.1874977

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1111277	278.8659	5.129146	46.19625	.5484198	.0023201
Stddev	.0009078	2.7067	.062465	.45556	.0021430	.0008268
%RSD	.8168546	.9706242	1.217852	.9861433	.3907530	35.63775

#1	.1117735	275.7960	5.062815	45.71795	.5483893	.0024602
#2	.1100898	280.9090	5.186849	46.62503	.5462922	.0030680
#3	.1115197	279.8927	5.137773	46.24575	.5505778	.0014322

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.619343	.3637259	.7535749	3.930409	F 17.09198	1.056944
Stddev	.093919	.0009082	.0120176	.051590	.07635	.013091
%RSD	5.799813	.2496974	1.594741	1.312582	.4467142	1.238570

#1	1.520402	.3626810	.7401108	3.873520	17.09064	1.041853
#2	1.707268	.3641704	.7632155	3.943549	17.01631	1.065249
#3	1.630360	.3643262	.7573984	3.974159	17.16900	1.063730

Sample Name: Q1246-08 Acquired: 2/2/2025 14:41:36 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6334 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0136659	F 32.00438	8.624445	.0329467	6.194050	.4466189
Stddev	.0001551	.13857	.031674	.0006363	.020450	.0074209
%RSD	1.134850	.4329699	.3672582	1.931413	.3301573	1.661580

#1	.0137719	31.94826	8.630694	.0331106	6.191993	.4380500
#2	.0137378	31.90266	8.652529	.0334850	6.215451	.4508742
#3	.0134879	32.16220	8.590112	.0322444	6.174706	.4509324

Elem	Sr4077
Units	ppm
Avg	.4357722
Stddev	.0035300
%RSD	.8100593

#1	.4317108
#2	.4375033
#3	.4381026

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	4313.039	84063.47	14120.24	2737.980	3819.218
Stddev	2.607	885.81	54.59	26.779	10.984
%RSD	.0604331	1.053742	.3865822	.9780678	.2875893

#1	4313.558	85029.82	14111.42	2768.548	3826.261
#2	4315.347	83289.97	14070.60	2718.655	3824.831
#3	4310.212	83870.63	14178.70	2726.737	3806.562

Sample Name: Q1246-12 Acquired: 2/2/2025 14:45:31 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6343 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0493225	-.004455	.2480667	.0160267	.0058716	76.60877	.1896869
Stddev	.0006198	.001402	.0022764	.0006318	.0007749	.03871	.0003854
%RSD	1.256590	31.47160	.9176641	3.942428	13.19678	.0505352	.2031987
#1	.0489609	-.006043	.2473604	.0166376	.0050765	76.61624	.1895555
#2	.0489685	-.003386	.2506126	.0160666	.0059139	76.64321	.1901209
#3	.0500382	-.003937	.2462272	.0153758	.0066245	76.56687	.1893844
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0024991	.0014906	5.913974	.1510268	.0182656	.0210179	59.73938
Stddev	.0001195	.0000915	.018419	.0001309	.0001587	.0020028	.08381
%RSD	4.780685	6.137756	.3114561	.0866648	.8688502	9.528889	.1402974
#1	.0024062	.0014752	5.910662	.1508764	.0180982	.0228542	59.74141
#2	.0024572	.0014079	5.933825	.1510885	.0182847	.0213172	59.82215
#3	.0026338	.0015889	5.897435	.1511154	.0184138	.0188823	59.65456
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5069910	13.41642	.0658413	.0024486	1.557407	.1203590	.1698244
Stddev	.0002719	.02260	.0005593	.0000861	.740216	.0028791	.0040985
%RSD	.0536265	.1684455	.8494761	3.516071	47.52874	2.392107	2.413388
#1	.5069587	13.43378	.0652141	.0023750	2.410708	.1176547	.1651731
#2	.5072776	13.42462	.0662883	.0024276	1.087998	.1233858	.1729063
#3	.5067367	13.39087	.0660216	.0025433	1.173516	.1200365	.1713938
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.375003	2.723703	.2327184	.0032993	5.183710	7.367658	.0153422
Stddev	.051286	.002356	.0004176	.0004014	.000623	.058957	.0010012
%RSD	2.159417	.0865115	.1794321	12.16448	.0120245	.8002134	6.525582
#1	2.422245	2.726367	.2328723	.0033821	5.183120	7.301179	.0161743
#2	2.382308	2.721890	.2330372	.0028630	5.184362	7.413599	.0156212
#3	2.320456	2.722854	.2322457	.0036528	5.183649	7.388195	.0142311

Sample Name: Q1246-12 Acquired: 2/2/2025 14:45:31 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6343 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	2.601469	.1126290	.0515786
Stddev	.022987	.0003748	.0001211
%RSD	.8836010	.3327708	.2347715
#1	2.575576	.1130401	.0516266
#2	2.619469	.1123065	.0514409
#3	2.609362	.1125403	.0516684

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3660.666	72561.64	13353.06	2355.248	4168.236
Stddev	3.440	98.52	101.85	4.416	1.310
%RSD	.0939594	.1357703	.7627515	.1874771	.0314344
#1	3657.085	72574.25	13470.26	2353.502	4166.754
#2	3660.971	72457.43	13286.00	2360.269	4169.241
#3	3663.943	72653.25	13302.92	2351.972	4168.712

Sample Name: Q1246-13 Acquired: 2/2/2025 14:49:32 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6344 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0401321	.0000767	.0832484	.0089312	.0037365	35.63492	.1891154
Stddev	.0026977	.0021261	.0008188	.0037004	.0005568	.26652	.0005669
%RSD	6.721964	2770.691	.9835314	41.43262	14.90215	.7479134	.2997368

#1	.0428029	.0001749	.0841389	.0078801	.0043711	35.47100	.1888848
#2	.0401851	-.002097	.0825281	.0058700	.0033300	35.49132	.1887003
#3	.0374083	.002152	.0830782	.0130435	.0035082	35.94245	.1897612

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0022582	.0019169	10.82413	.0921833	.0327807	.0222315	40.44665
Stddev	.0000766	.0000568	.08253	.0003383	.0002661	.0021962	.26857
%RSD	3.390072	2.963832	.7624296	.3669534	.8117555	9.878889	.6640171

#1	.0021785	.0019522	10.75590	.0918233	.0330880	.0196955	40.30231
#2	.0022651	.0019472	10.80064	.0924946	.0326306	.0234960	40.28111
#3	.0023311	.0018514	10.91586	.0922320	.0326236	.0235030	40.75653

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5966717	9.667952	.0707663	.0013758	.5071096	.0653346	.1962088
Stddev	.0037575	.058930	.0005445	.0003476	.0814048	.0007443	.0034284
%RSD	.6297360	.6095371	.7694219	25.26189	16.05271	1.139225	1.747332

#1	.5936222	9.616097	.0713811	.0013736	.4136990	.0651618	.1931124
#2	.5955235	9.655722	.0703450	.0017245	.5447270	.0661501	.1956208
#3	.6008692	9.732037	.0705728	.0010294	.5629028	.0646919	.1998932

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.597591	1.911323	.1523450	.0014124	6.021964	5.119851	.0061618
Stddev	.078770	.002996	.0010140	.0002810	.015151	.040629	.0003428
%RSD	3.032437	.1567607	.6656126	19.89709	.2515933	.7935644	5.562921

#1	2.521158	1.912086	.1513227	.0011814	6.039389	5.119314	.0061521
#2	2.593108	1.913863	.1523619	.0017253	6.014600	5.160746	.0058240
#3	2.678507	1.908018	.1533505	.0013305	6.011902	5.079493	.0065093

Sample Name: Q1246-13 Acquired: 2/2/2025 14:49:32 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6344 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	1.678000	.0938001	.0518285
Stddev	.016087	.0008642	.0004768
%RSD	.9587002	.9213191	.9200149
#1	1.665560	.0936454	.0515228
#2	1.672272	.0930237	.0515847
#3	1.696167	.0947312	.0523779

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3702.470	71462.13	12543.38	2342.807	4247.817
Stddev	7.733	310.62	93.22	9.130	8.649
%RSD	.2088487	.4346574	.7431778	.3897236	.2035993
#1	3695.170	71814.45	12642.83	2346.692	4237.873
#2	3710.572	71344.14	12529.34	2332.376	4253.584
#3	3701.668	71227.80	12457.99	2349.352	4251.994

Sample Name: Q1246-14 Acquired: 2/2/2025 14:53:33 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6345 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0443276	-.004036	.1125988	.0129867	.0044686	62.56114	.3454298
Stddev	.0018570	.002418	.0015037	.0013257	.0007596	.23408	.0028716
%RSD	4.189326	59.90146	1.335478	10.20809	16.99930	.3741689	.8313150

#1	.0464597	-.003311	.1128479	.0120618	.0039244	62.60871	.3452447
#2	.0434593	-.002064	.1139624	.0123929	.0041449	62.76778	.3483894
#3	.0430638	-.006734	.1109860	.0145055	.0053365	62.30692	.3426552

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0027956	.0019407	12.46640	.1515360	.0352483	.0253952	64.64858
Stddev	.0000947	.0000093	.02786	.0006538	.0002662	.0017829	.18111
%RSD	3.389051	.4776094	.2234651	.4314849	.7551511	7.020595	.2801392

#1	.0027077	.0019322	12.47631	.1507811	.0354295	.0274533	64.66192
#2	.0028960	.0019506	12.48795	.1519045	.0349427	.0244106	64.82265
#3	.0027832	.0019393	12.43494	.1519224	.0353726	.0243217	64.46117

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.032502	16.30656	.0887834	.0025137	.6192152	.1014960	.2434255
Stddev	.005640	.03598	.0002082	.0002378	.0177347	.0016611	.0017078
%RSD	.5462148	.2206470	.2345145	9.460070	2.864064	1.636586	.7015808

#1	1.032661	16.33731	.0888594	.0026227	.6149495	.1000761	.2453095
#2	1.038060	16.31537	.0885478	.0022409	.6040024	.1010891	.2429882
#3	1.026784	16.26699	.0889429	.0026774	.6386938	.1033227	.2419789

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	3.949874	1.782587	.2530048	.0022618	5.974877	6.407141	.0112812
Stddev	.059597	.001774	.0012277	.0004239	.019267	.029440	.0005660
%RSD	1.508838	.0995095	.4852539	18.74210	.3224615	.4594900	5.017309

#1	3.992505	1.784615	.2521490	.0025143	5.995758	6.417378	.0109251
#2	3.975342	1.781324	.2544114	.0017724	5.971083	6.430096	.0119338
#3	3.881774	1.781822	.2524538	.0024987	5.957790	6.373949	.0109846

Sample Name: Q1246-14 Acquired: 2/2/2025 14:53:33 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6345 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	2.705532	.1468543	.0892822
Stddev	.011031	.0009960	.0004765
%RSD	.4077368	.6782247	.5336817
#1	2.701692	.1461950	.0894321
#2	2.717970	.1480000	.0896657
#3	2.696934	.1463678	.0887488

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3712.885	71213.40	13409.37	2324.049	4202.146
Stddev	2.487	99.03	28.77	11.573	9.134
%RSD	.0669841	.1390594	.2145664	.4979692	.2173537
#1	3710.056	71325.76	13439.10	2333.793	4192.300
#2	3713.872	71175.66	13407.34	2327.096	4203.796
#3	3714.727	71138.80	13381.66	2311.257	4210.342

Sample Name: Q1246-15 Acquired: 2/2/2025 14:57:32 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6346 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0400427	-.003097	.0865456	.0129439	.0071303	46.60846	.2591700
Stddev	.0019941	.000895	.0012002	.0020770	.0016052	.13219	.0023439
%RSD	4.979872	28.91333	1.386745	16.04590	22.51198	.2836078	.9043734

#1	.0378226	-.002080	.0854942	.0142020	.0053355	46.62380	.2609333
#2	.0416817	-.003444	.0878532	.0140831	.0076270	46.73230	.2600665
#3	.0406237	-.003767	.0862894	.0105466	.0084285	46.46927	.2565102

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0024832	.0018503	9.887678	.1266958	.0368280	.0415652	60.85368
Stddev	.0000830	.0000586	.023568	.0003318	.0002264	.0006019	.23166
%RSD	3.344367	3.166648	.2383552	.2618582	.6147207	1.448007	.3806766

#1	.0025335	.0019160	9.906229	.1264729	.0365981	.0422383	60.93153
#2	.0023873	.0018034	9.895646	.1265375	.0368353	.0410787	61.03638
#3	.0025287	.0018315	9.861159	.1270771	.0370507	.0413787	60.59313

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.111948	15.22620	.0892267	.0026439	.6063665	.0949022	.2174726
Stddev	.003309	.06671	.0006231	.0004682	.2306995	.0010536	.0027263
%RSD	.2976139	.4381058	.6982987	17.71010	38.04622	1.110222	1.253615

#1	1.112980	15.28912	.0887538	.0026028	.6699521	.0954256	.2205397
#2	1.114619	15.23321	.0889936	.0021975	.3505427	.0936894	.2165531
#3	1.108246	15.15626	.0899327	.0031312	.7986049	.0955918	.2153250

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	6.196920	2.230108	.2377326	.0019694	4.357267	6.272406	.0094117
Stddev	.024450	.003969	.0015303	.0003181	.013690	.077010	.0010234
%RSD	.3945511	.1779574	.6437190	16.15052	.3141790	1.227766	10.87351

#1	6.204818	2.232655	.2375687	.0019866	4.354713	6.284463	.0085079
#2	6.216445	2.225536	.2393383	.0022785	4.345034	6.190078	.0092042
#3	6.169498	2.232134	.2362908	.0016431	4.372054	6.342677	.0105229

Sample Name: Q1246-15 Acquired: 2/2/2025 14:57:32 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6346 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	2.658821	.1138158	.0580551
Stddev	.046576	.0003282	.0003229
%RSD	1.751760	.2884078	.5561130
#1	2.692059	.1141919	.0579513
#2	2.605586	.1136685	.0584171
#3	2.678819	.1135871	.0577969

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3740.091	71716.25	13469.35	2351.402	4219.278
Stddev	10.837	134.63	237.05	6.508	7.818
%RSD	.2897487	.1877195	1.759932	.2767645	.1852988
#1	3731.718	71763.49	13343.14	2350.129	4212.103
#2	3752.331	71564.37	13742.81	2345.625	4227.611
#3	3736.224	71820.88	13322.11	2358.453	4218.121

Sample Name: Q1246-16 Acquired: 2/2/2025 15:01:31 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6347 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0248948	-.003299	.1425832	.0232647	.0093372	84.82717	.2780592
Stddev	.0001928	.002324	.0014087	.0011939	.0001634	.53988	.0014106
%RSD	.7743427	70.43107	.9879993	5.131674	1.749732	.6364480	.5073173

#1	.0251102	-.000954	.1436185	.0245850	.0093498	84.21329	.2764440
#2	.0247386	-.003344	.1431522	.0222612	.0094938	85.04013	.2786846
#3	.0248357	-.005600	.1409790	.0229478	.0091678	85.22810	.2790492

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0027652	.0017762	6.494403	.2224777	.0306580	.0057647	87.82675
Stddev	.0000249	.0000871	.038557	.0007368	.0002276	.0023035	.43986
%RSD	.9018645	4.905782	.5936991	.3311928	.7422599	39.95900	.5008293

#1	.0027465	.0017900	6.451879	.2218730	.0306270	.0074279	87.32009
#2	.0027935	.0018556	6.504243	.2222618	.0308995	.0031355	88.04919
#3	.0027555	.0016830	6.527087	.2232984	.0304475	.0067307	88.11097

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.7955366	21.32441	.0923077	.0032530	.8056535	.1422705	.1904328
Stddev	.0048509	.05670	.0002277	.0000600	.3722206	.0003730	.0031918
%RSD	.6097685	.2658947	.2467174	1.843050	46.20108	.2621692	1.676073

#1	.7899856	21.26941	.0924366	.0033220	.4893928	.1419152	.1868794
#2	.7989609	21.38267	.0920447	.0032139	1.215841	.1426590	.1930567
#3	.7976633	21.32115	.0924417	.0032231	.711727	.1422374	.1913621

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.655215	1.235084	.3404708	.0013830	2.873801	8.515312	.0197334
Stddev	.030800	.000794	.0019116	.0004458	.014232	.037617	.0005462
%RSD	1.159974	.0642618	.5614634	32.23517	.4952220	.4417626	2.767921

#1	2.620124	1.235091	.3384036	.0013860	2.864597	8.552921	.0197992
#2	2.677769	1.235875	.3408341	.0009357	2.866614	8.515330	.0202438
#3	2.667753	1.234287	.3421747	.0018273	2.890194	8.477686	.0191573

Sample Name: Q1246-16 Acquired: 2/2/2025 15:01:31 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6347 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	4.150330	.1910444	.0462610
Stddev	.005553	.0023214	.0002089
%RSD	.1337918	1.215094	.4515267
#1	4.145572	.1883850	.0460255
#2	4.156431	.1920829	.0463336
#3	4.148988	.1926651	.0464239

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3637.613	71544.05	13244.17	2368.500	4091.693
Stddev	10.410	212.49	16.83	7.631	4.758
%RSD	.2861793	.2970012	.1270668	.3221682	.1162755
#1	3628.800	71741.40	13227.42	2376.206	4087.971
#2	3649.098	71571.64	13244.02	2368.348	4097.053
#3	3634.940	71319.12	13261.08	2360.947	4090.055

Sample Name: CCV035 Acquired: 2/2/2025 15:05:31 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV035 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.858309	4.926736	24.19654	4.929083	4.979525	419.1833
Stddev	.006500	.001097	.03965	.011275	.002043	2.0083
%RSD	.1337933	.0222712	.1638488	.2287370	.0410182	.4791047

#1	4.856369	4.926386	24.17487	4.924364	4.979092	419.7497
#2	4.865559	4.925856	24.24230	4.941950	4.981749	420.8476
#3	4.853000	4.927965	24.17246	4.920934	4.977734	416.9526

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.42029	.4909201	2.446965	415.9388	15.48257	2.460236
Stddev	.07654	.0052064	.004481	6.0123	.12122	.002771
%RSD	.7345030	1.060545	.1831409	1.445482	.7829684	.1126309

#1	10.47819	.4955199	2.444732	422.5265	15.61434	2.460142
#2	10.33351	.4919726	2.452124	410.7478	15.45758	2.463052
#3	10.44916	.4852678	2.444039	414.5421	15.37578	2.457513

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	15.58645	422.6421	15.43850	411.8284	2.455840	1.294216
Stddev	.21708	5.3394	.19456	4.4924	.003124	.011255
%RSD	1.392718	1.263337	1.260205	1.090846	.1272050	.8696681

#1	15.82663	428.8075	15.66249	417.0156	2.456859	1.307203
#2	15.52847	419.5326	15.31163	409.2060	2.458328	1.288161
#3	15.40426	419.5864	15.34137	409.2634	2.452334	1.287285

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	400.5358	2.489249	15.67239	160.9420	4.879522	F 5.948043
Stddev	5.7387	.026409	.20507	2.1832	.021001	.053549
%RSD	1.432758	1.060919	1.308507	1.356537	.4303817	.9002860

#1	407.1519	2.519212	15.90258	163.4616	4.856406	6.004833
#2	397.5489	2.479177	15.50917	159.6105	4.897425	5.940830
#3	396.9066	2.469359	15.60542	159.7538	4.884736	5.898465

Sample Name: CCV035 Acquired: 2/2/2025 15:05:31 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV035 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.910705	4.943792	4.925027	4.906450	5.058021	5.312647
Stddev	.009269	.016916	.067738	.005956	.065809	.075560
%RSD	.1887465	.3421749	1.375387	.1213872	1.301090	1.422266

#1	4.903390	4.940491	5.003238	4.905791	5.130073	5.399345
#2	4.921129	4.928770	4.886830	4.912708	5.042905	5.260819
#3	4.907596	4.962116	4.885015	4.900851	5.001085	5.277778

Elem	Sr4077
Units	ppm
Avg	5.338930
Stddev	.048843
%RSD	.9148379

#1	5.394050
#2	5.301029
#3	5.321710

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2888.360	58997.44	11680.20	1906.505	3199.293
Stddev	6.444	551.78	118.68	18.319	7.591
%RSD	.2230934	.9352533	1.016076	.9608829	.2372581

#1	2883.244	58364.87	11562.90	1885.377	3192.714
#2	2886.240	59247.73	11677.49	1916.171	3197.566
#3	2895.597	59379.71	11800.21	1917.967	3207.598

Sample Name: CCB035 Acquired: 2/2/2025 15:09:50 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB035 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0012184	-.000840	.0004070	.0013629	.0003225	-.000219	.0045344
Stddev	.0023090	.001534	.0003683	.0013113	.0015908	.008042	.0003303
%RSD	189.5215	182.5864	90.49874	96.22027	493.2838	3667.832	7.283376

#1	.0032376	-.000068	-.000002	.0028553	.0013150	-.009506	.0048117
#2	-.001299	-.002607	.000712	.0008382	.0011648	.004364	.0046226
#3	.001717	.000154	.000511	.0003951	-.001512	.004484	.0041690

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000287	.0001514	.0114202	.0004022	.0004392	.0012856	.0134411
Stddev	.0000528	.0001436	.0065978	.0000857	.0000811	.0027755	.0025635
%RSD	183.6924	94.84441	57.77301	21.31698	18.46901	215.8973	19.07197

#1	-.000014	.0000004	.0139384	.0003060	.0005250	-.000194	.0147269
#2	.000013	.0002864	.0039342	.0004303	.0003638	.004487	.0151073
#3	.000088	.0001675	.0163881	.0004705	.0004288	-.000436	.0104892

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0004633	-.001434	-.000116	.0004585	-.235137	-.001343	.0017655
Stddev	.0005488	.011533	.000351	.0004938	.217999	.003201	.0015398
%RSD	118.4602	804.3539	302.1562	107.6982	92.71134	238.4327	87.21951

#1	.0000278	.002362	.000071	.0004346	-.483700	-.004222	.0029489
#2	.0002823	-.014386	-.000521	.0009638	-.076420	.002105	.0000246
#3	.0010796	.007723	.000101	-.000023	-.145291	-.001910	.0023229

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3151463	-.001392	-.001401	.0004694	.0020335	.0012346	-.000583
Stddev	.0508679	.000293	.000719	.0002432	.0034347	.0008303	.000273
%RSD	16.14105	21.02243	51.35454	51.80324	168.9091	67.25126	46.83886

#1	.2602113	-.001443	-.001433	.0006826	.0026391	.0013567	-.000268
#2	.3606180	-.001077	-.002104	.0002046	-.001664	.0003500	-.000740
#3	.3246095	-.001656	-.000666	.0005211	.005125	.0019970	-.000742

Sample Name: CCB035 Acquired: 2/2/2025 15:09:50 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB035 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0008087	-.004729	.0001380
Stddev	.0006274	.000941	.0000377
%RSD	77.57485	19.90677	27.28081
#1	.0007315	-.004666	.0000967
#2	.0002235	-.003821	.0001470
#3	.0014711	-.005700	.0001704

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3599.771	70112.14	12302.02	2345.145	4330.161
Stddev	34.327	159.17	96.61	7.310	41.094
%RSD	.9535867	.2270223	.7853280	.3117095	.9490250
#1	3594.727	69991.57	12225.98	2337.555	4325.966
#2	3568.244	70292.56	12269.35	2352.139	4291.325
#3	3636.340	70052.28	12410.73	2345.742	4373.192

Sample Name: Q1223-14DLX2 Acquired: 2/2/2025 15:13:59 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6322 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.8910155	-.038717	.6642477	.1039634	.0671388	62.32640
Stddev	.0056398	.004140	.0029897	.0021635	.0005594	.19135
%RSD	.6329681	10.69352	.4500867	2.081016	.8332105	.3070151

#1	.8897371	-.033960	.6669408	.1022065	.0677838	62.24453
#2	.8861246	-.040686	.6610307	.1063800	.0667855	62.18961
#3	.8971849	-.041506	.6647717	.1033039	.0668472	62.54507

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.7566679	.0066647	.0208711	38.79941	8.827265	.1069225
Stddev	.0034205	.0003411	.0002414	.12121	.037162	.0006680
%RSD	.4520469	5.117267	1.156779	.3124037	.4209907	.6247210

#1	.7578857	.0070560	.0211065	38.72584	8.784358	.1069113
#2	.7528051	.0064300	.0206241	38.73307	8.848197	.1062602
#3	.7593128	.0065083	.0208827	38.93931	8.849240	.1075960

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.215803	470.2194	5.173516	15.60706	.3950714	.0185359
Stddev	.028042	5.4755	.021597	.07549	.0012148	.0013235
%RSD	.6651607	1.164457	.4174495	.4837069	.3074984	7.140461

#1	4.242798	464.6246	5.165973	15.54118	.3955051	.0171205
#2	4.217790	475.5673	5.156702	15.59058	.3936992	.0197429
#3	4.186820	470.4662	5.197872	15.68944	.3960098	.0187442

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.999466	.2010599	1.205680	6.790007	9.661701	1.834909
Stddev	.195516	.0005055	.009210	.050806	.029431	.024680
%RSD	3.910736	.2514374	.7639239	.7482473	.3046142	1.345048

#1	4.811727	.2013294	1.199640	6.792738	9.687855	1.808673
#2	4.984746	.2013736	1.201120	6.737891	9.629831	1.857665
#3	5.201927	.2004767	1.216281	6.839393	9.667416	1.838389

Sample Name: Q1223-14DLX2 Acquired: 2/2/2025 15:13:59 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: A6322 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0156483	F 22.02325	F 10.92028	1.512402	2.490599	.1366012
Stddev	.0004309	.06486	.08693	.006574	.012403	.0007898
%RSD	2.753827	.2945158	.7960321	.4346428	.4980045	.5782030

#1	.0151792	22.01797	10.97102	1.509846	2.504687	.1366986
#2	.0157393	21.96120	10.96991	1.507491	2.485789	.1373377
#3	.0160265	22.09060	10.81990	1.519870	2.481321	.1357671

Elem	Sr4077
Units	ppm
Avg	.2697477
Stddev	.0008282
%RSD	.3070431

#1	.2696365
#2	.2689807
#3	.2706260

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3565.653	73418.66	12923.67	2383.376	3972.607
Stddev	7.540	346.41	100.01	16.094	4.860
%RSD	.2114658	.4718302	.7738822	.6752461	.1223344

#1	3558.990	73804.68	12907.48	2401.931	3968.713
#2	3573.838	73134.86	12832.74	2374.982	3978.053
#3	3564.130	73316.45	13030.80	2373.214	3971.053

Sample Name: CCV036 Acquired: 2/2/2025 15:18:00 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV036 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.852887	4.924063	24.20031	4.924598	4.959182	417.7797
Stddev	.018284	.037896	.08634	.011953	.010423	1.6374
%RSD	.3767592	.7696055	.3567827	.2427135	.2101782	.3919383

#1	4.842297	4.886273	24.15778	4.921399	4.967350	416.1622
#2	4.873999	4.923853	24.29966	4.937824	4.962753	417.7406
#3	4.842364	4.962064	24.14348	4.914570	4.947443	419.4364

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.25387	.4914336	2.446931	412.7570	15.66435	2.457907
Stddev	.03862	.0036923	.010177	1.9052	.07262	.007841
%RSD	.3766345	.7513341	.4159002	.4615865	.4635880	.3190007

#1	10.23377	.4921011	2.440110	413.1968	15.69536	2.454695
#2	10.22945	.4874531	2.458628	410.6704	15.58137	2.466844
#3	10.29840	.4947466	2.442054	414.4039	15.71631	2.452182

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	15.40821	419.7493	15.15562	410.0834	2.454002	1.300869
Stddev	.05332	.7650	.02941	.9601	.008315	.003234
%RSD	.3460562	.1822479	.1940247	.2341290	.3388278	.2486343

#1	15.45200	420.5878	15.16917	411.1888	2.450865	1.303502
#2	15.34883	419.5706	15.17580	409.4564	2.463429	1.297259
#3	15.42379	419.0894	15.12188	409.6052	2.447713	1.301847

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	384.1197	2.444695	15.50309	159.4383	4.918047	F 5.911804
Stddev	.6342	.009601	.04738	.5610	.012769	.022160
%RSD	.1651122	.3927300	.3056055	.3518643	.2596372	.3748463

#1	384.2857	2.446740	15.45991	159.7937	4.903473	5.922627
#2	384.6544	2.434236	15.55378	159.7296	4.923398	5.886312
#3	383.4190	2.453108	15.49559	158.7915	4.927269	5.926472

Sample Name: CCV036 Acquired: 2/2/2025 15:18:00 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV036 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.883399	4.959668	4.787977	4.916042	4.925322	5.201490
Stddev	.010138	.013492	.005897	.016430	.011290	.024907
%RSD	.2076012	.2720383	.1231589	.3342104	.2292257	.4788439

#1	4.874478	4.944476	4.781612	4.906186	4.927524	5.203730
#2	4.894424	4.970252	4.789064	4.935008	4.913093	5.225200
#3	4.881294	4.964277	4.793254	4.906930	4.935349	5.175538

Elem	Sr4077
Units	ppm
Avg	5.344944
Stddev	.043602
%RSD	.8157586

#1	5.336092
#2	5.306448
#3	5.392293

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2904.087	58624.20	11694.59	1888.888	3201.417
Stddev	3.704	190.40	82.23	3.587	6.119
%RSD	.1275343	.3247849	.7031299	.1898844	.1911305

#1	2903.029	58474.64	11666.04	1892.275	3202.419
#2	2901.028	58838.54	11787.28	1889.260	3194.859
#3	2908.205	58559.42	11630.43	1885.130	3206.974

Sample Name: CCB036 Acquired: 2/2/2025 15:22:19 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB036 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.001431	-.000616	-.000080	-.001678	.0007669	.0023413	.0051644
Stddev	.000999	.000095	.000860	.004078	.0008869	.0105139	.0002282
%RSD	69.84433	15.44124	1075.404	243.0038	115.6515	449.0576	4.418198

#1	-.001296	-.000726	.000903	-.003312	.0012860	-.004098	.0052641
#2	-.002491	-.000564	-.000452	.002963	-.000257	.014474	.0053258
#3	-.000506	-.000558	-.000691	-.004686	.001272	-.003352	.0049033

Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000694	.0000251	.0110026	.0006106	.0002974	.0020999	.0145025
Stddev	.0000631	.0000091	.0090020	.0000889	.0000626	.0007111	.0020981
%RSD	90.91461	36.30271	81.81729	14.56618	21.06307	33.86141	14.46751

#1	.0000006	.0000226	.0195851	.0005231	.0003348	.0013189	.0168023
#2	.0000830	.0000352	.0016327	.0007009	.0002251	.0022713	.0126927
#3	.0001247	.0000175	.0117901	.0006078	.0003323	.0027097	.0140123

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001860	.0020861	-.000182	.0003822	-.240732	-.000920	-.000540
Stddev	.0003073	.0144504	.000035	.0002200	.348576	.001433	.002421
%RSD	165.2305	692.6953	19.19223	57.57186	144.7984	155.7106	447.9847

#1	.0005368	.0067609	-.000213	.0003634	-.535307	-.000706	-.002016
#2	.0000562	.0136203	-.000188	.0006110	.144094	-.002447	.002253
#3	-.000035	-.014123	-.000144	.0001722	-.330983	.000394	-.001858

Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3924953	.0010126	-.001551	.0002435	.0023591	.0049625	-.000139
Stddev	.0120744	.0019253	.000361	.0001844	.0011168	.0026428	.000799
%RSD	3.076326	190.1245	23.24864	75.71499	47.33907	53.25561	573.6245

#1	.3986420	.0025951	-.001228	.0001712	.0016191	.0068050	.000579
#2	.4002597	-.001131	-.001940	.0004530	.0036437	.0061480	-.001000
#3	.3785843	.001574	-.001484	.0001062	.0018145	.0019345	.000003

Sample Name: CCB036 Acquired: 2/2/2025 15:22:19 Type: Unk
Method: EPA SFAM01.0(v61) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB036 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0013569	-.003432	.0001408
Stddev	.0002642	.001404	.0000609
%RSD	19.47342	40.90695	43.22121
#1	.0010675	-.003769	.0001568
#2	.0014180	-.001890	.0001921
#3	.0015853	-.004636	.0000735

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3596.865	69644.88	12607.37	2290.746	4305.843
Stddev	39.306	246.26	20.78	12.428	45.139
%RSD	1.092782	.3535869	.1648523	.5425148	1.048328
#1	3559.222	69855.63	12624.35	2297.335	4262.680
#2	3593.728	69374.18	12584.19	2276.411	4302.121
#3	3637.646	69704.82	12613.56	2298.492	4352.728

Prep Standard - Chemical Standard Summary

Order ID : Q1223
Test : Metals CLP12
Prepbatch ID : PB166385,
Sequence ID/Qc Batch ID: LB134523,

Standard ID :
MP83500,MP84041,MP84063,MP84070,MP84204,MP84206,MP84207,MP84208,MP84209,MP84210,MP 84211,MP84212,MP84213,MP84214,MP84215,MP84216,MP84218,MP84219,

Chemical ID :
M5130,M5218,M5223,M5289,M5295,M5298,M5393,M5429,M5466,M5472,M5476,M5496,M5497,M5513,M5519,M5565,M5658,M5697,M5798,M5799,M5800,M5801,M5802,M5806,M5815,M5817,M5819,M5875,M5942,M5959,M5961,M5962,M5976,M5977,M5978,M5985,M5990,M6021,M6023,M6025,M6028,M6030,M6032,M6077,M6121,M6125,M6126,M6127,M6128,M6144,W3112,

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
902	ICP AES CAL BLK (SO/ICB/CCB)	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

<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	MP84041	01/14/2025	07/14/2025	Eman Mughal	None	None	Sarabjit Jaswal
								01/16/2025

FROM 1250.00000ml of M6126 + 1250.00000ml of W3112 = 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.)	MP84063	01/14/2025	02/14/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/16/2025

FROM 0.02000ml of M5815 + 0.03000ml of M5429 + 0.10000ml of M5798 + 0.10000ml of M6028 + 0.14000ml of M5799 + 0.20000ml of 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>
921	ICPAES SPIKE SOL#6	MP84070	01/14/2025	02/14/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/16/2025

FROM 2.50000ml of M5962 + 50.00000ml of M5565 + 50.00000ml of M5990 + 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>
902	ICP AES CAL BLK (SO/ICB/CCB)	MP84204	01/24/2025	02/24/2025	Kareem Khairalla	None	None	Sarabjit Jaswal 01/27/2025

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

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
2480	ICP AES STD 6 ISM01.3	MP84206	01/24/2025	02/04/2025	Kareem Khairalla	None	None	Sarabjit Jaswal 01/27/2025

FROM 4.00000ml of M5289 + 4.00000ml of M5298 + 4.00000ml of M5497 + 4.00000ml of M6127 + 4.00000ml of M6144 + 30.00000ml of MP84204 = 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)	MP84207	01/24/2025	02/04/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/27/2025

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 M5819 + 12.50000ml of M6128 + 12.50000ml of M6144 + 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 M5393 + 5.00000ml of M5802 + 5.00000ml of M5875 + 5.00000ml of M6077 + 303.50000ml of MP84204 =
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)	MP84208	01/24/2025	02/04/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/27/2025

FROM 250.00000ml of MP84204 + 250.00000ml of MP84207 = 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)	MP84209	01/24/2025	02/04/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/27/2025

FROM 25.00000ml of MP84207 + 75.00000ml of MP84204 = Final Quantity: 100.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1008	ICPAES ISM01.2(S2)	MP84210	01/24/2025	02/04/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/27/2025

FROM 12.50000ml of MP84207 + 87.50000ml of MP84204 = Final Quantity: 100.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
994	ICPAES ISM01.2 S1 (CONC.)	MP84211	01/24/2025	02/04/2025	Kareem Khairalla	None	None	Sarabjit Jaswal 01/27/2025

FROM 0.02000ml of M5815 + 0.03000ml of M5429 + 0.10000ml of M5798 + 0.10000ml of M6028 + 0.14000ml of M5799 + 0.20000ml of M5298 + 0.20000ml of M5476 + 0.20000ml of M5658 + 0.20000ml of M5801 + 0.20000ml of M5817 + 0.20000ml of M5977 + 0.20000ml of M6025 + 0.20000ml of M6030 + 0.30000ml of M6128 + 0.40000ml of M5496 + 0.50000ml of M5697 + 0.50000ml of M6023 + 0.70000ml of M5962 + 0.80000ml of M5961 + 1.00000ml of M5800 + 1.00000ml of M6021 + 1.20000ml of M5802 + 1.20000ml of M5819 + 10.00000ml of M5497 + 10.00000ml of M5519 + 10.00000ml of M6127 + 10.00000ml of M6144 + 2.00000ml of M5978 + 4.00000ml of M6032 + 34.24000ml of MP84204 = Final Quantity: 100.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1003	ICPAES ISM01.2 S1	MP84212	01/24/2025	02/04/2025	Kareem Khairalla	None	None	Sarabjit Jaswal 01/27/2025

FROM 0.50000ml of MP84211 + 99.50000ml of MP84204 = Final Quantity: 100.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
912	ICP AES ICV SOLN	MP84213	01/24/2025	02/05/2025	Kareem Khairalla	None	None	Sarabjit Jaswal 01/27/2025

FROM 0.02500ml of M5429 + 0.02500ml of M5815 + 0.02500ml of M5817 + 0.10000ml of M5466 + 0.25000ml of M5218 + 0.25000ml of M5472 + 10.00000ml of M5295 + 89.77500ml of MP84204 = Final Quantity: 100.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
904	ICP AES ICSA SOLN	MP84214	01/24/2025	02/07/2025	Kareem Khairalla	None	None	Sarabjit Jaswal 01/27/2025

FROM 25.00000ml of M5130 + 225.00000ml of MP84204 = 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	MP84215	01/24/2025	02/07/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/27/2025

FROM 25.00000ml of M5130 + 25.00000ml of M5223 + 200.00000ml of MP84204 = Final Quantity: 250.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1119	ICPAES ISM01.2(CCV)	MP84216	01/24/2025	02/04/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/27/2025

FROM 0.75000ml of M5497 + 0.75000ml of M6127 + 1.22500ml of M5496 + 1.25000ml of M5298 + 1.25000ml of M6144 + 19.77500ml of MP84204 + 25.00000ml of MP84207 = 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	MP84218	01/24/2025	02/24/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								01/27/2025

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

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

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

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 /bin	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 /bin	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 #
Absolute Standards, Inc.	58126 / Fe, 10000 PPM, 500 ml	020422	02/04/2025	05/02/2023 / jaswal	06/15/2022 / jaswal	M5298

CHEMICAL RECEIPT LOG BOOK

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

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57058 / Cerium, 1000PPM, 100ML	061322	06/13/2025	03/06/2023 / bin	03/01/2023 / bin	M5466

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	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

CHEMICAL RECEIPT LOG BOOK

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.	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.	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 #
Inorganic Ventures	CLPP-SPK-1 / SOIL/WATER SPIKE SOLN 1, 125mL	T2-MEB721963	07/27/2027	05/30/2023 / jaswal	05/26/2023 / jaswal	M5565

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

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.	57116 / S, 10000 PPM, 125 ml	071123	07/11/2026	03/01/2024 / jaswal	02/09/2024 / jaswal	M5817

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
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

CHEMICAL RECEIPT LOG BOOK

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

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

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	CGT11-1 / 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

CHEMICAL RECEIPT LOG BOOK

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 #
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

CHEMICAL RECEIPT LOG BOOK

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

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

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
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

CHEMICAL RECEIPT LOG BOOK

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

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
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

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-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 #

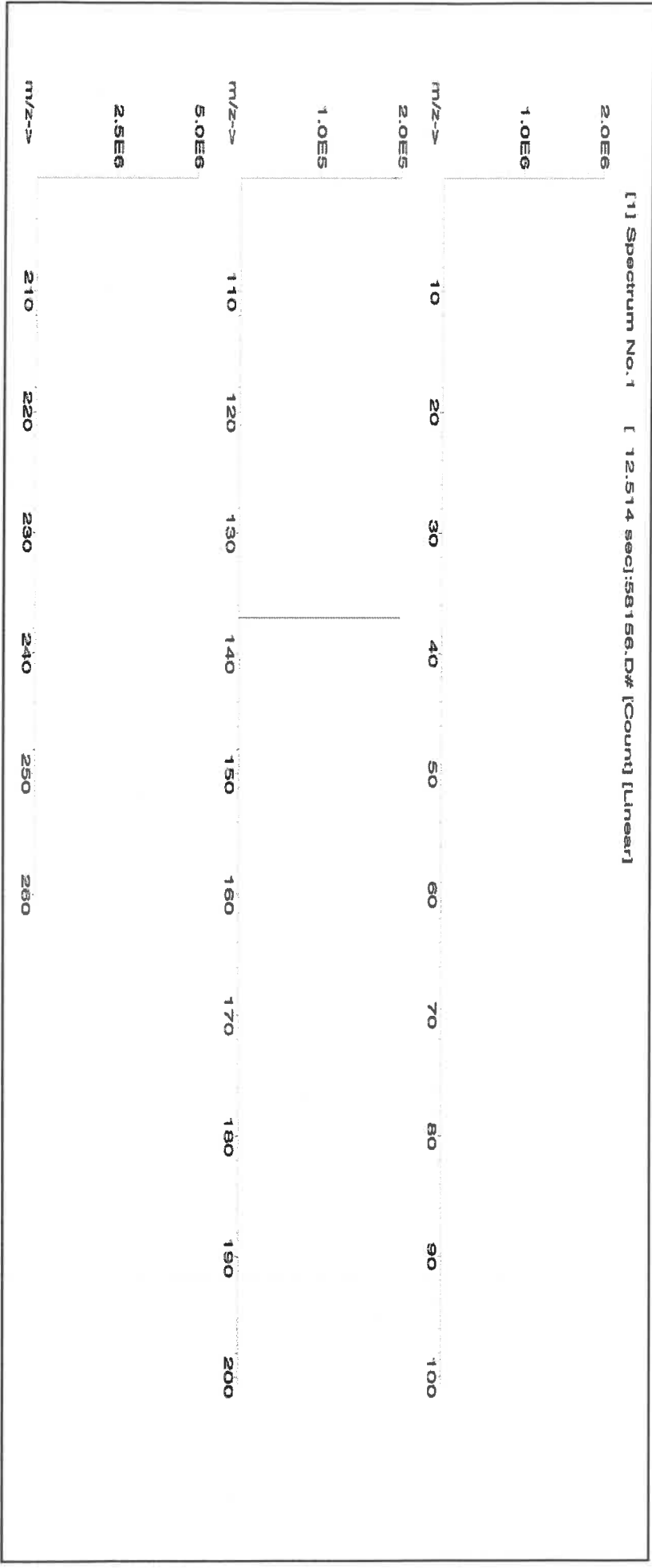
Expiration Date: 010927
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
2% **40.0** **Nitric Acid**
(mL)

NIST Test Number: 6UTB

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

<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito
	010924
<i>Pedro L. Renteria</i>	
Reviewed By:	Pedro L. Renteria
	010924

SDS Information									
Compound	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)
1. Barium nitrate (Ba)	IN023	BA0022019A1	1000	99.999	0.10	52.3	3.82417	3.82441	1000.1
									2.0
									10022-31-8
									0.5 mg/m3
									or-hat 355 mg/kg
									3104a





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

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

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

(T) = Target analyte

Physical Characterization:

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

SE-05 Balance Uncertainty

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

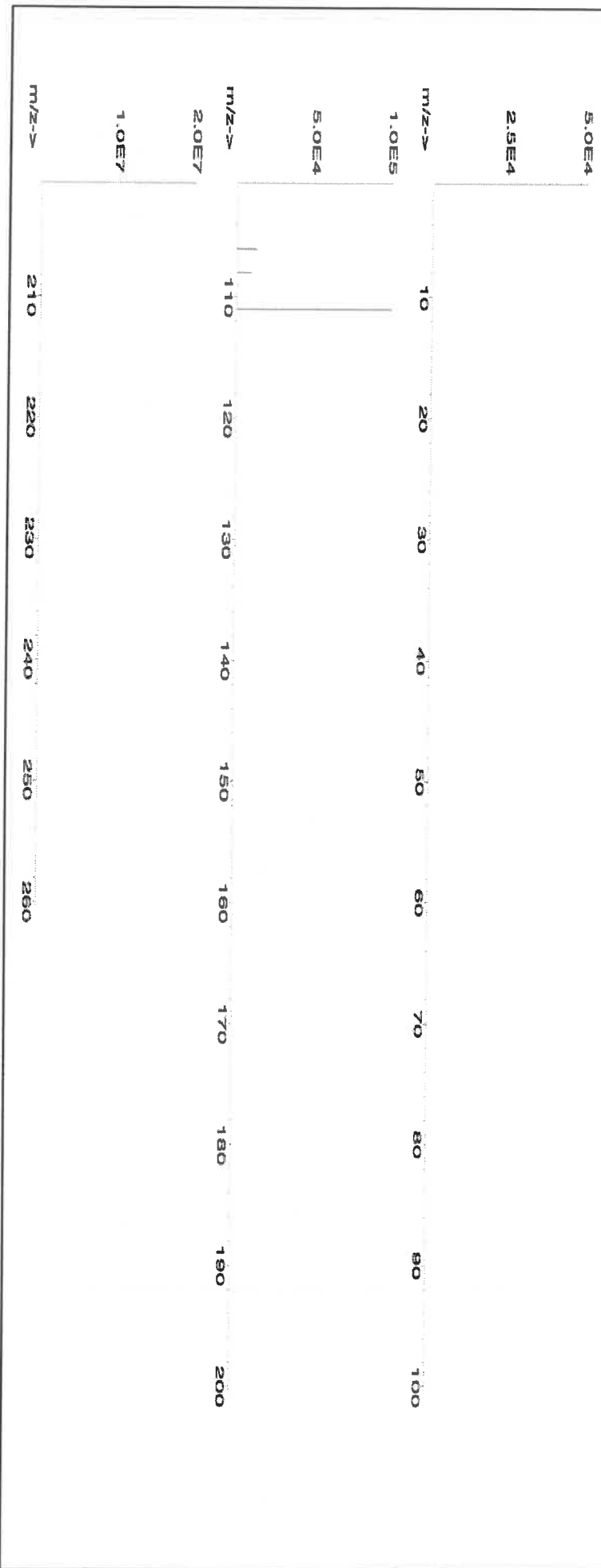
<i>Aleah O'Brady</i>	
Formulated By:	Aleah O'Brady
	070124
<i>Pedro L. Rentas</i>	
Reviewed By:	Pedro L. Rentas
	070124

Compound

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

1. Cadmium nitrate tetrahydrate (Cd) IN024 CDM09221A1 1000 99.999 0.10 36.5 5.4797 5.4804 1000.1 2.0 10022-68-1 0.01 mg/m3 orl-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):

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



Refine your results. Redefine your industry.

Certificate of Analysis

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

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

3.0 CERTIFIED VALUES AND UNCERTAINTIES

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

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

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ag	ICP Assay	3151	160729
Ag	Volhard	999c	999c
Al	ICP Assay	3101a	140903
Al	EDTA	928	928
Ba	ICP Assay	3104a	140909
Ba	Gravimetric		See Sec. 4.2
Be	ICP Assay	3105a	090514
Be	Calculated		See Sec. 4.2
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
Co	ICP Assay	3113	190630
Co	EDTA	928	928
Cr	ICP Assay	3112a	170630
Cr	Calculated		See Sec. 4.2
Cu	ICP Assay	3114	121207
Cu	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
K	ICP Assay	3141a	140813
K	Gravimetric		See Sec. 4.2
Mg	ICP Assay	3131a	140110
Mg	EDTA	928	928
Mn	ICP Assay	3132	050429
Mn	EDTA	928	928
Na	ICP Assay	3152a	120715
Na	Gravimetric		See Sec. 4.2
Ni	ICP Assay	3136	120619
Ni	EDTA	928	928
V	IC Assay	3165	160906
V	EDTA	928	928
Zn	ICP Assay	3168a	120629
Zn	EDTA	928	928

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 27, 2022

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

11.2 Lot Expiration Date

- **January 27, 2027**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





Refine your results. Redefine your industry.

Certificate of Analysis

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

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

3.0 CERTIFIED VALUES AND UNCERTAINTIES

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

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

Assay Information:

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

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

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

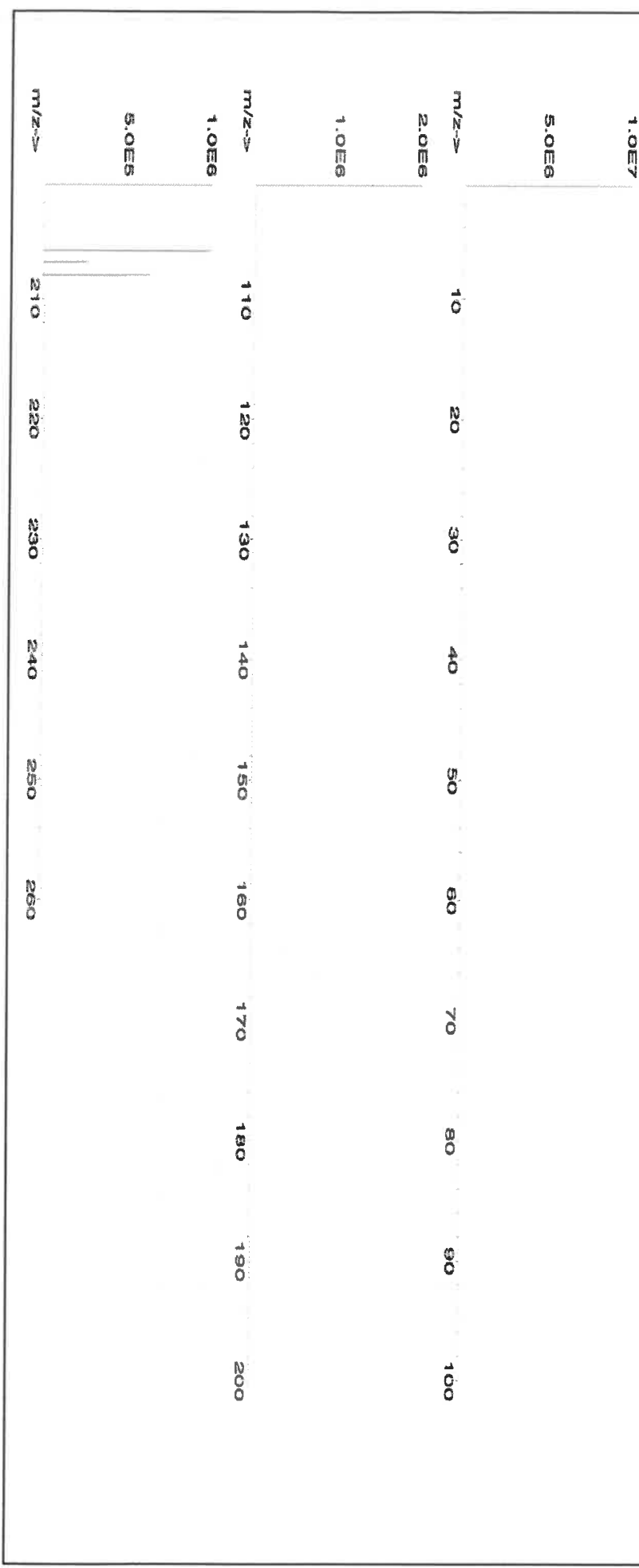
Expiration Date: 110926
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 10000
NIST Test Number: 6UTB
Weight shown below was diluted to (mL): 2000.02
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

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

Compound	SDS Information									
	RM#	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)

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

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





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

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

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

Physical Characterization:

(T)= Target analyte

Certified by:

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

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



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
 Christiansburg, VA 24073 USA
 inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

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

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

3.0 CERTIFIED VALUES AND UNCERTAINTIES

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

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

Assay Information:

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

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

November 02, 2021

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

11.2 Lot Expiration Date

- **November 02, 2026**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





Instructions for QATS Reference Material: *ICP-AES ICS*

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

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

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

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

Contains Heavy Metals
HAZARDOUS MATERIAL

Safety Data Sheets
Available Upon Request

(A) SAMPLE DESCRIPTION

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

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

(B) BREAKAGE OR MISSING ITEMS

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

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

(C) ANALYSIS OF SAMPLES

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





Instructions for QATS Reference Material: ICP-AES ICS

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

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

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

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

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

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

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

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

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

ICSA
M5126
M5127
M5128
M5129
M5130

ICSB
M5219
M5220
M5221
M5222
M5223



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)

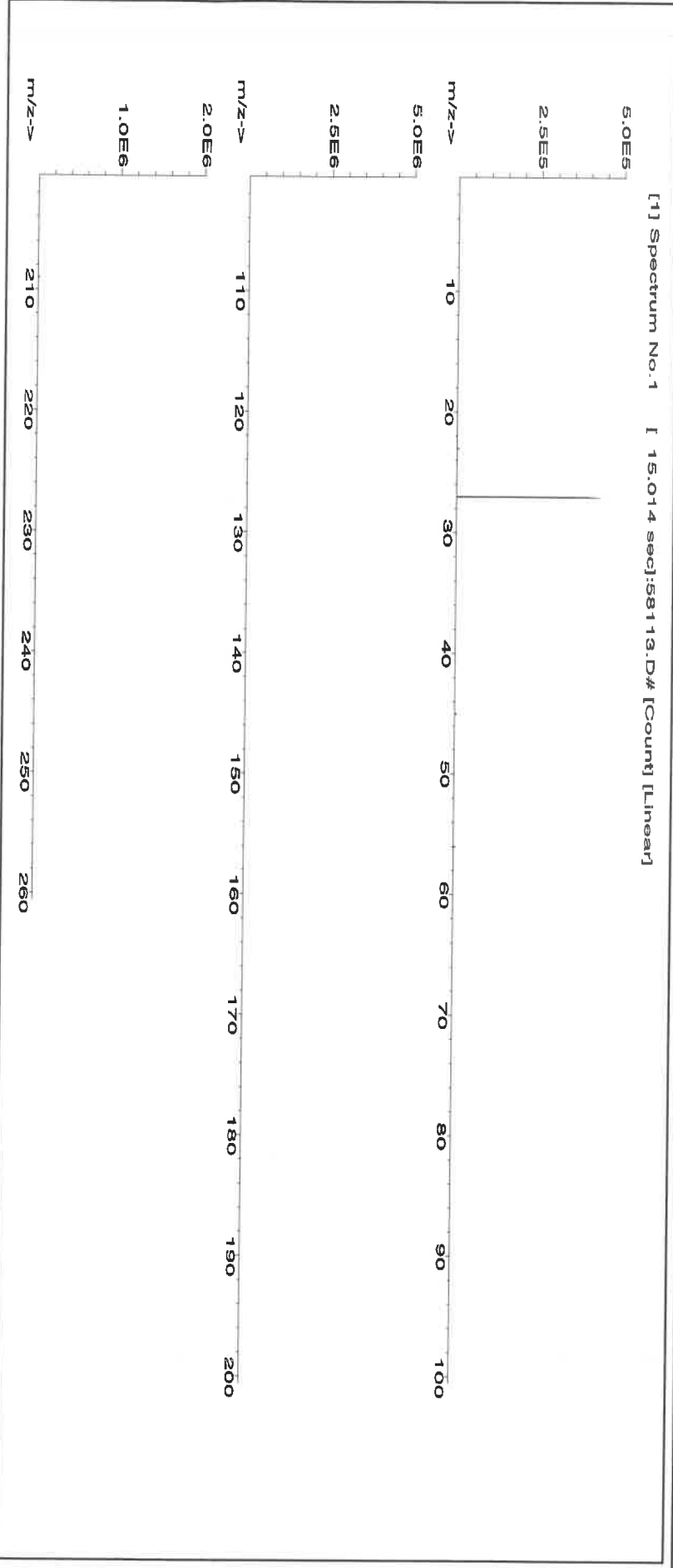
Solvent: 20370011 Nitric Acid
Lot #

Expiration Date: 070625
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	070622
Reviewed By:	Pedro L. Renteria	070622

SDS Information													
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#	Solvent Safety Info. On Attached pg.)	
												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	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: 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
M15292
M15293
M15294
M15295

(A) SAMPLE DESCRIPTION

Enclosed is a set of one (1) or more Aqueous Inorganic Reference Materials containing various analyte concentrations. ICV1 and ICV5 are in a matrix of dilute nitric acid. ICV6 is in a matrix of dilute basic solution. **For the reference material source in reporting ICVs use "USEPA". For the reference material lot number for the ICV1, ICV5, and ICV6 solutions use "ICV1-1014", "ICV5-0415", and "ICV6-0400", respectively.**

(B) BREAKAGE OR MISSING ITEMS

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

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

(C) ANALYSIS OF SAMPLES

The Initial Calibration Verification Solutions (ICVs) are to be used to evaluate the accuracy of the initial calibrations of ICP, AA, and Cyanide colorimetric instruments, and are to be used with the CLP SOWs and revisions. The values for each element in the ICVs are listed below in µg/L (ppb) for the resulting solution(s) after the dilution of the concentrate(s) according to the following instructions. Use Class 'A' glassware to prepare the solution(s).

ICV1-1014 For ICP-AES analysis, use a 10-fold dilution by pipetting 10 mL of the ICV1 concentrate into a 100 mL volumetric flask and dilute to volume with 2% (v/v) nitric acid.





QUALITY ASSURANCE TECHNICAL SUPPORT LABORATORY
"An ISO 9001:2015 Certified Program"

Instructions for QATS Reference Material: *Inorganic ICV Solutions*

- ICV1-1014** For ICP-MS analysis, use a 50-fold dilution by pipetting 2 mL of the ICV1 concentrate into a 100 mL volumetric flask and dilute to volume with 1% (v/v) nitric acid.
- ICV5-0415** For the cold vapor analysis of mercury by AA, use a 100-fold dilution by pipetting 1 mL of the ICV5 concentrate into a 100 mL volumetric flask and dilute to volume with 2% (v/v) nitric acid. The ICV5 concentrate is prepared in 0.05% (w/v) $K_2Cr_2O_7$ 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 ($\mu\text{g/mL}$):
NIST Test Number:

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

M15298

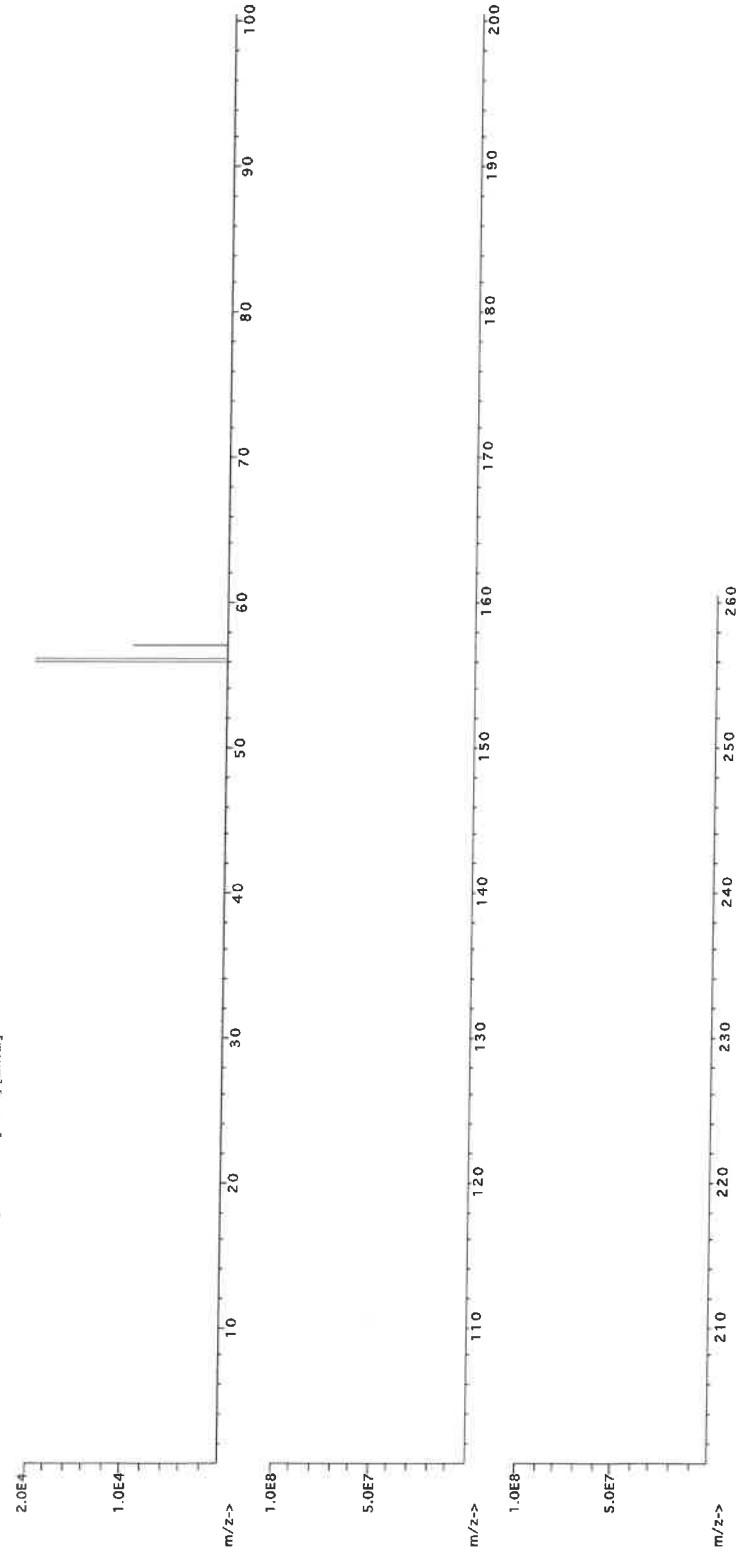
5.0%
150.0
(mL)
Nitric Acid

Giovanni Esposito	
Formulated By:	Giovanni Esposito 020422
Pedro L. Rentas	
Reviewed By:	Pedro L. Rentas 020422

Compound	RM#	Lot Number	Nominal Conc. ($\mu\text{g/mL}$)	Purity (%)	Uncertainty (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. ($\mu\text{g/mL}$)	Expanded Uncertainty +/- ($\mu\text{g/mL}$)	SDS Information		
											(Solvent Safety Info. On Attached pg.)	LD50	NIST SRM

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 or-hat 7500mg/kg 3126a

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





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

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

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.10	Pr	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Te	<0.02	U	<0.02
As	<0.2	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.01	Os	<0.02	Rh	<0.02	Ag	<0.02	Tl	<0.02	V	<0.02
Ba	<0.02	Cs	<0.02	Gd	<0.02	Ir	<0.10	Mn	<0.10	Pd	<0.02	Rb	<0.02	Na	<0.2	Th	<0.02	Yb	<0.02
Be	<0.01	Cr	<0.5	Ga	<0.2	Fe	<0.2	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	<0.02	Tm	<0.02	Y	<0.02
Bi	<0.02	Co	<0.10	Ge	<0.02	La	<0.10	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	Sn	<0.02	Zn	<0.02
B	<0.02	Cu	<0.10	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	Ti	<0.02	Zr	<0.02

(T)= Target analyte

Physical Characterization:

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

Certified by:

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



Certified Reference Material CRM

M5429 R1 0126/23 (B)

CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57103
070622
Lithium (Li)

Solvent: 20510011 Nitric Acid

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

070625
Ambient (20 °C)
10000
6UTB

2% 20.0 (mL)

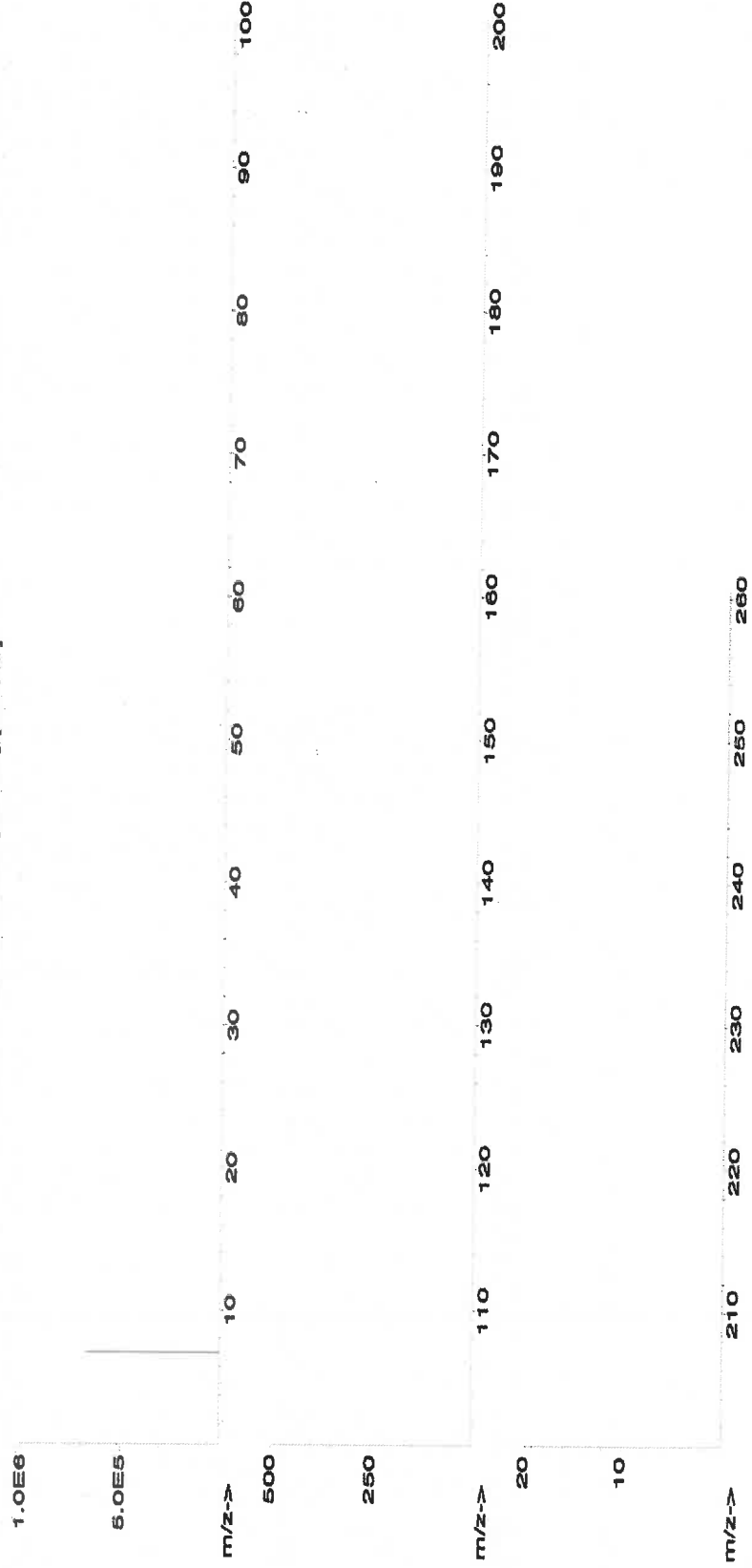
Weight shown below was diluted to (mL): 1000.12
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

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

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

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
-------------------------	-------	------------	-------	--------	------	------	----------	----------	---------	------	-----------	---------	-------------------	----

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





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

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

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pr	<0.02	Se	<0.02	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	<0.02	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	<0.02	Th	<0.02	Yb	<0.02
Be	<0.01	Cr	<0.02	Ga	<0.02	Fe	<0.02	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	<0.02	Tm	<0.02	Y	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	Sn	<0.02	Zn	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	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 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	Rc	<0.02	Si	<0.02	Te	<0.02	U	<0.02
As	<0.2	Ce	T	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:

Certified by:

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

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



Certified Reference Material CRM



CERTIFIED WEIGHT REPORT:

Part Number: **58113**
Lot Number: **011623**
Description: **Aluminum (Al)**

Solvent: **20510011 Nitric Acid**

Lot #

R 17/20/23

Part Number: **58113**
Lot Number: **011623**
Description: **Aluminum (Al)**

Expiration Date: **011626**

Recommended Storage: **Ambient (20 °C)**

Nominal Concentration (µg/mL): **10000**

NIST Test Number: **6UTB**

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

5E-05 Balance Uncertainty

0.058 Flask Uncertainty

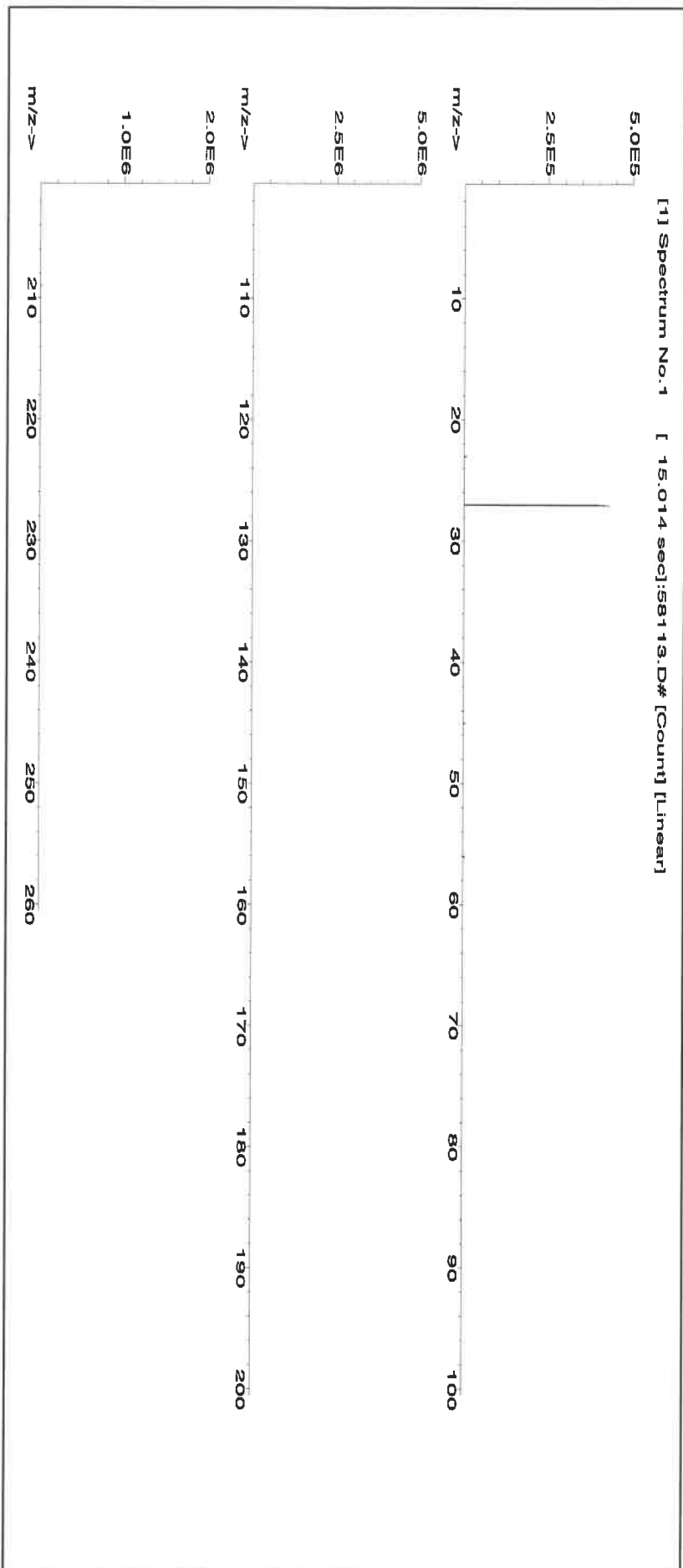
2% 40.0 (mL) Nitric Acid

<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito
Reviewed By:	Pedro L. Rentas
	011623

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
1. Aluminum nitrate nonahydrate (Al)	ALM112021A1	10000	99.999	0.10	7.30	273.9779	274.0078	10001.1	20.0	7784-27-2	2 mg/m3	or-hat 3671 mg/kg	3101a

[1] Spectrum No. 1 [15.014 sec]:58113.D# [Count] [Linear]





15497-15498 R: 03/17/23 (2)

CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

58120
031523
Calcium (Ca)

Solvent: 21110221 Nitric Acid

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

031526
Ambient (20 °C)
10000
6UTB
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

2%
60.0
Nitric Acid
(mL)

Weight shown below was diluted to (mL): 3000.41

<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito 031523
<i>Pedro L. Rentas</i>	
Reviewed By:	Pedro L. Rentas 031523

SDS Information

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

Expanded
Uncertainty

Actual
Conc. (µg/mL)

Actual
Weight (g)

Target
Weight (g)

Assay
(%)

Purity
(%)

Nominal
Conc. (µg/mL)

Lot
Number

RM#

Compound

1. Calcium carbonate (Ca)

IN014 CAD072022A1

10000

99.999

0.10

39.9

75.1990

75.2093

10001.4

20.0

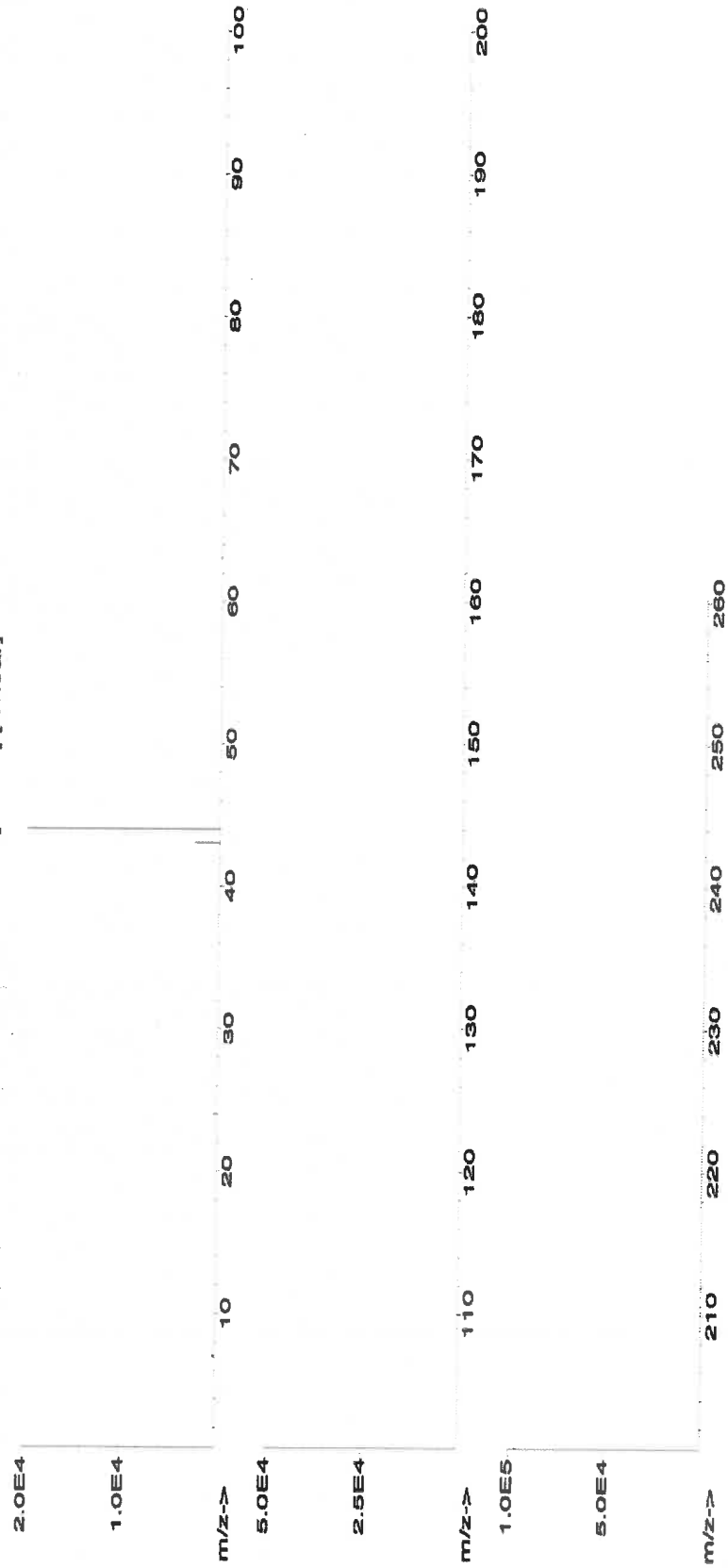
471-34-1

5 mg/m3

or: rat >2000mg/kg

3109a

[1] Spectrum No.1 [12.514 sec]:58120.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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

CERTIFIED 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

Lot #

Solvent: 20510011 Nitric Acid

2% 40.0 (mL)

Nitric Acid

<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito 061522
<i>Pedro L. Rentas</i>	
Reviewed By:	Pedro L. Rentas 061522

Expanded Uncertainty

SDS Information

Actual Weight (g) **Actual Conc. (µg/mL)** **+/- (µg/mL)**

Target Weight (g) **Assay (%)** **Purity (%)**

Actual Conc. (µg/mL) **CAS#** **OSHA PEL (TWA)**

(Solvent Safety Info. On Attached pg.) **LD50** **NIST SRM**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**

32.0006 **82.5** **99.999**

10000 **0.10** **10099-74-8**

0.05 mg/m3 **intrins-rat 88 mg/kg** **3128**

10001.1 **32.0041** **20.0**



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	<0.02	Os	<0.01	Rh	<0.02	Ag	<0.02	Tl	<0.02	V	<0.02
Ba	<0.02	Cs	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.02	Pd	<0.02	Rb	<0.02	Na	<0.02	Th	<0.02	Yb	<0.02
Be	<0.01	Cr	<0.02	Ga	<0.02	Fe	<0.02	Hg	<0.2	P	<0.2	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	Pr	<0.02	Sm	<0.02	S	<0.02	Sn	<0.02	Zn	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	Ti	<0.02	Zr	<0.02

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



Certified Reference Material CRM

CERTIFIED WEIGHT REPORT:

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

Solvent: 20510011 Nitric Acid

Lot #

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

2% 60.0 (mL) Nitric Acid

Weight shown below was diluted to (mL): 3000.4

5E-05 Balance Uncertainty
0.06 Flask Uncertainty

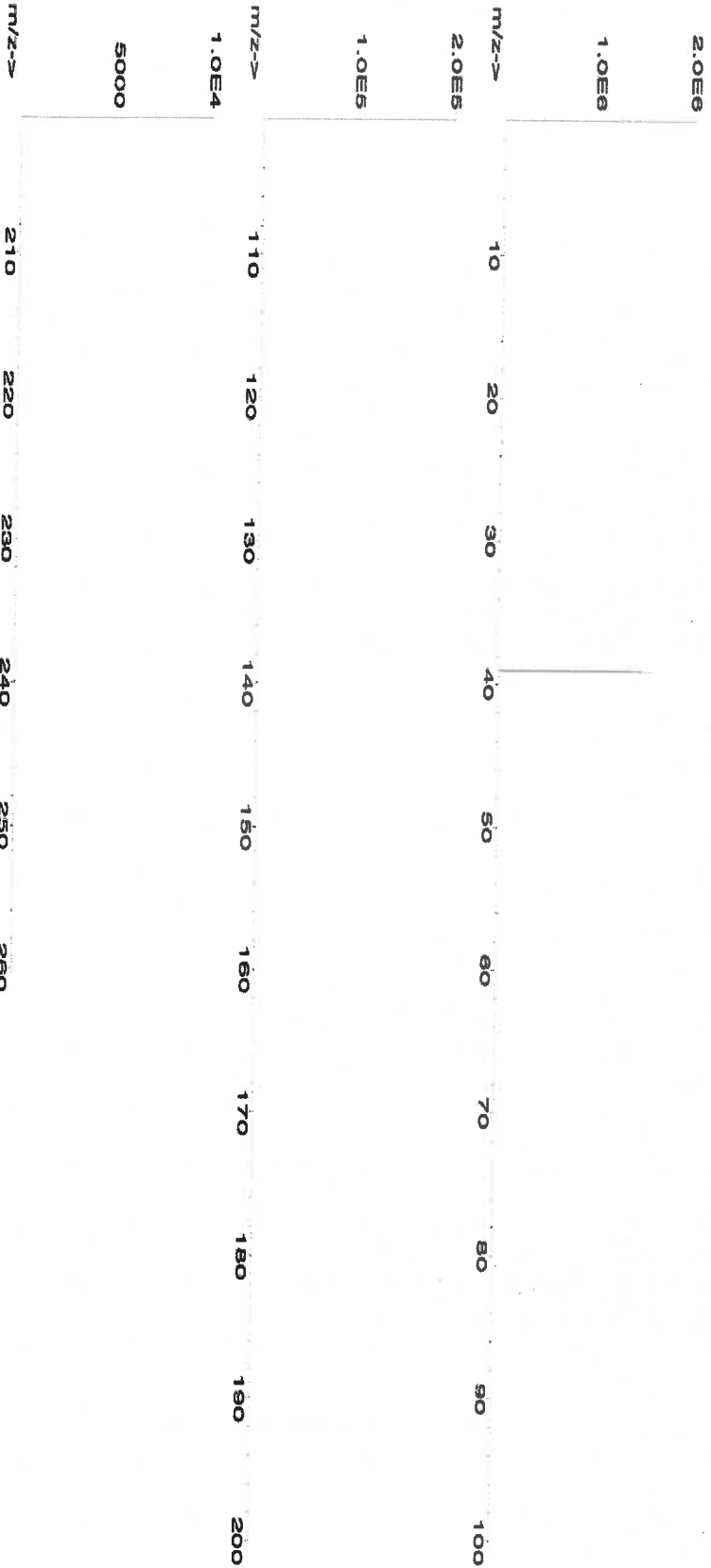
<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito
Reviewed By:	<i>Pedro L. Renteria</i>
	120822

Compound

Lot	Nominal	Purity	Uncertainty	Assay	Target	Actual	Actual	Expanded	SDS Information	NIST
Number	Conc. (µg/mL)	(%)	Purity (%)	(%)	Weight (g)	Weight (g)	Conc. (µg/mL)	Uncertainty +/- (µg/mL)	(Solvent Safety Info. On Attached pg.)	SRM

1. Potassium nitrate (K) IN034 KD022021A1 10000 99.989 0.10 37.6 79.7990 79.8075 10001.1 20.0 7757-79-1 5 mg/m3 crtat 3015 mg/kg 3141a

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





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



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-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, $X_{CRM/RM}$, 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:

$$X_{CRM/RM} = (\bar{X}_a) (u_{char\ a})$$

$\bar{X}_a$ = 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

- 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





CERTIFIED WEIGHT REPORT:

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

Lot #
21110221
Solvent: Nitric Acid

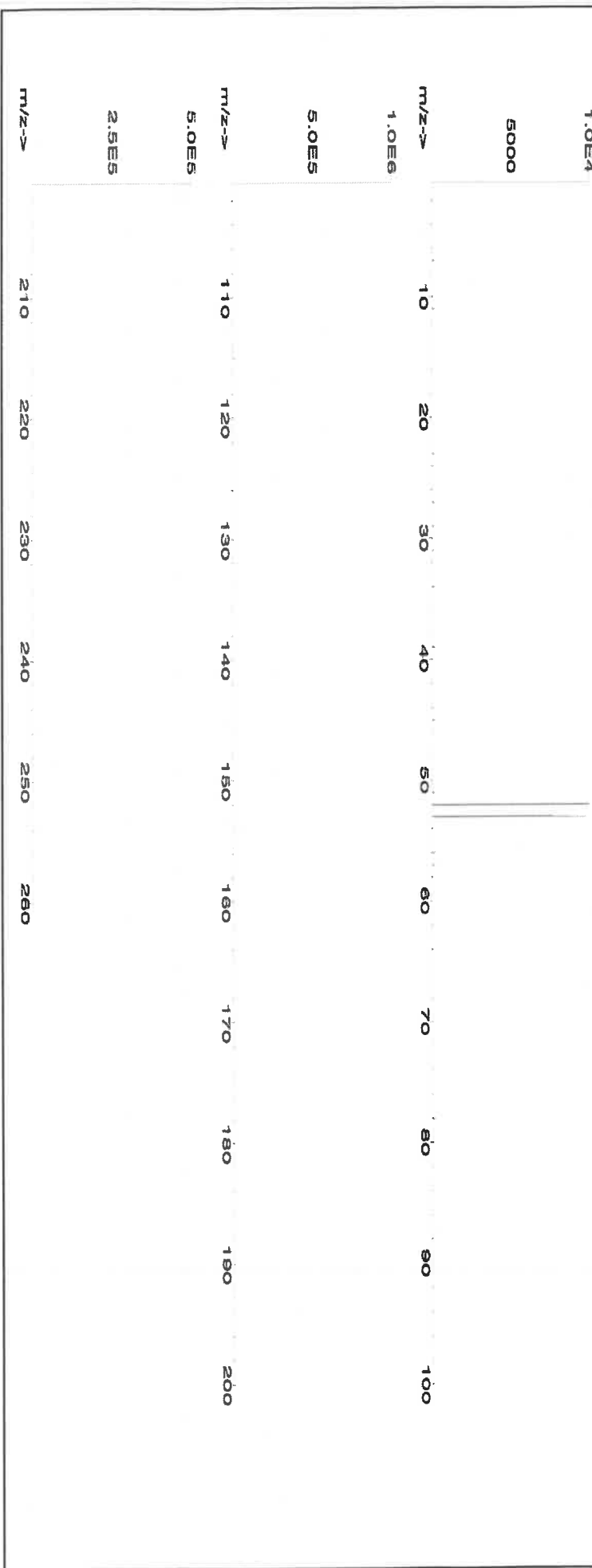
Formulated By:	Lawrence Barry
	060523
Reviewed By:	Pedro L. Ruelas
	060523

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

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
----------	-------------	------------	-----------------	-------------------	------------------	-----------------------	-----------------------	---------------------	----------------------------------	------	----------------	------	----------

1. Chromium(III) nitrate nonahydrate (Cr) 58124 071122 0.1000 200.0 0.084 1000 10000.1 1000.0 2.2 7789-02-8 0.5 mg(Cr)/m3 or rat 3250 mg/kg 3112a

[1] Spectrum No.1 [31.393 sec]:57024.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

- * The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- * Purified acids, 18.2 megohm deionized water, calibrated Class A glassware and the highest purity raw materials are used in the preparation of all standards.
- * 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



M5697 R: 10/27/23

CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

58029
102523
Copper (Cu)

Lot #
Solvent:

24002546 Nitric Acid

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

102526
Ambient (20 °C)
1000
6UTB

2.0% Nitric Acid
40.0 (mL)

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

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

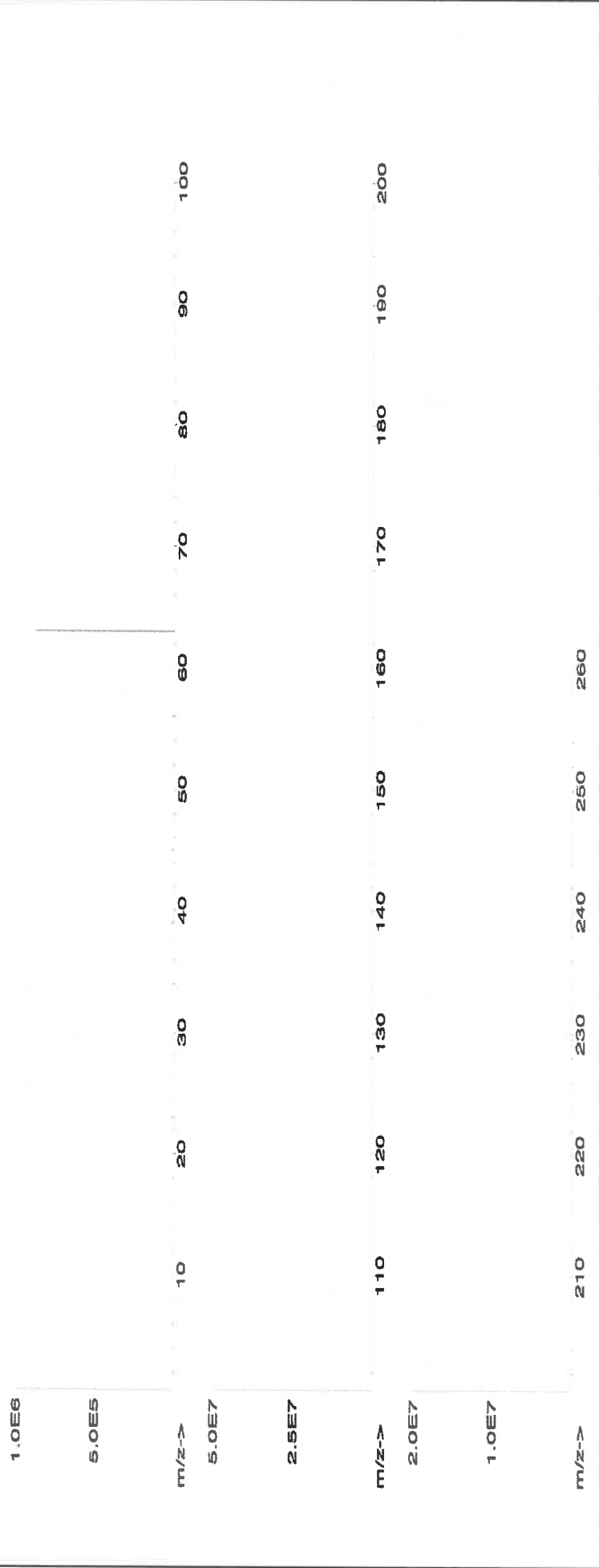
SDS Information

Expanded Uncertainty	(Solvent Safety Info. On Attached pg.)	NIST
+/- (µg/mL)	CAS#	LD50
1000.0	10031-43-3	1 mg/m3 orl-rat 794 mg/kg 3114

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty <th>SDS Information</th>	SDS Information
----------	-------------	------------	-----------------	-------------------	------------------	-----------------------	-----------------------	---------------------	---	-----------------

1. Copper(II) nitrate trihydrate (Cu) 58129 100223 0.1000 200.0 0.084 1000 10000.1 1000.0 2.2 10031-43-3 1 mg/m3 orl-rat 794 mg/kg 3114

[1] Spectrum No. 1 [33.422 sec]:58029.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

Part Number: 57004
Lot Number: 102523
Description: Beryllium (Be)

Lot # 24002546
Solvent: Nitric Acid

Expiration Date:

102526

2.0%

40.0 (mL)

Nitric Acid

Recommended Storage:

Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

Volume shown below was diluted to (mL):

5E-05

Balance Uncertainty

0.058

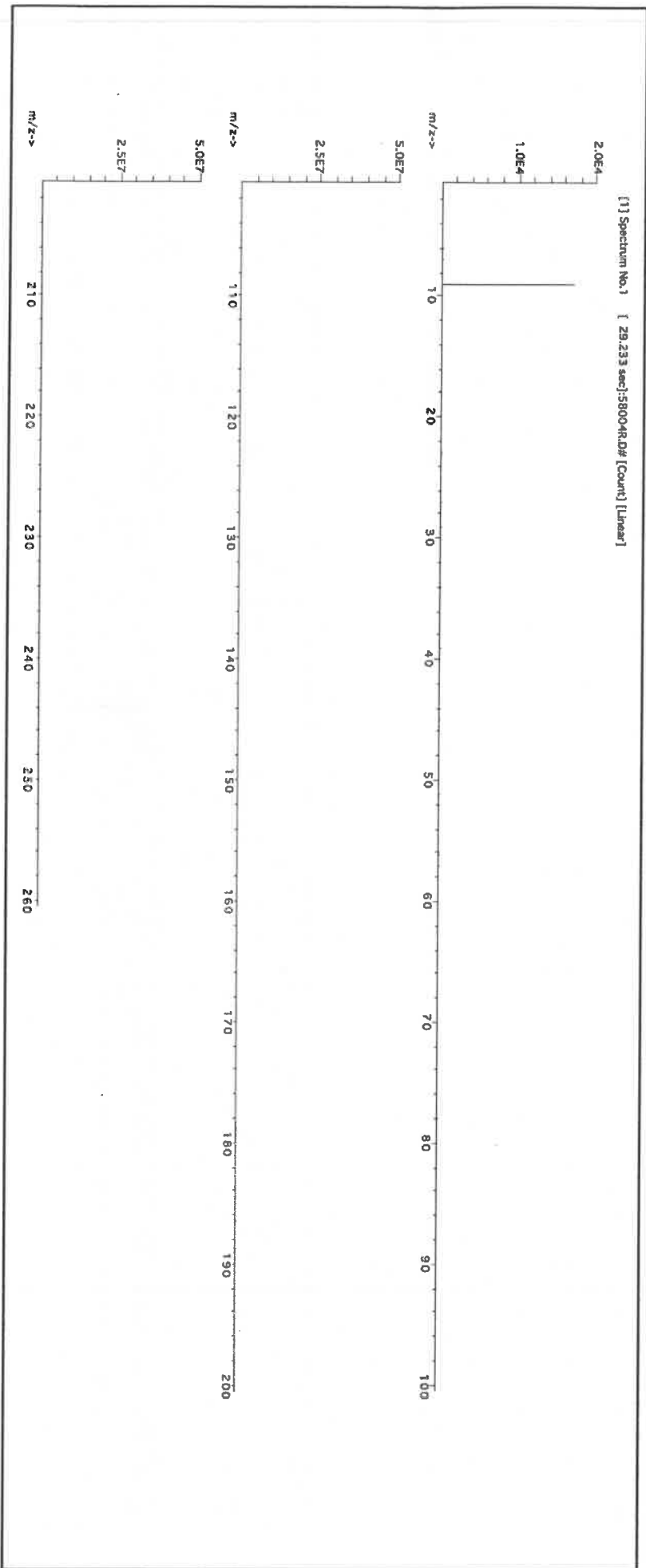
Flask Uncertainty

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

SDS Information

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
----------	-------------	------------	-----------------	-------------------	--------------------------	-----------------------	-----------------------	---------------------	----------------------------------	------	----------------	------	----------

1. Beryllium nitrate (Be)	58104	091423	0.1000	200.0	0.084	1000	10001.5	1000.0	2.2	13597-99-4	0.2µg/m3	intrinsc-rat 3.16mg/kg	NA
---------------------------	-------	--------	--------	-------	-------	------	---------	--------	-----	------------	----------	------------------------	----





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

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

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Tc	<0.02	U	<0.02
As	<0.02	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.01	Os	<0.02	Rh	<0.02	Ag	<0.02	Ti	<0.02	V	<0.02
Ba	<0.02	Cs	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.02	Pd	<0.02	Rb	<0.02	Na	<0.2	Th	<0.02	Yb	<0.02
Be	T	Cr	<0.02	Ga	<0.02	Fe	<0.02	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	<0.02	Tm	<0.02	Y	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	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.

* Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).

* Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.

* All Standards should be stored with caps tight and under appropriate laboratory conditions.

* Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, D.C. (1994).



Certified Reference Material CRM

CERTIFIED WEIGHT REPORT:

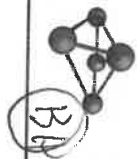
Part Number: 57050
Lot Number: 071123
Description: Tin (Sn)

Solvents: 21110221 Nitric Acid
22D0562008 Hydrochloric acid

Lot #

R-02509124

M599



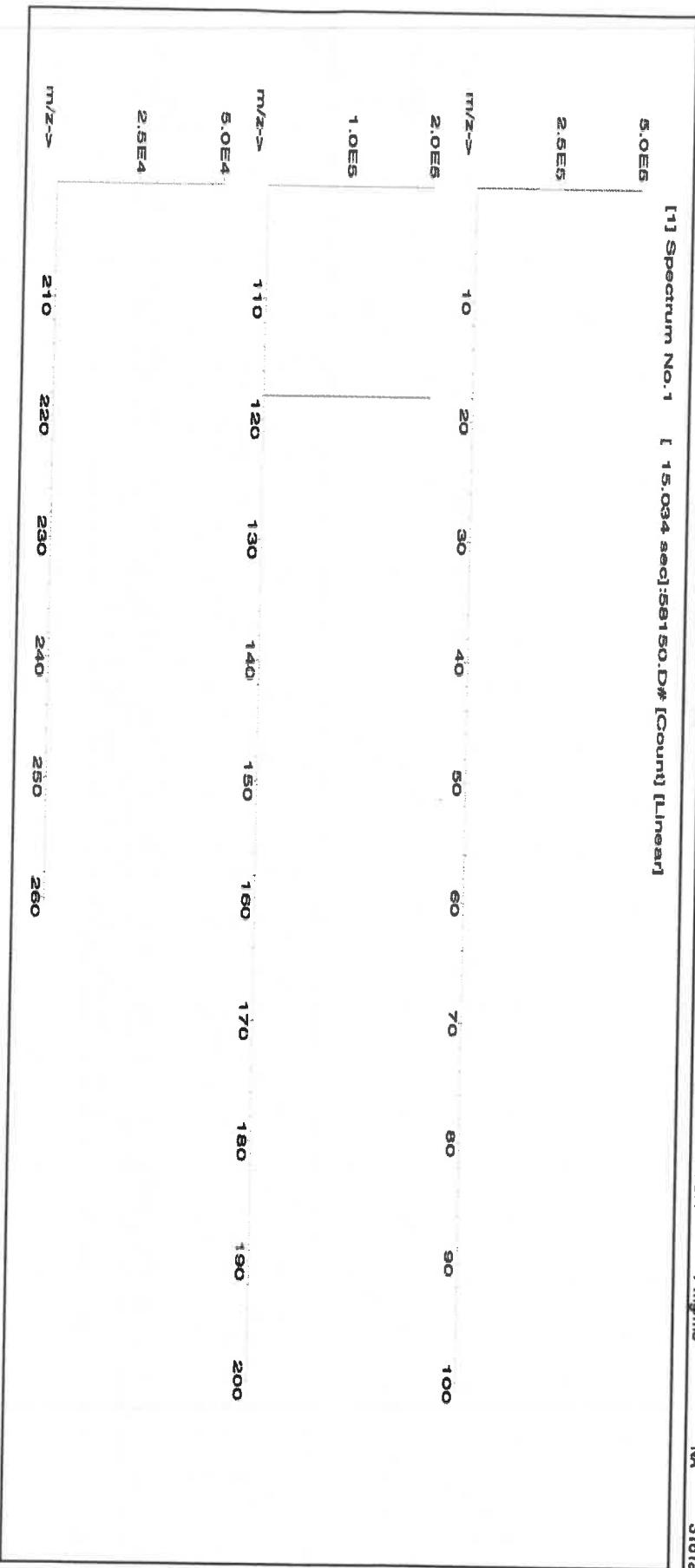
Expiration Date: 071126
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Weight shown below was diluted to (mL): 499.93
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

Formulated By:	Benson Chan
	071123
Reviewed By:	Pedro L. Rentas
	071123

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

1. Ammonium hexafluoroantimonate(V) (Sn) IN010 SMD042023A1 1000 99.999 0.10 44.2 1.13107 1.13286 1001.6 2.0 16919-24-7 7 mg/m3 NA 3161a

[1] Spectrum No. 1 [15.034 sec]:56150.D# [Count] [Linear]





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

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

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pr	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Te	<0.02	U	<0.02
As	<0.2	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.01	Os	<0.02	Rh	<0.02	Ag	<0.02	Ti	<0.02	V	<0.02
Ba	<0.02	Cs	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.02	Pd	<0.02	Rb	<0.02	Na	<500	Th	<0.02	Yb	<0.02
Be	<0.01	Cr	<0.02	Ga	<0.02	Fe	<0.2	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	<0.02	Tm	<0.02	Y	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	Ta	<0.02	Zn	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	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: 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

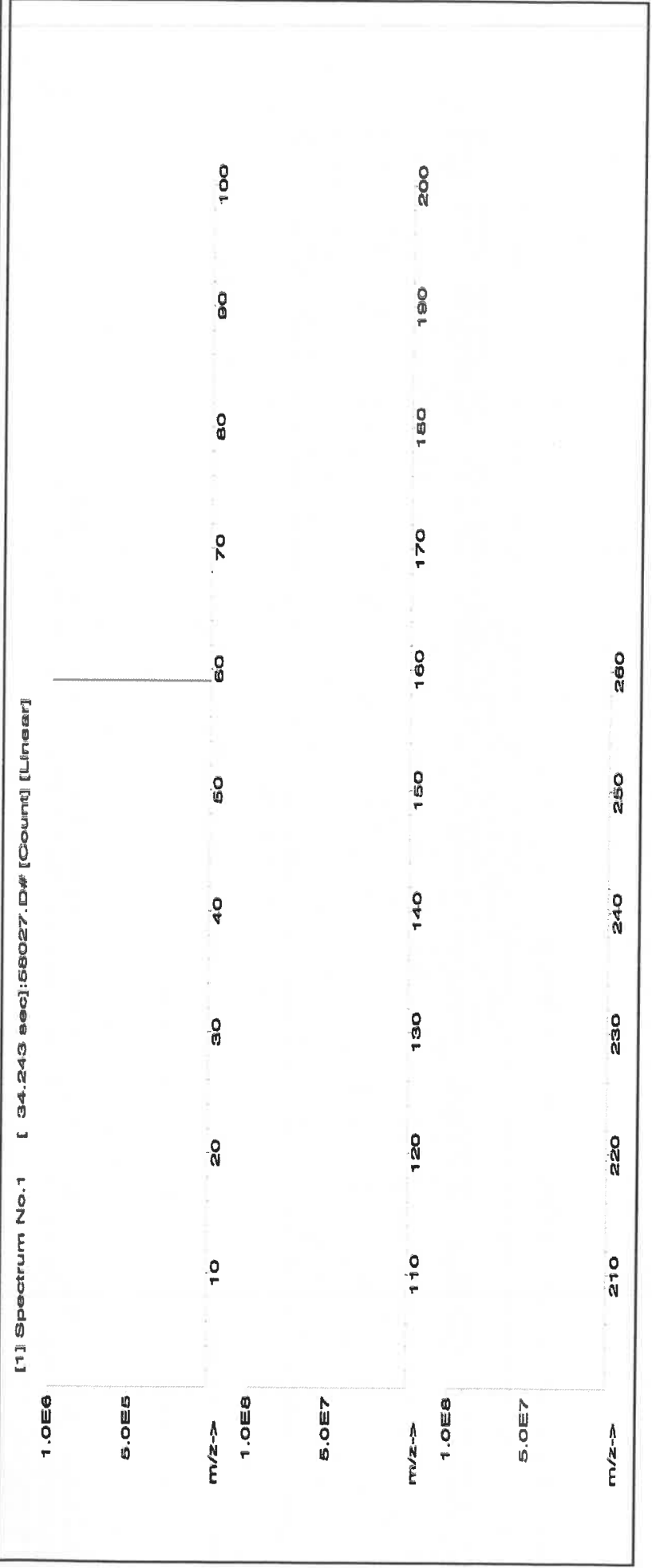
2.0% Nitric Acid
40.0 (mL)

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

SDS Information

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

1. Cobalt(II) nitrate hexahydrate (Co) 58127 050923 0.1000 200.0 0.084 1000 10000.0 1000.0 2.2 10026-22-9 0.02 mg/m3 orl-rat 691 mg/kg 3113





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

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

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

57033
111323
Arsenic (As)

Lot #
Solvent:

24002546
Nitric Acid

Expiration Date:

111326

2.0%
80.0 (mL)

Nitric Acid

Recommended Storage:

Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

Volume shown below was diluted to (mL):

4000.0

5E-05 Balance Uncertainty
0.06 Flask Uncertainty

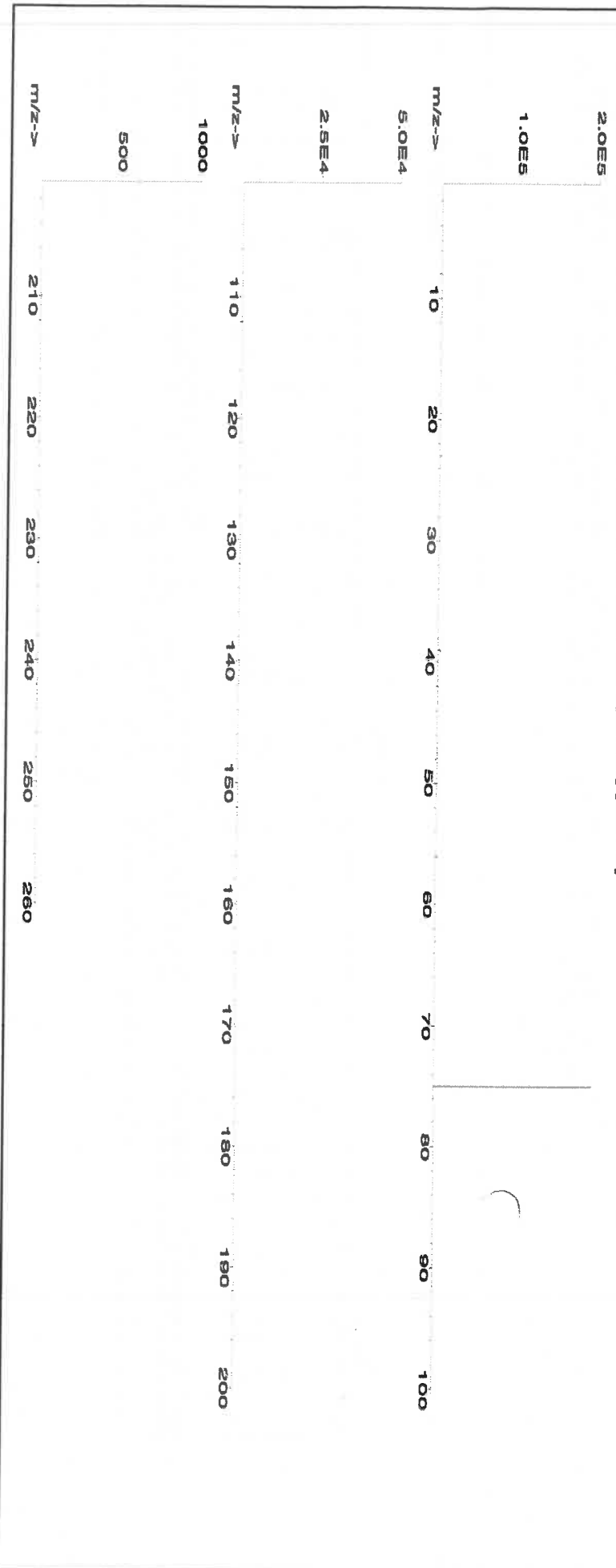
Formulated By:	Lawrence Barry
Reviewed By:	
	Pedro L. Rendas
	111323

Compound

Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
-------------	------------	-----------------	-------------------	--------------------------	-----------------------	-----------------------	---------------------	----------------------------------	--	------	----------------	------	----------

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
-----------------	-------	--------	--------	-------	-------	------	---------	--------	-----	-----------	-----------	------------------	-------

[1] Spectrum No. 1 [34.433 sec]:57033.D# [Count] [Linear]





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

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

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	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 _h	<0.02	Yb	<0.02
Bc	<0.01	Cr	<0.02	Ga	<0.02	Fe	<0.2	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	<0.02	Tm	<0.02	Y	<0.02
Bi	<0.02	Co	<0.02	Ge [*]	<0.02	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	Sn	<0.02	Zn	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	Ti	<0.02	Zr	<0.02

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

Part Number: 57115
Lot Number: 041723
Description: Phosphorous (P)

Solvent: 21110221 Nitric Acid

Lot #

R102109124 M5815

Expiration Date: 041726
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 10000
NIST Test Number: 6UTB

2% 40.0 (mL) Nitric Acid

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

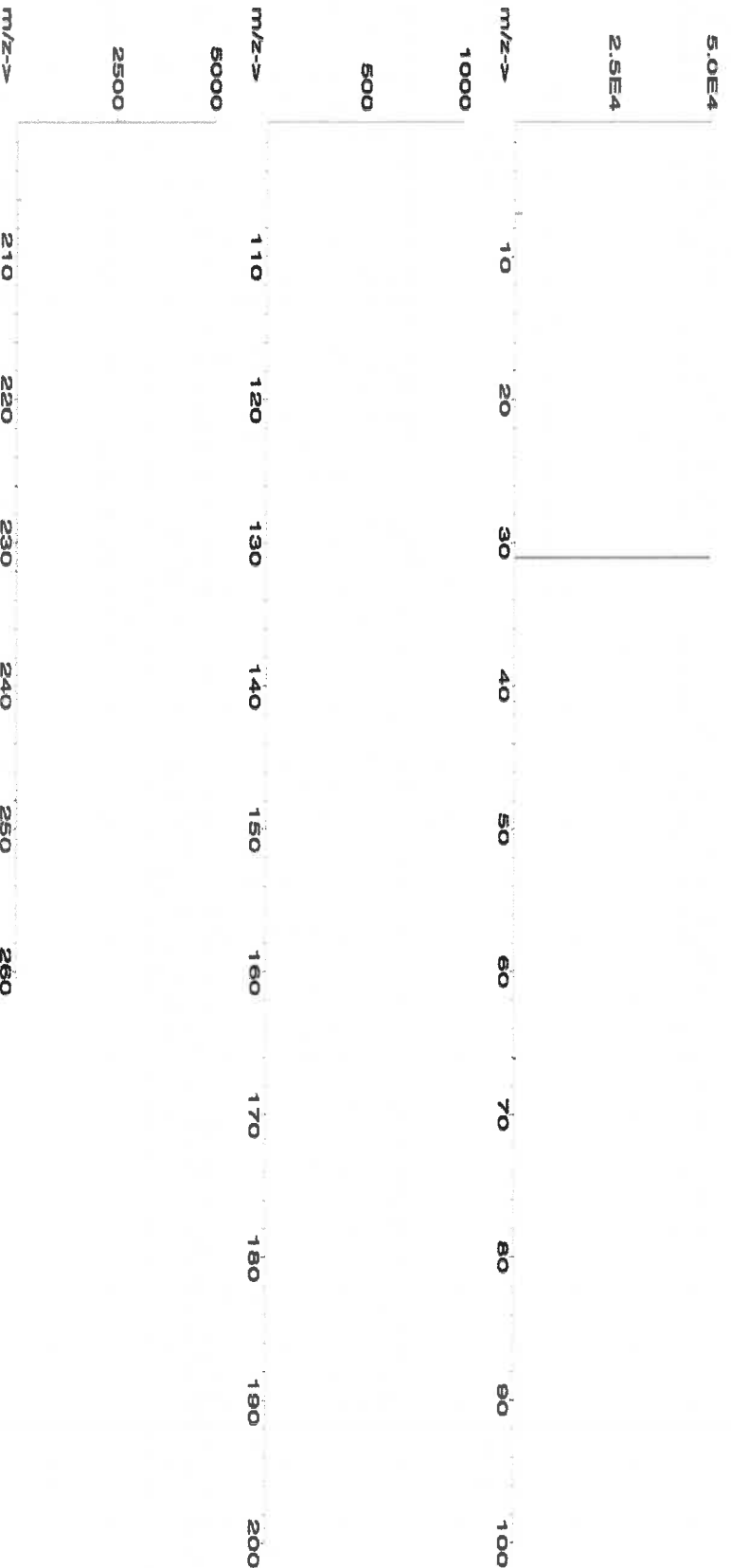
Formulated By: Lawrence Barry	041723
Reviewed By: Pedro L. Rentas	041723

SDS Information

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

1. Ammonium dihydrogen phosphate (P) IN008 PVR2019A1 10000 99.999 0.10 27.5 72.7287 72.7289 10000.0 20.0 7722-76-1 5 mg/m3 or-hal >2000mg/kg 3186

[1] Spectrum No.1 [12.074 sec]:58115.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

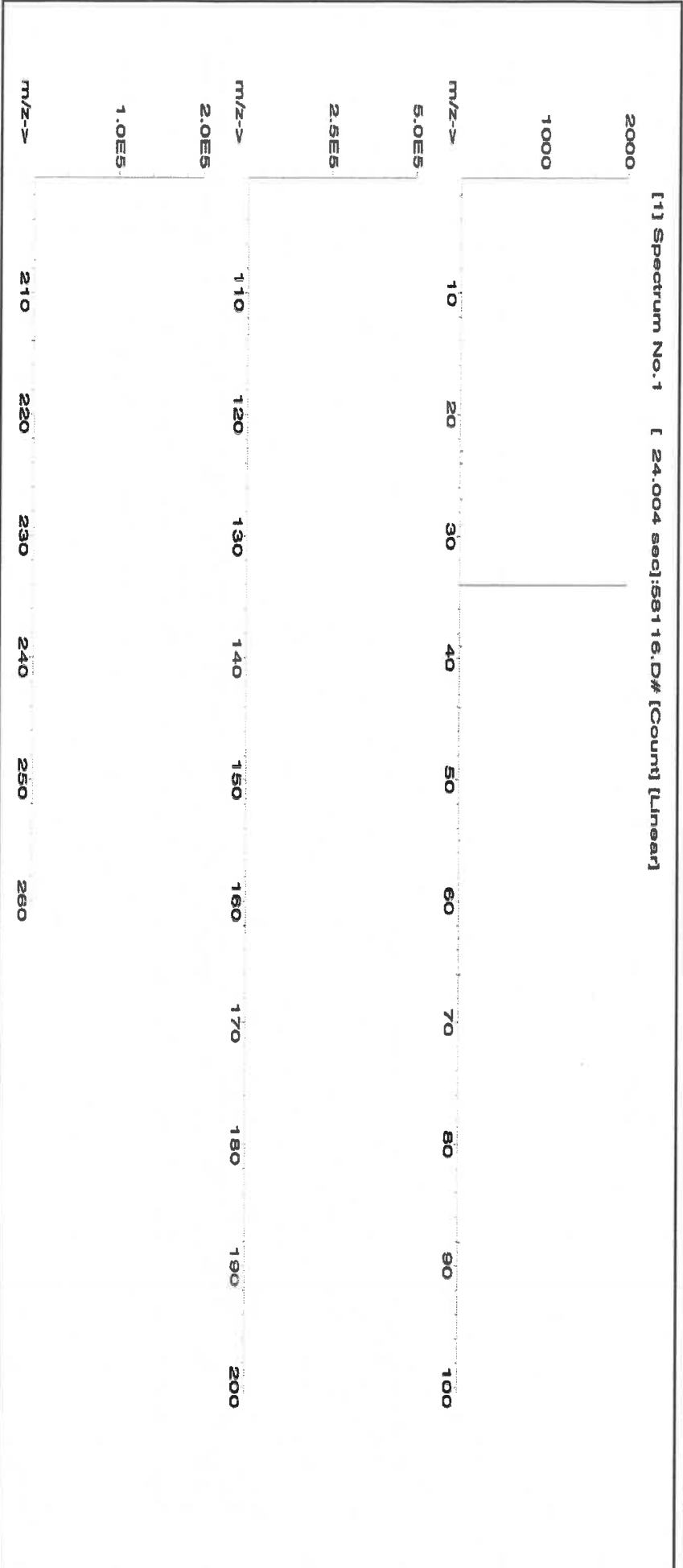
Part Number: **57116**
Lot Number: **071123**
Description: **Sulfur (S)**

Lot #
Solvent: 071123
ASTM Type 1 Water

Formulated By:	Lawrence Barry
Reviewed By:	
Pedro L. Rentas	
071123	

Expiration Date: 071126
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 10000
NIST Test Number: 6UTB
Weight shown below was diluted to (mL): 1999.48
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

SDS Information									
Compound	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)
Ammonium sulfate (S)	IN117 SLBR7225V	10000	99.9	0.10	24.3	82.4675	82.4692	10000.1	20.0
						7763-20-2	NA	oralal 4250mg/kg	3181





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: 58030
Lot Number: 111623
Description: Zinc (Zn)

Solvent: 24002546 Nitric Acid

2% 60.0 (mL) Nitric Acid

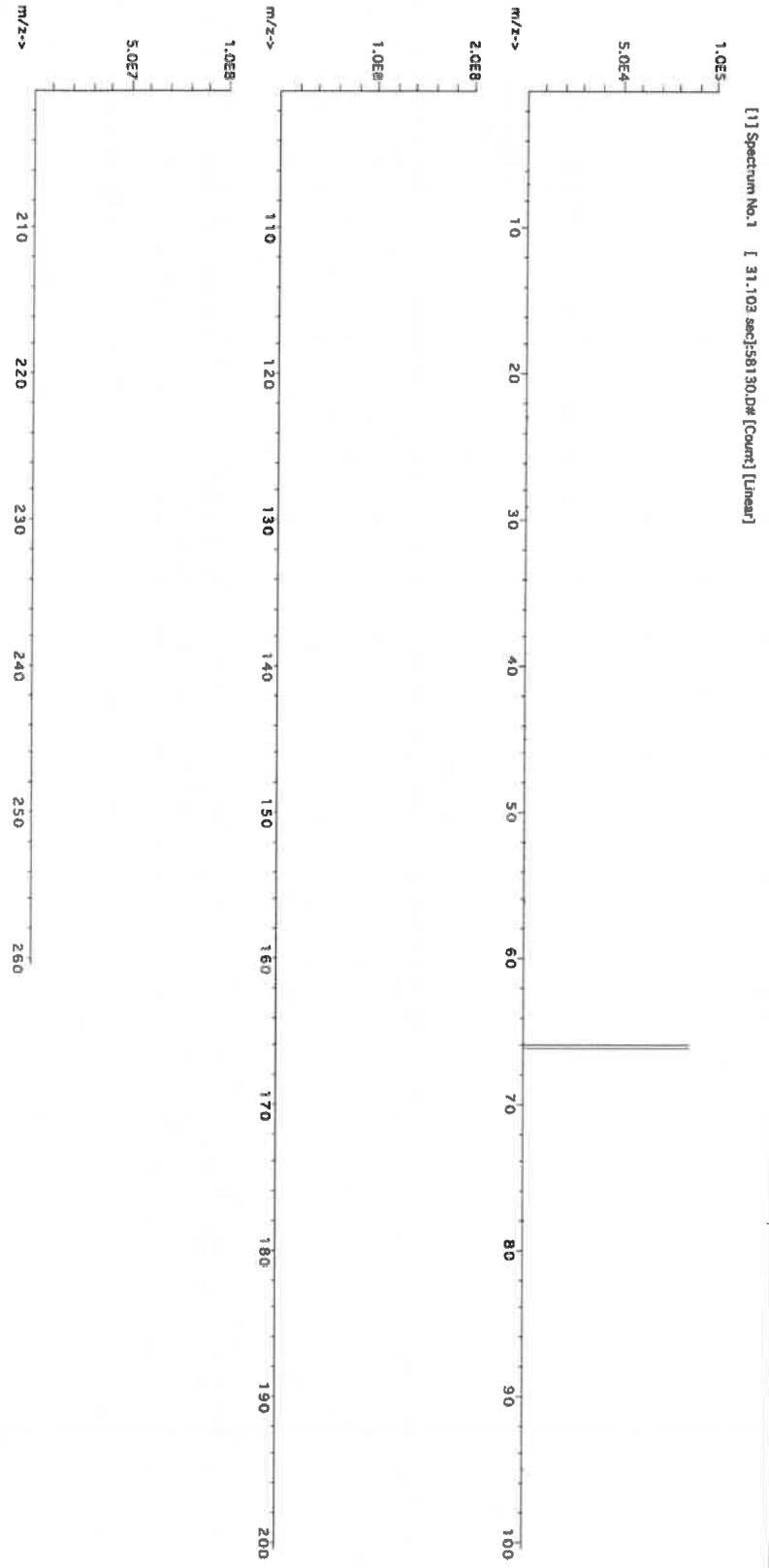
Expiration Date: 111626
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB

Formulated By:	Benson Chan
Reviewed By:	Pedro L. Reintas
111623	

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

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

1. Zinc nitrate hexahydrate (Zn) IN016 ZNE03021A1 1000 99.999 0.10 24.3 12.3475 12.3502 1000.2 2.0 10196-16-6 1 mg/mL 3168





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

June 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

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

F: 540-585-3012

info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
Catalog Number: CGY10
Lot Number: V2-Y740548
Matrix: 2% (v/v) HNO₃
Value / Analyte(s): 10 000 µg/mL ea:
Yttrium
Starting Material: Yttrium Oxide
Starting Material Lot#: 2661 and 06230520YL
Starting Material Purity: 99.9984%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10000 ± 30 µg/mL
Density: 1.032 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1	10011 ± 25 µg/mL EDTA NIST SRM 928 Lot Number: 928
Assay Method #2	9997 ± 50 µg/mL ICP Assay NIST SRM 3167a Lot Number: 190730
Assay Method #3	9984 ± 31 µg/mL Calculated NIST SRM Lot Number: See Sec. 4.2

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

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

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

M Ag <	0.004600	M Eu	0.009037	M Na	0.086360	M Se <	0.005200	M Zn	0.030125
M Al	0.014862	O Fe	0.002410	M Nb <	0.000570	O Si	0.024100	O Zr <	0.002600
M As <	0.003500	M Ga <	0.000570	M Nd	0.000923	M Sm	0.000461		
M Au <	0.001700	M Gd <	0.003500	M Ni <	0.005700	M Sn <	0.002300		
O B	0.002209	M Ge <	0.005200	M Os <	0.001200	M Sr <	0.004600		
O Ba <	0.002500	M Hf <	0.000570	n P <		M Ta <	0.000570		
O Be <	0.001400	M Hg <	0.000570	M Pb	0.005020	M Tb	0.001044		
M Bi <	0.003500	M Ho	0.009037	M Pd <	0.005100	M Te <	0.002300		
O Ca	0.009841	M In <	0.002300	M Pr <	0.002300	M Th <	0.000570		
M Cd <	0.000570	M Ir <	0.000570	M Pt <	0.000570	M Ti <	0.003500		
M Ce <	0.002300	O K	0.018677	M Rb <	0.000570	M Tl <	0.000570		
M Co <	0.000570	M La	0.000461	M Re <	0.000570	M Tm <	0.003500		
M Cr <	0.004000	O Li <	0.009300	M Rh <	0.008000	M U <	0.000570		
M Cs <	0.000570	M Lu	0.000582	M Ru <	0.000570	M V	0.001265		
M Cu	0.002610	O Mg	0.001486	n S <		M W <	0.002300		
M Dy	0.003815	M Mn	0.000582	M Sb	0.005422	s Y <			
M Er	0.003615	M Mo <	0.005700	M Sc <	0.001200	M Yb	0.001827		

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

6.0 INTENDED USE

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

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.
- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.
- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

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

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 88.91 +3 6 Y(OH)(H₂O)_{x+2}

Chemical Compatibility -Soluble in HCl, H₂SO₄ and HNO₃. Avoid HF, H₃PO₄ and neutral to basic media.

Stable with most metals and inorganic anions forming an insoluble carbonate, oxide, oxalate, and fluoride.

Avoid mixing with elements / solutions containing moderate amounts of fluoride.

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

Y Containing Samples (Preparation and Solution) - Metal (Soluble in acids); Oxide (Dissolve by heating in H₂O / HNO₃); Ores (Carbonate fusion in PtO followed by HCl dissolution); Organic Matrices (Dry ash and dissolve in 1:1 H₂O / HCl or HNO₃).

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

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 89 amu	0.8 ppt	N/A	73Ge16O, 178Hf+2
ICP-OES 360.073 nm	0.005 / 0.000036 µg/mL	1	Ce, Th
ICP-OES 371.030 nm	0.004 / 0.00007 µg/mL	1	Ce
ICP-OES 377.433 nm	0.005 / 0.0009 µg/mL	1	Ta, Th

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

February 20, 2024

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

11.2 Lot Expiration Date

- February 20, 2029

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:

Uyen Truong
Custom Processing Supervisor



Certificate Approved By:

Muzzammil Khan
Stock Laboratory Supervisor



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





CERTIFIED WEIGHT REPORT:

Part Number: 57028

Lot Number: 041124

Description: Nickel (NI)

Solvent: 24002546 Nitric Acid

Lot #

MS961 R-1 6/11/24

2% 5.0 (mL) Nitric Acid

Expiration Date: 041127

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL): 1000

NIST Test Number: 6UTB

5E-05 Balance Uncertainty

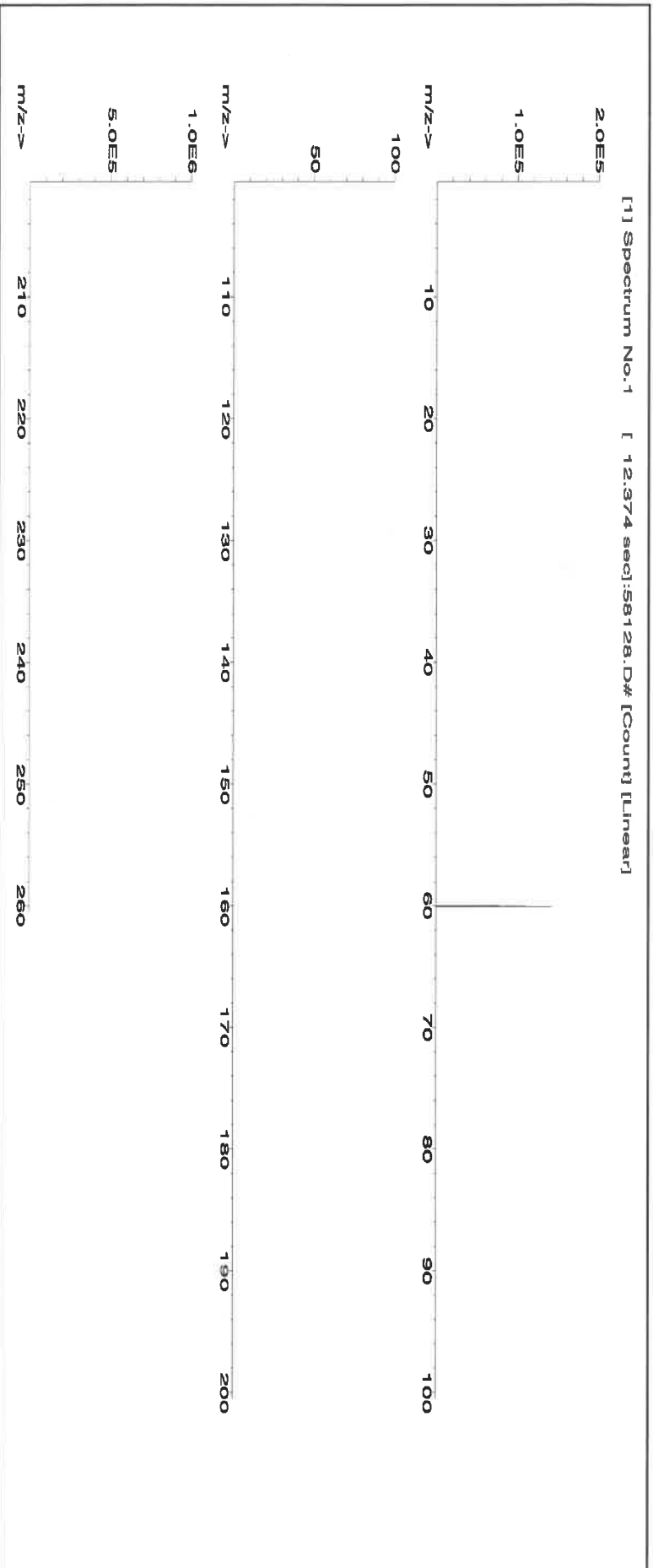
Weight shown below was diluted to (mL): 249.85 0.002 Flask Uncertainty

Formulated By:	Brian Geddes	041124
Reviewed By:	Pedro L. Rentas	041124

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	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	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 ($\mu\text{g/mL}$)

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

MS962 **R10614124**

Lot # **24002546** Solvent: **Nitric Acid**

Part Number: **57034**
Lot Number: **060624**
Description: **Selenium (Se)**

2.0% 40.0 (mL) Nitric Acid

Expiration Date: **060627**

Recommended Storage: **Ambient (20 °C)**

Nominal Concentration (µg/mL): **1000**

NIST Test Number: **6UTB**

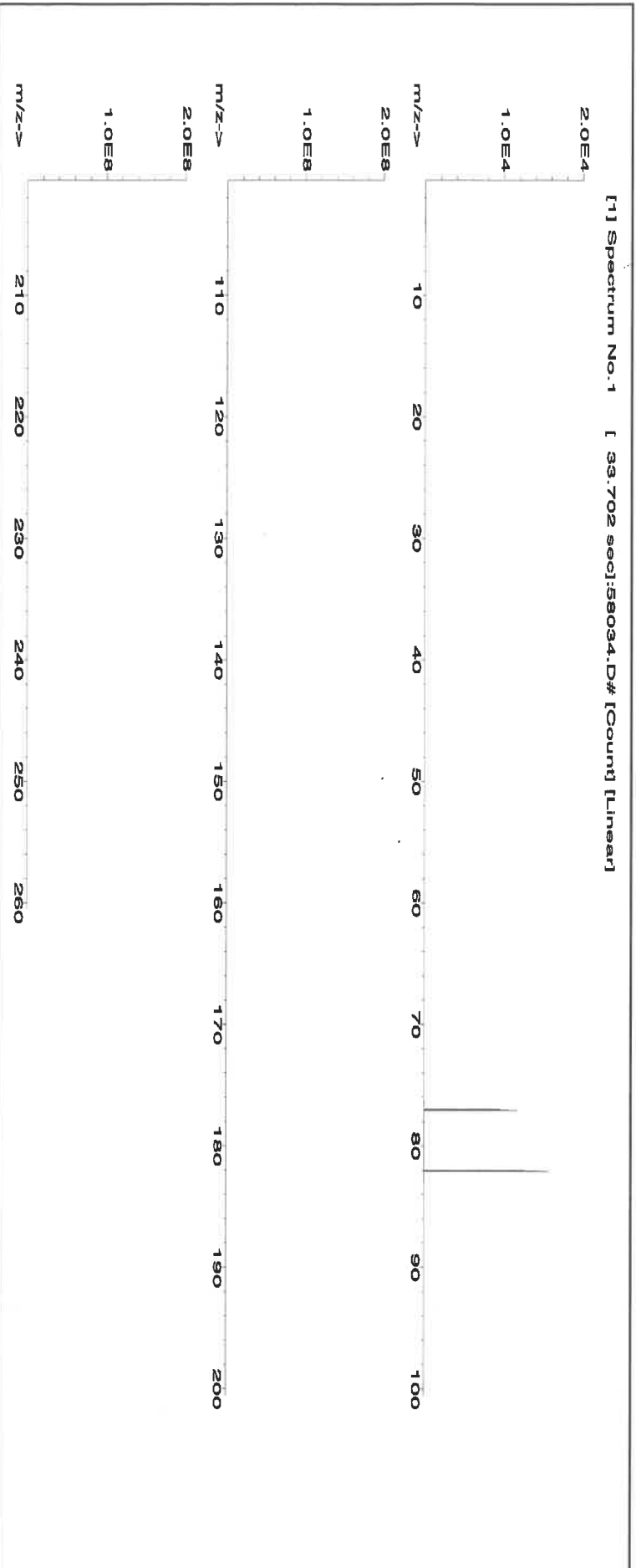
Volume shown below was diluted to (mL): **2000.07**

SE-05 Balance Uncertainty
0.100 Flask Uncertainty

SDS Information

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	(Solvent Safety Info. On Attached pg.)	NIST SRM
1. Selenium (Se)	58134	071223	0.1000	200.0	0.084	1000	10002.5	1000.0	2.2	7782-49-2 0.2 mg/m3 or-tral 6700 mg/kg	3149

[1] Spectrum No.1 [33.702 sec]:58034.D# [Count] [Linear]





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

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

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pt	<0.02	Se	<0.02	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Te	<0.02	U	<0.02
As	<0.2	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.01	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	Zr	<0.02

(T) = Target analyte

Physical Characterization:

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

Certified by:

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

Certificate of Analysis

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: 800.569.6799; 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

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: 800.569.6798; 540.585.3030, Fax: 540.585.3012; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

July 17, 2022

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

11.2 Lot Expiration Date

- July 17, 2027

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:

Uyen Truong
Supervisor, Product Documentation



Certificate Approved By:

Michael Booth
Director, Technical



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Certificate of Analysis

MS978, MS979



Refine your results. Redefine your industry.

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

R: 2/22/24

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution

Catalog Number: CGT1

Lot Number: T2-T1719972

Matrix: 2% (v/v) HNO₃

Value / Analyte(s): tr. HF

Starting Material: 1 000 µg/mL ea.

Starting Material: Titanium

Starting Material: Ti Metal

Starting Material Lot#: 2094

Starting Material Purity: 99.9975%

Certified Value: 1002 ± 5 µg/mL

Density: 1.012 g/mL (measured at 20 ± 4 °C)

Assay 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:

$X_{CRM/RM} = \sum (X_i / U_i^2)$ where X_i = mean of Assay Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

$U_{A,HR} = k \cdot U_{A,HR}$ where $U_{A,HR}$ = the standard uncertainty of characterization Method A with $U_{A,HR}$ = the standard uncertainty of characterization Method A with

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

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

M Ag	<	0.000536	M Eu	<	0.000268	O Na	<	0.032670	M Se	<	0.001204	O Zn	<	0.003267
M Al	<	0.000872	O Fe	<	0.003225	O Nb	<	0.043560	O Si	<	0.004735	O Zr	<	0.043560
M As	<	0.008586	M Ga	<	0.000268	M Nd	<	0.000268	M Sm	<	0.000268			
M Au	<	0.004577	M Gd	<	0.000268	O Ni	<	0.010890	M Sn	<	0.000986			
O B	<	0.008929	M Ge	<	0.002146	M Os	<	0.000269	O Sr	<	0.000986			
M Ba	<	0.002683	M Hf	<	0.002161	O P	<	0.054450	M Ta	<	0.010560			
M Be	<	0.005366	M Hg	<	0.003231	M Pb	<	0.001073	M Tb	<	0.000268			
M Bi	<	0.001609	M Ho	<	0.000268	M Pd	<	0.000268	M Th	<	0.001341			
O Ca	<	0.000676	M In	<	0.002683	M Pr	<	0.000268	M Tl	<	0.053663			
M Cd	<	0.000268	M Ir	<	0.000269	M Pt	<	0.000536	S Ti	<				
M Co	<	0.000268	M K	<	0.001172	M Rb	<	0.000268	M Tl	<	0.000268			
M Cr	<	0.000752	O Li	<	0.000268	M Re	<	0.000268	M Tm	<	0.000268			
M Cs	<	0.000268	M Lu	<	0.000268	M Rh	<	0.000268	M U	<	0.000268			
O Cu	<	0.010890	O Mg	<	0.005445	I S	<	0.006976	M Y	<	0.002146			
M Dy	<	0.000268	O Mn	<	0.003267	M Sb	<	0.004900	M Yb	<	0.000536			
M Er	<	0.000268	M Mo	<	0.000774	O Sc	<							

6.0 INTENDED USE

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

- 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.	14 ppt
ICP-MS 48 amu		

HAZARDOUS INFORMATION

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

ICP-OES 323.452 nm	ICP-OES 334.941 nm	ICP-OES 336.121 nm
0.0054 / 0.00092 µg/mL	0.0038 / 0.00028 µg/mL	0.0053 / 0.00034 µg/mL

1 W, Mo, Co
1 Nb, Ta, Cr, U
1 Ce, Ar, Ni
Ru
(where X = Zr, Mo,
14N17N2, 36Ar12C,
48Ca, 196X=2
14N16O18O,
32S16O, 32S14N,
N/A

8.0 HOMOGENEITY

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

9.0 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"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, VA 24073, USA; Telephone: 800.868.6786; 540.565.3030; Fax: 540.565.3030; Email: info@inorganicventures.com

11.0

CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

June 17, 2022

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

11.2 Lot Expiration Date

- June 17, 2027

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date:

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

12.0

NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Thomas Kozlikowski
Manager, Quality Control

TD9784

Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

Paul Gaines



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

M5985
R: 6/14/24

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
Catalog Number: CGIN10
Lot Number: U2-IN729349
Matrix: 5% (v/v) HNO₃
Value / Analyte(s): 10 000 µg/mL ea:
Indium
Starting Material: Indium Metal
Starting Material Lot#: 2511
Starting Material Purity: 99.9995%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10022 ± 30 µg/mL
Density: 1.044 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1	10021 ± 56 µg/mL ICP Assay NIST SRM 3124a Lot Number: 110516
Assay Method #2	10035 ± 25 µg/mL EDTA NIST SRM 928 Lot Number: 928
Assay Method #3	10001 ± 33 µg/mL Calculated NIST SRM Lot Number: See Sec. 4.2

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

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

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

M	Ag	<	0.000760	M	Eu	<	0.000760	O	Na	0.012771	M	Se	<	0.023000	M	Zn	<	0.006100
M	Al	0.003385	O	Fe	0.004462	M	Nb	<	0.000760	O	Si	0.024619	M	Zr	<	0.000760		
M	As	<	0.004600	M	Ga	<	0.000760	M	Nd	<	0.000760	M	Sm	<	0.000760			
M	Au	<	0.002300	M	Gd	<	0.000760	O	Ni	<	0.005100	M	Sn	<	0.000760			
O	B	0.003692	M	Ge	<	0.001600	M	Os	<	0.000760	O	Sr	<	0.000610				
M	Ba	<	0.001600	M	Hf	<	0.000760	n	P	<		M	Ta	<	0.000760			
O	Be	<	0.000130	M	Hg	<	0.003100	M	Pb	0.001400	M	Tb	<	0.000760				
M	Bi	<	0.000760	M	Ho	<	0.000760	M	Pd	<	0.001600	M	Te	<	0.000760			
O	Ca	0.004616	s	In	<			M	Pr	<	0.000760	M	Th	<	0.000760			
M	Cd	<	0.000760	M	Ir	<	0.000760	M	Pt	<	0.000760	O	Ti	<	0.001100			
M	Ce	<	0.000760	O	K	0.007078	M	Rb	<	0.000760	M	Tl	<	0.000760				
M	Co	<	0.000760	M	La	<	0.000760	M	Re	<	0.000760	M	Tm	<	0.000760			
O	Cr	<	0.001300	O	Li	<	0.000130	M	Rh	<	0.000760	M	U	<	0.000760			
M	Cs	<	0.000760	M	Lu	<	0.000760	M	Ru	<	0.000760	M	V	<	0.001600			
M	Cu	<	0.003800	O	Mg	0.000707	n	S	<		M	W	<	0.001600				
M	Dy	<	0.000760	O	Mn	0.000149	M	Sb	<	0.000760	M	Y	<	0.000760				
M	Er	<	0.000760	M	Mo	<	0.002300	M	Sc	<	0.000760	M	Yb	<	0.000760			

M - Checked by ICP-MS

O - Checked by ICP-OES

i - Spectral Interference

n - Not Checked For

s - Solution Standard Element

6.0 INTENDED USE

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

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.
- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.
- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

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

Atomic Weight; Valence; Coordination Number; Chemical Form In Solution - 114.82 +3 6 In(H₂O)₆+3

Chemical Compatibility -Soluble in HCl, HNO₃, and H₂SO₄. Avoid neutral and basic media. Stable with most metals and inorganic anions. The oxalate, sulfide, carbonate, hydroxide and phosphate are insoluble in water.

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

In Containing Samples (Preparation and Solution) -Metal (Best dissolved in HCl / HNO₃); Oxide (Soluble in mineral acids); Ores (Carbonate fusion in PtO followed by HCl dissolution); Organic Matrices (Sulfuric/peroxide digestion or dry ash and dissolution in dilute HCl).

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

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 115 amu	1 ppt	n/a	115Sn, 99Ru16O
ICP-OES 158.583 nm	0.05 / 0.002 µg/mL	1	
ICP-OES 230.606 nm	0.1 / 0.03 µg/mL	1	Ni, Os
ICP-OES 325.609 nm	0.2 / 0.05 µg/mL	1	Mn, Mo, Th

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

February 21, 2023

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

11.2 Lot Expiration Date

- February 21, 2028

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





Refine your results. Redefine your industry.

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

Certificate of Analysis

M6074
M6075
M6076
M6077

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

F: 540-585-3012

info@inorganicventures.com

EXP: 9/6/2029

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: CHEM-CLP-4
Lot Number: V2-MEB746762
Matrix: 3% (v/v) HNO₃
3% (v/v) HF
Value / Analyte(s): 1 000 µg/mL ea:
Boron, Molybdenum,
Silicon, Tin,
Titanium

3.0 CERTIFIED VALUES AND UNCERTAINTIES

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

Density: 1.033 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
B	ICP Assay	3107	190605
B	Calculated		See Sec. 4.2
Mo	ICP Assay	traceable to 3134	U2-MO739068
Si	ICP Assay	Traceable to 3150	S2-SI702546
Sn	ICP Assay	3161a	140917
Ti	ICP Assay	traceable to 3162a	T2-TI725816

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

N/A

6.0 INTENDED USE

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

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 06, 2024

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

11.2 Lot Expiration Date

- **September 06, 2029**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Joseph Burns
Custom VS Manager



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Hydrochloric Acid, 36.5-38.0%
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis

avantor™



R → 16/13/24
Met dig

M 6121

Material No.: 9530-33
Batch No.: 0000275677
Manufactured Date: 2020/12/16
Retest Date: 2025/12/15
Revision No: 1

Certificate of Analysis

Test	Specification	Result
ACS - Assay (as HCl) (by acid-base titrn)	36.5 - 38.0 %	37.6
ACS - Color (APHA)	<= 10	5
ACS - Residue after Ignition	<= 3 ppm	1
ACS - Specific Gravity at 60°/60°F	1.185 - 1.192	1.190
ACS - Bromide (Br)	<= 0.005 %	< 0.005
ACS - Extractable Organic Substances	<= 5 ppm	1
ACS - Free Chlorine (as Cl ₂)	<= 0.5 ppm	< 0.5
Phosphate (PO ₄)	<= 0.05 ppm	< 0.03
Sulfate (SO ₄)	<= 0.5 ppm	< 0.3
Sulfite (SO ₃)	<= 0.8 ppm	0.3
Ammonium (NH ₄)	<= 3 ppm	< 1
Trace Impurities - Arsenic (As)	<= 0.010 ppm	< 0.003
Trace Impurities - Aluminum (Al)	<= 10.0 ppb	< 0.2
Arsenic and Antimony (as As)	<= 5 ppb	< 3
Trace Impurities - Barium (Ba)	<= 1.0 ppb	< 0.2
Trace Impurities - Beryllium (Be)	<= 1.0 ppb	< 0.2
Trace Impurities - Bismuth (Bi)	<= 10.0 ppb	< 1.0
Trace Impurities - Boron (B)	<= 20.0 ppb	< 5.0
Trace Impurities - Cadmium (Cd)	<= 1.0 ppb	< 0.3
Trace Impurities - Calcium (Ca)	<= 50.0 ppb	29.7
Trace Impurities - Chromium (Cr)	<= 1.0 ppb	< 0.4
Trace Impurities - Cobalt (Co)	<= 1.0 ppb	< 0.3
Trace Impurities - Copper (Cu)	<= 1.0 ppb	< 0.1
Trace Impurities - Gallium (Ga)	<= 1.0 ppb	< 0.2

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700

Avantor Performance Materials, LLC

100 Matsonford Rd, Suite 200, Radnor, PA 19087. U.S.A. Phone: 610.386.1700

Material No.: 9530-33

Batch No.: 0000275677

Test	Specification	Result
Trace Impurities – Germanium (Ge)	≤ 3.0 ppb	< 2.0
Trace Impurities – Gold (Au)	≤ 4.0 ppb	< 0.2
Heavy Metals (as Pb)	≤ 100 ppb	< 50
Trace Impurities – Iron (Fe)	≤ 15.0 ppb	< 1
Trace Impurities – Lead (Pb)	≤ 1.0 ppb	< 0.5
Trace Impurities – Lithium (Li)	≤ 1.0 ppb	0.2
Trace Impurities – Magnesium (Mg)	≤ 10.0 ppb	0.4
Trace Impurities – Manganese (Mn)	≤ 1.0 ppb	< 0.4
Trace Impurities – Mercury (Hg)	≤ 0.5 ppb	0.1
Trace Impurities – Molybdenum (Mo)	≤ 10.0 ppb	< 5.0
Trace Impurities – Nickel (Ni)	≤ 4.0 ppb	< 0.3
Trace Impurities – Niobium (Nb)	≤ 1.0 ppb	< 0.2
Trace Impurities – Potassium (K)	≤ 9.0 ppb	< 2.0
Trace Impurities – Selenium (Se), For Information Only	ppb	1.0
Trace Impurities – Silicon (Si)	≤ 100.0 ppb	< 10.0
Trace Impurities – Silver (Ag)	≤ 1.0 ppb	< 0.3
Trace Impurities – Sodium (Na)	≤ 100.0 ppb	< 5.0
Trace Impurities – Strontium (Sr)	≤ 1.0 ppb	< 0.2
Trace Impurities – Tantalum (Ta)	≤ 1.0 ppb	< 0.9
Trace Impurities – Thallium (Tl)	≤ 5.0 ppb	< 2.0
Trace Impurities – Tin (Sn)	≤ 5.0 ppb	< 0.8
Trace Impurities – Titanium (Ti)	≤ 1.0 ppb	0.2
Trace Impurities – Vanadium (V)	≤ 1.0 ppb	< 0.2
Trace Impurities – Zinc (Zn)	≤ 5.0 ppb	0.3
Trace Impurities – Zirconium (Zr)	≤ 1.0 ppb	< 0.1

For Laboratory, Research or Manufacturing Use

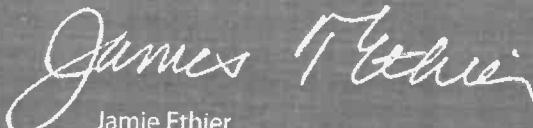
Product Information (not specifications):

Appearance (clear, fuming liquid)

Meets ACS Specifications

Country of Origin: US

Packaging Site: Phillipsburg Mfg Ctr & DC



Jamie Ethier
Vice President Global Quality

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700

Avantor Performance Materials, LLC

100 Matsonford Rd, Suite 200, Radnor, PA 19087. U.S.A. Phone: 610.386.1700

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

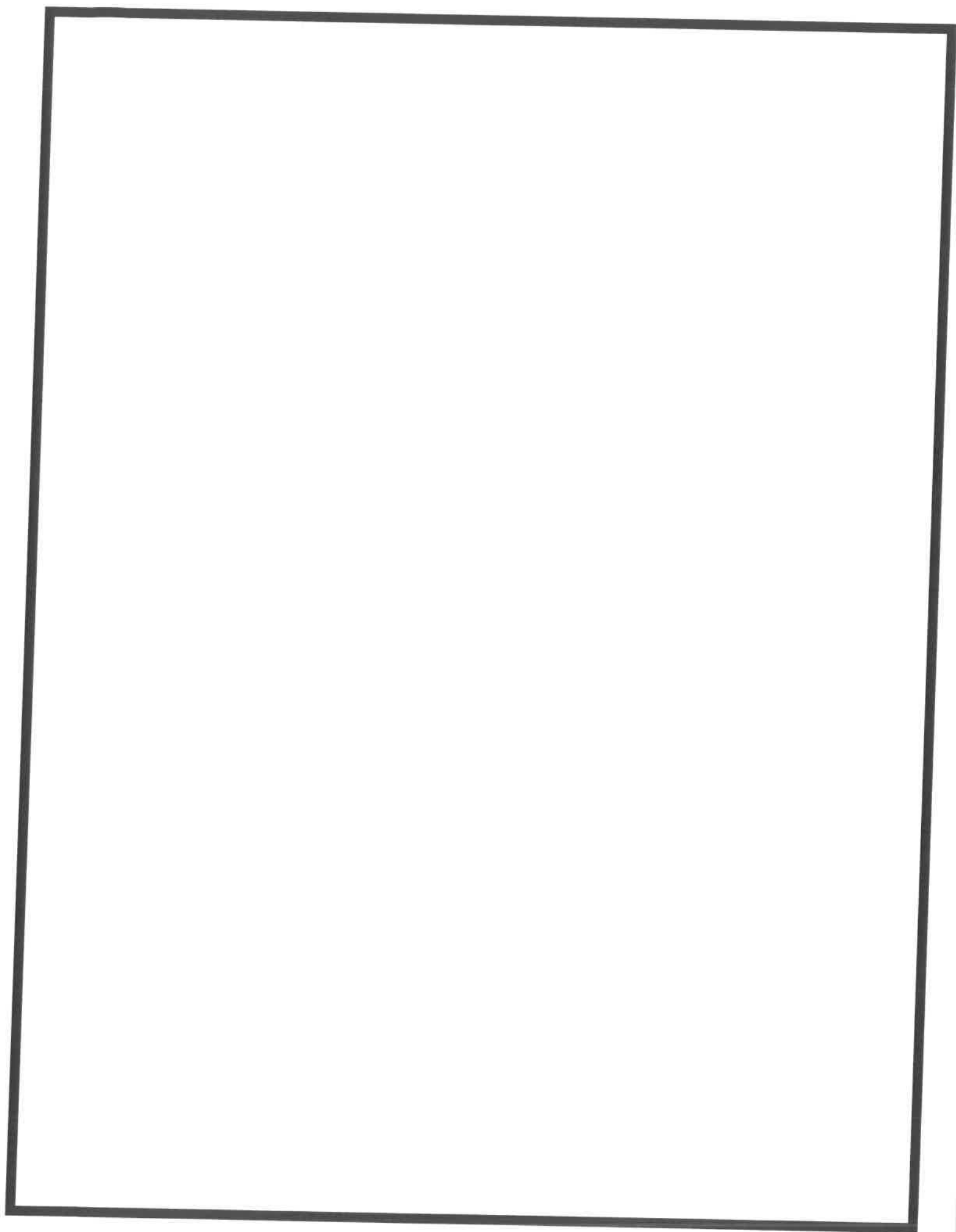
Phone: 215-295-5006
Fax: 215-295-0781

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
------	---------------	--------

For Microelectronic Use

Country of Origin: USA
Packaging Site: Phillipsburg Mfg Ctr & DC



Jamie Croak
Director Quality Operations, Bioscience Production



CERTIFIED WEIGHT REPORT:

Part Number: 58112
Lot # 112124
Description: Magnesium (Mg)
Solvent: Nitric Acid

Expiration Date: 11/21/27
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 10000
NIST Test Number: 6LUB

Weight shown below was diluted to (mL): 2000.07
5E-05 Balance Uncertainty
0.100 Flask Uncertainty

<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito
Reviewed By:	Pedro L. Rentas
	112124

Compound

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

1. Magnesium nitrate hexahydrate (Mg) IN030 MG000023A1 10000 99.999 0.10 8.51 234.9183 234.9459 10001.2 20.0 13446-18-9 NA off-rat 5440 mg/kg 3131a

[1] Spectrum No. 1 [19.823 sec]:58112.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

Part Number: **58025**
Lot Number: **101124**
Description: **Manganese (Mn)**

R-71113128

Lot #: **24002546**
Solvent: **Nitric Acid**

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**

0.10 Flask Uncertainty

2% **80.0** **Nitric Acid**
(mL)

<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito
Reviewed By:	<i>Pedro L. Renteria</i>
	101124

Compound

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

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->	110	120	130	140	150	160	170	180	190	200
2.5E6	m/z->	10	20	30	40	50	60	70	80	90	100
1.0E6	m/z->	10	20	30	40	50	60	70	80	90	100
5.0E7	m/z->	110	120	130	140	150	160	170	180	190	200
1.0E6	m/z->	110	120	130	140	150	160	170	180	190	200
5.0E7	m/z->	110	120	130	140	150	160	170	180	190	200
210	m/z->	220	230	240	250	260					



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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

Part Number: 58111
Lot Number: 072424
Description: Sodium (Na)

Lot # R-1113125
Solvent: 24002546 Nitric Acid

Expiration Date: 072427
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 10000
NIST Test Number: 6UTB

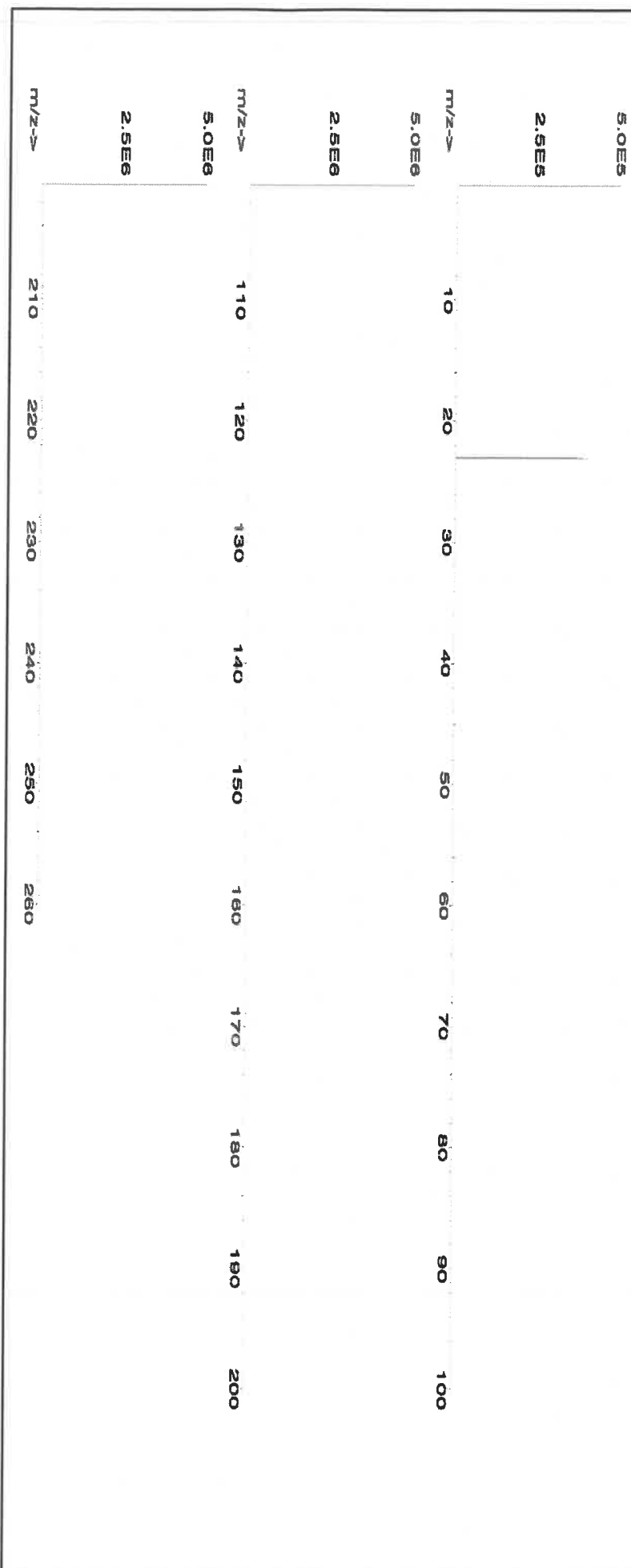
Weight shown below was diluted to (mL): 4000.2
5E-05 Balance Uncertainty
0.10 Flask Uncertainty

Formulated By:	Benson Chan	072424
Reviewed By:	Pedro L. Renteria	072424

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

1. Sodium nitrate (Na) IN036 NAV01201511 10000 99.999 0.10 26.9 148.7096 ##### 10000.0 20.0 7631-99-4 5 mg/m3 orl-rat 3430 mg/kg 3152a

[1] Spectrum No. 1 [8.935 sec]:58111.D# [Count] [Linear]





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

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

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	Er	<0.02	Ho	<0.02	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	Rb	<0.02	Ag	<0.02	Tl	<0.02	V	<0.02
Ba	<0.02	Cs	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.02	Pd	<0.02	Rb	<0.02	Na	T	Th	<0.02	Yb	<0.02
Be	<0.01	Cr	<0.02	Ga	<0.02	Fe	<0.2	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	<0.02	Tm	<0.02	Y	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	Sn	<0.02	Zn	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	Ti	<0.02	Zr	<0.02

(T) = Target analyte

Physical Characterization:

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

Certified by:

- * The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- * Purified acids, 18.2 megohm deionized water, calibrated Class A glassware and the highest purity raw materials are used in the preparation of all standards.
- * 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

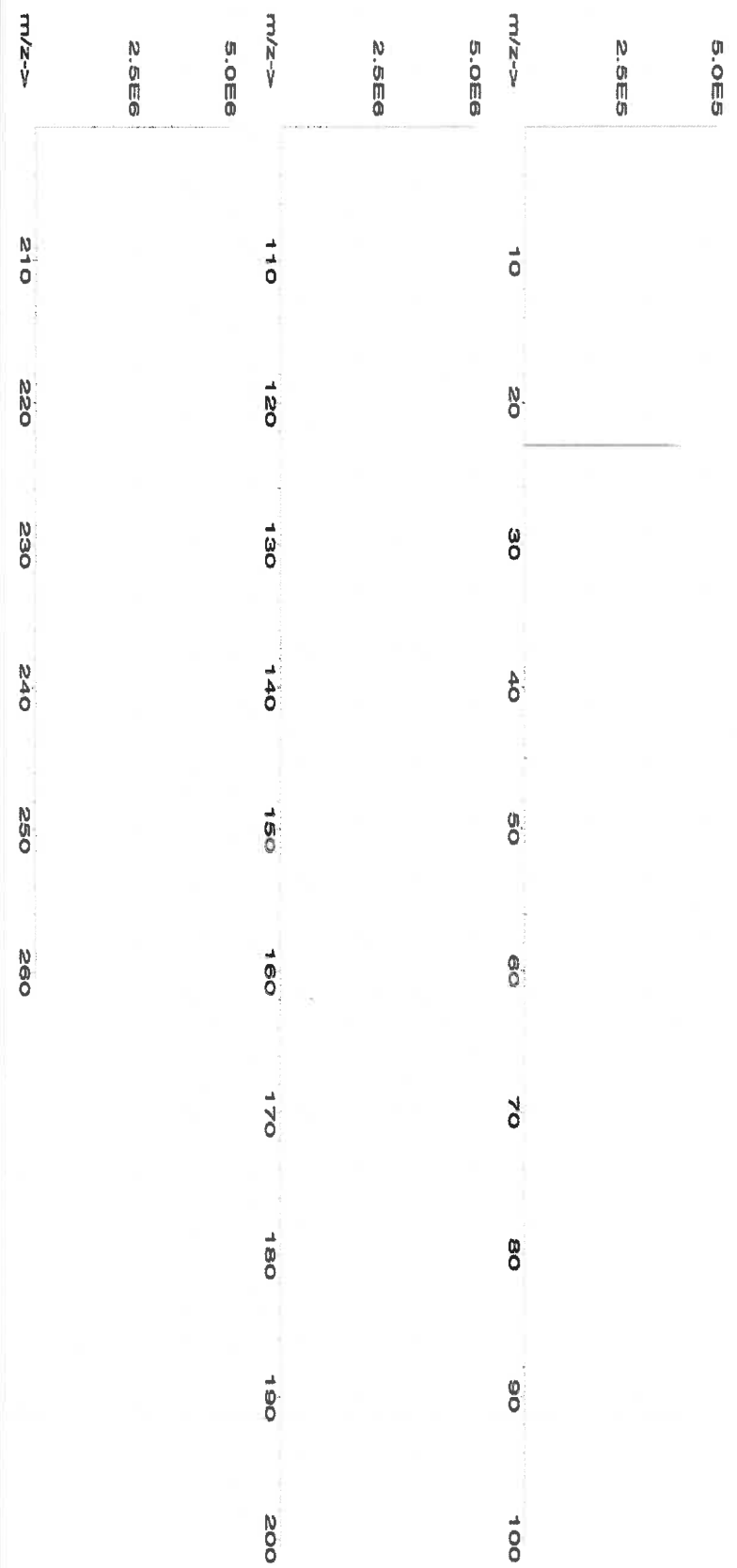
<i>Aleah O Brady</i>	
Formulated By:	Aleah O Brady
Reviewed By:	Pedro L. Rentas
	122223

SDS Information

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

1. Sodium nitrate (Na)	IND36 NAV01201511	10000	99.999	0.10	26.9	111.5406	111.5479	10000.7	20.0	7631-99-4	5 mg/m3	or-rat 3430 mg/kg	3152a
------------------------	-------------------	-------	--------	------	------	----------	----------	---------	------	-----------	---------	-------------------	-------

[1] Spectrum No.1 [8.935 sec]:58111.D# [Count] [Linear]





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

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

Al	<0.02	Cd	<0.02	Dy	<0.02	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

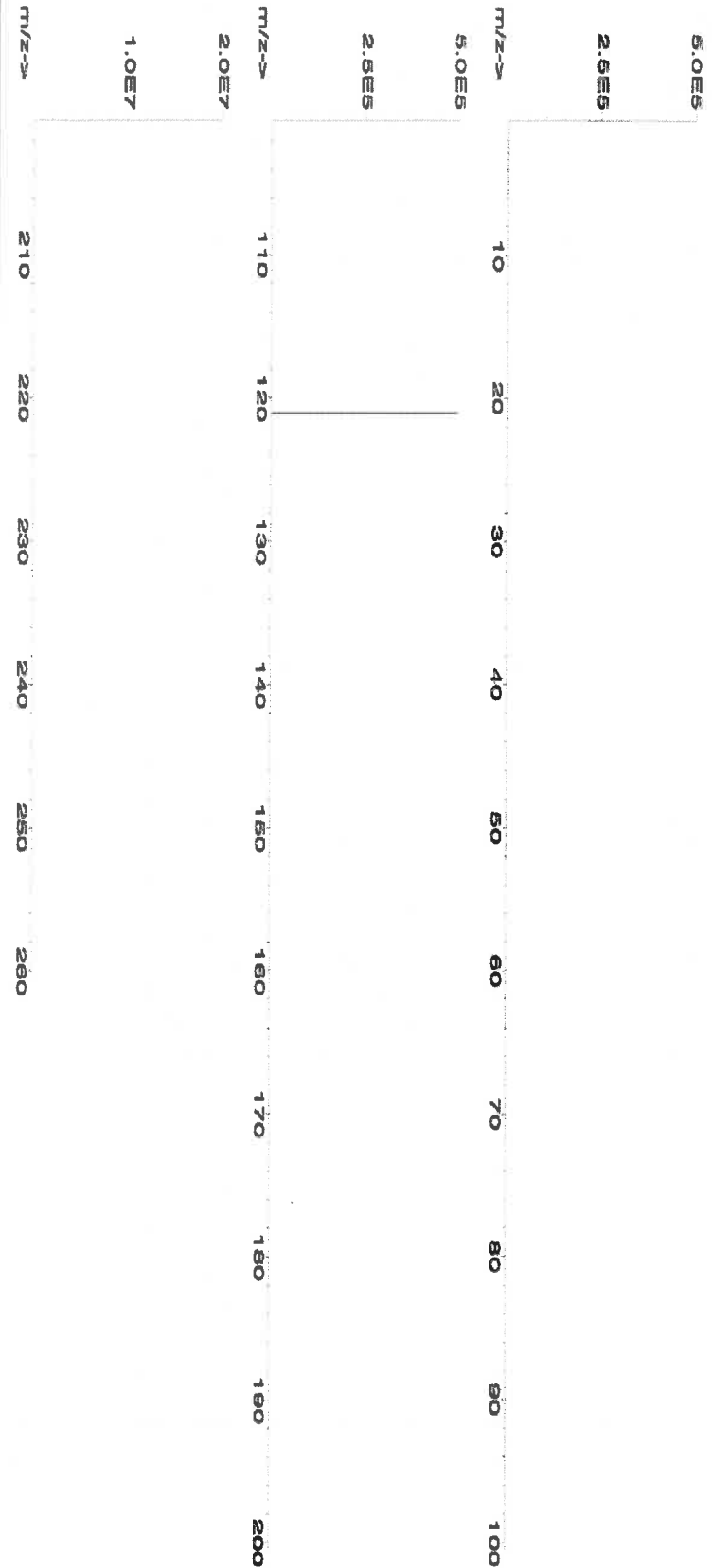
Formulated By:	Lawrence Barry	120523
Reviewed By:	Pedro L. Rientas	120523

Compound

Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
-------------	------------	-----------------	-------------------	--------------------------	-----------------------	-----------------------	---------------------	----------------------------------	------	----------------	------	----------

1. Antimony (Sb) 58151 100923 0.1000 300.0 0.084 1000 10001.4 1000.0 2.1 7440-36-0 0.5 mg/m3 or-rel 7000 mg/kg 3102a

[1] Spectrum No.1 [17.964 sec]:58051.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



Certified Reference Material CRM

M6030



CERTIFIED WEIGHT REPORT:

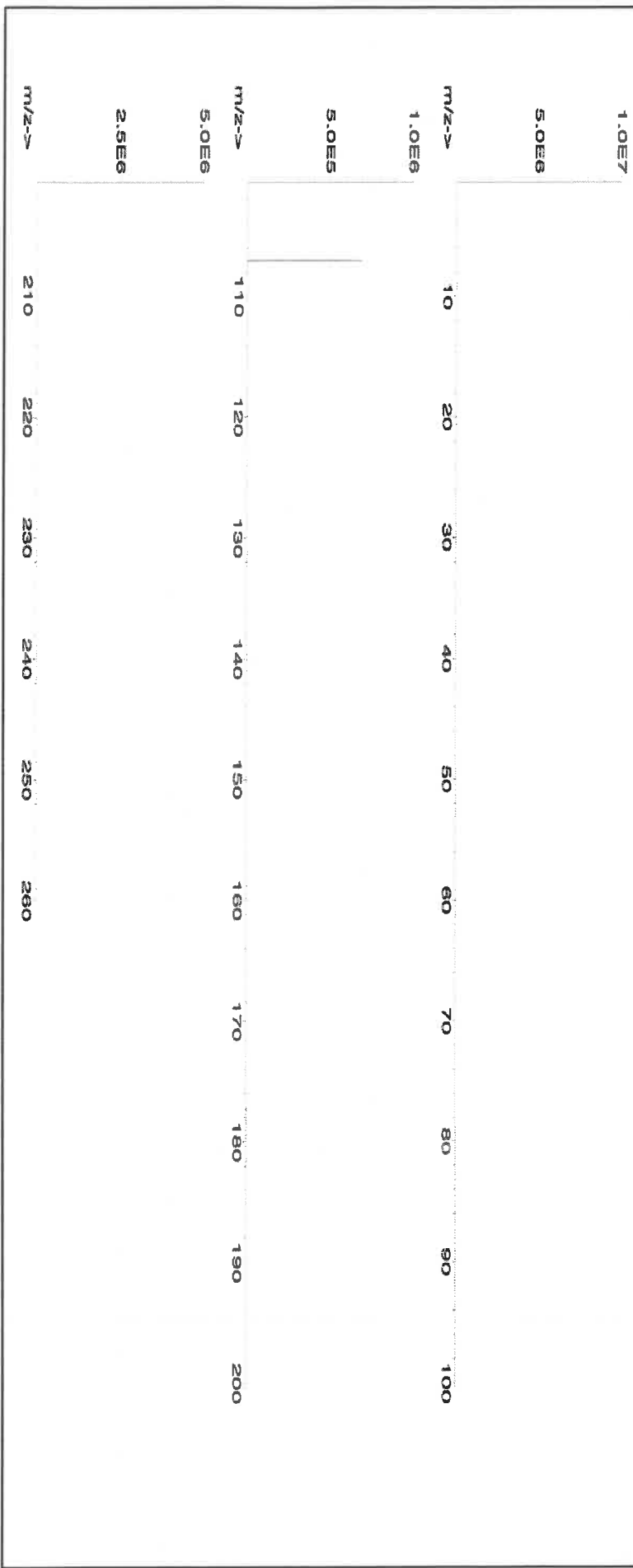
Part Number: 57047
Lot Number: 122823
Description: Silver (Ag)
Solvent: 24002546 Nitric Acid
Lot #

Expiration Date: 122826
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Weight shown below was diluted to (mL): 4000.30
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

Formulated By:	Benson Chan
Reviewed By:	Pedro L. Rentas
122823	

SDS Information									
Compound	RM#	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)
1. Silver nitrate (Ag)	IN035	J0612AGA1	1000.0	99.9996	0.10	63.7	6.27992	6.27998	1000.0
							2.0	7761-88-8	10 µg/mL
									NA
									3151

[1] Spectrum No. 1 [14.044 sec]:58147.D# [Count] [Linear]





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

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

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

(T)= Target analyte

Physical Characterization:

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

Certified by:

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

R: 8/5/24

M6019

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
Catalog Number: CGSR1
Lot Number: U2-SR730227
Matrix: 0.1% (v/v) HNO₃
Value / Analyte(s): 1 000 µg/mL ea:
Strontium
Starting Material: SrCO₃
Starting Material Lot#: M2-2192
Starting Material Purity: 99.9993%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1001 ± 3 µg/mL
Density: 1.000 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1	998 ± 4 µg/mL ICP Assay NIST SRM Traceable to 3153a Lot Number: K2-SR650985
Assay Method #2	1001 ± 3 µg/mL EDTA NIST SRM 928 Lot Number: 928
Assay Method #3	1001 ± 2 µg/mL Calculated NIST SRM Lot Number: See Sec. 4.2

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

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

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

M	Ag	<	0.001980	M	Eu	<	0.000495	O	Na	0.000200	M	Se	<	0.013862	O	Zn	0.000143	
O	Al	0.000370	O	Fe	0.000410	M	Nb	<	0.000495	i	Si	<			M	Zr	<	0.000495
M	As	<	0.000495	M	Ga	<	0.000495	M	Nd	<	0.000495	M	Sm	<	0.000495			
M	Au	<	0.000989	M	Gd	<	0.000495	O	Ni	<	0.007631	M	Sn	<	0.000990			
M	B	<	0.039606	M	Ge	<	0.000495	M	Os	<	0.000494	s	Sr	<				
M	Ba	0.006486	M	Hf	<	0.000495	i	P	<			M	Ta	<	0.000495			
M	Be	<	0.000990	M	Hg	<	0.000989	M	Pb	<	0.002970	M	Tb	<	0.000495			
M	Bi	<	0.000495	M	Ho	<	0.000495	M	Pd	<	0.003957	M	Te	<	0.027724			
O	Ca	0.004255	M	In	<	0.000495	M	Pr	<	0.000495	M	Th	<	0.000990				
M	Cd	0.001339	M	Ir	<	0.000494	M	Pt	<	0.002970	M	Ti	<	0.005940				
M	Ce	<	0.004950	O	K	<	0.008184	M	Rb	<	0.002970	M	Tl	<	0.000495			
M	Co	<	0.000495	M	La	<	0.000495	M	Re	<	0.000495	M	Tm	<	0.000495			
O	Cr	<	0.003207	O	Li	<	0.000884	O	Rh	<	0.012829	M	U	<	0.001485			
M	Cs	<	0.000990	M	Lu	<	0.002970	M	Ru	<	0.000989	M	V	<	0.001980			
M	Cu	0.000099	O	Mg	0.000064	i	S	<				M	W	<	0.003960			
M	Dy	<	0.000495	O	Mn	0.000066	M	Sb	<	0.014852	O	Y	<	0.000995				
M	Er	<	0.000495	M	Mo	<	0.001980	M	Sc	<	0.001980	M	Yb	<	0.000495			

M - Checked by ICP-MS

O - Checked by ICP-OES

i - Spectral Interference

n - Not Checked For

s - Solution Standard Element

6.0 INTENDED USE

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

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.
- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.
- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

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

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 87.62 +2 6 Sr(H₂O)₆+2

Chemical Compatibility - Soluble in HCl, and HNO₃. Avoid H₂SO₄, HF and neutral to basic media. Stable with most metals and inorganic anions forming insoluble silicate, carbonate, hydroxide, oxide, fluoride, sulfate, oxalate, chromate, arsenate and tungstate in neutral aqueous media.

Stability - 2-100 ppb levels stable for months in 1% HNO₃ / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1 - 3.5% HNO₃ / LDPE container.

Sr Containing Samples (Preparation and Solution) -Metal (Best dissolved in diluted HNO₃); Ores (Carbonate fusion in PtO followed by HCl dissolution); Organic Matrices (Dry ash and dissolution in dilute HCl).

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

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 88 amu	1200 ppt	N/A	72Ge16O, 176Yb+2, 176Lu+2 , 176Hf+2
ICP-OES 407.771 nm	0.0004 / 0.00006 µg/mL	1	U, Ce
ICP-OES 421.552 nm	0.0008 / 0.00004 µg/mL	1	Rb
ICP-OES 460.733 nm	0.07 / 0.003 µg/mL	1	Ce

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 03, 2023

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

11.2 Lot Expiration Date

- March 03, 2028

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





Certified Reference Material CRM



R: 03/16/23 MS473 MS474 MS475 MS476

CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

56138
082922
Strontium (Sr)

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

082925
Ambient (20 °C)
10000

NIST Test Number:
Weight shown below was diluted to (mL):

6UTB
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

Lot #

Solvent: 20510011 Nitric Acid

2% Nitric Acid
20.0 (mL)

Formulated By:	Lawrence Barry	082922
Reviewed By:	Pedro L. Rentas	082922

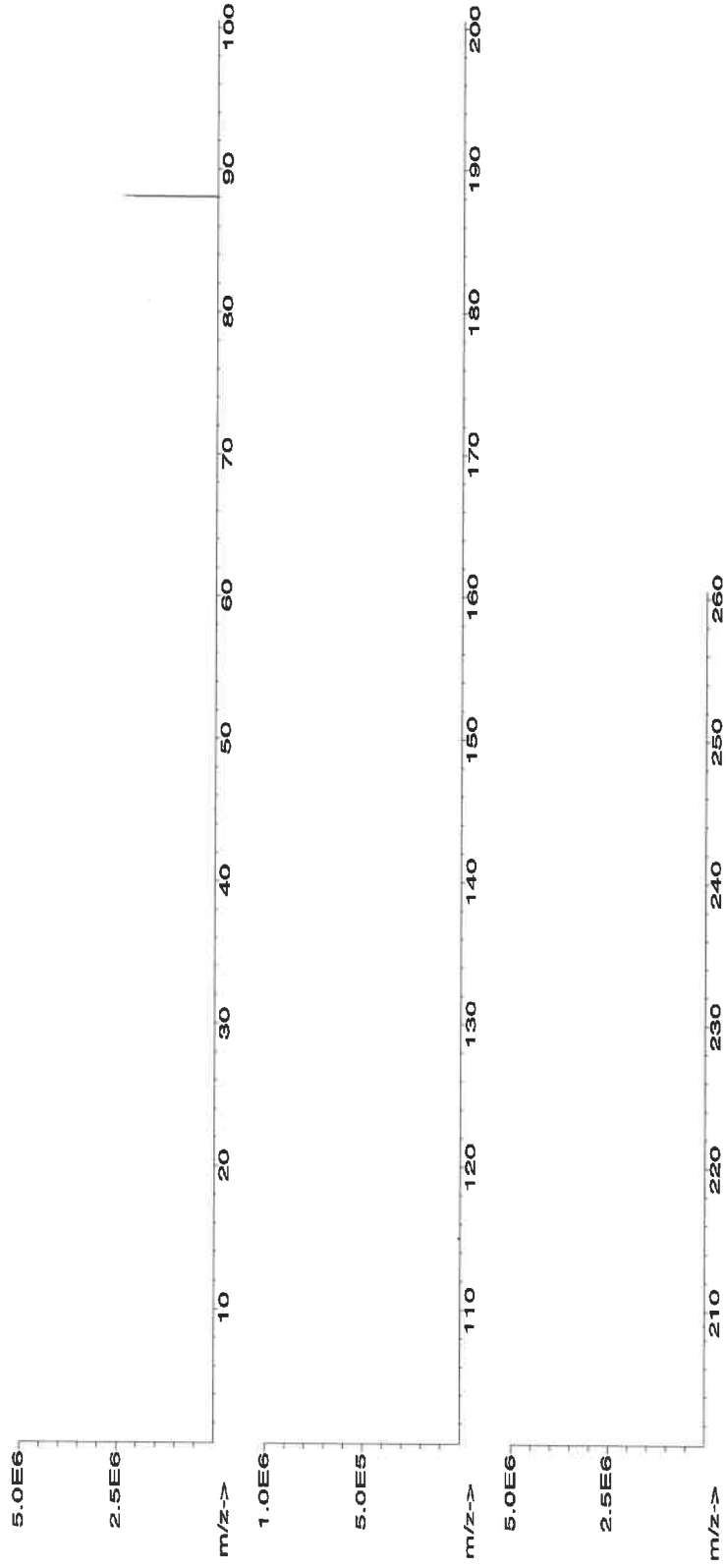
SDS Information

Expanded Uncertainty	(Solvent Safety Info. On Attached pg.)	NIST
+/- (µg/mL)	CAS#	LD50
Actual Conc. (µg/mL)	Actual Weight (g)	Actual Weight (g)

Compound

1. Strontium nitrate (Sr) IN017 SRZ02019A1 10000 99.997 0.10 41.2 24.2756 24.2758 10000.1 20.0 10042-76-9 NA orl-rat >2000mg/kg 3153a

[1] Spectrum No.1 [14.495 sec]:58138.D# [Count] [Linear]





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

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

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

(T)= Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

Part Number: 57081
Lot Number: 062724
Description: Thallium (TI)

Lot #

Solvent: 24002546 Nitric Acid

2% 40.0 Nitric Acid (mL)

Expiration Date:

062727

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

Weight shown below was diluted to (mL): 2000.1

5E-05 Balance Uncertainty
0.10 Flask Uncertainty

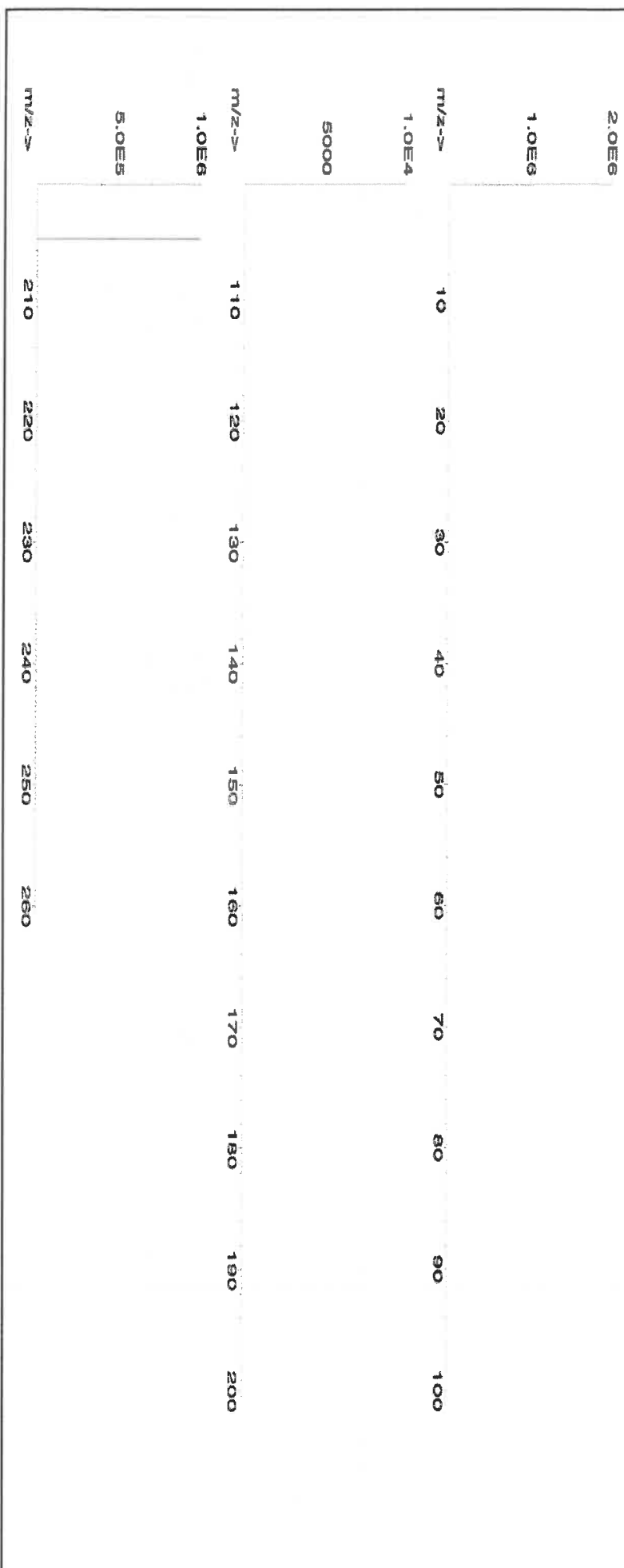
<i>Aleah O'Brady</i>	
Formulated By:	Aleah O'Brady
	062724
Reviewed By:	<i>Pedro L. Renias</i>
	Pedro L. Renias
	062724

SDS Information

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

1. Thallium nitrate (TI) IN037 BCCF4399 1000 99.999 0.10 77.0 2.5975 2.5977 1000.1 2.0 10102-45-1 0.1 mg/m3 or-mus 15mg/kg 3158

[1] Spectrum No.1 [14.044 sec]:57081.D# [Count] [Linear]





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

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

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pt	<0.02	Sc	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Te	<0.02	U	<0.02
As	<0.2	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.01	Os	<0.02	Rh	<0.02	Ag	<0.02	Tl	T	V	<0.02
Ba	<0.02	Cs	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.02	Pd	<0.02	Rb	<0.02	Na	<0.2	Tm	<0.02	Yb	<0.02
Be	<0.01	Cr	<0.02	Ga	<0.02	Fe	<0.2	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	<0.02	Sn	<0.02	Y	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	Ti	<0.02	Zn	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	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 Reference Material CRM

M6021



CERTIFIED WEIGHT REPORT:

Part Number: **57023**
Lot Number: **062424**
Description: **Vanadium (V)**

Lot # **24002546**
Solvent: **Nitric Acid**

Aleah O'Brady	
Formulated By:	Aleah O'Brady
	062424
Reviewed By:	Pedro L. Rantas
	062424

Expiration Date: **062427**
Recommended Storage: **Ambient (20 °C)**
Nominal Concentration (µg/mL): **1000**
NIST Test Number: **6UTB**

2.0%
40.0 (mL)
Nitric Acid

Volume shown below was diluted to (mL): **2000.3**

5E-05 Balance Uncertainty
0.06 Flask Uncertainty

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#	SDS Information (Solvent Safety Info. On Attached pg.)	NIST SRM

1. Ammonium metavanadate (V) 58123 021224 0.1000 200.0 0.084 1000 10000.3 1000.0 2.2 7803-55-6 0.05 mg/m3 or-at 58.1mg/kg 3165

[1] Spectrum No.1 [34.243 sec]:58023.D# [Count] [Linear]

2.0E6	m/z-->	10	20	30	40	50	60	70	80	90	100
1.0E6	m/z-->	10	20	30	40	50	60	70	80	90	100
2.0E7	m/z-->	10	20	30	40	50	60	70	80	90	100
1.0E7	m/z-->	10	20	30	40	50	60	70	80	90	100
5.0E8	m/z-->	110	120	130	140	150	160	170	180	190	200
2.5E8	m/z-->	110	120	130	140	150	160	170	180	190	200

SOP ID : M3050B-Digestion-20, MSFAM01.1-Trace Metals-2

SDG No : A6301

Matrix : SOIL

Pipette ID: ICP A

Balance ID : M SC-2

Filter paper ID : N/A

pH Strip ID : N/A

Hood ID : #3

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

Start Digest Date: 01/30/2025 Time : 13:30 Temp : 96 °C

End Digest Date: 01/30/2025 Time : 15:35 Temp : 96 °C

Digestion tube ID: M6054

Block thermometer ID: MET-DIG. #3

Dig Technician Signature: *S/S*

Supervisor Signature: *[Signature]*

Temp : 1. 96°C 2. N/A

Standard Name	MLS USED	STD REF. # FROM LOG
LCSS	1.00	MP84063
Spike Sol 6	1.00	MP84070
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	MP84041
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
01/30/25 16:35	<i>S/S.mctds.</i>	<i>[Signature]</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
PB166385BL	PBS385	N/A	1.00	100	Colorless	Colorless	Fine	N/A	N/A	1
PB166385BS	LCS385	N/A	1.00	100	Colorless	Colorless	Fine	N/A	MP84063	2
Q1223-01	A6301	N/A	4.86	100	Brown	Yellow	Medium	N/A	N/A	3
Q1223-02	A6302	N/A	5.09	100	Brown	Yellow	Medium	N/A	N/A	4
Q1223-03	A6303	N/A	1.31	100	Brown	Yellow	Medium	N/A	N/A	5
Q1223-04	A6304	N/A	1.16	100	Brown	Yellow	Medium	N/A	N/A	6
Q1223-05	A6305	N/A	5.15	100	Brown	Yellow	Medium	N/A	N/A	7
Q1223-06	A6305D	N/A	5.06	100	Brown	Yellow	Medium	N/A	N/A	8
Q1223-07	A6305S	N/A	5.18	100	Brown	Yellow	Medium	N/A	MP84070	9
Q1223-08	A6306	N/A	1.11	100	Brown	Yellow	Medium	N/A	N/A	10
Q1223-09	A6307	N/A	5.25	100	Brown	Yellow	Medium	N/A	N/A	11
Q1223-10	A6308	N/A	1.12	100	Brown	Yellow	Medium	N/A	N/A	12
Q1223-11	A6309	N/A	1.40	100	Brown	Yellow	Medium	N/A	N/A	13
Q1223-12	A6320	N/A	1.30	100	Brown	Yellow	Medium	N/A	N/A	14
Q1223-13	A6321	N/A	1.46	100	Brown	Yellow	Medium	N/A	N/A	15
Q1223-14	A6322	N/A	8.67	100	Brown	Yellow	Medium	N/A	N/A	16
Q1223-15	A6323	N/A	3.60	100	Brown	Yellow	Medium	N/A	N/A	17
Q1223-16	A6324	N/A	4.79	100	Brown	Yellow	Medium	N/A	N/A	18

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134523

Review By	Sarabjit Jaswal	Review On	2/3/2025 2:07:55 PM
Supervise By	Eman Mughal	Supervise On	2/5/2025 9:21:39 AM
STD. NAME	STD REF.#		
ICAL Standard	MP84204,MP84212,MP84210,MP84209,MP84208,MP84207,MP84206		
ICV Standard	MP84213		
CCV Standard	MP84216		
ICSA Standard	MP84214,MP84215		
CRI Standard			
LCS Standard	MP84063		
Chk Standard	MP84218,MP84219		

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	S0	S0	CAL1	02/02/25 10:59		Kareem	OK
2	S1	S01	CAL2	02/02/25 11:03		Kareem	OK
3	S2	S02	CAL3	02/02/25 11:08		Kareem	OK
4	S3	S03	CAL4	02/02/25 11:12		Kareem	OK
5	S4	S04	CAL5	02/02/25 11:15		Kareem	OK
6	S5	S05	CAL6	02/02/25 11:19		Kareem	OK
7	S6	S06	CAL7	02/02/25 11:24		Kareem	OK
8	ICV007	ICV007	ICV	02/02/25 11:52	Inst. paused for calibration review	Kareem	OK
9	ICB007	ICB007	ICB	02/02/25 11:56		Kareem	OK
10	ICSA007	ICSA007	ICSA	02/02/25 12:00		Kareem	OK
11	ICSAB007	ICSAB007	ICSAB	02/02/25 12:05		Kareem	OK
12	CCV033	CCV033	CCV	02/02/25 12:08		Kareem	OK
13	CCB033	CCB033	CCB	02/02/25 12:13		Kareem	OK
14	PB166472BL	PBS472	MB	02/02/25 12:17		Kareem	OK
15	PB166472BS	LCS472	LCS	02/02/25 12:21		Kareem	OK
16	PB166385BL	PBS385	MB	02/02/25 12:26		Kareem	OK
17	PB166385BS	LCS385	LCS	02/02/25 12:30		Kareem	OK
18	Q1223-05	A6305	SAM	02/02/25 12:34		Kareem	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134523

Review By	Sarabjit Jaswal	Review On	2/3/2025 2:07:55 PM
Supervise By	Eman Mughal	Supervise On	2/5/2025 9:21:39 AM
STD. NAME	STD REF.#		
ICAL Standard	MP84204,MP84212,MP84210,MP84209,MP84208,MP84207,MP84206		
ICV Standard	MP84213		
CCV Standard	MP84216		
ICSA Standard	MP84214,MP84215		
CRI Standard			
LCS Standard	MP84063		
Chk Standard	MP84218,MP84219		

19	Q1223-06	A6305D	DUP	02/02/25 12:38		Kareem	OK
20	Q1223-05L	A6305L	SD	02/02/25 12:42		Kareem	OK
21	Q1223-07	A6305S	MS	02/02/25 12:46		Kareem	OK
22	Q1246-09	A6342	SAM	02/02/25 12:50		Kareem	OK
23	Q1246-10	A6342D	DUP	02/02/25 12:53		Kareem	OK
24	Q1246-09L	A6342L	SD	02/02/25 12:57		Kareem	OK
25	Q1246-11	A6342S	MS	02/02/25 13:02		Kareem	OK
26	Q1223-01	A6301	SAM	02/02/25 13:05		Kareem	OK
27	Q1223-02	A6302	SAM	02/02/25 13:09		Kareem	OK
28	Q1223-03	A6303	SAM	02/02/25 13:13		Kareem	OK
29	Q1223-04	A6304	SAM	02/02/25 13:17		Kareem	OK
30	Q1223-08	A6306	SAM	02/02/25 13:21		Kareem	OK
31	Q1223-09	A6307	SAM	02/02/25 13:25		Kareem	OK
32	Q1223-10	A6308	SAM	02/02/25 13:29		Kareem	OK
33	Q1223-11	A6309	SAM	02/02/25 13:33		Kareem	OK
34	CCV034	CCV034	CCV	02/02/25 13:37		Kareem	OK
35	CCB034	CCB034	CCB	02/02/25 13:42		Kareem	OK
36	Q1223-12	A6320	SAM	02/02/25 13:46		Kareem	OK
37	Q1223-13	A6321	SAM	02/02/25 13:50		Kareem	OK
38	Q1223-14	A6322	SAM	02/02/25 13:54	Fe high	Kareem	Dilution

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134523

Review By	Sarabjit Jaswal	Review On	2/3/2025 2:07:55 PM
Supervise By	Eman Mughal	Supervise On	2/5/2025 9:21:39 AM
STD. NAME	STD REF.#		
ICAL Standard	MP84204,MP84212,MP84210,MP84209,MP84208,MP84207,MP84206		
ICV Standard	MP84213		
CCV Standard	MP84216		
ICSA Standard	MP84214,MP84215		
CRI Standard			
LCS Standard	MP84063		
Chk Standard	MP84218,MP84219		

39	Q1223-15	A6323	SAM	02/02/25 13:58		Kareem	OK
40	Q1223-16	A6324	SAM	02/02/25 14:02		Kareem	OK
41	Q1246-01	A6313	SAM	02/02/25 14:06		Kareem	OK
42	Q1246-02	A6314	SAM	02/02/25 14:10		Kareem	OK
43	Q1246-03	A6325	SAM	02/02/25 14:21		Kareem	OK
44	Q1246-04	A6326	SAM	02/02/25 14:25		Kareem	OK
45	Q1246-05	A6331	SAM	02/02/25 14:29		Kareem	OK
46	Q1246-06	A6332	SAM	02/02/25 14:33		Kareem	OK
47	Q1246-07	A6333	SAM	02/02/25 14:37		Kareem	OK
48	Q1246-08	A6334	SAM	02/02/25 14:41		Kareem	OK
49	Q1246-12	A6343	SAM	02/02/25 14:45		Kareem	OK
50	Q1246-13	A6344	SAM	02/02/25 14:49		Kareem	OK
51	Q1246-14	A6345	SAM	02/02/25 14:53		Kareem	OK
52	Q1246-15	A6346	SAM	02/02/25 14:57		Kareem	OK
53	Q1246-16	A6347	SAM	02/02/25 15:01		Kareem	OK
54	CCV035	CCV035	CCV	02/02/25 15:05		Kareem	OK
55	CCB035	CCB035	CCB	02/02/25 15:09		Kareem	OK
56	Q1223-14DL	A6322	SAM	02/02/25 15:13	2X for Fe	Kareem	Confirms
57	CCV036	CCV036	CCV	02/02/25 15:18		Kareem	OK
58	CCB036	CCB036	CCB	02/02/25 15:22		Kareem	OK