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Analysis Type
LOQ Verification

Department	Year	Quarter
Metals	2024	2nd

Instrument ID	Method	Matrix
P4	6010D	SOIL

Compounds Used/Spike Concentration in PPM
Al =5.0, Sb =2.5, As =1.0, Ba =5.0, Be =0.3,B = 5.0, Cd =0.3, Ca =100, Cr =0.5, Co =1.5, Cu =1.0,
Fe=5.0, Pb =0.6, Mg =100, Mn =1.0, Ni =2.0, K =100 , Se =1.0, Si = 20, Ag =0.5, ,, Sn = 2.0 ,
Na = 100 , Tl = 2.0, Ti = 2.0 , V = 2.0 , Zn = 2.0

LOQ Verification Status	Comment
Pass / Fail	Pass

Laboratory Analyst	Laboratory Supervisor	Laboratory Manager
Kareem Khairalla	Sarabjit Jaswal	Mohammad Ahmed

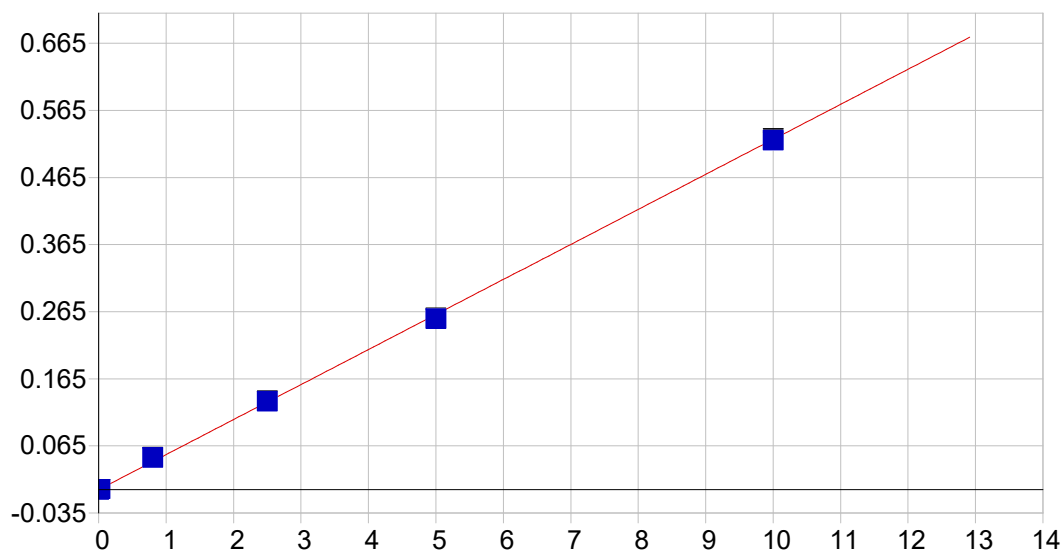
Metals

- 7 -

LABORATORY CONTROL SAMPLE SUMMARY

Client: LB134725 **SDG No.:** LB134725
Contract: **Lab Code:** CHEM **Case No.:** LB134725 **SAS No.:** LB134725

Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
P2403-02							
Aluminum	mg/Kg	5	4.89	J	98	70 - 130	P
Antimony	mg/Kg	2.5	2.55		102	70 - 130	P
Arsenic	mg/Kg	1	1.16		116	70 - 130	P
Barium	mg/Kg	5	4.69	J	94	70 - 130	P
Beryllium	mg/Kg	0.3	0.28	J	93	70 - 130	P
Boron	mg/Kg	5	4.49	J	90	70 - 130	P
Cadmium	mg/Kg	0.3	0.306		102	70 - 130	P
Calcium	mg/Kg	100	94.8	J	95	70 - 130	P
Chromium	mg/Kg	0.5	0.507		101	70 - 130	P
Cobalt	mg/Kg	1.5	1.47	J	98	70 - 130	P
Copper	mg/Kg	1	1.12		112	70 - 130	P
Iron	mg/Kg	5	4.81	J	96	70 - 130	P
Lead	mg/Kg	0.6	0.555	J	92	70 - 130	P
Magnesium	mg/Kg	100	101		101	70 - 130	P
Manganese	mg/Kg	1	0.971	J	97	70 - 130	P
Molybdenum	mg/Kg	10	10.11		101	70 - 130	P
Nickel	mg/Kg	2	1.98	J	99	70 - 130	P
Potassium	mg/Kg	100	94.9	J	95	70 - 130	P
Phosphorus	mg/Kg	1	0.984	J	98	70 - 130	P
Selenium	mg/Kg	1	0.98	J	98	70 - 130	P
Silicon	mg/Kg	20	18.7	J	94	70 - 130	P
Silver	mg/Kg	0.5	0.526		105	70 - 130	P
Sulfur	mg/Kg	1	1.12	J	56	70 - 130	P
Sodium	mg/Kg	100	94.2	J	94	70 - 130	P
Strontium	mg/Kg	1	0.967	J	97	70 - 130	P
Lithium	mg/Kg	1	0.865	J	87	70 - 130	P
Thallium	mg/Kg	2	1.91	J	96	70 - 130	P
Tin	mg/Kg	2	1.94	J	97	70 - 130	P
Titanium	mg/Kg	2	1.94	J	97	70 - 130	P
Vanadium	mg/Kg	2	1.81	J	91	70 - 130	P
Zinc	mg/Kg	2	2.11		106	70 - 130	P

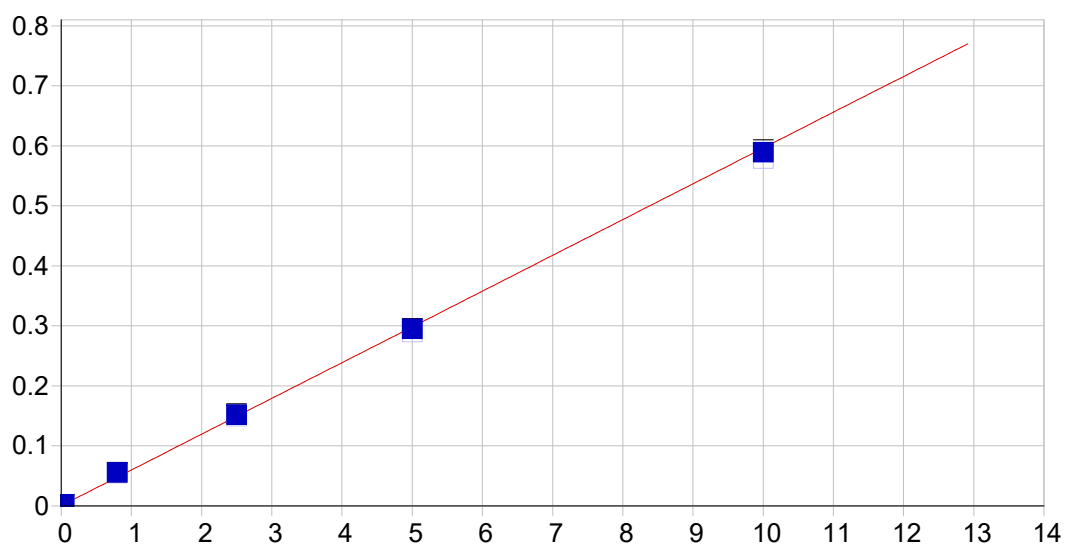


As 189.042 {479}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.000234 Re-Slope: 1.000000
 A1 (Gain): 0.052214 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999467 Status: OK.
 Std Error of Est: 0.000040
 Predicted MDL: 0.002850
 Predicted MQL: 0.009501

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	-.00023	.000	1
S1	.02000	.02226	.002	11.3	.00092	.000	1
S3	2.5000	2.5266	.027	1.07	.13155	.000	1
S4	5.0000	4.8797	-.120	-2.41	.25427	.001	1
S5	10.000	9.9781	-.022	-.219	.52020	.003	1
S2	.80000	.91325	.113	14.2	.04741	.000	1

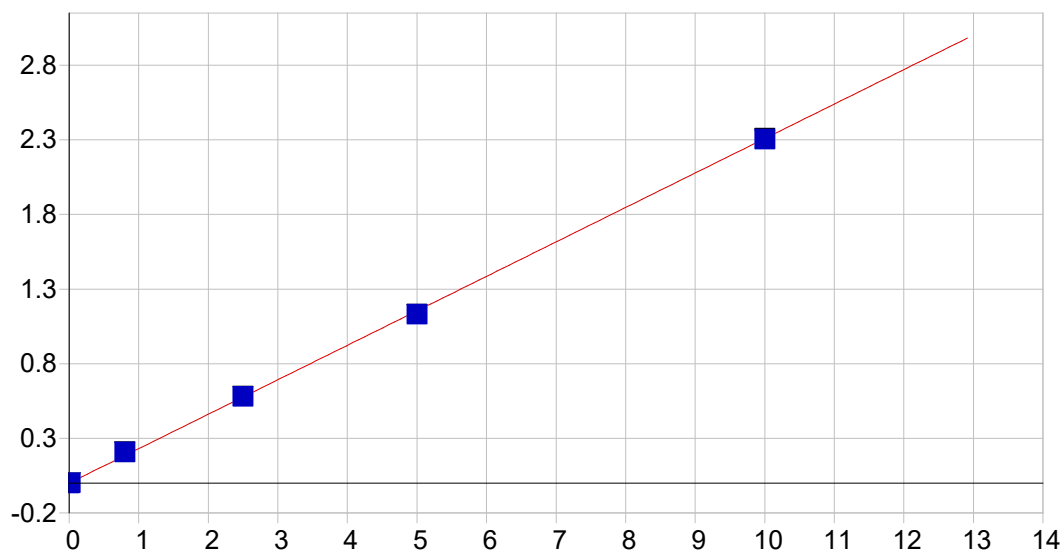


TI 190.856 {477}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.000254 Re-Slope: 1.000000
 A1 (Gain): 0.059610 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999364 Status: OK.
 Std Error of Est: 0.000069
 Predicted MDL: 0.001927
 Predicted MQL: 0.006422

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00001	-.000	.000	.00025	.000	1
S1	.04000	.03953	-.000	-1.18	.00246	.000	1
S3	2.5000	2.5441	.044	1.76	.14916	.002	1
S4	5.0000	4.9466	-.053	-1.07	.28963	.000	1
S5	10.000	9.8839	-.116	-1.16	.57846	.004	1
S2	.80000	.92587	.126	15.7	.05457	.001	1

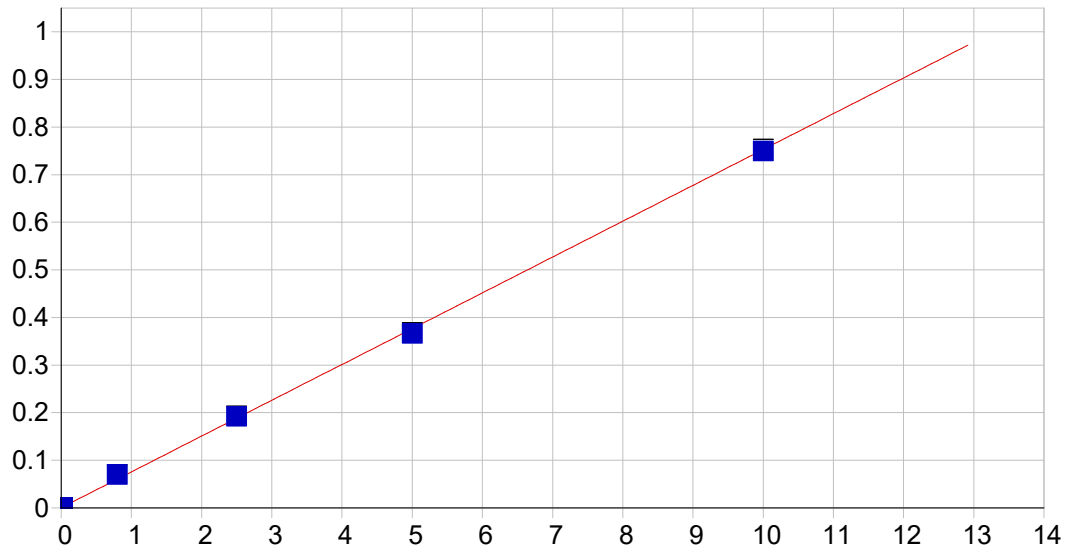


Pb 220.353 {453}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.000162 Re-Slope: 1.000000
 A1 (Gain): 0.230910 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999579 Status: OK.
 Std Error of Est: 0.000122
 Predicted MDL: 0.001241
 Predicted MQL: 0.004138

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	-.00016	.000	1
S1	.01200	.01215	.000	1.21	.00259	.000	1
S3	2.5000	2.5135	.014	.541	.57960	.002	1
S4	5.0000	4.8998	-.100	-2.00	1.1300	.001	1
S5	10.000	9.9834	-.017	-.166	2.3026	.007	1
S2	.80000	.90310	.103	12.9	.20817	.001	1

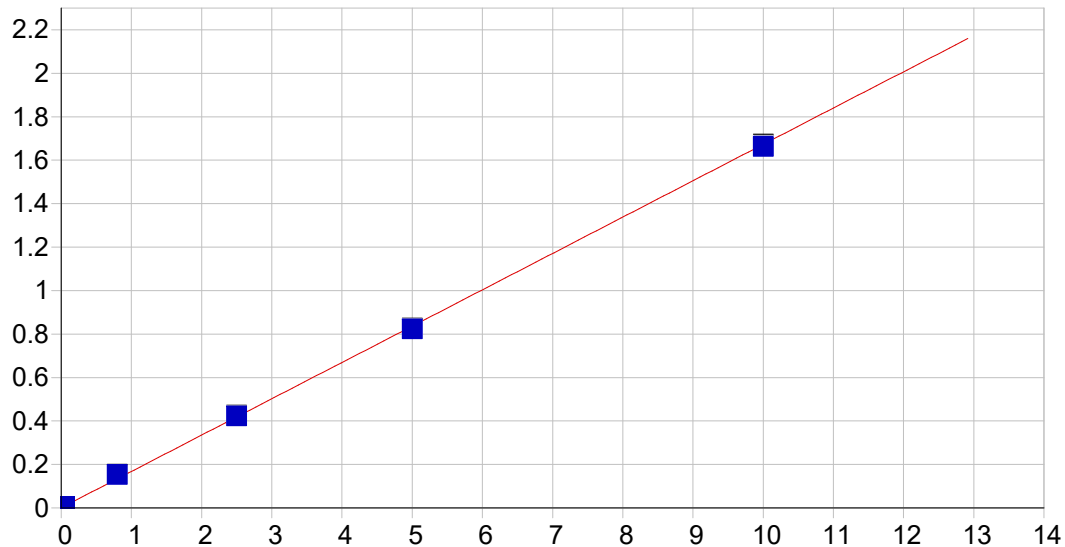


Se 196.090 {472}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.000327 Re-Slope: 1.000000
 A1 (Gain): 0.075244 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999363 Status: OK.
 Std Error of Est: 0.000063
 Predicted MDL: 0.002647
 Predicted MQL: 0.008824

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00001	-.000	.000	.00033	.000	1
S1	.02000	.02267	.003	13.3	.00203	.000	1
S3	2.5000	2.5488	.049	1.95	.19206	.001	1
S4	5.0000	4.8681	-.132	-2.64	.36652	.002	1
S5	10.000	9.9592	-.041	-.408	.74951	.004	1
S2	.80000	.92124	.121	15.2	.06963	.000	1

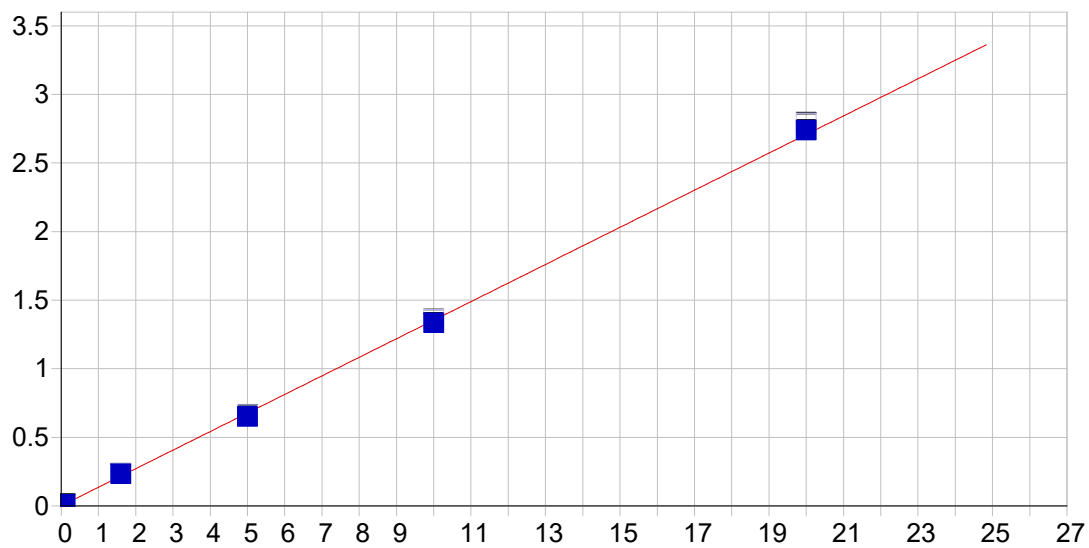


Sb 206.833 {463}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.000458 Re-Slope: 1.000000
 A1 (Gain): 0.167209 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999499 Status: OK.
 Std Error of Est: 0.000197
 Predicted MDL: 0.001502
 Predicted MQL: 0.005008

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00001	-.000	.000	.00046	.000	1
S1	.05000	.05219	.002	4.38	.00920	.000	1
S3	2.5000	2.5279	.028	1.12	.42428	.003	1
S4	5.0000	4.9162	-.084	-1.68	.82477	.003	1
S5	10.000	9.9394	-.061	-.606	1.6670	.007	1
S2	.80000	.91423	.114	14.3	.15369	.001	1

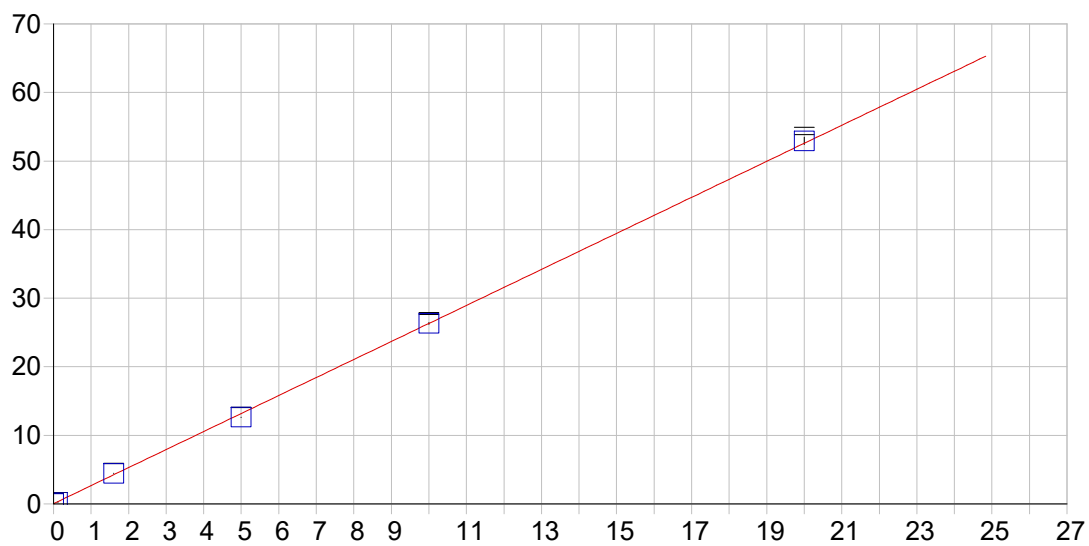


AI 396.152 { 85}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.000669 Re-Slope: 1.000000
 A1 (Gain): 0.135358 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999738 Status: OK.
 Std Error of Est: 0.000234
 Predicted MDL: 0.005648
 Predicted MQL: 0.018828

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	.00000	.000	.000	.00067	.000	1
S1	.10000	.09691	-.003	-3.09	.01484	.001	1
S3	5.0000	4.8082	-.192	-3.84	.66463	.002	1
S4	10.000	9.8543	-.146	-1.46	1.3608	.002	1
S5	20.000	20.229	.229	1.14	2.7913	.006	1
S2	1.6000	1.7117	.112	6.98	.23657	.001	1

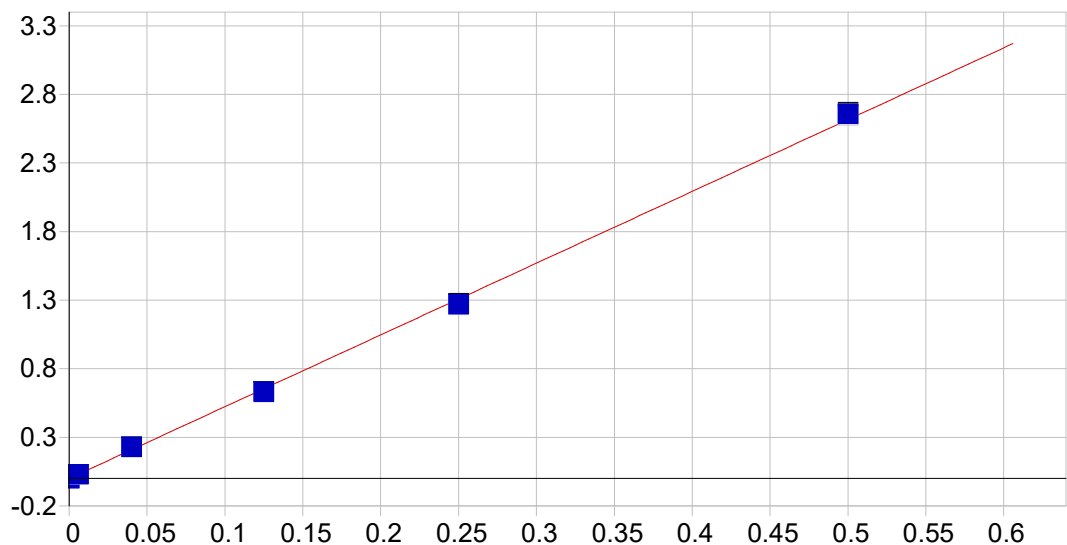


Ba 493.409 { 68}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.044315 Re-Slope: 1.000000
 A1 (Gain): 2.627254 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999817 Status: OK.
 Std Error of Est: 0.003730
 Predicted MDL: 0.000845
 Predicted MQL: 0.002816

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	.00000	.000	.000	.04432	.002	1
S1	.10000	.09679	-.003	-3.21	.29860	.001	1
S3	5.0000	4.7921	-.208	-4.16	12.634	.019	1
S4	10.000	10.000	.000	.002	26.317	.136	1
S5	20.000	20.133	.133	.664	52.938	.545	1
S2	1.6000	1.6782	.078	4.89	4.4534	.029	1

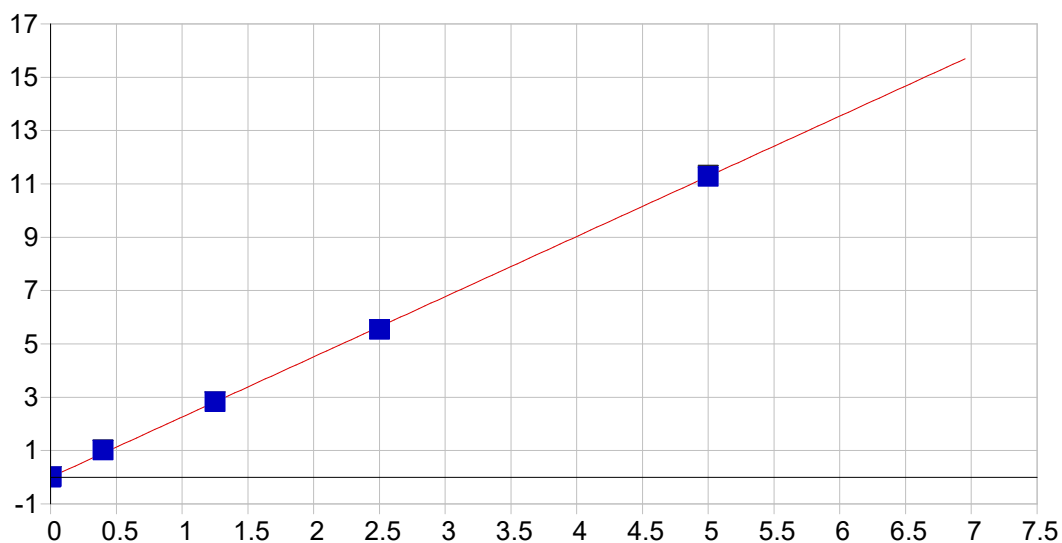


Be 234.861 {144}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.000124 Re-Slope: 1.000000
 A1 (Gain): 5.232378 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999520 Status: OK.
 Std Error of Est: 0.000464
 Predicted MDL: 0.000056
 Predicted MQL: 0.000185

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	.00012	.000	1
S1	.00600	.00571	-.000	-4.87	.02975	.000	1
S3	.12500	.12073	-.004	-3.42	.62888	.002	1
S4	.25000	.24268	-.007	-2.93	1.2640	.008	1
S5	.50000	.50802	.008	1.60	2.6466	.011	1
S2	.04000	.04386	.004	9.66	.22869	.000	1

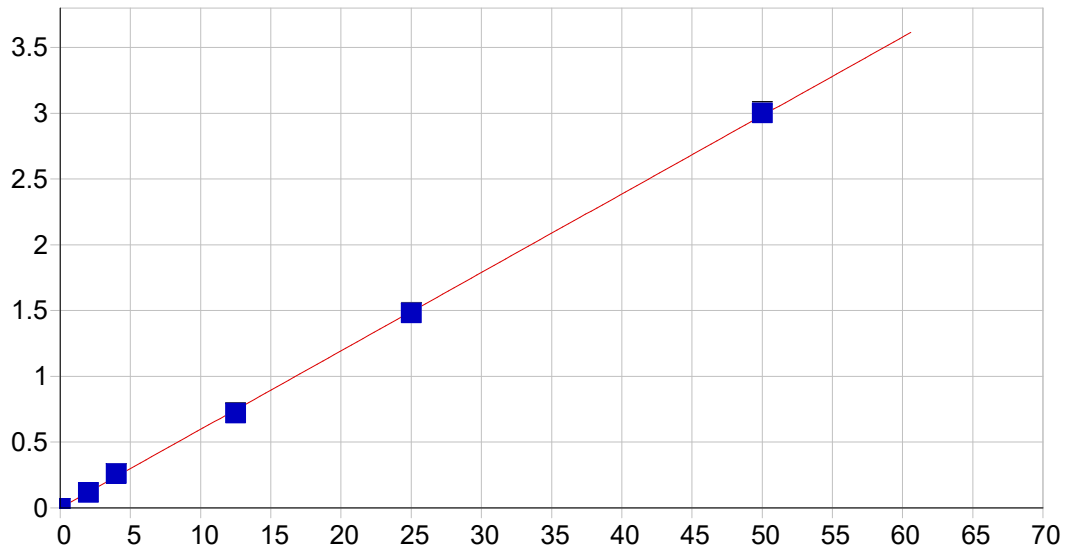


Cd 226.502 {449}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.000053 Re-Slope: 1.000000
 A1 (Gain): 2.257158 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999624 Status: OK.
 Std Error of Est: 0.000562
 Predicted MDL: 0.000097
 Predicted MQL: 0.000322

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	.00005	.000	1
S1	.00600	.00621	.000	3.45	.01411	.000	1
S3	1.2500	1.2505	.001	.041	2.8246	.013	1
S4	2.5000	2.4523	-.048	-1.91	5.5392	.003	1
S5	5.0000	4.9980	-.002	-.040	11.289	.038	1
S2	.40000	.44894	.049	12.2	1.0140	.003	1

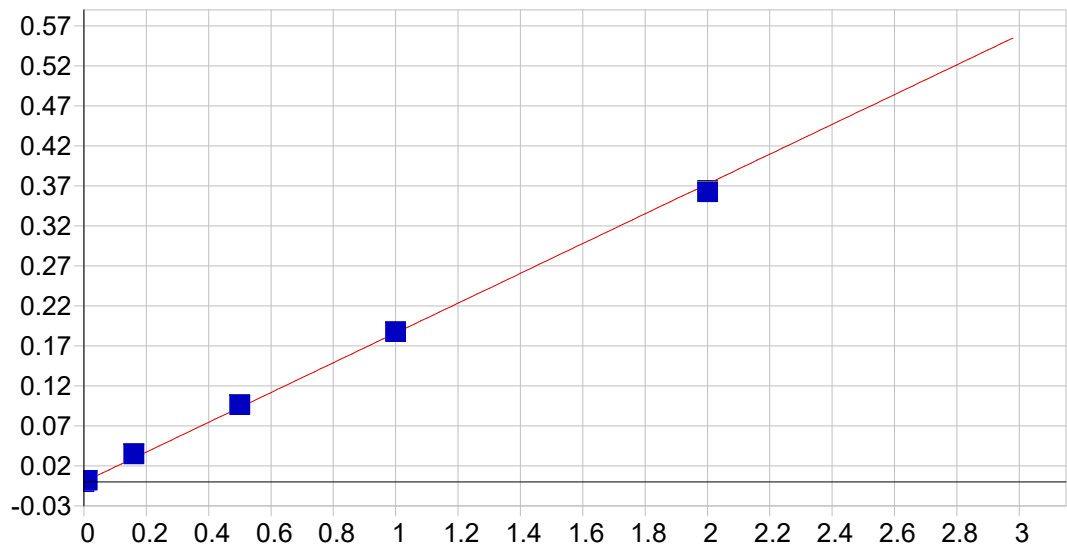


Ca 373.690 { 90}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.000856 Re-Slope: 1.000000
 A1 (Gain): 0.059639 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999738 Status: OK.
 Std Error of Est: 0.000722
 Predicted MDL: 0.009835
 Predicted MQL: 0.032785

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00004	-.000	.000	.00085	.000	1
S2	4.0000	4.3404	.340	8.51	.25971	.001	1
S3	12.500	12.069	-.431	-3.45	.72062	.003	1
S4	25.000	24.826	-.174	-.696	1.4815	.005	1
S5	50.000	50.325	.325	.649	3.0022	.010	1
S1	2.0000	1.9403	-.060	-2.99	.11657	.001	1

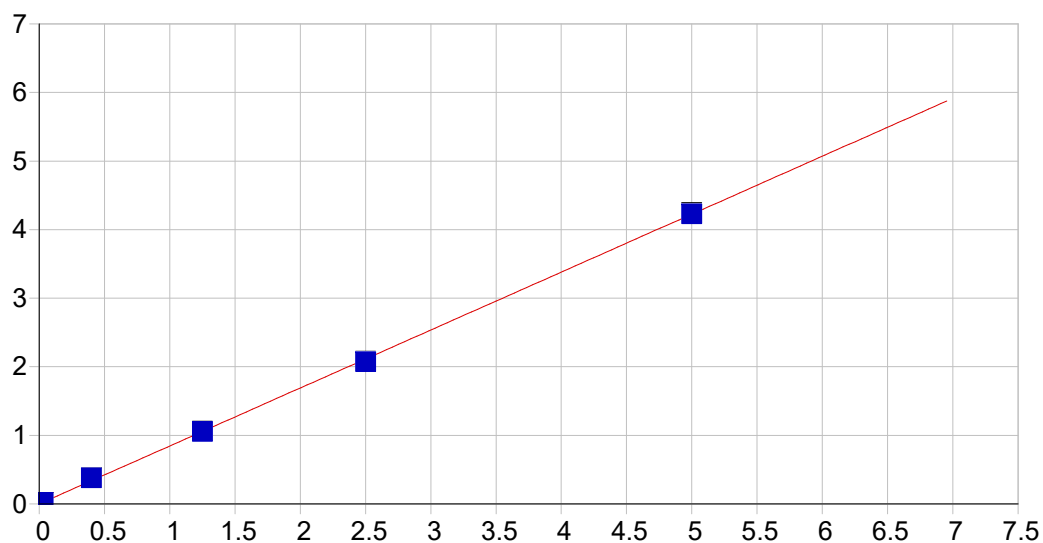


Cr 267.716 {126}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.000008 Re-Slope: 1.000000
 A1 (Gain): 0.186216 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999089 Status: OK.
 Std Error of Est: 0.000059
 Predicted MDL: 0.000494
 Predicted MQL: 0.001648

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	-.00001	.000	1
S1	.01000	.00998	-.000	-.232	.00185	.000	1
S3	.50000	.51744	.017	3.49	.09638	.000	1
S4	1.0000	1.0082	.008	.816	.18778	.000	1
S5	2.0000	1.9472	-.053	-2.64	.36270	.001	1
S2	.16000	.18722	.027	17.0	.03487	.000	1

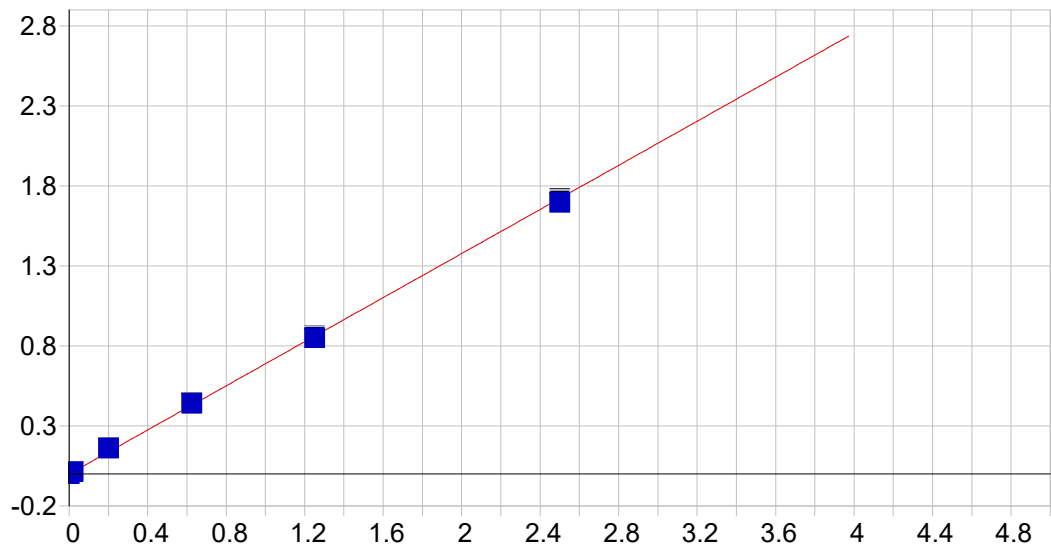


Co 228.616 {448}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset):	0.000170	Re-Slope:	1.000000
A1 (Gain):	0.845055	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999619	Status:	OK.
Std Error of Est:	0.000474		
Predicted MDL:	0.000229		
Predicted MQL:	0.000762		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	.00017	.000	1
S1	.03000	.02976	-.000	-.790	.02521	.000	1
S3	1.2500	1.2474	-.003	-.210	1.0561	.005	1
S4	2.5000	2.4523	-.048	-1.91	2.0761	.003	1
S5	5.0000	5.0011	.001	.023	4.2336	.014	1
S2	.40000	.44939	.049	12.3	.38050	.001	1

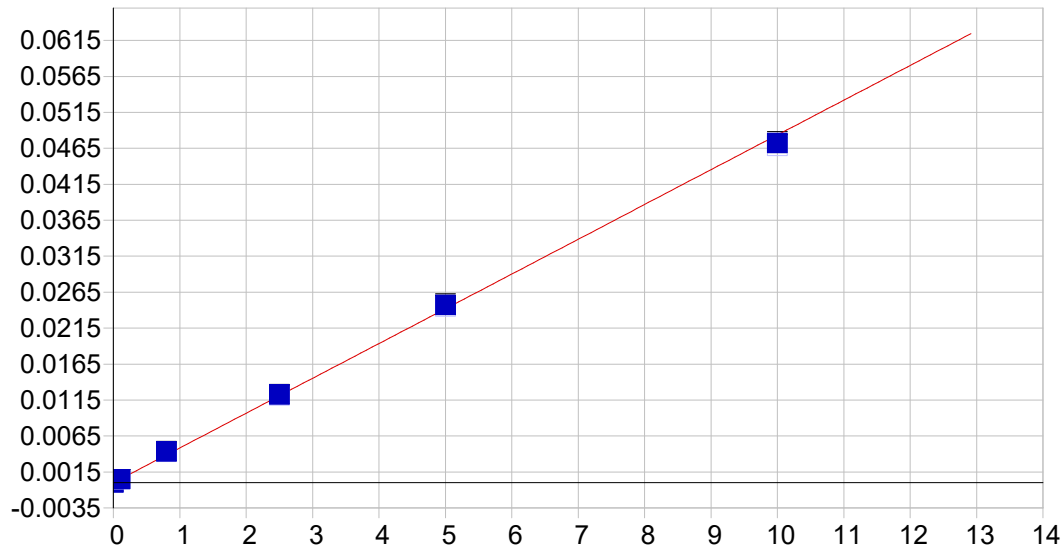


Cu 224.700 {450}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.000736 Re-Slope: 1.000000
 A1 (Gain): 0.688986 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999234 Status: OK.
 Std Error of Est: 0.000320
 Predicted MDL: 0.000463
 Predicted MQL: 0.001544

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00001	-.000	.000	-.00074	.000	1
S1	.02000	.02266	.003	13.3	.01505	.000	1
S3	.62500	.63887	.014	2.22	.44354	.003	1
S4	1.2500	1.2361	-.014	-1.11	.85911	.003	1
S5	2.5000	2.4632	-.037	-1.47	1.7128	.007	1
S2	.20000	.23413	.034	17.1	.16189	.001	1

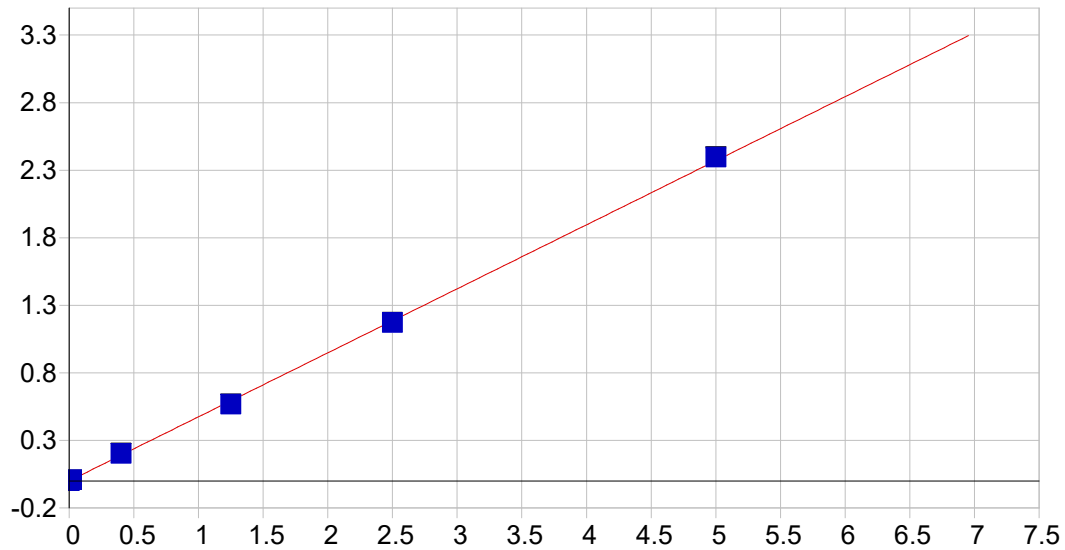


Fe 240.488 {140}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.000004 Re-Slope: 1.000000
 A1 (Gain): 0.004835 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999454 Status: OK.
 Std Error of Est: 0.000008
 Predicted MDL: 0.005953
 Predicted MQL: 0.019844

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00001	-.000	.000	.00000	.000	1
S1	.10000	.10004	.000	.037	.00048	.000	1
S3	2.5000	2.5301	.030	1.21	.01213	.000	1
S4	5.0000	5.1072	.107	2.14	.02449	.000	1
S5	10.000	9.7662	-.234	-2.34	.04681	.000	1
S2	.80000	.89643	.096	12.1	.00431	.000	1

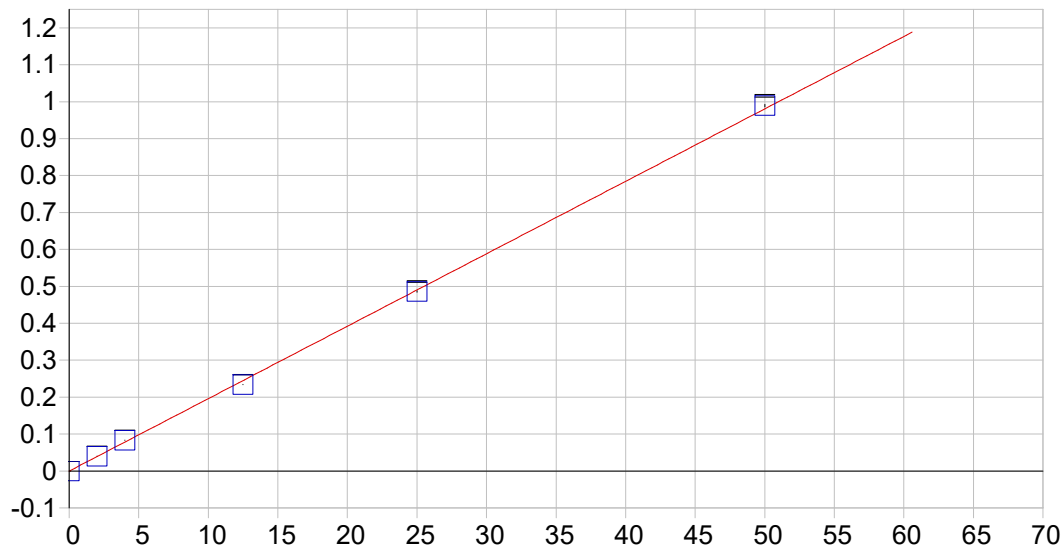


Mn 257.610 {131}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset):	0.000061	Re-Slope:	1.000000
A1 (Gain):	0.473941	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999716	Status:	OK.
Std Error of Est:	0.000187		
Predicted MDL:	0.000462		
Predicted MQL:	0.001539		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	.00006	.000	1
S1	.02000	.01973	-.000	-1.33	.00942	.000	1
S3	1.2500	1.1959	-.054	-4.33	.56697	.002	1
S4	2.5000	2.4716	-.028	-1.14	1.1717	.002	1
S5	5.0000	5.0549	.055	1.10	2.3963	.005	1
S2	.40000	.42783	.028	6.96	.20286	.001	1

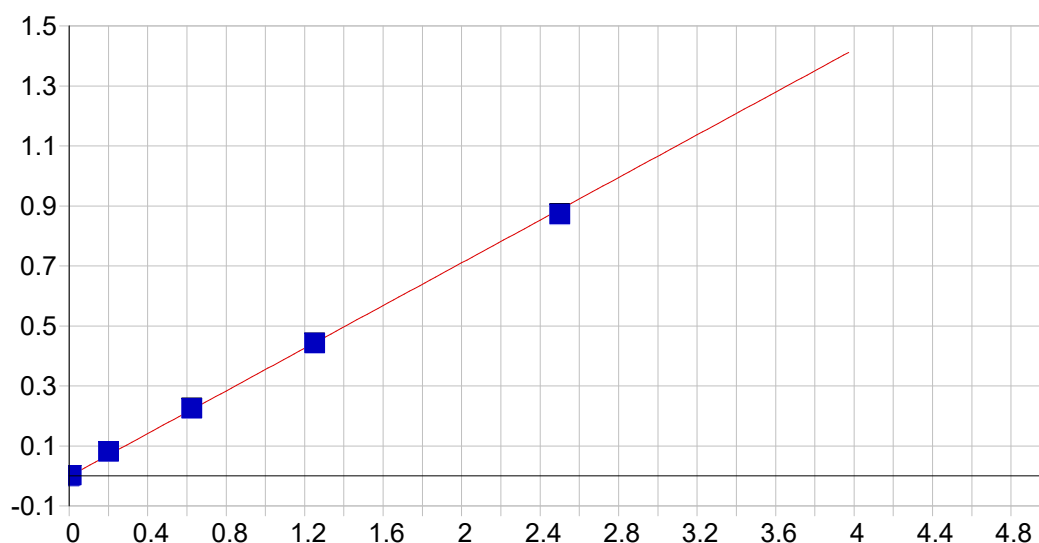


Mg 279.079 {121}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.000257 Re-Slope: 1.000000
 A1 (Gain): 0.019614 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999740 Status: OK.
 Std Error of Est: 0.000236
 Predicted MDL: 0.013667
 Predicted MQL: 0.045557

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00009	-.000	.000	-.00026	.000	1
S2	4.0000	4.2581	.258	6.45	.08326	.000	1
S3	12.500	11.944	-.556	-4.45	.23401	.001	1
S4	25.000	24.790	-.210	-.841	.48596	.002	1
S5	50.000	50.461	.461	.922	.98948	.003	1
S1	2.0000	2.0475	.048	2.38	.03990	.000	1

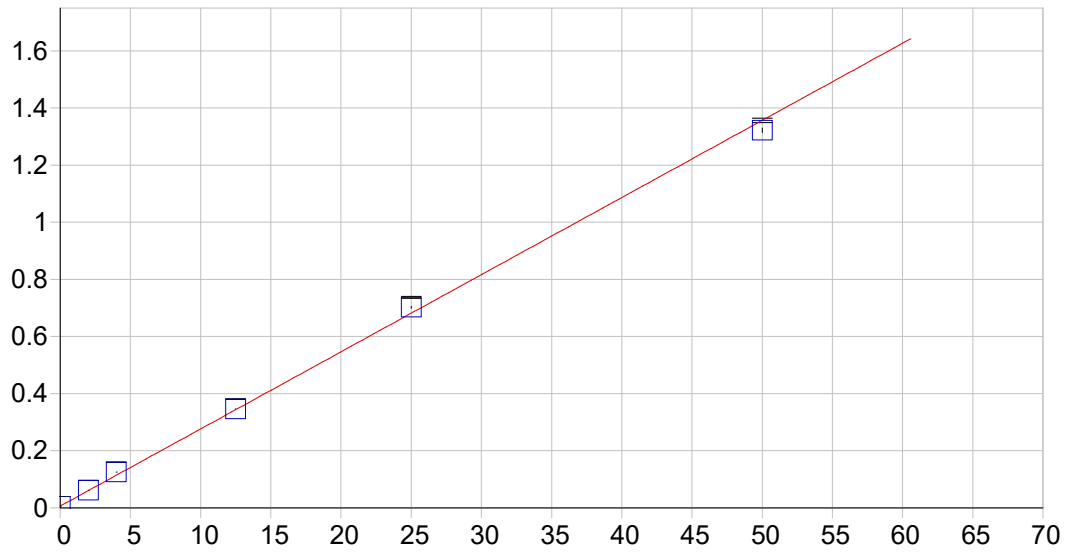


Ag 328.068 {103}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.001192 Re-Slope: 1.000000
 A1 (Gain): 0.355663 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999326 Status: OK.
 Std Error of Est: 0.000108
 Predicted MDL: 0.000372
 Predicted MQL: 0.001241

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	-.00119	.000	1
S1	.01000	.01083	.001	8.33	.00264	.000	1
S3	.62500	.63615	.011	1.78	.22418	.001	1
S4	1.2500	1.2476	-.002	-.191	.44077	.001	1
S5	2.5000	2.4583	-.042	-1.67	.86959	.002	1
S2	.20000	.23214	.032	16.1	.08109	.000	1

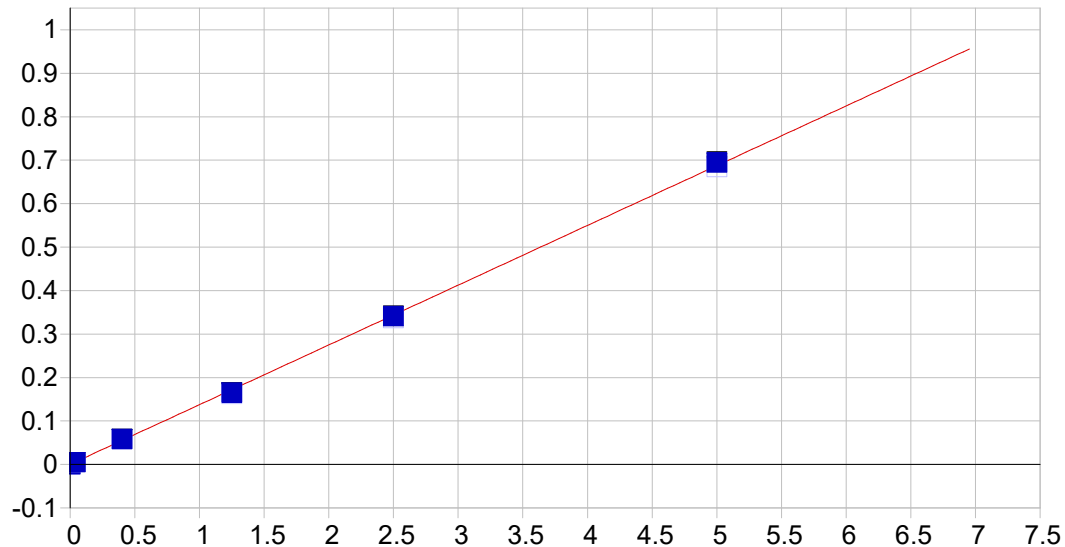


Na 589.592 { 57}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.006426 Re-Slope: 1.000000
 A1 (Gain): 0.027008 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999460 Status: OK.
 Std Error of Est: 0.000470
 Predicted MDL: 0.008298
 Predicted MQL: 0.027661

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00027	-.000	.000	.00642	.000	1
S2	4.0000	4.4105	.411	10.3	.12555	.000	1
S3	12.500	12.582	.082	.655	.34623	.001	1
S4	25.000	25.768	.768	3.07	.70236	.004	1
S5	50.000	48.699	-1.30	-2.60	1.3217	.008	1
S1	2.0000	2.0409	.041	2.04	.06155	.000	1

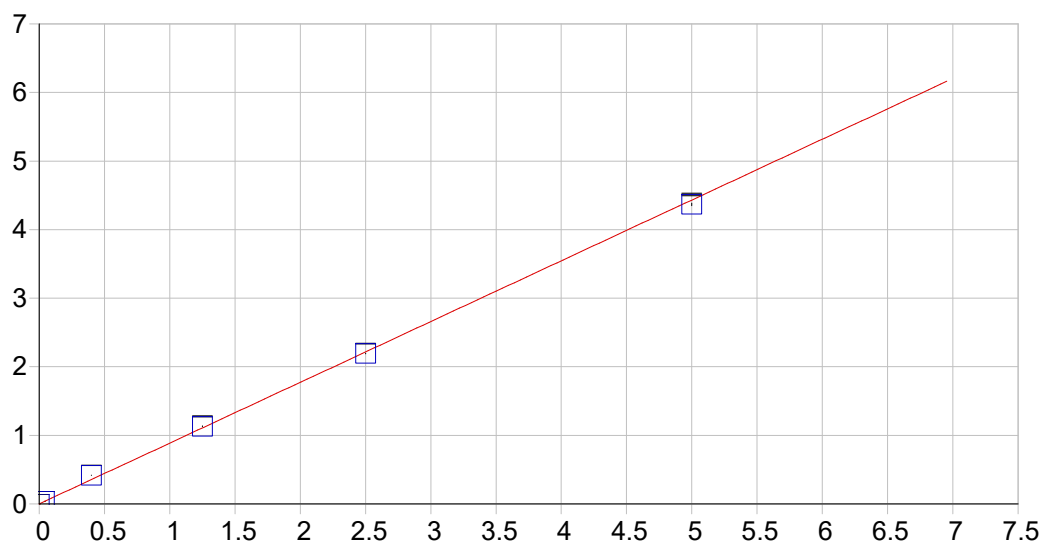


V 292.402 {115}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.000088 Re-Slope: 1.000000
 A1 (Gain): 0.137459 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999762 Status: OK.
 Std Error of Est: 0.000069
 Predicted MDL: 0.001961
 Predicted MQL: 0.006535

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	.00000	.000	.000	.00009	.000	1
S1	.04000	.03754	-.002	-6.14	.00504	.000	1
S3	1.2500	1.1975	-.053	-4.20	.16219	.000	1
S4	2.5000	2.4821	-.018	-.715	.33627	.000	1
S5	5.0000	5.0503	.050	1.01	.68428	.002	1
S2	.40000	.42246	.022	5.61	.05736	.000	1

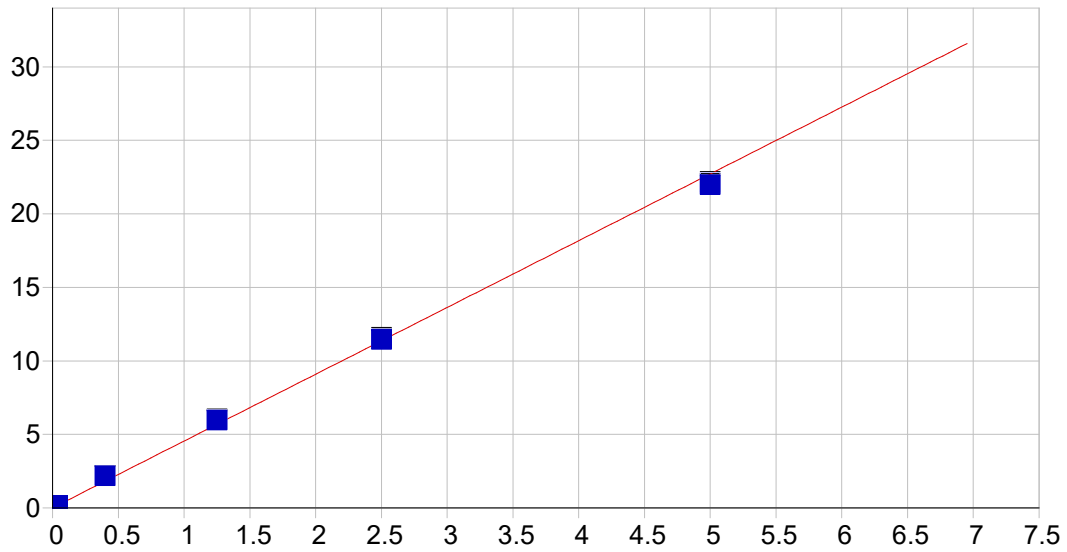


Zn 206.200 {464}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.000271 Re-Slope: 1.000000
 A1 (Gain): 0.886333 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999219 Status: OK.
 Std Error of Est: 0.000822
 Predicted MDL: 0.000222
 Predicted MQL: 0.000739

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00001	-.000	.000	.00026	.000	1
S1	.04000	.04276	.003	6.89	.03817	.000	1
S3	1.2500	1.2757	.026	2.06	1.1310	.006	1
S4	2.5000	2.4727	-.027	-1.09	2.1919	.005	1
S5	5.0000	4.9285	-.071	-1.43	4.3686	.019	1
S2	.40000	.47022	.070	17.6	.41704	.001	1

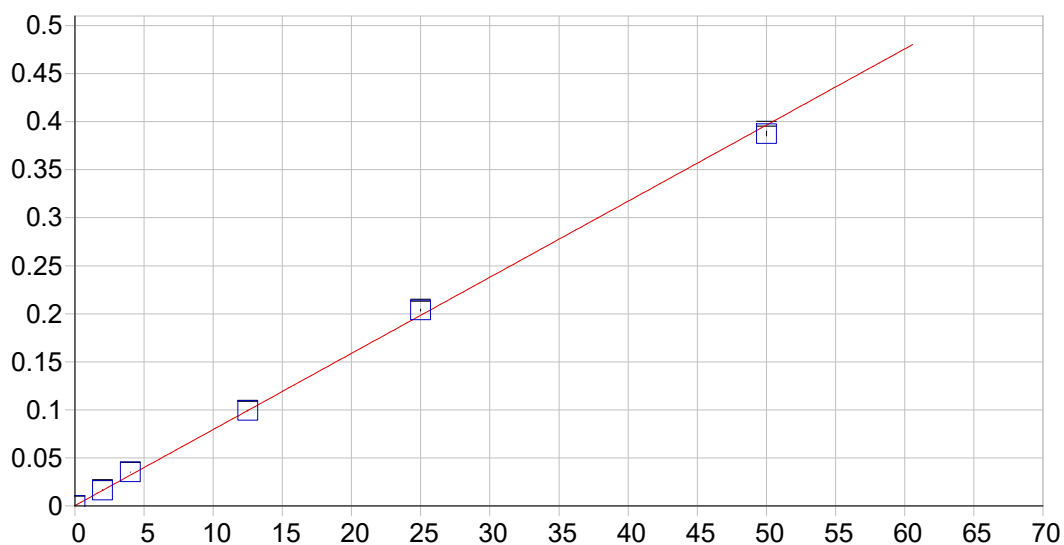


Zn 213.856 {158}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset):	0.004882	Re-Slope:	1.000000
A1 (Gain):	4.542907	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.998703	Status:	OK.
Std Error of Est:	0.005473		
Predicted MDL:	0.000237		
Predicted MQL:	0.000789		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00001	-.000	.000	.00483	.000	1
S1	.04000	.04279	.003	6.98	.20056	.001	1
S3	1.2500	1.3132	.063	5.06	6.0101	.043	1
S4	2.5000	2.5175	.018	.702	11.521	.074	1
S5	5.0000	4.8379	-.162	-3.24	22.141	.063	1
S2	.40000	.47859	.079	19.6	2.1917	.005	1

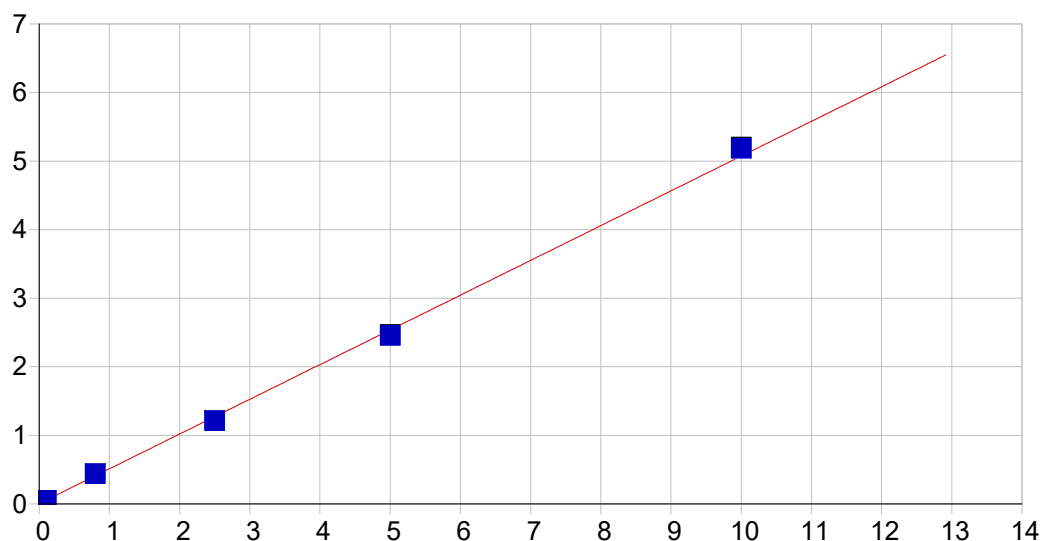


K 766.490 { 44}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.000342 Re-Slope: 1.000000
 A1 (Gain): 0.007921 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999536 Status: OK.
 Std Error of Est: 0.000128
 Predicted MDL: 0.034201
 Predicted MQL: 0.114003

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00025	-.000	.000	.00034	.000	1
S2	4.0000	4.4041	.404	10.1	.03523	.000	1
S3	12.500	12.477	-.023	-.188	.09917	.000	1
S4	25.000	25.706	.706	2.82	.20397	.001	1
S5	50.000	48.875	-1.12	-2.25	.38750	.002	1
S1	2.0000	2.0384	.038	1.92	.01649	.000	1

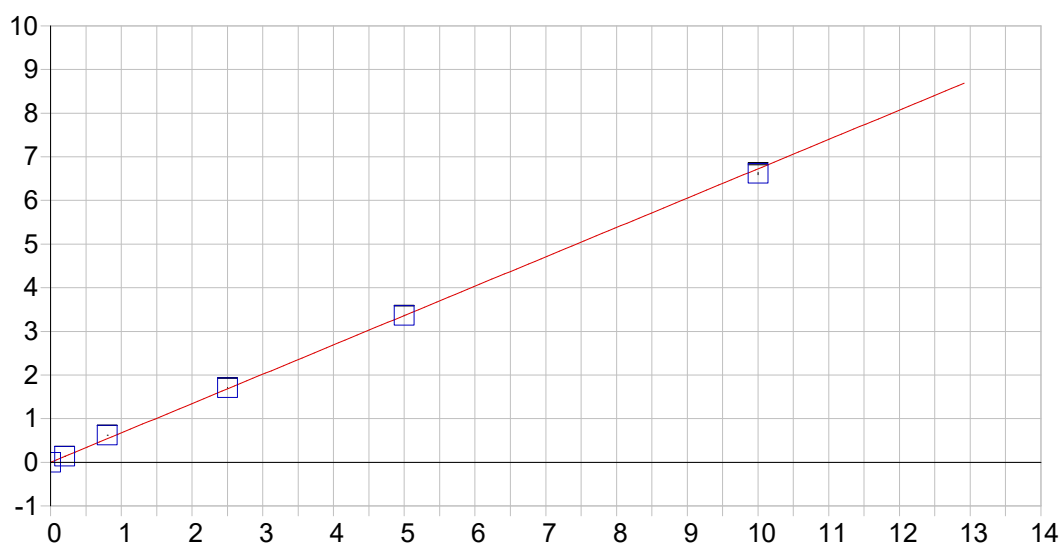


B 249.678 {135}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.005247 Re-Slope: 1.000000
 A1 (Gain): 0.506605 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999459 Status: OK.
 Std Error of Est: 0.000873
 Predicted MDL: 0.000708
 Predicted MQL: 0.002358

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	.00000	.000	.000	.00525	.000	1
S1	.10000	.09461	-.005	-5.39	.05296	.001	1
S3	2.5000	2.3880	-.112	-4.48	1.2126	.004	1
S4	5.0000	4.8369	-.163	-3.26	2.4507	.012	1
S5	10.000	10.222	.222	2.22	5.1738	.019	1
S2	.80000	.85861	.059	7.33	.43943	.001	1

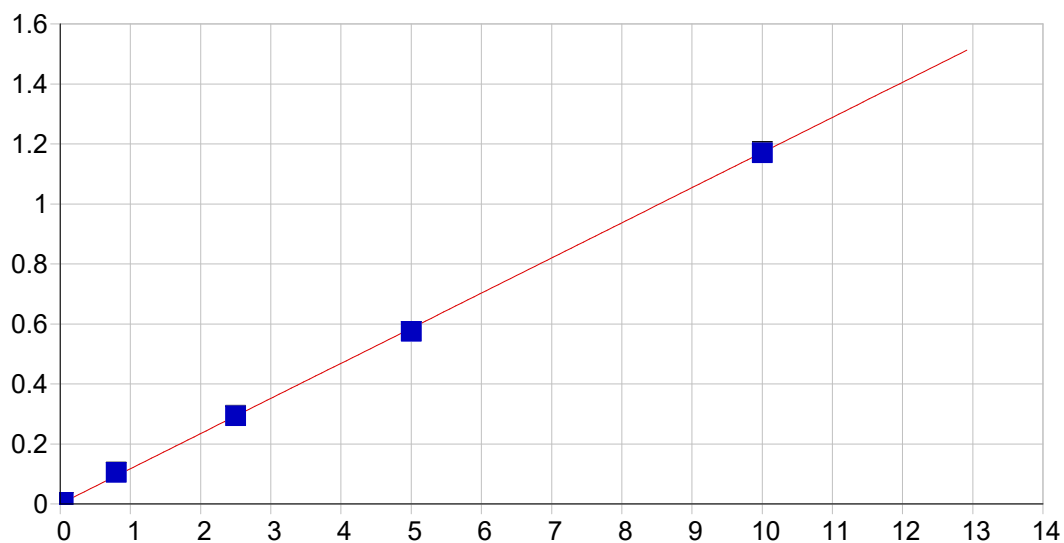


Mo 202.030 {467}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.000024 Re-Slope: 1.000000
 A1 (Gain): 0.672538 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999410 Status: OK.
 Std Error of Est: 0.001721
 Predicted MDL: 0.000310
 Predicted MQL: 0.001034

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00004	-.000	.000	-.00005	.000	1
S1	.20000	.20607	.006	3.04	.13857	.001	1
S3	2.5000	2.5336	.034	1.34	1.7039	.009	1
S4	5.0000	4.9990	-.001	-.020	3.3620	.008	1
S5	10.000	9.8393	-.161	-1.61	6.6173	.024	1
S2	.80000	.92209	.122	15.3	.62012	.003	1

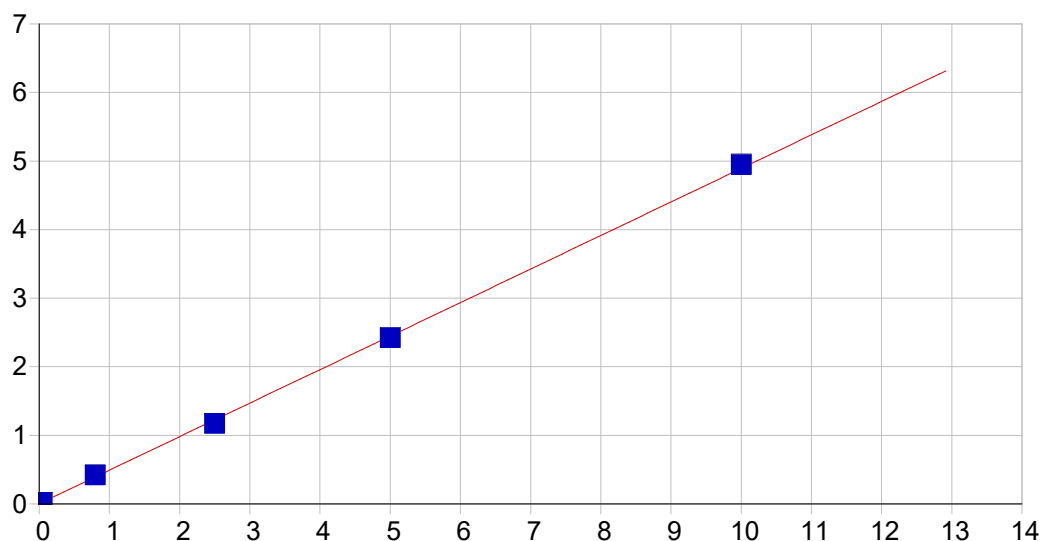


Sn 189.989 {478}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.000152 Re-Slope: 1.000000
 A1 (Gain): 0.117096 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999638 Status: OK.
 Std Error of Est: 0.000104
 Predicted MDL: 0.000853
 Predicted MQL: 0.002842

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	.00015	.000	1
S1	.04000	.03903	-.001	-2.42	.00472	.000	1
S3	2.5000	2.5047	.005	.189	.29315	.002	1
S4	5.0000	4.9057	-.094	-1.89	.57400	.000	1
S5	10.000	9.9948	-.005	-.052	1.1693	.004	1
S2	.80000	.89570	.096	12.0	.10494	.001	1

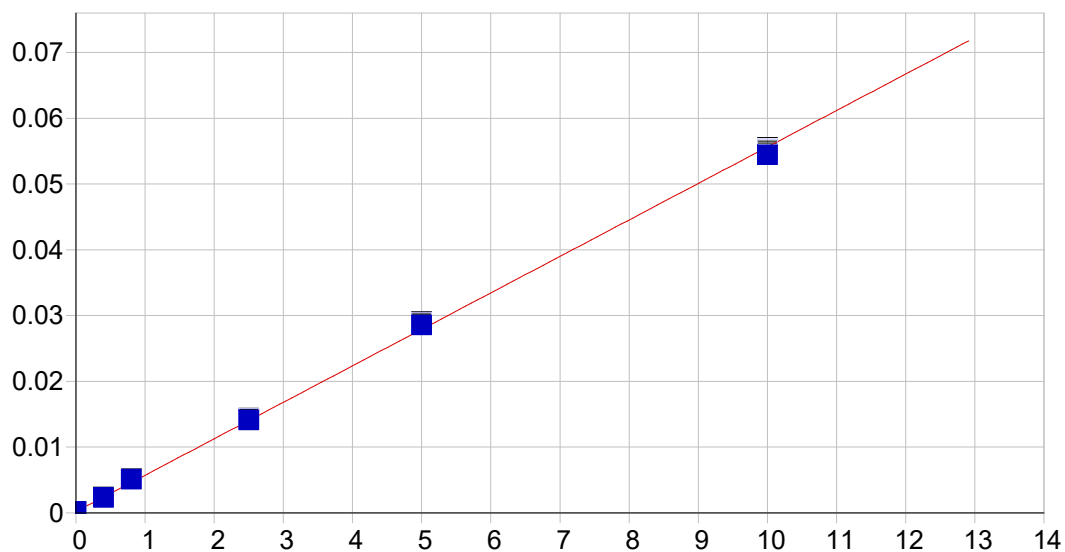


Ti 336.121 {100}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.002855 Re-Slope: 1.000000
 A1 (Gain): 0.488880 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999733 Status: OK.
 Std Error of Est: 0.000374
 Predicted MDL: 0.000789
 Predicted MQL: 0.002629

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	.00285	.000	1
S1	.04000	.03994	-.000	-.141	.02237	.000	1
S3	2.5000	2.3886	-.111	-4.45	1.1702	.003	1
S4	5.0000	4.9488	-.051	-1.02	2.4213	.003	1
S5	10.000	10.114	.114	1.14	4.9454	.007	1
S2	.80000	.84912	.049	6.14	.41783	.003	1

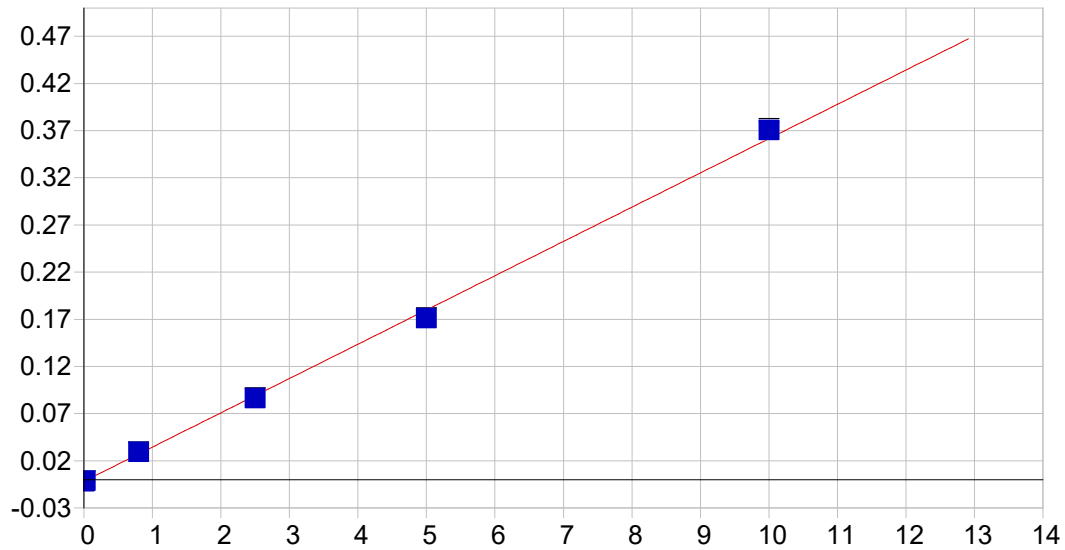


Si 288.158 {117}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.000183 Re-Slope: 1.000000
 A1 (Gain): 0.005545 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999542 Status: OK.
 Std Error of Est: 0.000018
 Predicted MDL: 0.009537
 Predicted MQL: 0.031790

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00003	-.000	.000	.00018	.000	1
S1	.40000	.38627	-.014	-3.43	.00233	.000	1
S3	2.5000	2.5153	.015	.612	.01434	.000	1
S4	5.0000	5.1204	.120	2.41	.02899	.000	1
S5	10.000	9.7895	-.210	-2.10	.05530	.000	1
S2	.80000	.88838	.088	11.0	.00518	.000	1

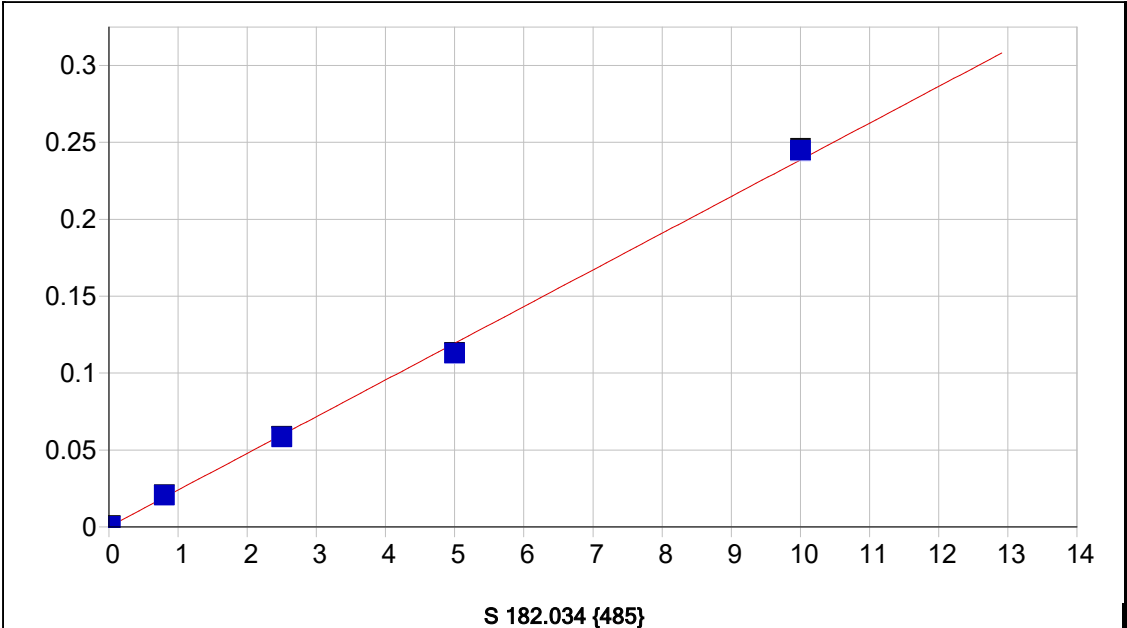


P 177.495 {490}

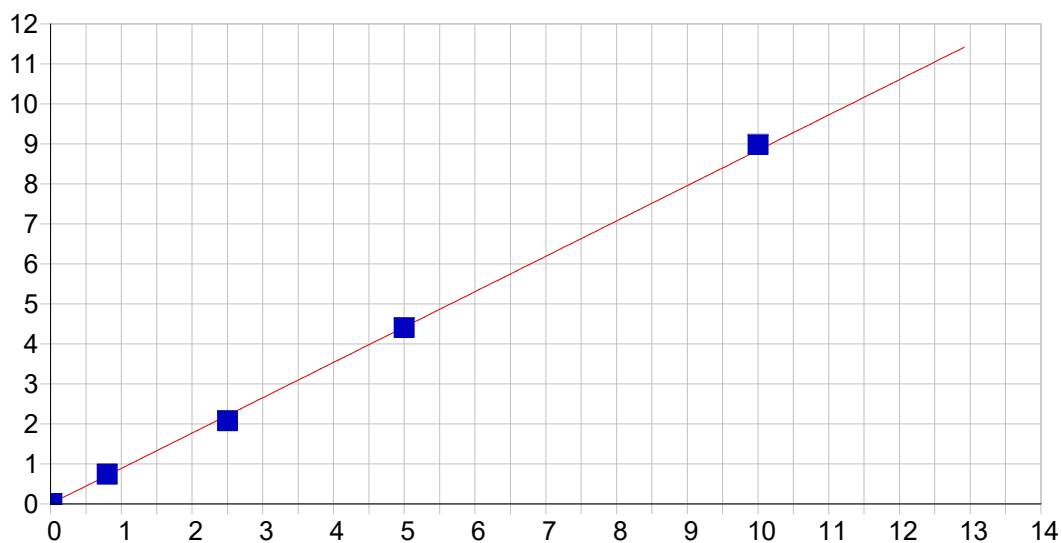
Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.001838 Re-Slope: 1.000000
 A1 (Gain): 0.036341 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999332 Status: OK.
 Std Error of Est: 0.000031
 Predicted MDL: 0.002646
 Predicted MQL: 0.008820

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	-.00184	.000	1
S1	.02000	.02014	.000	.711	-.00111	.000	1
S3	2.5000	2.4291	-.071	-2.84	.08642	.001	1
S4	5.0000	4.7606	-.239	-4.79	.17114	.001	1
S5	10.000	10.248	.248	2.48	.37051	.002	1
S2	.80000	.86256	.063	7.82	.02950	.000	1



Date of Fit: 2/14/2025 20:55:47		Type of Fit: Linear		Weighting: 1/Conc			
A0 (Offset):	0.000117	Re-Slope:		1.000000			
A1 (Gain):	0.023854	Y-int:		0.000000			
A2 (Curvature):	0.000000						
n (Exponent):	1.000000						
Correlation:	0.999239	Status:		OK.			
Std Error of Est:	0.000022						
Predicted MDL:	0.003822						
Predicted MQL:	0.012739						
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	.00012	.000	1
S1	.02000	.02291	.003	14.6	.00064	.000	1
S3	2.5000	2.4422	-.058	-2.31	.05822	.001	1
S4	5.0000	4.7311	-.269	-5.38	.11266	.000	1
S5	10.000	10.263	.263	2.63	.24431	.001	1
S2	.80000	.86093	.061	7.62	.02060	.000	1

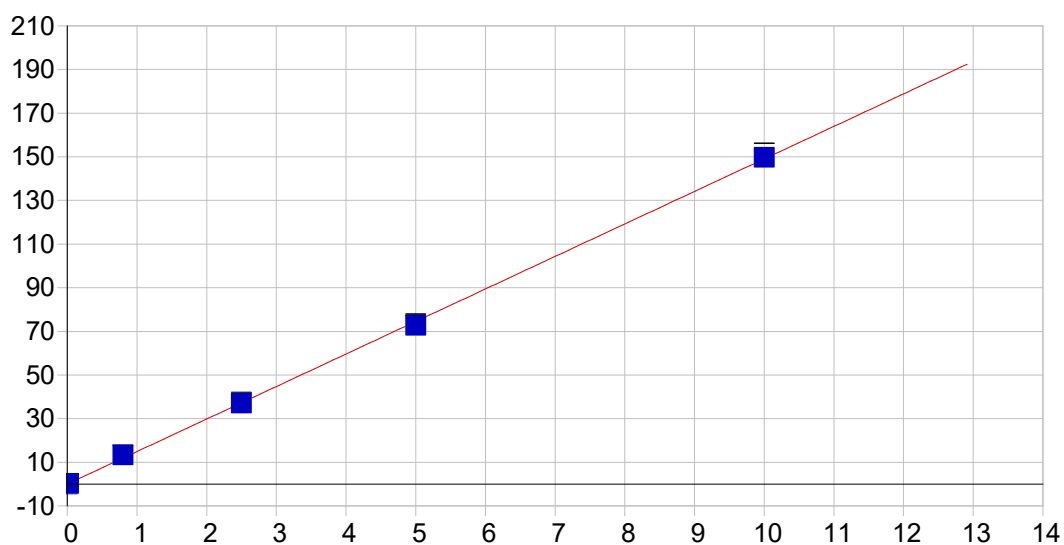


Li 670.784 { 50}

Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.003080 Re-Slope: 1.000000
 A1 (Gain): 0.883686 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999614 Status: OK.
 Std Error of Est: 0.000576
 Predicted MDL: 0.001319
 Predicted MQL: 0.004396

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	.00000	.000	.000	.00308	.001	1
S5	10.000	10.154	.154	1.54	8.9802	.012	1
S4	5.0000	4.9757	-.024	-.487	4.4022	.002	1
S3	2.5000	2.3408	-.159	-6.37	2.0727	.006	1
S1	.02000	.01774	-.002	-11.3	.01904	.001	1
S2	.80000	.83210	.032	4.01	.73875	.005	1

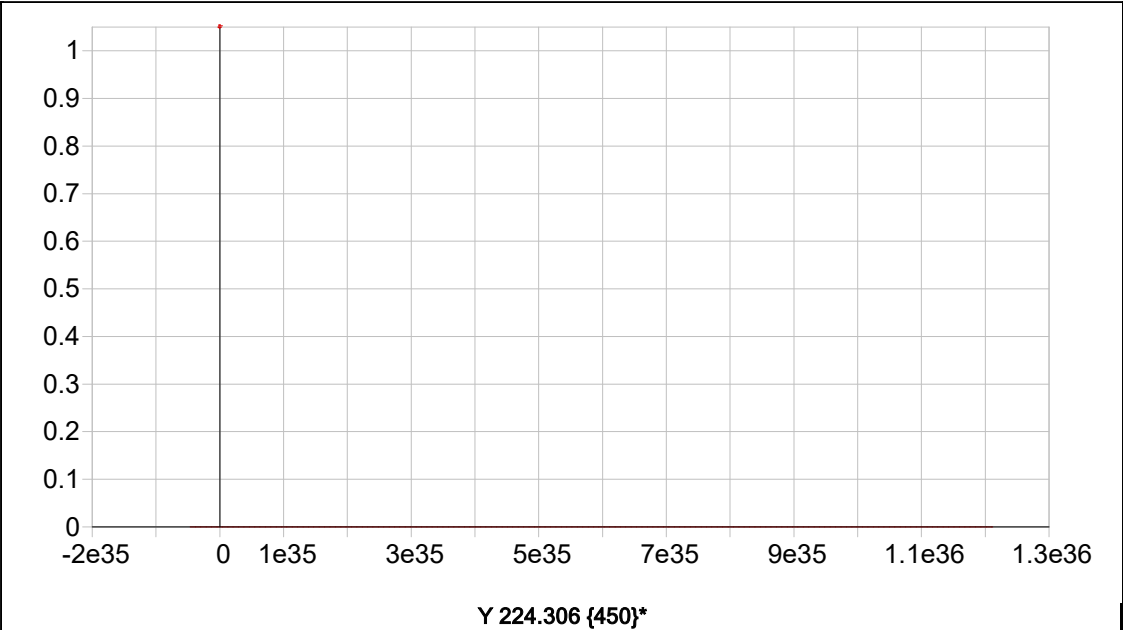


Sr 407.771 { 83}

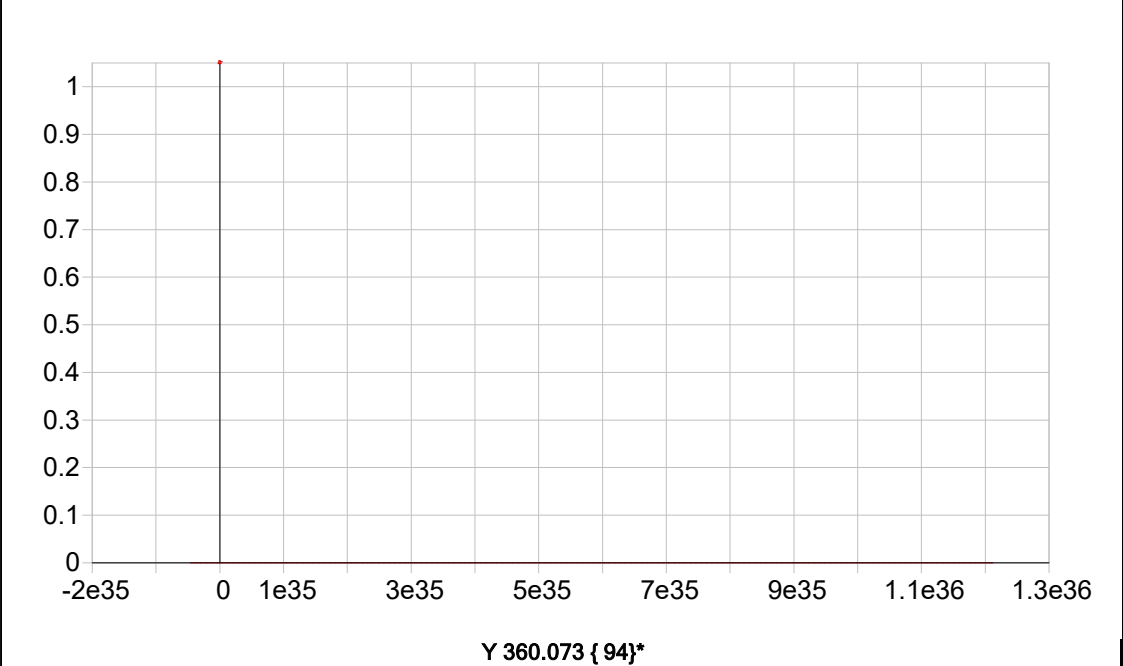
Date of Fit: 2/14/2025 20:55:47 Type of Fit: Linear Weighting: 1/Conc

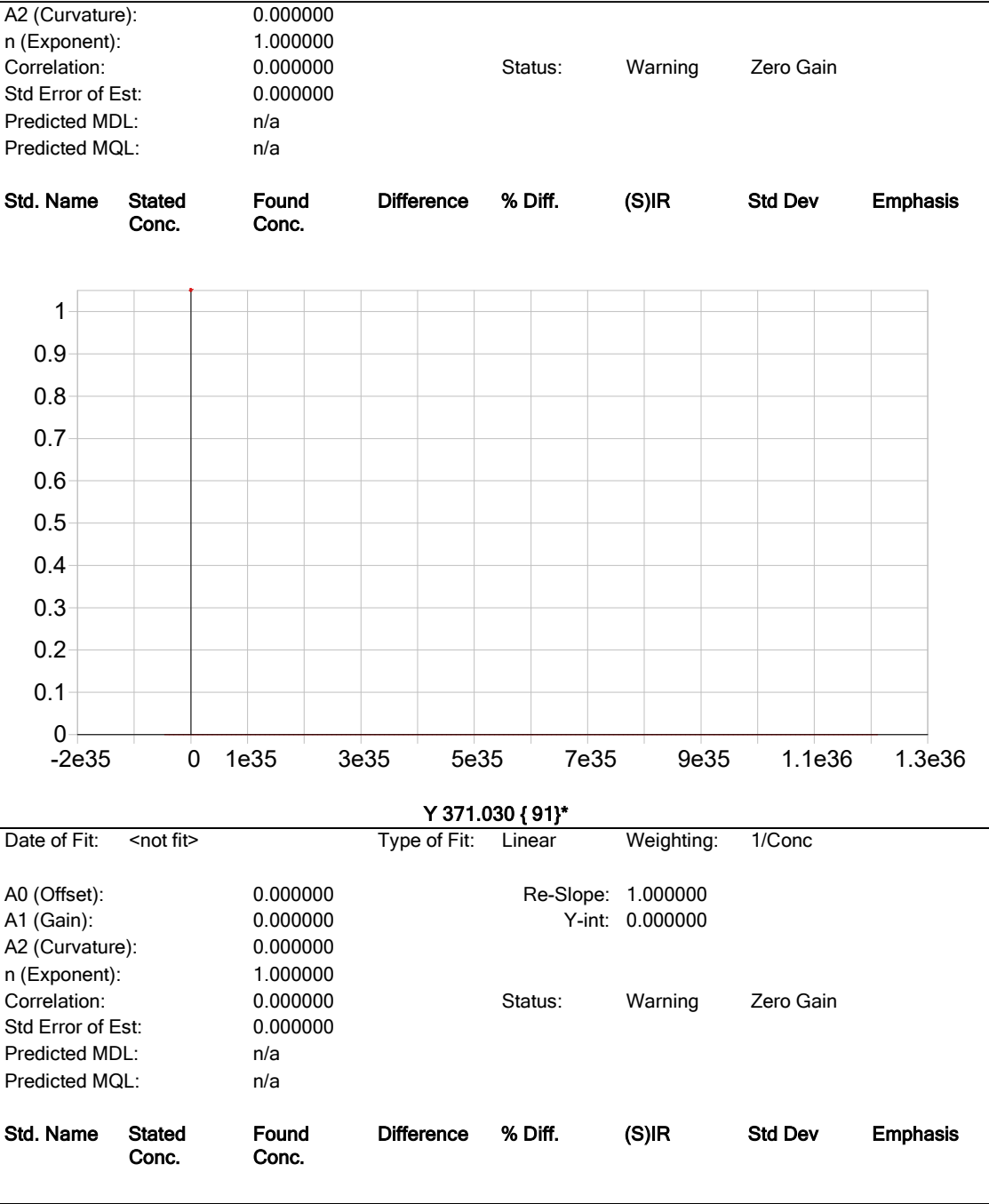
A0 (Offset): 0.000064 Re-Slope: 1.000000
 A1 (Gain): 14.903980 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999638 Status: OK.
 Std Error of Est: 0.009411
 Predicted MDL: 0.000047
 Predicted MQL: 0.000157

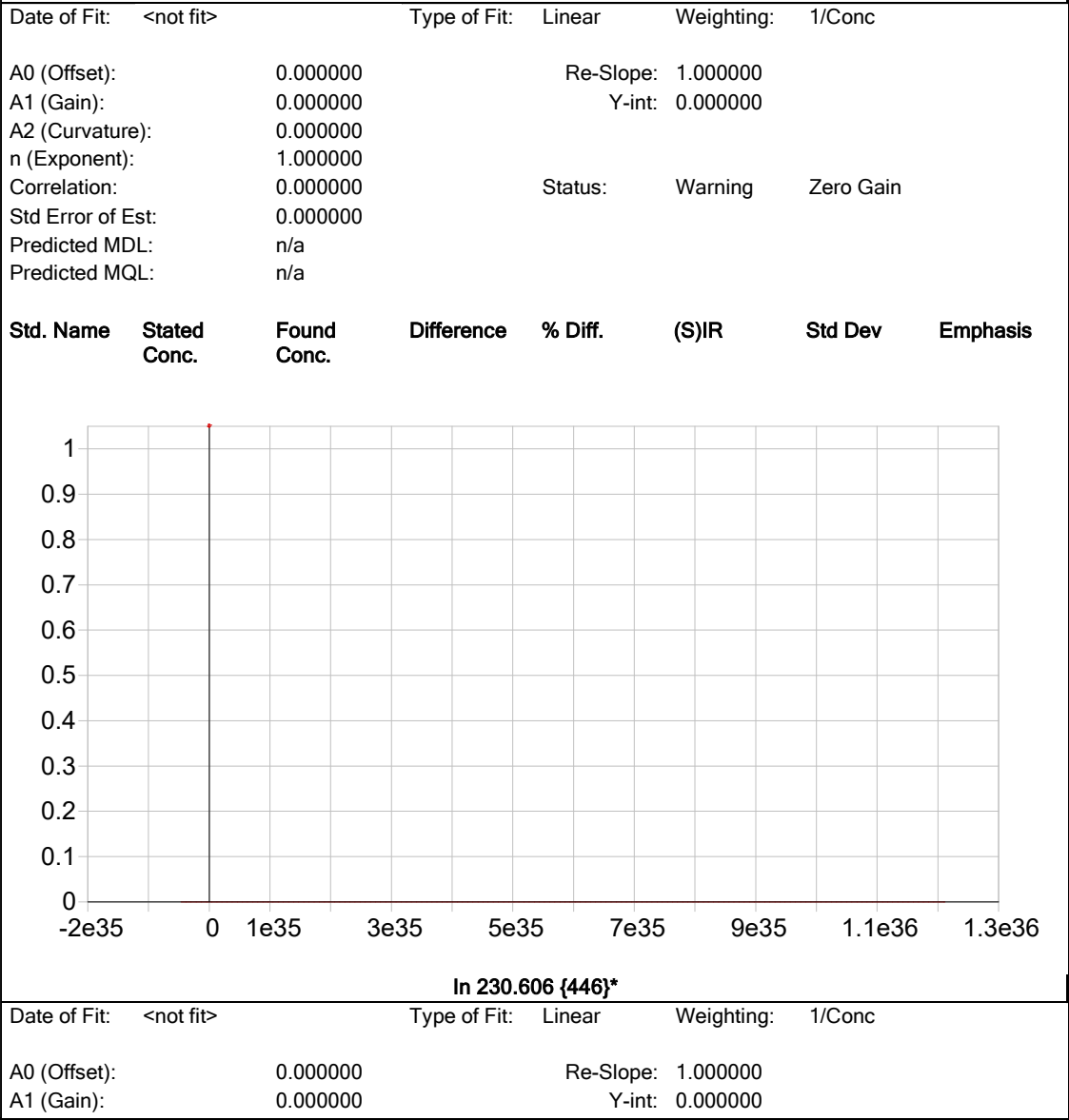
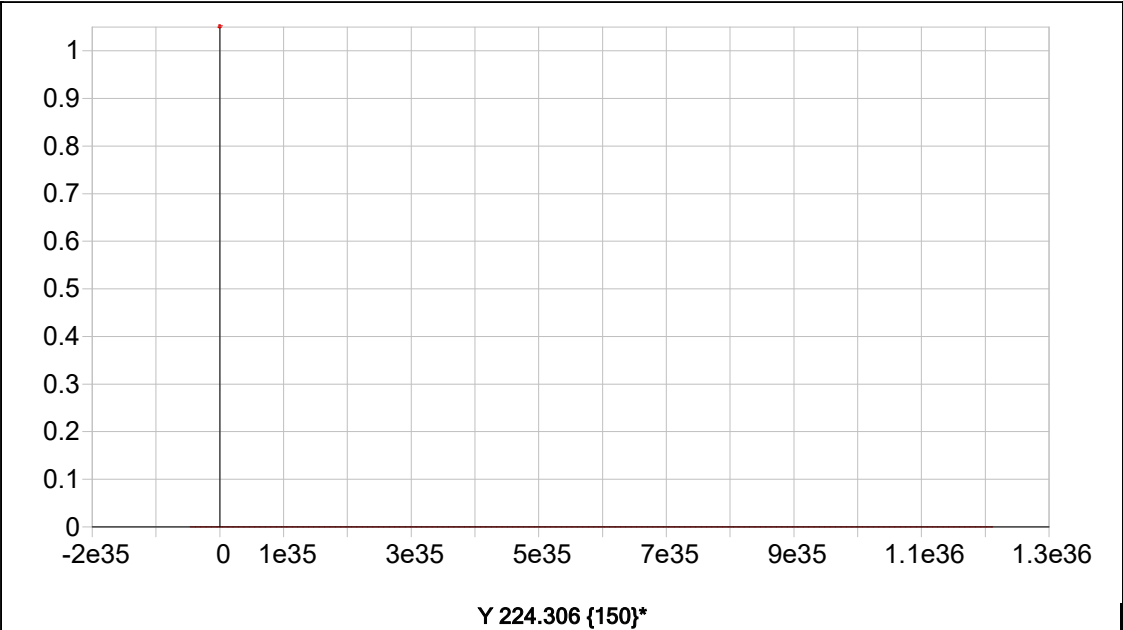
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	.00004	.000	1
S1	.02000	.01959	-.000	-2.05	.29351	.001	1
S3	2.5000	2.4831	-.017	-.675	37.046	.456	1
S4	5.0000	4.8777	-.122	-2.45	72.772	.670	1
S5	10.000	10.050	.050	.504	149.94	1.84	1
S2	.80000	.88917	.089	11.1	13.264	.030	1



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

Sample Name: S0 Acquired: 2/14/2025 13:55:36 Type: Cal
Method: NON EPA-6010-200.7(v2698) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934	Be2348
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-.00023	.00025	-.00016	.00033	.00046	.00067	.04432	.00012
Stddev	.00006	.00010	.00035	.00014	.00013	.00034	.00221	.00032
%RSD	24.583	40.482	216.69	43.005	28.354	50.822	4.9890	262.18

#1	-.00028	.00014	.00023	.00032	.00031	.00054	.04645	-.00009
#2	-.00025	.00028	-.00026	.00019	.00049	.00041	.04448	.00050
#3	-.00017	.00034	-.00046	.00047	.00057	.00105	.04203	-.00004

Elem	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00005	.00085	-.00001	.00017	-.00074	.00000	.00006	-.00026
Stddev	.00015	.00036	.00005	.00005	.00011	.00001	.00011	.00002
%RSD	295.17	41.822	560.96	28.131	14.378	265.24	177.69	8.7445

#1	-.00004	.00044	-.00001	.00017	-.00073	.00001	.00000	-.00024
#2	-.00003	.00110	.00004	.00021	-.00064	-.00001	-.00001	-.00025
#3	.00023	.00102	-.00005	.00012	-.00085	.00001	.00018	-.00028

Elem	Ni2316	Ag3280	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-.00016	-.00119	.00642	.00009	.00483	.00034	.00525	-.00005
Stddev	.00022	.00009	.00020	.00022	.00039	.00022	.00024	.00028
%RSD	140.19	7.5363	3.0985	248.54	8.1680	63.699	4.6604	572.72

#1	-.00033	-.00127	.00619	-.00016	.00525	.00057	.00551	.00027
#2	-.00024	-.00110	.00657	.00019	.00447	.00014	.00503	-.00019
#3	.00009	-.00121	.00650	.00024	.00477	.00032	.00521	-.00022

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707	Sr4077	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	.00015	.00285	.00018	-.00184	.00012	.00308	.00004	
Stddev	.00007	.00035	.00003	.00008	.00007	.00130	.00021	
%RSD	43.202	12.352	13.733	4.2144	58.021	42.177	459.57	

#1	.00009	.00326	.00017	-.00183	.00010	.00359	-.00019	
#2	.00014	.00268	.00016	-.00192	.00019	.00161	.00017	
#3	.00022	.00262	.00021	-.00176	.00006	.00405	.00016	

Sample Name: S0 Acquired: 2/14/2025 13:55:36 Type: Cal
Method: NON EPA-6010-200.7(v2698) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2832.3	53497.	9700.2	1742.5	4403.4
Stddev	10.6	125.	16.0	5.9	10.9
%RSD	.37463	.23372	.16520	.33934	.24679
#1	2830.6	53409.	9716.3	1746.6	4403.1
#2	2843.6	53441.	9684.3	1735.7	4414.3
#3	2822.6	53640.	9700.1	1745.2	4392.6

Sample Name: S1 Acquired: 2/14/2025 14:00:02 Type: Cal
Method: NON EPA-6010-200.7(v2698) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934	Be2348
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00092	.00246	.00259	.00203	.00920	.01484	.29860	.02975
Stddev	.00007	.00006	.00008	.00018	.00010	.00077	.00129	.00037
%RSD	7.3662	2.5899	3.0676	8.6452	1.0586	5.2165	.43361	1.2509
#1	.00085	.00249	.00250	.00195	.00929	.01546	.29847	.02968
#2	.00099	.00238	.00265	.00191	.00910	.01397	.29995	.03016
#3	.00093	.00250	.00261	.00224	.00923	.01507	.29737	.02943
Elem	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.01411	.11657	.00185	.02521	.01505	.00048	.00942	.03990
Stddev	.00006	.00085	.00002	.00010	.00026	.00002	.00018	.00010
%RSD	.39670	.73314	.90366	.39945	1.7244	4.3178	1.9155	.25447
#1	.01409	.11597	.00183	.02528	.01479	.00048	.00925	.03982
#2	.01407	.11755	.00186	.02510	.01507	.00046	.00961	.04002
#3	.01417	.11619	.00186	.02526	.01531	.00050	.00939	.03987
Elem	Ni2316	Ag3280	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.03181	.00264	.06155	.00504	.20056	.01649	.05296	.13857
Stddev	.00027	.00001	.00024	.00035	.00106	.00035	.00054	.00056
%RSD	.85303	.39752	.38649	7.0180	.52994	2.1198	1.0147	.40314
#1	.03158	.00264	.06173	.00516	.19934	.01674	.05238	.13812
#2	.03174	.00262	.06163	.00532	.20102	.01664	.05305	.13838
#3	.03211	.00264	.06128	.00464	.20131	.01609	.05344	.13919
Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707	Sr4077	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	.00472	.02237	.00233	-.00111	.00064	.01904	.29351	
Stddev	.00004	.00015	.00004	.00008	.00007	.00097	.00064	
%RSD	.92769	.68594	1.9137	7.3399	11.120	5.1110	.21942	
#1	.00468	.02255	.00229	-.00117	.00059	.01997	.29298	
#2	.00476	.02228	.00238	-.00101	.00072	.01911	.29422	
#3	.00471	.02228	.00232	-.00114	.00062	.01803	.29333	

Sample Name: S1 Acquired: 2/14/2025 14:00:02 Type: Cal
Method: NON EPA-6010-200.7(v2698) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2826.3	52881.	10060.	1701.0	4351.6
Stddev	2.5	86.	52.	1.8	4.7
%RSD	.08862	.16347	.51572	.10621	.10732
#1	2828.6	52963.	10120.	1702.3	4351.6
#2	2826.6	52791.	10032.	1699.0	4356.3
#3	2823.6	52888.	10027.	1701.9	4346.9

Sample Name: S2 Acquired: 2/14/2025 14:04:27 Type: Cal
Method: NON EPA-6010-200.7(v2698) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934	Be2348
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.04741	.05457	.20817	.06963	.15369	.23657	4.4534	.22869
Stddev	.00036	.00066	.00092	.00047	.00073	.00083	.0290	.00038
%RSD	.75934	1.2171	.43971	.67691	.47517	.35294	.65001	.16413

#1	.04699	.05436	.20716	.06927	.15299	.23713	4.4604	.22894
#2	.04759	.05403	.20841	.06945	.15363	.23696	4.4783	.22888
#3	.04763	.05531	.20894	.07016	.15445	.23561	4.4216	.22826

Elem	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1.0140	.25971	.03487	.38050	.16189	.00431	.20286	.08326
Stddev	.0026	.00059	.00016	.00112	.00058	.00003	.00124	.00020
%RSD	.25957	.22529	.44967	.29545	.36091	.59728	.60901	.23946

#1	1.0118	.25927	.03486	.37963	.16136	.00431	.20292	.08304
#2	1.0133	.26037	.03503	.38010	.16180	.00433	.20407	.08342
#3	1.0169	.25949	.03471	.38177	.16252	.00428	.20160	.08333

Elem	Ni2316	Ag3280	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.35785	.08109	.12555	.05736	2.1917	.03523	.43943	.62012
Stddev	.00027	.00017	.00020	.00040	.0052	.00014	.00086	.00276
%RSD	.07499	.20795	.16261	.69982	.23511	.39269	.19558	.44564

#1	.35757	.08127	.12553	.05716	2.1877	.03518	.44022	.61800
#2	.35790	.08107	.12576	.05782	2.1900	.03538	.43851	.61911
#3	.35810	.08094	.12535	.05709	2.1975	.03512	.43955	.62324

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707	Sr4077	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	.10494	.41783	.00518	.02950	.02060	.73875	13.264	
Stddev	.00054	.00269	.00001	.00033	.00015	.00528	.030	
%RSD	.51503	.64497	.21680	1.1151	.75066	.71425	.22638	

#1	.10455	.41889	.00517	.02927	.02047	.74071	13.261	
#2	.10471	.41984	.00519	.02937	.02057	.74277	13.236	
#3	.10556	.41477	.00517	.02988	.02077	.73277	13.296	

Sample Name: S2 Acquired: 2/14/2025 14:04:27 Type: Cal
Method: NON EPA-6010-200.7(v2698) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2804.7	52286.	9853.8	1676.4	4255.9
Stddev	6.2	82.	16.3	.7	4.6
%RSD	.22238	.15590	.16553	.04110	.10862
#1	2810.7	52318.	9851.9	1675.6	4261.2
#2	2805.1	52193.	9838.6	1676.8	4253.7
#3	2798.2	52346.	9871.0	1676.8	4252.8

Sample Name: S3 Acquired: 2/14/2025 14:08:36 Type: Cal
Method: NON EPA-6010-200.7(v2698) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934	Be2348
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.13155	.14916	.57960	.19206	.42428	.66463	12.634	.62888
Stddev	.00045	.00151	.00211	.00104	.00306	.00241	.019	.00196
%RSD	.34246	1.0120	.36374	.54133	.72134	.36235	.14816	.31099

#1	.13140	.15045	.57908	.19238	.42409	.66718	12.655	.63111
#2	.13119	.14750	.57780	.19090	.42132	.66431	12.629	.62810
#3	.13206	.14953	.58192	.19290	.42744	.66240	12.618	.62744

Elem	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2.8246	.72062	.09638	1.0561	.44354	.01213	.56697	.23401
Stddev	.0129	.00265	.00023	.0046	.00288	.00008	.00174	.00077
%RSD	.45548	.36713	.23511	.43689	.64959	.62388	.30625	.32723

#1	2.8253	.72354	.09640	1.0560	.44339	.01214	.56857	.23489
#2	2.8114	.71840	.09614	1.0515	.44074	.01206	.56722	.23355
#3	2.8371	.71991	.09659	1.0607	.44650	.01221	.56512	.23358

Elem	Ni2316	Ag3280	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.98968	.22418	.34623	.16219	6.0101	.09917	1.2126	1.7039
Stddev	.00408	.00089	.00107	.00042	.0430	.00047	.0043	.0086
%RSD	.41177	.39645	.30956	.25742	.71633	.47104	.35708	.50498

#1	.98833	.22494	.34619	.16258	5.9793	.09932	1.2169	1.7043
#2	.98645	.22321	.34519	.16175	5.9916	.09865	1.2125	1.6951
#3	.99426	.22440	.34733	.16223	6.0593	.09955	1.2083	1.7123

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707	Sr4077	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	.29315	1.1702	.01434	.08642	.05822	2.0727	37.046	
Stddev	.00170	.0027	.00008	.00062	.00058	.0061	.456	
%RSD	.58129	.22872	.55788	.72297	1.0038	.29247	1.2308	

#1	.29337	1.1730	.01427	.08640	.05829	2.0797	36.547	
#2	.29134	1.1697	.01432	.08581	.05760	2.0699	37.440	
#3	.29473	1.1677	.01443	.08706	.05876	2.0686	37.151	

Sample Name: S3 Acquired: 2/14/2025 14:08:36 Type: Cal
Method: NON EPA-6010-200.7(v2698) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2777.5	51893.	9846.8	1646.6	4145.0
Stddev	13.0	220.	19.6	10.7	15.6
%RSD	.46982	.42355	.19856	.65082	.37611
#1	2780.4	51837.	9824.3	1652.0	4145.5
#2	2788.9	52136.	9857.3	1653.7	4160.4
#3	2763.3	51707.	9858.9	1634.3	4129.2

Sample Name: S4 Acquired: 2/14/2025 14:12:46 Type: Cal
Method: NON EPA-6010-200.7(v2698) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934	Be2348
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.25427	.28963	1.1300	.36652	.82477	1.3608	26.317	1.2640
Stddev	.00112	.00017	.0008	.00179	.00256	.0023	.136	.0076
%RSD	.43876	.05772	.06820	.48972	.31063	.17050	.51695	.60341

#1	.25416	.28970	1.1295	.36602	.82440	1.3623	26.457	1.2693
#2	.25322	.28944	1.1295	.36503	.82241	1.3619	26.185	1.2675
#3	.25544	.28976	1.1309	.36852	.82749	1.3581	26.311	1.2553

Elem	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	5.5392	1.4815	.18778	2.0761	.85911	.02449	1.1717	.48596
Stddev	.0032	.0050	.00025	.0030	.00331	.00017	.0024	.00200
%RSD	.05721	.33690	.13124	.14637	.38476	.70292	.20697	.41198

#1	5.5371	1.4867	.18773	2.0749	.85715	.02442	1.1743	.48798
#2	5.5377	1.4809	.18805	2.0739	.85726	.02437	1.1712	.48593
#3	5.5429	1.4767	.18757	2.0796	.86293	.02469	1.1696	.48398

Elem	Ni2316	Ag3280	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1.9291	.44077	.70236	.33627	11.521	.20397	2.4507	3.3620
Stddev	.0024	.00059	.00375	.00032	.074	.00095	.0124	.0083
%RSD	.12633	.13312	.53405	.09610	.64590	.46378	.50767	.24595

#1	1.9275	.44015	.69906	.33638	11.534	.20321	2.4622	3.3586
#2	1.9279	.44132	.70156	.33652	11.588	.20366	2.4523	3.3560
#3	1.9319	.44084	.70644	.33590	11.441	.20503	2.4375	3.3714

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707	Sr4077	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	.57400	2.4213	.02899	.17114	.11266	4.4022	72.772	
Stddev	.00019	.0032	.00011	.00071	.00033	.0022	.670	
%RSD	.03368	.13036	.37212	.41709	.29484	.04945	.92019	

#1	.57381	2.4250	.02893	.17070	.11235	4.4041	73.411	
#2	.57399	2.4198	.02893	.17075	.11262	4.4027	72.830	
#3	.57419	2.4193	.02912	.17196	.11301	4.3998	72.075	

Sample Name: S4 Acquired: 2/14/2025 14:12:46 Type: Cal
Method: NON EPA-6010-200.7(v2698) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2785.4	51334.	9516.6	1641.5	4131.1
Stddev	5.2	91.	72.9	8.7	2.2
%RSD	.18690	.17631	.76628	.53258	.05247
#1	2785.5	51236.	9448.2	1638.3	4129.6
#2	2790.5	51352.	9508.3	1634.9	4133.6
#3	2780.1	51414.	9593.3	1651.4	4130.1

Sample Name: S5 Acquired: 2/14/2025 14:16:59 Type: Cal
Method: NON EPA-6010-200.7(v2698) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934	Be2348
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.52020	.57846	2.3026	.74951	1.6670	2.7913	52.938	2.6466
Stddev	.00251	.00399	.0072	.00372	.0073	.0060	.545	.0105
%RSD	.48211	.69015	.31101	.49652	.43546	.21544	1.0296	.39755

#1	.51796	.57450	2.2949	.74584	1.6614	2.7939	52.327	2.6442
#2	.51973	.58249	2.3037	.74940	1.6643	2.7956	53.375	2.6581
#3	.52291	.57837	2.3091	.75328	1.6752	2.7845	53.112	2.6375

Elem	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	11.289	3.0022	.36270	4.2336	1.7128	.04681	2.3963	.98948
Stddev	.038	.0098	.00117	.0145	.0067	.00020	.0048	.00350
%RSD	.33952	.32474	.32274	.34188	.38886	.43272	.20124	.35365

#1	11.247	3.0024	.36402	4.2197	1.7071	.04699	2.3955	.98901
#2	11.299	3.0118	.36177	4.2325	1.7112	.04659	2.4014	.99319
#3	11.321	2.9923	.36233	4.2486	1.7202	.04685	2.3919	.98623

Elem	Ni2316	Ag3280	Na5895	V_2924	Zn2138	K_7664	B_2496	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3.9245	.86959	1.3217	.68428	22.141	.38750	5.1738	6.6173
Stddev	.0145	.00154	.0077	.00203	.063	.00244	.0194	.0242
%RSD	.36981	.17699	.58130	.29627	.28558	.63037	.37549	.36546

#1	3.9095	.87078	1.3274	.68563	22.211	.38929	5.1605	6.5929
#2	3.9255	.86785	1.3129	.68526	22.125	.38472	5.1961	6.6176
#3	3.9385	.87015	1.3246	.68195	22.087	.38848	5.1647	6.6413

Elem	Sn1899	Ti3361	Si2881	P_1774	S_1820	Li6707	Sr4077	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	1.1693	4.9454	.05530	.37051	.24431	8.9802	149.94	
Stddev	.0039	.0070	.00027	.00192	.00123	.0116	1.84	
%RSD	.33367	.14080	.48159	.51850	.50548	.12889	1.2284	

#1	1.1648	4.9501	.05531	.36830	.24301	8.9896	148.95	
#2	1.1721	4.9486	.05503	.37144	.24443	8.9673	152.07	
#3	1.1710	4.9374	.05557	.37180	.24547	8.9837	148.81	

Sample Name: S5 Acquired: 2/14/2025 14:16:59 Type: Cal
Method: NON EPA-6010-200.7(v2698) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2641.4	50782.	8771.6	1607.1	3792.4
Stddev	5.2	145.	30.6	2.5	7.3
%RSD	.19547	.28483	.34937	.15359	.19248
#1	2646.7	50641.	8776.9	1604.2	3800.7
#2	2641.0	50930.	8738.7	1608.5	3789.7
#3	2636.4	50775.	8799.3	1608.5	3786.8

Sample Name: ICV01 Acquired: 2/14/2025 17:35:15 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICV01 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.044136	1.022707	1.013671	1.039941	1.012220	2.395513	.5272902
Stddev	.006102	.008019	.003214	.003780	.003895	.007895	.0025164
%RSD	.5843626	.7841076	.3170155	.3635259	.3847563	.3295769	.4772308
#1	1.037877	1.028372	1.015393	1.041683	1.015020	2.386735	.5245222
#2	1.044465	1.026218	1.009964	1.035604	1.007772	2.397770	.5279086
#3	1.050067	1.013531	1.015657	1.042537	1.013867	2.402033	.5294396
Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5191967	.5103771	10.32068	.5212003	.5113178	.5207321	10.08823
Stddev	.0023947	.0012032	.01264	.0011663	.0006923	.0009176	.06570
%RSD	.4612335	.2357370	.1225078	.2237664	.1353917	.1762138	.6512388
#1	.5188010	.5105202	10.32445	.5220905	.5108002	.5201870	10.06164
#2	.5217646	.5091088	10.33101	.5216304	.5110491	.5202178	10.04000
#3	.5170245	.5115023	10.30658	.5198801	.5121042	.5217915	10.16306
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5161550	6.257182	.5144812	.2557632	9.866766	.5027786	1.003065
Stddev	.0019319	.030249	.0011856	.0005640	.020899	.0015901	.003995
%RSD	.3742820	.4834244	.2304422	.2205014	.2118082	.3162566	.3983285
#1	.5140740	6.238103	.5138720	.2554669	9.884865	.5022987	1.006180
#2	.5164998	6.292059	.5137240	.2564136	9.843894	.5045534	1.004455
#3	.5178913	6.241384	.5158475	.2554092	9.871540	.5014838	.998560
Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.848973	2.579598	2.414620	2.517695	2.456374	2.434973	2.575889
Stddev	.059842	.010192	.001890	.003996	.004805	.002706	.002537
%RSD	.6075971	.3951185	.0782764	.1587320	.1956163	.1111108	.0984925
#1	9.839083	2.576969	2.415335	2.515454	2.451373	2.433603	2.575028
#2	9.794692	2.590848	2.412476	2.515323	2.460955	2.438089	2.573895
#3	9.913144	2.570978	2.416047	2.522309	2.456795	2.433227	2.578745

Sample Name: ICV01 Acquired: 2/14/2025 17:35:15 Type: Unk
 Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
 User: Kareem Custom ID1: ICV01 Custom ID2: Custom ID3:
 Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	2.431468	2.583665	2.576661
Stddev	.002139	.010944	.032117
%RSD	.0879784	.4235898	1.246465

#1	2.432451	2.571824	2.588931
#2	2.432939	2.585761	2.600835
#3	2.429014	2.593409	2.540218

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2845.725	54043.28	10195.56	1744.317	4283.624
Stddev	2.021	110.25	46.45	5.938	5.380
%RSD	.0710179	.2039960	.4555547	.3404194	.1255960

#1	2847.810	53946.53	10199.85	1740.123	4286.467
#2	2843.775	54020.01	10147.11	1741.717	4286.986
#3	2845.589	54163.30	10239.71	1751.111	4277.419

Sample Name: LLICV01 Acquired: 2/14/2025 17:41:00 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LLICV01 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0233431	.0388877	.0125678	.0218863	.0515082	.0935837	.0952973
Stddev	.0008184	.0008709	.0004318	.0020261	.0008149	.0070612	.0004227
%RSD	3.506189	2.239560	3.435727	9.257520	1.582033	7.545331	.4435373

#1	.0229195	.0394513	.0124966	.0199717	.0515866	.1017298	.0949131
#2	.0242866	.0378846	.0130307	.0240080	.0506570	.0892071	.0952287
#3	.0228233	.0393273	.0121760	.0216793	.0522811	.0898144	.0957501

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0056095	.0062267	1.904137	.0102076	.0293050	.0220833	.0955900
Stddev	.0000286	.0000932	.005994	.0004063	.0001874	.0002498	.0027029
%RSD	.5107109	1.496949	.3148104	3.980248	.6394426	1.131134	2.827607

#1	.0056156	.0061217	1.910805	.0106675	.0293022	.0219838	.0925315
#2	.0055783	.0062588	1.899193	.0100578	.0291191	.0218985	.0976575
#3	.0056346	.0062996	1.902414	.0098975	.0294938	.0223675	.0965809

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0193683	1.993229	.0398764	.0106234	1.903260	.0371224	.0440972
Stddev	.0000996	.014651	.0000363	.0003646	.003115	.0008837	.0001253
%RSD	.5140131	.7350281	.0911036	3.432118	.1636684	2.380464	.2840477

#1	.0192620	1.977692	.0399135	.0109984	1.905912	.0381182	.0442415
#2	.0193836	1.995199	.0398746	.0106016	1.904039	.0364316	.0440158
#3	.0194594	2.006794	.0398410	.0102702	1.899830	.0368175	.0440343

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.930719	.0925583	.2023620	.0390920	.0390896	.3777533	.0201863
Stddev	.003782	.0004632	.0013198	.0013485	.0003445	.0022504	.0018443
%RSD	.1958947	.5004879	.6522141	3.449629	.8812807	.5957310	9.136424

#1	1.927831	.0924011	.2012015	.0397240	.0394794	.3782035	.0183018
#2	1.929326	.0921942	.2020867	.0375435	.0388260	.3753118	.0202696
#3	1.935000	.0930797	.2037977	.0400084	.0389634	.3797446	.0219876

Sample Name: LLICV01 Acquired: 2/14/2025 17:41:00 Type: Unk
 Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
 User: Kareem Custom ID1: LLICV01 Custom ID2: Custom ID3:
 Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0182127	.0198722	.0198209
Stddev	.0036159	.0003395	.0000921
%RSD	19.85380	1.708319	.4644049
#1	.0183288	.0195188	.0199003
#2	.0217692	.0201958	.0197200
#3	.0145402	.0199019	.0198426

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2906.651	54885.05	10451.94	1741.933	4483.602
Stddev	5.939	83.77	40.97	2.684	10.047
%RSD	.2043360	.1526355	.3919880	.1540697	.2240872
#1	2904.785	54788.38	10442.57	1739.256	4476.416
#2	2913.300	54936.39	10496.79	1741.920	4495.083
#3	2901.870	54930.38	10416.47	1744.624	4479.307

Sample Name: ICB01 Acquired: 2/14/2025 17:46:28 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICB01 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002187	-.002413	-.000848	-.000384	-.000984	-.000630	-.000295
Stddev	.0014141	.001900	.000402	.001382	.001161	.002779	.000809
%RSD	646.6206	78.73562	47.39128	359.6409	117.9664	440.8547	274.0168

#1	.0010669	-.002198	-.001263	.000030	.000303	.000839	-.001195
#2	-.001414	-.000629	-.000820	-.001926	-.001952	-.003836	-.000065
#3	.001003	-.004410	-.000461	.000743	-.001304	.001105	.000374

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000041	-.000046	-.002924	.0002387	-.000201	.0002137	-.004413
Stddev	.000036	.000081	.003868	.0001364	.000015	.0003322	.005225
%RSD	86.06477	177.0847	132.2758	57.14229	7.475427	155.4145	118.4009

#1	-.000072	-.000082	-.006383	.0002020	-.000217	.0000595	-.001821
#2	-.000050	-.000103	.001252	.0001243	-.000199	-.000013	-.000991
#3	-.000002	.000047	-.003641	.0003897	-.000187	.000595	-.010428

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002023	.0046759	.0001179	.0000545	-.105072	-.001455	.0000373
Stddev	.0001375	.0099857	.0000997	.0001449	.003456	.001066	.0000817
%RSD	67.96089	213.5541	84.58346	265.7097	3.289301	73.27257	219.2624

#1	.0000654	.0075267	.0000143	-.000098	-.105031	-.001628	-.000041
#2	.0003404	-.006425	.0001262	.000070	-.108549	-.000313	.000122
#3	.0002010	.012926	.0002133	.000191	-.101637	-.002425	.000030

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.050208	-.004557	.0001511	-.000345	-.000094	.0039338	-.001988
Stddev	.018295	.000514	.0001187	.000511	.000468	.0067563	.002519
%RSD	36.43731	11.27757	78.57470	148.2523	495.1953	171.7503	126.7538

#1	-.029094	-.004517	.0001691	-.000116	-.000511	-.002764	-.002883
#2	-.060182	-.004063	.0000244	-.000930	.000411	.010748	.000857
#3	-.061348	-.005089	.0002597	.000012	-.000183	.003818	-.003937

Sample Name: ICB01 Acquired: 2/14/2025 17:46:28 Type: Unk
 Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
 User: Kareem Custom ID1: ICB01 Custom ID2: Custom ID3:
 Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	-.002235	-.000809	-.000048
Stddev	.002145	.000856	.000045
%RSD	95.98953	105.8674	92.22284

#1	-.003537	-.001331	-.000095
#2	.000241	-.001276	-.000006
#3	-.003408	.000179	-.000044

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2928.916	55083.38	10457.15	1749.887	4537.717
Stddev	4.607	106.82	3.71	7.951	7.889
%RSD	.1573105	.1939200	.0355236	.4543846	.1738622

#1	2929.658	55161.23	10454.88	1753.668	4540.487
#2	2933.108	54961.60	10461.44	1740.751	4543.847
#3	2923.983	55127.30	10455.14	1755.242	4528.816

Sample Name: CRI01 Acquired: 2/14/2025 17:50:49 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CRI01 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0252063	.0412241	.0136743	.0233403	.0542305	.0994125	.0975115
Stddev	.0005590	.0001754	.0009331	.0021671	.0010861	.0036288	.0014153
%RSD	2.217827	.4254538	6.823512	9.284962	2.002765	3.650220	1.451475

#1	.0258469	.0413669	.0136140	.0231943	.0529770	.0952549	.0976564
#2	.0249545	.0412771	.0146361	.0212499	.0548932	.1019426	.0988488
#3	.0248174	.0410283	.0127729	.0255768	.0548213	.1010399	.0960292

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0057414	.0076038	1.959190	.0108810	.0309266	.0228765	.0999083
Stddev	.0001042	.0000254	.016696	.0002499	.0002027	.0004301	.0050447
%RSD	1.815323	.3342304	.8521936	2.296346	.6554579	1.880049	5.049325

#1	.0057579	.0076174	1.959935	.0106216	.0310519	.0226812	.1057315
#2	.0058364	.0076194	1.975502	.0109012	.0306928	.0233696	.0968683
#3	.0056299	.0075744	1.942135	.0111202	.0310352	.0225787	.0971250

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0209595	2.026216	.0415095	.0108031	1.977212	.0383115	.0511185
Stddev	.0007495	.011720	.0000612	.0001400	.006559	.0009126	.0004449
%RSD	3.575748	.5784077	.1473445	1.295883	.3317529	2.381953	.8703107

#1	.0205215	2.012911	.0414389	.0109554	1.970740	.0378409	.0515829
#2	.0218248	2.035009	.0415439	.0106799	1.983856	.0393633	.0510765
#3	.0205321	2.030729	.0415458	.0107741	1.977041	.0377303	.0506961

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.020452	.0895488	.2050699	.0417248	.0397590	.3829547	.0190898
Stddev	.026210	.0005016	.0004029	.0005056	.0006195	.0071182	.0014098
%RSD	1.297217	.5601438	.1964751	1.211798	1.558122	1.858747	7.384990

#1	2.005278	.0899116	.2046392	.0414283	.0397945	.3823001	.0193962
#2	2.050716	.0889764	.2054376	.0414375	.0403599	.3903775	.0175521
#3	2.005362	.0897584	.2051330	.0423087	.0391225	.3761864	.0203212

Sample Name: CRI01 Acquired: 2/14/2025 17:50:49 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CRI01 Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0250669	.0213850	.0222390
Stddev	.0029885	.0012739	.0001878
%RSD	11.92217	5.956966	.8442355

#1	.0244572	.0228380	.0222891
#2	.0224303	.0208571	.0223965
#3	.0283133	.0204599	.0220312

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2898.335	54120.70	10462.91	1728.043	4456.451
Stddev	3.061	289.05	87.09	16.975	4.683
%RSD	.1056259	.5340864	.8323369	.9823035	.1050878

#1	2898.096	53992.67	10434.63	1712.847	4460.254
#2	2901.510	53917.77	10393.48	1724.920	4457.879
#3	2895.401	54451.65	10560.62	1746.362	4451.220

Sample Name: ICSA01 Acquired: 2/14/2025 17:55:08 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSA01 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0004373	.0004817	.0056515	-.015544	-.002013	234.3314	.0017763
Stddev	.0019013	.0017900	.0009657	.005134	.000221	2.1396	.0005655
%RSD	434.8036	371.6016	17.08758	33.03214	10.99572	.9130537	31.83338

#1	-.000653	-.001267	.0067300	-.015692	-.002268	236.2117	.0017277
#2	.002633	.002310	.0053576	-.010337	-.001878	234.7792	.0023645
#3	-.000668	.000402	.0048669	-.020602	-.001892	232.0034	.0012367

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0011166	.0062829	222.9193	.0561067	.0013448	.0033853	98.20464
Stddev	.0000791	.0002261	.8697	.0003255	.0001734	.0009445	.30220
%RSD	7.082036	3.599517	.3901564	.5802032	12.89150	27.89877	.3077236

#1	.0010320	.0065038	223.9127	.0558280	.0015044	.0026928	98.34708
#2	.0011292	.0060519	222.2949	.0564645	.0013696	.0030020	98.40929
#3	.0011887	.0062930	222.5503	.0560276	.0011603	.0044612	97.85754

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0040714	239.0694	.0028787	.0034893	-.017996	.0055644	.0038528
Stddev	.0005378	.7767	.0004227	.0003766	.008417	.0005368	.0001422
%RSD	13.20955	.3248817	14.68288	10.79338	46.76890	9.646340	3.690544

#1	.0045436	239.9518	.0028197	.0038910	-.027398	.0050247	.0037190
#2	.0034860	238.4891	.0024886	.0034327	-.015425	.0055704	.0040021
#3	.0041846	238.7675	.0033278	.0031442	-.011165	.0060982	.0038373

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0100929	.0104421	.0001729	-.004089	-.002530	.0178883	.0025676
Stddev	.0075347	.0006637	.0005065	.000223	.000615	.0051025	.0035880
%RSD	74.65407	6.355580	292.9378	5.452035	24.30118	28.52450	139.7448

#1	.0018174	.0109591	.0001336	-.003931	-.002287	.0159596	-.001089
#2	.0165564	.0106734	-.000313	-.004344	-.002075	.0236740	.002710
#3	.0119048	.0096937	.000698	-.003992	-.003230	.0140311	.006082

Sample Name: ICSA01 Acquired: 2/14/2025 17:55:08 Type: Unk
 Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
 User: Kareem Custom ID1: ICSA01 Custom ID2: Custom ID3:
 Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	-.018250	.0065141	-.000435
Stddev	.001888	.0005293	.000395
%RSD	10.34785	8.125435	90.78433

#1	-.020307	.0067191	-.000696
#2	-.017849	.0069103	-.000627
#3	-.016595	.0059130	.000019

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2605.738	48603.45	9741.525	1549.897	3667.855
Stddev	7.047	73.16	41.390	9.651	6.188
%RSD	.2704328	.1505169	.4248802	.6226802	.1686990

#1	2606.478	48639.01	9696.632	1559.834	3669.391
#2	2612.386	48519.31	9778.169	1540.561	3673.129
#3	2598.351	48652.03	9749.775	1549.297	3661.044

Sample Name: ICSAB01 Acquired: 2/14/2025 18:45:32 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSAB01 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1067225	.0949325	.0551513	.0353837	.6071420	233.8471	.5903709
Stddev	.0049319	.0021189	.0010262	.0046228	.0051771	2.4859	.0014152
%RSD	4.621227	2.232036	1.860633	13.06490	.8527067	1.063051	.2397121

#1	.1073195	.0968070	.0550484	.0407213	.6090724	231.0254	.5919990
#2	.1113287	.0926334	.0541804	.0326653	.6012770	234.8011	.5894354
#3	.1015193	.0953569	.0562250	.0327643	.6110766	235.7146	.5896783

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.4711916	1.006769	221.4287	.5551420	.5022219	.4820052	98.16238
Stddev	.0019720	.001479	.2788	.0011183	.0019295	.0028229	.53957
%RSD	.4185219	.1469220	.1259288	.2014534	.3841973	.5856642	.5496696

#1	.4689287	1.006160	221.1612	.5543463	.5015436	.4799951	98.63819
#2	.4721034	1.005692	221.4071	.5546590	.5007232	.4807880	97.57614
#3	.4725427	1.008456	221.7176	.5564207	.5043990	.4852326	98.27281

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.4493339	236.0341	.9956668	.2184799	-.061606	.4443464	1.046788
Stddev	.0032105	.4466	.0008362	.0005597	.001292	.0010894	.002497
%RSD	.7144994	.1892107	.0839888	.2561886	2.097209	.2451625	.2385838

#1	.4499105	235.5215	.9954410	.2183842	-.063023	.4456031	1.044323
#2	.4458742	236.2413	.9949666	.2179742	-.060494	.4436708	1.046722
#3	.4522171	236.3394	.9965927	.2190813	-.061302	.4437653	1.049317

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.035826	1.008446	1.114109	1.119018	1.009820	.9935043	1.042523
Stddev	.029576	.002086	.006363	.002183	.002898	.0082277	.004913
%RSD	82.55432	.2068346	.5711676	.1950629	.2870179	.8281522	.4712879

#1	-.009865	1.006243	1.111829	1.117781	1.013138	1.001922	1.037782
#2	-.029590	1.008703	1.109199	1.117734	1.008537	.985480	1.042195
#3	-.068022	1.010391	1.121298	1.121538	1.007785	.993111	1.047592

Sample Name: ICSAB01 Acquired: 2/14/2025 18:45:32 Type: Unk
 Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
 User: Kareem Custom ID1: ICSAB01 Custom ID2: Custom ID3:
 Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.9911569	.9747981	.9687381
Stddev	.0102799	.0033231	.0029742
%RSD	1.037160	.3409059	.3070166

#1	.9796779	.9777136	.9676681
#2	.9942789	.9711797	.9720993
#3	.9995138	.9755010	.9664470

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2597.673	48745.28	9824.480	1551.928	3655.166
Stddev	7.712	18.83	41.424	3.347	7.893
%RSD	.2969002	.0386254	.4216404	.2156921	.2159468

#1	2596.759	48767.02	9872.284	1555.793	3650.958
#2	2605.802	48734.63	9802.000	1549.970	3664.272
#3	2590.458	48734.18	9799.156	1550.020	3650.269

Sample Name: ICSADLX20 Acquired: 2/14/2025 18:49:40 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSADLX20 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0005338	.0001060	-.000253	-.000417	-.000714	12.02522	-.000261
Stddev	.0011652	.0017118	.001095	.000965	.000789	.02598	.000655
%RSD	218.2539	1615.215	432.6074	231.3395	110.5221	.2160793	251.4493

#1	-.000370	-.000683	-.000972	.000401	.000157	11.99540	-.000963
#2	.001849	.002070	-.000795	-.000171	-.000916	12.04298	.000334
#3	.000123	-.001069	.001007	-.001481	-.001381	12.03729	-.000152

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000821	.0001402	12.04135	.0028231	-.000217	.0005202	5.233687
Stddev	.0000268	.0000294	.04804	.0003031	.000114	.0003441	.066271
%RSD	32.61997	20.96464	.3989453	10.73652	52.38421	66.15141	1.266235

#1	.0000571	.0001443	12.00591	.0030087	-.000123	.0008999	5.309403
#2	.0001104	.0001673	12.09602	.0024733	-.000184	.0004320	5.186234
#3	.0000789	.0001090	12.02211	.0029872	-.000343	.0002288	5.205422

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000018	12.28537	.0005055	.0004765	-.054450	-.000610	.0002960
Stddev	.0004425	.04138	.0002841	.0001978	.012154	.001685	.0002400
%RSD	24267.56	.3368218	56.20645	41.51034	22.32177	276.2405	81.10761

#1	-.000124	12.26176	.0001875	.0006964	-.067451	-.000931	.0000448
#2	-.000364	12.33315	.0007344	.0003131	-.043372	.001212	.0003200
#3	.000493	12.26121	.0005945	.0004200	-.052528	-.002111	.0005230

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.060553	-.005613	.0002953	-.001775	-.000831	-.001967	-.000768
Stddev	.014063	.000221	.0003652	.001180	.000487	.007970	.001240
%RSD	23.22425	3.935165	123.6443	66.50981	58.61063	405.0765	161.3823

#1	-.048467	-.005779	.0001280	-.001445	-.000915	.006512	.000406
#2	-.057203	-.005363	.0007142	-.003085	-.001271	-.003112	-.002064
#3	-.075988	-.005699	.0000438	-.000795	-.000308	-.009303	-.000647

Sample Name: ICSADLX20 Acquired: 2/14/2025 18:49:40 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSADLX20 Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0015899	-.000600	-.000293
Stddev	.0006921	.000894	.000117
%RSD	43.53209	149.0530	39.84936

#1	.0018379	-.001070	-.000427
#2	.0008080	-.001161	-.000214
#3	.0021239	.000431	-.000237

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2866.032	53569.57	10394.36	1726.208	4338.786
Stddev	6.267	747.60	67.28	19.756	8.685
%RSD	.2186616	1.395569	.6473008	1.144479	.2001748

#1	2871.545	52723.34	10407.49	1703.753	4347.910
#2	2867.335	53844.93	10321.48	1733.952	4337.830
#3	2859.216	54140.43	10454.11	1740.919	4330.619

Sample Name: ICSABDLX20 Acquired: 2/14/2025 18:53:57 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSABDLX20 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0072868	.0024073	.0017223	.0025157	.0282645	11.51346	.0200594
Stddev	.0031530	.0018300	.0009765	.0015905	.0003762	.01742	.0002347
%RSD	43.26973	76.01730	56.70021	63.22453	1.330936	.1512678	1.169786

#1	.0036717	.0040755	.0021093	.0013708	.0286731	11.53352	.0203091
#2	.0094677	.0004500	.0024461	.0043318	.0281878	11.50226	.0200256
#3	.0087211	.0026966	.0006116	.0018444	.0279326	11.50459	.0198435

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0246746	.0486391	11.45838	.0283689	.0237370	.0249630	4.815384
Stddev	.0001589	.0002082	.06013	.0001874	.0001282	.0002445	.021151
%RSD	.6441659	.4280338	.5247606	.6604349	.5399860	.9793739	.4392381

#1	.0248342	.0486222	11.51308	.0282102	.0235921	.0248815	4.839807
#2	.0246733	.0484399	11.46807	.0283210	.0237834	.0247696	4.803162
#3	.0245163	.0488553	11.39400	.0285756	.0238355	.0252378	4.803184

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0234438	11.69043	.0486284	.0104599	-.065826	.0213571	.0502247
Stddev	.0003345	.03632	.0003961	.0003630	.003707	.0014705	.0006051
%RSD	1.427047	.3107201	.8145099	3.470134	5.631719	6.885517	1.204872

#1	.0237601	11.73237	.0484546	.0104695	-.069991	.0199479	.0495324
#2	.0234778	11.66953	.0490817	.0100921	-.064603	.0228822	.0506534
#3	.0230936	11.66939	.0483490	.0108179	-.062886	.0212413	.0504881

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.049503	.0469066	.0562081	.0514378	.0505938	.0448450	.0005634
Stddev	.018418	.0003818	.0005155	.0005680	.0007675	.0025957	.0011817
%RSD	37.20526	.8138924	.9170720	1.104208	1.516906	5.788050	209.7372

#1	-.069940	.0468008	.0557506	.0517474	.0510658	.0418530	-.000559
#2	-.044380	.0473301	.0561072	.0517838	.0510074	.0461882	.001796
#3	-.034189	.0465889	.0567666	.0507823	.0497082	.0464937	.000453

Sample Name: ICSABDLX20 Acquired: 2/14/2025 18:53:57 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSABDLX20 Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0000805	.0002437	-.000020
Stddev	.0020121	.0004214	.000030
%RSD	2500.380	172.8988	152.2673

#1	.0023741	.0006780	-.000052
#2	-.000745	.0002169	.000006
#3	-.001387	-.000164	-.000012

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2963.277	54594.13	10039.19	1766.428	4549.530
Stddev	14.060	101.50	19.00	16.195	14.888
%RSD	.4744749	.1859126	.1892719	.9168056	.3272323

#1	2963.077	54695.37	10019.29	1784.999	4554.441
#2	2977.435	54594.66	10041.12	1755.244	4561.341
#3	2949.318	54492.37	10057.15	1759.041	4532.807

Sample Name: CCV01 Acquired: 2/14/2025 18:58:12 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV01 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.984378	5.107907	4.941992	5.018678	4.983084	9.702445	9.839937
Stddev	.011309	.034100	.006963	.014974	.012670	.050242	.149285
%RSD	.2268889	.6675982	.1408923	.2983580	.2542510	.5178271	1.517137

#1	4.973038	5.115158	4.934530	5.019025	4.968579	9.733837	9.991636
#2	4.984440	5.070764	4.943131	5.003534	4.988687	9.729000	9.693188
#3	4.995655	5.137799	4.948315	5.033475	4.991987	9.644498	9.834987

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2394997	2.482534	24.44540	.9877185	2.475680	1.243589	5.067046
Stddev	.0016586	.003209	.14130	.0013450	.004918	.003482	.032329
%RSD	.6925355	.1292766	.5780321	.1361731	.1986591	.2800125	.6380322

#1	.2414068	2.478870	24.51726	.9874751	2.470056	1.239820	5.048042
#2	.2383932	2.483884	24.53634	.9891685	2.479173	1.244260	5.104374
#3	.2386992	2.484848	24.28262	.9865118	2.477812	1.246687	5.048721

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.444440	24.10212	2.483008	1.232728	25.28295	2.436798	2.454359
Stddev	.015143	.09170	.005521	.003319	.13847	.011112	.008433
%RSD	.6194925	.3804600	.2223457	.2692600	.5476722	.4559939	.3435979

#1	2.452750	24.15178	2.476651	1.232835	25.17574	2.436606	2.463029
#2	2.453607	24.15828	2.486592	1.235992	25.43928	2.448005	2.453864
#3	2.426961	23.99630	2.485783	1.229356	25.23384	2.425784	2.446185

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	25.45991	4.794566	4.981944	4.954602	4.892099	4.960959	4.977491
Stddev	.11613	.030739	.014629	.006493	.033021	.025086	.015322
%RSD	.4561292	.6411288	.2936462	.1310452	.6749897	.5056619	.3078332

#1	25.35620	4.829451	4.967930	4.948853	4.913483	4.935137	4.985640
#2	25.58538	4.782794	4.980783	4.953309	4.908746	4.985237	4.959816
#3	25.43817	4.771453	4.997119	4.961644	4.854067	4.962504	4.987017

Sample Name: CCV01 Acquired: 2/14/2025 18:58:12 Type: Unk
 Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
 User: Kareem Custom ID1: CCV01 Custom ID2: Custom ID3:
 Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	4.947896	4.969710	4.834359
Stddev	.006538	.031101	.036252
%RSD	.1321409	.6258117	.7498735

#1	4.940717	4.990414	4.842995
#2	4.949462	4.984769	4.794569
#3	4.953509	4.933945	4.865512

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2799.999	53338.61	9883.722	1702.450	4104.041
Stddev	9.640	120.36	53.972	4.253	8.879
%RSD	.3442806	.2256459	.5460666	.2497971	.2163464

#1	2810.414	53411.58	9824.541	1702.657	4114.191
#2	2798.191	53199.69	9896.396	1698.097	4100.222
#3	2791.390	53404.55	9930.228	1706.595	4097.711

Sample Name: CCB01 Acquired: 2/14/2025 19:02:23 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB01 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0019755	-.000039	-.000314	.0015407	-.000029	-.002412	-.002029
Stddev	.0036796	.000797	.000411	.0013200	.001915	.003995	.000703
%RSD	186.2636	2061.293	130.9863	85.67106	6589.364	165.6704	34.64638

#1	-.002262	-.000774	-.000476	.0002600	-.001802	.002136	-.001836
#2	.003831	.000807	-.000620	.0014656	.002002	-.005360	-.001443
#3	.004358	-.000149	.000154	.0028967	-.000287	-.004011	-.002808

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000252	.0000639	-.000051	.0001680	-.000195	.0002157	-.005160
Stddev	.0000367	.0000257	.005224	.0002286	.000036	.0001200	.003229
%RSD	145.4306	40.21915	10256.49	136.0057	18.40762	55.63289	62.57588

#1	.0000349	.0000796	-.004549	-.000096	-.000169	.0000830	-.005560
#2	.0000562	.0000779	.005678	.000307	-.000180	.0003166	-.008170
#3	-.000015	.0000342	-.001283	.000293	-.000236	.0002475	-.001750

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000142	-.001816	.0001707	-.000074	-.074970	-.001261	.0001004
Stddev	.000195	.008936	.0000907	.000287	.003680	.000474	.0001047
%RSD	136.9909	492.1403	53.15502	388.5785	4.908234	37.57802	104.2785

#1	-.000303	-.009310	.0002749	.000254	-.075228	-.001807	.0002211
#2	-.000197	.008073	.0001095	-.000279	-.078514	-.001013	.0000454
#3	.000074	-.004210	.0001276	-.000197	-.071168	-.000962	.0000347

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.044395	.0002129	-.000132	-.000439	-.000650	.0090828	.0002251
Stddev	.026565	.0008328	.000033	.000231	.000614	.0066663	.0010603
%RSD	59.83681	391.0983	25.32397	52.55386	94.49709	73.39405	471.0183

#1	-.024665	.0005843	-.000128	-.000228	-.000301	.0015649	-.000408
#2	-.074600	-.000741	-.000101	-.000403	-.001359	.0114104	-.000366
#3	-.033920	.000795	-.000167	-.000685	-.000290	.0142732	.001449

Sample Name: CCB01 Acquired: 2/14/2025 19:02:23 Type: Unk
 Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
 User: Kareem Custom ID1: CCB01 Custom ID2: Custom ID3:
 Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0003705	-.000837	.0000014
Stddev	.0031701	.000267	.0000178
%RSD	855.6085	31.93454	1272.217

#1	.0037157	-.000673	.0000118
#2	-.000015	-.000693	-.000019
#3	-.002589	-.001146	.000011

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2906.283	55728.54	10248.73	1777.709	4507.658
Stddev	11.344	208.12	31.67	5.449	20.519
%RSD	.3903438	.3734461	.3089873	.3065063	.4551982

#1	2912.717	55717.17	10272.29	1782.685	4512.290
#2	2912.949	55942.10	10261.18	1778.556	4525.465
#3	2893.184	55526.33	10212.73	1771.887	4485.219

Sample Name: P2403-01 Acquired: 2/14/2025 19:06:43 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0055718	.0067233	.0028540	.0042743	.0107257	.0129737	.0207172
Stddev	.0015284	.0016022	.0007591	.0004153	.0005340	.0010758	.0008156
%RSD	27.43055	23.83020	26.59823	9.715206	4.978362	8.292449	3.936833

#1	.0067021	.0072866	.0037177	.0047419	.0113130	.0134939	.0216589
#2	.0061802	.0079678	.0022928	.0039485	.0105945	.0117366	.0202408
#3	.0038329	.0049156	.0025514	.0041325	.0102696	.0136905	.0202517

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0011817	.0011817	.3945484	.0021342	.0057366	.0044551	.0174317
Stddev	.0000243	.0000361	.0067312	.0002175	.0000854	.0000482	.0034148
%RSD	2.059147	3.057742	1.706053	10.18990	1.488279	1.081281	19.58944

#1	.0012095	.0011845	.3875038	.0021180	.0057597	.0044229	.0172150
#2	.0011642	.0011442	.3952265	.0019252	.0058080	.0044319	.0141305
#3	.0011714	.0012163	.4009149	.0023593	.0056420	.0045105	.0209497

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0038556	.4033822	.0082205	.0020318	.3438262	.0078686	.0085697
Stddev	.0001360	.0140383	.0001976	.0004222	.0180269	.0016572	.0002021
%RSD	3.526312	3.480135	2.403982	20.78226	5.243018	21.06016	2.357766

#1	.0037240	.3872532	.0080454	.0015571	.3334037	.0088353	.0086155
#2	.0039955	.4100450	.0081812	.0023657	.3334331	.0059552	.0083487
#3	.0038473	.4128483	.0084347	.0021725	.3646418	.0088155	.0087449

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3876409	.0156734	.0409112	.0076081	.0072051	.0715861	.0020238
Stddev	.0350161	.0001635	.0002946	.0005250	.0005788	.0021981	.0021270
%RSD	9.033119	1.043419	.7201670	6.900501	8.032852	3.070620	105.0979

#1	.3473843	.0158401	.0410096	.0076255	.0078570	.0721914	.0037160
#2	.4045012	.0156669	.0405800	.0081241	.0070068	.0734181	-.000364
#3	.4110372	.0155132	.0411441	.0070746	.0067516	.0691487	.002719

Sample Name: P2403-01 Acquired: 2/14/2025 19:06:43 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0037712	.0015768	.0038675
Stddev	.0015177	.0001301	.0000291
%RSD	40.24382	8.249474	.7533730

#1	.0037435	.0017226	.0038852
#2	.0022675	.0015349	.0038834
#3	.0053025	.0014728	.0038339

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2962.356	55243.60	10369.43	1788.314	4602.733
Stddev	10.749	259.88	21.30	8.197	16.808
%RSD	.3628665	.4704221	.2054438	.4583839	.3651794

#1	2961.870	54954.95	10346.14	1781.116	4607.193
#2	2973.340	55458.97	10374.20	1797.237	4616.862
#3	2951.858	55316.88	10387.94	1786.590	4584.145

Sample Name: P2403-02 Acquired: 2/14/2025 19:19:50 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0232646	.0381676	.0111094	.0196091	.0510364	.0978288	.0938828
Stddev	.0016362	.0003925	.0008925	.0010485	.0007155	.0036984	.0002465
%RSD	7.033214	1.028500	8.034015	5.347094	1.401963	3.780426	.2625225

#1	.0228604	.0381651	.0121258	.0185727	.0507475	.0954292	.0941631
#2	.0218683	.0377763	.0107488	.0195853	.0505104	.0959694	.0937850
#3	.0250650	.0385614	.0104536	.0206694	.0518511	.1020879	.0937002

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0055955	.0061127	1.896268	.0101433	.0294527	.0224013	.0961557
Stddev	.0000166	.0000629	.014264	.0003031	.0003885	.0002204	.0039306
%RSD	.2962492	1.029190	.7522379	2.988422	1.319036	.9839524	4.087748

#1	.0056122	.0061416	1.885373	.0104919	.0293673	.0221584	.0921939
#2	.0055791	.0061560	1.891017	.0099422	.0291141	.0225887	.0962191
#3	.0055951	.0060406	1.912413	.0099956	.0298768	.0224567	.1000543

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0194102	2.018314	.0396666	.0105142	1.883432	.0361560	.0422314
Stddev	.0003988	.004792	.0002802	.0001373	.013826	.0017602	.0003123
%RSD	2.054475	.2374173	.7064276	1.305792	.7340963	4.868427	.7396253

#1	.0190320	2.021434	.0393432	.0103635	1.891600	.0347408	.0420087
#2	.0198268	2.012796	.0398205	.0106322	1.867468	.0356000	.0420972
#3	.0193717	2.020711	.0398362	.0105467	1.891227	.0381270	.0425885

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.897942	.0898296	.2022274	.0387718	.0388440	.3737352	.0196875
Stddev	.015214	.0005633	.0008785	.0003420	.0001889	.0108328	.0006982
%RSD	.8016260	.6270607	.4344326	.8819984	.4864016	2.898516	3.546143

#1	1.897388	.0891802	.2019801	.0386491	.0387290	.3615266	.0193153
#2	1.883012	.0901229	.2014990	.0385081	.0387410	.3821978	.0204929
#3	1.913425	.0901857	.2032031	.0391582	.0390621	.3774812	.0192543

Sample Name: P2403-02 Acquired: 2/14/2025 19:19:50 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0223042	.0172967	.0193312
Stddev	.0012619	.0009979	.0000439
%RSD	5.657875	5.769155	.2271105

#1	.0224683	.0167393	.0192823
#2	.0209682	.0184488	.0193441
#3	.0234761	.0167021	.0193672

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2924.575	55622.07	10407.89	1769.465	4494.143
Stddev	9.235	152.39	17.74	7.407	14.520
%RSD	.3157850	.2739692	.1704030	.4186011	.3230919

#1	2924.838	55607.99	10422.80	1766.095	4497.284
#2	2933.675	55781.01	10412.59	1777.958	4506.835
#3	2915.210	55477.21	10388.28	1764.343	4478.309

Sample Name: P2403-07 Acquired: 2/14/2025 19:28:25 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0060034	.0067564	.0017164	.0055062	.0093339	.0193605	.0162020
Stddev	.0005037	.0020323	.0008970	.0005169	.0014053	.0042078	.0008230
%RSD	8.390408	30.07913	52.25705	9.388092	15.05590	21.73374	5.079579

#1	.0057320	.0058641	.0016141	.0051853	.0081609	.0152749	.0170880
#2	.0056935	.0090822	.0026602	.0052309	.0089494	.0191260	.0154615
#3	.0065845	.0053230	.0008751	.0061026	.0108915	.0236806	.0160564

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0011331	.0012663	.3846109	.0021092	.0055994	.0047710	.0191254
Stddev	.0000051	.0000206	.0049034	.0001705	.0000378	.0001328	.0033909
%RSD	.4503846	1.629654	1.274904	8.081512	.6741641	2.782932	17.72997

#1	.0011383	.0012851	.3875842	.0021477	.0056300	.0048060	.0152111
#2	.0011281	.0012696	.3789514	.0022571	.0056110	.0048828	.0211684
#3	.0011329	.0012442	.3872971	.0019228	.0055572	.0046242	.0209966

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0035865	.4014710	.0082565	.0019988	.2784603	.0074097	.0086618
Stddev	.0002749	.0140500	.0003898	.0002071	.0162740	.0002195	.0003400
%RSD	7.665610	3.499641	4.721230	10.36387	5.844277	2.962730	3.925453

#1	.0032693	.4174029	.0086082	.0019957	.2597088	.0074978	.0089929
#2	.0037557	.3908527	.0078374	.0017932	.2867728	.0075715	.0086789
#3	.0037345	.3961574	.0083238	.0022075	.2888992	.0071598	.0083135

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3129040	.0131965	.0407527	.0070342	.0072848	.0680247	.0040712
Stddev	.0128111	.0013256	.0003191	.0009239	.0002644	.0016954	.0023247
%RSD	4.094259	10.04527	.7829469	13.13518	3.629429	2.492262	57.09997

#1	.3026899	.0146890	.0405003	.0081004	.0074893	.0677972	.0029170
#2	.3272781	.0127445	.0406463	.0065331	.0073787	.0698223	.0025495
#3	.3087440	.0121560	.0411113	.0064690	.0069862	.0664546	.0067471

Sample Name: P2403-07 Acquired: 2/14/2025 19:28:25 Type: Unk
 Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
 User: Kareem Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0067598	.0031548	.0039105
Stddev	.0038192	.0004223	.0000449
%RSD	56.49851	13.38671	1.149210

#1	.0097304	.0026811	.0039573
#2	.0080973	.0032914	.0038676
#3	.0024518	.0034919	.0039067

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2979.358	55980.67	10021.32	1797.433	4634.854
Stddev	12.588	58.53	77.02	5.631	17.802
%RSD	.4225092	.1045552	.7685382	.3132524	.3840796

#1	2977.895	56046.15	9932.41	1802.843	4631.520
#2	2992.613	55962.43	10064.12	1791.605	4654.087
#3	2967.565	55933.44	10067.44	1797.852	4618.955

Sample Name: P2403-16 Acquired: 2/14/2025 19:43:11 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0238632	.0367876	.0117755	.0198508	.0493745	.0886566	.0874588
Stddev	.0022973	.0003070	.0006574	.0007113	.0003275	.0036435	.0008012
%RSD	9.627111	.8345289	5.583223	3.583079	.6633262	4.109678	.9161478

#1	.0244813	.0364594	.0110225	.0203377	.0490570	.0880962	.0880032
#2	.0257882	.0370678	.0122356	.0190345	.0493552	.0853258	.0878344
#3	.0213200	.0368356	.0120684	.0201801	.0497112	.0925479	.0865387

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0056546	.0058029	1.864392	.0099265	.0287728	.0215181	.0900920
Stddev	.0000214	.0000708	.013654	.0002850	.0003190	.0003121	.0077415
%RSD	.3790360	1.219832	.7323487	2.871062	1.108600	1.450531	8.592862

#1	.0056349	.0057240	1.877071	.0102493	.0284106	.0213719	.0983945
#2	.0056774	.0058607	1.866168	.0098209	.0290121	.0213059	.0888096
#3	.0056513	.0058241	1.849937	.0097095	.0288955	.0218765	.0830717

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0189549	1.973943	.0392370	.0099781	1.783892	.0355077	.0422572
Stddev	.0003521	.023072	.0004458	.0002475	.007145	.0028863	.0002163
%RSD	1.857595	1.168812	1.136111	2.480390	.4005428	8.128730	.5119155

#1	.0191055	1.977700	.0387577	.0097423	1.776557	.0324891	.0421029
#2	.0192068	1.994906	.0396393	.0102358	1.784288	.0382405	.0425045
#3	.0185526	1.949224	.0393140	.0099562	1.790831	.0357934	.0421644

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.831887	.0894432	.1982934	.0376460	.0357670	.3487425	.0165733
Stddev	.028547	.0012783	.0003098	.0006362	.0016703	.0108468	.0022498
%RSD	1.558366	1.429169	.1562483	1.689837	4.669882	3.110266	13.57485

#1	1.836138	.0908894	.1980539	.0369262	.0376957	.3463370	.0148263
#2	1.801452	.0889758	.1981830	.0381328	.0347975	.3605901	.0157818
#3	1.858070	.0884643	.1986433	.0378790	.0348078	.3393003	.0191119

Sample Name: P2403-16 Acquired: 2/14/2025 19:43:11 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0213342	.0170201	.0188991
Stddev	.0025190	.0003730	.0000986
%RSD	11.80726	2.191820	.5217841

#1	.0197342	.0174242	.0189829
#2	.0242378	.0169472	.0189240
#3	.0200305	.0166889	.0187904

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2926.056	55025.60	10151.89	1774.803	4511.962
Stddev	5.595	68.52	94.25	1.470	14.544
%RSD	.1912056	.1245212	.9284166	.0828475	.3223449

#1	2931.928	54946.81	10094.04	1775.895	4528.699
#2	2925.453	55058.74	10100.98	1773.131	4502.390
#3	2920.788	55071.24	10260.65	1775.384	4504.797

Sample Name: P2403-08 Acquired: 2/14/2025 19:47:29 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0212023	.0378094	.0115374	.0203270	.0493854	.0910523	.0849695
Stddev	.0029190	.0012427	.0009691	.0012980	.0006771	.0012001	.0004034
%RSD	13.76738	3.286630	8.399817	6.385456	1.371099	1.318074	.4747958

#1	.0237164	.0392386	.0110160	.0214070	.0486293	.0905257	.0848649
#2	.0218896	.0372053	.0109406	.0206870	.0495911	.0924258	.0846286
#3	.0180010	.0369843	.0126556	.0188870	.0499359	.0902056	.0854149

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0056832	.0058050	1.856405	.0097756	.0285531	.0217191	.0925601
Stddev	.0000632	.0001262	.005842	.0005678	.0002550	.0002134	.0045208
%RSD	1.111994	2.174017	.3146776	5.808517	.8929560	.9824723	4.884195

#1	.0057442	.0056981	1.861867	.0091818	.0283112	.0218602	.0898211
#2	.0056180	.0057726	1.857103	.0098318	.0285287	.0218236	.0900809
#3	.0056874	.0059442	1.850246	.0103133	.0288194	.0214737	.0977781

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0189622	1.938878	.0388968	.0098701	1.727688	.0360294	.0419322
Stddev	.0000582	.011314	.0004959	.0002845	.011439	.0013748	.0003830
%RSD	.3068875	.5835104	1.274992	2.882703	.6620877	3.815838	.9134335

#1	.0188957	1.951755	.0383946	.0101009	1.714511	.0362851	.0420192
#2	.0189872	1.930534	.0393863	.0099573	1.735060	.0372585	.0415132
#3	.0190038	1.934345	.0389095	.0095522	1.733494	.0345447	.0422643

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.763574	.0908583	.1971972	.0375861	.0351167	.3457461	.0167276
Stddev	.029273	.0017500	.0004864	.0008552	.0003540	.0086883	.0016049
%RSD	1.659865	1.926073	.2466724	2.275365	1.007976	2.512922	9.594300

#1	1.767007	.0917339	.1976014	.0378822	.0352616	.3364683	.0150625
#2	1.790979	.0888433	.1966573	.0366221	.0353753	.3470791	.0182646
#3	1.732736	.0919976	.1973329	.0382538	.0347133	.3536909	.0168556

Sample Name: P2403-08 Acquired: 2/14/2025 19:47:29 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0204296	.0170751	.0188246
Stddev	.0013726	.0010344	.0000940
%RSD	6.718500	6.058102	.4995137

#1	.0205029	.0182566	.0189022
#2	.0190218	.0166364	.0188517
#3	.0217640	.0163323	.0187201

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2942.370	54508.84	9974.549	1769.477	4531.096
Stddev	7.975	347.79	94.658	11.535	18.062
%RSD	.2710299	.6380436	.9489956	.6518891	.3986327

#1	2943.433	54573.26	9877.271	1775.708	4546.462
#2	2949.760	54819.92	10066.35	1776.556	4535.625
#3	2933.917	54133.35	9980.03	1756.166	4511.200

Sample Name: P2403-17 Acquired: 2/14/2025 19:51:47 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0233197	.0392713	.0131903	.0211739	.0518452	.0959539	.0962989
Stddev	.0012221	.0019246	.0004132	.0026338	.0008997	.0023312	.0004881
%RSD	5.240611	4.900734	3.132587	12.43870	1.735374	2.429461	.5068270

#1	.0219589	.0382250	.0133654	.0212557	.0509484	.0934622	.0957354
#2	.0236768	.0380964	.0134870	.0185002	.0518393	.0980817	.0965719
#3	.0243236	.0414923	.0127184	.0237658	.0527478	.0963179	.0965893

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0056662	.0066635	1.932635	.0100448	.0297562	.0227327	.0949378
Stddev	.0000735	.0000503	.020546	.0005084	.0001774	.0004830	.0051461
%RSD	1.297568	.7548232	1.063115	5.061728	.5963189	2.124454	5.420501

#1	.0056486	.0066202	1.909009	.0100181	.0296031	.0232901	.0932026
#2	.0056032	.0066515	1.942576	.0105660	.0297149	.0224407	.0908836
#3	.0057470	.0067187	1.946320	.0095502	.0299507	.0224672	.1007272

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0199431	2.005194	.0400904	.0106351	1.892001	.0376700	.0459213
Stddev	.0004418	.008139	.0001334	.0001736	.014978	.0003855	.0002867
%RSD	2.215382	.4058882	.3327106	1.632581	.7916629	1.023252	.6244188

#1	.0194553	1.999361	.0402440	.0108344	1.890100	.0381150	.0461303
#2	.0200577	2.001729	.0400232	.0105542	1.907839	.0374501	.0455944
#3	.0203164	2.014492	.0400039	.0105168	1.878064	.0374447	.0460393

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.903042	.0886227	.2018223	.0391740	.0388496	.3667643	.0189295
Stddev	.024473	.0009900	.0004906	.0008362	.0009068	.0138206	.0008224
%RSD	1.286006	1.117143	.2430924	2.134661	2.334049	3.768244	4.344442

#1	1.912319	.0881837	.2016107	.0382405	.0383344	.3787932	.0186398
#2	1.921519	.0879281	.2023832	.0394269	.0383178	.3698320	.0198575
#3	1.875286	.0897563	.2014730	.0398546	.0398966	.3516676	.0182912

Sample Name: P2403-17 Acquired: 2/14/2025 19:51:47 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0235448	.0187442	.0202979
Stddev	.0009984	.0004333	.0000795
%RSD	4.240504	2.311569	.3915272

#1	.0233964	.0185598	.0202101
#2	.0246091	.0184336	.0203650
#3	.0226289	.0192392	.0203187

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2936.064	55406.63	10441.36	1783.629	4526.260
Stddev	2.906	99.56	87.24	6.755	3.185
%RSD	.0989639	.1796847	.8355283	.3787271	.0703717

#1	2938.749	55301.52	10478.30	1778.313	4529.935
#2	2932.979	55418.87	10504.05	1791.230	4524.542
#3	2936.462	55499.50	10341.72	1781.343	4524.303

Sample Name: P2403-10 Acquired: 2/14/2025 19:56:06 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0052878	.0069835	.0016089	.0036320	.0094668	.0164158	.0180808
Stddev	.0017613	.0018620	.0006240	.0011048	.0011160	.0040899	.0008232
%RSD	33.30866	26.66292	38.78145	30.41798	11.78817	24.91424	4.552988

#1	.0052247	.0086107	.0011803	.0043189	.0082092	.0124418	.0184987
#2	.0035589	.0073869	.0023248	.0042196	.0098525	.0161933	.0186113
#3	.0070798	.0049529	.0013217	.0023576	.0103388	.0206125	.0171325

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0011188	.0011717	.3821867	.0024198	.0054873	.0048758	.0152610
Stddev	.0000108	.0000615	.0035621	.0003170	.0001304	.0005262	.0020799
%RSD	.9653698	5.249118	.9320245	13.10216	2.375978	10.79171	13.62881

#1	.0011140	.0011206	.3793263	.0024012	.0056370	.0042775	.0146874
#2	.0011112	.0011545	.3861766	.0027457	.0053985	.0050837	.0175674
#3	.0011312	.0012400	.3810572	.0021125	.0054265	.0052663	.0135280

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0037395	.4090564	.0079512	.0020861	.2964761	.0071570	.0088311
Stddev	.0002874	.0085198	.0000766	.0001392	.0066917	.0023618	.0002285
%RSD	7.686732	2.082793	.9630994	6.673103	2.257072	32.99941	2.587737

#1	.0034076	.4185787	.0079123	.0020389	.2893211	.0050991	.0086501
#2	.0039018	.4064352	.0080394	.0019766	.3025800	.0066362	.0087554
#3	.0039090	.4021551	.0079019	.0022427	.2975272	.0097357	.0090879

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3025967	.0122148	.0405123	.0075026	.0071523	.0701160	.0049891
Stddev	.0239077	.0005725	.0000784	.0003990	.0001870	.0035627	.0012339
%RSD	7.900843	4.686918	.1936238	5.317553	2.614352	5.081146	24.73268

#1	.2846132	.0122809	.0404401	.0072093	.0073505	.0733728	.0058216
#2	.3297275	.0127513	.0405011	.0079569	.0071275	.0663110	.0055741
#3	.2934495	.0116120	.0405958	.0073418	.0069790	.0706643	.0035714

Sample Name: P2403-10 Acquired: 2/14/2025 19:56:06 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0056006	.0013249	.0038583
Stddev	.0019257	.0007868	.0000262
%RSD	34.38266	59.38472	.6788743

#1	.0073422	.0005095	.0038823
#2	.0059271	.0020795	.0038622
#3	.0035326	.0013856	.0038304

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2968.645	55414.09	10302.51	1797.666	4641.243
Stddev	3.347	164.39	6.61	3.281	1.255
%RSD	.1127333	.2966579	.0641753	.1825092	.0270306

#1	2965.082	55477.39	10310.13	1800.450	4641.972
#2	2971.722	55537.43	10299.11	1798.499	4641.963
#3	2969.131	55227.46	10298.29	1794.049	4639.795

Sample Name: P2403-11 Acquired: 2/14/2025 20:00:26 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0207783	.0367256	.0104710	.0189125	.0500602	.0897966	.0883413
Stddev	.0014846	.0004054	.0007639	.0016820	.0008223	.0031138	.0004989
%RSD	7.144866	1.103863	7.295454	8.893290	1.642560	3.467657	.5647176

#1	.0206797	.0367720	.0106683	.0190869	.0497917	.0911707	.0882765
#2	.0193455	.0362989	.0096278	.0205005	.0494059	.0919871	.0878779
#3	.0223097	.0371057	.0111169	.0171502	.0509832	.0862321	.0888694

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0056646	.0058732	1.888104	.0100715	.0286679	.0216784	.0908366
Stddev	.0000431	.0000867	.003240	.0005416	.0000515	.0002621	.0067120
%RSD	.7607973	1.476539	.1716159	5.377536	.1796924	1.209032	7.389131

#1	.0056750	.0058826	1.888958	.0106241	.0286428	.0214859	.0930468
#2	.0056173	.0059549	1.884522	.0100488	.0286338	.0215725	.0961649
#3	.0057015	.0057822	1.890831	.0095416	.0287272	.0219769	.0832982

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0186837	1.976633	.0387538	.0098634	1.772380	.0372427	.0416860
Stddev	.0005210	.013767	.0000476	.0001827	.041248	.0015896	.0012009
%RSD	2.788408	.6964887	.1229268	1.852234	2.327250	4.268194	2.880894

#1	.0182770	1.969344	.0388064	.0100396	1.786980	.0355558	.0422703
#2	.0192709	1.968044	.0387135	.0098758	1.804342	.0374596	.0424829
#3	.0185031	1.992512	.0387416	.0096748	1.725818	.0387127	.0403047

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.811584	.0906379	.1986156	.0370713	.0359715	.3427596	.0192705
Stddev	.031789	.0001603	.0004460	.0010766	.0004232	.0065936	.0012182
%RSD	1.754771	.1769168	.2245544	2.904044	1.176410	1.923680	6.321829

#1	1.807175	.0906909	.1981171	.0381601	.0360794	.3392614	.0206510
#2	1.845347	.0904578	.1987529	.0360074	.0363303	.3503651	.0188140
#3	1.782229	.0907650	.1989768	.0370463	.0355048	.3386523	.0183464

Sample Name: P2403-11 Acquired: 2/14/2025 20:00:26 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0187263	.0174480	.0188763
Stddev	.0020310	.0008893	.0001423
%RSD	10.84571	5.096971	.7537837

#1	.0208627	.0170840	.0187351
#2	.0168203	.0184615	.0188743
#3	.0184958	.0167984	.0190196

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2937.938	55442.43	10097.93	1804.272	4549.123
Stddev	6.712	959.84	66.28	30.309	14.703
%RSD	.2284467	1.731233	.6563985	1.679849	.3232123

#1	2932.100	54942.85	10138.25	1787.886	4534.582
#2	2945.271	54835.43	10134.10	1785.682	4563.983
#3	2936.442	56549.02	10021.43	1839.247	4548.804

Sample Name: PB166765BL Acquired: 2/14/2025 20:04:45 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0016311	-.001045	-.000387	.0006271	.0000351	-.003122	.0000636
Stddev	.0014365	.000554	.001148	.0029652	.0006806	.004650	.0005319
%RSD	88.07175	53.07628	297.0359	472.8445	1940.501	148.9184	836.5672

#1	.0018593	-.000446	-.000161	.0019094	.0004865	-.000597	.0001041
#2	.0000941	-.001148	.000632	-.002763	-.000748	-.008488	.0005741
#3	.0029398	-.001540	-.001631	.002735	.000366	-.000282	-.000487

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000036	.0000179	-.002339	.0004031	-.000260	.0005707	-.002851
Stddev	.000025	.0000422	.004700	.0001683	.000021	.0002111	.003117
%RSD	70.84878	236.1362	200.9423	41.74551	8.105069	36.98560	109.3399

#1	-.000063	.0000358	.001420	.0003253	-.000281	.0003694	-.004924
#2	-.000031	-.000030	-.000828	.0002878	-.000239	.0005524	-.004362
#3	-.000013	.000048	-.007609	.0005962	-.000261	.0007903	.000734

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000068	.0015645	.0003134	.0001233	-.098856	-.001396	.0001621
Stddev	.000227	.0074491	.0000556	.0002720	.011684	.001444	.0002275
%RSD	333.3446	476.1221	17.73904	220.5639	11.81895	103.4749	140.3368

#1	.000046	-.006970	.0002558	-.000002	-.111233	-.002796	.0002168
#2	-.000329	.006762	.0003176	.000435	-.088018	-.001481	-.000088
#3	.000079	.004901	.0003668	-.000063	-.097317	.000089	.000357

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.066655	-.007998	-.000121	-.000282	-.000327	-.002663	.0003890
Stddev	.019251	.000244	.000120	.000464	.000515	.004050	.0022962
%RSD	28.88140	3.046354	98.85306	164.7196	157.6538	152.0932	590.2376

#1	-.082213	-.007718	-.000130	-.000611	.000101	-.006510	.0003606
#2	-.072627	-.008112	-.000236	-.000484	-.000183	.001563	-.001893
#3	-.045126	-.008163	.000003	.000249	-.000899	-.003040	.002699

Sample Name: PB166765BL Acquired: 2/14/2025 20:04:45 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0009287	-.001971	-.000078
Stddev	.0022206	.000419	.000029
%RSD	239.1046	21.25502	37.43768

#1	.0020217	-.001493	-.000050
#2	.0023909	-.002275	-.000108
#3	-.001627	-.002145	-.000077

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2924.022	55545.14	10402.05	1803.222	4546.681
Stddev	6.654	309.01	51.26	15.011	14.708
%RSD	.2275735	.5563283	.4927463	.8324432	.3234979

#1	2921.664	55232.50	10348.56	1786.854	4543.188
#2	2931.534	55552.52	10406.85	1806.466	4562.822
#3	2918.868	55850.39	10450.73	1816.345	4534.033

Sample Name: PB166765BS Acquired: 2/14/2025 20:16:40 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.7602524	1.930639	.9240137	1.857685	.7494167	1.766130	.1754361
Stddev	.0002944	.010594	.0020388	.008636	.0010125	.012581	.0007713
%RSD	.0387276	.5487235	.2206430	.4648528	.1350999	.7123747	.4396556

#1	.7599285	1.920346	.9217284	1.848906	.7483020	1.777650	.1751439
#2	.7603249	1.930059	.9246670	1.857980	.7502793	1.768037	.1763108
#3	.7605038	1.941510	.9256458	1.866170	.7496689	1.752704	.1748535

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1791906	.1836776	.9343326	.3768396	.1841576	.2904209	2.832534
Stddev	.0010684	.0005454	.0081723	.0003773	.0004846	.0011830	.007949
%RSD	.5962462	.2969544	.8746616	.1001247	.2631363	.4073268	.2806200

#1	.1789102	.1830484	.9381577	.3765645	.1835982	.2901178	2.823415
#2	.1803712	.1840150	.9398909	.3772697	.1844480	.2894190	2.836186
#3	.1782903	.1839695	.9249493	.3766845	.1844266	.2917259	2.838000

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1819932	1.782039	.4652358	.0695656	2.700700	.2662837	.1913926
Stddev	.0012349	.006939	.0012204	.0002905	.013845	.0017365	.0010358
%RSD	.6785418	.3893755	.2623174	.4175635	.5126518	.6521421	.5411771

#1	.1813375	1.785816	.4639239	.0697230	2.685845	.2648104	.1913690
#2	.1834176	1.786270	.4654460	.0697434	2.713245	.2681983	.1924400
#3	.1812245	1.774031	.4663374	.0692304	2.703008	.2658424	.1903689

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.147427	.2567516	.3753939	.6383343	.1772520	1.049995	5.384525
Stddev	.014856	.0016407	.0010363	.0013694	.0006347	.003825	.032491
%RSD	.1624028	.6390016	.2760704	.2145276	.3581017	.3642585	.6034078

#1	9.136110	.2552247	.3742057	.6368207	.1778707	1.047870	5.347276
#2	9.141921	.2584862	.3758645	.6386948	.1772832	1.047705	5.399279
#3	9.164250	.2565439	.3761114	.6394874	.1766023	1.054411	5.407021

Sample Name: PB166765BS Acquired: 2/14/2025 20:16:40 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	8.915589	.1853369	.1778910
Stddev	.038400	.0016555	.0012947
%RSD	.4307076	.8932566	.7278216

#1	8.880663	.1841904	.1779979
#2	8.909393	.1872349	.1791290
#3	8.956710	.1845853	.1765462

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2941.941	55224.76	10289.96	1789.619	4511.088
Stddev	4.778	54.27	58.69	7.113	9.853
%RSD	.1624258	.0982655	.5703984	.3974721	.2184172

#1	2946.771	55175.09	10286.42	1790.645	4521.336
#2	2941.835	55216.50	10233.12	1782.049	4510.246
#3	2937.216	55282.68	10350.35	1796.164	4501.684

Sample Name: CCV02 Acquired: 2/14/2025 20:20:40 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV02 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.824681	5.007062	4.820741	4.816643	4.841600	9.432821	9.404153
Stddev	.027616	.046217	.017973	.030229	.026287	.019894	.119921
%RSD	.5723838	.9230268	.3728257	.6276004	.5429497	.2109021	1.275190

#1	4.800513	4.953791	4.821125	4.790552	4.820921	9.419638	9.265850
#2	4.818749	5.030947	4.802580	4.809608	4.832697	9.423119	9.479235
#3	4.854780	5.036449	4.838519	4.849769	4.871183	9.455704	9.467374

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2413422	2.419519	23.66649	.9776276	2.417005	1.210880	4.792444
Stddev	.0017753	.010550	.07996	.0005972	.009414	.005782	.042353
%RSD	.7355796	.4360512	.3378644	.0610901	.3894756	.4775233	.8837492

#1	.2393559	2.418382	23.57419	.9783011	2.415703	1.206372	4.834139
#2	.2427740	2.409583	23.71462	.9771622	2.408310	1.208869	4.749462
#3	.2418966	2.430592	23.71066	.9774196	2.427002	1.217399	4.793730

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.351832	23.42982	2.417069	1.212037	23.54500	2.360274	2.444922
Stddev	.003167	.12176	.010130	.000818	.15037	.002264	.007843
%RSD	.1346446	.5196757	.4191068	.0675008	.6386466	.0959213	.3207895

#1	2.349287	23.29211	2.415515	1.211240	23.70910	2.359372	2.435866
#2	2.350831	23.47415	2.407806	1.212875	23.41382	2.358600	2.449538
#3	2.355378	23.52321	2.427887	1.211996	23.51208	2.362850	2.449361

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	23.68126	4.812147	4.903136	4.839900	4.705563	4.677389	4.812794
Stddev	.14388	.037761	.025016	.014185	.006354	.018962	.036891
%RSD	.6075890	.7847019	.5102058	.2930786	.1350416	.4054041	.7665203

#1	23.83869	4.770083	4.881455	4.840661	4.706694	4.691183	4.777749
#2	23.55655	4.843121	4.897446	4.825350	4.698719	4.655766	4.809343
#3	23.64853	4.823237	4.930507	4.853689	4.711277	4.685218	4.851289

Sample Name: CCV02 Acquired: 2/14/2025 20:20:40 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV02 Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	4.728717	4.722131	4.869592
Stddev	.022491	.000941	.015236
%RSD	.4756318	.0199251	.3128849

#1	4.712077	4.722650	4.861635
#2	4.719768	4.722697	4.887159
#3	4.754305	4.721044	4.859981

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2879.437	53754.68	9706.360	1716.682	4239.177
Stddev	9.945	131.02	51.015	1.289	13.642
%RSD	.3453940	.2437310	.5255878	.0750778	.3218173

#1	2883.387	53629.99	9765.267	1716.745	4234.929
#2	2886.801	53891.22	9676.853	1717.938	4254.439
#3	2868.124	53742.81	9676.958	1715.362	4228.165

Sample Name: CCB02 Acquired: 2/14/2025 20:24:52 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB02 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000599	-.000873	-.001097	-.000848	.0009663	-.002989	-.000423
Stddev	.0006743	.000789	.000691	.000740	.0008585	.001129	.000323
%RSD	1125.156	90.38659	62.99104	87.25844	88.84148	37.76711	76.38216

#1	-.000541	-.000940	-.001607	-.000192	.0017376	-.001688	-.000341
#2	.000789	-.001627	-.001373	-.001650	.0011200	-.003561	-.000149
#3	-.000068	-.000053	-.000311	-.000702	.0000414	-.003716	-.000780

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000070	.0000629	-.004126	.0000913	-.000189	.0000371	-.001096
Stddev	.0000264	.0000451	.003535	.0004779	.000131	.0001315	.004340
%RSD	375.4848	71.68598	85.66678	523.3358	69.60255	354.5393	396.0319

#1	.0000351	.0000733	-.005755	-.000333	-.000071	-.000106	-.005038
#2	-.000017	.0001019	-.000071	.000609	-.000164	.000153	-.001804
#3	.000003	.0000135	-.006552	-.000002	-.000331	.000063	.003555

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000234	-.003785	.0005739	.0002923	-.113194	-.000697	.0003237
Stddev	.000139	.007074	.0001673	.0001657	.001769	.001418	.0001240
%RSD	59.36301	186.8723	29.15764	56.67923	1.563135	203.5025	38.29607

#1	-.000392	-.002693	.0007638	.0002029	-.114458	-.000869	.0004149
#2	-.000181	-.011342	.0005098	.0004835	-.113952	.000799	.0003736
#3	-.000130	.002679	.0004481	.0001906	-.111172	-.002021	.0001825

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.054823	-.001059	-.000123	-.000503	-.000692	.0053182	.0012273
Stddev	.014003	.000390	.000201	.000193	.000704	.0029471	.0027822
%RSD	25.54244	36.79367	163.4372	38.37795	101.6068	55.41527	226.6974

#1	-.057257	-.001366	-.000101	-.000716	.000116	.0027579	-.001046
#2	-.039762	-.000621	.000066	-.000450	-.001029	.0085397	.004330
#3	-.067449	-.001191	-.000334	-.000342	-.001164	.0046569	.000398

Sample Name: CCB02 Acquired: 2/14/2025 20:24:52 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB02 Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0042673	-.001205	-.000032
Stddev	.0029317	.000655	.000020
%RSD	68.70188	54.31696	61.49403

#1	.0070484	-.001513	-.000012
#2	.0045482	-.000453	-.000051
#3	.0012052	-.001649	-.000033

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2971.482	55780.38	10452.94	1802.422	4635.493
Stddev	6.017	287.88	28.69	9.987	10.574
%RSD	.2024999	.5160879	.2744278	.5540843	.2281002

#1	2967.827	55490.41	10468.80	1795.323	4633.312
#2	2978.427	55784.63	10470.20	1798.101	4646.987
#3	2968.191	56066.11	10419.83	1813.842	4626.180

Sample Name: PB166788BL Acquired: 2/14/2025 20:29:12 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0018363	-.001660	-.000000	.0005543	.0003806	-.005208	-.001266
Stddev	.0035677	.000964	.000709	.0003133	.0008494	.001739	.000527
%RSD	194.2927	58.05063	845435.5	56.52601	223.1507	33.39212	41.59504

#1	-.002283	-.001155	.000683	.0003067	.0007862	-.004024	-.001863
#2	.003870	-.001054	-.000732	.0009066	-.000596	-.007205	-.000867
#3	.003922	-.002772	.000050	.0004496	.000951	-.004396	-.001068

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000035	-.000001	-.003407	.0004306	-.000259	-.000098	-.001656
Stddev	.000008	.000111	.011526	.0003043	.000047	.000674	.003029
%RSD	23.28311	9051.482	338.3061	70.67159	18.26061	689.9246	182.9074

#1	-.000045	.000115	-.016703	.0003138	-.000282	.000590	-.001041
#2	-.000031	-.000106	.003759	.0002020	-.000290	-.000758	.001018
#3	-.000030	-.000013	.002723	.0007760	-.000205	-.000125	-.004945

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000076	.0013940	.0002021	.0000898	-.110482	.0010569	.0001600
Stddev	.000507	.0066373	.0001928	.0002191	.000311	.0015092	.0001634
%RSD	669.4780	476.1472	95.39435	244.1878	.2812084	142.7996	102.1896

#1	-.000427	.0084322	-.000010	-.000040	-.110168	.0000285	.0002031
#2	-.000306	.0005019	.000249	.000343	-.110789	.0003527	-.000021
#3	.000506	-.004752	.000367	-.000034	-.110489	.0027894	.000298

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.070436	-.004723	.0001359	-.000281	-.000253	-.004064	-.000755
Stddev	.023078	.000303	.0002194	.000625	.000341	.007706	.002294
%RSD	32.76405	6.410058	161.4675	222.6493	134.8334	189.6179	303.7780

#1	-.047746	-.004987	-.000031	-.000875	-.000633	.003435	.001709
#2	-.093882	-.004791	.000384	-.000337	-.000151	-.011963	-.001145
#3	-.069679	-.004393	.000055	.000371	.000026	-.003664	-.002829

Sample Name: PB166788BL Acquired: 2/14/2025 20:29:12 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0012454	-.001310	-.000081
Stddev	.0024147	.000439	.000052
%RSD	193.8920	33.53685	64.11204

#1	-.001533	-.001007	-.000141
#2	.002838	-.001814	-.000058
#3	.002431	-.001110	-.000045

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2972.095	55702.45	10565.97	1797.054	4613.691
Stddev	2.861	156.59	31.46	14.660	4.571
%RSD	.0962628	.2811235	.2977513	.8157791	.0990710

#1	2971.485	55527.95	10564.00	1780.835	4618.537
#2	2975.212	55830.74	10598.37	1809.361	4609.458
#3	2969.588	55748.65	10535.54	1800.968	4613.079

Sample Name: PB166788BS Acquired: 2/14/2025 20:33:33 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.7641991	1.873050	.9300051	1.851840	.7562264	1.759471	.1705759
Stddev	.0030344	.018502	.0031561	.009263	.0021689	.012833	.0006083
%RSD	.3970732	.9877886	.3393639	.5001857	.2868031	.7293582	.3565936

#1	.7625735	1.862833	.9276940	1.841371	.7539674	1.754287	.1702987
#2	.7623238	1.894408	.9287205	1.855178	.7564194	1.774085	.1701556
#3	.7677000	1.861910	.9336010	1.858971	.7582923	1.750042	.1712734

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1810951	.1847691	.9436423	.3774215	.1856273	.2915939	2.782337
Stddev	.0012872	.0002005	.0065928	.0020337	.0004226	.0006462	.016106
%RSD	.7107982	.1084979	.6986542	.5388300	.2276441	.2216234	.5788839

#1	.1798337	.1846318	.9360558	.3766156	.1855019	.2908477	2.783906
#2	.1810449	.1846764	.9468885	.3797347	.1852816	.2919666	2.797601
#3	.1824067	.1849992	.9479825	.3759144	.1860984	.2919675	2.765503

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1799001	1.747670	.4683405	.0693513	2.599680	.2640830	.1917077
Stddev	.0004305	.006021	.0007141	.0006563	.027450	.0004928	.0002885
%RSD	.2392836	.3445090	.1524795	.9463329	1.055914	.1866126	.1505052

#1	.1802465	1.741913	.4676263	.0686655	2.616342	.2638223	.1918602
#2	.1800356	1.747173	.4683408	.0699734	2.614702	.2646514	.1918879
#3	.1794182	1.753924	.4690545	.0694150	2.567997	.2637753	.1913749

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	8.826804	.2634173	.3781433	.6405350	.1759216	.9731671	5.328339
Stddev	.091590	.0016461	.0013298	.0004883	.0009904	.0015703	.011433
%RSD	1.037633	.6249109	.3516689	.0762375	.5629610	.1613613	.2145653

#1	8.913717	.2616869	.3772033	.6409666	.1770044	.9722138	5.316660
#2	8.835532	.2636013	.3775617	.6406335	.1756988	.9723080	5.328846
#3	8.731162	.2649637	.3796648	.6400049	.1750616	.9749796	5.339509

Sample Name: PB166788BS Acquired: 2/14/2025 20:33:33 Type: Unk
 Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
 User: Kareem Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	8.648233	.1834042	.1807311
Stddev	.019751	.0021223	.0007267
%RSD	.2283830	1.157149	.4020805

#1	8.643660	.1835886	.1800948
#2	8.669869	.1854282	.1815230
#3	8.631169	.1811957	.1805754

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2957.465	56182.39	10282.91	1803.183	4530.199
Stddev	.499	123.38	58.49	3.837	2.170
%RSD	.0168791	.2196087	.5687832	.2128014	.0479076

#1	2957.789	56314.37	10346.07	1802.726	4529.440
#2	2957.716	56069.94	10272.04	1799.596	4528.509
#3	2956.891	56162.86	10230.62	1807.229	4532.646

Sample Name: PB166781BL Acquired: 2/14/2025 20:37:33 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0026225	-.001001	-.000317	.0008139	-.000614	-.003344	-.004807
Stddev	.0025596	.000908	.001229	.0012393	.001367	.003348	.000440
%RSD	97.59975	90.69535	387.3572	152.2671	222.6757	100.1281	9.157289

#1	.0001153	.000046	-.000988	.0000601	-.001870	.000204	-.004546
#2	.0025209	-.001561	.001101	.0022443	-.000812	-.006447	-.005315
#3	.0052314	-.001488	-.001065	.0001374	.000841	-.003788	-.004559

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000001	-.000008	-.003056	.0003837	-.000236	.0000879	-.004570
Stddev	.000029	.000055	.001552	.0002644	.000056	.0002134	.002765
%RSD	2063.987	711.4620	50.76447	68.92098	23.69862	242.7061	60.51518

#1	-.000021	.000037	-.001374	.0006856	-.000231	-.000123	-.005647
#2	-.000015	-.000070	-.003365	.0001932	-.000294	.000083	-.006635
#3	.000032	.000009	-.004431	.0002723	-.000182	.000304	-.001428

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000056	-.002160	.0002902	.0003374	-.131335	-.000714	.0001512
Stddev	.000244	.001300	.0001745	.0001592	.006550	.001852	.0002115
%RSD	436.3431	60.16732	60.11702	47.20050	4.987613	259.2787	139.9318

#1	-.000287	-.001289	.0000896	.0003748	-.124902	-.002745	.0002388
#2	.000200	-.001538	.0004064	.0001627	-.137997	.000883	-.000090
#3	-.000081	-.003654	.0003746	.0004745	-.131105	-.000281	.000305

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.076199	-.005869	.0001577	-.000060	-.000534	-.001086	.0013977
Stddev	.001507	.000994	.0000991	.000249	.000178	.012681	.0014925
%RSD	1.978009	16.93617	62.84655	418.5198	33.27331	1167.999	106.7822

#1	-.076847	-.005695	.0002711	-.000173	-.000333	-.015705	.0025823
#2	-.074476	-.006939	.0001150	-.000231	-.000670	.006946	-.000279
#3	-.077274	-.004974	.0000872	.000226	-.000598	.005502	.001889

Sample Name: PB166781BL Acquired: 2/14/2025 20:37:33 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0013501	-.001031	-.000066
Stddev	.0008185	.000392	.000033
%RSD	60.62282	38.02994	49.35193

#1	.0014722	-.001108	-.000029
#2	.0004774	-.001378	-.000081
#3	.0021007	-.000606	-.000089

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3014.212	56333.88	10049.98	1808.247	4724.549
Stddev	3.185	69.86	52.63	8.172	10.967
%RSD	.1056757	.1240083	.5236673	.4519030	.2321226

#1	3011.770	56254.65	10064.12	1800.640	4721.830
#2	3017.815	56386.59	9991.73	1807.216	4736.620
#3	3013.051	56360.41	10094.10	1816.885	4715.198

Sample Name: PB166781BS Acquired: 2/14/2025 20:41:53 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.7833789	1.961313	.9543165	1.898322	.7718931	1.809112	.1763066
Stddev	.0017028	.001560	.0039198	.007950	.0018140	.004505	.0009702
%RSD	.2173611	.0795446	.4107466	.4187834	.2350020	.2489985	.5503145

#1	.7816101	1.962081	.9508327	1.898323	.7707297	1.804800	.1755059
#2	.7835199	1.962340	.9535558	1.890371	.7709664	1.808748	.1760284
#3	.7850068	1.959518	.9585609	1.906271	.7739832	1.813788	.1773856

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1853549	.1895226	.9639777	.3891193	.1902009	.2985535	2.916236
Stddev	.0014487	.0004375	.0081926	.0009580	.0010070	.0012050	.024942
%RSD	.7815816	.2308507	.8498733	.2462010	.5294437	.4036185	.8552736

#1	.1837785	.1891002	.9563920	.3899245	.1892307	.2975704	2.941200
#2	.1856583	.1894937	.9628756	.3880598	.1901310	.2981922	2.891317
#3	.1866278	.1899738	.9726656	.3893736	.1912411	.2998978	2.916191

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1858221	1.794155	.4798054	.0715246	2.726933	.2723666	.1987046
Stddev	.0015345	.021632	.0014403	.0001530	.018579	.0008741	.0003004
%RSD	.8258014	1.205711	.3001868	.2139485	.6813151	.3209337	.1511762

#1	.1848479	1.769575	.4782900	.0716456	2.742516	.2715875	.1988544
#2	.1850275	1.802592	.4799698	.0713526	2.706372	.2722004	.1983588
#3	.1875910	1.810297	.4811565	.0715756	2.731912	.2733119	.1989006

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.286922	.2673540	.3872281	.6562518	.1811557	1.020988	5.467875
Stddev	.028769	.0021242	.0014235	.0019051	.0006269	.003388	.015380
%RSD	.3097770	.7945380	.3676196	.2902938	.3460640	.3318268	.2812827

#1	9.319862	.2650804	.3858997	.6550185	.1804746	1.023598	5.454393
#2	9.266730	.2676939	.3870539	.6552909	.1812838	1.017160	5.464603
#3	9.274174	.2692878	.3887307	.6584459	.1817086	1.022206	5.484627

Sample Name: PB166781BS Acquired: 2/14/2025 20:41:53 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	8.932080	.1880032	.1855822
Stddev	.008776	.0003264	.0004156
%RSD	.0982556	.1736107	.2239217

#1	8.930821	.1880602	.1851362
#2	8.924001	.1876520	.1859585
#3	8.941418	.1882973	.1856520

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2939.383	55080.26	10237.86	1776.957	4498.360
Stddev	10.745	181.70	56.53	2.063	11.364
%RSD	.3655571	.3298880	.5521914	.1160748	.2526357

#1	2947.583	54917.33	10300.70	1778.724	4505.994
#2	2943.346	55276.21	10221.75	1774.690	4503.786
#3	2927.219	55047.23	10191.13	1777.456	4485.299

Sample Name: CCV03 Acquired: 2/14/2025 20:45:53 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV03 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.864487	4.935828	4.858624	4.875153	4.881091	9.472821	9.608094
Stddev	.026374	.027310	.018685	.025890	.020860	.046891	.133616
%RSD	.5421673	.5532960	.3845755	.5310649	.4273622	.4950053	1.390659

#1	4.839278	4.905244	4.838109	4.852884	4.863900	9.438940	9.476344
#2	4.862294	4.944464	4.863098	4.869014	4.875076	9.526338	9.743501
#3	4.891888	4.957775	4.874667	4.903561	4.904298	9.453186	9.604437

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2341266	2.440911	23.74836	.9737244	2.435434	1.218040	4.905325
Stddev	.0031649	.008275	.15389	.0030227	.009336	.003828	.071425
%RSD	1.351776	.3389935	.6479987	.3104314	.3833283	.3142618	1.456079

#1	.2329558	2.431872	23.69690	.9711162	2.426509	1.214031	4.910980
#2	.2377100	2.442749	23.92138	.9730197	2.434662	1.218433	4.831240
#3	.2317139	2.448111	23.62679	.9770372	2.445132	1.221657	4.973755

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.362049	23.54569	2.439816	1.204500	24.52206	2.373502	2.443762
Stddev	.009645	.15995	.009798	.002983	.23339	.009219	.016616
%RSD	.4083379	.6793143	.4015828	.2476221	.9517406	.3884247	.6799558

#1	2.357122	23.44414	2.429020	1.201087	24.59257	2.371544	2.426718
#2	2.373162	23.73007	2.442283	1.205812	24.26155	2.383543	2.444655
#3	2.355862	23.46286	2.448144	1.206602	24.71206	2.365419	2.459915

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	24.54033	4.659631	4.889391	4.867854	4.752863	4.829242	4.856133
Stddev	.27451	.068813	.020836	.018226	.014727	.053592	.014686
%RSD	1.118608	1.476799	.4261556	.3744234	.3098549	1.109741	.3024234

#1	24.59851	4.637127	4.869028	4.846829	4.745777	4.821009	4.846841
#2	24.24139	4.736879	4.888475	4.879175	4.769794	4.780242	4.848495
#3	24.78109	4.604887	4.910671	4.877558	4.743019	4.886474	4.873064

Sample Name: CCV03 Acquired: 2/14/2025 20:45:53 Type: Unk
 Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
 User: Kareem Custom ID1: CCV03 Custom ID2: Custom ID3:
 Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	4.812842	4.821208	4.827442
Stddev	.023148	.013210	.069946
%RSD	.4809543	.2739975	1.448923

#1	4.787214	4.823686	4.788367
#2	4.819083	4.833004	4.908195
#3	4.832229	4.806935	4.785764

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2855.149	54218.16	10021.92	1718.029	4178.054
Stddev	11.020	279.19	102.43	13.244	13.326
%RSD	.3859801	.5149427	1.022052	.7708964	.3189526

#1	2864.253	54415.75	10080.99	1731.088	4189.423
#2	2858.296	54339.97	9903.64	1718.391	4181.350
#3	2842.897	53898.76	10081.12	1704.607	4163.389

Sample Name: CCB03 Acquired: 2/14/2025 20:50:04 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB03 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0007355	-.001499	-.000032	.0005468	-.001477	-.007255	-.000452
Stddev	.0007100	.001238	.000690	.0005011	.000259	.002439	.000620
%RSD	96.52459	82.59386	2121.899	91.62915	17.51688	33.61702	137.0233

#1	-.000067	-.000616	.000702	.0009563	-.001431	-.004924	-.001102
#2	.000994	-.000966	-.000666	.0006961	-.001756	-.009789	.000132
#3	.001280	-.002914	-.000134	-.000012	-.001244	-.007051	-.000387

Elem	Be2348	Cd2265	Ca3736	Cr2677	Co2286	Cu2247	Fe2404
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000000	.0000023	-.002415	.0003200	-.000191	.0003760	-.003297
Stddev	.000017	.0000750	.006684	.0002214	.000137	.0002078	.003972
%RSD	5036.606	3246.986	276.8406	69.20429	71.53451	55.27472	120.4763

#1	.000019	-.000052	-.006613	.0001391	-.000034	.0004690	-.004931
#2	-.000006	.000088	-.005925	.0005669	-.000254	.0001379	-.006192
#3	-.000014	-.000029	.005294	.0002539	-.000285	.0005210	.001232

Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na5895	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000438	-.000209	.0001339	.0004191	-.115167	-.000915	.0002353
Stddev	.000478	.010946	.0002553	.0003148	.005354	.001168	.0000737
%RSD	109.1969	5247.375	190.6399	75.12253	4.648687	127.6378	31.31544

#1	-.000809	.010494	.0000097	.0007820	-.121337	.000054	.0001890
#2	-.000606	.000264	.0004275	.0002189	-.112423	-.000588	.0003202
#3	.000102	-.011384	-.000035	.0002564	-.111743	-.002212	.0001966

Elem	K_7664	B_2496	Mo2020	Sn1899	Ti3361	Si2881	P_1774
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.060016	-.000676	.0001413	-.000248	-.000192	-.002863	-.001298
Stddev	.037830	.000058	.0000882	.000109	.000367	.001804	.002301
%RSD	63.03350	8.654087	62.42942	44.12334	191.3602	63.03708	177.2426

#1	-.096424	-.000743	.0001415	-.000374	-.000266	-.001743	-.002539
#2	-.062713	-.000648	.0002295	-.000194	.000207	-.004944	-.002713
#3	-.020909	-.000636	.0000530	-.000176	-.000516	-.001901	.001357

Sample Name: CCB03 Acquired: 2/14/2025 20:50:04 Type: Unk
Method: NON EPA-6010-200.7(v2698) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB03 Custom ID2: Custom ID3:
Comment:

Elem	S_1820	Li6707	Sr4077
Units	ppm	ppm	ppm
Avg	.0030193	-.000450	.0000031
Stddev	.0043037	.000054	.0000428
%RSD	142.5380	12.01616	1357.050

#1	.0035354	-.000395	.0000472
#2	.0070416	-.000452	-.000038
#3	-.001519	-.000503	.000001

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2950.103	56105.15	10600.33	1799.102	4559.575
Stddev	9.917	46.63	87.48	7.213	12.758
%RSD	.3361488	.0831164	.8252886	.4009182	.2798080

#1	2961.483	56135.32	10681.87	1792.345	4574.307
#2	2945.515	56051.44	10507.92	1806.698	4552.304
#3	2943.311	56128.69	10611.20	1798.265	4552.116

SOP ID : M3050B-Digestion-20

SDG No : N/A

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 #2 2. N/A

Start Digest Date: 05/20/2024 Time : 08:40 Temp : 96 °C

End Digest Date: 05/20/2024 Time : 10:45 Temp : 96 °C

Digestion tube ID: M5586

Block thermometer ID: MET-DIG. #2

Dig Technician Signature: *Karen*

Supervisor Signature: *[Signature]*

Temp : 1. 96°C 2. N/A

Standard Name	MLS USED	STD REF. # FROM LOG
LFS-1	1.00	M5643
LFS-2	1.00	M5633
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	MP81119
Conc. HNO3	5.00	M5965
30% H2O2	3.00	M5633
Conc. HCL	10.00	M5952
PTFE Boiling Stones	N/A	M5585
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#2 CELL#35 : 96 c

Date / Time	Prepped Sample Relinquished By/Location	Received By/Location
5/20/24 11:10	<i>Karen Met Dig</i> Preparation Group	<i>[Signature]</i> Analysis Group

Lab Sample ID	Client Sample ID	pH	Initial Weight (g)	Final Vol (ml)	Color Before	Color After	Texture	Artifact	Comment	Prep Pos
P2403-01	LOD-MDL-SOIL-01-QT2-202	N/A	2	100	Brown	Yellow	Medium	N/A	0.4ML MP80769	1
P2403-02	LOQ-SOIL-02-QT2-2024	N/A	2	100	Brown	Yellow	Medium	N/A	2.00ML MP80679	2
P2403-16	LLOQ-SOIL-QT2-2024	N/A	2	100	Brown	Yellow	Medium	N/A	2.00ML MP80769	3
PB166765BL	PBW765	N/A	2	100	Brown	Yellow	Medium	N/A	N/A	4
PB166765BS	LCS765	N/A	2	100	Brown	Yellow	Medium	N/A	M5643,M5633	5

Prep Standard - Chemical Standard Summary

Order ID : P2403

Test : Metal ICP TAL

Prepbatch ID : PB166765,

Sequence ID/Qc Batch ID: LB134725,

Standard ID :

MP81119,MP81559,MP84636,MP84637,MP84638,MP84639,MP84640,MP84641,MP84642,MP84643,MP84644,MP84646,MP84649,MP84650,MP84721,

Chemical ID :

M4884,M5192,M5218,M5288,M5296,M5395,M5429,M5467,M5472,M5496,M5497,M5643,M5649,M5658,M5747,M5748,M5751,M5789,M5792,M5798,M5799,M5800,M5801,M5811,M5814,M5815,M5816,M5817,M5820,M5875,M5929,M5935,M5959,M5962,M5970,M5978,M5985,M6021,M6023,M6028,M6030,M6032,M6077,M6127,M6128,M6144,M6145,M6146,M6150,M6152,M6155,W2606,W3112,



<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	MP81119	06/21/2024	04/24/2025	Al-Terek Isaac	METALS_SCALE_2 (M SC-2)	METALS_PIPETTE_1 (ICP)	Sarabjit Jaswal
FROM 1250.00000ml of M5935 + 1250.00000ml of W2606 = 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>
170	1:1HCL	MP81559	07/23/2024	12/08/2024	Rubina Mughal	None	None	Mohan Bera 07/23/2024
<u>FROM</u> 1250.00000ml of M5929 + 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>
902	ICP AES CAL BLK (SO/ICB/CCB)	MP84636	02/25/2025	03/25/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								02/28/2025

FROM 125.00000ml of M5792 + 2350.00000ml of W3112 + 25.00000ml of M5789 = 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>
907	ICP AES STD S (S5)	MP84637	02/25/2025	03/25/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								02/28/2025

FROM 5.00000ml of M5395 + 5.00000ml of M5467 + 5.00000ml of M5472 + 5.00000ml of M5816 + 5.00000ml of M5820 + 5.00000ml of M5875 + 5.00000ml of M5970 + 5.00000ml of M6077 + 5.00000ml of M6146 + 455.00000ml of MP84636 = Final Quantity: 500.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
910	ICP AES STD S4	MP84638	02/25/2025	03/25/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								02/28/2025

FROM 50.00000ml of MP84636 + 50.00000ml of MP84637 = Final Quantity: 100.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
909	ICP AES STD S3	MP84639	02/25/2025	03/25/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								02/28/2025

FROM 25.00000ml of MP84637 + 75.00000ml of MP84636 = Final Quantity: 100.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
3913	ICP AES STD S2	MP84640	02/25/2025	03/25/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								02/28/2025

FROM 16.00000ml of MP84637 + 184.00000ml of MP84636 = Final Quantity: 200.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
2950	ICP AES S1/CRI STOCK STD	MP84641	02/25/2025	03/09/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								02/28/2025

FROM 0.00200ml of M5816 + 0.00400ml of M5978 + 0.03000ml of M6028 + 0.04000ml of M4884 + 0.05000ml of M5496 + 0.05000ml of M5658 + 0.05000ml of M5811 + 0.05000ml of M6030 + 0.06000ml of M5747 + 0.10000ml of M5472 + 0.10000ml of M5751 + 0.10000ml of M5801 + 0.10000ml of M5820 + 0.10000ml of M5962 + 0.10000ml of M5970 + 0.10000ml of M6128 + 0.15000ml of M5800 + 0.20000ml of M5748 + 0.20000ml of M5799 + 0.20000ml of M6021 + 0.20000ml of M6023 + 0.20000ml of M6145 + 0.25000ml of M5467 + 0.25000ml of M6146 + 0.50000ml of M5798 + 0.50000ml of M5814 + 0.50000ml of M6032 + 1.00000ml of M5192 + 1.00000ml of M5288 + 1.00000ml of M5497 + 1.00000ml of M6127 + 1.00000ml of M6144 + 77.68000ml of MP84636 = Final Quantity: 100.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
2951	ICP AES S1/CRI WORK STD	MP84642	02/25/2025	03/09/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								02/28/2025

FROM 2.00000ml of MP84641 + 98.00000ml of MP84636 = Final Quantity: 100.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
912	ICP AES ICV SOLN	MP84643	02/25/2025	03/25/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								02/28/2025

FROM 0.02500ml of M5429 + 0.02500ml of M5815 + 0.02500ml of M5817 + 0.10000ml of M5467 + 0.25000ml of M5218 + 0.25000ml of M5472 + 10.00000ml of M6150 + 89.77500ml of MP84636 = 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>
904	ICP AES ICSA SOLN	MP84644	02/24/2025	03/25/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								02/28/2025

FROM 25.00000ml of M6152 + 225.00000ml of MP84636 = 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>
911	ICP AES CCV SOLN	MP84646	02/25/2025	03/25/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								02/28/2025

FROM 50.00000ml of MP84636 + 50.00000ml of MP84637 = 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>
919	ICP AES INTERNAL STD	MP84649	02/25/2025	03/25/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								02/28/2025

FROM 1.00000ml of M5959 + 10.00000ml of M5985 + 1969.00000ml of W3112 + 20.00000ml of M5789 = 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>
513	RINSE SOLN	MP84650	02/25/2025	03/25/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								02/28/2025

FROM 200.00000ml of M5789 + 9800.00000ml of W3112 = Final Quantity: 10000.000 ml



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
3494	ICP AES ICSAB SOLN-1	MP84721	02/25/2025	03/25/2025	Kareem Khairalla	None	None	Sarabjit Jaswal 02/28/2025
<u>FROM</u>	0.01000ml of M5815 + 0.01000ml of M5817 + 0.10000ml of M5296 + 0.10000ml of M5472 + 0.10000ml of M5970 + 10.00000ml of M6152 + 10.00000ml of M6155 + 79.50000ml of MP84636 = Final Quantity: 100.000 ml							

CHEMICAL RECEIPT LOG BOOK

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

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

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

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

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

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	01/30/2024 / bin	09/19/2022 / bin	M5395

CHEMICAL RECEIPT LOG BOOK

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

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

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

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

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	WW-LFS-1 / Laboratory Fortified Stock Solution 1, 125 ml	T2-MEB723367	08/28/2024	08/18/2023 / bin	04/16/2023 / bin	M5643

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	WW-LFS-2 / Laboratory Fortified Stock Solution 2, 125 ml	T2-MEB715594	02/17/2027	12/11/2023 / bin	04/16/2023 / bin	M5649

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.	/ Lead (Pb) 1000PPM	100923	10/09/2026	05/20/2024 / Jaswal	12/20/2023 / jaswal	M5747

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58029 / Cu, 1000 PPM, 500 ml	071723	07/17/2026	10/01/2024 / Jaswal	08/25/2023 / jaswal	M5751

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)	23G1262003	07/30/2025	02/08/2024 / Al-Terek	06/26/2023 / Al-Terek	M5789

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9530-33 / Hydrochloric Acid, Instra-Analyzed (cs/6x2.5L)	22D1462006	08/05/2025	02/05/2024 / Al-Terek	02/24/2022 / Al-Terek	M5792

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.	58126 / Fe, 10000 PPM, 500 ml	051523	05/15/2026	02/06/2025 / kareem	01/03/2024 / jaswal	M5811

CHEMICAL RECEIPT LOG BOOK

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

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

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

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

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

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

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9530-33 / Hydrochloric Acid, Instra-Analyzed (cs/6x2.5L)	22G2862015	12/08/2024	06/24/2024 / Al-Terek	06/07/2024 / Al-Terek	M5929

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	12/08/2024	06/21/2024 / Al-Terek	06/07/2024 / Al-Terek	M5935

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

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

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	CGT11-1 / TITANIUM 125mL 1000ug/mL	T2-T1719972	06/17/2027	08/07/2024 / jaswal	02/22/2024 / Jaswal	M5978

CHEMICAL RECEIPT LOG BOOK

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

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

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

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

CHEMICAL RECEIPT LOG BOOK

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

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

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

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

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

CHEMICAL RECEIPT LOG BOOK

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

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	08/24/2025	02/24/2025 / kareem	04/20/2021 / kareem	M6152

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	06/20/2025	02/10/2025 / kareem	02/09/2024 / kareem	M6155

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	DIW / DI Water	Daily Lab-Certified	10/24/2024	10/24/2019 / apatel	10/24/2019 / apatel	W2606

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



M6032



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)

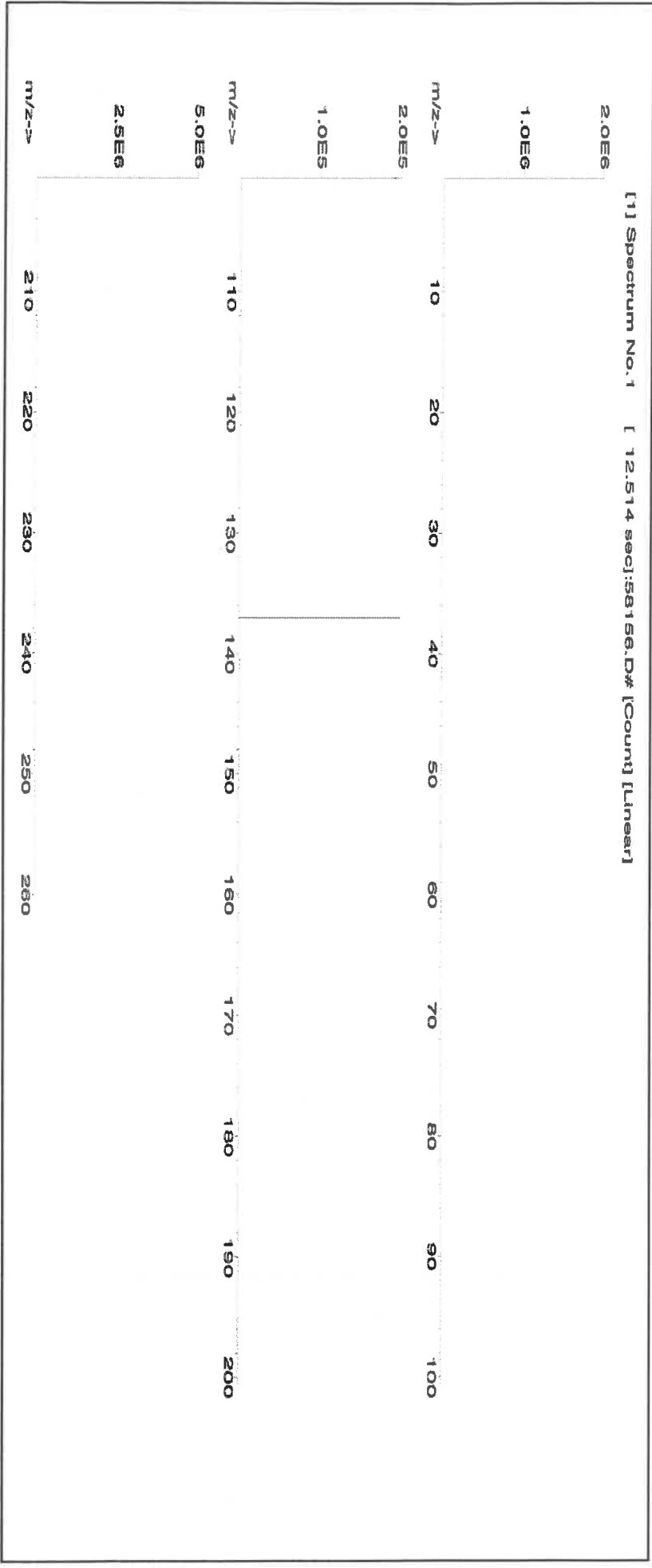
NIST Test Number: 6UTB

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)
Barium nitrate (Ba)	IN023 BA0022019A1	1000	99.999	0.10	52.3	3.82417	3.82441	1000.1	2.0

1. Barium nitrate (Ba) IN023 BA0022019A1 1000 99.999 0.10 52.3 3.82417 3.82441 1000.1 2.0 10022-31-8 0.5 mg/mL 3 0.1 µg/mL 355 mg/kg 3104a





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

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

Lot #

R: 815/24

2% 40.0 Nitric Acid (mL)

Expiration Date: 070127

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL): 1000

NIST Test Number: 6UTB

SE-05 Balance Uncertainty

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

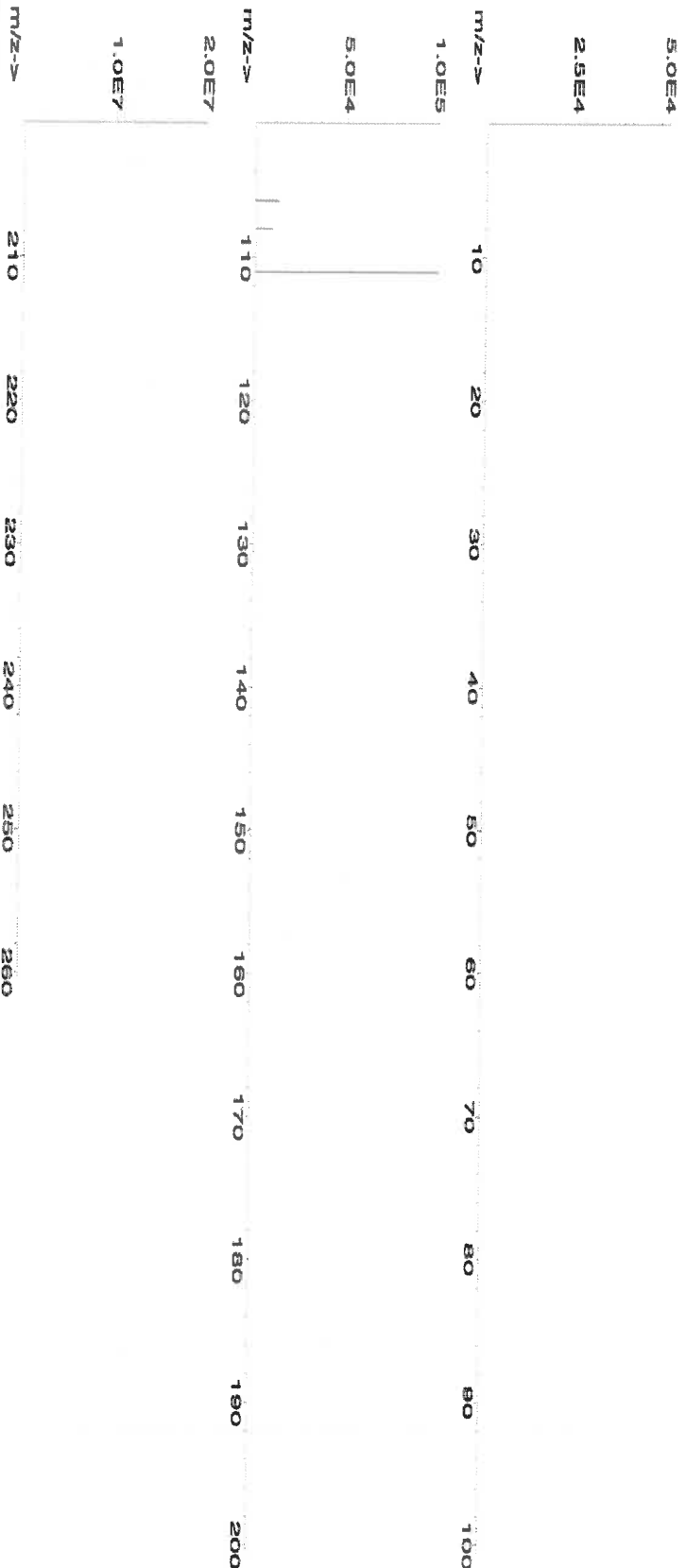
<i>Aleah O'Brady</i>	
Formulated By:	Aleah O'Brady
	070124
<i>Pedro L. Rentas</i>	
Reviewed By:	Pedro L. Rentas
	070124

Compound

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

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

[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).



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Certificate of Analysis

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1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: CHEM-CLP-4
Lot Number: S2-MEB711673
Matrix: 3% (v/v) HNO₃
3% (v/v) HF
Value / Analyte(s): 1 000 µg/mL ea:
Boron, Molybdenum,
Silicon, Tin,
Titanium

3.0 CERTIFIED VALUES AND UNCERTAINTIES

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

Density: 1.030 g/mL (measured at 20 ± 4 °C)

Assay Information:

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

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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





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Certificate of Analysis

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Christiansburg, VA 24073 USA
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1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code:	Multi Analyte Custom Grade Solution	
Catalog Number:	CLPP-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

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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





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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 WEIGHT REPORT:

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

Solvent: 21110221 Nitric Acid

Lot #

Expiration Date: 051526

5.0% 250.0 (mL) Nitric Acid

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL): 10000

NIST Test Number: 6UTB

5E-05 Balance Uncertainty

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

Giovanni Esposito

Formulated By: Giovanni Esposito **051523**

Pedro L. Renias

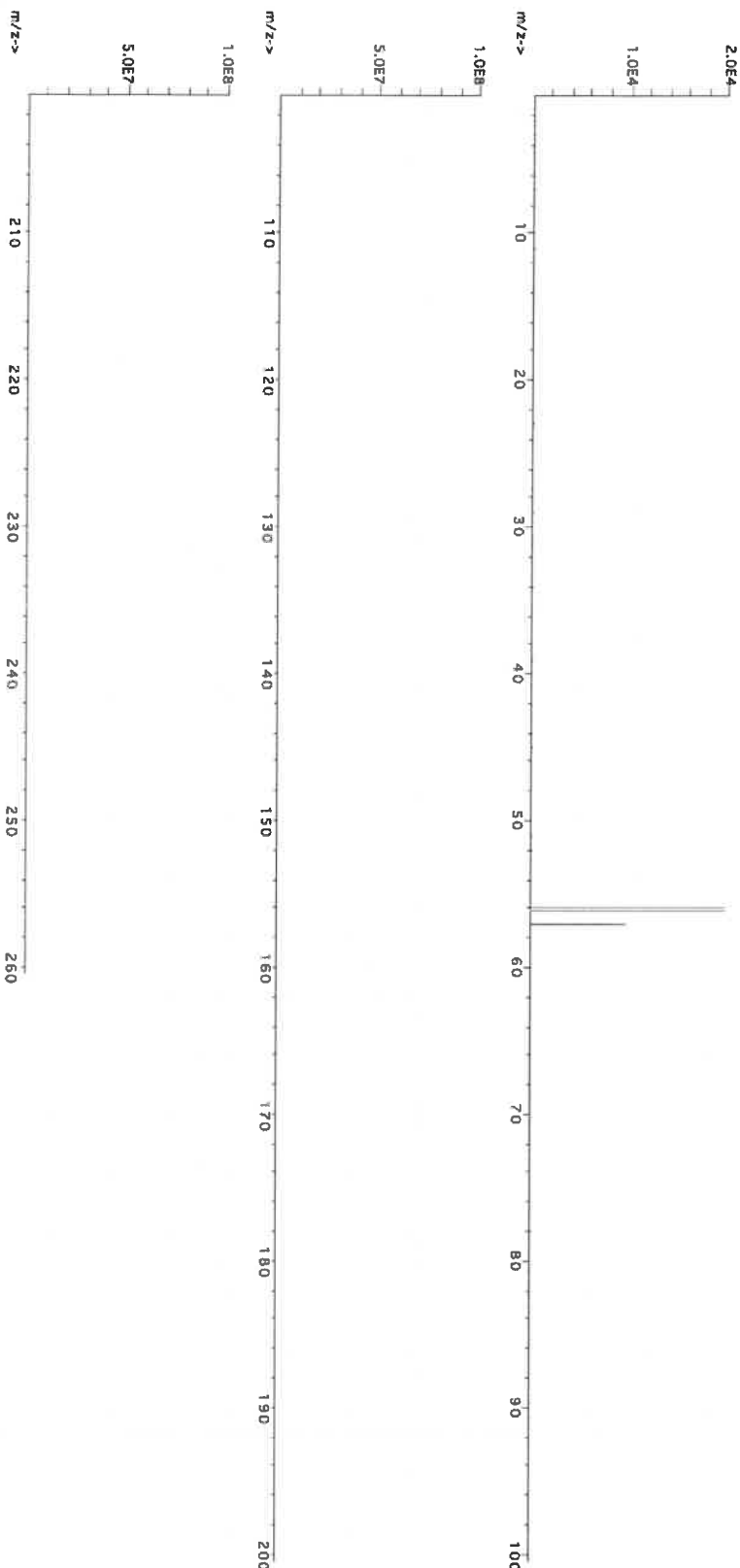
Reviewed By: Pedro L. Renias **051523**

SDS Information

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

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

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





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

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

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.10	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ce	<0.2	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Te	<0.02	U	<0.02
As	<0.2	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.01	Os	<0.02	Rb	<0.02	Ag	<0.02	Tl	<0.02	V	<0.02
Ba	<0.02	Cs	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.10	Pd	<0.02	Rb	<0.02	Na	<0.2	Th	<0.02	Yb	<0.02
Be	<0.01	Cr	<0.05	Ga	<0.02	Fe	<0.2	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	<0.02	Tm	<0.02	Y	<0.02
Bi	<0.02	Co	<0.10	Ge	<0.10	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	Sn	<0.02	Zn	<0.10
B	<0.02	Cu	<0.10	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	Tl	<0.02	Zr	<0.02

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



Certified Reference Material CRM



CERTIFIED WEIGHT REPORT:

Part Number: **57014**
 Lot Number: **030921**
 Description: **Silicon (Si)**

Lot # 19410105
 Solvent: Nitric Acid

2.0% 60.0 Nitric Acid
 (mL)

Expiration Date: 030924

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL): **1000**

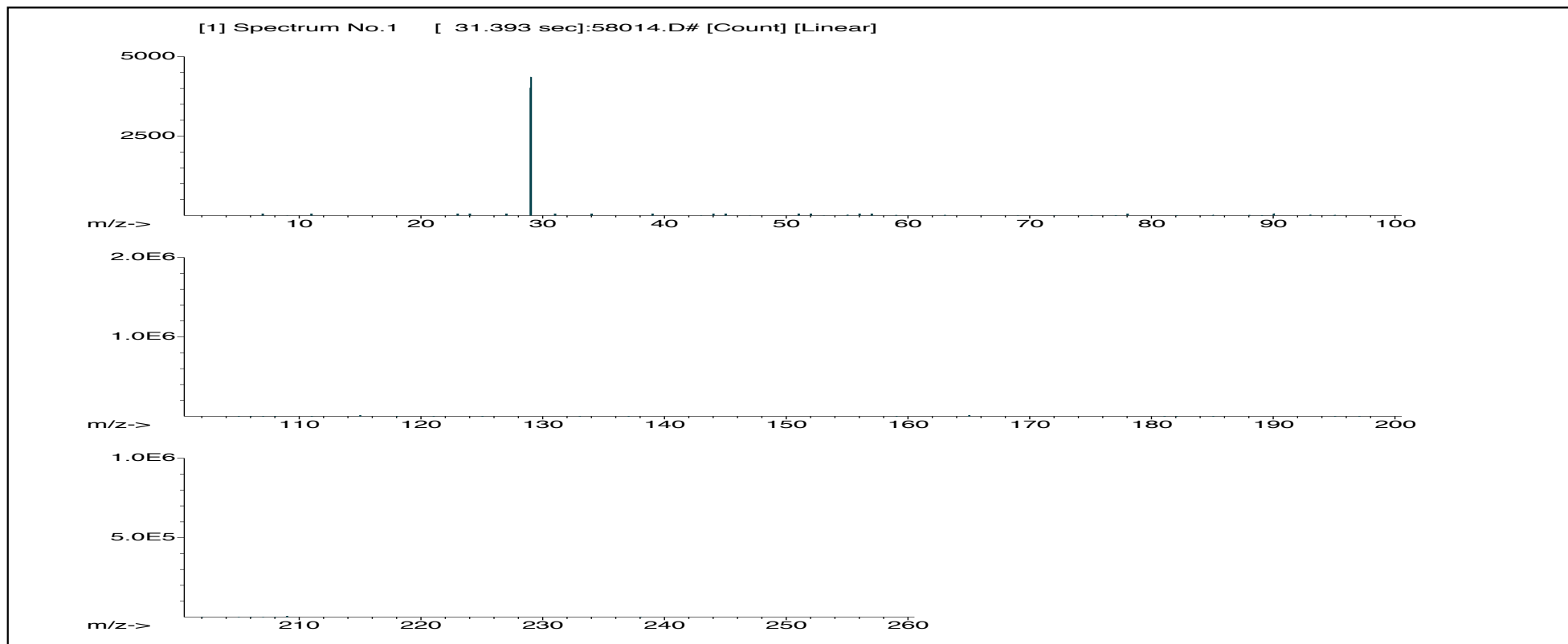
NIST Test Number: 6UTB

5E-05 Balance Uncertainty

Volume shown below was diluted to (mL): 3000.41 0.058 Flask Uncertainty

Formulated By:	Lawrence Barry	030921
Reviewed By:	Pedro L. Rentas	030921

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.)			NIST SRM
										CAS#	OSHA PEL (TWA)	LD50	
1. Ammonium hexafluorosilicate (Si)	58114	070120	0.1000	300.0	0.084	1000	10000.0	1000.0	2.1	16919-19-0	2.50 mg/m3	orl-rat 70 mg/kg	NA





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	T	Te	<0.02	U	<0.02
As	<0.2	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.01	Os	<0.02	Rh	<0.02	Ag	<0.02	Tl	<0.02	V	<0.02
Ba	<0.02	Cs	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.02	Pd	<0.02	Rb	<0.02	Na	<0.2	Th	<0.02	Yb	<0.02
Be	<0.01	Cr	<0.02	Ga	<0.02	Fe	<0.2	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

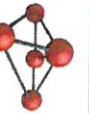
(T)= Target analyte

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:

57042
051722
Molybdenum (Mo)

Lot # **Solvent:**
MKB08597V Ammonium hydroxide

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

Expiration Date: 051725

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

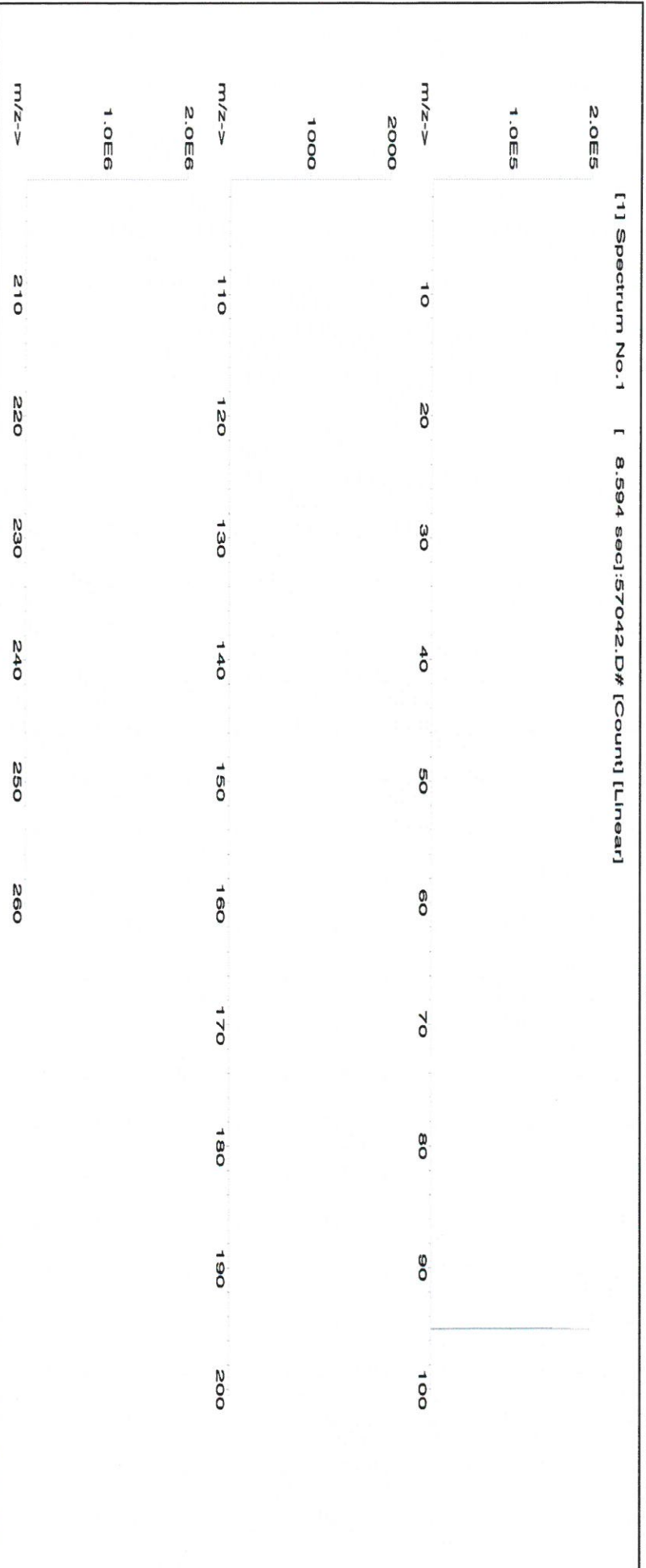
Volume shown below was diluted to (mL): 3000.41

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

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

SDS Information

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





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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

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 Christiansburg, VA 24073 USA
 inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: 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



Absolute Standards, Inc.

800-368-1131
www.absolutestandards.com


Certified Reference Material CRM

M5288 R: 07/21/2022 SA



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

CERTIFIED WEIGHT REPORT:

Part Number: 58119
Lot Number: 071122
Description: Potassium (K)

Lot #
Solvent: 20510011 Nitric Acid

2% 40.0 Nitric Acid
(mL)

Expiration Date: 071125
Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL): 10000

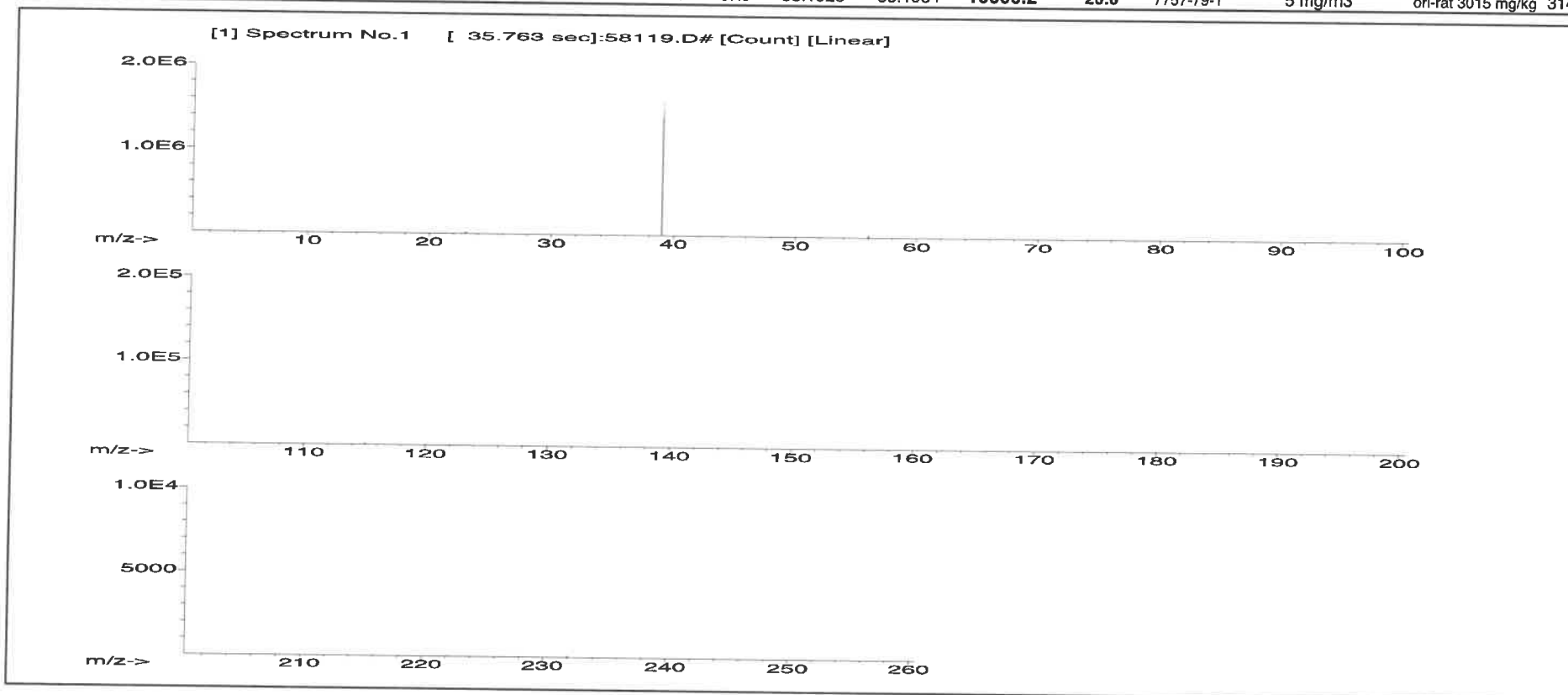
NIST Test Number: 6UTB

5E-05 Balance Uncertainty

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

Formulated By:	Lawrence Barry 071122
Reviewed By:	Pedro L. Rentas 071122

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





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	<0.01	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	T	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

M5429 R1 0126/23 (B)

CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57103
070622
Lithium (Li)

Solvent: 20510011 Nitric Acid

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

070625
Ambient (20 °C)
10000
6UTB

2% 20.0 (mL)

Weight shown below was diluted to (mL): 1000.12
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

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

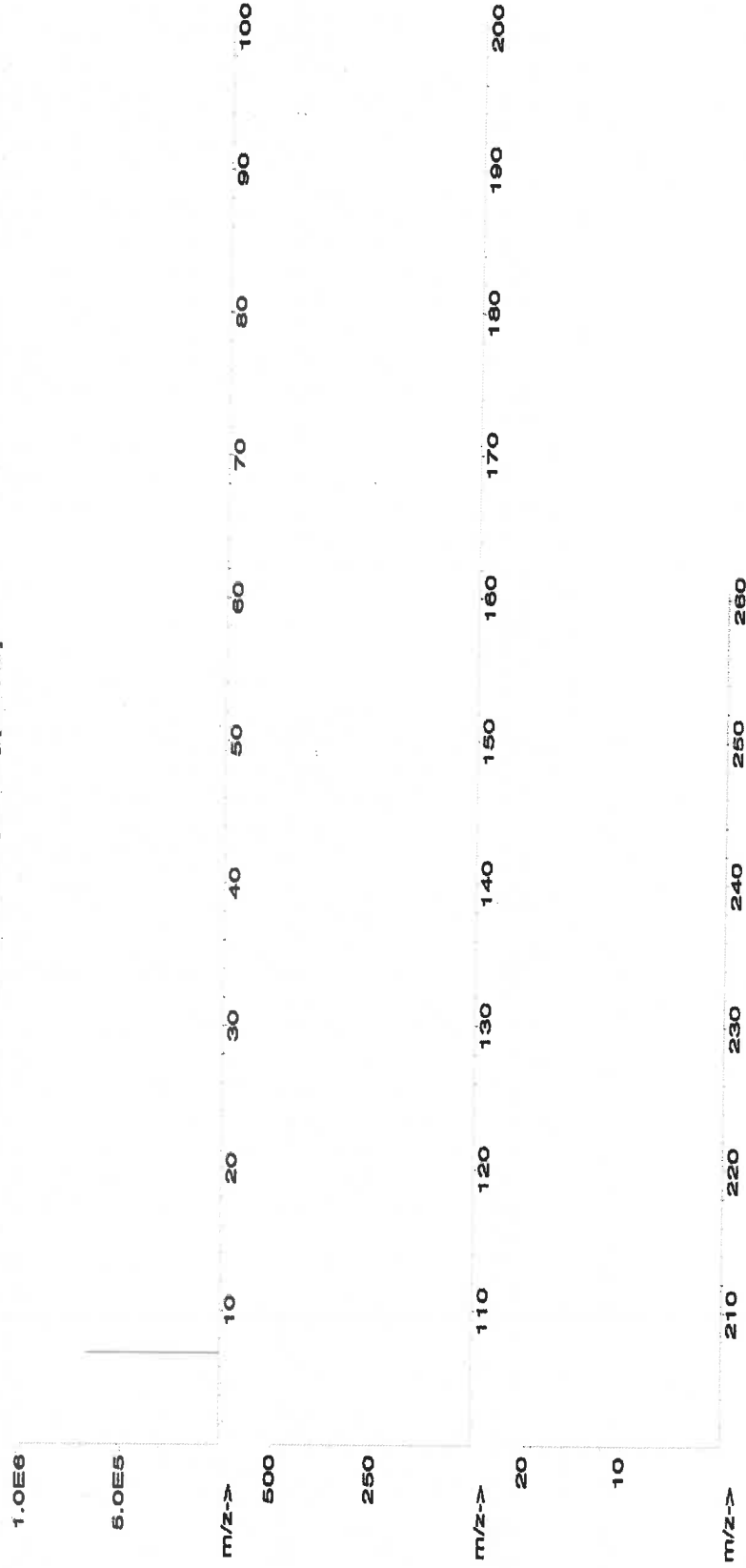
SDS Information

Expanded Uncertainty	(Solvent Safety Info. On Attached pg.)	NIST
+/- (µg/mL)	CAS#	SRM
20.0	7790-69-4	LD50
5 mg/m3	of-rat 1426 mg/kg	NA

Compound	Lot	Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Conc. (µg/mL)	Actual
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1. Lithium nitrate (Li)	IN019	L2042019A1	10000	99.999	0.10	10.0	100.0134	100.0173	10000.4	20.0	7790-69-4	5 mg/m3	of-rat 1426 mg/kg	NA
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[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	<0.01	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	<0.02	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).



CERTIFIED WEIGHT REPORT:

Part Number: 57058
Lot Number: 020623
Description: Cerium (Ce)

Expiration Date: 020626
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Weight shown below was diluted to (mL): 1000.12 0.058 Balance Uncertainty
Flask Uncertainty

Lot # 21110221
Solvent: Nitric Acid

2% 20.0 Nitric Acid (mL)

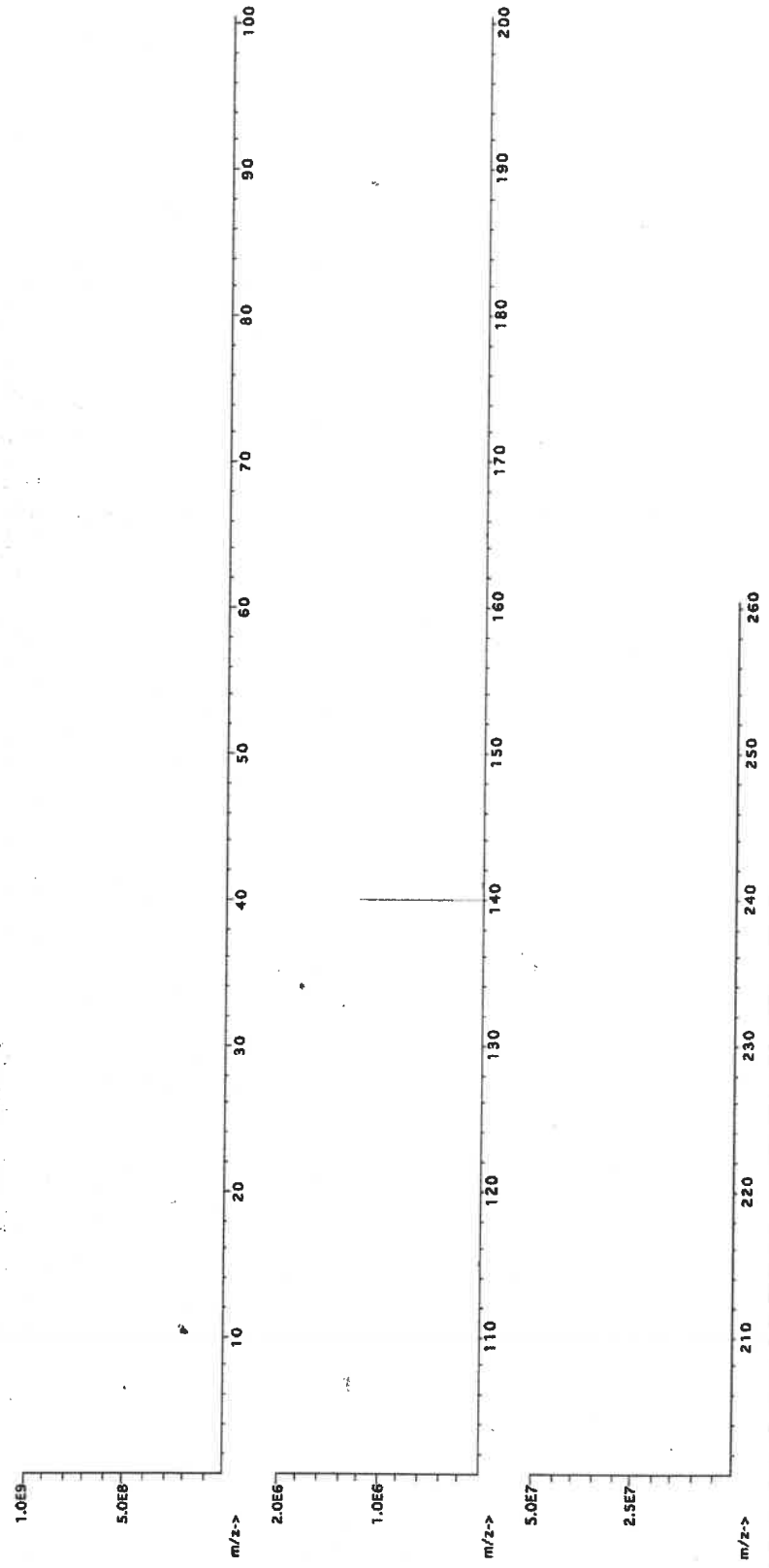
Lawrence Barry
Formulated By: Lawrence Barry 020623

Pedro L. Rentas
Reviewed By: Pedro L. Rentas 020623

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

1. Cerium nitrate hexahydrate (Ce)	IN146	Z512CEB1	1000	99.999	0.10	32.8	3.04919	3.04921	1000.0	2.0	10294-41-4	NA	NA
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[1] Spectrum No.1 [43.472 sec]58158.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



Certified Reference Material CRM
MS496 R 17/20/23



CERTIFIED WEIGHT REPORT:

Part Number: **58113**

Lot Number: **011623**

Description: **Aluminum (Al)**

Solvent: **20510011 Nitric Acid**

Lot #

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** **Nitric Acid**
(mL)

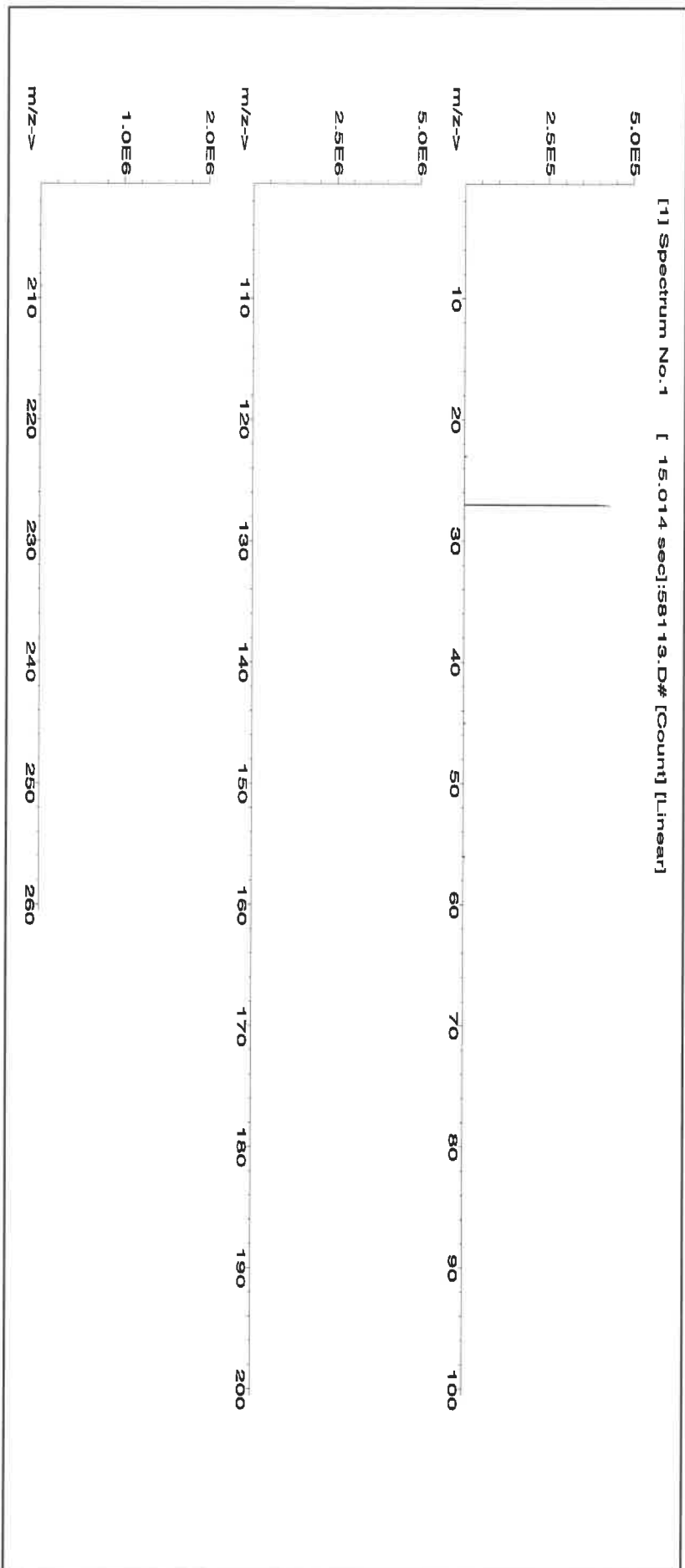
Giovanni Esposito	
Formulated By:	Giovanni Esposito
	011623
Pedro L. Rentas	
Reviewed By:	Pedro L. Rentas
	011623

SDS Information

Compound	Lot	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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1. Aluminum nitrate nonahydrate (Al) [NO22 ALUM112021A1] **10000** **99.999** **0.10** **7.30** **273.9779** **274.0078** **10001.1** **20.0** **7784-27-2** **2 mg/m3** **or-hat 3671 mg/kg 3101a**

[1] Spectrum No. 1 [15.014 sec]:58113.D# [Count] [Linear]





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

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

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	<0.02	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Te	<0.02	U	<0.02
As	<0.2	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.02	Os	<0.01	Rh	<0.02	Ag	<0.02	Tl	<0.02	V	<0.02
Ba	<0.02	Cs	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.02	Pd	<0.02	Rb	<0.02	Na	<0.2	Th	<0.02	Yb	<0.02
Be	<0.01	Cr	<0.02	Ga	<0.02	Fe	<0.02	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	<0.02	Tm	<0.02	Y	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	Sn	<0.02	Zn	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	Ti	<0.02	Zr	<0.02

(T) = Target analyte

Physical Characterization:

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

Certified by:

Ben. P. Davis

- * 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).
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- * All Standards should be stored with caps tight and under appropriate laboratory conditions.
- * Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, D.C. (1994).



CERTIFIED WEIGHT REPORT:

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

Lot #: 2110221 Solvent: Nitric Acid

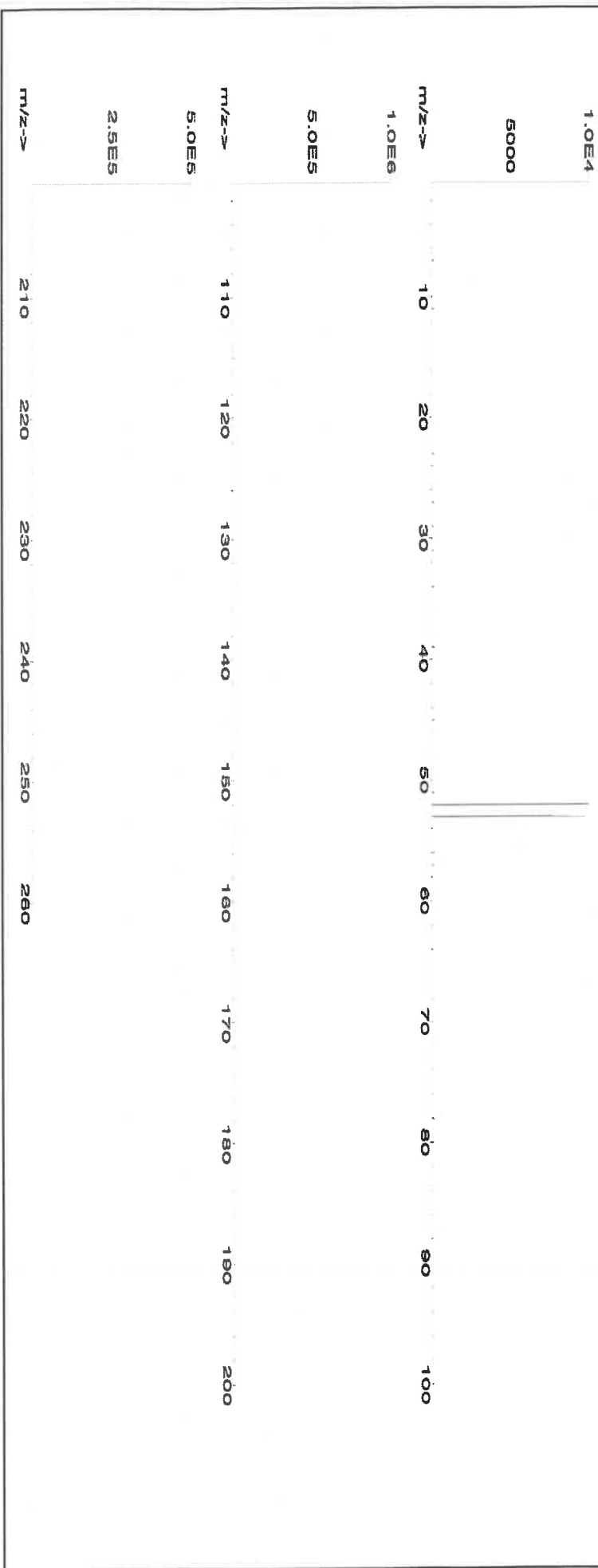
Formulated By:	Lawrence Barry
	060523
Reviewed By:	Pedro L. Ruelas
	060523

Expiration Date: 060526
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Volume shown below was diluted to (mL): 2000.02 0.058 Balance Uncertainty
Flask Uncertainty

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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1. Chromium(III) nitrate nonahydrate (Cr) 58124 071122 0.1000 200.0 0.084 1000 10000.1 1000.0 2.2 7789-02-8 0.5 mg(Cr)/m3 or rat 3250 mg/kg 3112a

[1] Spectrum No.1 [31.393 sec]:57024.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

- * The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- * Purified acids, 18.2 megohm deionized water, calibrated Class A glassware and the highest purity raw materials are used in the preparation of all standards.
- * 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: 57082
Lot Number: 100923
Description: Lead (Pb)

Solvent: 24002546 Nitric Acid

Lot #

R: 12/20/23 MS747

Formulated By:	Lawrence Barry
	100923
Reviewed By:	Pedro L. Rentas
	100923

Expiration Date: 100926
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB

2% 60.0 Nitric Acid
(mL)

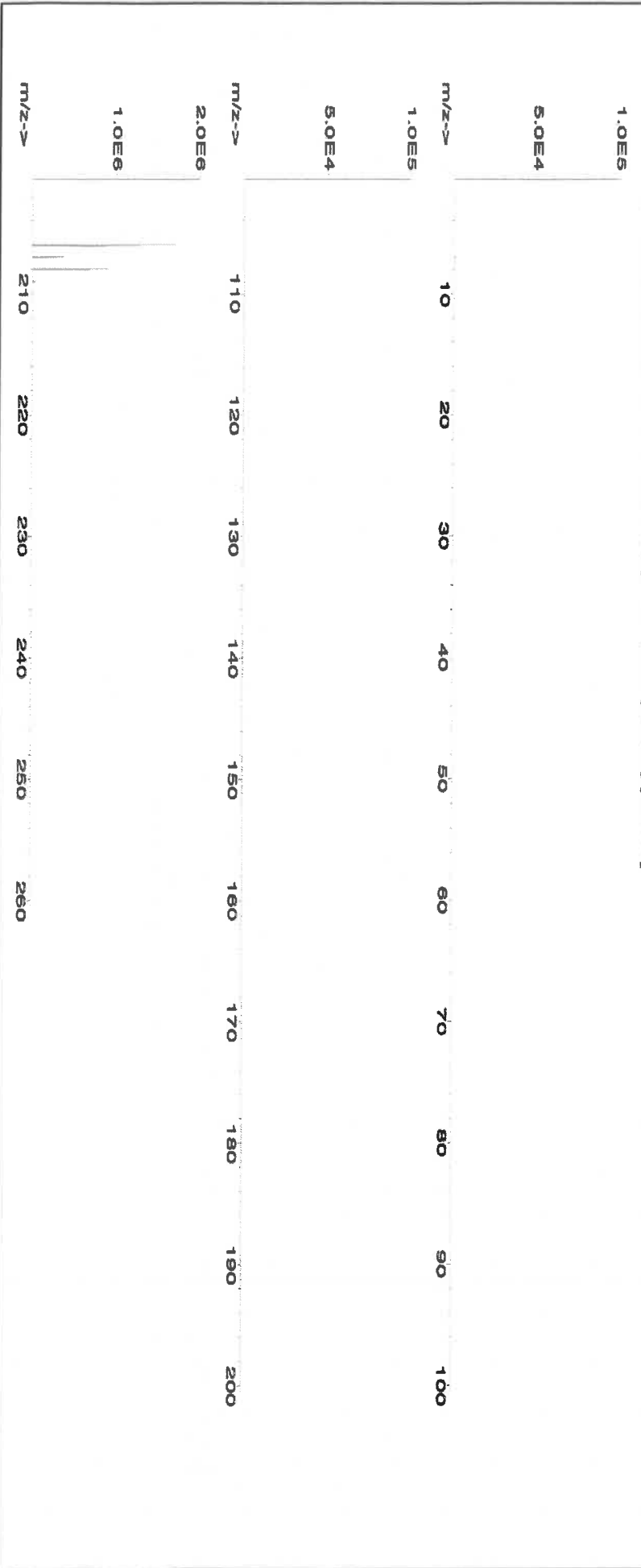
Weight shown below was diluted to (mL): 3000.41 0.06 Flask Uncertainty

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

1. Lead(II) nitrate (Pb) IN029 Pb0122016A1 1000 99.999 0.10 62.5 4.80071 4.80077 1000.0 2.0 10099-74-8 0.05 mg/m3 Intyms-ret 89 mg/kg 3128

[1] Spectrum No. 1 [14.144 sec]:58082.D# [Count] [Linear]





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

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

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

Physical Characterization:

(T) = Target analyte

Certified by:

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

- * The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- * Purified acids, 18.2 megohm deionized water, calibrated Class A glassware and the highest purity raw materials are used in the preparation of all standards.
- * 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: **57028**
Lot Number: **091223**
Description: **Nickel (NI)**

Lot # **24002546**
Solvent: **Nitric Acid**

Expiration Date: **091226**
Recommended Storage: **Ambient (20 °C)**
Nominal Concentration (µg/mL): **1000**

2.0% 40.0 (mL) Nitric Acid

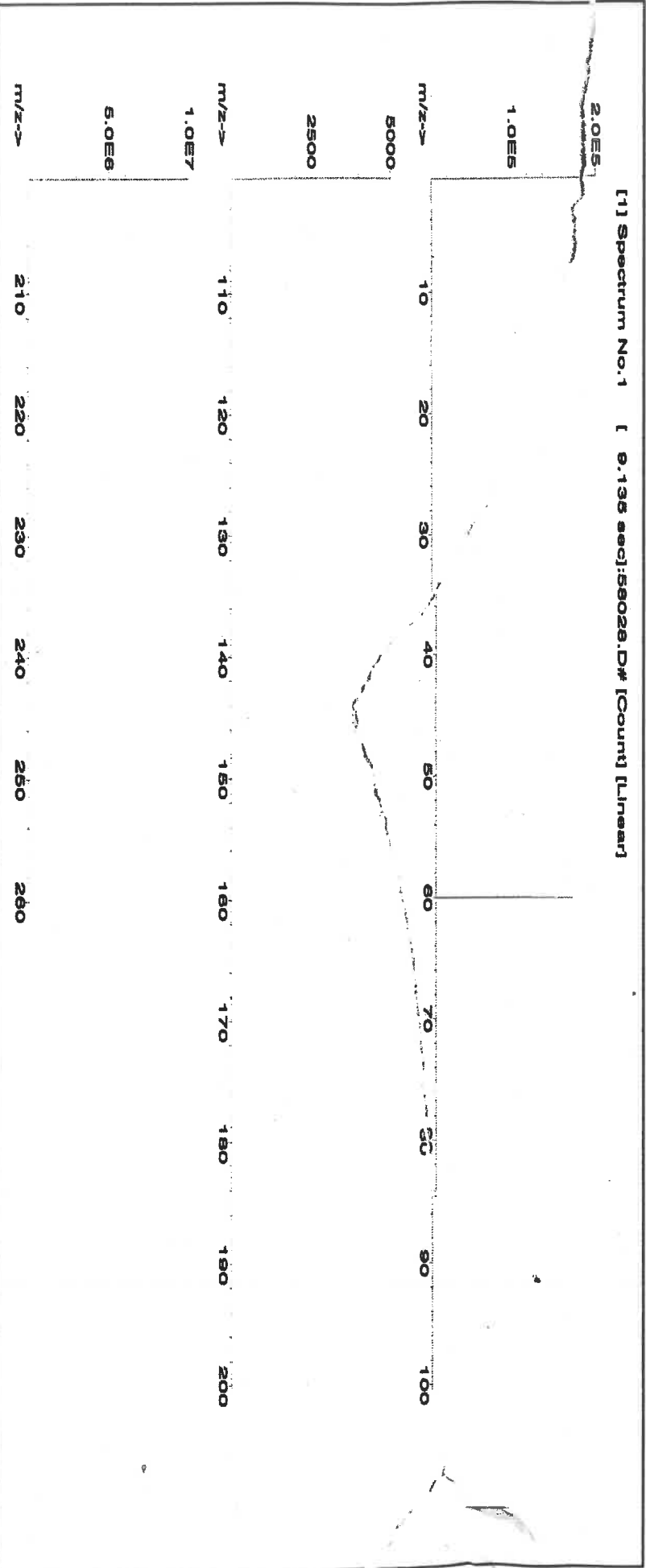
NIST Test Number: **6U7B**

Volume shown below was diluted to (mL): **2000.02** Balance Uncertainty **5E-05** Flask Uncertainty **0.056**

Formulated By:	<i>Lawrence Barry</i>	091223
Reviewed By:	<i>Pedro L. Renteria</i>	091223

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty (mL)	Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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1. Nickel(II) nitrate hexahydrate (NI) 58128 062023 0.1000 200.0 0.084 1000 10000.4 1000.0 2.2 13478-00-7 1 mg/m3 or-rel 1620 mg/kg 3136





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

Part Number: **58029**
Lot Number: **071723**
Description: **Copper (Cu)**

Lot #: **2110221**
Solvent: **Nitric Acid**

2.0%

40.0 (mL)
Nitric Acid

Formulated By:	Benson Chan	071723
Reviewed By:	Pedro L. Ruelas	071723

Expiration Date: **071726**
Recommended Storage: **Ambient (20 °C)**
Nominal Concentration (µg/mL): **1000**

NIST Test Number: **6L7B**

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

SDS Information

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
----------	-------------	------------	-----------------	-------------------	------------------	-----------------------	-----------------------	---------------------	----------------------------------	------	----------------	------	----------

1. Copper(II) nitrate trihydrate (Cu) 58129 022723 0.1000 200.0 0.084 1000 10000.5 1000.0 2.2 10031-43-3 1 mg/m3 or rat 794 mg/kg 3114

[1] Spectrum No.1 [33.422 sec]:58029.D# [Count] [Linear]

1.0E6	m/z-->	10	20	30	40	50	60	70	80	90	100
5.0E5	m/z-->	110	120	130	140	150	160	170	180	190	200
2.5E7	m/z-->	210	220	230	240	250	260				



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

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

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pr	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Te	<0.02	U	<0.02
As	<0.2	Ce	<0.02	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	Ru	<0.02	Na	<0.2	Th	<0.02	Yb	<0.02
Be	<0.01	Cr	<0.02	Ga	<0.02	La	<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	Pb	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	Ta	<0.02	Sn	<0.02	Zn	<0.02
B	<0.02	Cu	T	Au	<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).



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):

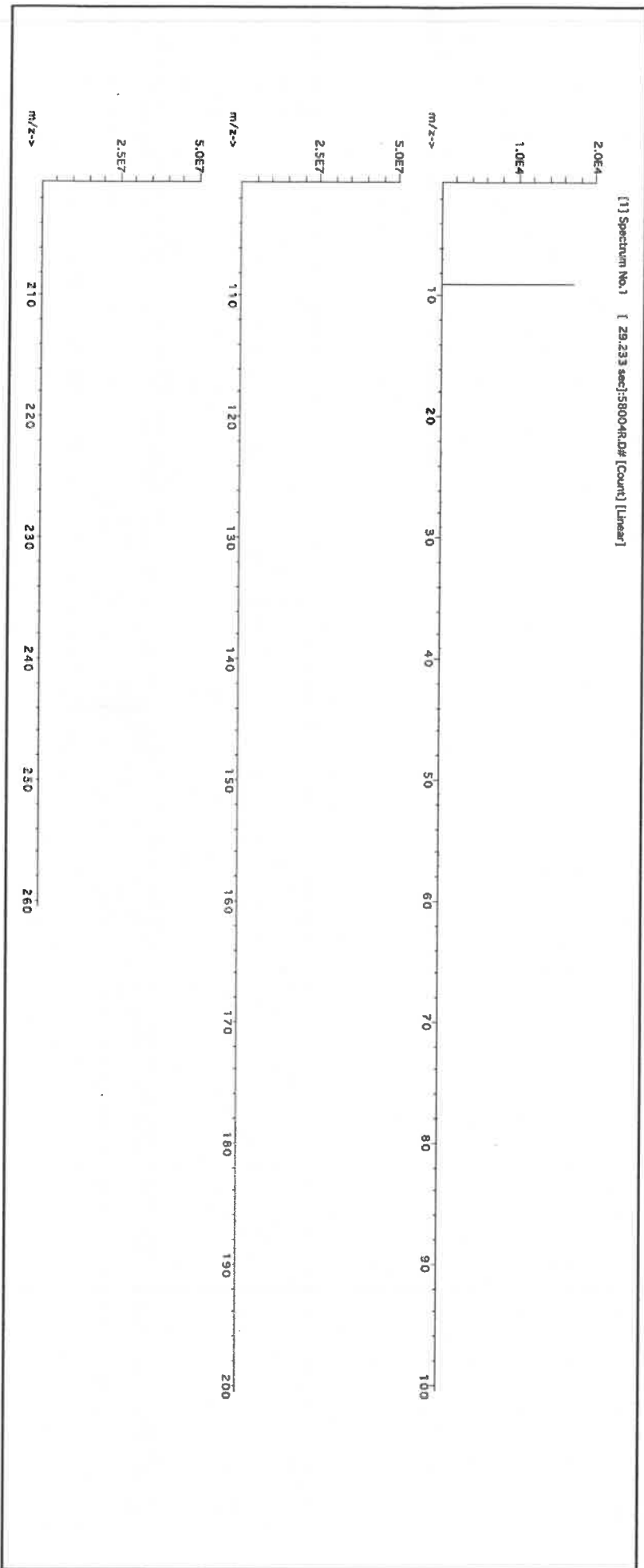
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

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

SDS Information

Compound	Part Number	Lot	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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1. Beryllium nitrate (Be)	58104	091423	0.1000	200.0	0.084	1000	10001.5	1000.0	2.2	13597-99-4	0.2µg/m3	intrinsc-rat 3.16mg/kg	NA
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Instrumental Analysis by Inductively Coupled Plasma Mass Spectrometry (ICP-MS):

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

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Tc	<0.02	U	<0.02
As	<0.02	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.01	Os	<0.02	Rh	<0.02	Ag	<0.02	Ti	<0.02	V	<0.02
Ba	<0.02	Cs	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.02	Pd	<0.02	Rb	<0.02	Na	<0.2	Th	<0.02	Yb	<0.02
Be	T	Cr	<0.02	Ga	<0.02	Fe	<0.02	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	<0.02	Tm	<0.02	Y	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	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

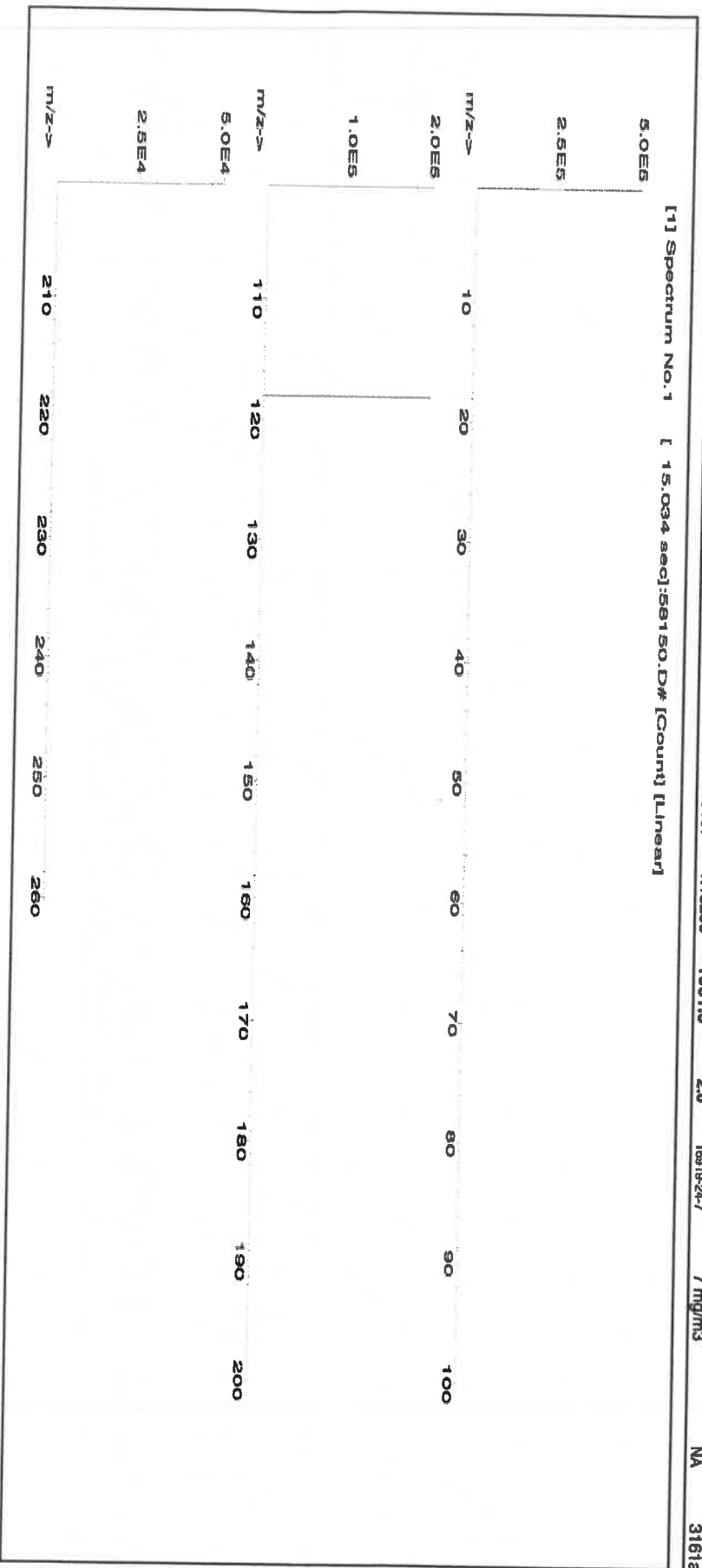
Expiration Date: 071126
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Weight shown below was diluted to (mL): 499.93
5E-05 Balance Uncertainty
0.0058 Flask Uncertainty

Formulated By:	Benson Chan
	071123
Reviewed By:	Pedro L. Rentas
	071123

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

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

Lot # 24002546
Solvent: Nitric Acid

2.0% Nitric Acid
40.0 (mL)

5E-05 Balance Uncertainty
0.058 Flask Uncertainty

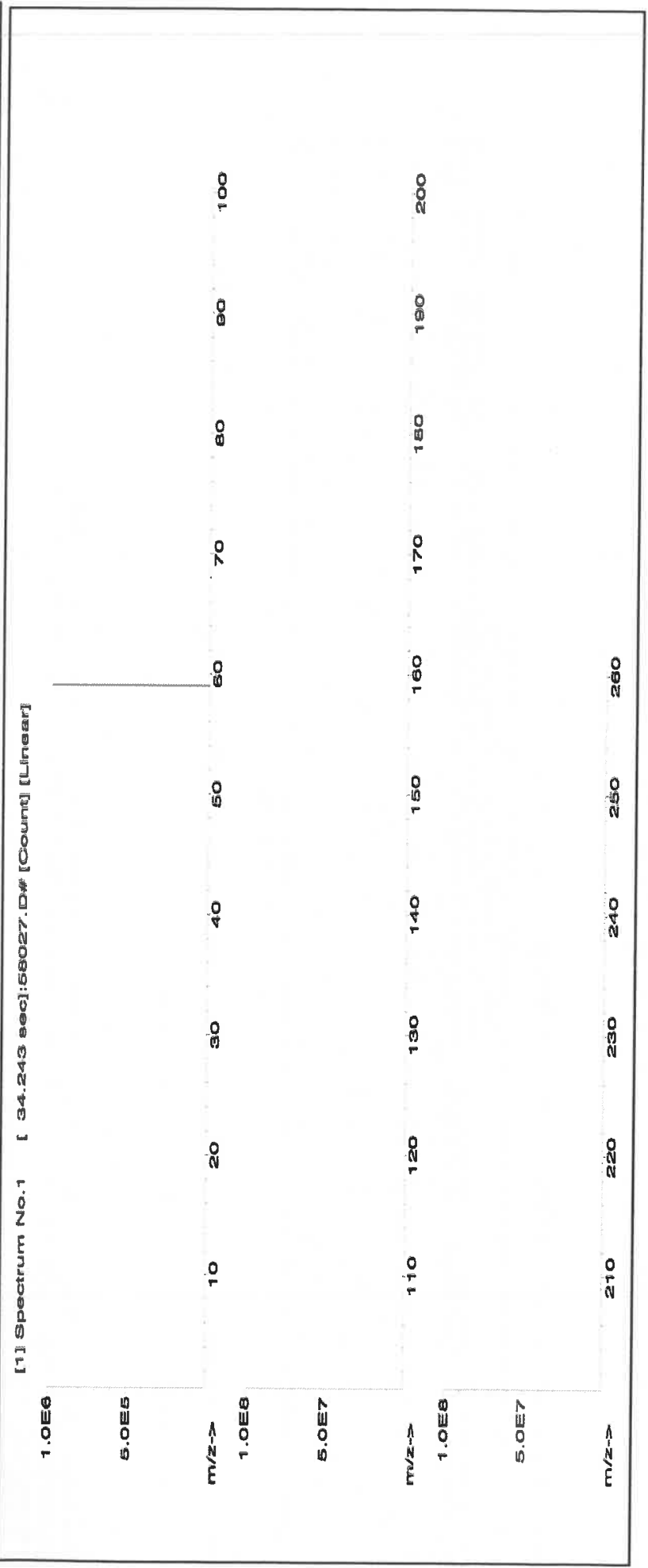
Formulated By:	Lawrence Barry
Reviewed By:	Pedro L. Rentas

SDS Information

Expanded Uncertainty +/- (µg/mL)
Final Conc. (µg/mL)
Initial Conc. (µg/mL)
Nominal Conc. (µg/mL)
Pipette (mL)
Initial Vol. (mL)
Dilution Factor
Part Number
Lot Number

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

1. Cobalt(II) nitrate hexahydrate (Co) 58127 050923 0.1000 200.0 0.084 1000 10000.0 1000.0 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.
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- * Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- * Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.
- * All standards should be stored with caps tight and under appropriate laboratory conditions.
- * Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, D.C. (1994).



CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57033
111323
Arsenic (As)

Lot #
Solvent:

24002546
Nitric Acid

2.0%
80.0 (mL)

Nitric Acid

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

111326
Ambient (20 °C)
1000

NIST Test Number:
Volume shown below was diluted to (mL):

6UTB
4000.0

5E-05
Balance Uncertainty

0.06
Flask Uncertainty

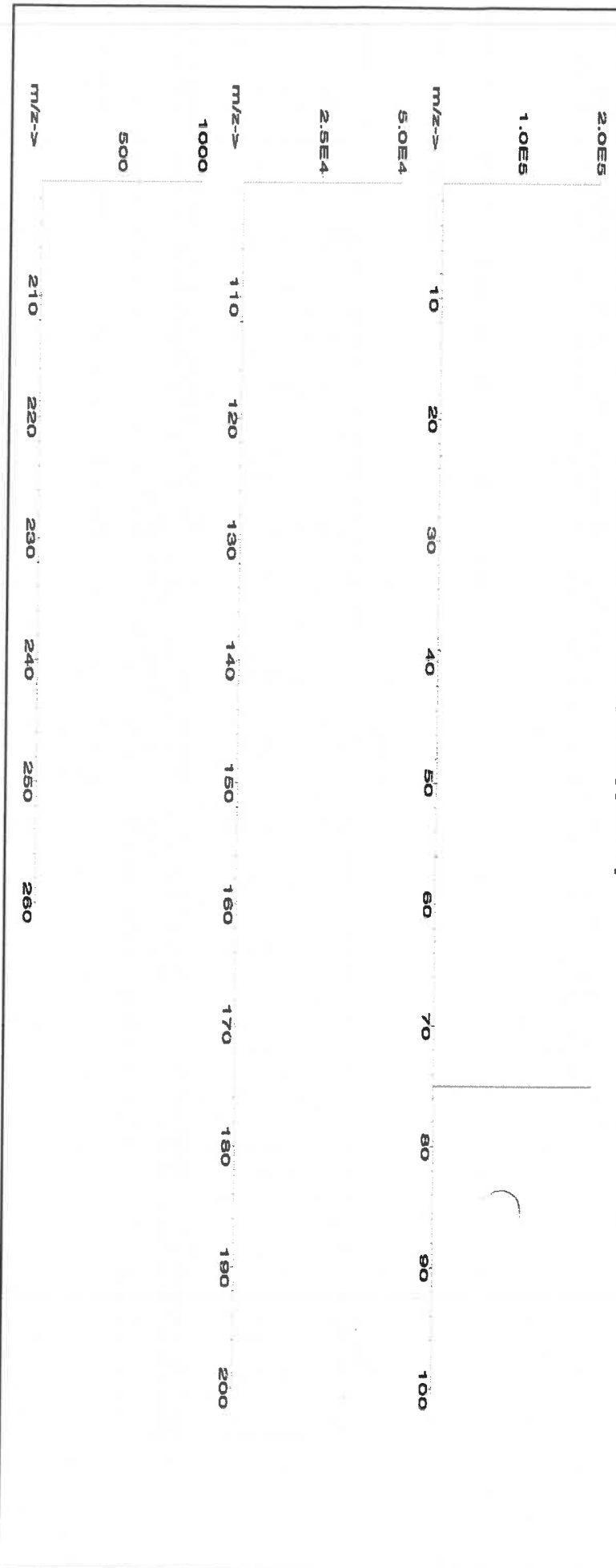
Formulated By:	Lawrence Barry
Reviewed By:	Pedro L. Rendas
	111323

Compound

Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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1. Arsenic (As)	58133	020522	0.1000	400.0	0.084	1000	10001.0	1000.0	2.0	7440-38-2	0.5 mg/m3	or-rat 500 mg/kg	3103a
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[1] Spectrum No.1 [34.433 sec]:57033.D# [Count] [Linear]





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

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

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Te	<0.02	U	<0.02
As	T	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.01	Os	<0.02	Rh	<0.02	Ag	<0.02	Tl	<0.02	V	<0.02
Ba	<0.02	Cs	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.02	Pd	<0.02	Rb	<0.02	Na	<0.2	Tl _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.
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- * Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.
- * All standards should be stored with caps tight and under appropriate laboratory conditions.
- * Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, D.C. (1994).



CERTIFIED WEIGHT REPORT:

Part Number: **57005**
Lot Number: **071123**
Description: **Boron (B)**

Solvent: MKB0857V Ammonium hydroxide

Lot #

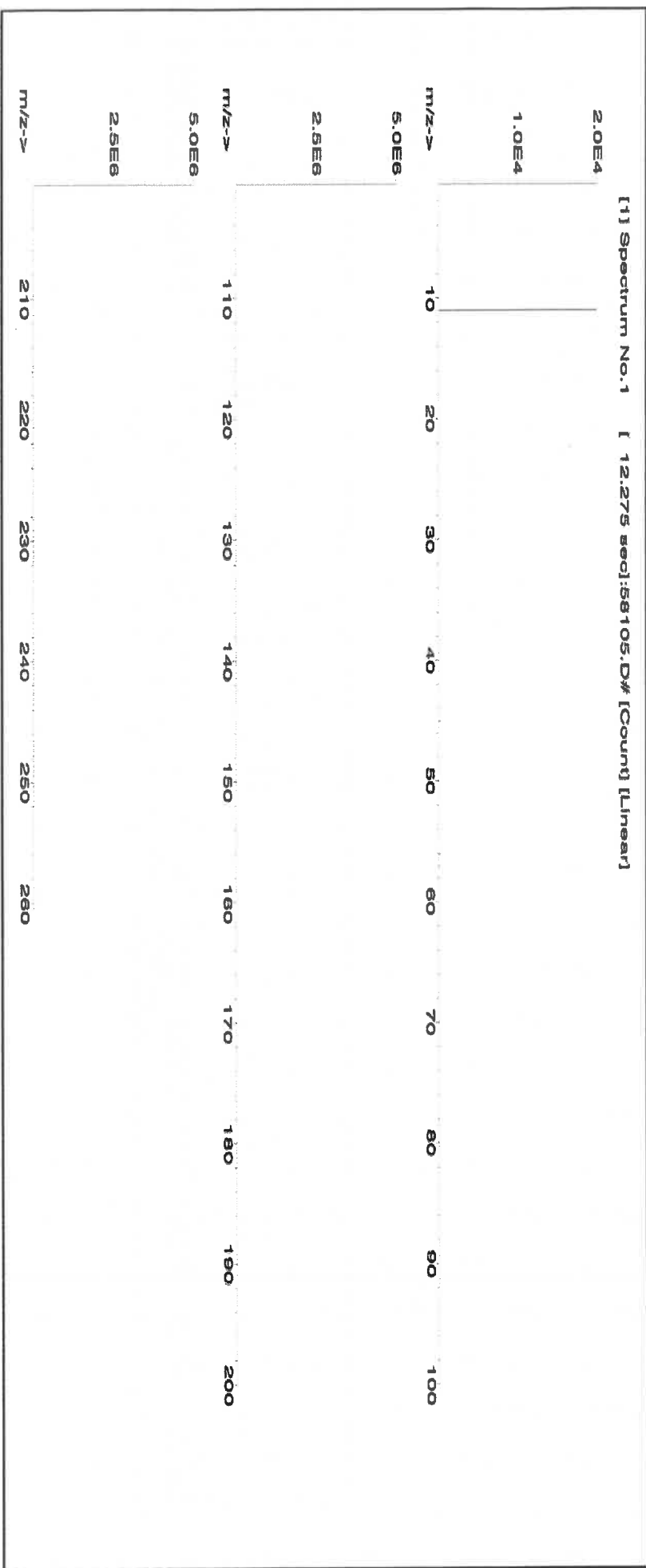
AI: 021009124 M5814

Expiration Date: 071126
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Weight shown below was diluted to (mL): 1999.48 0.058 Balance Uncertainty
2.0% 40.0 Ammonium hydroxide (mL)

Formulated By:	Benson Chan
071123	
Reviewed By:	Pedro L. Rientas
071123	

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

1. Boric acid (B) IN018 BV082018A1 1000 99.9999 0.10 17.3 11.55772 11.56201 1000.4 2.0 10043-35-3 2 mg/m3 or-nat 2660 mg/kg 3107





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

- * 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

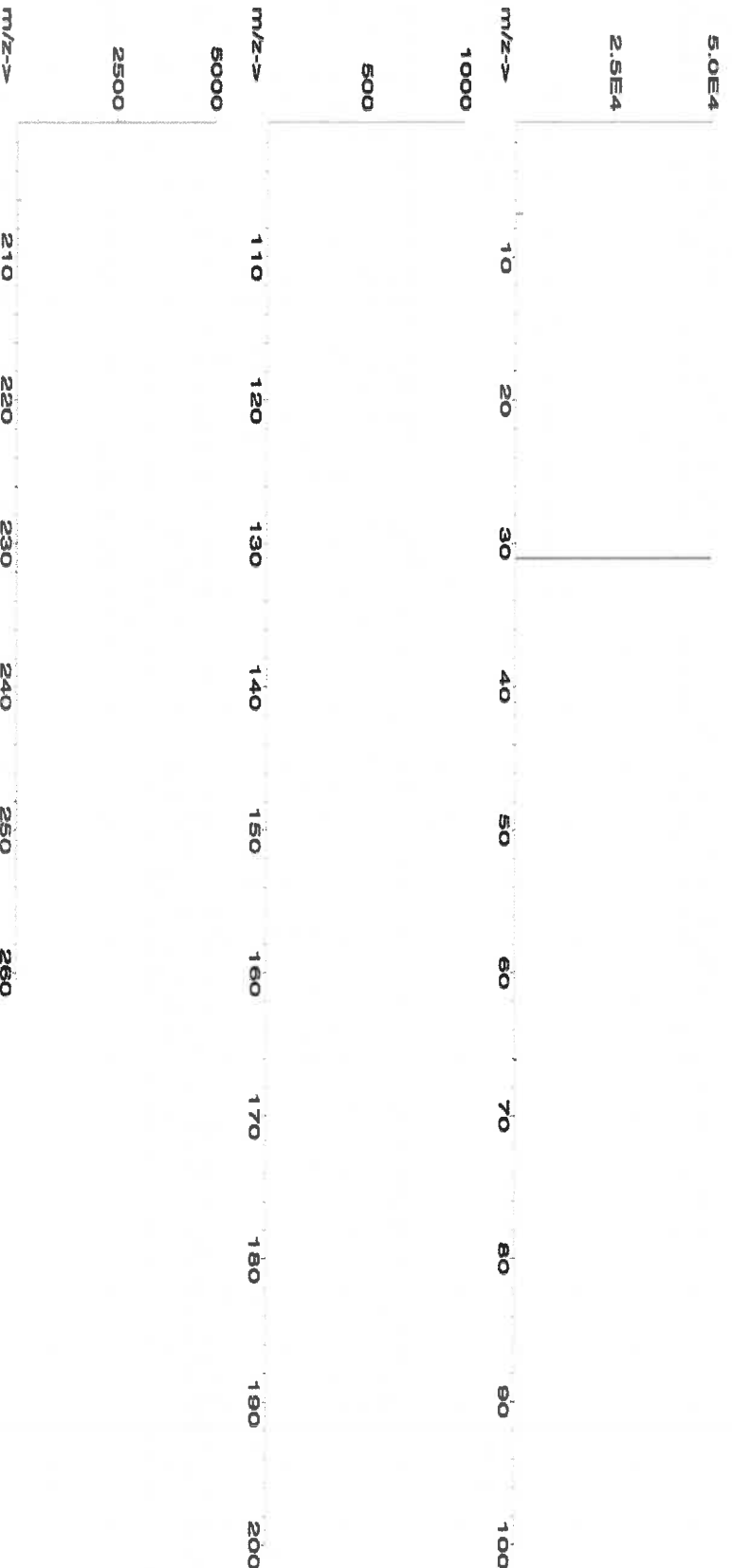
Formulated By: Lawrence Barry	041723
Reviewed By: Pedro L. Rentas	041723

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
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1. Ammonium dihydrogen phosphate (P) IN008 P082019A1 10000 99.999 0.10 27.5 72.7287 72.7289 10000.0 20.0 7722-76-1 5 mg/m3 or-hal >2000mg/kg 3186

[1] Spectrum No.1 [12.074 sec]:58115.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57016
122923
Sulfur (S)

Lot #

ASTM Type 1 Water

Formulated By:	Benson Chan	122923
Reviewed By:	Pedro L. Rentas	122923

Expiration Date: 122926
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000

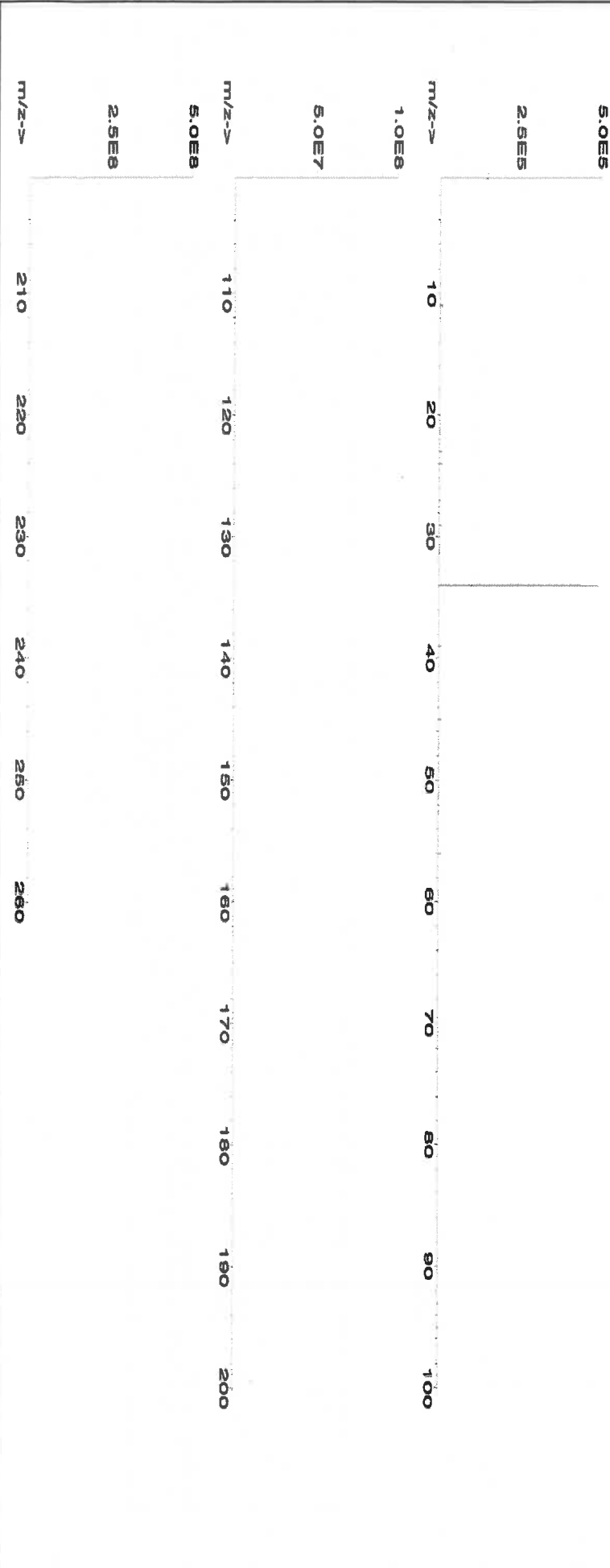
NIST Test Number: 6L7B
Weight shown below was diluted to (mL): 4000.0
SE-05 Balance Uncertainty
0.06 Flask Uncertainty

Compound

RM#	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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1. Ammonium sulfate (S) IN117 SLBR725V 1000 99.9 0.10 24.3 16.4979 16.4980 1000.0 2.0 7783-20-2 NA 0.01-0.1 4250mg/kg 3181

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





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

- * The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- * Purified acids, 18.2 megohm deionized water, calibrated Class A glassware and the highest purity raw materials are used in the preparation of all standards.
- * All standard containers are meticulously cleaned prior to use.
- * 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:

57116
071123
Sulfur (S)

Lot #
Solvent: 071123
ASTM Type 1 Water

Formulated By:	Lawrence Barry
	071123
Reviewed By:	Pedro L. Rentas
	071123

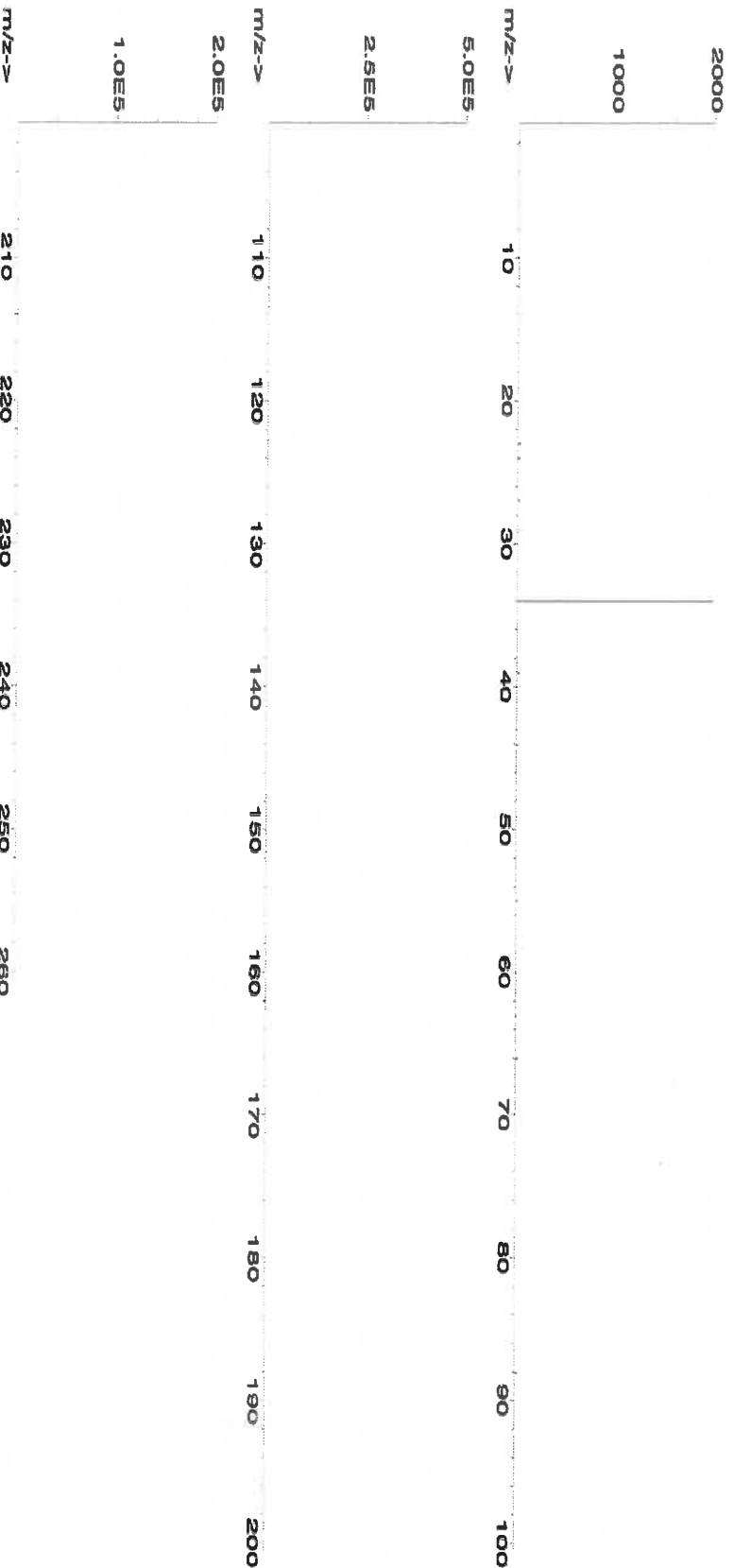
Expiration Date: 071126
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 10000
NIST Test Number: 6UTB
Weight shown below was diluted to (mL): 1999.48
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

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

SDS Information

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

[1] Spectrum No. 1 [24.004 sec]:58116.D# [Count] [Linear]





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

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

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Te	<0.02	U	<0.02
As	<0.2	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.01	Os	<0.02	Rh	<0.02	Ag	<0.02	Tl	<0.02	V	<0.02
Ba	<0.02	Cs	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.02	Pd	<0.02	Rb	<0.02	Na	<0.2	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.
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- * Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, D.C. (1994).



CERTIFIED WEIGHT REPORT:

Part Number: 57015
Lot Number: 091123
Description: Phosphorous (P)

Solvent: 24002546 Nitric Acid

Lot #

R: 02109124 M5820

Formulated By: Lawrence Barry 091123

Reviewed By: Pedro L. Rentas 091123

2% 40.0 (mL) Nitric Acid

Expiration Date: 091126
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6LJB

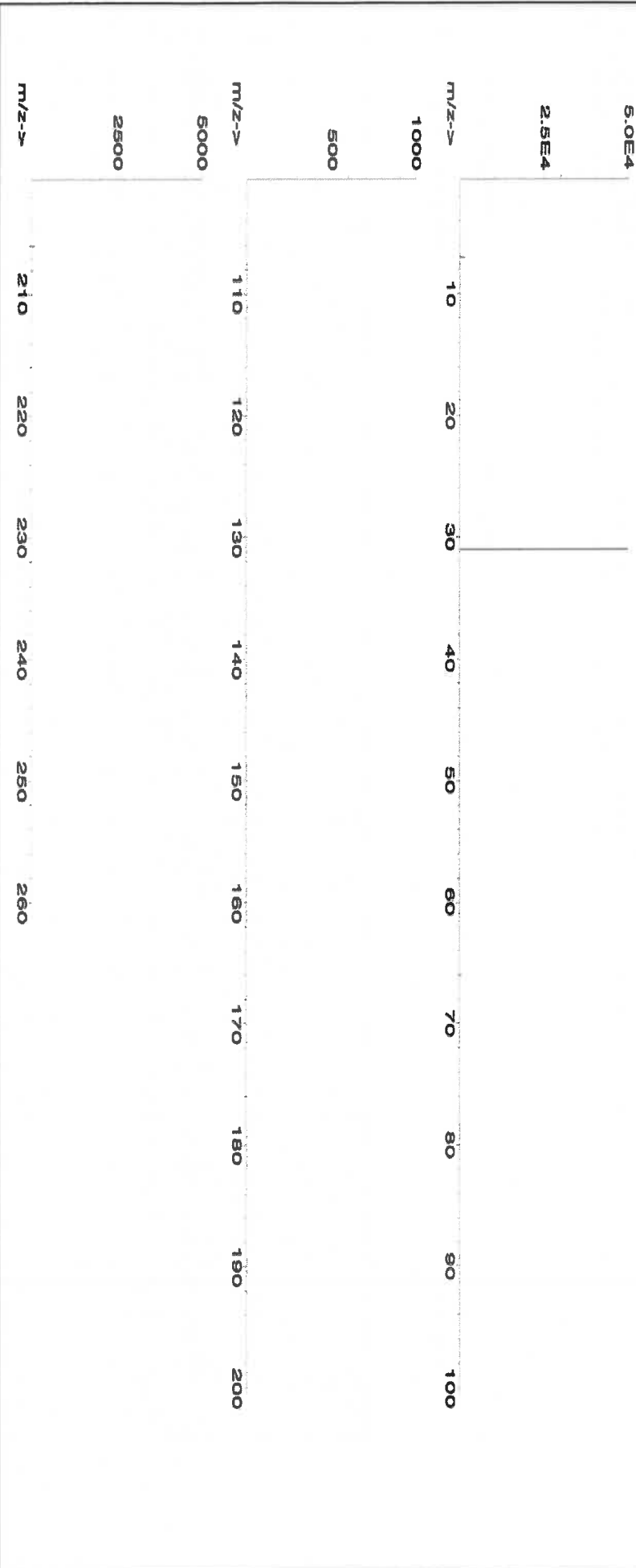
Weight shown below was diluted to (mL): 2000.02 0.058 Balance Uncertainty Flask Uncertainty

Compound

RM#	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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1. Ammonium dihydrogen phosphate (P) IN008 PVO62019A1 1000 99.999 0.10 27.5 7.2729 7.2730 1000.0 2.0 7722-76-1 5 mg/m3 xH-rat >2000mg/kg 3186

[1] Spectrum No.1 [12.074 sec]:58115.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

- * The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- * Purified acids, 18.2 megohm deionized water, calibrated Class A glassware and the highest purity raw materials are used in the preparation of all standards.
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- * All Standards should be stored with caps tight and under appropriate laboratory conditions.
- * Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, D.C. (1994).

Hydrochloric Acid, 36.5–38.0%
BAKER INSTRA–ANALYZED® Reagent
For Trace Metal Analysis



Material No.: 9530–33
Batch No.: 22G2862015
Manufactured Date: 2022–06–15
Retest Date: 2027–06–14
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
ACS – Assay (as HCl) (by acid–base titrn)	36.5 – 38.0 %	37.9 %
ACS – Color (APHA)	≤ 10	5
ACS – Residue after Ignition	≤ 3 ppm	< 1 ppm
ACS – Specific Gravity at 60°/60°F	1.185 – 1.192	1.191
ACS – Bromide (Br)	≤ 0.005 %	< 0.005 %
ACS – Extractable Organic Substances	≤ 5 ppm	< 1 ppm
ACS – Free Chlorine (as Cl ₂)	≤ 0.5 ppm	< 0.5 ppm
Phosphate (PO ₄)	≤ 0.05 ppm	< 0.03 ppm
Sulfate (SO ₄)	≤ 0.5 ppm	< 0.3 ppm
Sulfite (SO ₃)	≤ 0.8 ppm	0.3 ppm
Ammonium (NH ₄)	≤ 3 ppm	< 1 ppm
Trace Impurities – Arsenic (As)	≤ 0.010 ppm	< 0.003 ppm
Trace Impurities – Aluminum (Al)	≤ 10.0 ppb	1.3 ppb
Arsenic and Antimony (as As)	≤ 5.0 ppb	< 3.0 ppb
Trace Impurities – Barium (Ba)	≤ 1.0 ppb	0.2 ppb
Trace Impurities – Beryllium (Be)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Bismuth (Bi)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Boron (B)	≤ 20.0 ppb	< 5.0 ppb
Trace Impurities – Cadmium (Cd)	≤ 1.0 ppb	< 0.3 ppb
Trace Impurities – Calcium (Ca)	≤ 50.0 ppb	163.0 ppb
Trace Impurities – Chromium (Cr)	≤ 1.0 ppb	0.7 ppb
Trace Impurities – Cobalt (Co)	≤ 1.0 ppb	< 0.3 ppb
Trace Impurities – Copper (Cu)	≤ 1.0 ppb	< 0.1 ppb
Trace Impurities – Gallium (Ga)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Germanium (Ge)	≤ 3.0 ppb	< 2.0 ppb
Trace Impurities – Gold (Au)	≤ 4.0 ppb	0.6 ppb
Heavy Metals (as Pb)	≤ 100 ppb	< 50 ppb
Trace Impurities – Iron (Fe)	≤ 15 ppb	6 ppb

>>> Continued on page 2 >>>

Test	Specification	Result
Trace Impurities – Lead (Pb)	≤ 1.0 ppb	< 0.5 ppb
Trace Impurities – Lithium (Li)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Magnesium (Mg)	≤ 10.0 ppb	2.9 ppb
Trace Impurities – Manganese (Mn)	≤ 1.0 ppb	< 0.4 ppb
Trace Impurities – Mercury (Hg)	≤ 0.5 ppb	0.1 ppb
Trace Impurities – Molybdenum (Mo)	≤ 10.0 ppb	< 3.0 ppb
Trace Impurities – Nickel (Ni)	≤ 4.0 ppb	< 0.3 ppb
Trace Impurities – Niobium (Nb)	≤ 1.0 ppb	0.8 ppb
Trace Impurities – Potassium (K)	≤ 9.0 ppb	< 2.0 ppb
Trace Impurities – Selenium (Se), For Information Only		< 1.0 ppb
Trace Impurities – Silicon (Si)	≤ 100.0 ppb	< 10.0 ppb
Trace Impurities – Silver (Ag)	≤ 1.0 ppb	0.5 ppb
Trace Impurities – Sodium (Na)	≤ 100.0 ppb	2.3 ppb
Trace Impurities – Strontium (Sr)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Tantalum (Ta)	≤ 1.0 ppb	1.6 ppb
Trace Impurities – Thallium (Tl)	≤ 5.0 ppb	< 2.0 ppb
Trace Impurities – Tin (Sn)	≤ 5.0 ppb	4.0 ppb
Trace Impurities – Titanium (Ti)	≤ 1.0 ppb	1.5 ppb
Trace Impurities – Vanadium (V)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Zinc (Zn)	≤ 5.0 ppb	0.8 ppb
Trace Impurities – Zirconium (Zr)	≤ 1.0 ppb	0.3 ppb

>>> Continued on page 3 >>>

Hydrochloric Acid, 36.5–38.0%
BAKER INSTRA–ANALYZED® Reagent
For Trace Metal Analysis



Material No.: 9530–33
Batch No.: 22G2862015

Test	Specification	Result
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For Laboratory, Research, or Manufacturing Use
Product Information (not specifications):
Appearance (clear, fuming liquid)
Meets ACS Specifications
Storage Condition: Store below 25 °C.

Country of Origin: USA
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

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:

MS962 **R10614124**

Lot # 24002546 Solvent: Nitric Acid

Part Number: **57034**
Lot Number: **060624**
Description: **Selenium (Se)**

2.0% 40.0 (mL) Nitric Acid

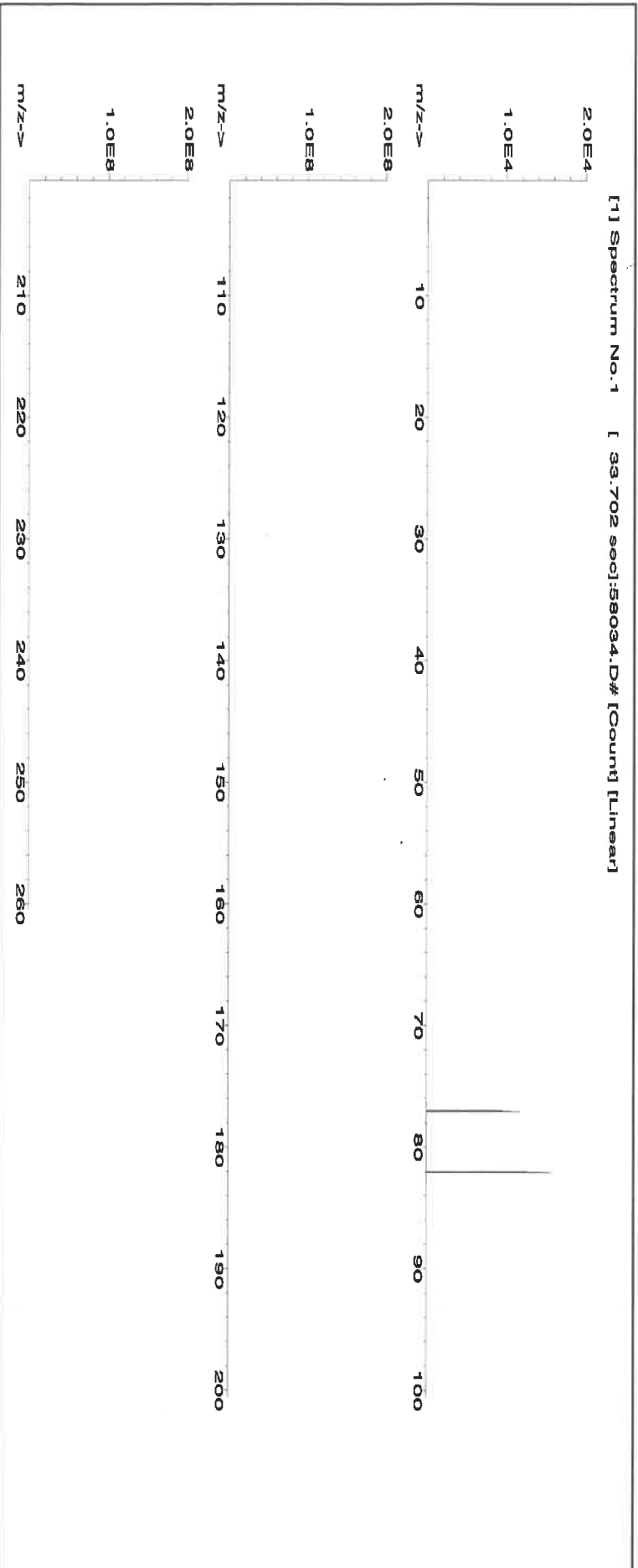
Expiration Date: 060627
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Volume shown below was diluted to (mL): 2000.07
SE-05 Balance Uncertainty 0.100
Flask Uncertainty

Formulated By:	Benson Chan	060624
Reviewed By:	Pedro L. Rantas	060624

SDS Information

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	(Solvent Safety Info. On Attached pg.)	CAS#	OSHA PEL (TWA)	LDSO	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
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Instrumental Analysis by Inductively Coupled Plasma Mass Spectrometry (ICP-MS):

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

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pt	<0.02	Se	<0.02	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	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	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).

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



Certified Reference Material CRM

M5970 M5971

R. J. 10/12/24



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

CERTIFIED WEIGHT REPORT:

Part Number: **57003**
Lot Number: **062124**
Description: **Lithium (Li)**
Expiration Date: **06/127**
Recommended Storage: **Ambient (20 °C)**
Nominal Concentration (µg/mL): **1000**
NIST Test Number: **6UTB**
Volume shown below was diluted to (mL): **250.11**
SE-05 Balance Uncertainty
0.016 Flask Uncertainty

Lot # **24002546**
Solvent: **Nitric Acid**

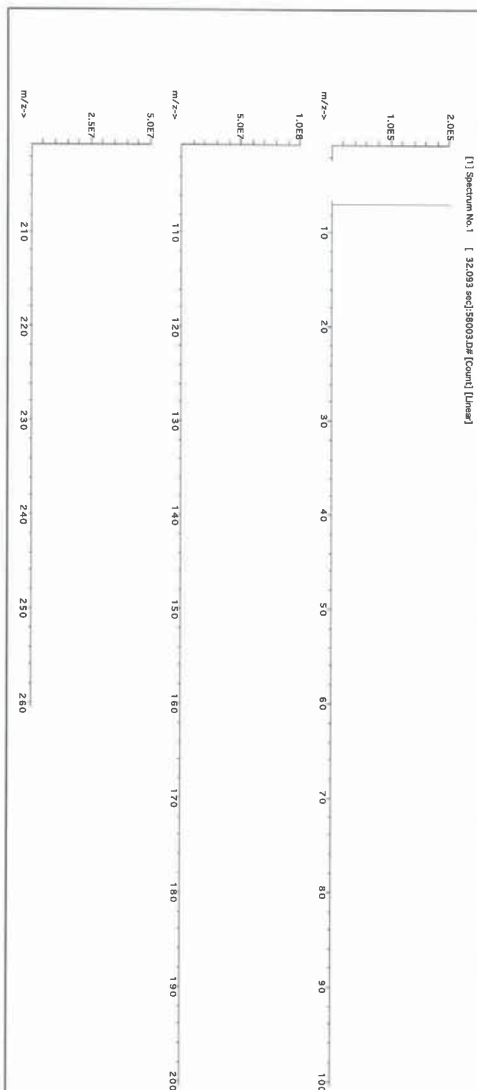
2.0% 5.0 (mL) Nitric Acid

Microvial Capable	
Formulated By:	062124
Giovanni Esposito	

Reviewed By: *[Signature]* Pedro L. Parias 062124

Compound		Part		Lot		Dilution		Initial		Uncertainty		Nominal		Initial		Final		Expanded		SDS Information		NIST	
Number	Factor	Number	Factor	Vol. (mL)	Pipette (mL)	Conc. (µg/mL)	Conc. (µg/mL)	Vol. (mL)	Pipette (mL)	Conc. (µg/mL)	Conc. (µg/mL)	Vol. (mL)	Pipette (mL)	Conc. (µg/mL)	Conc. (µg/mL)	Vol. (mL)	Pipette (mL)	Uncertainty	± (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	SM

1. Lithium nitrate (Li) 58103 070622 0.1000 25.0 0.004 1000 10000.4 10000.4 2.0 7790-68-4 5 mg/m3 or-hal 1428 mg/kg NA



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:

$X_{CRM/RM} = \sum (X_i / U_i^2)$
 X_i = mean of Assay Method A with
 $U_{A,HR}$ = the standard uncertainty of characterization Method A

$U_{A,HR} = \sqrt{U_{A,HR}^2 + U_{A,HR}^2 + U_{A,HR}^2 + U_{A,HR}^2}$
the variance

$U_{A,HR} = \sqrt{U_{A,HR}^2 + U_{A,HR}^2 + U_{A,HR}^2 + U_{A,HR}^2}$
CRM/RM Expanded Uncertainty (2) = $U_{CRM/RM} = k \cdot U_{A,HR}$

k = coverage factor = 2
 $U_{A,HR}$ = the mean of Assay Method A with
 $U_{A,HR} = \sqrt{U_{A,HR}^2 + U_{A,HR}^2 + U_{A,HR}^2 + U_{A,HR}^2}$

$U_{A,HR}$ = the mean of Assay Method A with
 $U_{A,HR} = \sqrt{U_{A,HR}^2 + U_{A,HR}^2 + U_{A,HR}^2 + U_{A,HR}^2}$

$U_{A,HR}$ = the mean of Assay Method A with
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$U_{A,HR}$ = the mean of Assay Method A with
 $U_{A,HR} = \sqrt{U_{A,HR}^2 + U_{A,HR}^2 + U_{A,HR}^2 + U_{A,HR}^2}$

$U_{A,HR}$ = the mean of Assay Method A with
 $U_{A,HR} = \sqrt{U_{A,HR}^2 + U_{A,HR}^2 + U_{A,HR}^2 + U_{A,HR}^2}$

$U_{A,HR}$ = the mean of Assay Method A with
 $U_{A,HR} = \sqrt{U_{A,HR}^2 + U_{A,HR}^2 + U_{A,HR}^2 + U_{A,HR}^2}$

$U_{A,HR}$ = the mean of Assay Method A with
 $U_{A,HR} = \sqrt{U_{A,HR}^2 + U_{A,HR}^2 + U_{A,HR}^2 + U_{A,HR}^2}$

$U_{A,HR}$ = the mean of Assay Method A with
 $U_{A,HR} = \sqrt{U_{A,HR}^2 + U_{A,HR}^2 + U_{A,HR}^2 + U_{A,HR}^2}$

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

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 47.87 ± 4.6 Ti(F)₆-2 media. Unstable at ppm levels with metals that would pull F- away (i.e. Do not mix with Alkaline or Rare Earths or high levels of transition elements unless they are fluorinated). Stable with most inorganic anions with a tendency to hydrolyze forming the hydrated oxide in all dilute acids except HF.

Stability - 2-100 ppb levels stable (Alone or mixed with all other metals) as the Ti(F)₆-2 for months in 1% HNO₃ / LDPE container. 1-10,000 ppm single element solutions as the Ti(F)₆-2 chemically stable for years in 2-5% HNO₃ / trace HF in an LDPE container.

TI Containing Samples (Preparation and Solution) - Metal (Soluble in H₂O / HF caution - powder reacts violently). Oxide - low temperature history anatase or rutile (Dissolved by heating in 1:1:1 H₂O / HF / H₂SO₄); K₂SiO₇ - no KF if silica not present); Organic Matrices (Dry ash at 450EC in P10 and dissolve by heating with 1:1:1 H₂O / HF / H₂SO₄ or fuse ash with pyrosulfate if oxide is as plastic pigment and likely in brookite crystaline form).

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

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 48 amu	14 ppt	N/A	32S16O, 32S14N,
ICP-OES 323.452 nm	0.0054 / 0.00092 µg/mL	1	14N17N2, 36Ar12C,
ICP-OES 334.941 nm	0.0038 / 0.00028 µg/mL	1	48Ca, 196X=2
ICP-OES 336.121 nm	0.0053 / 0.00034 µg/mL	1	W, Mo, Co
			Nb, Ta, Cr, U
			Ce, Ar, Ni
			Ru
			(where X = Zr, Mo,

HAZARDOUS INFORMATION

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

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.

QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, VA 24073, USA; Telephone: 800.868.6786; 540.585.3030; Fax: 540.585.3030; Email: info@inorganicventures.com; <http://www.inorganicventures.com>

11.0

CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

June 17, 2022

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

11.2 Lot Expiration Date

- June 17, 2027

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date:

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

12.0

NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Thomas Kozlikowski
Manager, Quality Control

TD9784

Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

Paul R. Gaines

Certificate of Analysis

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

M5985
R: 6/14/24

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
Catalog Number: CGIN10
Lot Number: U2-IN729349
Matrix: 5% (v/v) HNO₃
Value / Analyte(s): 10 000 µg/mL ea:
Indium
Starting Material: Indium Metal
Starting Material Lot#: 2511
Starting Material Purity: 99.9995%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10022 ± 30 µg/mL
Density: 1.044 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1	10021 ± 56 µg/mL ICP Assay NIST SRM 3124a Lot Number: 110516
Assay Method #2	10035 ± 25 µg/mL EDTA NIST SRM 928 Lot Number: 928
Assay Method #3	10001 ± 33 µg/mL Calculated NIST SRM Lot Number: See Sec. 4.2

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

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

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

M	Ag	<	0.000760	M	Eu	<	0.000760	O	Na	0.012771	M	Se	<	0.023000	M	Zn	<	0.006100
M	Al	0.003385	O	Fe	0.004462	M	Nb	<	0.000760	O	Si	0.024619	M	Zr	<	0.000760		
M	As	<	0.004600	M	Ga	<	0.000760	M	Nd	<	0.000760	M	Sm	<	0.000760			
M	Au	<	0.002300	M	Gd	<	0.000760	O	Ni	<	0.005100	M	Sn	<	0.000760			
O	B	0.003692	M	Ge	<	0.001600	M	Os	<	0.000760	O	Sr	<	0.000610				
M	Ba	<	0.001600	M	Hf	<	0.000760	n	P	<		M	Ta	<	0.000760			
O	Be	<	0.000130	M	Hg	<	0.003100	M	Pb	0.001400	M	Tb	<	0.000760				
M	Bi	<	0.000760	M	Ho	<	0.000760	M	Pd	<	0.001600	M	Te	<	0.000760			
O	Ca	0.004616	s	In	<			M	Pr	<	0.000760	M	Th	<	0.000760			
M	Cd	<	0.000760	M	Ir	<	0.000760	M	Pt	<	0.000760	O	Ti	<	0.001100			
M	Ce	<	0.000760	O	K	0.007078	M	Rb	<	0.000760	M	Tl	<	0.000760				
M	Co	<	0.000760	M	La	<	0.000760	M	Re	<	0.000760	M	Tm	<	0.000760			
O	Cr	<	0.001300	O	Li	<	0.000130	M	Rh	<	0.000760	M	U	<	0.000760			
M	Cs	<	0.000760	M	Lu	<	0.000760	M	Ru	<	0.000760	M	V	<	0.001600			
M	Cu	<	0.003800	O	Mg	0.000707	n	S	<		M	W	<	0.001600				
M	Dy	<	0.000760	O	Mn	0.000149	M	Sb	<	0.000760	M	Y	<	0.000760				
M	Er	<	0.000760	M	Mo	<	0.002300	M	Sc	<	0.000760	M	Yb	<	0.000760			

M - Checked by ICP-MS

O - Checked by ICP-OES

i - Spectral Interference

n - Not Checked For

s - Solution Standard Element

6.0 INTENDED USE

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

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.
- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.
- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

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

Atomic Weight; Valence; Coordination Number; Chemical Form In Solution - 114.82 +3 6 In(H₂O)₆+3

Chemical Compatibility -Soluble in HCl, HNO₃, and H₂SO₄. Avoid neutral and basic media. Stable with most metals and inorganic anions. The oxalate, sulfide, carbonate, hydroxide and phosphate are insoluble in water.

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

In Containing Samples (Preparation and Solution) -Metal (Best dissolved in HCl / HNO₃); Oxide (Soluble in mineral acids); Ores (Carbonate fusion in PtO followed by HCl dissolution); Organic Matrices (Sulfuric/peroxide digestion or dry ash and dissolution in dilute HCl).

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

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 115 amu	1 ppt	n/a	115Sn, 99Ru16O
ICP-OES 158.583 nm	0.05 / 0.002 µg/mL	1	
ICP-OES 230.606 nm	0.1 / 0.03 µg/mL	1	Ni, Os
ICP-OES 325.609 nm	0.2 / 0.05 µg/mL	1	Mn, Mo, Th

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

February 21, 2023

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

11.2 Lot Expiration Date

- February 21, 2028

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





Refine your results. Redefine your industry.

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

Certificate of Analysis

M6074
M6075
M6076
M6077

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

F: 540-585-3012

info@inorganicventures.com

EXP: 9/6/2029

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: CHEM-CLP-4
Lot Number: V2-MEB746762
Matrix: 3% (v/v) HNO₃
3% (v/v) HF
Value / Analyte(s): 1 000 µg/mL ea:
Boron, Molybdenum,
Silicon, Tin,
Titanium

3.0 CERTIFIED VALUES AND UNCERTAINTIES

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

Density: 1.033 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
B	ICP Assay	3107	190605
B	Calculated		See Sec. 4.2
Mo	ICP Assay	traceable to 3134	U2-MO739068
Si	ICP Assay	Traceable to 3150	S2-SI702546
Sn	ICP Assay	3161a	140917
Ti	ICP Assay	traceable to 3162a	T2-TI725816

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

N/A

6.0 INTENDED USE

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

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 06, 2024

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

11.2 Lot Expiration Date

- **September 06, 2029**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Joseph Burns
Custom VS Manager



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





CERTIFIED WEIGHT REPORT:

Part Number: 58112
Lot # 112124
Description: Magnesium (Mg)
Lot # 24012496
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

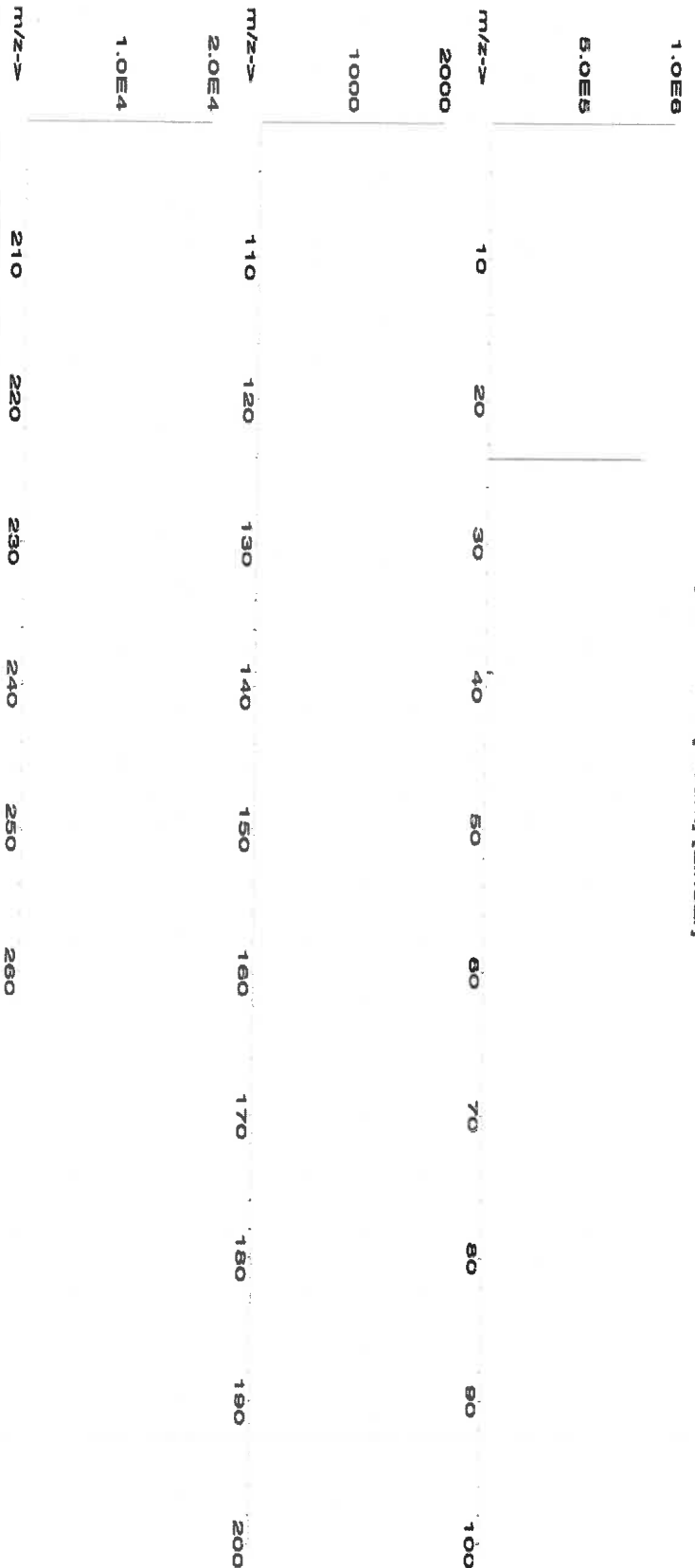
<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito
Reviewed By:	Pedro L. Rentas
	112124

Compound

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

1. Magnesium nitrate hexahydrate (Mg) IN030 MG000023A1 10000 99.999 0.10 8.51 234.9183 234.9459 10001.2 20.0 13446-18-9 NA off-rat 5440 mg/kg 3131a

[1] Spectrum No. 1 [19.823 sec]:58112.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

58025
101124
Manganese (Mn)

R-71113128

Lot #
Solvent: 24002546 Nitric Acid

Expiration Date:

101127

2% 80.0 (mL) Nitric Acid

Recommended Storage:

Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

SE-05 Balance Uncertainty

Weight shown below was diluted to (mL):

4000.2

0.10 Flask Uncertainty

<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito
Reviewed By:	<i>Pedro L. Renteria</i>
	101124

Compound

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

1. Manganese(II) nitrate hydrate (Mn) IN031 MNM02020A1 1000 99.999 0.10 20.8 19.2322 19.2344 1000.1 2.0 15710-66-4 5 mg/m3 or-rel >300mg/kg 3132

[1] Spectrum No.1 [34.243 sec]:57025.D# [Count] [Linear]

5.0E6													
2.5E6													
m/z->	10	20	30	40	50	60	70	80	90	100			
1.0E6													
5.0E7													
m/z->	110	120	130	140	150	160	170	180	190	200			
1.0E6													
5.0E7													
m/z->	210	220	230	240	250	260							



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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

Part Number: 58111
Lot Number: 072424
Description: Sodium (Na)

Lot # R-1113125
Solvent: 24002546 Nitric Acid

Expiration Date: 072427
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 10000
NIST Test Number: 6UTB

Weight shown below was diluted to (mL): 4000.2
5E-05 Balance Uncertainty
0.10 Flask Uncertainty

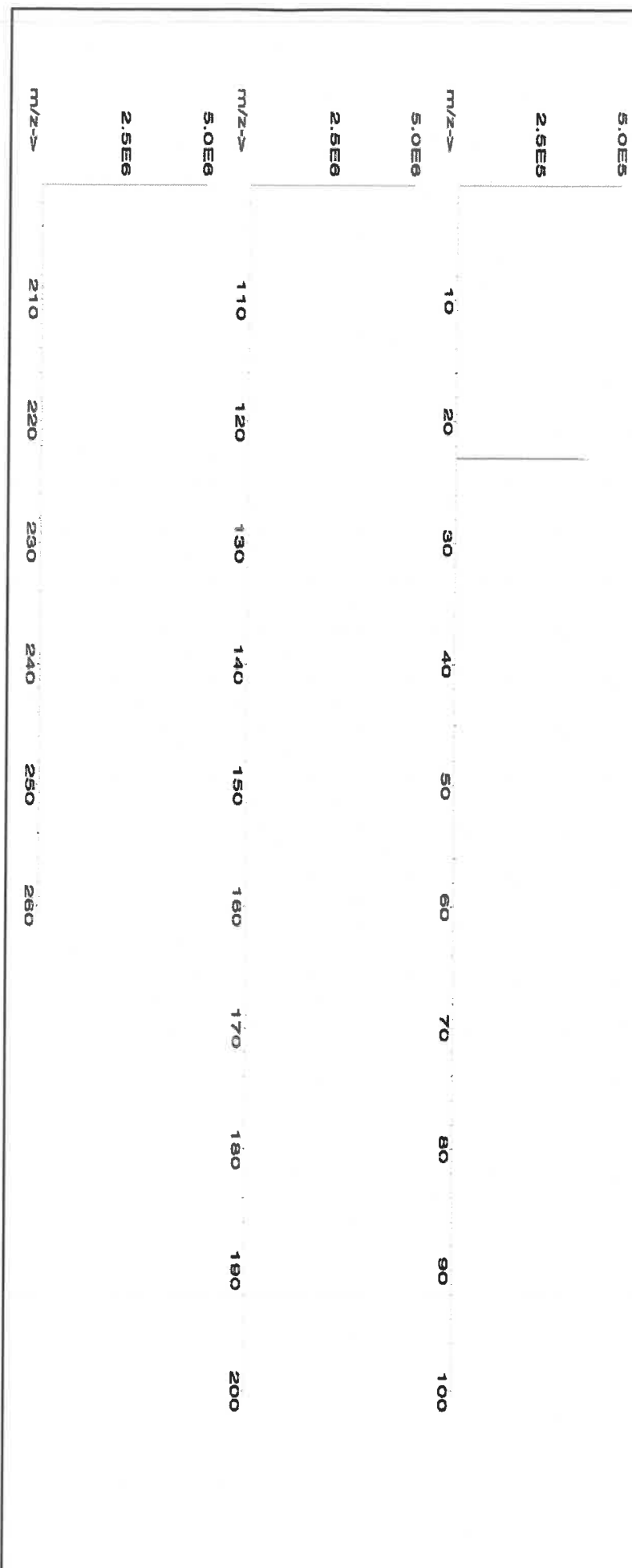
Formulated By:	Benson Chan	072424
Reviewed By:	Pedro L. Renteria	072424

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)	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	Tb	<0.02	Yb	<0.02
Be	<0.01	Cr	<0.02	Ga	<0.02	Fe	<0.2	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	<0.02	Tm	<0.02	Y	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	Sn	<0.02	Zn	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	Ti	<0.02	Zr	<0.02

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

Part Number: **58030** Lot # **121724**
Description: **Zinc (Zn)**

Expiration Date: **121727** Solvent: **24012496 Nitric Acid**

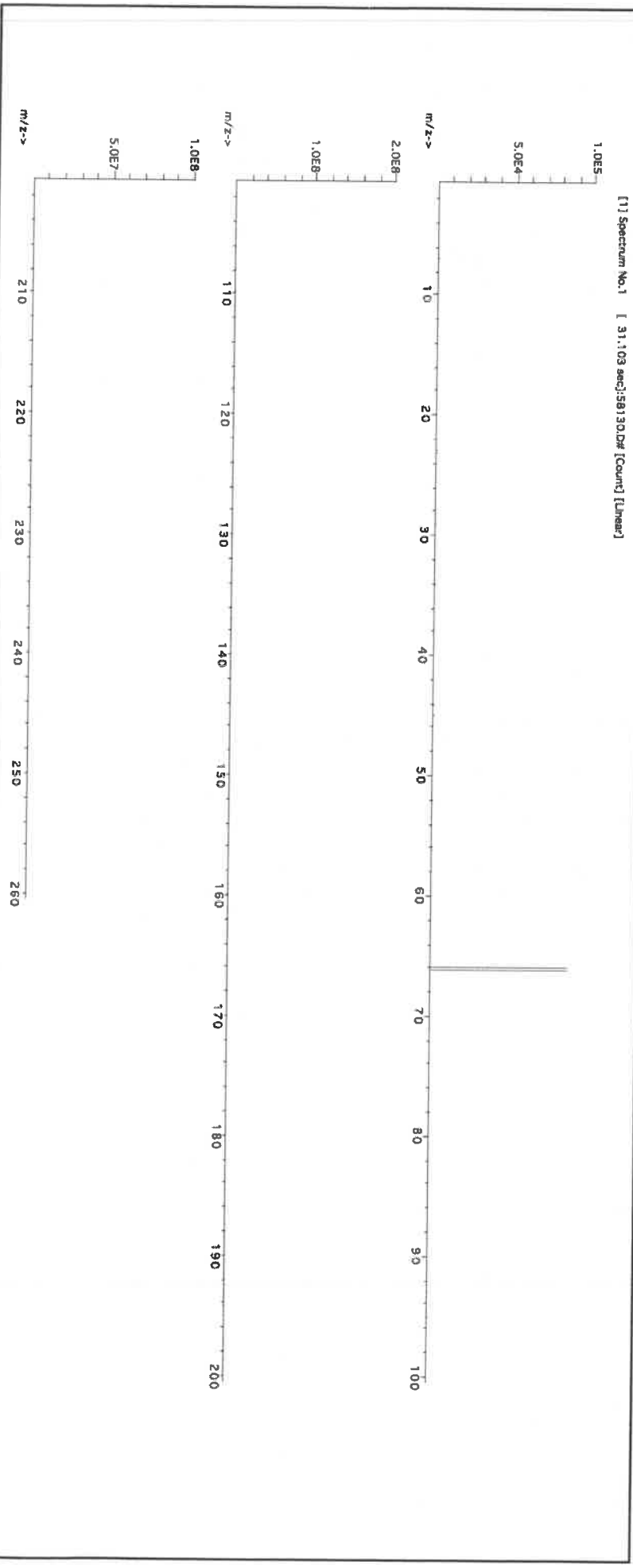
Recommended Storage: **Ambient (20 °C)** 2% 40.0 Nitric Acid
Nominal Concentration (µg/mL): **1000**

NIST Test Number: **6UTB** 5E-05 Balance Uncertainty
Weight shown below was diluted to (mL): **2000.1** 0.10 Flask Uncertainty

<i>Aleah O'Brady</i>	
Formulated By:	Aleah O'Brady
Reviewed By:	<i>Pedro L. Rentes</i>
	Pedro L. Rentes
	121724

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
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1. Zinc nitrate hexahydrate (Zn) IN016 ZNE032021A1 1000 99.999 0.10 24.3 8.2308 8.2311 1000.0 2.0 10196-18-6 1 mg/m3 or-rat 1190mg/kg 3168





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



QUALITY ASSURANCE TECHNICAL SUPPORT LABORATORY
"An ISO 9001:2015 Certified Program"

R: 4/20/21

Instructions for QATS Reference Material: *Inorganic ICV Solutions*

QATS LABORATORY INORGANIC REFERENCE MATERIAL
INITIAL CALIBRATION VERIFICATION SOLUTIONS
(ICV1, ICV5, AND ICV6)

MG180

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

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

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

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

Safety Data Sheets
Available Upon Request

(A) SAMPLE DESCRIPTION

Enclosed is a set of one (1) or more Aqueous Inorganic Reference Materials containing various analyte concentrations. ICV1 and ICV5 are in a matrix of dilute nitric acid. ICV6 is in a matrix of dilute basic solution. For the reference material source in reporting ICVs use "USEPA". For the reference material lot number for the ICV1, ICV5, and ICV6 solutions use "ICV1-1014", "ICV5-0415", and "ICV6-0400", respectively.

(B) BREAKAGE OR MISSING ITEMS

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

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

(C) ANALYSIS OF SAMPLES

The Initial Calibration Verification Solutions (ICVs) are to be used to evaluate the accuracy of the initial calibrations of ICP, AA, and Cyanide colorimetric instruments, and are to be used with the CLP SOWs and revisions. The values for each element in the ICVs are listed below in µg/L (ppb) for the resulting solution(s) after the dilution of the concentrate(s) according to the following instructions. Use Class 'A' glassware to prepare the solution(s).

ICV1-1014 For ICP-AES analysis, use a 10-fold dilution by pipetting 10 mL of the ICV1 concentrate into a 100 mL volumetric flask and dilute to volume with 2% (v/v) nitric acid.





QUALITY ASSURANCE TECHNICAL SUPPORT LABORATORY
"An ISO 9001:2015 Certified Program"

Instructions for QATS Reference Material: *Inorganic ICV Solutions*

ICV1-1014 For ICP-MS analysis, use a 50-fold dilution by pipetting 2 mL of the ICV1 concentrate into a 100 mL volumetric flask and dilute to volume with 1% (v/v) nitric acid.

ICV5-0415 For the cold vapor analysis of mercury by AA, use a 100-fold dilution by pipetting 1 mL of the ICV5 concentrate into a 100 mL volumetric flask and dilute to volume with 2% (v/v) nitric acid. The ICV5 concentrate is prepared in 0.05% (w/v) K₂Cr₂O₇ and 5% (v/v) nitric acid.

ICV6-0400 For the analysis of cyanide, use a 100-fold dilution by pipetting 1 mL of the ICV6 concentrate into a 100 mL volumetric flask and dilute to volume with Type II water. Distill this solution along with the samples before analysis. The cyanide concentrate is prepared from K₃Fe(CN)₆, Type II water, and 0.1 % sodium hydroxide, and will decompose rapidly if exposed to light.

NOTE: USE TYPE II WATER AND HIGH-PURITY ACIDS FOR ALL DILUTIONS.

(D) CERTIFIED CONCENTRATIONS OF QATS ICV1, ICV5, AND ICV6 SOLUTIONS

ICV1-1014		
Element	Concentration (µg/L) (after 10-fold dilution)	Concentration (µg/L) (after 50-fold dilution)
Al	2500	500
Sb	1000	200
As	1000	200
Ba	520	100
Be	510	100
Cd	510	100
Ca	10000	2000
Cr	520	100
Co	520	100
Cu	510	100
Fe	10000	2000
Pb	1000	200
Mg	6000	1200
Mn	520	100
Ni	530	110
K	9900	2000
Se	1000	200
Ag	250	50
Na	10000	2000
Tl	1000	210
V	500	100
Zn	1000	200

ICV5-0415		ICV6-0400	
Element	Concentration (µg/L) (after 100-fold dilution)	Analyte	Concentration (µg/L) (after 100-fold dilution)
Hg	4.0	CN ⁻	99



Certified Reference Material CRM

M6030



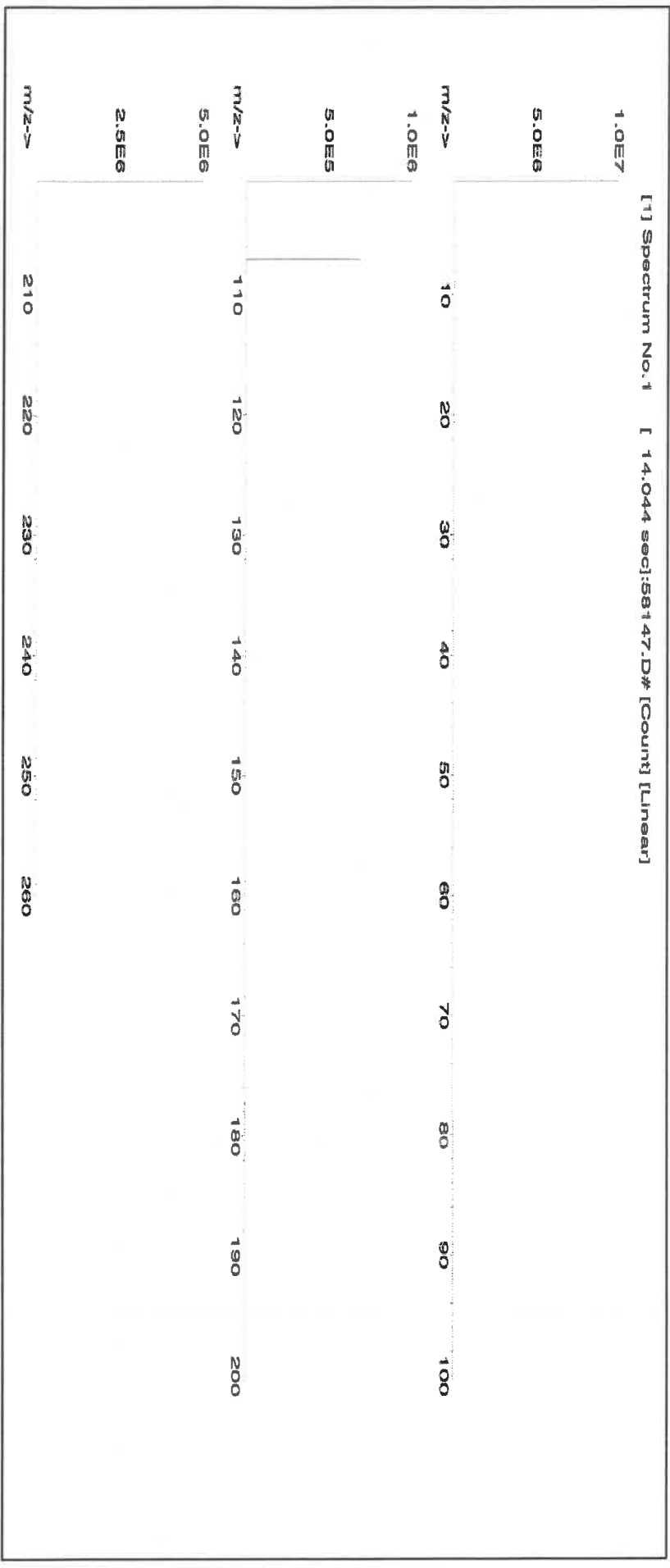
CERTIFIED WEIGHT REPORT:

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
122823	
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





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 meghom 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: 10/18/24
Certified Reference Material CRM



CERTIFIED WEIGHT REPORT:

Part Number:

57051

Lot #
24002546

Solvent:
Nitric Acid

Lot Number:

071724

Description:

Antimony (Sb)

Expiration Date:

071727

Recommended Storage:

Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UJB

Volume shown below was diluted to (mL):

2000.26

5E-05 Balance Uncertainty

0.058 Flask Uncertainty

2.0%

40.0 (mL)

Nitric Acid

Formulated By:

Giovanni Esposito

071724

Reviewed By:

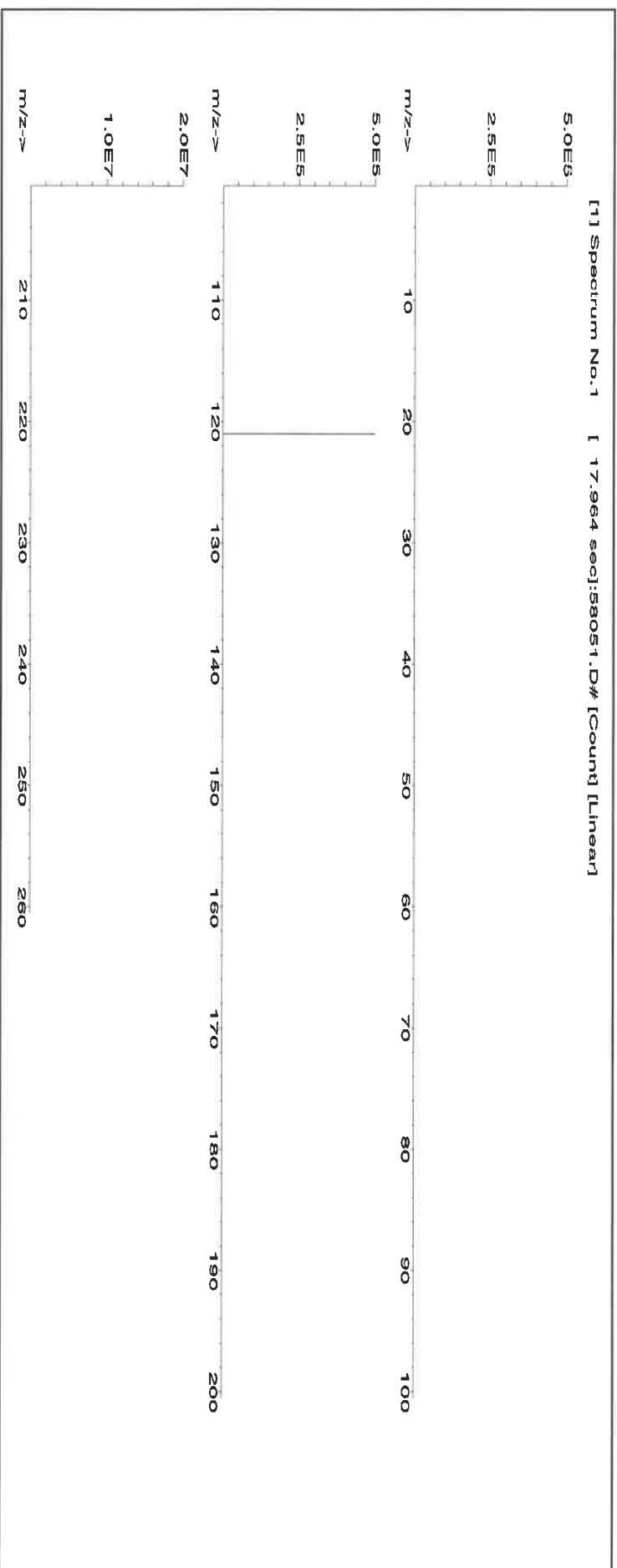
Pedro L. Rentas

071724

SDS Information

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
----------	-------------	------------	-----------------	-------------------	--------------------------	-----------------------	-----------------------	---------------------	----------------------------------	------	----------------	------	----------

1. Antimony (Sb) 58151 060324 0.1000 200.0 0.084 1000 10001.4 1000.0 2.2 7440-36-0 0.5 mg/m3 orl-rat 7000 mg/kg 3102a



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

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	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

Certified by:

Har. P.

- Printed: 9/27/2024. 11:20:14 PM



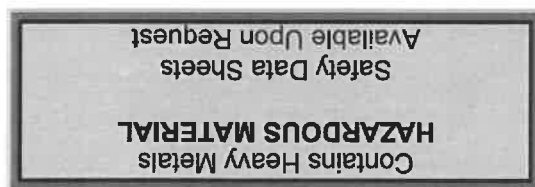
QATS LABORATORY INORGANIC REFERENCE MATERIAL INTERFERENCE CHECK SAMPLE SET FOR ICP-AES (ICSA WITH ICSB)

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.

M6152



(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) interfering 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 $\pm$ 1 times the associated CLP SOW CRQL. The acceptance ranges for all other analytes were determined using the certified value $\pm$ 15 percent of the listed certified value.



QUALITY ASSURANCE TECHNICAL SUPPORT LABORATORY
"An ISO 9001:2015 Certified Program"

R : 04/20/21

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.



M6155

(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,





QUALITY ASSURANCE TECHNICAL SUPPORT LABORATORY
"An ISO 9001:2015 Certified Program"

APTIM

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.

R: 8/5/24

M6019

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Christiansburg, VA 24073 USA
inorganicventures.com

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F: 540-585-3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
Catalog Number: CGSR1
Lot Number: U2-SR730227
Matrix: 0.1% (v/v) HNO₃
Value / Analyte(s): 1 000 µg/mL ea:
Strontium
Starting Material: SrCO₃
Starting Material Lot#: M2-2192
Starting Material Purity: 99.9993%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1001 ± 3 µg/mL
Density: 1.000 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1	998 ± 4 µg/mL ICP Assay NIST SRM Traceable to 3153a Lot Number: K2-SR650985
Assay Method #2	1001 ± 3 µg/mL EDTA NIST SRM 928 Lot Number: 928
Assay Method #3	1001 ± 2 µg/mL Calculated NIST SRM Lot Number: See Sec. 4.2

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

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

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

M	Ag	<	0.001980	M	Eu	<	0.000495	O	Na	0.000200	M	Se	<	0.013862	O	Zn	0.000143	
O	Al	0.000370	O	Fe	0.000410	M	Nb	<	0.000495	i	Si	<			M	Zr	<	0.000495
M	As	<	0.000495	M	Ga	<	0.000495	M	Nd	<	0.000495	M	Sm	<	0.000495			
M	Au	<	0.000989	M	Gd	<	0.000495	O	Ni	<	0.007631	M	Sn	<	0.000990			
M	B	<	0.039606	M	Ge	<	0.000495	M	Os	<	0.000494	s	Sr	<				
M	Ba	0.006486	M	Hf	<	0.000495	i	P	<			M	Ta	<	0.000495			
M	Be	<	0.000990	M	Hg	<	0.000989	M	Pb	<	0.002970	M	Tb	<	0.000495			
M	Bi	<	0.000495	M	Ho	<	0.000495	M	Pd	<	0.003957	M	Te	<	0.027724			
O	Ca	0.004255	M	In	<	0.000495	M	Pr	<	0.000495	M	Th	<	0.000990				
M	Cd	0.001339	M	Ir	<	0.000494	M	Pt	<	0.002970	M	Ti	<	0.005940				
M	Ce	<	0.004950	O	K	<	0.008184	M	Rb	<	0.002970	M	Tl	<	0.000495			
M	Co	<	0.000495	M	La	<	0.000495	M	Re	<	0.000495	M	Tm	<	0.000495			
O	Cr	<	0.003207	O	Li	<	0.000884	O	Rh	<	0.012829	M	U	<	0.001485			
M	Cs	<	0.000990	M	Lu	<	0.002970	M	Ru	<	0.000989	M	V	<	0.001980			
M	Cu	0.000099	O	Mg	0.000064	i	S	<				M	W	<	0.003960			
M	Dy	<	0.000495	O	Mn	0.000066	M	Sb	<	0.014852	O	Y	<	0.000995				
M	Er	<	0.000495	M	Mo	<	0.001980	M	Sc	<	0.001980	M	Yb	<	0.000495			

M - Checked by ICP-MS

O - Checked by ICP-OES

i - Spectral Interference

n - Not Checked For

s - Solution Standard Element

6.0 INTENDED USE

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

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.
- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.
- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

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

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 87.62 +2 6 Sr(H₂O)₆+2

Chemical Compatibility - Soluble in HCl, and HNO₃. Avoid H₂SO₄, HF and neutral to basic media. Stable with most metals and inorganic anions forming insoluble silicate, carbonate, hydroxide, oxide, fluoride, sulfate, oxalate, chromate, arsenate and tungstate in neutral aqueous media.

Stability - 2-100 ppb levels stable for months in 1% HNO₃ / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1 - 3.5% HNO₃ / LDPE container.

Sr Containing Samples (Preparation and Solution) -Metal (Best dissolved in diluted HNO₃); Ores (Carbonate fusion in PtO followed by HCl dissolution); Organic Matrices (Dry ash and dissolution in dilute HCl).

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

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 88 amu	1200 ppt	N/A	72Ge16O, 176Yb+2, 176Lu+2 , 176Hf+2
ICP-OES 407.771 nm	0.0004 / 0.00006 µg/mL	1	U, Ce
ICP-OES 421.552 nm	0.0008 / 0.00004 µg/mL	1	Rb
ICP-OES 460.733 nm	0.07 / 0.003 µg/mL	1	Ce

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 03, 2023

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

11.2 Lot Expiration Date

- March 03, 2028

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





CERTIFIED 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

5E-05 Balance Uncertainty

Weight shown below was diluted to (mL): 2000.1 0.10 Flask Uncertainty

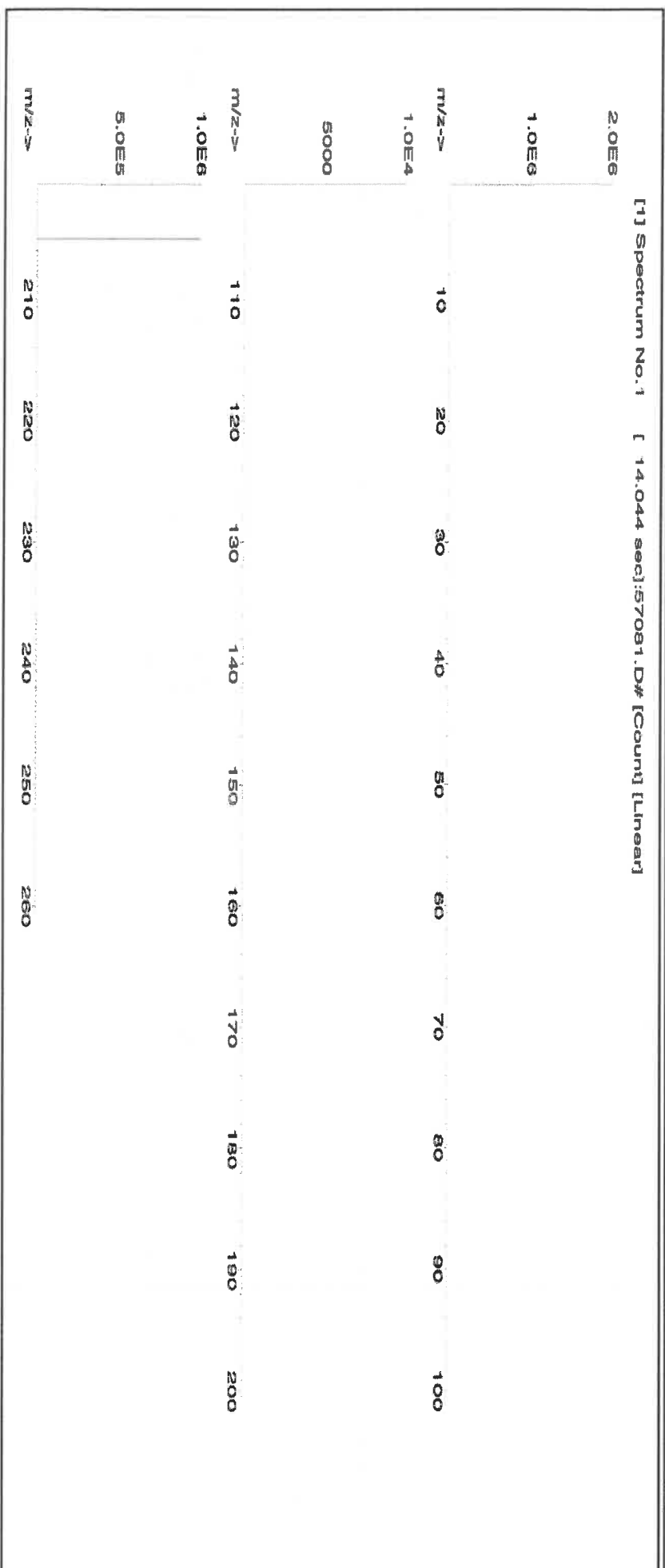
<i>Aleah O'Brady</i>	
Formulated By:	Aleah O'Brady
	062724
Reviewed By:	<i>Pedro L. Rendas</i>
	Pedro L. Rendas
	062724

SDS Information

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

1. Thallium nitrate (TI) IN037 BCCF4399 1000 99.999 0.10 77.0 2.5975 2.5977 1000.1 2.0 10102-45-1 0.1 mg/m3 orl-mus 15mg/kg 3158

[1] Spectrum No.1 [14.044 sec]:57081.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

Certified by:

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

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



Certified Reference Material CRM

M6021



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

CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57023
062424
Vanadium (V)

Lot #
Solvent:

24002546
Nitric Acid

2.0%

40.0
(mL)

Nitric Acid

Formulated By:

Aleah O'Brady

062424

Expiration Date:
Recommended Storage:
Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

Volume shown below was diluted to (mL):

2000.3

5E-05 Balance Uncertainty
0.06 Flask Uncertainty

Expanded

Uncertainty

+/- (µg/mL)

CAS#

05HA PEL (TWA)

LD50

NIST

SRM

SDS Information

(Solvent Safety Info. On Attached pg.)

Reviewed By:

Pedro L. Rantas

062424

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 3165

[1] Spectrum No.1 [34.243 sec]:58023.D# [Count] [Linear]

2.0E6	10	20	30	40	50	60	70	80	90	100
1.0E6	10	20	30	40	50	60	70	80	90	100
2.0E7	10	20	30	40	50	60	70	80	90	100
1.0E7	10	20	30	40	50	60	70	80	90	100
5.0E8	110	120	130	140	150	160	170	180	190	200
2.5E8	210	220	230	240	250	260				

Certificate of Analysis

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

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

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

3.0 CERTIFIED VALUES AND UNCERTAINTIES

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

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

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ag	ICP Assay	3151	160729
Ag	Volhard	999c	999c
Ag	Calculated		See Sec. 4.2
Al	ICP Assay	3101a	140903
Al	EDTA	928	928
As	ICP Assay	3103a	100818
B	ICP Assay	3107	190605
Ba	ICP Assay	3104a	140909
Ba	Gravimetric		See Sec. 4.2
Be	ICP Assay	3105a	090514
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
Cd	ICP Assay	3108	130116
Cd	EDTA	928	928
Ce	ICP Assay	3110	090504
Ce	EDTA	928	928
Co	ICP Assay	3113	190630
Co	EDTA	928	928
Cr	ICP Assay	3112a	170630
Cu	ICP Assay	3114	121207
Cu	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
Hg	ICP Assay	3133	160921
Hg	EDTA	928	928
K	ICP Assay	3141a	140813
K	Gravimetric		See Sec. 4.2
Li	ICP Assay	3129a	100714
Li	Gravimetric		See Sec. 4.2
Mg	ICP Assay	3131a	140110
Mg	EDTA	928	928
Mn	ICP Assay	3132	050429
Mn	EDTA	928	928
Na	ICP Assay	Traceable to 3152A	S2-NA700842
Na	Gravimetric		See Sec. 4.2
Ni	ICP Assay	3136	120619
Ni	EDTA	928	928
P	ICP Assay	3139a	060717
P	Acidimetric	84L	84L
Pb	ICP Assay	3128	101026
Pb	EDTA	928	928
Se	ICP Assay	3149	100901
Sr	EDTA	928	928
Sr	ICP Assay	Traceable to 3153a	K2-SR650985
Tl	ICP Assay	3158	151215
V	IC Assay	3165	160906
V	EDTA	928	928
Zn	ICP Assay	3168a	120629
Zn	EDTA	928	928

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

August 30, 2022

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

11.2 Lot Expiration Date

- **August 30, 2026**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Certificate of Analysis

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: WW-LFS-2
Lot Number: T2-MEB715594
Matrix: 5% (v/v) HNO₃
tr. HF
Value / Analyte(s): 200 µg/mL ea:
Silica,
80 µg/mL ea:
Antimony,
70 µg/mL ea:
Tin,
40 µg/mL ea:
Molybdenum,
20 µg/mL ea:
Titanium

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Antimony, Sb	80.1 ± 0.6 µg/mL	Molybdenum, Mo	40.04 ± 0.24 µg/mL
Silica, SiO ₂	200.2 ± 1.1 µg/mL	Tin, Sn	70.1 ± 0.4 µg/mL
Titanium, Ti	20.02 ± 0.14 µg/mL		

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

Assay Information:

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

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

February 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

- **February 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



Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134725

Review By	kareem	Review On	3/12/2025 10:19:04 AM
Supervise By	Janvi	Supervise On	3/12/2025 10:20:10 AM
STD. NAME	STD REF.#		
ICAL Standard	MP84636,MP84637,MP84638,MP84639,MP84640,MP84642		
ICV Standard	MP84643		
CCV Standard	MP84646		
ICSA Standard	MP84644,MP84721		
CRI Standard	MP84642		
LCS Standard			
Chk Standard	MP84649,MP84650		

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	S0	S0	CAL1	02/14/25 13:55		Kareem	OK
2	S1	S1	CAL2	02/14/25 14:00		Kareem	OK
3	S2	S2	CAL3	02/14/25 14:04		Kareem	OK
4	S3	S3	CAL4	02/14/25 14:08		Kareem	OK
5	S4	S4	CAL5	02/14/25 14:12		Kareem	OK
6	S5	S5	CAL6	02/14/25 14:16		Kareem	OK
7	ICV01	ICV01	ICV	02/14/25 17:35		Kareem	OK
8	LLICV01	LLICV01	LLICV	02/14/25 17:41		Kareem	OK
9	ICB01	ICB01	ICB	02/14/25 17:46		Kareem	OK
10	CRI01	CRI01	CRDL	02/14/25 17:50		Kareem	OK
11	ICSA01	ICSA01	ICSA	02/14/25 17:55		Kareem	OK
12	ICSAB01	ICSAB01	ICSAB	02/14/25 18:45		Kareem	OK
13	ICSADL	ICSADL	ICSA	02/14/25 18:49		Kareem	OK
14	ICSABDL	ICSABDL	ICSAB	02/14/25 18:53		Kareem	OK
15	CCV01	CCV01	CCV	02/14/25 18:58		Kareem	OK
16	CCB01	CCB01	CCB	02/14/25 19:02		Kareem	OK
17	P2403-01	LOD-MDL-SOIL-01-Q	SAM	02/14/25 19:06		Kareem	OK
18	P2403-02	LOQ-SOIL-02-QT2-20	LOQ	02/14/25 19:19		Kareem	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134725

Review By	kareem	Review On	3/12/2025 10:19:04 AM
Supervise By	Janvi	Supervise On	3/12/2025 10:20:10 AM
STD. NAME	STD REF.#		
ICAL Standard	MP84636,MP84637,MP84638,MP84639,MP84640,MP84642		
ICV Standard	MP84643		
CCV Standard	MP84646		
ICSA Standard	MP84644,MP84721		
CRI Standard	MP84642		
LCS Standard			
Chk Standard	MP84649,MP84650		

19	P2403-07	LOD-MDL-WATER-01	SAM	02/14/25 19:28		Kareem	OK
20	P2403-16	LLOQ-SOIL-QT2-202	SAM	02/14/25 19:43		Kareem	OK
21	P2403-08	LOQ-WATER-02-QT2	LOQ	02/14/25 19:47		Kareem	OK
22	P2403-17	LLOQ-WATER-QT2-2	SAM	02/14/25 19:51		Kareem	OK
23	P2403-10	LOD-MDL-WATER-04	SAM	02/14/25 19:56		Kareem	OK
24	P2403-11	LOQ-WATER-05-QT2	LOQ	02/14/25 20:00		Kareem	OK
25	PB166765BL	PB166765BL	MB	02/14/25 20:04		Kareem	OK
26	PB166765BS	PB166765BS	LCS	02/14/25 20:16	0.1 ML M6003 AMD M6011 WERE ADDED TO 10 ML OF SAMPLE	Kareem	OK
27	CCV02	CCV02	CCV	02/14/25 20:20		Kareem	OK
28	CCB02	CCB02	CCB	02/14/25 20:24		Kareem	OK
29	PB166788BL	PB166788BL	MB	02/14/25 20:29		Kareem	OK
30	PB166788BS	PB166788BS	LCS	02/14/25 20:33	0.1 ML M6003 AMD M6011 WERE ADDED TO 10 ML OF SAMPLE	Kareem	OK
31	PB166781BL	PB166781BL	MB	02/14/25 20:37		Kareem	OK
32	PB166781BS	PB166781BS	LCS	02/14/25 20:41	0.1 ML M6003 AMD M6011 WERE ADDED TO 10 ML OF SAMPLE	Kareem	OK
33	CCV03	CCV03	CCV	02/14/25 20:45		Kareem	OK
34	CCB03	CCB03	CCB	02/14/25 20:50		Kareem	OK