

FORM 1 - IN
INORGANIC ANALYSIS DATA SHEET

MBHKM2

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

Lab Code: ACE Case No.: 51879 MA No. : SDG No.: MBHKM2

Matrix: SOIL Lab Sample ID: P5043-01

% Solids: 85.3 Date Received: 11/27/2024

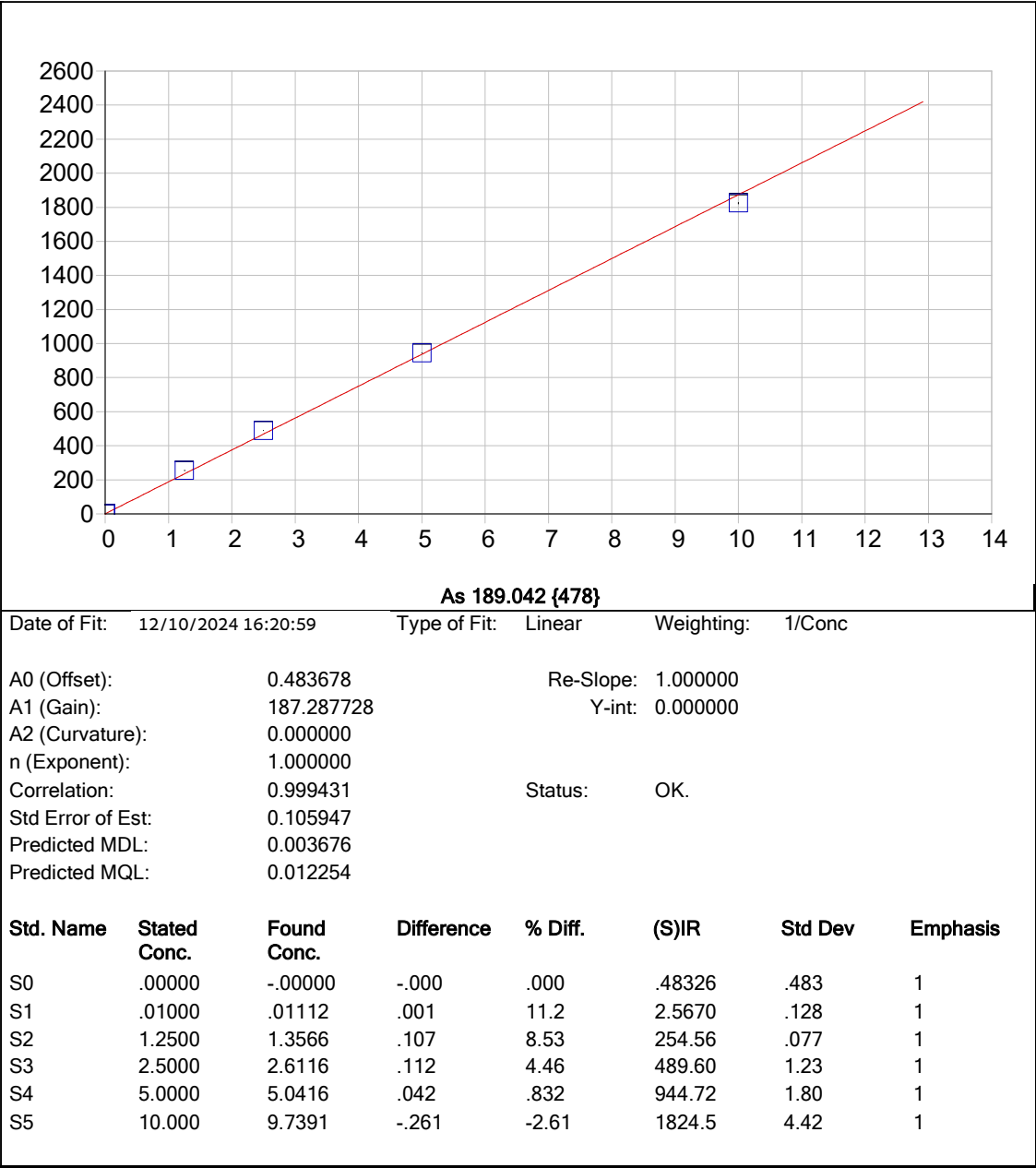
Analytical Method: ICP_AES

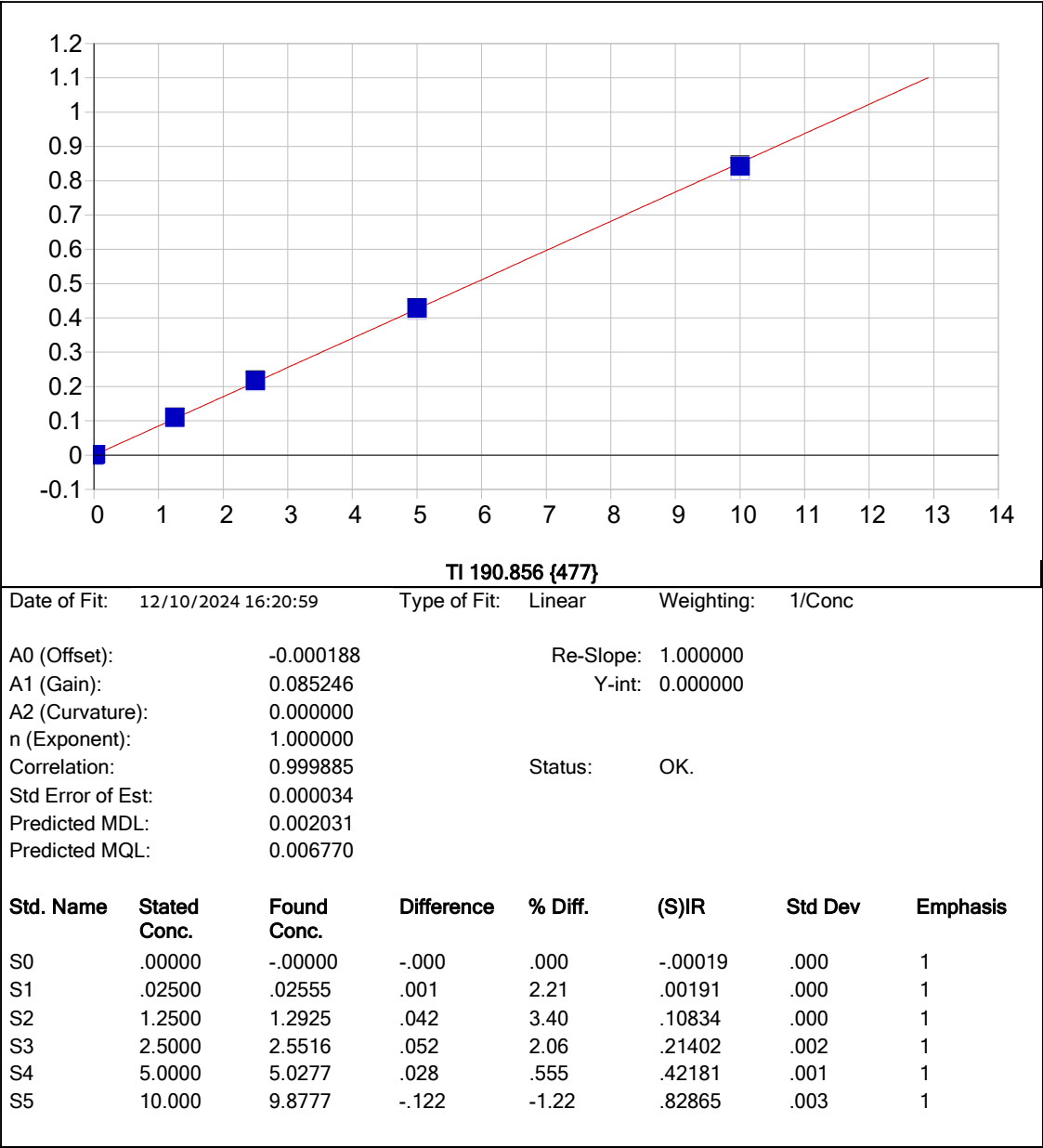
Concentration Units ($\mu\text{g/L}$, mg/L , mg/kg dry weight, μg , or $\mu\text{g/cm}^2$): mg/kg

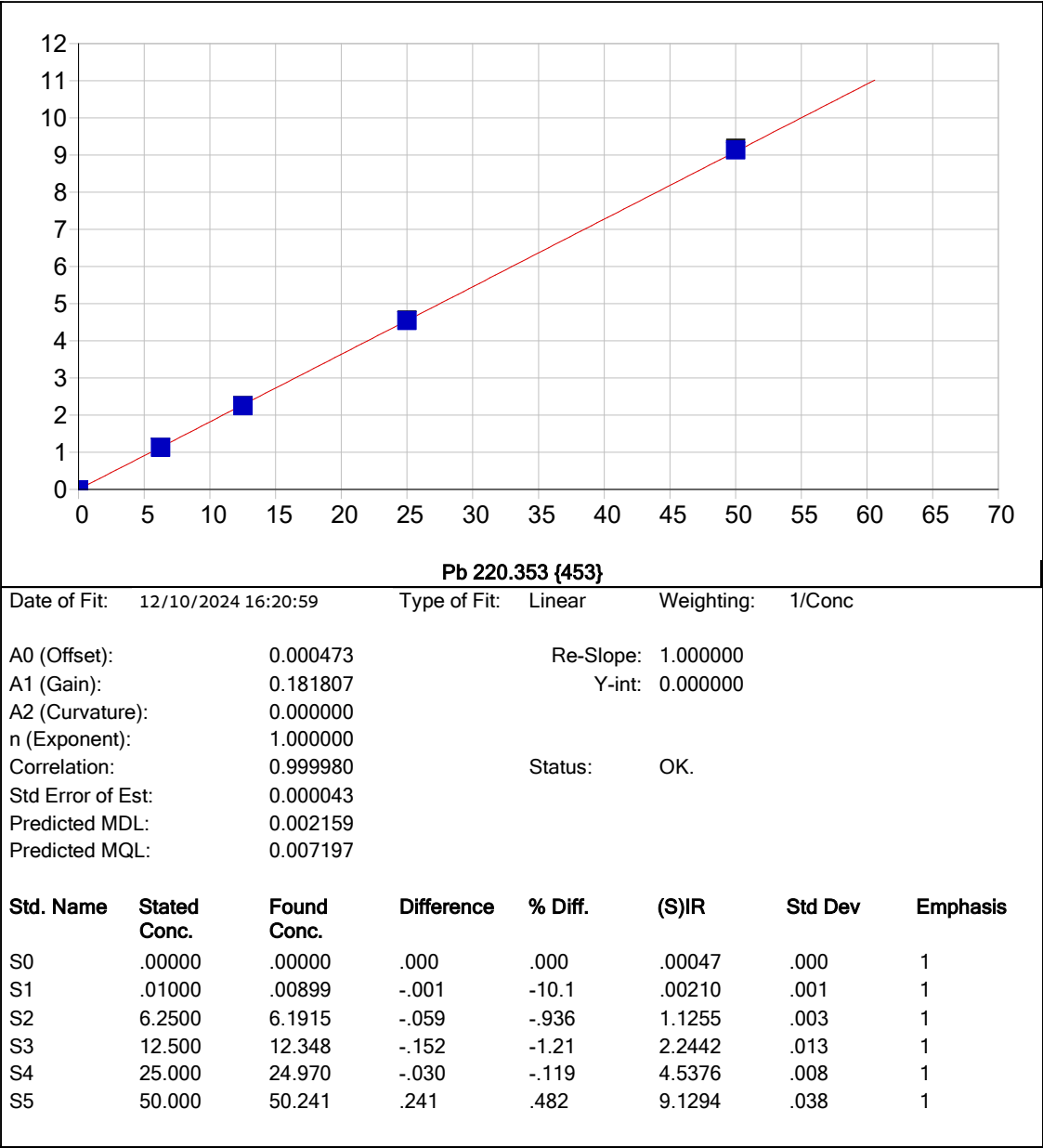
CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7429-90-5	Aluminum	5800		12/10/2024	1904
7440-36-0	Antimony	5.0	U	12/10/2024	1904
7440-38-2	Arsenic	3.9		12/10/2024	1904
7440-39-3	Barium	52		12/10/2024	1904
7440-41-7	Beryllium	0.50		12/10/2024	1904
7440-43-9	Cadmium	0.19	J	12/10/2024	1904
7440-70-2	Calcium	3100		12/10/2024	1904
7440-47-3	Chromium	6.8		12/10/2024	1904
7440-48-4	Cobalt	6.2		12/10/2024	1904
7440-50-8	Copper	10		12/10/2024	1904
7439-89-6	Iron	12000		12/10/2024	1904
7439-92-1	Lead	21		12/10/2024	1904
7439-95-4	Magnesium	1500		12/10/2024	1904
7439-96-5	Manganese	270		12/10/2024	1904
7440-02-0	Nickel	8.5		12/10/2024	1904
7440-09-7	Potassium	200	J	12/10/2024	1904
7782-49-2	Selenium	2.9	U	12/10/2024	1904
7440-22-4	Silver	0.83	U*	12/10/2024	1904
7440-23-5	Sodium	410	U	12/10/2024	1904
7440-28-0	Thallium	2.1	U	12/10/2024	1904
7440-62-2	Vanadium	13		12/10/2024	1904
7440-66-6	Zinc	27		12/10/2024	1904

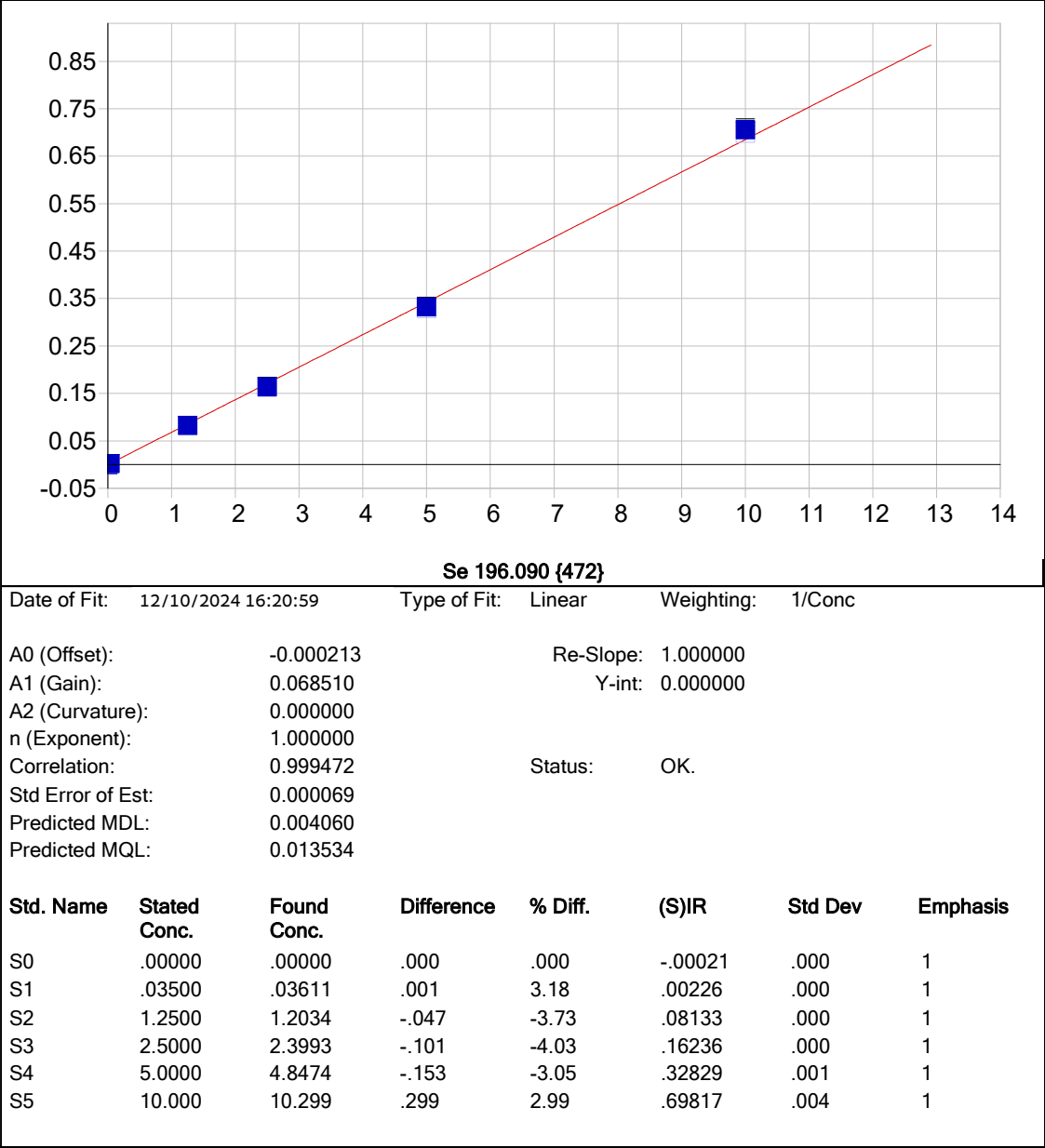
NOTE: Hardness (total) is reported in mg/L

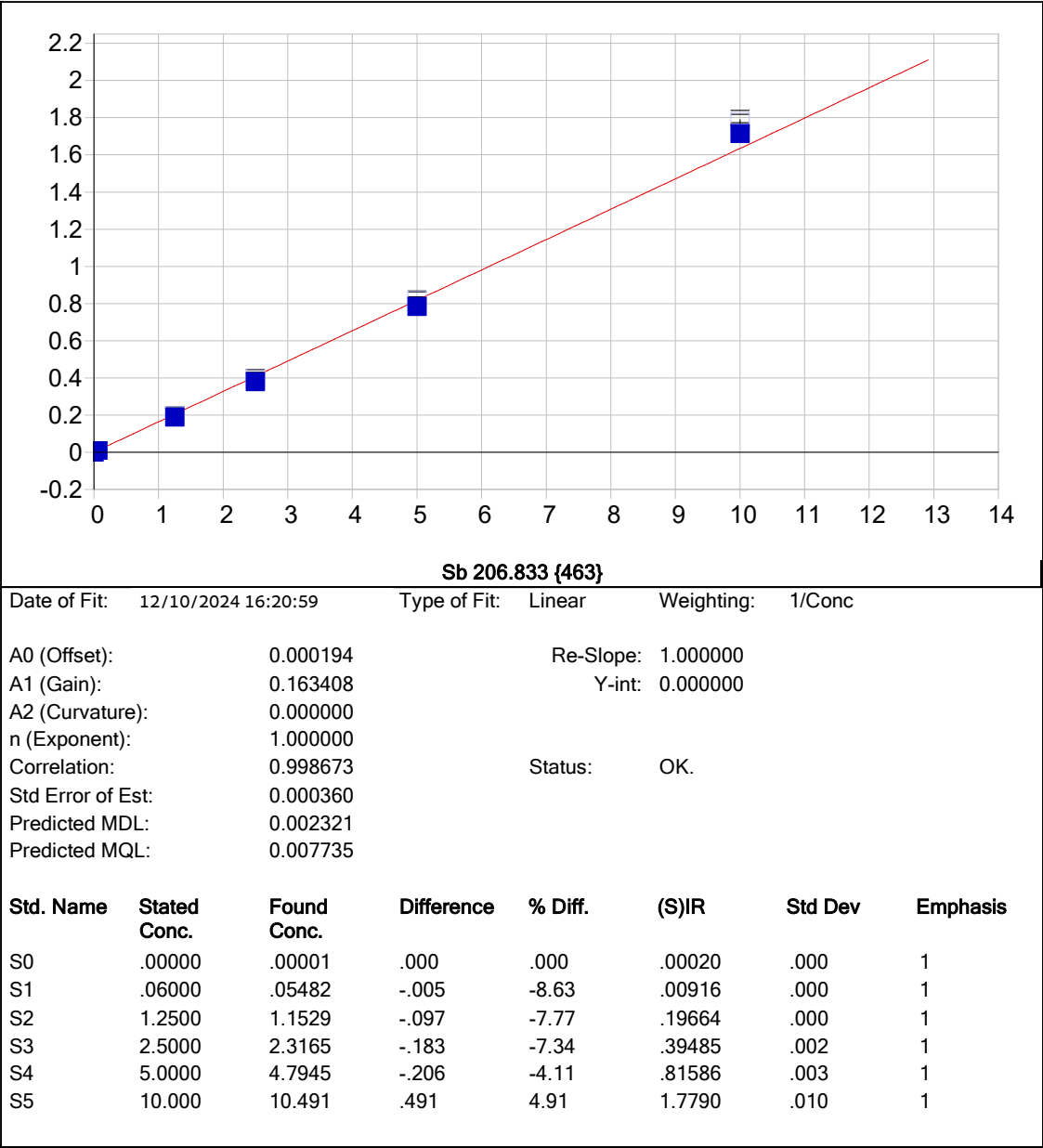
Comments:

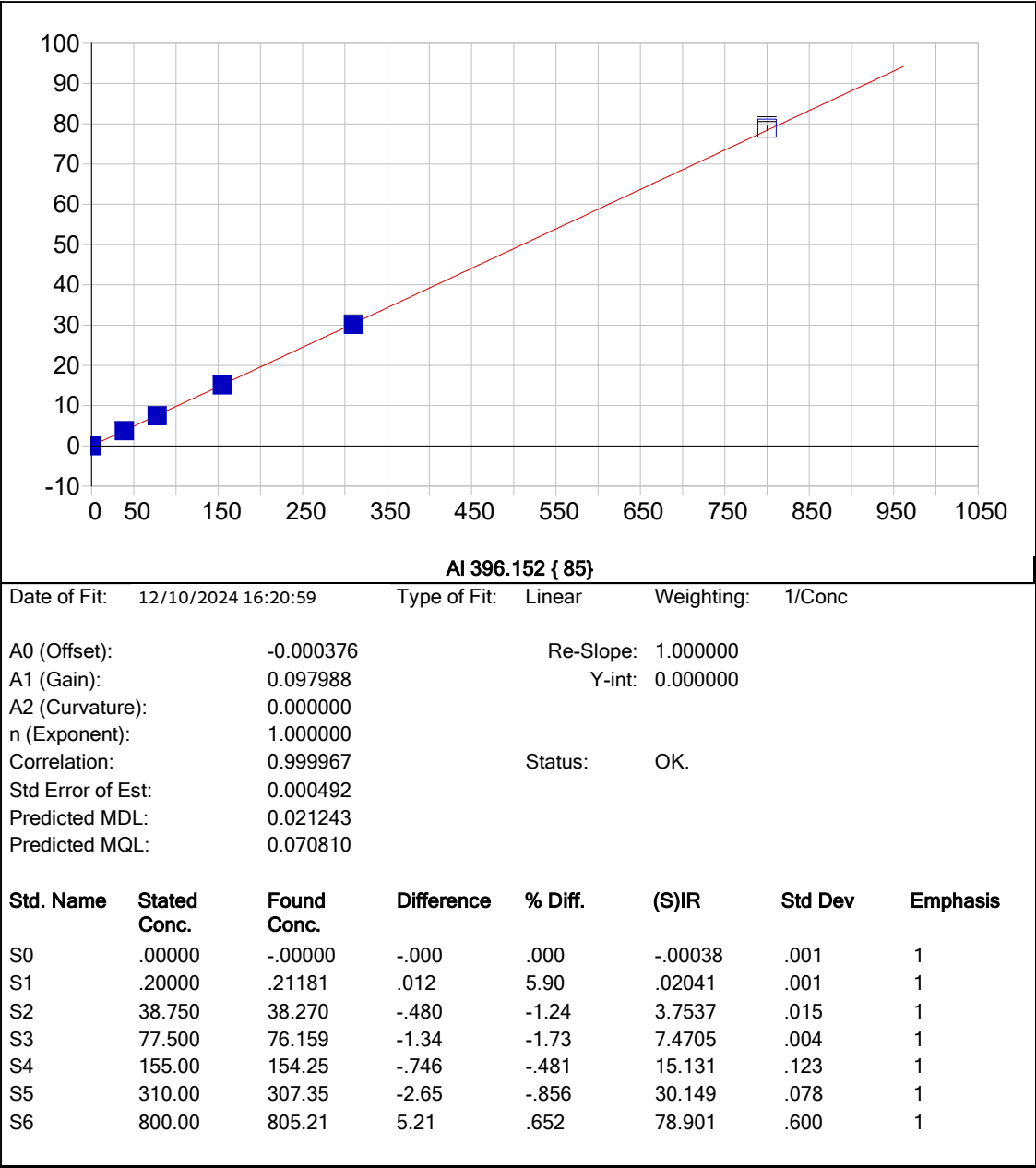


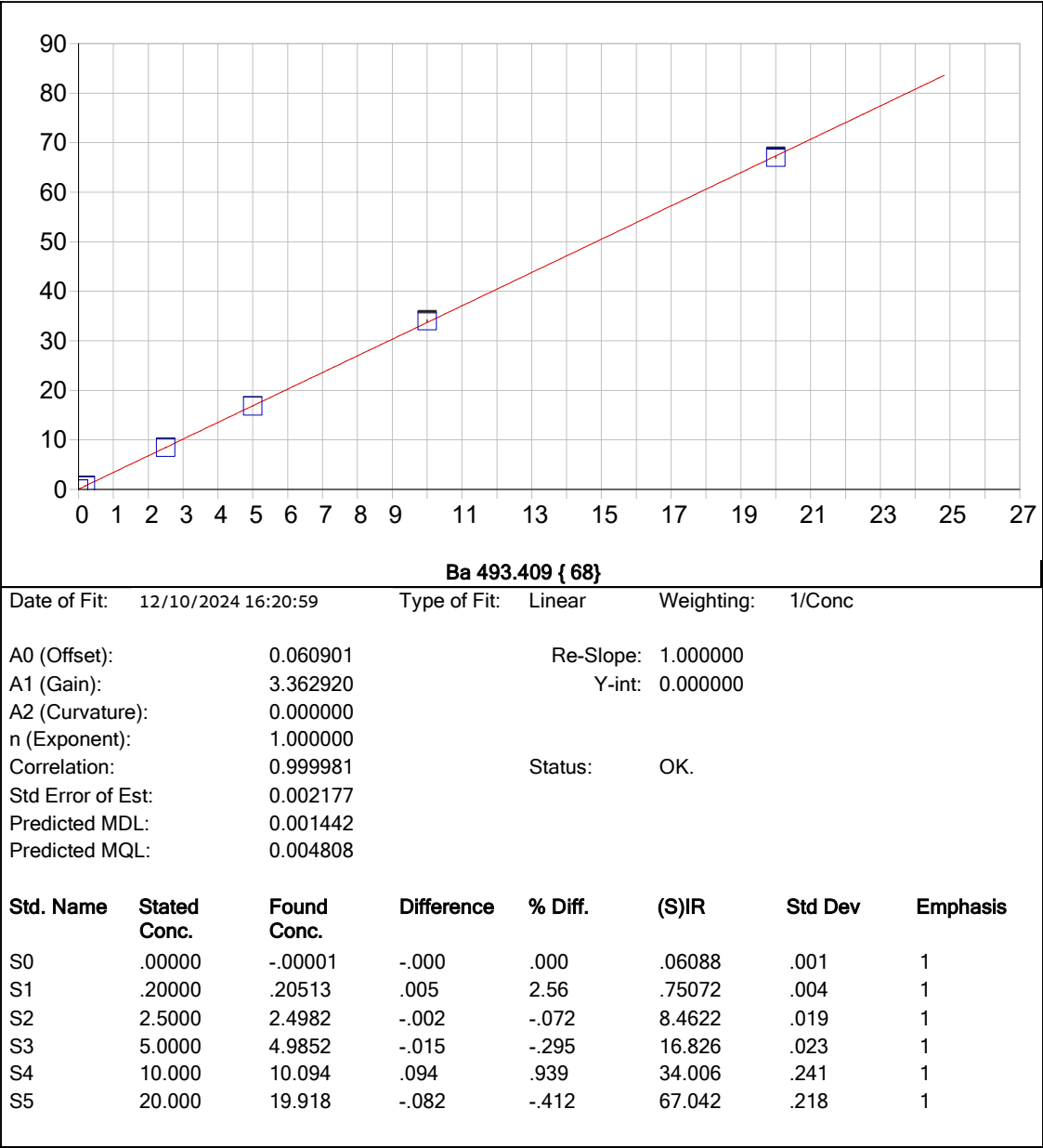


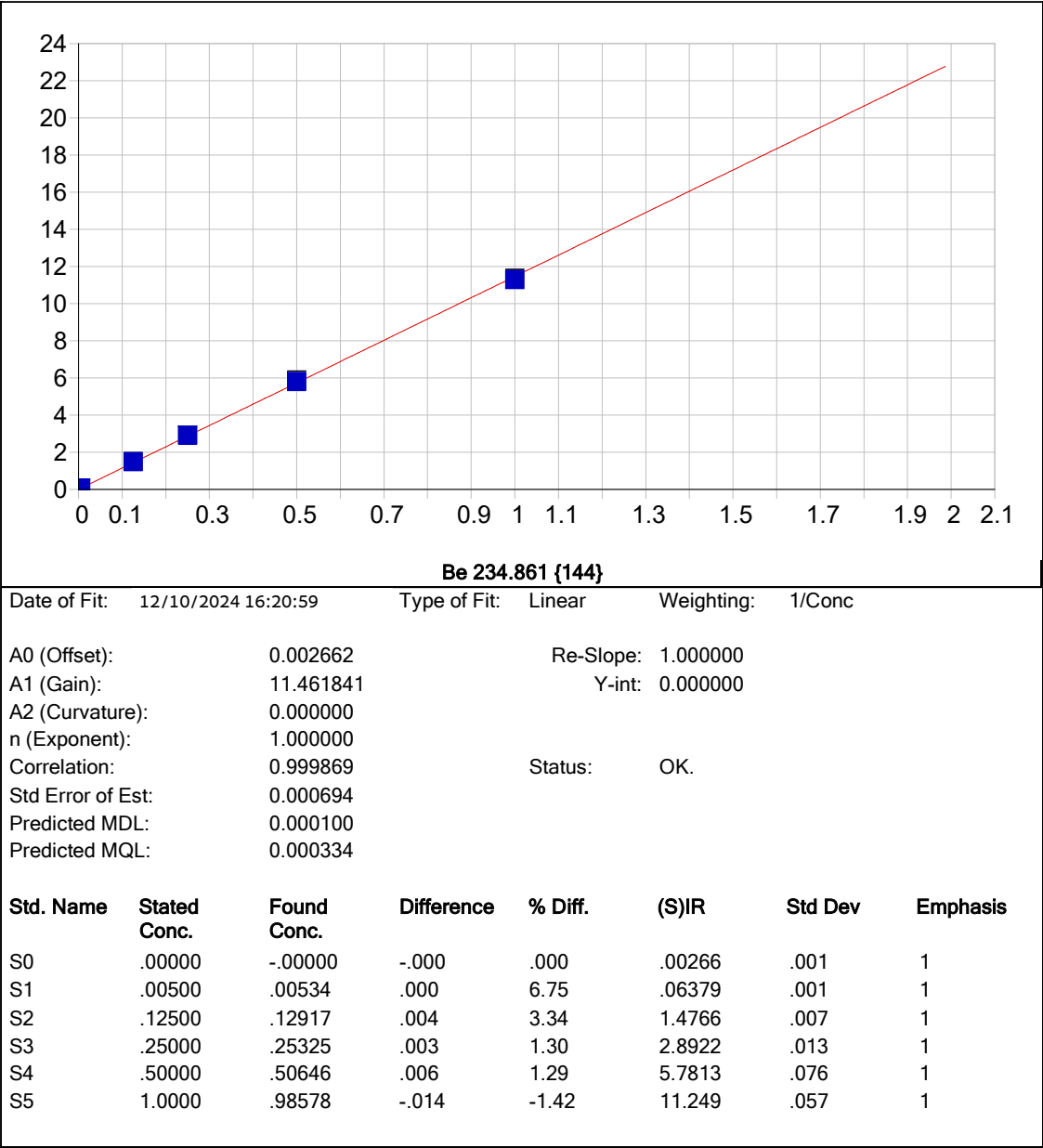


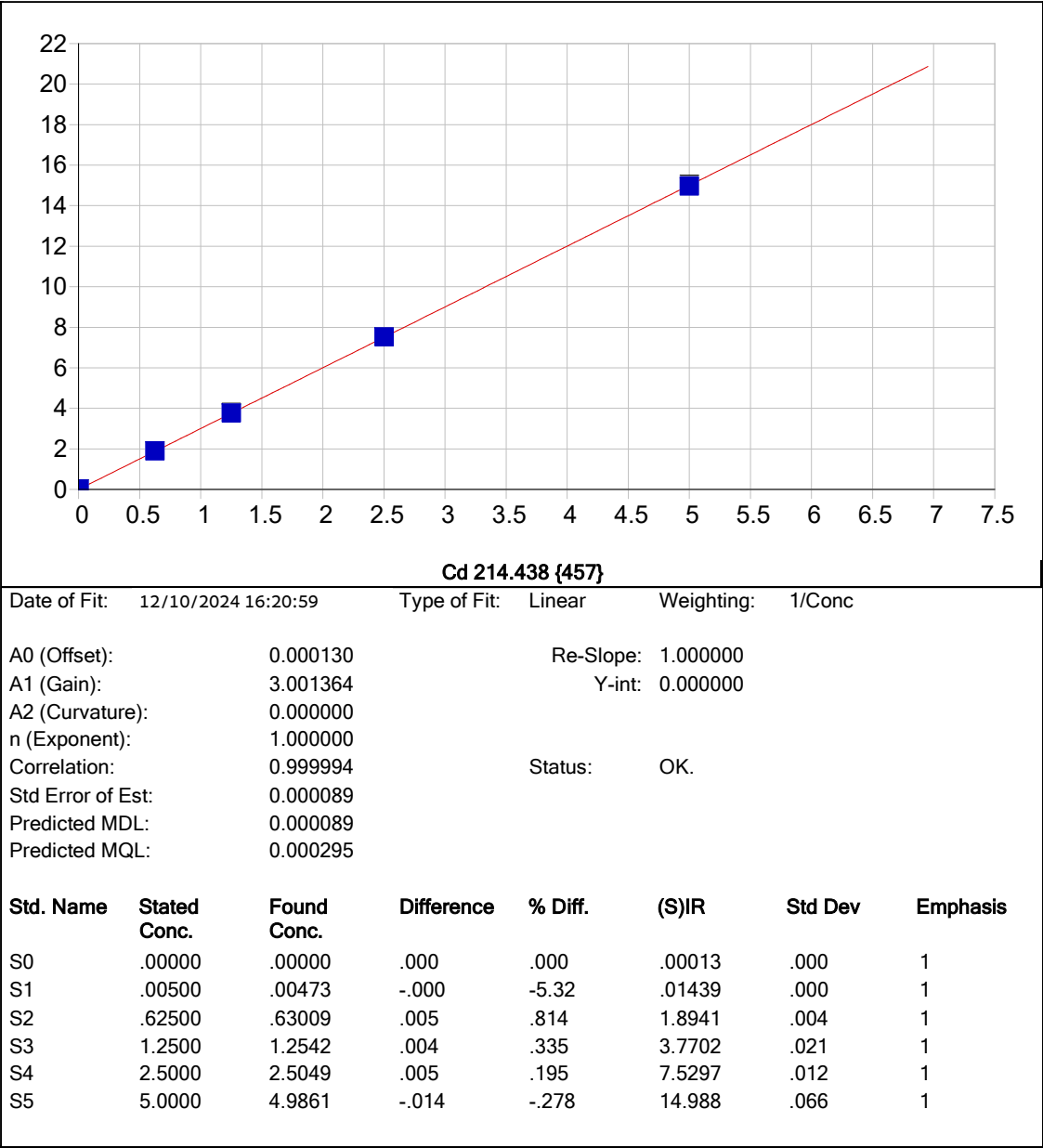


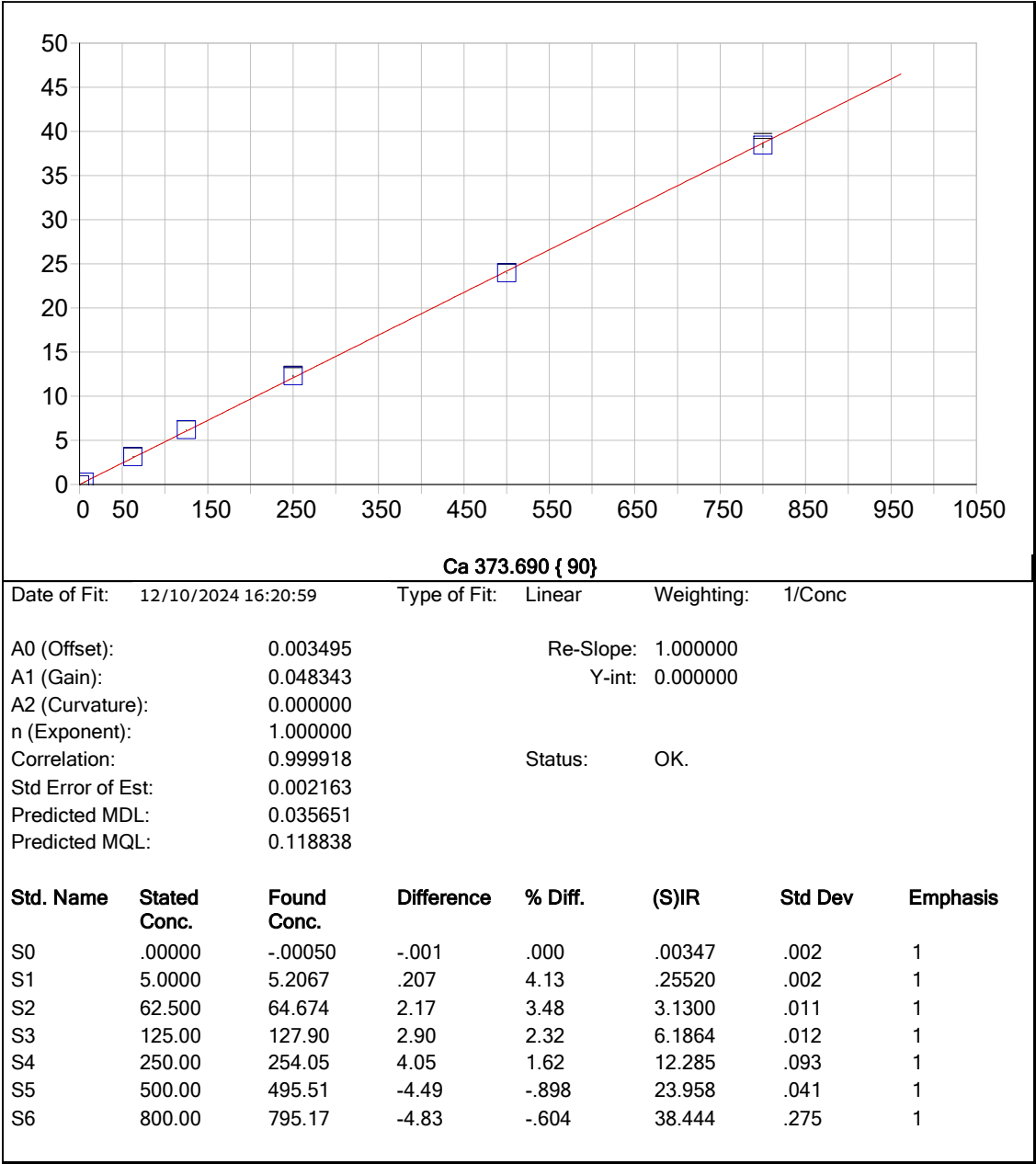


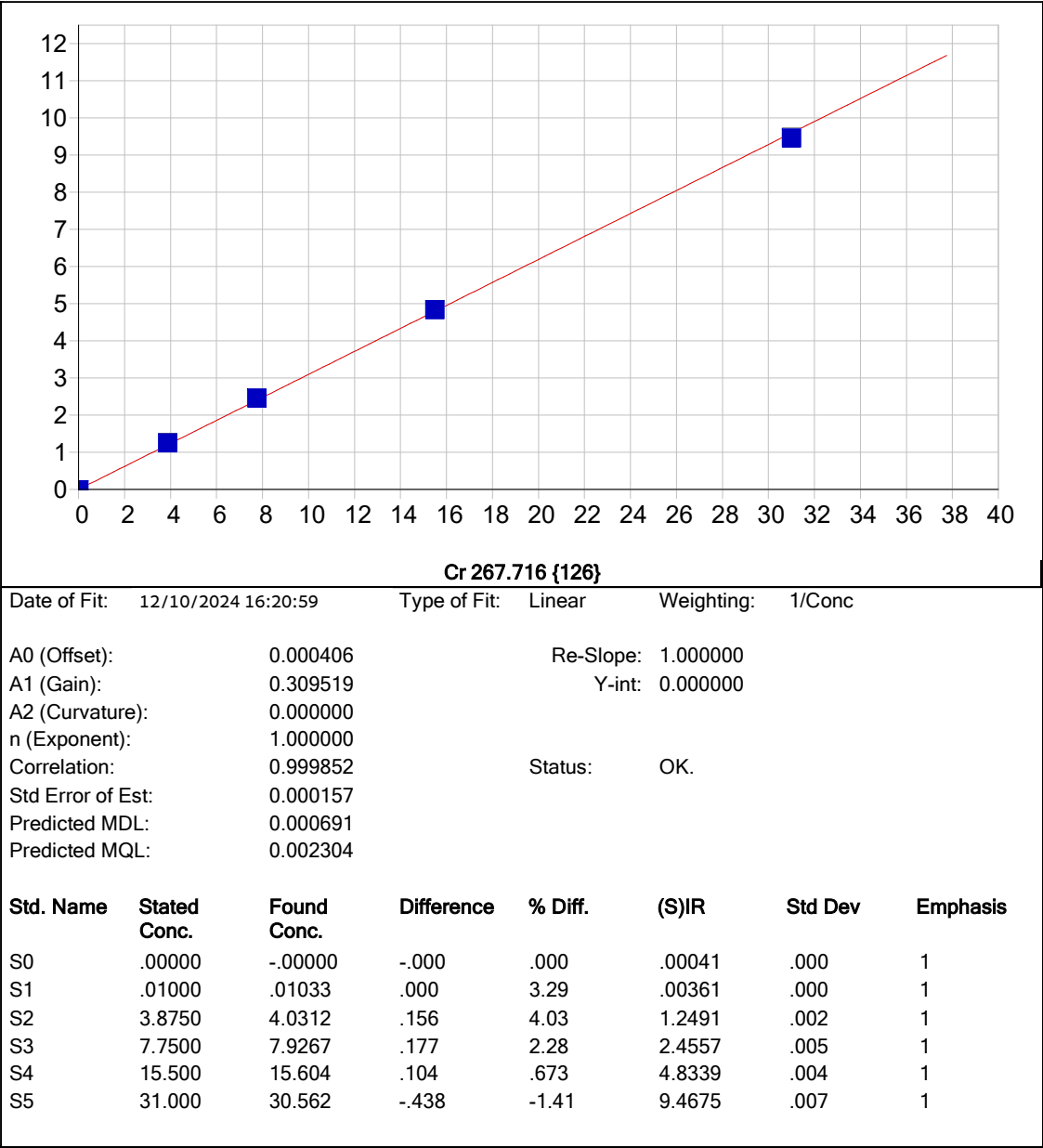


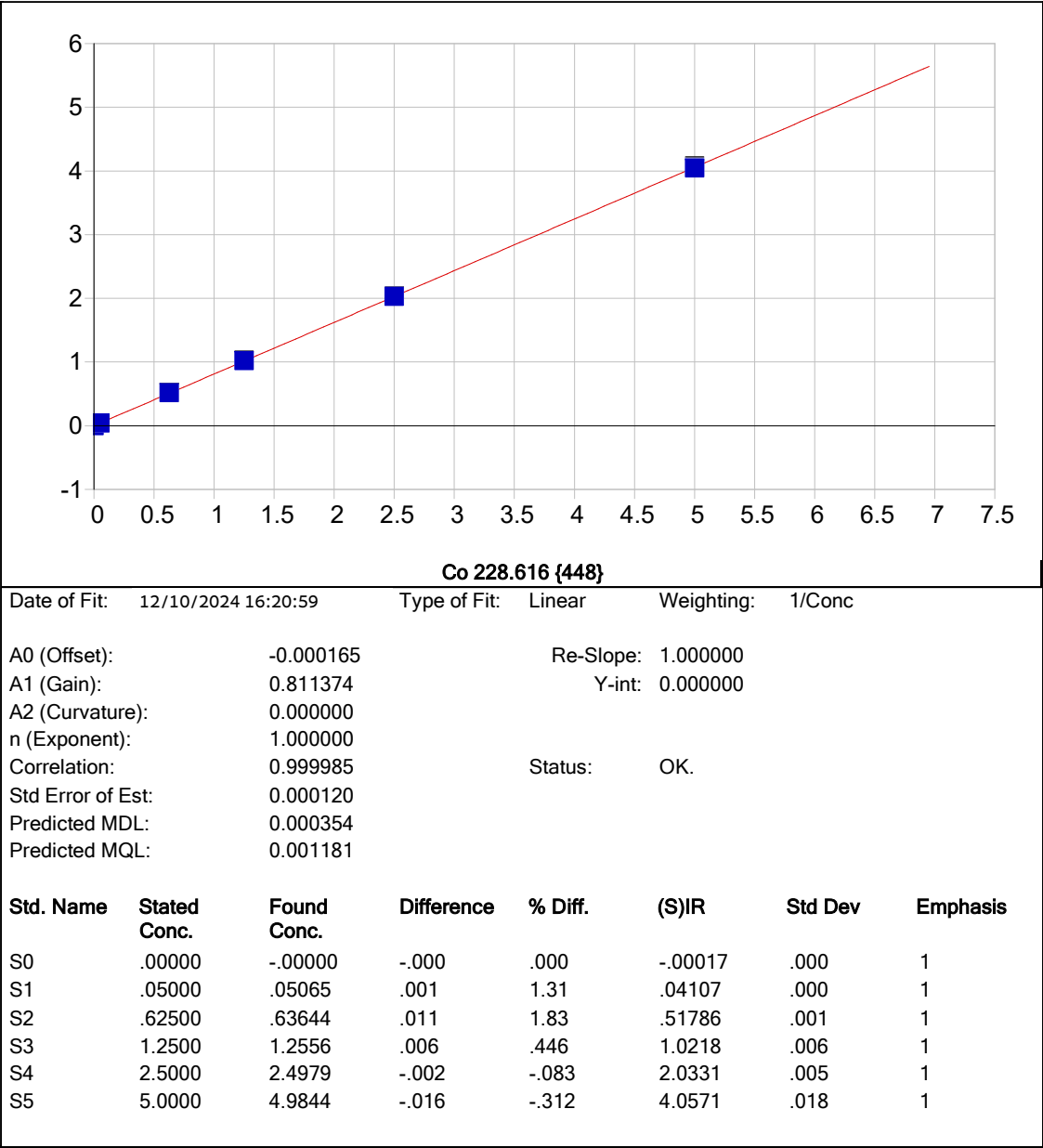


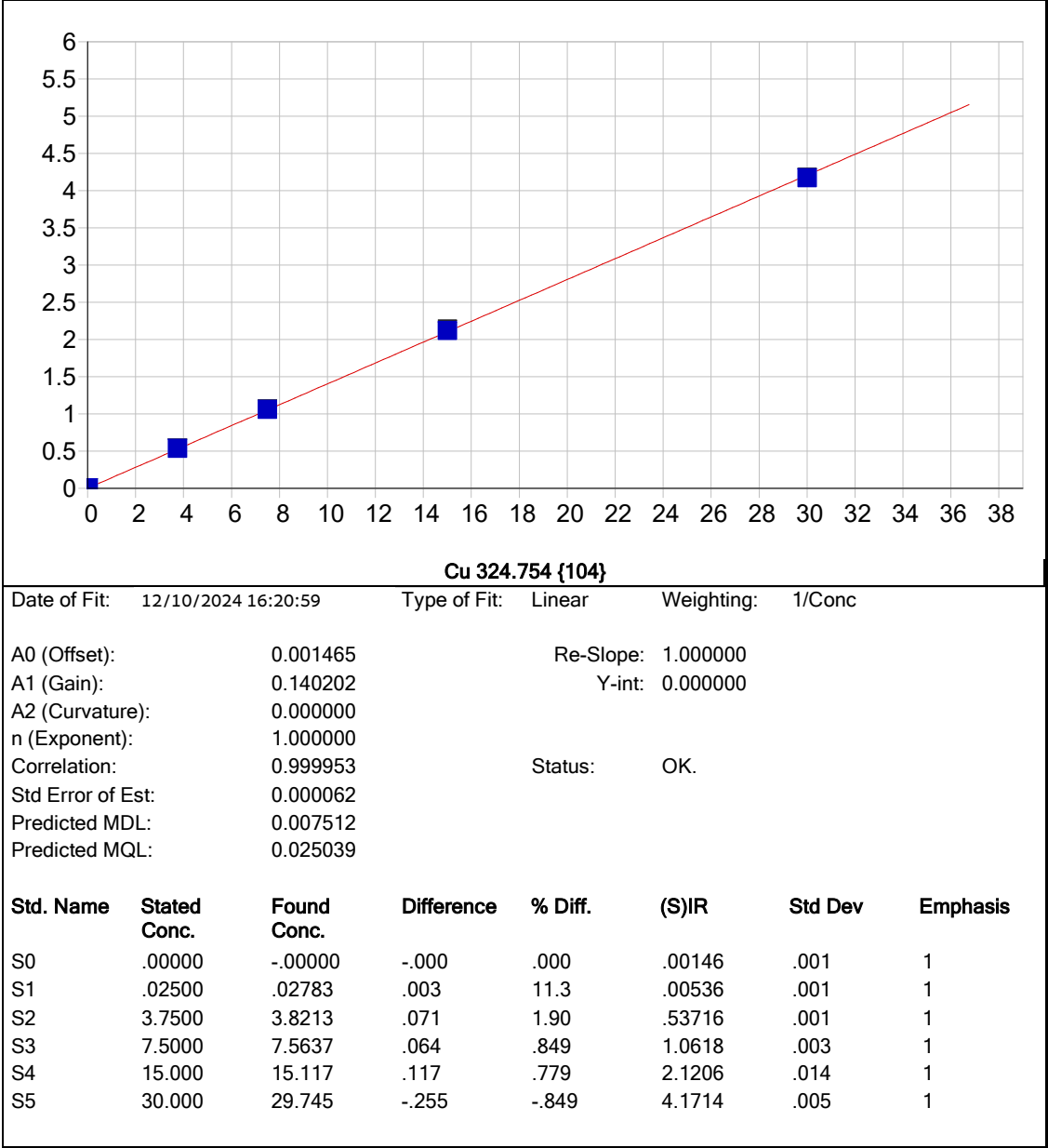


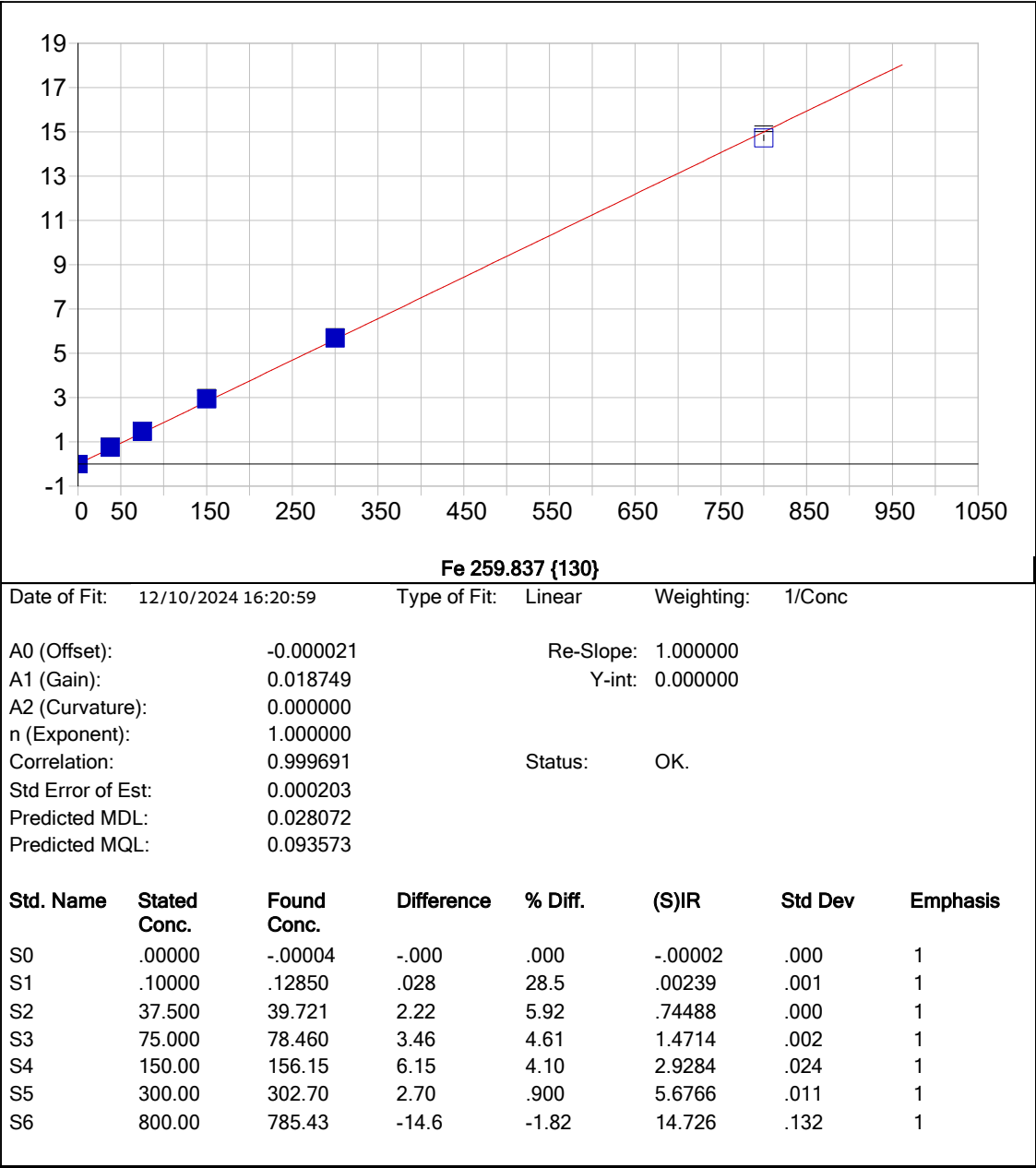


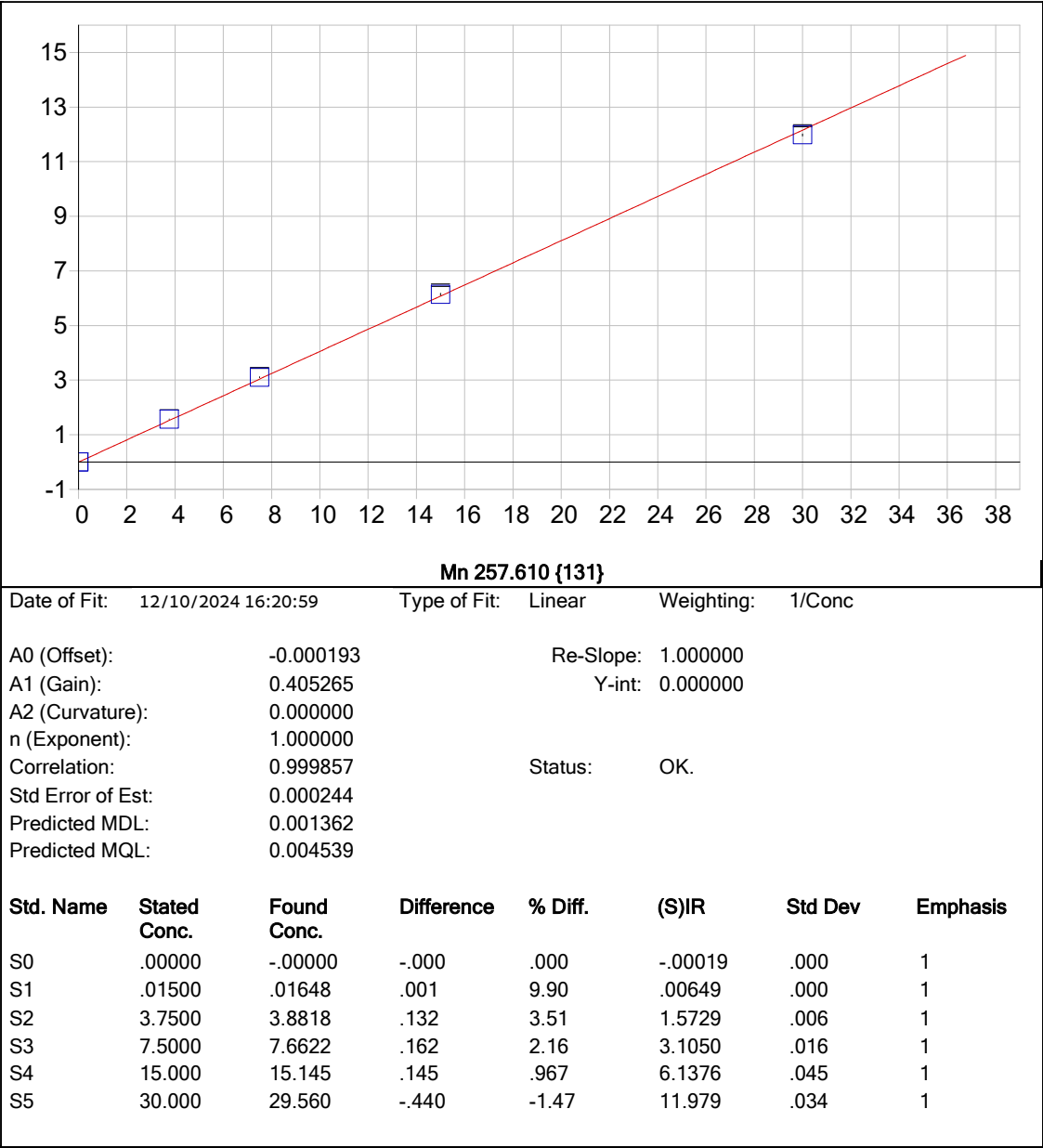


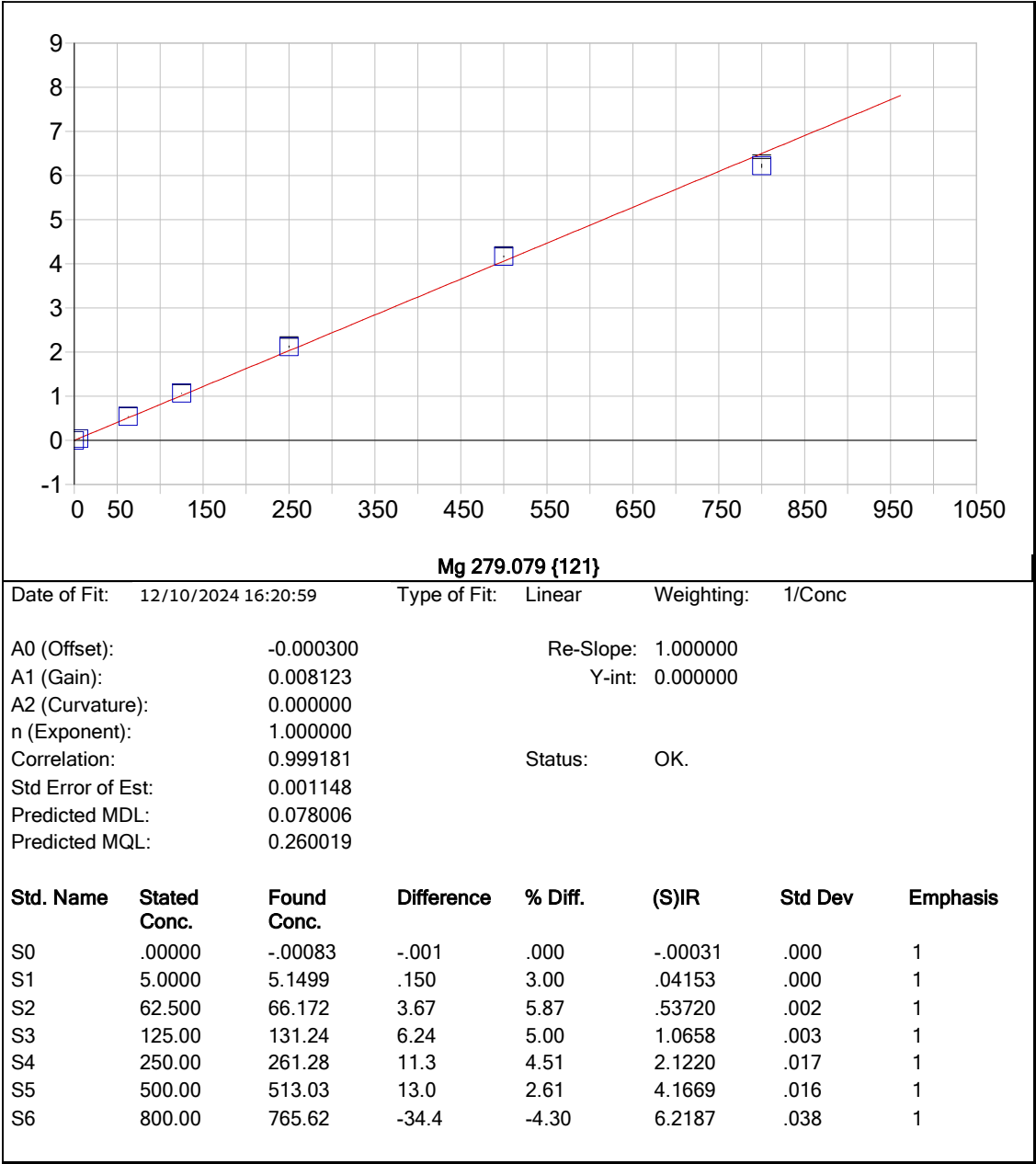


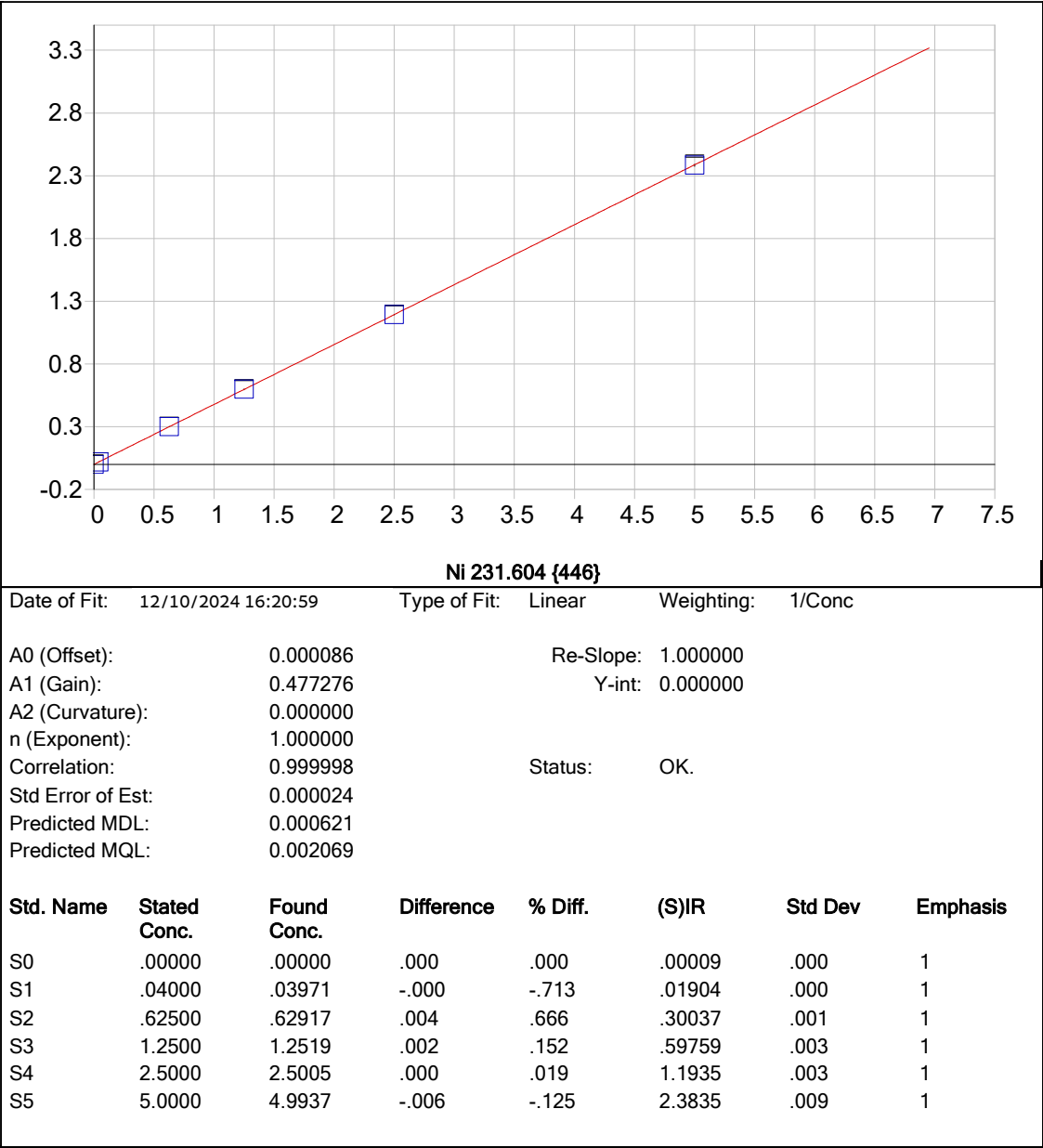


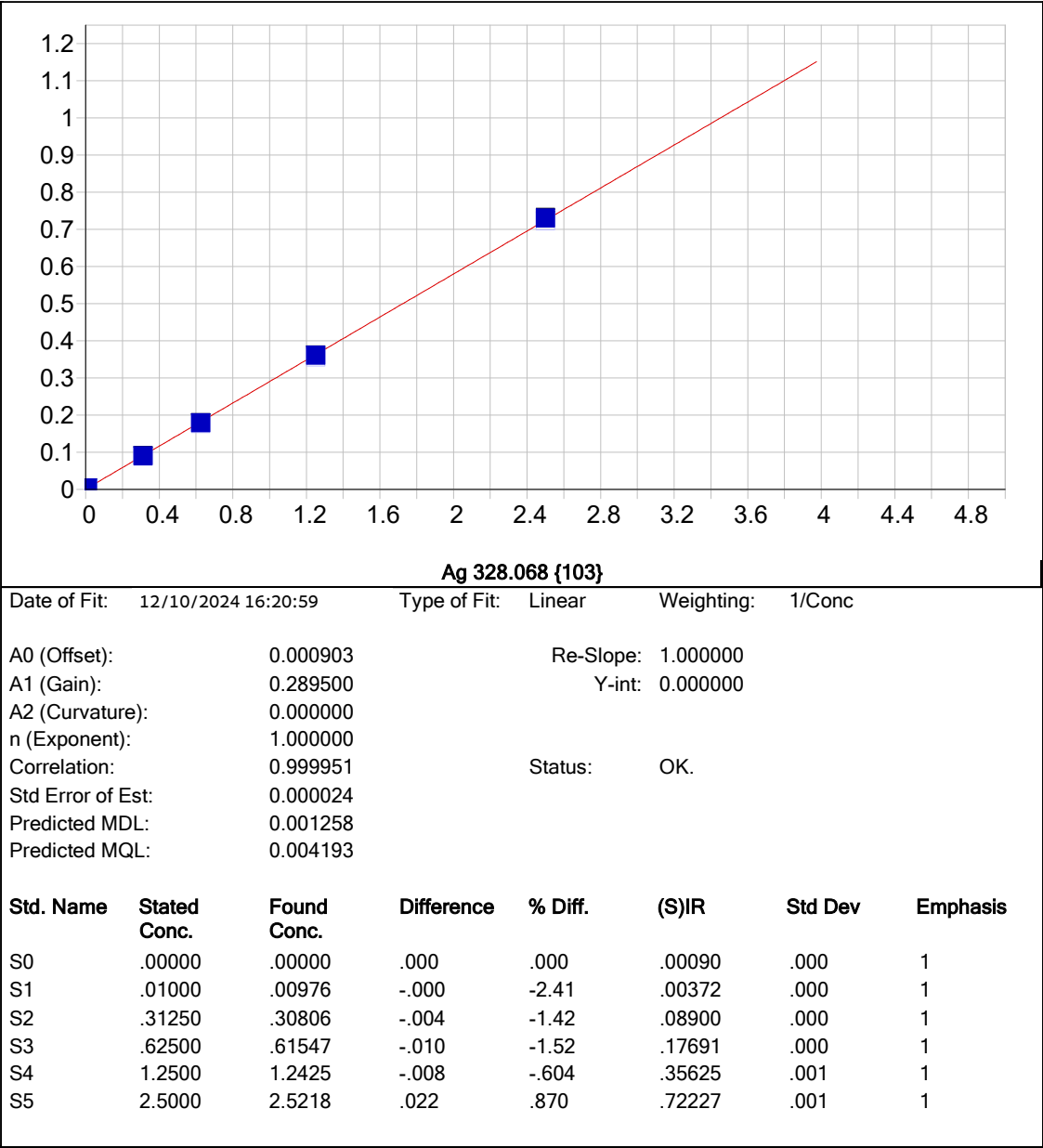


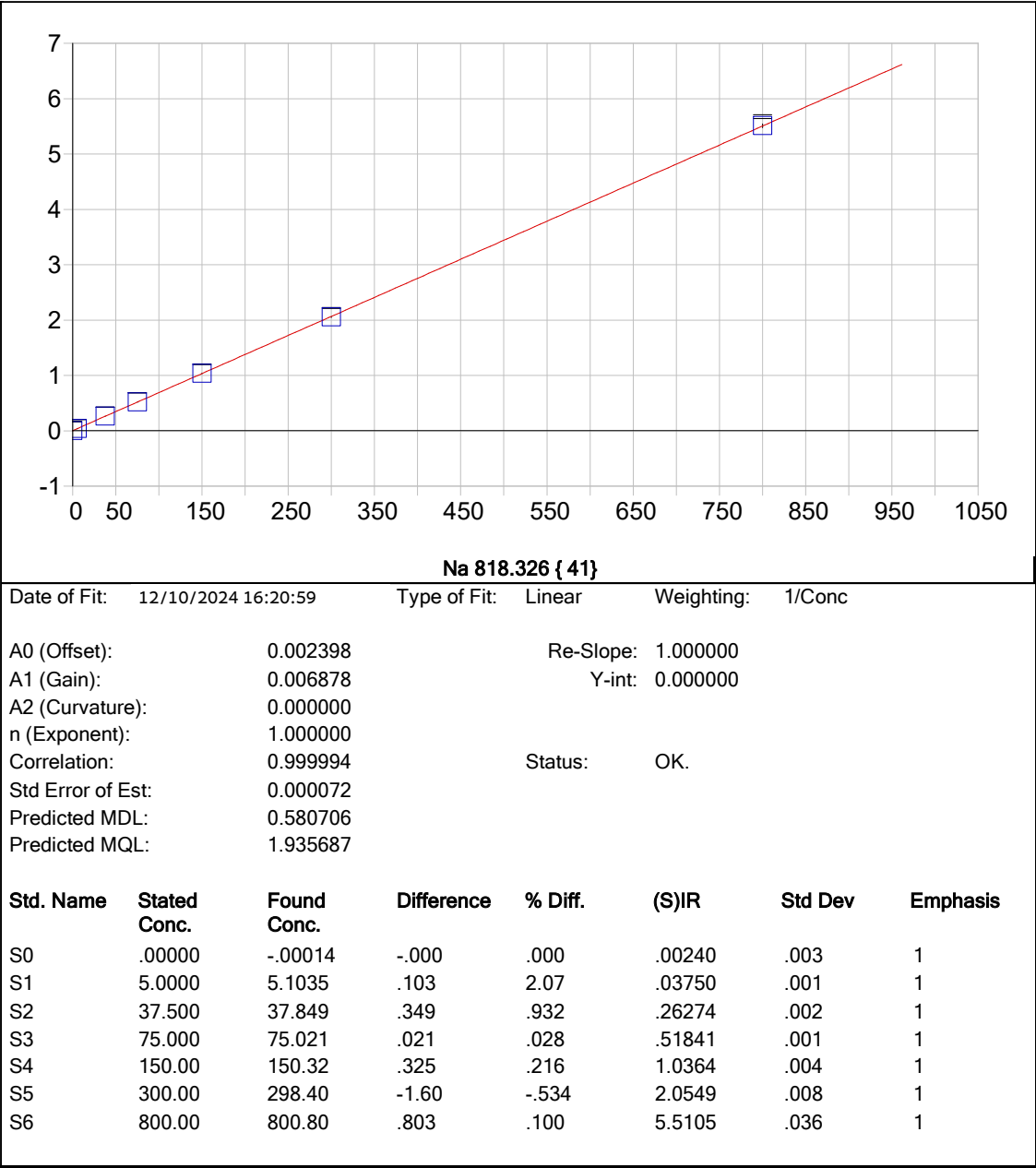


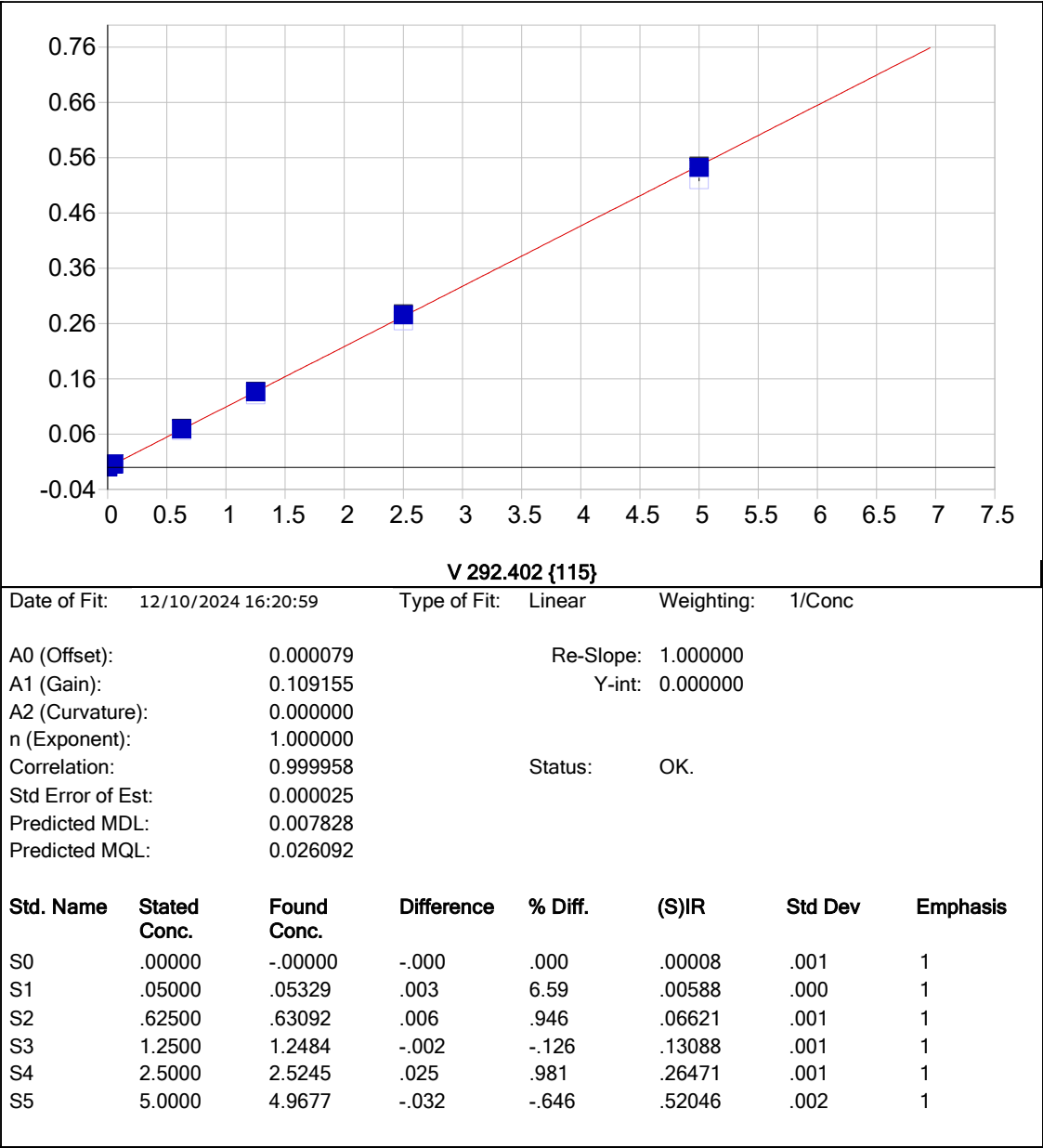


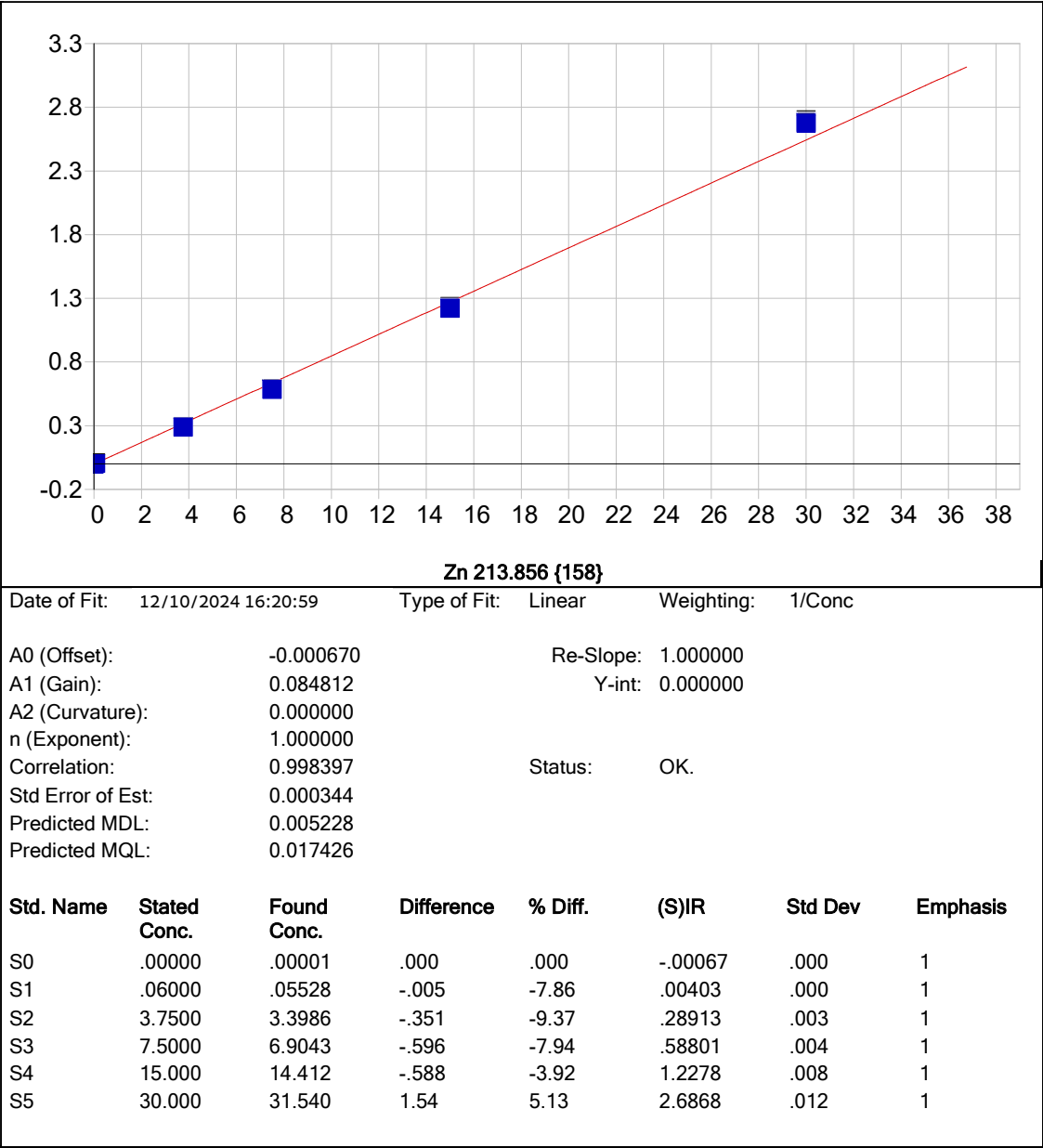


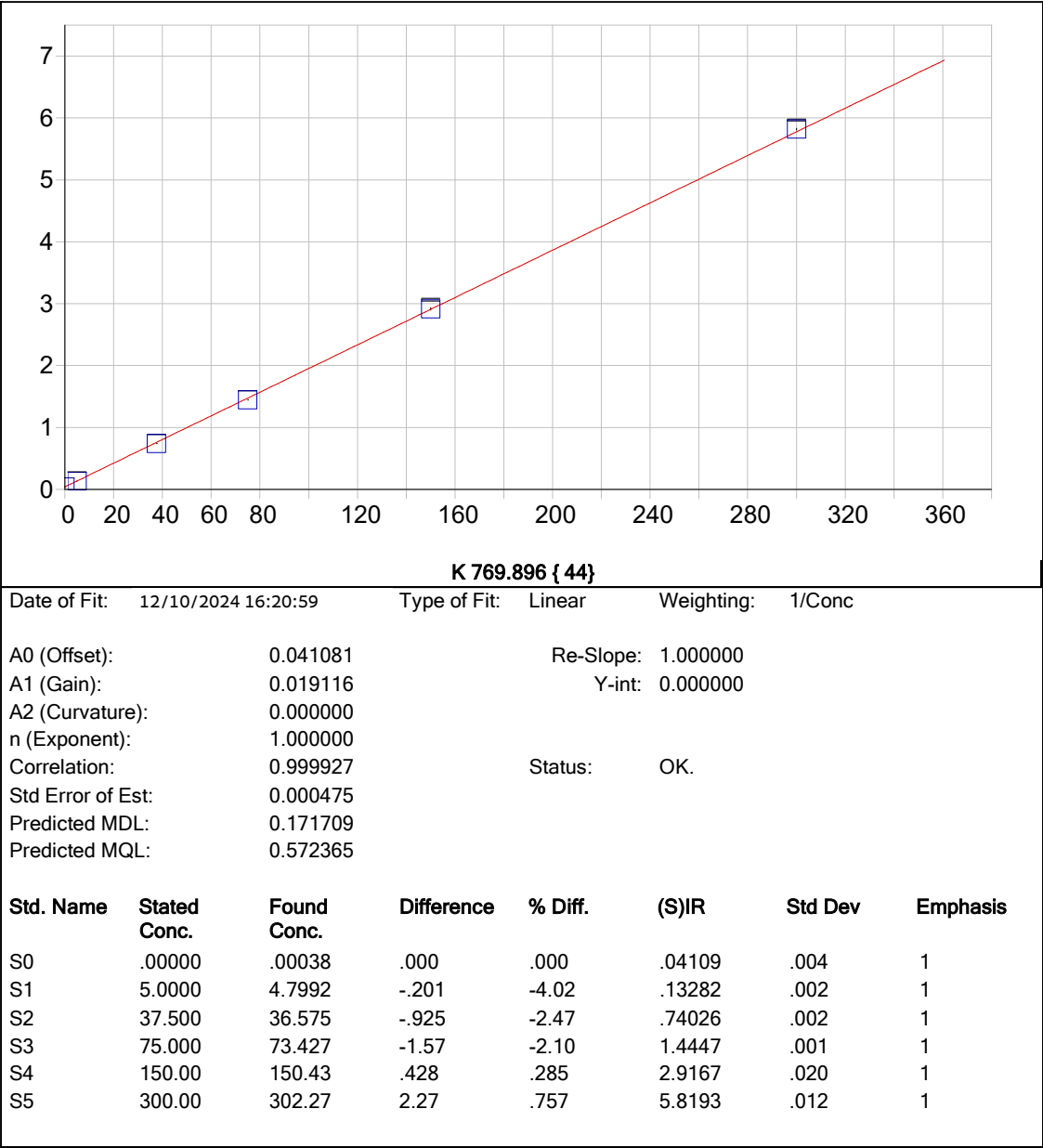


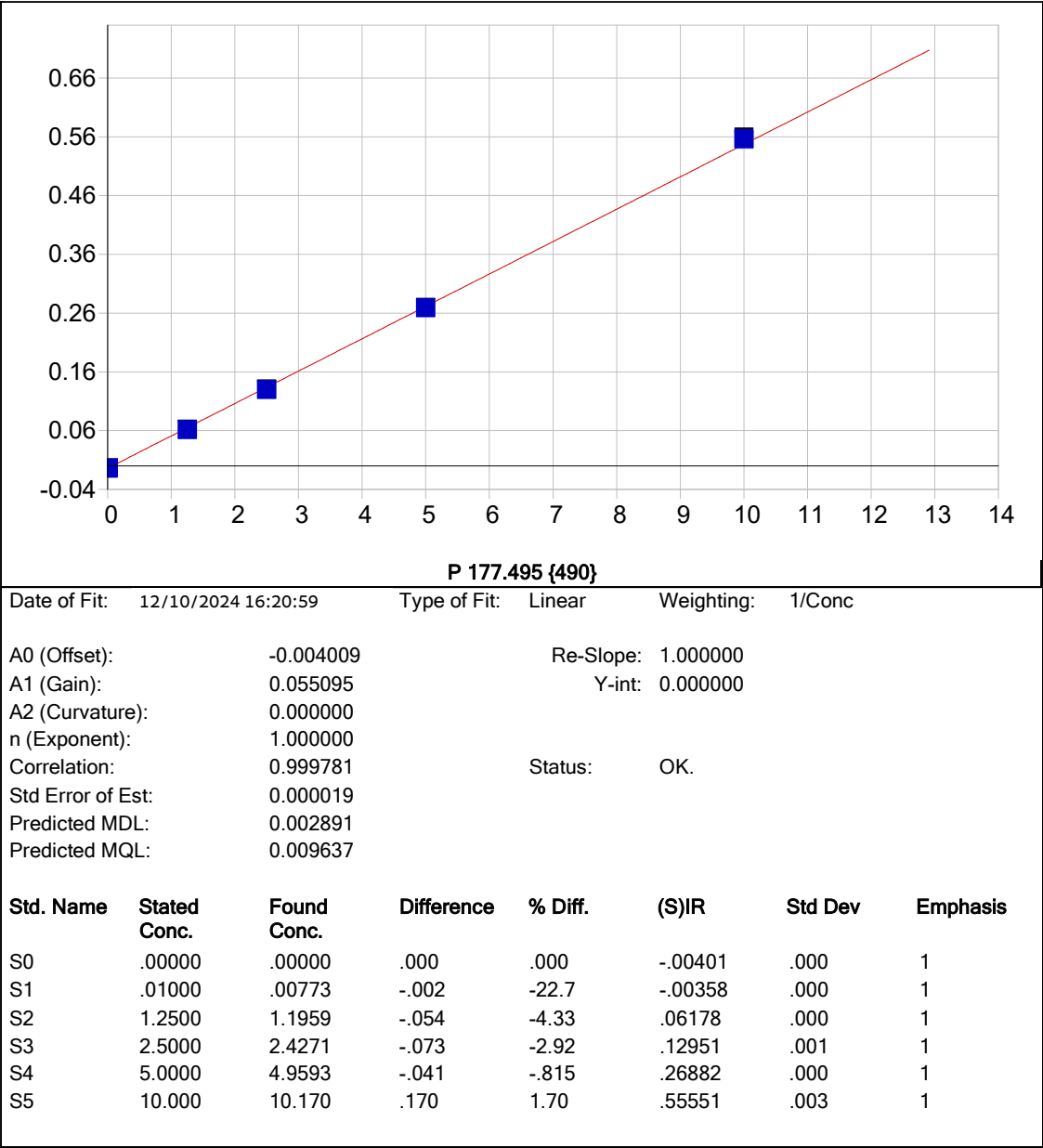


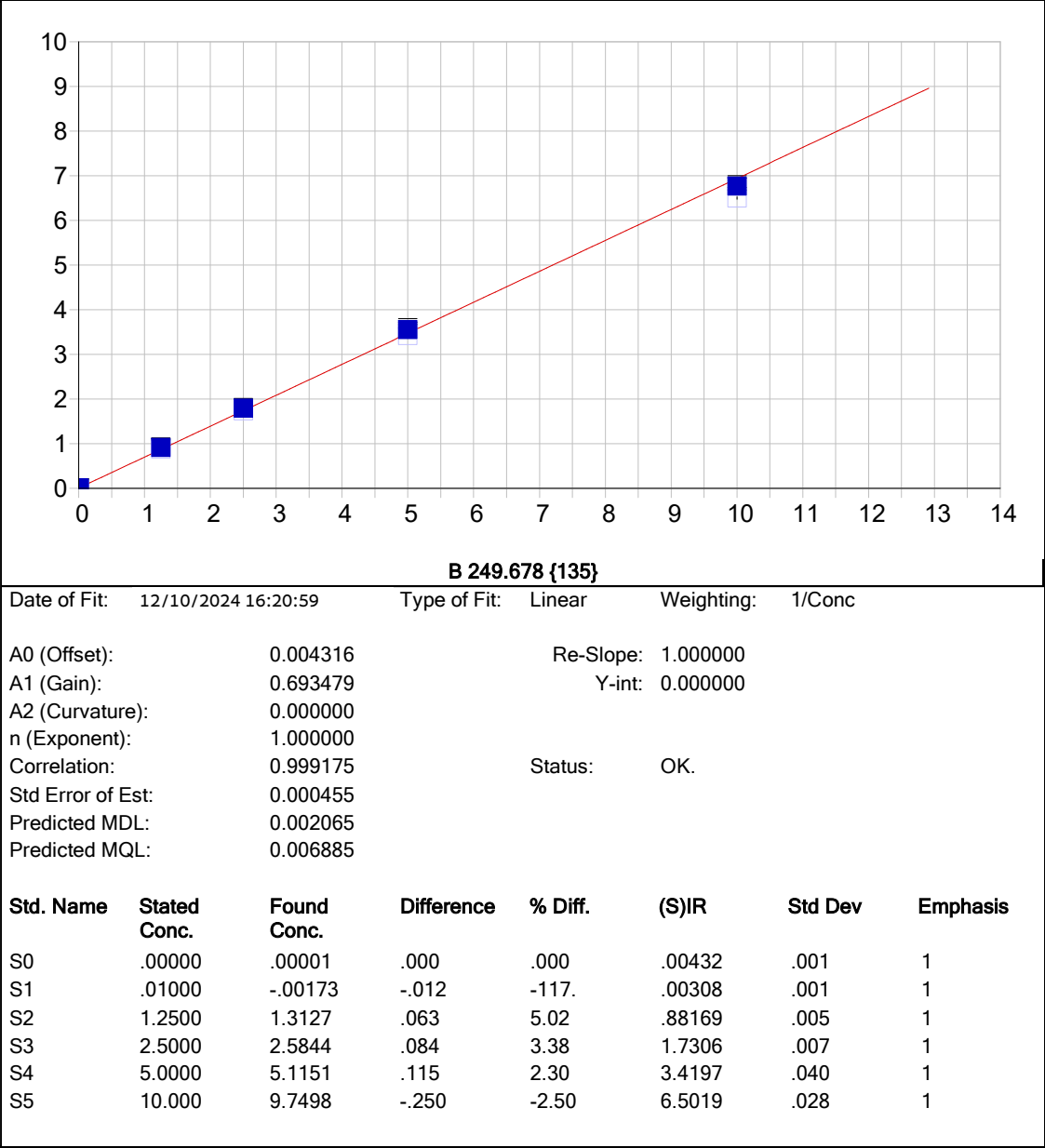


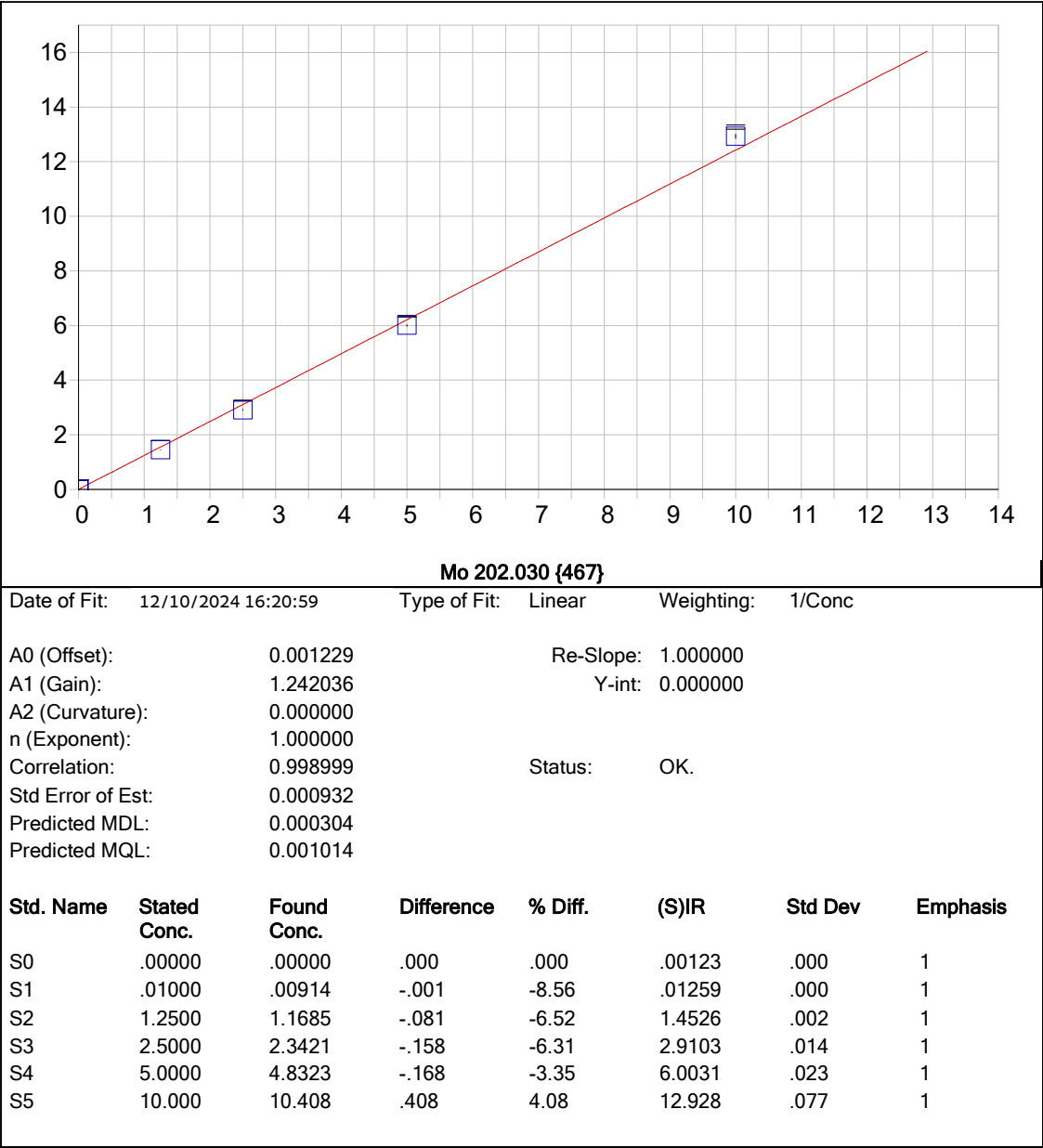


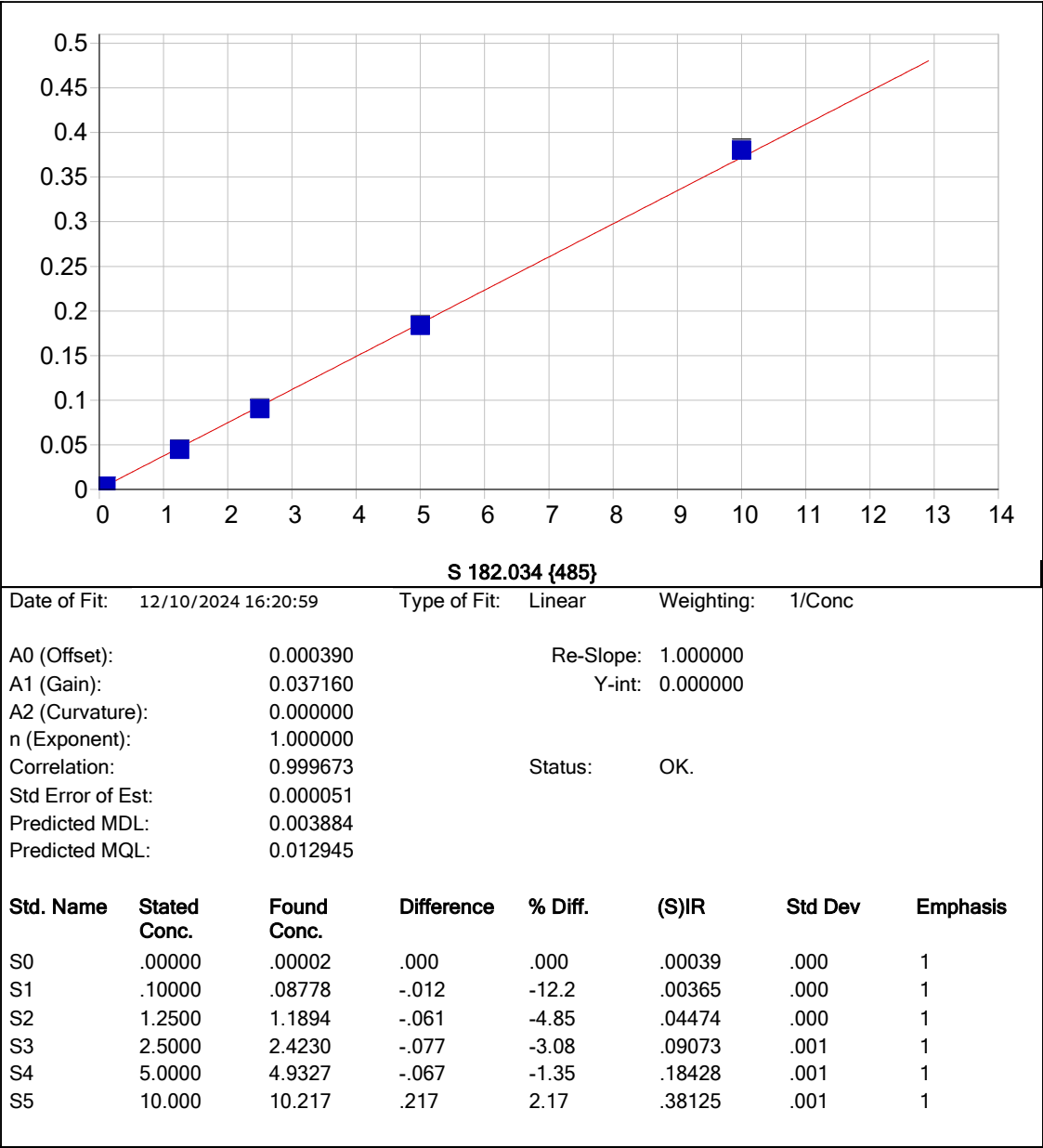


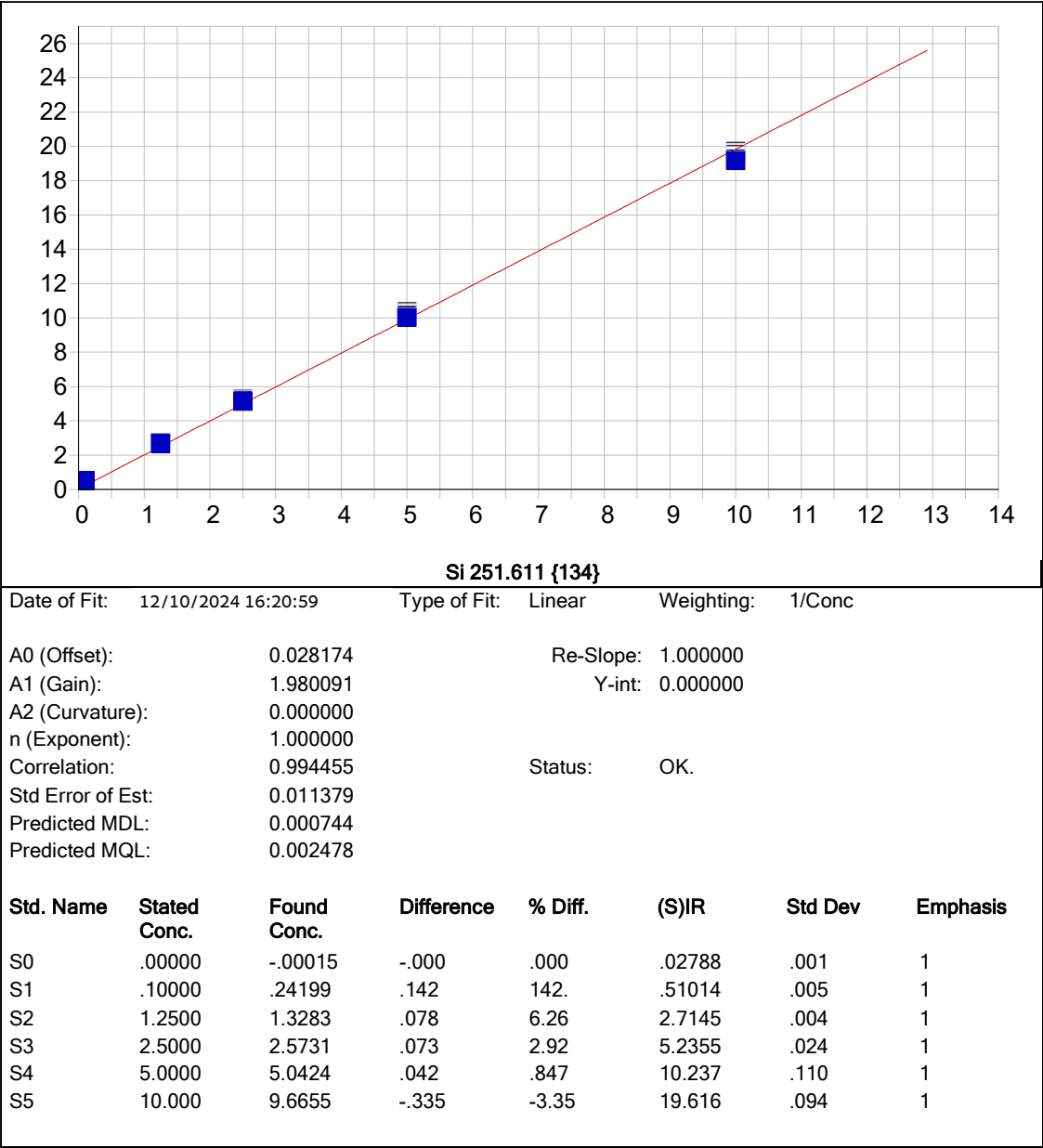


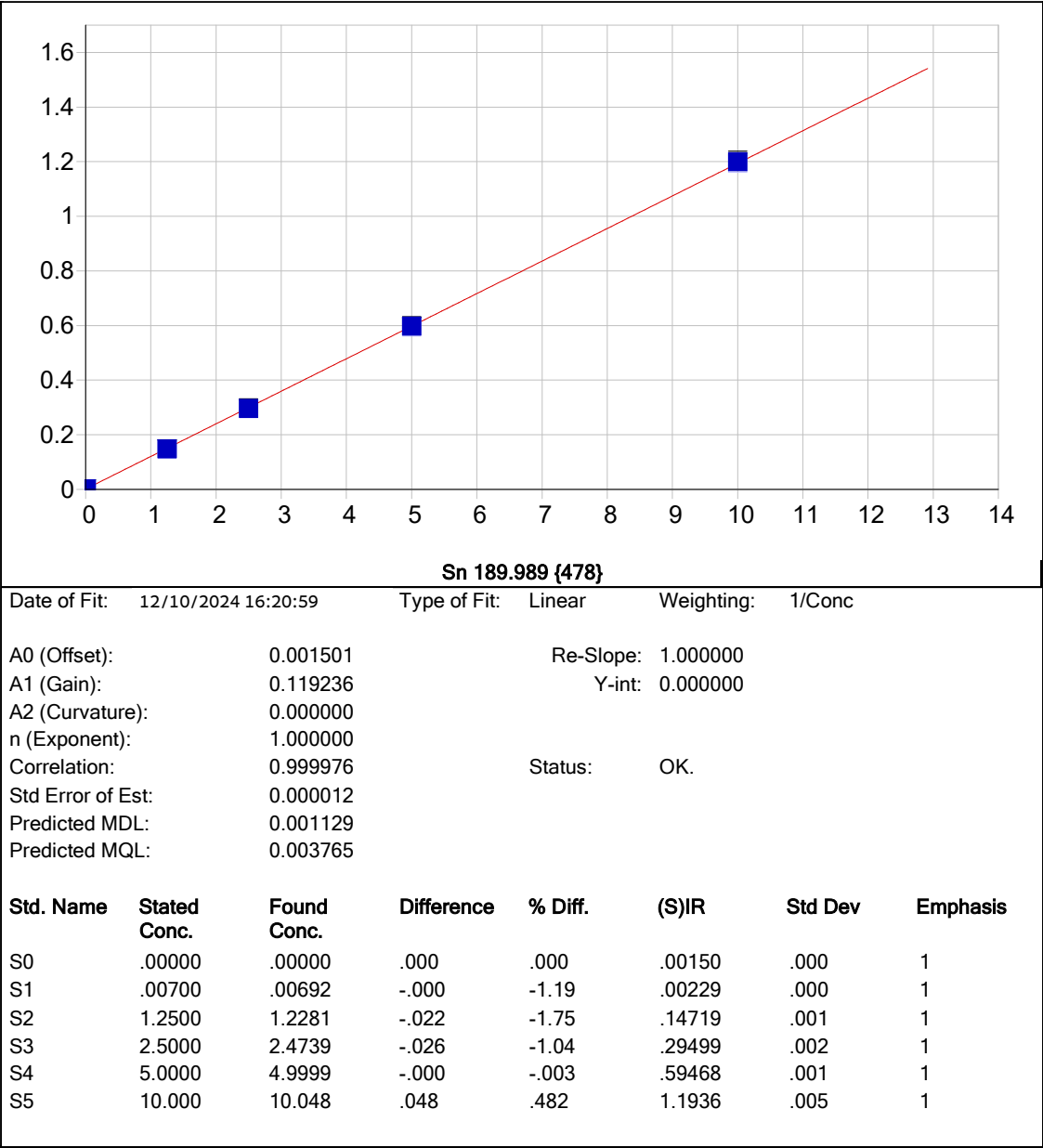


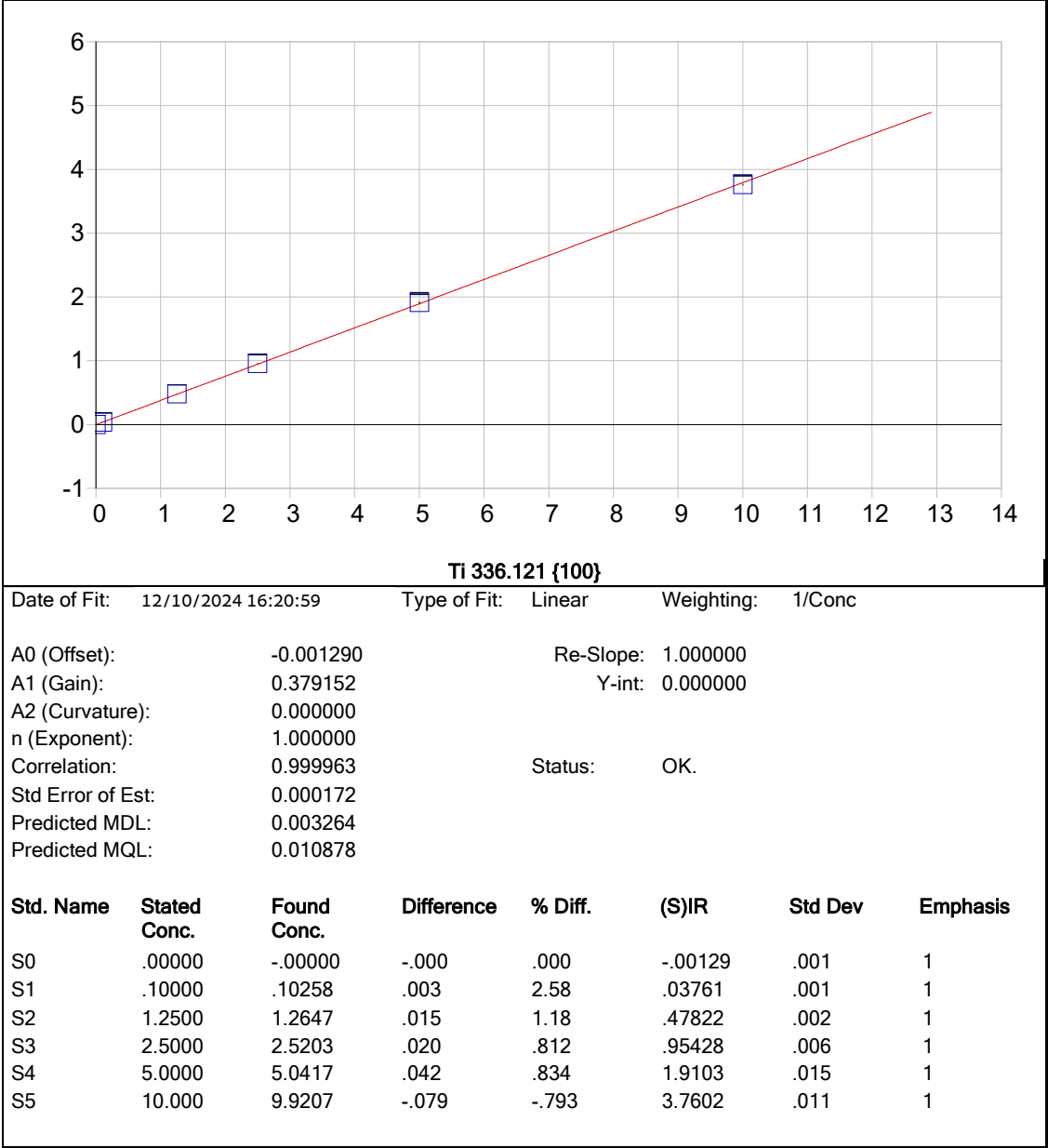


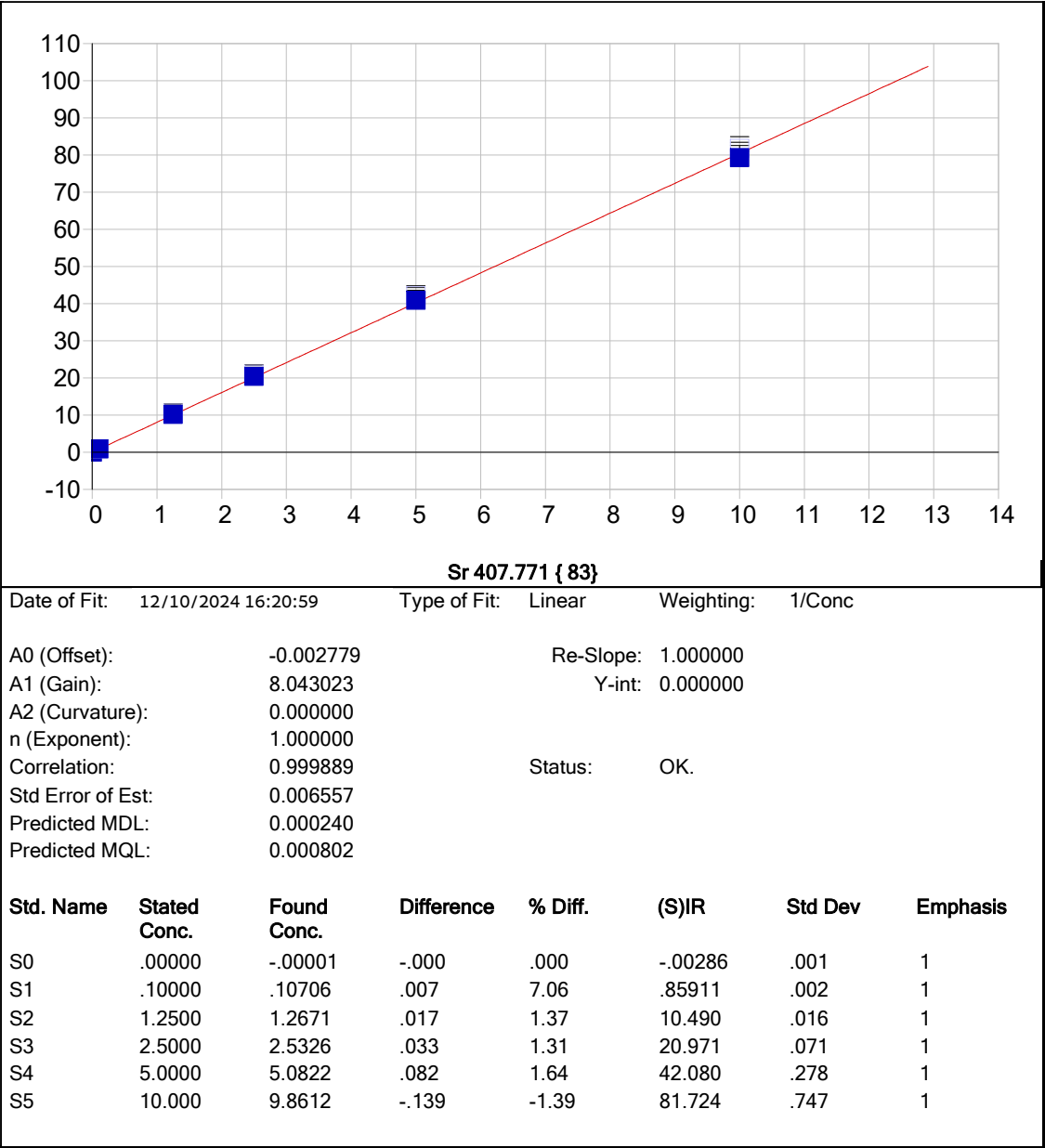


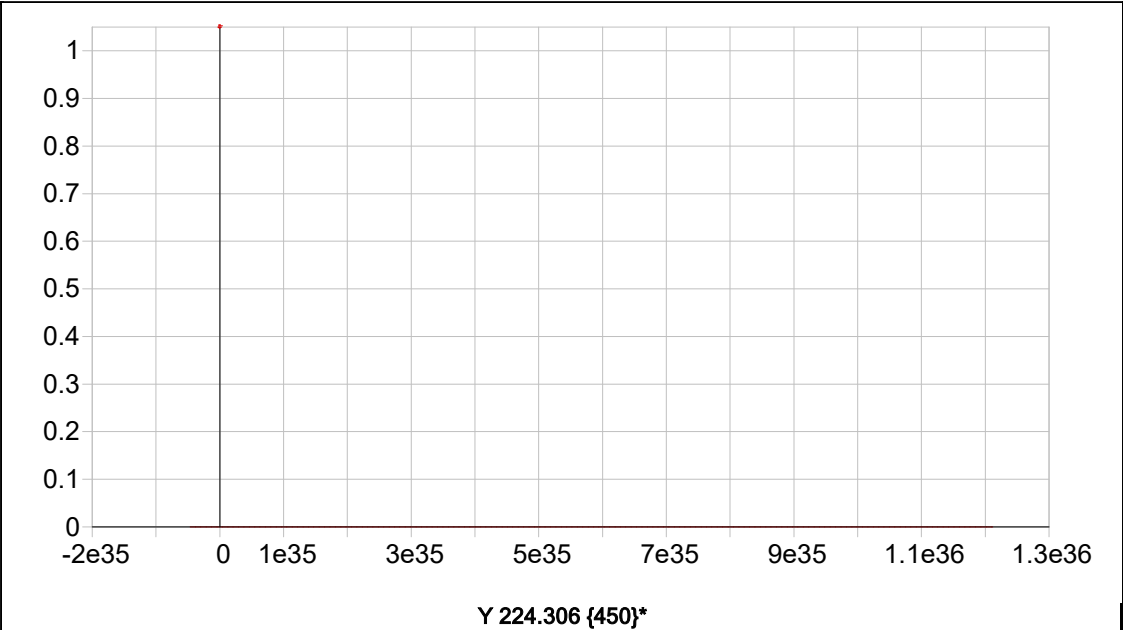




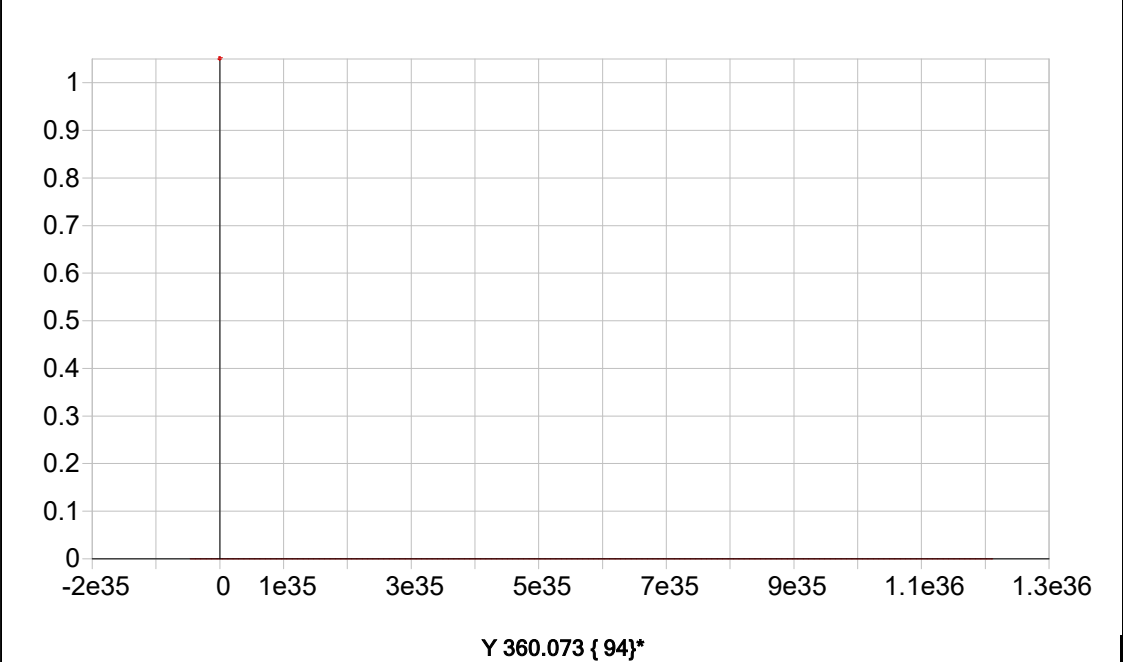




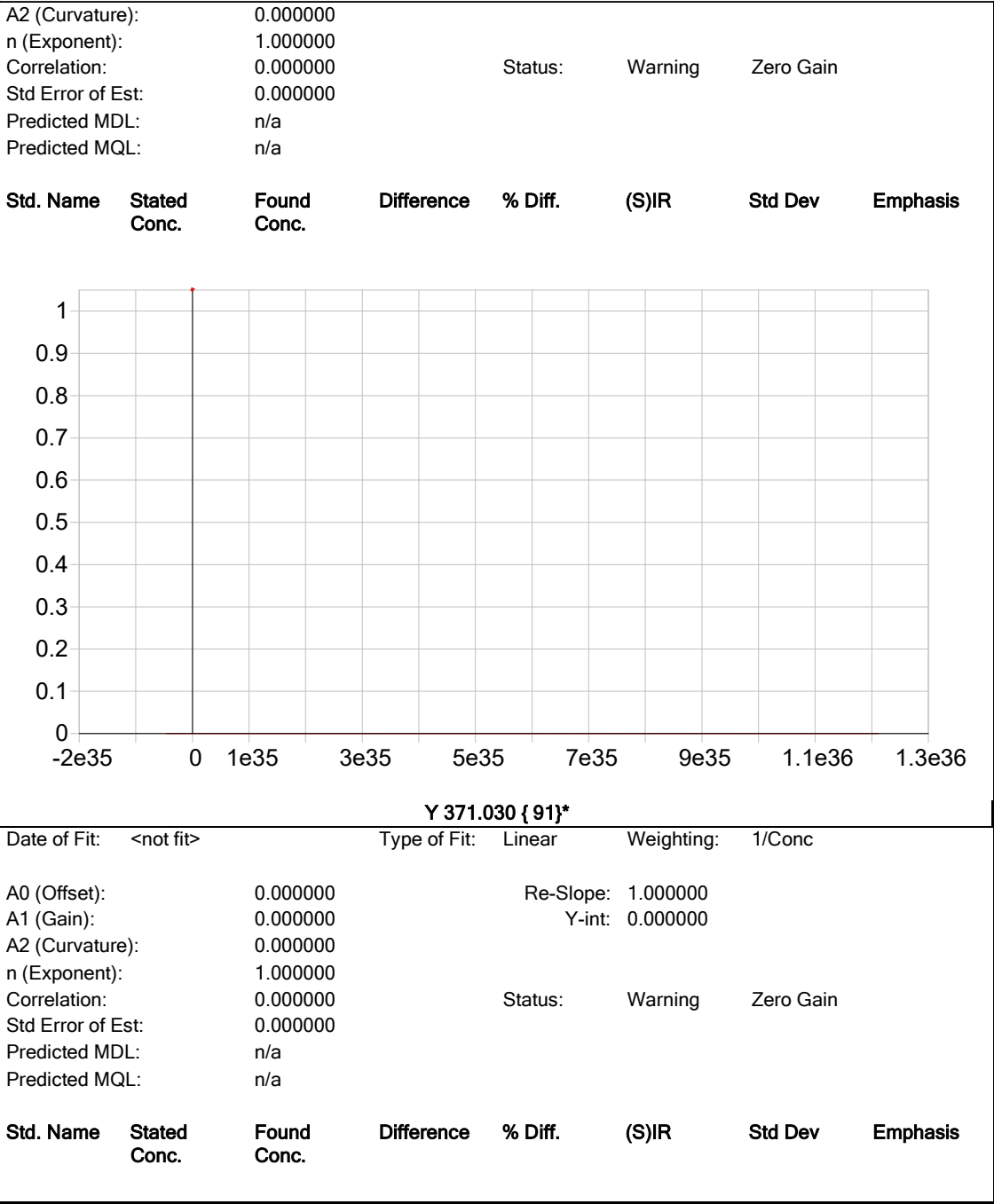


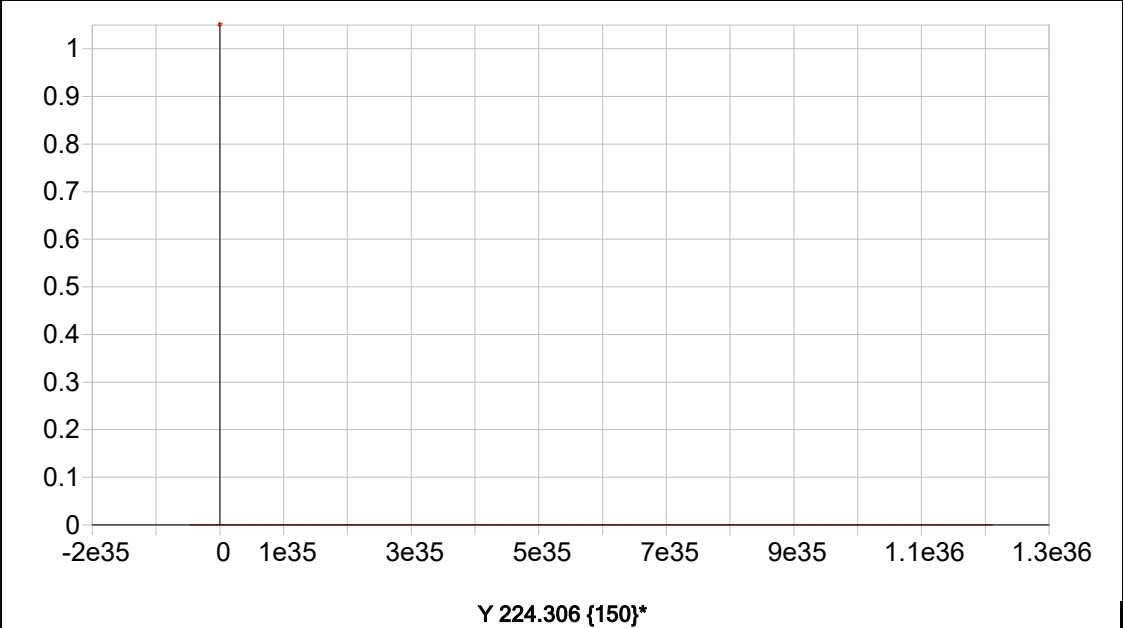


Date of Fit:	<not fit>		Type of Fit:	Linear	Weighting:	1/Conc	
A0 (Offset):	0.000000		Re-Slope:	1.000000			
A1 (Gain):	0.000000		Y-int:	0.000000			
A2 (Curvature):	0.000000						
n (Exponent):	1.000000						
Correlation:	0.000000		Status:	Warning	Zero Gain		
Std Error of Est:	0.000000						
Predicted MDL:	n/a						
Predicted MQL:	n/a						
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis

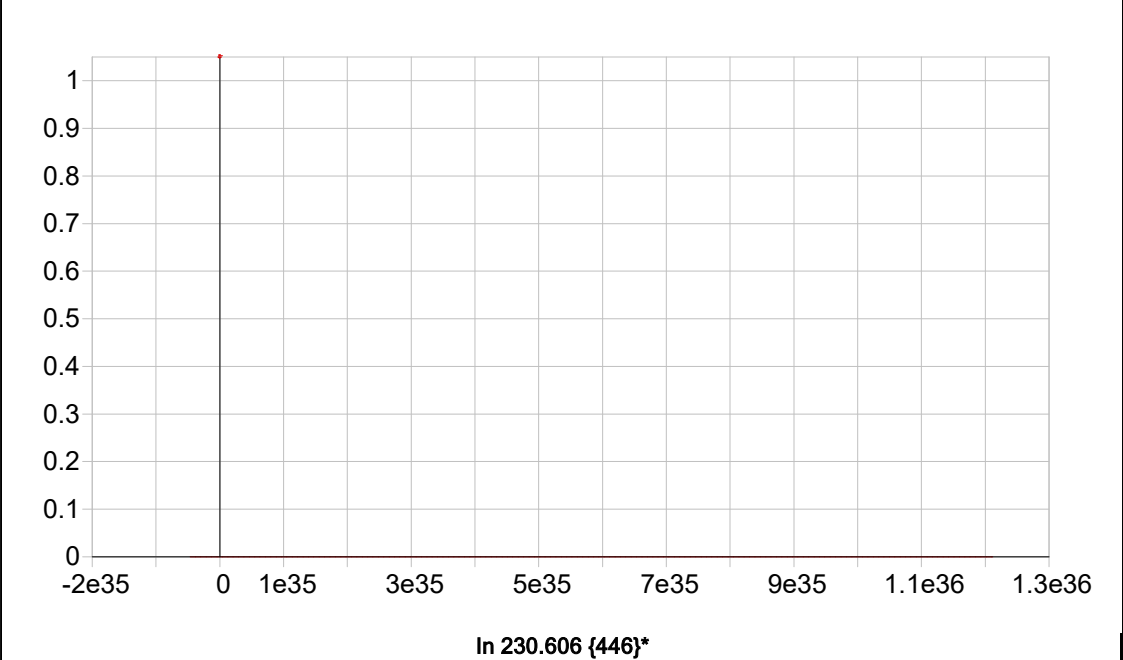


Date of Fit:	<not fit>		Type of Fit:	Linear	Weighting:	1/Conc	
A0 (Offset):	0.000000		Re-Slope:	1.000000			
A1 (Gain):	0.000000		Y-int:	0.000000			

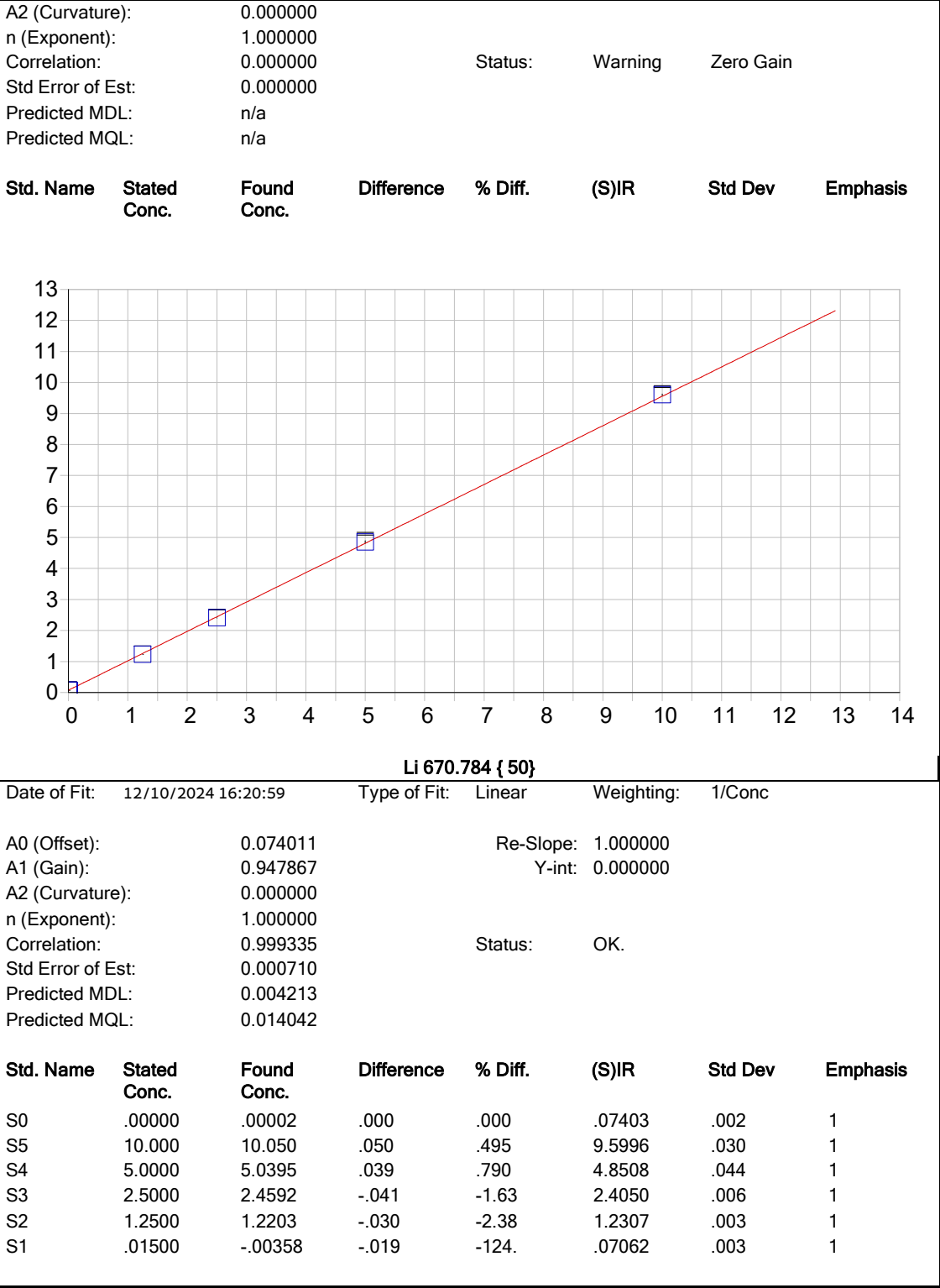




Date of Fit:	<not fit>		Type of Fit:	Linear	Weighting:	1/Conc	
A0 (Offset):	0.000000		Re-Slope:	1.000000			
A1 (Gain):	0.000000		Y-int:	0.000000			
A2 (Curvature):	0.000000						
n (Exponent):	1.000000						
Correlation:	0.000000		Status:	Warning	Zero Gain		
Std Error of Est:	0.000000						
Predicted MDL:	n/a						
Predicted MQL:	n/a						
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis



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



Sample Name: S0 Acquired: 12/10/2024 15:54:09 Type: Cal
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S0 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934	Be2348
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.48326	-.00019	.00047	-.00021	.00020	-.00038	.06088	.00266
Stddev	.48277	.00012	.00024	.00028	.00037	.00120	.00124	.00106
%RSD	99.900	64.400	49.878	130.58	187.84	318.94	2.0368	39.736
#1	.38681	-.00021	.00071	-.00048	.00061	.00062	.05993	.00380
#2	.05599	-.00029	.00048	.00007	.00009	-.00171	.06229	.00244
#3	1.0070	-.00006	.00023	-.00023	-.00011	-.00004	.06043	.00172
Elem	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00013	.00347	.00041	-.00017	.00146	-.00002	-.00019	-.00031
Stddev	.00004	.00211	.00005	.00005	.00053	.00029	.00035	.00033
%RSD	29.144	60.717	12.041	32.963	36.015	1320.0	179.14	106.80
#1	.00010	.00527	.00044	-.00014	.00200	-.00019	.00020	-.00024
#2	.00012	.00399	.00043	-.00013	.00144	.00031	-.00030	-.00066
#3	.00017	.00115	.00035	-.00023	.00095	-.00019	-.00047	-.00002
Elem	Ni2316	Ag3280	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00009	.00090	.00240	.00008	-.00067	.04109	-.00401	.00432
Stddev	.00026	.00046	.00347	.00115	.00037	.00357	.00011	.00056
%RSD	302.14	50.599	144.62	1459.4	55.189	8.6945	2.6506	13.011
#1	.00036	.00132	-.00155	-.00055	-.00088	.04230	-.00392	.00368
#2	-.00015	.00098	.00493	-.00062	-.00024	.03707	-.00397	.00472
#3	.00005	.00041	.00382	.00140	-.00089	.04390	-.00413	.00457
Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077	Li6707	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	.00123	.00039	.02788	.00150	-.00129	-.00286	.07403	
Stddev	.00019	.00008	.00068	.00006	.00111	.00129	.00194	
%RSD	15.534	20.405	2.4366	3.6675	85.967	45.259	2.6201	
#1	.00131	.00031	.02713	.00152	-.00255	-.00429	.07305	
#2	.00101	.00047	.02846	.00155	-.00045	-.00176	.07626	
#3	.00137	.00039	.02805	.00144	-.00087	-.00253	.07277	

Sample Name: S0 Acquired: 12/10/2024 15:54:09 Type: Cal
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S0 Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2501.2	27528.	2637.3	1949.0	3933.2
Stddev	5.6	17.	19.6	5.3	9.5
%RSD	.22584	.06235	.74159	.27279	.24266
#1	2496.9	27508.	2618.9	1953.3	3922.4
#2	2507.6	27536.	2635.0	1950.7	3940.4
#3	2499.0	27539.	2657.9	1943.1	3936.9

Sample Name: S1 Acquired: 12/10/2024 15:58:14 Type: Cal
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S01 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934	Be2348
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2.5670	.00191	.00210	.00226	.00916	.02041	.75072	.06379
Stddev	.1280	.00017	.00063	.00039	.00015	.00122	.00372	.00063
%RSD	4.9858	8.6499	30.037	17.181	1.6841	5.9959	.49558	.99493
#1	2.4793	.00184	.00160	.00271	.00902	.02031	.75343	.06448
#2	2.5077	.00210	.00281	.00202	.00933	.02168	.74648	.06365
#3	2.7138	.00179	.00189	.00205	.00913	.01924	.75225	.06323
Elem	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.01439	.25520	.00361	.04107	.00536	.00239	.00649	.04153
Stddev	.00027	.00157	.00014	.00027	.00083	.00071	.00023	.00040
%RSD	1.8423	.61360	3.8699	.66256	15.416	29.757	3.5387	.96761
#1	.01413	.25359	.00377	.04110	.00575	.00278	.00673	.04199
#2	.01439	.25529	.00351	.04078	.00592	.00157	.00645	.04127
#3	.01466	.25672	.00354	.04132	.00441	.00282	.00628	.04132
Elem	Ni2316	Ag3280	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.01904	.00372	.03750	.00588	.00403	.13282	-.00358	.00308
Stddev	.00019	.00028	.00072	.00036	.00035	.00192	.00007	.00099
%RSD	1.0178	7.4286	1.9223	6.1928	8.7031	1.4425	2.0718	32.208
#1	.01926	.00400	.03793	.00593	.00443	.13153	-.00350	.00370
#2	.01894	.00344	.03667	.00622	.00391	.13191	-.00359	.00194
#3	.01892	.00373	.03790	.00549	.00376	.13502	-.00365	.00360
Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077	Li6707	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	.01259	.00365	.51014	.00229	.03761	.85911	.07062	
Stddev	.00010	.00009	.00508	.00002	.00105	.00190	.00269	
%RSD	.75885	2.4433	.99499	1.0777	2.8035	.22084	3.8144	
#1	.01260	.00355	.51113	.00228	.03858	.85694	.07035	
#2	.01267	.00373	.51465	.00232	.03649	.85993	.07343	
#3	.01248	.00367	.50465	.00227	.03774	.86046	.06806	

Sample Name: S1 Acquired: 12/10/2024 15:58:14 Type: Cal
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S01 Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2509.7	27575.	2653.6	1962.1	3927.2
Stddev	.9	123.	7.4	4.7	1.0
%RSD	.03740	.44685	.27852	.23940	.02493
#1	2509.9	27674.	2661.1	1964.0	3928.3
#2	2508.7	27614.	2646.3	1956.7	3926.3
#3	2510.5	27437.	2653.4	1965.5	3927.1

Sample Name: S2 Acquired: 12/10/2024 16:02:21 Type: Cal
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S02 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934	Be2348
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	254.56	.10834	1.1255	.08133	.19664	3.7537	8.4622	1.4766
Stddev	.08	.00031	.0030	.00019	.00048	.0149	.0195	.0069
%RSD	.03026	.28234	.26404	.23935	.24642	.39689	.23027	.46815

#1	254.56	.10820	1.1265	.08116	.19652	3.7697	8.4832	1.4707
#2	254.49	.10813	1.1221	.08154	.19623	3.7402	8.4586	1.4749
#3	254.64	.10869	1.1278	.08129	.19717	3.7512	8.4447	1.4842

Elem	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1.8941	3.1300	1.2491	.51786	.53716	.74488	1.5729	.53720
Stddev	.0041	.0111	.0024	.00121	.00113	.00030	.0062	.00204
%RSD	.21689	.35552	.18824	.23459	.21024	.04029	.39649	.38050

#1	1.8978	3.1420	1.2518	.51869	.53774	.74490	1.5795	.53941
#2	1.8897	3.1281	1.2478	.51647	.53586	.74517	1.5671	.53538
#3	1.8949	3.1200	1.2476	.51843	.53788	.74457	1.5722	.53680

Elem	Ni2316	Ag3280	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.30037	.08900	.26274	.06621	.28913	.74026	.06178	.88169
Stddev	.00071	.00019	.00173	.00117	.00279	.00153	.00019	.00504
%RSD	.23769	.20995	.65934	1.7672	.96480	.20698	.30830	.57178

#1	.30078	.08879	.26191	.06489	.28910	.73919	.06199	.88025
#2	.29955	.08910	.26157	.06662	.29193	.74201	.06163	.87753
#3	.30079	.08912	.26473	.06712	.28635	.73956	.06171	.88730

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077	Li6707	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	1.4526	.04474	2.7145	.14719	.47822	10.490	1.2307	
Stddev	.0016	.00012	.0042	.00060	.00152	.016	.0034	
%RSD	.11095	.26988	.15405	.40519	.31731	.15324	.27959	

#1	1.4533	.04470	2.7122	.14735	.47700	10.506	1.2335	
#2	1.4508	.04464	2.7119	.14653	.47992	10.474	1.2317	
#3	1.4538	.04487	2.7193	.14769	.47774	10.490	1.2269	

Sample Name: S2 Acquired: 12/10/2024 16:02:21 Type: Cal
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S02 Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2429.4	26726.	2665.3	1876.0	3609.8
Stddev	4.7	185.	5.8	12.9	11.1
%RSD	.19324	.69151	.21680	.68746	.30805
#1	2428.5	26627.	2668.1	1875.5	3604.0
#2	2434.5	26612.	2658.7	1863.4	3622.6
#3	2425.3	26939.	2669.2	1889.2	3602.7

Sample Name: S3 Acquired: 12/10/2024 16:06:12 Type: Cal
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S03 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934	Be2348
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	489.60	.21402	2.2442	.16236	.39485	7.4705	16.826	2.8922
Stddev	1.23	.00182	.0128	.00045	.00171	.0039	.023	.0127
%RSD	.25036	.84884	.56973	.27960	.43185	.05222	.13471	.43786

#1	488.46	.21367	2.2373	.16229	.39417	7.4697	16.852	2.8860
#2	489.44	.21241	2.2363	.16195	.39358	7.4670	16.816	2.9068
#3	490.90	.21599	2.2589	.16285	.39678	7.4747	16.810	2.8839

Elem	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3.7702	6.1864	2.4557	1.0218	1.0618	1.4714	3.1050	1.0658
Stddev	.0215	.0116	.0047	.0058	.0033	.0022	.0165	.0033
%RSD	.56904	.18671	.19022	.56656	.31054	.14865	.53063	.31310

#1	3.7599	6.1996	2.4513	1.0194	1.0652	1.4712	3.1193	1.0696
#2	3.7558	6.1780	2.4553	1.0177	1.0586	1.4736	3.1087	1.0635
#3	3.7948	6.1817	2.4606	1.0285	1.0616	1.4693	3.0870	1.0641

Elem	Ni2316	Ag3280	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.59759	.17691	.51841	.13088	.58801	1.4447	.12951	1.7306
Stddev	.00320	.00035	.00073	.00078	.00369	.0012	.00071	.0073
%RSD	.53621	.19932	.14074	.59814	.62743	.08604	.55161	.42384

#1	.59640	.17650	.51908	.13097	.59190	1.4434	.12947	1.7280
#2	.59515	.17709	.51763	.13162	.58456	1.4459	.12882	1.7389
#3	.60122	.17714	.51852	.13006	.58758	1.4449	.13025	1.7250

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077	Li6707	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	2.9103	.09073	5.2355	.29499	.95428	20.971	2.4050	
Stddev	.0136	.00063	.0236	.00222	.00638	.071	.0062	
%RSD	.46715	.69329	.45143	.75379	.66845	.33931	.25911	

#1	2.9058	.09068	5.2162	.29389	.95926	21.051	2.4115	
#2	2.8994	.09012	5.2618	.29352	.95650	20.916	2.3991	
#3	2.9255	.09137	5.2284	.29754	.94709	20.944	2.4046	

Sample Name: S3 Acquired: 12/10/2024 16:06:12 Type: Cal
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S03 Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2318.5	25853.	2623.8	1790.1	3419.0
Stddev	7.4	115.	2.2	5.1	11.9
%RSD	.31714	.44456	.08393	.28644	.34923
#1	2313.6	25829.	2626.3	1789.0	3413.6
#2	2327.0	25978.	2623.0	1795.7	3432.6
#3	2315.0	25752.	2622.1	1785.7	3410.6

Sample Name: S4 Acquired: 12/10/2024 16:09:58 Type: Cal
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S04 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934	Be2348
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	944.72	.42181	4.5376	.32829	.81586	15.131	34.006	5.7813
Stddev	1.80	.00078	.0079	.00128	.00332	.123	.241	.0758
%RSD	.19009	.18552	.17397	.39109	.40704	.81339	.70942	1.3106

#1	944.22	.42100	4.5402	.32831	.81678	15.073	33.908	5.8105
#2	943.22	.42188	4.5288	.32699	.81218	15.048	33.829	5.6953
#3	946.71	.42256	4.5439	.32956	.81863	15.273	34.281	5.8381

Elem	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	7.5297	12.285	4.8339	2.0331	2.1206	2.9284	6.1376	2.1220
Stddev	.0122	.093	.0036	.0053	.0140	.0241	.0445	.0173
%RSD	.16215	.75744	.07469	.25818	.65818	.82304	.72550	.81736

#1	7.5269	12.217	4.8381	2.0333	2.1098	2.9152	6.0999	2.1102
#2	7.5192	12.246	4.8322	2.0278	2.1157	2.9138	6.1261	2.1138
#3	7.5431	12.391	4.8315	2.0383	2.1364	2.9562	6.1867	2.1419

Elem	Ni2316	Ag3280	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1.1935	.35625	1.0364	.26471	1.2278	2.9167	.26882	3.4197
Stddev	.0027	.00077	.0039	.00143	.0081	.0201	.00022	.0405
%RSD	.23021	.21729	.37541	.53922	.66355	.68840	.08068	1.1836

#1	1.1920	.35712	1.0354	.26412	1.2205	2.9066	.26861	3.4295
#2	1.1919	.35601	1.0330	.26367	1.2366	2.9036	.26881	3.3752
#3	1.1967	.35563	1.0407	.26634	1.2263	2.9398	.26904	3.4544

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077	Li6707
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	6.0031	.18428	10.237	.59468	1.9103	42.080	4.8508
Stddev	.0228	.00050	.110	.00069	.0152	.278	.0442
%RSD	.37948	.27380	1.0782	.11587	.79550	.66176	.91153

#1	6.0066	.18408	10.269	.59472	1.8957	41.839	4.8250
#2	5.9788	.18391	10.114	.59397	1.9092	42.017	4.8255
#3	6.0240	.18486	10.328	.59535	1.9260	42.385	4.9018

Sample Name: S4 Acquired: 12/10/2024 16:09:58 Type: Cal
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S04 Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2160.1	25097.	2564.8	1657.9	3226.8
Stddev	5.9	53.	25.0	2.4	3.0
%RSD	.27344	.20957	.97288	.14522	.09243
#1	2159.0	25136.	2561.9	1656.6	3228.1
#2	2166.5	25037.	2591.0	1656.4	3228.9
#3	2154.9	25118.	2541.4	1660.6	3223.4

Sample Name: S5 Acquired: 12/10/2024 16:13:43 Type: Cal
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S05 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934	Be2348
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1824.5	.82865	9.1294	.69817	1.7790	30.149	67.042	11.249
Stddev	4.4	.00349	.0383	.00366	.0097	.078	.218	.057
%RSD	.24207	.42158	.41963	.52426	.54637	.25954	.32471	.51089
#1	1819.6	.82569	9.1000	.69554	1.7715	30.064	66.792	11.297
#2	1828.2	.82776	9.1155	.69661	1.7754	30.165	67.141	11.185
#3	1825.7	.83250	9.1728	.70235	1.7900	30.218	67.193	11.265
Elem	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598	Mn2576	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	14.988	23.958	9.4675	4.0571	4.1714	5.6766	11.979	4.1669
Stddev	.066	.041	.0072	.0180	.0049	.0114	.034	.0162
%RSD	.43785	.16921	.07595	.44320	.11775	.20046	.28573	.38795
#1	14.946	23.914	9.4617	4.0482	4.1714	5.6658	11.966	4.1572
#2	14.955	23.967	9.4755	4.0454	4.1664	5.6885	11.954	4.1580
#3	15.064	23.993	9.4653	4.0778	4.1762	5.6756	12.018	4.1856
Elem	Ni2316	Ag3280	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2.3835	.72227	2.0549	.52046	2.6868	5.8193	.55551	6.5019
Stddev	.0089	.00114	.0081	.00239	.0125	.0124	.00299	.0278
%RSD	.37178	.15762	.39595	.45981	.46420	.21307	.53850	.42746
#1	2.3771	.72140	2.0455	.51920	2.6743	5.8050	.55315	6.5259
#2	2.3798	.72356	2.0587	.51895	2.6992	5.8257	.55450	6.4714
#3	2.3936	.72184	2.0604	.52322	2.6869	5.8271	.55888	6.5084
Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077	Li6707	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	12.928	.38125	19.616	1.1936	3.7602	81.724	9.5996	
Stddev	.077	.00110	.094	.0054	.0110	.747	.0304	
%RSD	.59938	.28814	.47952	.45322	.29362	.91465	.31670	
#1	12.870	.38067	19.703	1.1906	3.7488	80.861	9.5696	
#2	12.898	.38056	19.516	1.1904	3.7610	82.178	9.5989	
#3	13.016	.38252	19.629	1.1999	3.7708	82.133	9.6304	

Sample Name: S5 Acquired: 12/10/2024 16:13:43 Type: Cal
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S05 Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1917.4	23987.	2548.4	1454.2	3021.2
Stddev	7.9	79.	7.0	7.0	11.6
%RSD	.41027	.33048	.27597	.48294	.38335
#1	1919.9	24074.	2550.2	1460.7	3021.7
#2	1923.8	23918.	2554.4	1446.8	3032.5
#3	1908.6	23968.	2540.7	1455.1	3009.4

Sample Name: S6 Acquired: 12/10/2024 16:17:38 Type: Cal
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: IR Corr. Factor: 1.000000
User: Kareem Custom ID1: S06 Custom ID2: Custom ID3:
Comment:

Elem	Al3961	Ca3736	Fe2598	Mg2790	Na8183
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	78.901	38.444	14.726	6.2187	5.5105
Stddev	.600	.275	.132	.0382	.0361
%RSD	.76102	.71542	.89793	.61446	.65461

#1	79.325	38.635	14.824	6.2443	5.5264
#2	79.164	38.569	14.779	6.2370	5.5360
#3	78.214	38.129	14.576	6.1748	5.4692

Int. Std.	Y_3710
Units	Cts/S
Avg	2542.7
Stddev	25.0
%RSD	.98291

#1	2519.0
#2	2540.2
#3	2568.8

Sample Name: ICV014 Acquired: 12/10/2024 16:45:51 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICV014 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.038133	.9821663	.9687233	.9324097	.9126922	2.427014
Stddev	.003284	.0023432	.0045070	.0012098	.0034750	.018037
%RSD	.3163694	.2385762	.4652488	.1297539	.3807459	.7431855

#1	1.039430	.9848588	.9739237	.9331766	.9166857	2.440929
#2	1.040570	.9810507	.9659509	.9310150	.9103560	2.406636
#3	1.034398	.9805892	.9662952	.9330375	.9110350	2.433478

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5185802	.5224039	.4768094	10.23094	.5496085	.5007285
Stddev	.0058810	.0066120	.0012909	.15363	.0016435	.0021732
%RSD	1.134059	1.265693	.2707446	1.501665	.2990242	.4340026

#1	.5238998	.5298136	.4782849	10.37058	.5511777	.5032208
#2	.5195760	.5202931	.4762546	10.25588	.5478997	.4992289
#3	.5122649	.5171050	.4758886	10.06637	.5497482	.4997360

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.4977854	10.55741	.5266008	6.041075	.5100435	.2462849
Stddev	.0095474	.10428	.0038743	.030635	.0025162	.0009478
%RSD	1.917968	.9877732	.7357243	.5071099	.4933254	.3848486

#1	.5063483	10.64908	.5308768	6.063743	.5128012	.2473081
#2	.4874907	10.57920	.5256019	6.053260	.5094570	.2454368
#3	.4995171	10.44395	.5233238	6.006222	.5078724	.2461099

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.08662	.5069642	1.096831	9.429420	F -.002359	F -.032586
Stddev	.21868	.0050430	.007212	.422215	.003502	.003140
%RSD	2.168017	.9947489	.6575075	4.477633	148.4288	9.636940

#1	10.32729	.5104400	1.101781	9.662287	-.003575	-.034815
#2	10.03248	.5092724	1.088556	9.683924	-.005092	-.028994
#3	9.90010	.5011801	1.100155	8.942048	.001589	-.033948

Sample Name: ICV014 Acquired: 12/10/2024 16:45:51 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICV014 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F -.001069	F .0074127	F .0013432	F -.000939	F -.000027	F -.008887
Stddev	.000175	.0018892	.0010893	.000678	.002017	.000126
%RSD	16.33394	25.48625	81.10183	72.20485	7465.555	1.414808
#1	-.001079	.0088792	.0016550	-.001691	-.002324	-.008741
#2	-.001238	.0080781	.0022425	-.000373	.001455	-.008964
#3	-.000890	.0052808	.0001319	-.000754	.000788	-.008955

Elem	Li6707
Units	ppm
Avg	F -.020373
Stddev	.002664
%RSD	13.07509
#1	-.021425
#2	-.017344
#3	-.022349

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2503.473	27477.17	2700.638	1949.679	3878.282
Stddev	8.473	90.58	32.112	3.045	14.101
%RSD	.3384453	.3296673	1.189054	.1562011	.3635926
#1	2495.289	27463.81	2666.152	1951.649	3863.485
#2	2512.208	27394.02	2706.083	1946.171	3891.565
#3	2502.923	27573.70	2729.679	1951.217	3879.797

Sample Name: ICB014 Acquired: 12/10/2024 16:51:34 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICB014 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.003241	.0020314	.0002477	.0024117	.0018835	-.000223
Stddev	.000633	.0009655	.0017467	.0014332	.0012952	.004033
%RSD	19.52907	47.52791	705.1504	59.42922	68.76438	1808.974

#1	-.002783	.0031231	-.000308	.0037043	.0004089	-.004538
#2	-.003963	.0012898	-.001154	.0008704	.0024045	.000417
#3	-.002977	.0016814	.002205	.0026603	.0028370	.003452

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0013678	.0000193	.0000879	.0315601	-.000789	.0002502
Stddev	.0005705	.0001003	.0001202	.0289310	.000210	.0000890
%RSD	41.71269	518.8848	136.6633	91.66958	26.65738	35.55627

#1	.0016396	.0000016	.0001057	.0621562	-.000884	.0001642
#2	.0007121	.0001273	-.000040	.0046469	-.000935	.0003419
#3	.0017515	-.000071	.000198	.0278773	-.000548	.0002446

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0045260	-.011721	-.000646	-.041575	-.000543	-.000931
Stddev	.0069477	.003501	.000286	.071860	.000488	.000539
%RSD	153.5059	29.86797	44.26562	172.8446	89.99307	57.86898

#1	.0124126	-.011515	-.000376	-.113639	-.000055	-.000598
#2	.0018565	-.015321	-.000946	.030079	-.001032	-.001553
#3	-.000691	-.008328	-.000617	-.041165	-.000541	-.000643

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.016806	-.003525	-.001431	-.192227	-.000198	-.002333
Stddev	.604295	.002094	.003271	.138058	.001506	.002204
%RSD	3595.704	59.40579	228.5216	71.82033	761.3906	94.49567

#1	.334283	-.002884	-.005076	-.044874	-.000964	-.004217
#2	.329880	-.005865	-.000466	-.318586	-.001167	.000091
#3	-.714581	-.001827	.001249	-.213221	.001538	-.002873

Sample Name: ICB014 Acquired: 12/10/2024 16:51:34 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICB014 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000676	-.000294	-.001849	F -.008014	.0031709	.0000491
Stddev	.000228	.002736	.000877	.000142	.0026107	.0000706
%RSD	33.76338	930.2102	47.45976	1.777056	82.33172	143.8092
#1	-.000918	.002141	-.001891	-.007879	.0002788	.0001303
#2	-.000644	.000231	-.002704	-.007999	.0053533	.0000150
#3	-.000465	-.003255	-.000951	-.008163	.0038807	.0000020

Elem	Li6707
Units	ppm
Avg	F -.024117
Stddev	.003376
%RSD	13.99680
#1	-.020908
#2	-.027637
#3	-.023805

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2501.749	27688.72	2662.750	1960.673	3920.342
Stddev	4.228	292.82	23.298	21.041	8.536
%RSD	.1690122	1.057560	.8749723	1.073135	.2177482
#1	2506.097	27659.44	2635.934	1960.227	3928.756
#2	2501.499	27411.63	2674.285	1939.858	3911.688
#3	2497.651	27995.08	2678.030	1981.932	3920.582

Sample Name: ICSA014 Acquired: 12/10/2024 17:21:53 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSA014 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.009316	.0076976	-.009899	-.016151	-.006777	243.0741
Stddev	.003449	.0012353	.002492	.004140	.002821	.8857
%RSD	37.02249	16.04818	25.16986	25.63269	41.62276	.3643856

#1	-.011812	.0063986	-.011192	-.018481	-.004179	242.5953
#2	-.005380	.0078368	-.007027	-.011371	-.009777	242.5309
#3	-.010755	.0088575	-.011478	-.018600	-.006376	244.0962

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0073104	.0013640	.0008535	248.9195	.0521792	.0315269
Stddev	.0012721	.0000257	.0001104	1.0867	.0006842	.0007397
%RSD	17.40106	1.880227	12.93146	.4365838	1.311195	2.346152

#1	.0058416	.0013426	.0009203	248.3768	.0513991	.0307627
#2	.0080531	.0013571	.0007261	248.2110	.0524612	.0315786
#3	.0080366	.0013924	.0009142	250.1707	.0526773	.0322393

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.007006	102.7715	.0101976	254.7028	.0051102	-.007578
Stddev	.001301	.2110	.0003556	.8693	.0009110	.001531
%RSD	18.57211	.2052721	3.486808	.3412996	17.82628	20.19669

#1	-.008457	102.7065	.0098677	253.9026	.0048110	-.008383
#2	-.005945	102.6006	.0105743	254.5780	.0043865	-.008538
#3	-.006615	103.0073	.0101509	255.6277	.0061331	-.005813

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.050593	.0004836	-.036147	-.287852	.0016573	F -.315832
Stddev	.719102	.0103535	.003477	.185939	.0011819	.002925
%RSD	1421.348	2141.135	9.617872	64.59545	71.31401	.9262440

#1	.426291	.0055576	-.040154	-.352057	.0030209	-.318752
#2	-.877715	-.011428	-.034344	-.433180	.0010258	-.312901
#3	.299645	.007321	-.033942	-.078319	.0009254	-.315843

Sample Name: ICSA014 Acquired: 12/10/2024 17:21:53 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSA014 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.001618	.0119570	-.003369	F .0089128	-.000210	.0043013
Stddev	.000511	.0020568	.000647	.0006501	.001872	.0007235
%RSD	31.59322	17.20135	19.19310	7.294546	893.0594	16.82058
#1	-.002053	.0140509	-.003276	.0095751	.001284	.0039491
#2	-.001747	.0118807	-.004058	.0082755	.000397	.0038214
#3	-.001055	.0099395	-.002774	.0088880	-.002309	.0051335

Elem	Li6707
Units	ppm
Avg	F -.016973
Stddev	.002948
%RSD	17.36849
#1	-.015819
#2	-.014776
#3	-.020323

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2375.929	25459.86	2607.909	1840.195	3392.310
Stddev	6.242	138.51	19.170	9.240	12.531
%RSD	.2627059	.5440241	.7350772	.5020954	.3694004
#1	2377.524	25476.80	2596.429	1842.839	3394.255
#2	2381.219	25313.66	2630.040	1829.921	3403.756
#3	2369.045	25589.12	2597.259	1847.824	3378.920

Sample Name: ICSAB014 Acquired: 12/10/2024 17:27:39 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSAB014 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0891728	.1087786	.0423905	.0265995	.5579911	249.8614
Stddev	.0067044	.0010827	.0012290	.0097367	.0022440	1.7789
%RSD	7.518399	.9953717	2.899192	36.60468	.4021630	.7119633

#1	.0877906	.1075284	.0422049	.0154523	.5592903	250.6155
#2	.0832672	.1094143	.0437017	.0334410	.5553999	251.1390
#3	.0964605	.1093931	.0412648	.0309052	.5592831	247.8296

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5452643	.5455295	1.006569	256.5595	.6214702	.5421223
Stddev	.0049155	.0034723	.001172	1.6677	.0021124	.0008119
%RSD	.9014851	.6365099	.1163851	.6500155	.3399078	.1497692

#1	.5466557	.5490588	1.007736	257.7763	.6217123	.5427626
#2	.5493341	.5454128	1.006577	257.2437	.6192472	.5412091
#3	.5398031	.5421171	1.005393	254.6586	.6234512	.5423953

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.4862811	105.4551	.5456926	263.6768	1.077633	.1879370
Stddev	.0019497	.6025	.0043311	1.6630	.003101	.0008020
%RSD	.4009344	.5713349	.7936939	.6306788	.2877647	.4267580

#1	.4841677	105.8760	.5493320	265.2499	1.081047	.1887921
#2	.4880096	105.7243	.5468434	263.8438	1.076864	.1878175
#3	.4866659	104.7649	.5409022	261.9366	1.074989	.1872014

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.093579	.5298564	1.051819	-.602558	.0039692	F -.331678
Stddev	.007023	.0056390	.008499	.138229	.0035359	.003578
%RSD	7.504433	1.064243	.8080560	22.94032	89.08212	1.078629

#1	-.099572	.5360212	1.061352	-.492280	.0000736	-.334358
#2	-.085852	.5285888	1.049075	-.757628	.0069756	-.333062
#3	-.095313	.5249591	1.045031	-.557766	.0048586	-.327616

Sample Name: ICSAB014 Acquired: 12/10/2024 17:27:39 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ICSAB014 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.001313	.0239760	-.003112	.0036819	-.000539	.0053830
Stddev	.000361	.0070270	.000627	.0022167	.000950	.0001514
%RSD	27.52287	29.30848	20.15251	60.20648	176.1873	2.812137
#1	-.001089	.0276575	-.002651	.0051198	-.000095	.0053309
#2	-.001729	.0283975	-.003826	.0047969	.000107	.0055536
#3	-.001120	.0158732	-.002858	.0011290	-.001631	.0052646
Elem	Li6707					
Units	ppm					
Avg	F -.026064					
Stddev	.001522					
%RSD	5.840480					
#1	-.027769					
#2	-.025584					
#3	-.024840					
Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	2369.146	25424.04	2633.137	1830.951	3388.944	
Stddev	4.628	94.91	24.592	10.345	10.549	
%RSD	.1953609	.3733066	.9339431	.5650087	.3112649	
#1	2367.599	25343.40	2613.974	1824.406	3380.424	
#2	2365.490	25400.09	2624.570	1825.569	3385.665	
#3	2374.350	25528.63	2660.867	1842.877	3400.742	

Sample Name: CCV089 Acquired: 12/10/2024 17:48:20 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV089 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.991993	4.977525	25.34109	4.866938	4.910743	408.5371
Stddev	.026604	.014577	.11977	.021693	.022669	.6877
%RSD	.5329291	.2928587	.4726404	.4457152	.4616207	.1683439
#1	5.009469	4.976587	25.33609	4.856169	4.908401	409.0718
#2	4.961376	4.963440	25.22389	4.852738	4.889336	408.7782
#3	5.005135	4.992549	25.46328	4.891909	4.934493	407.7612
Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.37154	.5133734	2.549659	414.0573	15.83214	2.559715
Stddev	.02294	.0022107	.011833	.6444	.00855	.013648
%RSD	.2212014	.4306144	.4641113	.1556227	.0540188	.5331948
#1	10.39374	.5150288	2.547661	414.7970	15.82783	2.558332
#2	10.37296	.5142286	2.538952	413.7565	15.82660	2.546810
#3	10.34793	.5108629	2.562364	413.6183	15.84199	2.574002
Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	15.31721	417.3631	15.23792	418.6660	2.563457	1.275541
Stddev	.04715	.1071	.05449	1.5947	.011859	.002021
%RSD	.3078058	.0256521	.3575927	.3809035	.4626150	.1584532
#1	15.37163	417.2907	15.29868	420.5049	2.564398	1.276291
#2	15.28870	417.4861	15.22172	417.6624	2.551155	1.273252
#3	15.29130	417.3125	15.19338	417.8308	2.574817	1.277080
Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	408.5916	2.554473	14.81280	156.0263	5.086167	F 4.226022
Stddev	1.1883	.011428	.12595	.3582	.014121	.023726
%RSD	.2908174	.4473669	.8502770	.2295867	.2776317	.5614330
#1	409.8295	2.557102	14.71816	156.2850	5.089795	4.239805
#2	407.4601	2.541959	14.76450	156.1765	5.070585	4.239636
#3	408.4854	2.564357	14.95576	155.6174	5.098119	4.198626

Sample Name: CCV089 Acquired: 12/10/2024 17:48:20 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV089 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.894306	5.124721	5.026223	5.125622	5.109005	4.953363
Stddev	.022312	.022990	.027103	.026836	.031662	.016681
%RSD	.4558737	.4486075	.5392328	.5235562	.6197334	.3367529
#1	4.891604	5.128011	5.052912	5.121586	5.145476	4.971744
#2	4.873467	5.100264	5.027031	5.101033	5.088563	4.949157
#3	4.917845	5.145890	4.998724	5.154247	5.092975	4.939188

Elem	Li6707
Units	ppm
Avg	5.144013
Stddev	.010066
%RSD	.1956768
#1	5.146953
#2	5.152282
#3	5.132805

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2096.438	24130.05	2572.861	1607.681	3084.730
Stddev	5.036	54.17	7.733	5.502	8.610
%RSD	.2402341	.2244934	.3005530	.3422302	.2791210
#1	2097.682	24190.52	2567.616	1613.500	3087.687
#2	2100.736	24113.65	2569.226	1606.979	3091.472
#3	2090.896	24085.97	2581.742	1602.564	3075.031

Sample Name: CCB089 Acquired: 12/10/2024 17:52:04 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB089 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.001876	.0011680	-.000496	.0075643	.0014785	.1281478
Stddev	.000596	.0013684	.001029	.0013682	.0021895	.0102046
%RSD	31.76451	117.1628	207.3751	18.08823	148.0887	7.963108

#1	-.002241	.0024866	.000611	.0086013	.0034289	.1194935
#2	-.002199	.0012626	-.001422	.0080781	-.000890	.1255497
#3	-.001189	-.000245	-.000678	.0060135	.001896	.1394003

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0006440	-.000041	.0001051	.0344954	-.000462	-.000044
Stddev	.0011869	.000007	.0000298	.0330769	.000445	.000346
%RSD	184.3157	16.08311	28.33003	95.88787	96.26976	780.2851

#1	-.000016	-.000037	.0001084	-.000015	-.000909	-.000414
#2	.002014	-.000037	.0000738	.065923	-.000459	.000270
#3	-.000066	-.000049	.0001331	.037579	-.000019	.000011

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0148986	.0212159	.0016826	.0081215	-.000212	.0012962
Stddev	.0004585	.0442502	.0015387	.0477296	.000141	.0009381
%RSD	3.077181	208.5703	91.44977	587.6961	66.39710	72.37855

#1	.0147313	-.028564	.0012678	.0218834	-.000215	.0010166
#2	.0145473	.056082	.0003938	.0474581	-.000352	.0023423
#3	.0154172	.036131	.0033861	-.044977	-.000070	.0005296

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1500822	-.000528	.0045388	.0101803	-.000088	.0090417
Stddev	.4824192	.011110	.0071969	.0685011	.000732	.0003024
%RSD	321.4367	2102.754	158.5647	672.8780	828.3142	3.344104

#1	.5282789	-.007628	-.003561	-.027028	-.000425	.0090425
#2	.3151782	-.006232	.006979	-.031665	-.000591	.0093437
#3	-.393211	.012274	.010199	.089233	.000751	.0087389

Sample Name: CCB089 Acquired: 12/10/2024 17:52:04 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB089 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000430	-.005065	-.000315	F -.010061	.0024069	.0005013
Stddev	.000411	.000892	.000528	.000663	.0017968	.0001766
%RSD	95.59016	17.60920	167.7286	6.586545	74.65220	35.22525
#1	-.000414	-.004358	-.000063	-.010304	.0013342	.0005624
#2	-.000849	-.006067	-.000921	-.010568	.0014053	.0003023
#3	-.000027	-.004769	.000040	-.009311	.0044813	.0006392

Elem	Li6707
Units	ppm
Avg	-.012063
Stddev	.001306
%RSD	10.82358
#1	-.012340
#2	-.013208
#3	-.010641

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2492.338	27540.93	2653.489	1948.224	3902.794
Stddev	5.289	90.95	11.207	11.329	12.610
%RSD	.2122107	.3302512	.4223583	.5815167	.3230959
#1	2486.469	27436.25	2649.511	1935.153	3888.277
#2	2496.735	27585.90	2644.813	1955.220	3909.070
#3	2493.810	27600.64	2666.142	1954.299	3911.033

Sample Name: PB165364BL Acquired: 12/10/2024 17:56:11 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS364 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.002282	.0011688	-.001368	.0034675	.0012701	-.014200
Stddev	.001178	.0021536	.001440	.0032092	.0024412	.024124
%RSD	51.63063	184.2509	105.2834	92.55255	192.1987	169.8851

#1	-.001092	.0033931	-.001472	-.000238	.0038592	-.020082
#2	-.003449	-.000906	-.002754	.005284	.0009408	-.034840
#3	-.002306	.001020	.000121	.005357	-.000990	.012321

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002252	-.000053	.0000491	-.004716	-.000894	.0000845
Stddev	.0009271	.000127	.0000451	.035547	.000443	.0002964
%RSD	411.6797	239.3480	91.71720	753.8192	49.56872	350.9064

#1	-.000682	-.000199	.0000502	.035815	-.001000	-.000086
#2	.001171	.000012	.0000937	-.019364	-.000407	.000427
#3	.000187	.000028	.0000035	-.030598	-.001274	-.000088

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.002356	.0369219	.0008714	-.104887	.0001321	-.000511
Stddev	.005100	.0295119	.0007710	.056998	.0006330	.001252
%RSD	216.4920	79.93058	88.48255	54.34208	479.1607	244.8343

#1	-.007556	.0141646	.0014722	-.042880	-.000582	.000594
#2	.002639	.0263340	.0000020	-.154998	.000623	-.000258
#3	-.002151	.0702671	.0011400	-.116782	.000356	-.001871

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.152182	.0101984	-.004549	-.205403	-.000021	.0031030
Stddev	.670882	.0026232	.002497	.120645	.003215	.0008571
%RSD	440.8408	25.72200	54.89227	58.73580	15269.95	27.62070

#1	.407482	.0083635	-.005136	-.109416	.003628	.0025147
#2	.031843	.0090287	-.006700	-.165960	-.002438	.0040863
#3	-.895872	.0132030	-.001811	-.340833	-.001254	.0027079

Sample Name: PB165364BL Acquired: 12/10/2024 17:56:11 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS364 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.000597	-0.005492	-0.000774	F -0.011151	.0055051	-0.000172
Stddev	.000208	.001950	.000581	.000769	.0039116	.000102
%RSD	34.91264	35.51499	74.97986	6.894168	71.05440	58.92804
#1	-0.000619	-0.007455	-0.001398	-0.011074	.0069994	-0.000097
#2	-0.000793	-0.003554	-0.000676	-0.011956	.0010666	-0.000288
#3	-0.000378	-0.005465	-0.000250	-0.010424	.0084492	-0.000132
Elem	Li6707					
Units	ppm					
Avg	F -0.028936					
Stddev	.003091					
%RSD	10.68193					
#1	-0.031788					
#2	-0.029367					
#3	-0.025651					
Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306	
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	
Avg	2491.912	27969.30	2648.790	1974.589	3907.403	
Stddev	6.496	163.78	9.040	16.089	12.902	
%RSD	.2607002	.5855805	.3413026	.8148132	.3301865	
#1	2495.368	27869.98	2659.073	1959.424	3920.400	
#2	2484.418	27879.58	2645.202	1972.878	3894.599	
#3	2495.949	28158.34	2642.094	1991.465	3907.208	

Sample Name: PB165351BL Acquired: 12/10/2024 18:04:22 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS351 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000955	.0016947	.0001522	.0084685	.0016027	.0190964
Stddev	.000878	.0022935	.0012219	.0011783	.0006423	.0216212
%RSD	91.92039	135.3376	802.8487	13.91328	40.07817	113.2211

#1	-.000994	.0007742	.0015394	.0071090	.0010384	.0175347
#2	-.001813	.0000044	-.000765	.0091025	.0023017	.0414561
#3	-.000058	.0043055	-.000318	.0091940	.0014680	-.001702

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0006454	-.000023	.0000150	.0208534	-.001009	.0001633
Stddev	.0008413	.000070	.0000366	.0219433	.000361	.0001840
%RSD	130.3596	304.5415	243.7628	105.2263	35.78412	112.7195

#1	-.000316	.000020	.0000573	.0417489	-.001388	.0002782
#2	.001246	-.000104	-.000006	.0228170	-.000969	.0002606
#3	.001006	.000015	-.000006	-.002006	-.000669	-.000049

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0017960	.0084394	.0005919	-.093523	-.000722	.0001757
Stddev	.0026163	.0090155	.0009738	.066089	.000488	.0005393
%RSD	145.6787	106.8267	164.5372	70.66629	67.60812	307.0196

#1	-.000271	-.001832	.0000445	-.162441	-.000174	.0007698
#2	.000922	.012107	.0017162	-.087445	-.001110	-.000283
#3	.004737	.015043	.0000149	-.030683	-.000882	.000040

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1355961	.0016909	-.000355	-.243204	-.001316	-.000647
Stddev	.7739738	.0079338	.002893	.174543	.000305	.001816
%RSD	570.7936	469.1979	814.2156	71.76808	23.17813	280.6754

#1	-.022330	.0020530	.002682	-.228092	-.001037	-.000150
#2	.976353	-.006418	-.003079	-.076708	-.001269	-.002660
#3	-.547235	.009438	-.000669	-.424811	-.001642	.000869

Sample Name: PB165351BL Acquired: 12/10/2024 18:04:22 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS351 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.000749	-0.002116	-0.000915	F -0.010793	.0039613	-.000047
Stddev	.000220	.001477	.000161	.000749	.0039275	.000091
%RSD	29.40945	69.79352	17.54871	6.940391	99.14677	195.2248
#1	-0.000965	-0.001338	-0.001077	-0.010844	.0083476	-.000036
#2	-0.000756	-0.003819	-0.000756	-0.010019	.0027654	-.000142
#3	-0.000525	-0.001191	-0.000912	-0.011515	.0007707	.000038

Elem	Li6707
Units	ppm
Avg	F -0.039209
Stddev	.004555
%RSD	11.61764
#1	-0.043110
#2	-0.040314
#3	-0.034203

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2514.464	27794.45	2685.244	1967.978	3924.405
Stddev	1.358	68.50	14.786	10.889	2.716
%RSD	.0539909	.2464408	.5506477	.5533327	.0692141
#1	2513.629	27721.37	2700.804	1955.443	3922.076
#2	2516.030	27804.80	2671.378	1973.398	3923.752
#3	2513.733	27857.18	2683.551	1975.095	3927.389

Sample Name: PB165364BS Acquired: 12/10/2024 18:09:57 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS364 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0218092	.0501499	.0168783	.0646998	.1060886	.4137468
Stddev	.0033094	.0005867	.0011623	.0029418	.0008854	.0262463
%RSD	15.17415	1.169948	6.886599	4.546774	.8346200	6.343576

#1	.0254436	.0497308	.0171129	.0654433	.1051337	.3965479
#2	.0189695	.0498985	.0179053	.0614577	.1068825	.4439568
#3	.0210147	.0508205	.0156165	.0671985	.1062496	.4007355

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.4093234	.0103618	.0093700	10.22390	.0208632	.1002937
Stddev	.0024665	.0000884	.0000599	.03919	.0005266	.0003230
%RSD	.6025693	.8536094	.6388721	.3833481	2.524091	.3220006

#1	.4105440	.0102745	.0093462	10.21896	.0208304	.1005760
#2	.4064847	.0103597	.0094381	10.18741	.0203538	.1003635
#3	.4109415	.0104513	.0093257	10.26533	.0214055	.0999415

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0550138	.2193668	.0316028	10.14897	.0778661	.0188729
Stddev	.0044244	.0168486	.0015614	.02646	.0003908	.0002442
%RSD	8.042311	7.680543	4.940705	.2606893	.5018919	1.293688

#1	.0587329	.2024169	.0329311	10.17713	.0779452	.0190549
#2	.0501209	.2361121	.0298829	10.14516	.0782113	.0185954
#3	.0561876	.2195715	.0319944	10.12463	.0774418	.0189683

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.24193	.1025421	.1084216	9.775685	.0174045	F -.000890
Stddev	.16312	.0028401	.0075804	.093843	.0013003	.002326
%RSD	1.592717	2.769645	6.991631	.9599684	7.470963	261.2638

#1	10.11731	.1000702	.0996972	9.758308	.0187656	-.000716
#2	10.18191	.1019116	.1133977	9.877003	.0172729	.001344
#3	10.42656	.1056444	.1121698	9.691746	.0161750	-.003298

Sample Name: PB165364BS Acquired: 12/10/2024 18:09:57 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS364 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0177020	.1749439	F .4706532	.0126482	.2026342	.2109831
Stddev	.0002406	.0005311	.0030757	.0003718	.0012433	.0002639
%RSD	1.359136	.3035613	.6534882	2.939563	.6135597	.1250705
#1	.0176900	.1745130	.4684243	.0130774	.2019728	.2112876
#2	.0179484	.1755372	.4693732	.0124241	.2040684	.2108397
#3	.0174677	.1747816	.4741622	.0124432	.2018615	.2108219

Elem	Li6707
Units	ppm
Avg	F -.006820
Stddev	.004276
%RSD	62.70046
#1	-.009947
#2	-.008567
#3	-.001947

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2514.042	27545.77	2694.050	1954.770	3898.074
Stddev	3.818	197.41	12.537	18.603	11.922
%RSD	.1518512	.7166540	.4653668	.9516599	.3058376
#1	2510.485	27573.02	2708.343	1960.741	3884.662
#2	2513.565	27336.15	2688.898	1933.915	3902.093
#3	2518.076	27728.13	2684.910	1969.654	3907.467

Sample Name: PB165351BS Acquired: 12/10/2024 18:13:58 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS351 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0180158	.0478752	.0161490	.0641013	.1061401	.3915164
Stddev	.0022161	.0004967	.0017847	.0024542	.0014898	.0024781
%RSD	12.30088	1.037427	11.05142	3.828632	1.403576	.6329419

#1	.0183318	.0483982	.0140883	.0648185	.1044358	.3888815
#2	.0200570	.0478177	.0171706	.0613684	.1067899	.3938002
#3	.0156587	.0474098	.0171882	.0661170	.1071945	.3918674

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.4063930	.0103646	.0093516	10.16508	.0210271	.0995727
Stddev	.0000211	.0000542	.0000121	.03299	.0002544	.0000713
%RSD	.0051958	.5233914	.1297329	.3245826	1.209691	.0716467

#1	.4063800	.0103510	.0093609	10.14696	.0213122	.0994913
#2	.4063817	.0103184	.0093559	10.20317	.0209453	.0996245
#3	.4064174	.0104243	.0093379	10.14513	.0208236	.0996023

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0619444	.2263148	.0333637	10.07216	.0771604	.0200963
Stddev	.0017299	.0239746	.0013193	.09581	.0002714	.0014192
%RSD	2.792618	10.59348	3.954370	.9512248	.3517122	7.061884

#1	.0618650	.2071104	.0318646	10.13777	.0772415	.0198870
#2	.0637126	.2531848	.0338784	10.11651	.0768578	.0187934
#3	.0602556	.2186493	.0343481	9.96222	.0773821	.0216085

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.757025	.1059081	.1107055	9.364334	.0186681	F -.001706
Stddev	.375311	.0021702	.0083731	.048857	.0016554	.000460
%RSD	3.846576	2.049111	7.563364	.5217329	8.867529	26.98960

#1	9.976256	.1064706	.1109588	9.331583	.0173758	-.002200
#2	9.971156	.1035120	.1189490	9.420490	.0180945	-.001289
#3	9.323663	.1077416	.1022086	9.340929	.0205340	-.001628

Sample Name: PB165351BS Acquired: 12/10/2024 18:13:58 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS351 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0179941	.1737289	F .4733749	.0131819	.2000800	.2099483
Stddev	.0004035	.0025405	.0038842	.0003639	.0023169	.0006641
%RSD	2.242588	1.462339	.8205377	2.760914	1.157988	.3163205

#1	.0183129	.1764854	.4766442	.0128112	.2018489	.2104727
#2	.0181291	.1732199	.4743993	.0135387	.1974574	.2101707
#3	.0175404	.1714815	.4690811	.0131957	.2009337	.2092016

Elem	Li6707
Units	ppm
Avg	F -.011335
Stddev	.004071
%RSD	35.91962

#1	-.013720
#2	-.006634
#3	-.013651

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2482.952	27250.63	2653.928	1931.773	3863.191
Stddev	3.917	12.16	10.195	2.610	9.436
%RSD	.1577585	.0446216	.3841528	.1351267	.2442596

#1	2483.966	27245.81	2646.682	1933.360	3865.799
#2	2486.262	27241.62	2649.516	1933.199	3871.049
#3	2478.627	27264.46	2665.586	1928.760	3852.726

Sample Name: PB165350BL Acquired: 12/10/2024 18:17:59 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS350 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000526	.0012202	-.001306	.0016929	.0016674	.0278021
Stddev	.001609	.0017605	.000713	.0019551	.0012097	.0046085
%RSD	305.8720	144.2802	54.63499	115.4932	72.54836	16.57607

#1	-.000443	.0024829	-.000966	.0034970	.0021836	.0230784
#2	-.002175	-.000791	-.002126	-.000385	.0025334	.0280419
#3	.001040	.001969	-.000826	.001966	.0002853	.0322861

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0020912	-.000076	.0000854	-.048580	-.001257	.0002826
Stddev	.0013316	.000057	.0000432	.024389	.000572	.0003157
%RSD	63.67714	74.34177	50.56318	50.20447	45.48476	111.7133

#1	.0036198	-.000141	.0000591	-.029527	-.001900	.0004327
#2	.0011825	-.000041	.0001353	-.076066	-.001063	-.000080
#3	.0014714	-.000046	.0000619	-.040146	-.000807	.000495

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0004174	.0073270	.0004953	-.000541	-.000709	.0005378
Stddev	.0035233	.0108406	.0014011	.107363	.000374	.0003733
%RSD	844.1248	147.9536	282.8742	19858.56	52.71445	69.40593

#1	-.000225	-.004897	-.001113	.011469	-.000501	.0009581
#2	.004218	.015774	.001451	-.113403	-.000485	.0002449
#3	-.002741	.011104	.001149	.100313	-.001140	.0004104

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3181083	-.002985	-.002789	-.334348	-.000925	-.003109
Stddev	.1592376	.006685	.003674	.017912	.001639	.002477
%RSD	50.05766	223.9251	131.7386	5.357154	177.2205	79.67655

#1	.2165882	.004625	.001081	-.333921	-.000272	-.005718
#2	.5016345	-.007909	-.006230	-.316654	-.002789	-.002821
#3	.2361021	-.005672	-.003218	-.352469	.000287	-.000789

Sample Name: PB165350BL Acquired: 12/10/2024 18:17:59 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: PBS350 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.000778	-0.003173	-0.000757	F -0.010418	.0016708	.0001307
Stddev	.000154	.001098	.000172	.000363	.0019980	.0002157
%RSD	19.86266	34.59157	22.75327	3.488684	119.5875	164.9867
#1	-0.000873	-0.002718	-0.000622	-0.009999	.0013449	-0.000114
#2	-0.000599	-0.004426	-0.000951	-0.010649	-0.000144	.000212
#3	-0.000860	-0.002377	-0.000698	-0.010606	.003812	.000294

Elem	Li6707
Units	ppm
Avg	F -0.040814
Stddev	.003089
%RSD	7.567428
#1	-0.044372
#2	-0.038828
#3	-0.039242

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2508.071	27615.50	2655.583	1947.989	3929.348
Stddev	2.732	182.05	16.573	13.453	10.928
%RSD	.1089375	.6592327	.6240879	.6905966	.2781068
#1	2507.375	27443.94	2653.649	1935.103	3925.933
#2	2511.083	27596.08	2640.062	1946.920	3941.576
#3	2505.753	27806.48	2673.038	1961.945	3920.536

Sample Name: PB165350BS Acquired: 12/10/2024 18:22:04 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS350 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0198793	.0480192	.0166842	.0627768	.1051420	.4005138
Stddev	.0029917	.0009951	.0019704	.0015509	.0007845	.0014707
%RSD	15.04946	2.072233	11.81012	2.470543	.7461092	.3671917

#1	.0192531	.0477948	.0152591	.0612046	.1046675	.3988457
#2	.0172503	.0471555	.0189328	.0643055	.1047111	.4016230
#3	.0231346	.0491073	.0158608	.0628202	.1060475	.4010728

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.4082904	.0104674	.0093320	10.21888	.0207430	.1006185
Stddev	.0006520	.0001034	.0000668	.02404	.0001587	.0002395
%RSD	.1596977	.9881879	.7159520	.2352077	.7652365	.2379941

#1	.4090371	.0104638	.0093718	10.19791	.0205842	.1003478
#2	.4080005	.0103657	.0092549	10.21362	.0207433	.1007050
#3	.4078336	.0105725	.0093694	10.24511	.0209017	.1008027

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0532367	.2152129	.0331077	10.11124	.0785051	.0191622
Stddev	.0049239	.0310621	.0010755	.11884	.0001641	.0013433
%RSD	9.249079	14.43317	3.248506	1.175321	.2090621	7.009927

#1	.0589208	.1795739	.0320996	10.20960	.0786656	.0180623
#2	.0502828	.2295330	.0329836	10.14493	.0783375	.0206593
#3	.0505064	.2365319	.0342399	9.97919	.0785121	.0187652

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.836501	.0991553	.1079875	9.627275	.0160050	F -.004365
Stddev	.062424	.0024963	.0016207	.090884	.0031418	.002708
%RSD	.6346109	2.517554	1.500859	.9440239	19.63023	62.04891

#1	9.778896	.0977919	.1077836	9.566303	.0137213	-.002033
#2	9.902826	.1020363	.1064784	9.583792	.0147056	-.007335
#3	9.827781	.0976375	.1097006	9.731732	.0195881	-.003725

Sample Name: PB165350BS Acquired: 12/10/2024 18:22:04 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: LCS350 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0179937	.1759469	F .4739915	.0122529	.1985120	.2101155
Stddev	.0003542	.0005816	.0008987	.0011685	.0044624	.0008087
%RSD	1.968675	.3305804	.1895959	9.536603	2.247949	.3848859
#1	.0183734	.1761481	.4729539	.0120719	.1988629	.2093282
#2	.0176721	.1764012	.4744986	.0111854	.2027886	.2109441
#3	.0179355	.1752914	.4745221	.0135013	.1938845	.2100742

Elem	Li6707
Units	ppm
Avg	F -.009215
Stddev	.001419
%RSD	15.39640
#1	-.010445
#2	-.007663
#3	-.009536

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2493.475	27480.27	2659.990	1945.496	3876.824
Stddev	10.464	8.33	7.810	5.765	13.732
%RSD	.4196398	.0303161	.2936001	.2963023	.3542195
#1	2483.626	27472.49	2651.592	1950.720	3862.168
#2	2504.461	27489.06	2667.034	1939.311	3889.395
#3	2492.338	27479.26	2661.343	1946.457	3878.909

Sample Name: CCV090 Acquired: 12/10/2024 18:26:03 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV090 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.928887	4.901433	24.93959	4.760284	4.839254	399.5872
Stddev	.023847	.020221	.09706	.024082	.016021	1.4996
%RSD	.4838223	.4125565	.3891860	.5058902	.3310555	.3752917
#1	4.923919	4.889471	24.86718	4.742673	4.824509	400.7595
#2	4.907915	4.890048	24.90172	4.750453	4.836953	397.8974
#3	4.954826	4.924780	25.04988	4.787726	4.856301	400.1048
Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.12509	.5041438	2.508260	405.2378	15.60971	2.526815
Stddev	.04109	.0046286	.009799	1.1623	.01204	.010544
%RSD	.4058083	.9181016	.3906888	.2868120	.0771256	.4172752
#1	10.15170	.5085485	2.499341	406.2728	15.60749	2.517898
#2	10.07777	.4993199	2.506687	403.9804	15.59893	2.524096
#3	10.14580	.5045630	2.518750	405.4601	15.62270	2.538453
Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	15.06968	406.8036	14.96942	406.1755	2.521291	1.252044
Stddev	.02058	1.7643	.04752	.5961	.008692	.000792
%RSD	.1365661	.4337083	.3174660	.1467603	.3447259	.0632414
#1	15.06344	408.2259	15.01648	405.7619	2.514600	1.251154
#2	15.05294	404.8292	14.92144	405.9058	2.518160	1.252669
#3	15.09265	407.3556	14.97036	406.8588	2.531115	1.252310
Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	400.4574	2.518448	14.77530	152.5548	5.002156	F 4.165039
Stddev	.6264	.011870	.15856	.4888	.024410	.037151
%RSD	.1564176	.4713101	1.073122	.3204097	.4879895	.8919611
#1	400.6778	2.531473	14.68154	152.5408	4.980813	4.197484
#2	399.7506	2.515629	14.95837	152.0732	4.996883	4.124513
#3	400.9438	2.508242	14.68600	153.0505	5.028771	4.173120

Sample Name: CCV090 Acquired: 12/10/2024 18:26:03 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV090 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.825736	5.033655	4.935018	5.032312	5.017230	4.847350
Stddev	.016000	.029110	.054995	.023357	.007957	.007006
%RSD	.3315603	.5783125	1.114388	.4641330	.1585933	.1445345
#1	4.811335	5.002915	4.984253	5.009445	5.023850	4.849892
#2	4.822913	5.037249	4.875667	5.031362	5.019438	4.839427
#3	4.842960	5.060801	4.945132	5.056129	5.008402	4.852729

Elem	Li6707
Units	ppm
Avg	5.053269
Stddev	.024428
%RSD	.4834179
#1	5.074454
#2	5.026548
#3	5.058804

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2110.666	24155.30	2585.029	1607.210	3106.505
Stddev	4.720	56.27	20.282	11.454	7.579
%RSD	.2236070	.2329499	.7845796	.7126760	.2439583
#1	2116.115	24218.05	2566.253	1611.626	3115.243
#2	2108.027	24109.32	2606.539	1594.205	3102.557
#3	2107.855	24138.54	2582.294	1615.799	3101.716

Sample Name: CCB090 Acquired: 12/10/2024 18:29:44 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB090 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.001496	.0017547	-.000025	.0067262	.0002541	.0057372
Stddev	.002335	.0010944	.001330	.0033896	.0005715	.0240778
%RSD	156.0426	62.37322	5304.558	50.39481	224.9386	419.6764

#1	.000115	.0028461	-.000027	.0094100	-.000130	-.017977
#2	-.000430	.0006573	-.001355	.0029170	.000911	.005027
#3	-.004174	.0017605	.001306	.0078516	-.000019	.030163

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0003336	-.000035	.0000794	.0602072	-.001083	.0001745
Stddev	.0012691	.000104	.0000422	.0198071	.000493	.0000915
%RSD	380.4373	298.1970	53.17854	32.89821	45.53038	52.43496

#1	-.000912	.000059	.0001232	.0507472	-.001341	.0002793
#2	.000287	-.000146	.0000760	.0469039	-.001394	.0001103
#3	.001625	-.000017	.0000390	.0829706	-.000514	.0001341

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0010158	.0221267	.0010530	-.019814	-.000212	-.000942
Stddev	.0012131	.0400294	.0017237	.127146	.000611	.001234
%RSD	119.4257	180.9096	163.7035	641.6850	288.3008	131.0000

#1	-.000050	.0600912	-.000836	.054139	.000353	-.002157
#2	.000761	-.019689	.002540	-.166629	-.000861	-.000981
#3	.002336	.025978	.001456	.053046	-.000127	.000311

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.198652	.0011064	.0001775	-.035395	-.002861	.0117732
Stddev	.478711	.0050230	.0060336	.195654	.002162	.0003786
%RSD	240.9798	453.9808	3399.177	552.7672	75.54715	3.215806

#1	-.607849	-.004232	-.006494	-.186749	-.002376	.0120204
#2	-.315897	.005739	.001776	.185539	-.005224	.0113374
#3	.327789	.001812	.005251	-.104976	-.000984	.0119619

Sample Name: CCB090 Acquired: 12/10/2024 18:29:44 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB090 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.000513	-.006070	-.000356	F -.010088	.0042525	.0002400
Stddev	.000193	.004857	.000450	.000282	.0035783	.0002583
%RSD	37.71562	80.01954	126.5313	2.796533	84.14578	107.6251
#1	-.000481	-.001032	-.000726	-.009767	.0007006	.0004886
#2	-.000337	-.006453	-.000486	-.010203	.0078567	.0002587
#3	-.000720	-.010723	.000145	-.010295	.0042002	-.000027

Elem	Li6707
Units	ppm
Avg	F -.022281
Stddev	.002152
%RSD	9.657544
#1	-.022728
#2	-.019941
#3	-.024174

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2529.547	27820.01	2688.185	1968.046	3941.010
Stddev	15.361	49.98	4.735	6.863	22.852
%RSD	.6072625	.1796422	.1761558	.3487096	.5798599
#1	2530.031	27762.36	2691.221	1960.576	3943.271
#2	2544.660	27851.04	2690.605	1974.072	3962.648
#3	2513.949	27846.63	2682.728	1969.491	3917.111

Sample Name: P5041-01 Acquired: 12/10/2024 18:33:50 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHK78 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2394960	.0074021	9.663514	.0034025	-.005291	65.59257
Stddev	.0036207	.0025113	.025281	.0031466	.000868	.17505
%RSD	1.511810	33.92628	.2616155	92.47965	16.40689	.2668757

#1	.2434550	.0092437	9.638658	-.000129	-.004930	65.62083
#2	.2386801	.0045415	9.662684	.004430	-.006282	65.75177
#3	.2363528	.0084212	9.689200	.005907	-.004662	65.40510

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.475690	.0067769	.0114871	172.8325	.1614559	.1107733
Stddev	.010073	.0000810	.0000319	.4137	.0018697	.0007578
%RSD	.4068748	1.194772	.2776449	.2393439	1.158041	.6840959

#1	2.472467	.0066838	.0115236	173.1189	.1611983	.1101468
#2	2.486979	.0068159	.0114650	173.0204	.1597284	.1105575
#3	2.467622	.0068311	.0114726	172.3582	.1634411	.1116156

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.4421211	133.5144	9.472684	23.59242	.1888673	-.007249
Stddev	.0033218	.2355	.030617	.07932	.0005789	.001090
%RSD	.7513399	.1763752	.3232161	.3362240	.3065350	15.03764

#1	.4421052	133.5844	9.496777	23.57610	.1886465	-.007049
#2	.4454508	133.7069	9.483046	23.67864	.1884312	-.006272
#3	.4388072	133.2518	9.438231	23.52253	.1895241	-.008425

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.124758	.3563445	3.079255	7.987114	F 18.47128	-.338955
Stddev	.282646	.0049433	.021587	.152292	.03534	.006419
%RSD	25.12948	1.387219	.7010469	1.906720	.1913014	1.893888

#1	.899451	.3575977	3.077556	7.993373	18.44257	-.342255
#2	1.032921	.3605406	3.058568	7.831788	18.46052	-.331557
#3	1.441902	.3508953	3.101641	8.136179	18.51074	-.343054

Sample Name: P5041-01 Acquired: 12/10/2024 18:33:50 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHK78 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0212035	3.458861	4.905383	.2101124	.8283080	.6221564
Stddev	.0001649	.013347	.002529	.0003207	.0030113	.0024813
%RSD	.7777195	.3858788	.0515471	.1526083	.3635523	.3988297
#1	.0213242	3.443680	4.904763	.2098061	.8286774	.6240185
#2	.0212706	3.464150	4.908164	.2104457	.8311176	.6231112
#3	.0210156	3.468753	4.903222	.2100854	.8251290	.6193395

Elem	Li6707
Units	ppm
Avg	.0911111
Stddev	.0043257
%RSD	4.747737
#1	.0883201
#2	.0889191
#3	.0960940

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2927.112	31689.08	3172.789	2268.878	3813.693
Stddev	7.914	349.13	10.630	27.179	18.200
%RSD	.2703830	1.101747	.3350223	1.197917	.4772242
#1	2934.536	31948.02	3184.735	2282.887	3829.451
#2	2928.016	31827.20	3169.257	2286.195	3817.857
#3	2918.785	31292.02	3164.375	2237.552	3793.773

Sample Name: P5041-02 Acquired: 12/10/2024 18:37:40 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHK78D Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2312064	.0059890	9.560599	.0029381	-.003994	65.53130
Stddev	.0035231	.0007677	.046451	.0051157	.001969	.15461
%RSD	1.523794	12.81808	.4858538	174.1197	49.29545	.2359321

#1	.2308943	.0058351	9.590432	-.002632	-.003166	65.56120
#2	.2348751	.0053099	9.584285	.004020	-.002575	65.36393
#3	.2278497	.0068219	9.507080	.007426	-.006242	65.66879

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.453205	.0067272	.0114550	171.8328	.1583459	.1098403
Stddev	.002098	.0000407	.0001111	.4116	.0003159	.0007823
%RSD	.0855049	.6043810	.9702341	.2395441	.1995243	.7121918

#1	2.454939	.0067318	.0115593	172.0433	.1580010	.1103990
#2	2.450873	.0066844	.0114674	171.3585	.1584154	.1101757
#3	2.453803	.0067653	.0113381	172.0966	.1586213	.1089463

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.4379902	132.3762	9.462725	23.62938	.1875676	-.006985
Stddev	.0076794	.4436	.029987	.12781	.0010868	.000266
%RSD	1.753326	.3351277	.3168997	.5409027	.5794308	3.802452

#1	.4298476	132.3216	9.488471	23.75641	.1885970	-.007291
#2	.4390208	131.9624	9.429800	23.63093	.1876746	-.006822
#3	.4451023	132.8446	9.469905	23.50080	.1864312	-.006840

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.6967740	.3525237	3.053755	7.948310	F 18.21283	-.338265
Stddev	.6714712	.0037073	.003885	.182515	.08816	.001865
%RSD	96.36858	1.051659	.1272086	2.296271	.4840340	.5512225

#1	.9678575	.3568039	3.049568	7.796693	18.27565	-.336430
#2	1.190326	.3504482	3.057243	7.897347	18.25078	-.340158
#3	-.067861	.3503191	3.054455	8.150889	18.11205	-.338208

Sample Name: P5041-02 Acquired: 12/10/2024 18:37:40 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHK78D Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0211180	3.392633	4.876054	.2072082	.8297093	.6242348
Stddev	.0001344	.020719	.019206	.0010451	.0051540	.0027929
%RSD	.6364508	.6107062	.3938822	.5043873	.6211764	.4474148
#1	.0212718	3.411758	4.870651	.2060309	.8356603	.6271561
#2	.0210231	3.395518	4.860128	.2080267	.8266793	.6215910
#3	.0210591	3.370623	4.897382	.2075669	.8267884	.6239575

Elem	Li6707
Units	ppm
Avg	.0900102
Stddev	.0016495
%RSD	1.832570
#1	.0914886
#2	.0882310
#3	.0903110

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2890.768	31584.35	3116.520	2252.510	3786.376
Stddev	9.721	35.45	15.768	3.797	15.791
%RSD	.3362808	.1122413	.5059419	.1685568	.4170570
#1	2886.887	31607.67	3122.430	2256.410	3781.342
#2	2883.586	31543.55	3128.479	2252.295	3773.716
#3	2901.830	31601.83	3098.651	2248.825	3804.071

Sample Name: P5041-01LX5 Acquired: 12/10/2024 18:41:28 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHK78L Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0480449	.0021125	1.984514	.0054391	-.002851	14.94117	.5656299
Stddev	.0031876	.0011559	.002557	.0014450	.000414	.04999	.0028004
%RSD	6.634574	54.71421	.1288386	26.56699	14.53237	.3345956	.4950989
#1	.0513175	.0019220	1.986683	.0048473	-.003123	14.88715	.5636429
#2	.0478674	.0033518	1.985162	.0070860	-.003055	14.95057	.5644141
#3	.0449498	.0010638	1.981695	.0043839	-.002374	14.98580	.5688328
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0015834	.0022981	39.63291	.0351345	.0331792	.0988898	30.66144
Stddev	.0001408	.0001080	.08785	.0007395	.0005109	.0056262	.08445
%RSD	8.893621	4.701456	.2216628	2.104757	1.539798	5.689407	.2754116
#1	.0014436	.0024181	39.57734	.0351773	.0334443	.0946320	30.68492
#2	.0015813	.0022676	39.73419	.0358517	.0325903	.0967692	30.56774
#3	.0017252	.0022086	39.58720	.0343745	.0335031	.1052682	30.73167
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.181671	5.358811	.0373478	-.002630	.4552964	.0779713	.6902641
Stddev	.007057	.080061	.0010120	.001542	.5407217	.0087086	.0087114
%RSD	.3234862	1.493998	2.709689	58.61925	118.7626	11.16898	1.262043
#1	2.175456	5.334859	.0373985	-.001856	-.109236	.0706589	.6985061
#2	2.189343	5.448113	.0383334	-.004405	.506570	.0756494	.6811490
#3	2.180213	5.293460	.0363113	-.001629	.968555	.0876055	.6911372
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.568746	3.718199	-.080254	.0040837	.6839369	1.134186	.0345187
Stddev	.086944	.004487	.000633	.0002351	.0021807	.003163	.0006358
%RSD	5.542269	.1206899	.7882227	5.756649	.3188388	.2788811	1.841768
#1	1.468552	3.722841	-.080420	.0039652	.6857207	1.130542	.0347995
#2	1.624328	3.713884	-.079555	.0039315	.6815059	1.136214	.0337908
#3	1.613358	3.717871	-.080788	.0043545	.6845841	1.135803	.0349656

Sample Name: P5041-01LX5 Acquired: 12/10/2024 18:41:28 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHK78L Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Sr4077	Li6707
Units	ppm	ppm	ppm
Avg	.1867954	.1424149	-.002460
Stddev	.0040717	.0010537	.004661
%RSD	2.179752	.7398631	189.4717
#1	.1872423	.1416273	.002826
#2	.1906252	.1436118	-.004226
#3	.1825187	.1420055	-.005981

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2582.949	28469.79	2754.704	2012.852	3850.310
Stddev	5.370	113.23	15.805	6.056	5.980
%RSD	.2078849	.3977122	.5737304	.3008870	.1553011
#1	2578.543	28451.21	2770.983	2012.739	3845.922
#2	2588.930	28591.16	2739.421	2018.964	3857.121
#3	2581.373	28367.00	2753.710	2006.853	3847.888

Sample Name: P5041-03 Acquired: 12/10/2024 18:45:24 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHK78S Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3182951	.0981249	9.494938	.1507188	.1529614	69.14714
Stddev	.0026020	.0027555	.056698	.0011682	.0009796	2.63245
%RSD	.8174961	2.808192	.5971349	.7751115	.6404248	3.807022
#1	.3156196	.0996914	9.557741	.1505873	.1530117	72.18658
#2	.3184488	.0997401	9.479551	.1496218	.1519575	67.66095
#3	.3208169	.0949432	9.447522	.1519472	.1539148	67.59388

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	6.096958	.0974655	.1039023	171.8238	.5249846	1.086831
Stddev	.217635	.0031448	.0006352	6.4375	.0107018	.007009
%RSD	3.569570	3.226622	.6113100	3.746589	2.038504	.6449085
#1	6.348260	.1010482	.1046156	179.2526	.5127969	1.094208
#2	5.971944	.0951610	.1036935	168.3357	.5328459	1.086026
#3	5.970668	.0961873	.1033979	167.8831	.5293111	1.080259

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.8669256	134.7619	10.29128	23.42294	1.172917	.0740759
Stddev	.0392467	5.2682	.35234	.90772	.008709	.0001488
%RSD	4.527110	3.909299	3.423669	3.875366	.7424753	.2008809
#1	.9116518	140.8302	10.69793	24.46731	1.182039	.0740098
#2	.8382397	132.0958	10.07718	22.97772	1.172023	.0739716
#3	.8508854	131.3595	10.09872	22.82378	1.164690	.0742463

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9006630	1.266608	3.753619	8.052604	F 17.99994	-.330767
Stddev	.6871720	.056620	.062363	.262596	.09551	.011340
%RSD	76.29625	4.470186	1.661397	3.261009	.5306182	3.428275
#1	.7465166	1.331300	3.684660	8.354610	18.10450	-.342592
#2	.3036556	1.242450	3.806059	7.878129	17.97804	-.319985
#3	1.651817	1.226075	3.770137	7.925072	17.91728	-.329726

Sample Name: P5041-03 Acquired: 12/10/2024 18:45:24 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHK78S Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0209460	3.383938	4.806402	.2049373	.8222690	.6163751
Stddev	.0001743	.017572	.150459	.0027520	.0274326	.0203945
%RSD	.8319475	.5192637	3.130394	1.342856	3.336203	3.308775
#1	.0209128	3.399463	4.976164	.2075368	.8536505	.6398604
#2	.0207906	3.387490	4.689528	.2052204	.8028437	.6031278
#3	.0211344	3.364862	4.753514	.2020547	.8103128	.6061371

Elem	Li6707
Units	ppm
Avg	.0900121
Stddev	.0073629
%RSD	8.179896
#1	.0972064
#2	.0903384
#3	.0824915

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2923.196	32354.17	3135.787	2294.206	3839.623
Stddev	9.698	466.63	109.773	31.426	19.813
%RSD	.3317564	1.442260	3.500663	1.369781	.5160267
#1	2915.191	32859.17	3010.081	2329.611	3819.916
#2	2920.417	31938.96	3212.736	2269.616	3839.412
#3	2933.980	32264.39	3184.545	2283.392	3859.541

Sample Name: P5042-01 Acquired: 12/10/2024 18:49:13 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHKB0 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1284278	.0072712	2.500005	-.001371	-.002788	68.96950	1.497378
Stddev	.0015994	.0007306	.036268	.003693	.004879	1.00226	.023163
%RSD	1.245375	10.04760	1.450723	269.3792	175.0115	1.453188	1.546881
#1	.1293541	.0077421	2.480720	-.005348	-.008378	69.48077	1.505848
#2	.1293483	.0064296	2.541841	-.000714	.000613	67.81472	1.471173
#3	.1265809	.0076420	2.477454	.001949	-.000598	69.61302	1.515114
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0072107	.0084479	133.2050	.1171192	.1257808	.4904064	173.2357
Stddev	.0000873	.0001017	1.9199	.0007401	.0015443	.0139856	2.3778
%RSD	1.210971	1.203335	1.441340	.6319437	1.227727	2.851835	1.372605
#1	.0072795	.0084770	134.1903	.1173508	.1247044	.4980386	174.5500
#2	.0072401	.0085318	130.9924	.1177159	.1275502	.4742652	170.4908
#3	.0071124	.0083349	134.4321	.1162910	.1250878	.4989154	174.6663
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	13.37916	38.44643	.1971514	-.011429	.8740198	.1570916	1.661234
Stddev	.20132	.40923	.0019440	.000419	.6916265	.0031173	.014887
%RSD	1.504739	1.064405	.9860301	3.663329	79.13168	1.984406	.8961693
#1	13.47756	38.74188	.1965034	-.011720	1.200717	.1581122	1.659446
#2	13.14756	37.97934	.1993366	-.011619	.079562	.1535919	1.647322
#3	13.51234	38.61809	.1956142	-.010949	1.341780	.1595706	1.676935
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.459074	8.663444	-.460350	.0059322	2.754918	5.828430	.3464366
Stddev	.156874	.124066	.002676	.0002050	.045025	.047354	.0059447
%RSD	1.658447	1.432062	.5812980	3.455954	1.634361	.8124656	1.715967
#1	9.430450	8.605680	-.461060	.0057527	2.724742	5.878723	.3469719
#2	9.318483	8.805859	-.457391	.0058883	2.806672	5.784700	.3520955
#3	9.628288	8.578792	-.462600	.0061556	2.733342	5.821867	.3402423

Sample Name: P5042-01 Acquired: 12/10/2024 18:49:13 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHKB0 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Sr4077	Li6707
Units	ppm	ppm	ppm
Avg	.6196112	.9512900	.0385422
Stddev	.0105070	.0158011	.0044963
%RSD	1.695742	1.661013	11.66580
#1	.6204938	.9594490	.0406038
#2	.6086907	.9330774	.0333848
#3	.6296490	.9613437	.0416380

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2989.100	32574.78	3264.621	2321.097	3726.991
Stddev	24.880	122.15	14.544	5.455	42.280
%RSD	.8323669	.3749706	.4455028	.2350074	1.134415
#1	2996.495	32711.81	3248.533	2327.197	3748.018
#2	2961.361	32477.34	3276.838	2316.688	3678.320
#3	3009.445	32535.20	3268.491	2319.406	3754.634

Sample Name: P5042-02 Acquired: 12/10/2024 18:53:02 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHKB0D Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1287286	.0072564	2.491583	-.000657	-.003992	69.04628	1.508956
Stddev	.0011875	.0008990	.004015	.001615	.000722	.61159	.009107
%RSD	.9224953	12.38934	.1611304	245.7596	18.08776	.8857624	.6035320
#1	.1279456	.0068121	2.491863	.001183	-.004346	68.60917	1.504070
#2	.1281452	.0066660	2.495450	-.001841	-.004467	68.78448	1.503334
#3	.1300950	.0082910	2.487436	-.001313	-.003161	69.74518	1.519463
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0071765	.0083805	133.9119	.1165361	.1244751	.5014670	174.2288
Stddev	.0001950	.0001311	1.1960	.0019817	.0003093	.0080319	1.4948
%RSD	2.716550	1.564828	.8931553	1.700496	.2484470	1.601672	.8579558
#1	.0070522	.0084815	133.1699	.1175168	.1241470	.4933870	173.1481
#2	.0070762	.0084278	133.2742	.1142553	.1245170	.5094498	173.6035
#3	.0074012	.0082323	135.2917	.1178362	.1247612	.5015643	175.9347
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	13.38729	38.39321	.1945308	-.010049	.8509782	.1665441	1.641094
Stddev	.13591	.47782	.0010745	.000809	.4227719	.0022895	.026162
%RSD	1.015246	1.244535	.5523289	8.050461	49.68070	1.374695	1.594206
#1	13.31380	38.25545	.1954610	-.009962	1.117258	.1689645	1.656924
#2	13.30395	37.99941	.1947767	-.009287	1.072179	.1644131	1.610896
#3	13.54413	38.92478	.1933547	-.010898	.363497	.1662546	1.655463
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.494141	8.644209	-.463560	.0060098	2.747731	5.802488	.3471474
Stddev	.176594	.012872	.012528	.0002148	.009979	.116631	.0011658
%RSD	1.860032	.1489099	2.702520	3.574785	.3631891	2.010017	.3358099
#1	9.318739	8.640905	-.458666	.0060022	2.755970	5.746154	.3476830
#2	9.491779	8.658411	-.454218	.0057989	2.736635	5.724718	.3458101
#3	9.671904	8.633311	-.477796	.0062283	2.750589	5.936592	.3479491

Sample Name: P5042-02 Acquired: 12/10/2024 18:53:02 Type: Unk

Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000

User: Kareem Custom ID1: MBHKB0D Custom ID2: Custom ID3:

Comment:

Elem	Ti3361	Sr4077	Li6707
Units	ppm	ppm	ppm
Avg	.6248292	.9515195	.0379391
Stddev	.0047785	.0097704	.0021149
%RSD	.7647750	1.026824	5.574424
#1	.6202262	.9478598	.0403633
#2	.6244956	.9441072	.0369828
#3	.6297658	.9625914	.0364712

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3019.799	32905.82	3285.676	2351.826	3762.324
Stddev	8.130	396.52	50.358	29.943	9.016
%RSD	.2692397	1.205024	1.532653	1.273160	.2396466
#1	3012.354	32770.50	3309.574	2349.318	3751.944
#2	3018.568	33352.29	3319.635	2382.944	3766.814
#3	3028.475	32594.67	3227.818	2323.216	3768.214

Sample Name: P5042-01LX5 Acquired: 12/10/2024 18:56:51 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHKB0L Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0241831	.0028728	.4962245	.0004008	-.001211	15.82763	.3478329
Stddev	.0010472	.0011334	.0057135	.0023017	.001806	.02190	.0012219
%RSD	4.330419	39.45128	1.151388	574.2424	149.1140	.1383808	.3512970
#1	.0246696	.0023939	.5015312	.0012413	-.002292	15.80418	.3486038
#2	.0229811	.0041670	.4969657	-.002203	.000874	15.83114	.3484709
#3	.0248987	.0020575	.4901766	.002164	-.002215	15.84757	.3464240
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0016763	.0016867	30.88387	.0258782	.0331510	.1153704	40.28345
Stddev	.0001230	.0000045	.03725	.0013073	.0001367	.0037585	.06975
%RSD	7.335398	.2685833	.1206252	5.051759	.4124349	3.257770	.1731386
#1	.0018179	.0016868	30.85901	.0270430	.0331989	.1196276	40.35897
#2	.0016144	.0016912	30.86589	.0244643	.0332574	.1139724	40.26994
#3	.0015965	.0016822	30.92670	.0261275	.0329968	.1125112	40.22145
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	3.110861	8.874163	.0383027	-.003026	.1901624	.0412734	.3813697
Stddev	.008797	.064238	.0006507	.000598	.5528979	.0056571	.0055297
%RSD	.2827947	.7238772	1.698756	19.77565	290.7505	13.70642	1.449958
#1	3.111187	8.809738	.0385812	-.003438	-.427903	.0440385	.3858685
#2	3.101906	8.938213	.0387678	-.003299	.360657	.0450161	.3751962
#3	3.119492	8.874539	.0375591	-.002339	.637733	.0347655	.3830443
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.877256	1.692451	-.113003	.0006976	.5357538	1.404674	.0589650
Stddev	.086719	.014187	.001793	.0002669	.0059965	.003340	.0014701
%RSD	4.619479	.8382520	1.586924	38.25490	1.119257	.2377944	2.493224
#1	1.912112	1.708403	-.113231	.0009973	.5423831	1.406890	.0594036
#2	1.941124	1.687701	-.114671	.0004856	.5307080	1.406300	.0573255
#3	1.778532	1.681248	-.111107	.0006100	.5341702	1.400832	.0601659

Sample Name: P5042-01LX5 Acquired: 12/10/2024 18:56:51 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHKB0L Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Sr4077	Li6707
Units	ppm	ppm	ppm
Avg	.1435485	.2201422	-.024976
Stddev	.0028228	.0007407	.003522
%RSD	1.966429	.3364738	14.09993
#1	.1408574	.2205652	-.024463
#2	.1464867	.2192869	-.028726
#3	.1433015	.2205746	-.021739

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2613.962	28879.13	2803.304	2049.178	3845.175
Stddev	14.834	135.52	19.267	13.026	29.014
%RSD	.5674795	.4692698	.6872932	.6356926	.7545684
#1	2596.923	28772.75	2801.635	2035.115	3811.820
#2	2620.967	29031.71	2784.927	2060.831	3859.128
#3	2623.996	28832.93	2823.352	2051.589	3864.576

Sample Name: P5042-03 Acquired: 12/10/2024 19:00:46 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHKB0S Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2088738	.0965660	2.449293	.1429665	.1485082	70.40306	4.864656
Stddev	.0036036	.0014167	.022883	.0055797	.0036991	.38372	.023451
%RSD	1.725257	1.467120	.9342577	3.902808	2.490833	.5450399	.4820618
#1	.2062010	.0955819	2.439630	.1373071	.1483574	69.96485	4.837640
#2	.2074483	.0981898	2.432828	.1431293	.1448868	70.56541	4.876576
#3	.2129721	.0959263	2.475423	.1484630	.1522803	70.67893	4.879753
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0933524	.1022395	129.1797	.4840034	1.116597	.8841488	169.1462
Stddev	.0009647	.0007842	.7380	.0011454	.011198	.0066528	1.0804
%RSD	1.033368	.7670429	.5713260	.2366506	1.002849	.7524565	.6387241
#1	.0922398	.1018224	128.4515	.4852567	1.111209	.8829309	167.9222
#2	.0939545	.1017520	129.1603	.4837426	1.109112	.8781891	169.5490
#3	.0938630	.1031442	129.9272	.4830108	1.129471	.8913265	169.9673
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	13.81748	37.36702	1.196208	.0689656	.6873765	1.031279	2.365487
Stddev	.10443	.11396	.009255	.0006211	.4020434	.002571	.012002
%RSD	.7557667	.3049776	.7737255	.9005418	58.48954	.2492662	.5073890
#1	13.71746	37.27073	1.191008	.0682589	.2247923	1.029723	2.376904
#2	13.80917	37.33750	1.190723	.0692133	.9525912	1.034246	2.352975
#3	13.92582	37.49284	1.206894	.0694245	.8847461	1.029868	2.366582
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	8.966198	8.335409	-.458427	.0061559	2.653700	5.928839	.3341879
Stddev	.135207	.070221	.003204	.0001773	.029956	.063632	.0021489
%RSD	1.507960	.8424394	.6989479	2.879740	1.128828	1.073259	.6430261
#1	8.845989	8.293933	-.454753	.0063462	2.639808	5.855824	.3321357
#2	8.940029	8.295808	-.460641	.0061258	2.633213	5.958238	.3340060
#3	9.112577	8.416486	-.459887	.0059955	2.688080	5.972456	.3364220

Sample Name: P5042-03 Acquired: 12/10/2024 19:00:46 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHKB0S Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Sr4077	Li6707
Units	ppm	ppm	ppm
Avg	.6181173	.9176298	.0313650
Stddev	.0032964	.0077689	.0015543
%RSD	.5332974	.8466299	4.955488

#1	.6144889	.9098644	.0295721
#2	.6189353	.9176226	.0323334
#3	.6209277	.9254023	.0321893

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2970.309	32696.43	3281.037	2323.296	3746.581
Stddev	14.640	31.43	33.976	2.406	24.874
%RSD	.4928839	.0961322	1.035514	.1035758	.6639088

#1	2980.398	32679.30	3320.197	2325.489	3757.446
#2	2977.011	32732.70	3263.514	2323.679	3764.175
#3	2953.517	32677.28	3259.401	2320.722	3718.123

Sample Name: P5043-01 Acquired: 12/10/2024 19:04:34 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHKM2 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0468702	-.002836	.2504523	.0018773	.0013268	70.07477	.6247701
Stddev	.0031431	.002183	.0007550	.0042499	.0003088	.18127	.0031678
%RSD	6.705963	76.96988	.3014393	226.3877	23.27412	.2586819	.5070369
#1	.0450814	-.001039	.2512597	-.002785	.0011059	70.25900	.6278076
#2	.0504994	-.005266	.2503334	.005535	.0016796	69.89661	.6214864
#3	.0450298	-.002204	.2497638	.002881	.0011948	70.06870	.6250162
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0060278	.0023003	37.35375	.0827810	.0746474	.1270341	150.5426
Stddev	.0001490	.0001089	.16095	.0012778	.0004766	.0033214	.6672
%RSD	2.472310	4.734375	.4308888	1.543562	.6384178	2.614562	.4432188
#1	.0060283	.0022122	37.49809	.0825036	.0744427	.1248261	151.2654
#2	.0058785	.0022667	37.18019	.0841747	.0743073	.1308538	149.9502
#3	.0061766	.0024221	37.38296	.0816648	.0751921	.1254223	150.4122
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	3.297124	17.80525	.1025876	-.013897	.7169306	.1623280	.3244434
Stddev	.012362	.02163	.0005502	.000313	.4560405	.0051725	.0096491
%RSD	.3749233	.1214818	.5363207	2.254127	63.61013	3.186441	2.974061
#1	3.310312	17.78029	.1025591	-.013990	.7477897	.1655011	.3354787
#2	3.285800	17.81854	.1020521	-.013547	1.156758	.1563593	.3175949
#3	3.295260	17.81693	.1031514	-.014152	.246244	.1651236	.3202565
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.466233	3.385891	-.427399	.0023911	.8940549	6.137211	.0125612
Stddev	.084290	.017726	.007688	.0001440	.0094077	.019433	.0006883
%RSD	3.417774	.5235360	1.798725	6.023090	1.052250	.3166503	5.479513
#1	2.372343	3.376551	-.424442	.0024349	.8890833	6.136175	.0131544
#2	2.490965	3.374788	-.436127	.0022303	.8881761	6.157142	.0127228
#3	2.535390	3.406334	-.421630	.0025082	.9049054	6.118316	.0118065

Sample Name: P5043-01 Acquired: 12/10/2024 19:04:34 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHKM2 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Sr4077	Li6707
Units	ppm	ppm	ppm
Avg	.7646850	-.057937	.0520618
Stddev	.0074394	.000524	.0019422
%RSD	.9728670	.9045836	3.730543

#1	.7661187	-.058388	.0513013
#2	.7566331	-.058060	.0542691
#3	.7713031	-.057362	.0506149

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2861.773	31449.88	3057.875	2225.932	3868.589
Stddev	12.132	126.04	12.109	3.874	19.559
%RSD	.4239495	.4007617	.3959782	.1740310	.5055768

#1	2863.148	31407.27	3048.544	2221.770	3872.526
#2	2873.159	31350.67	3053.523	2229.433	3885.880
#3	2849.011	31591.70	3071.558	2226.594	3847.361

Sample Name: P5043-02 Acquired: 12/10/2024 19:08:25 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHKM2D Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0467148	-.001754	.2496880	-.002476	.0021646	70.03459	.6276288
Stddev	.0024427	.000491	.0017528	.003028	.0007055	.14002	.0012399
%RSD	5.229007	28.01092	.7019970	122.3175	32.59332	.1999231	.1975479
#1	.0440390	-.001196	.2487697	-.004970	.0015148	69.87487	.6262121
#2	.0472799	-.002122	.2485852	.000894	.0020640	70.13617	.6281587
#3	.0488254	-.001944	.2517092	-.003350	.0029151	70.09273	.6285157
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0060370	.0023366	37.23224	.0837481	.0747448	.1305523	150.7711
Stddev	.0001517	.0001237	.05859	.0011437	.0001461	.0078955	.3703
%RSD	2.513177	5.294022	.1573697	1.365679	.1954835	6.047786	.2456259
#1	.0059298	.0023387	37.20082	.0824374	.0748839	.1221445	150.3435
#2	.0059707	.0022119	37.29984	.0845440	.0747578	.1378092	150.9890
#3	.0062106	.0024592	37.19606	.0842627	.0745926	.1317031	150.9808
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	3.294371	17.71818	.1032219	-.013207	1.040113	.1590573	.3176123
Stddev	.011895	.02203	.0002114	.000567	.112743	.0104113	.0051212
%RSD	.3610657	.1243504	.2047581	4.294430	10.83945	6.545624	1.612407
#1	3.290918	17.70877	.1030610	-.013541	1.169273	.1470799	.3163768
#2	3.307611	17.74336	.1031433	-.012552	.989648	.1641506	.3232382
#3	3.284585	17.70242	.1034612	-.013527	.961418	.1659415	.3132218
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.467511	3.412450	-.424268	.0021655	.8982200	6.118127	.0141735
Stddev	.103507	.022934	.002709	.0001713	.0043514	.023889	.0001916
%RSD	4.194793	.6720706	.6384593	7.910969	.4844435	.3904621	1.351606
#1	2.568630	3.401798	-.421864	.0020743	.9008790	6.120779	.0142926
#2	2.361771	3.396778	-.423738	.0020590	.8931984	6.093023	.0142754
#3	2.472131	3.438773	-.427203	.0023631	.9005827	6.140580	.0139525

Sample Name: P5043-02 Acquired: 12/10/2024 19:08:25 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHKM2D Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Sr4077	Li6707
Units	ppm	ppm	ppm
Avg	.7591919	-.057967	.0494344
Stddev	.0074457	.000426	.0036033
%RSD	.9807377	.7348833	7.289032
#1	.7560149	-.057503	.0535875
#2	.7676991	-.058059	.0475758
#3	.7538617	-.058340	.0471399

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2875.936	31717.68	3088.501	2245.841	3873.752
Stddev	7.600	284.46	6.310	14.547	12.244
%RSD	.2642514	.8968561	.2043155	.6477428	.3160733
#1	2877.114	31959.94	3088.752	2254.992	3874.715
#2	2882.878	31404.45	3082.069	2229.067	3885.487
#3	2867.816	31788.64	3094.682	2253.465	3861.056

Sample Name: P5043-01LX5 Acquired: 12/10/2024 19:12:17 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHKM2L Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0108586	-.001458	.0507955	.0022038	.0005621	15.62458	.1400574
Stddev	.0046896	.001805	.0018775	.0010499	.0018358	.05686	.0020346
%RSD	43.18763	123.7882	3.696210	47.64220	326.6292	.3639123	1.452672
#1	.0076725	-.001785	.0495517	.0020094	-.000176	15.58372	.1390412
#2	.0162436	.000488	.0498796	.0033374	-.000790	15.68951	.1423999
#3	.0086597	-.003077	.0529551	.0012646	.002652	15.60050	.1387312
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0013235	.0005125	8.392441	.0180676	.0170827	.0275839	33.71058
Stddev	.0000310	.0000192	.037117	.0011014	.0001237	.0022234	.08290
%RSD	2.340339	3.743545	.4422621	6.096129	.7240222	8.060497	.2459106
#1	.0013033	.0005337	8.435284	.0180973	.0171528	.0300077	33.69930
#2	.0013592	.0005075	8.370034	.0169516	.0171554	.0271051	33.79854
#3	.0013081	.0004963	8.372004	.0191538	.0169399	.0256389	33.63390
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.7469713	3.958011	.0203066	-.003619	.2161651	.0386551	.0698225
Stddev	.0036190	.086919	.0001180	.000167	.2866416	.0030342	.0048767
%RSD	.4844929	2.196017	.5811117	4.621929	132.6031	7.849360	6.984379
#1	.7494726	4.057779	.0202189	-.003557	-.062271	.0352381	.0733776
#2	.7428215	3.917593	.0202601	-.003491	.510362	.0396931	.0718269
#3	.7486197	3.898661	.0204408	-.003808	.200404	.0410340	.0642630
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1065655	.6975489	-.101973	-.000233	.1818661	1.423573	-.005961
Stddev	.1574021	.0020302	.001603	.000293	.0034128	.013114	.000820
%RSD	147.7046	.2910548	1.572324	125.6204	1.876561	.9211734	13.75752
#1	.0061630	.6978177	-.103631	-.000471	.1794361	1.429265	-.005056
#2	.2879724	.6953976	-.101858	-.000323	.1857679	1.432880	-.006172
#3	.0255610	.6994314	-.100430	.000094	.1803944	1.408576	-.006654

Sample Name: P5043-01LX5 Acquired: 12/10/2024 19:12:17 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHKM2L Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Sr4077	Li6707
Units	ppm	ppm	ppm
Avg	.1729576	-.012775	-.020273
Stddev	.0032859	.000202	.002436
%RSD	1.899812	1.584319	12.01670
#1	.1695033	-.012764	-.022890
#2	.1733255	-.012579	-.019858
#3	.1760441	-.012983	-.018071

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2613.850	28979.69	2799.739	2052.676	3930.678
Stddev	7.963	291.59	20.765	24.980	10.851
%RSD	.3046618	1.006177	.7416635	1.216966	.2760592
#1	2606.331	28876.55	2793.180	2049.850	3921.785
#2	2622.194	29308.83	2783.047	2078.949	3942.769
#3	2613.025	28753.69	2822.992	2029.228	3927.481

Sample Name: P5043-03 Acquired: 12/10/2024 19:16:14 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHKM2S Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1312930	.0891965	.2894326	.1529458	.1608943	72.97117	4.315334
Stddev	.0010919	.0018836	.0015882	.0020275	.0023773	.24265	.014711
%RSD	.8316584	2.111769	.5487259	1.325614	1.477543	.3325253	.3409120
#1	.1324403	.0901015	.2908303	.1532199	.1595382	72.76570	4.303869
#2	.1311721	.0870312	.2897620	.1507951	.1636393	73.23887	4.331922
#3	.1302666	.0904568	.2877055	.1548222	.1595055	72.90895	4.310213
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0977499	.0968166	37.38537	.4753820	1.073400	.5666482	151.9548
Stddev	.0008757	.0006294	.15908	.0016524	.004504	.0050811	.5119
%RSD	.8958856	.6500565	.4255200	.3475920	.4195606	.8966975	.3368732
#1	.0973748	.0974850	37.24617	.4766572	1.078005	.5719976	151.6345
#2	.0971242	.0967296	37.55877	.4735153	1.073188	.5660606	152.5451
#3	.0987507	.0962353	37.35117	.4759736	1.069006	.5618865	151.6847
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.249494	17.67094	1.122833	.0703476	.5334384	1.087667	1.102634
Stddev	.023977	.07158	.005945	.0002216	.2096579	.009853	.011752
%RSD	.5642391	.4050573	.5294875	.3150233	39.30311	.9058827	1.065800
#1	4.241762	17.60674	1.128538	.0704358	.3912619	1.086755	1.105867
#2	4.276383	17.74812	1.123287	.0705115	.7742199	1.097945	1.112432
#3	4.230336	17.65796	1.116673	.0700954	.4348334	1.078302	1.089605
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.397137	3.433001	-.442048	.0019320	.9269723	6.161765	.0134899
Stddev	.170859	.019624	.003149	.0000741	.0027161	.029936	.0016774
%RSD	7.127610	.5716269	.7124052	3.837365	.2930087	.4858306	12.43437
#1	2.218380	3.452292	-.445244	.0019764	.9298730	6.159772	.0140624
#2	2.558814	3.433653	-.441952	.0019732	.9265548	6.132875	.0148061
#3	2.414217	3.413060	-.438948	.0018464	.9244892	6.192647	.0116013

Sample Name: P5043-03 Acquired: 12/10/2024 19:16:14 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHKM2S Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Sr4077	Li6707
Units	ppm	ppm	ppm
Avg	.7636629	-.058845	.0485860
Stddev	.0087466	.000444	.0019226
%RSD	1.145345	.7541782	3.957171
#1	.7584118	-.058439	.0484767
#2	.7737598	-.058778	.0467203
#3	.7588169	-.059319	.0505609

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2890.268	31948.82	3114.283	2278.155	3889.673
Stddev	10.977	91.89	10.120	10.370	16.298
%RSD	.3797932	.2876019	.3249635	.4551965	.4190008
#1	2879.755	31842.83	3110.625	2268.385	3871.368
#2	2901.656	32005.97	3125.724	2289.036	3902.610
#3	2889.392	31997.66	3106.500	2277.044	3895.040

Sample Name: P4977-03 Acquired: 12/10/2024 19:20:03 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ME29F8 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0138540	.0122074	.0328907	-.037477	-.017691	14.20222
Stddev	.0017275	.0016874	.0013319	.003650	.000201	.17264
%RSD	12.46944	13.82258	4.049467	9.738504	1.135882	1.215574

#1	.0118888	.0116933	.0343988	-.038793	-.017706	14.30954
#2	.0151331	.0140921	.0323982	-.033352	-.017483	14.29405
#3	.0145400	.0108369	.0318753	-.040286	-.017884	14.00307

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0649781	.0013763	.0009147	F 1296.241	.0393410	.0659914
Stddev	.0017659	.0001342	.0000303	18.561	.0005649	.0006834
%RSD	2.717656	9.750539	3.316009	1.431913	1.435892	1.035576

#1	.0666441	.0013887	.0009408	1308.604	.0388784	.0666070
#2	.0651632	.0015039	.0008814	1305.223	.0399706	.0652560
#3	.0631269	.0012363	.0009221	1274.898	.0391740	.0661113

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0486635	41.86525	2.387758	191.1119	.0730500	-.003593
Stddev	.0094139	.52253	.031352	2.4529	.0004896	.001951
%RSD	19.34488	1.248125	1.313030	1.283503	.6702653	54.29680

#1	.0462483	42.25641	2.404106	191.8862	.0728470	-.005803
#2	.0406925	42.06752	2.407556	193.0842	.0726945	-.002867
#3	.0590497	41.27182	2.351610	188.3652	.0736085	-.002109

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.6119801	.0621205	.1395470	.7332986	2.028418	-.092208
Stddev	.2534865	.0044583	.0024535	.0433736	.007547	.003566
%RSD	41.42072	7.176814	1.758212	5.914862	.3720479	3.867078

#1	.3575348	.0655817	.1423801	.7808112	2.032569	-.093156
#2	.6139088	.0570897	.1381233	.7232604	2.032979	-.088264
#3	.8644968	.0636902	.1381375	.6958243	2.019707	-.095204

Sample Name: P4977-03 Acquired: 12/10/2024 19:20:03 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ME29F8 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0045780	2.819679	1.859659	.0357120	.4522572	1.042790
Stddev	.0008396	.011336	.015799	.0028119	.0075886	.015057
%RSD	18.33906	.4020144	.8495628	7.873895	1.677929	1.443910
#1	.0039565	2.828230	1.853576	.0387079	.4569943	1.051380
#2	.0042444	2.823987	1.877596	.0331299	.4562727	1.051587
#3	.0055330	2.806821	1.847807	.0352983	.4435046	1.025405

Elem	Li6707
Units	ppm
Avg	-.026160
Stddev	.002283
%RSD	8.726485
#1	-.023538
#2	-.027705
#3	-.027237

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2419.958	26351.86	2786.971	1876.958	3232.122
Stddev	5.697	192.62	19.547	12.617	13.396
%RSD	.2354350	.7309570	.7013658	.6722123	.4144497
#1	2414.512	26138.86	2777.601	1865.653	3217.682
#2	2419.485	26513.83	2773.874	1890.569	3234.541
#3	2425.877	26402.88	2809.439	1874.651	3244.144

Sample Name: P4977-04 Acquired: 12/10/2024 19:23:55 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ME29F8D Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0086500	.0120320	.0320997	-.033496	-.018392	14.29031
Stddev	.0031408	.0011305	.0004921	.003073	.001437	.07181
%RSD	36.30982	9.395885	1.532908	9.172698	7.812466	.5024993
#1	.0116589	.0113645	.0320521	-.030104	-.017606	14.35284
#2	.0053921	.0133373	.0316332	-.036091	-.017520	14.30622
#3	.0088991	.0113943	.0326139	-.034294	-.020050	14.21189
Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0646136	.0014580	.0008677	F 1298.225	.0391374	.0664910
Stddev	.0005551	.0000415	.0000575	5.076	.0007132	.0006278
%RSD	.8591475	2.843831	6.625906	.3910134	1.822384	.9441153
#1	.0639727	.0015038	.0009173	1300.324	.0399561	.0658664
#2	.0649209	.0014230	.0008047	1301.915	.0386507	.0664848
#3	.0649471	.0014472	.0008812	1292.436	.0388054	.0671219
Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0529879	41.96544	2.401117	193.4014	.0716415	-.004520
Stddev	.0021220	.05856	.010759	.6977	.0006375	.000395
%RSD	4.004755	.1395316	.4480771	.3607302	.8898026	8.742314
#1	.0536149	42.00922	2.406999	193.9314	.0716441	-.004225
#2	.0547258	41.98818	2.407653	193.6617	.0710028	-.004368
#3	.0506230	41.89893	2.388700	192.6110	.0722777	-.004969
Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.7702172	.0563929	.1310328	.9476001	2.002600	-.086222
Stddev	.2680462	.0078771	.0041262	.1651489	.008275	.000614
%RSD	34.80138	13.96819	3.148965	17.42812	.4132027	.7124039
#1	.4616336	.0474716	.1352814	1.052446	1.994018	-.085767
#2	.9037511	.0593182	.1307759	1.033125	2.003252	-.086921
#3	.9452669	.0623887	.1270410	.757229	2.010529	-.085979

Sample Name: P4977-04 Acquired: 12/10/2024 19:23:55 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ME29F8D Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0044236	2.785631	1.870576	.0353324	.4587017	1.048950
Stddev	.0000991	.017467	.009321	.0003133	.0069787	.002904
%RSD	2.240649	.6270536	.4982806	.8867385	1.521409	.2768760
#1	.0044731	2.765587	1.875380	.0353728	.4598597	1.050252
#2	.0043095	2.797603	1.876514	.0350009	.4650289	1.050975
#3	.0044883	2.793702	1.859833	.0356236	.4512163	1.045622

Elem	Li6707
Units	ppm
Avg	-.025368
Stddev	.001537
%RSD	6.060621
#1	-.026546
#2	-.025928
#3	-.023629

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2405.551	26166.17	2729.981	1859.511	3224.383
Stddev	3.019	106.51	23.387	8.760	9.264
%RSD	.1254861	.4070653	.8566729	.4710664	.2873020
#1	2404.301	26086.46	2710.170	1849.426	3231.944
#2	2408.994	26124.90	2723.995	1865.216	3227.155
#3	2403.358	26287.14	2755.780	1863.893	3214.050

Sample Name: P4977-03LX5 Acquired: 12/10/2024 19:27:47 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ME29F8L Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0028671	.0079843	.0037898	-.020107	-.012362	2.899261	.0130660
Stddev	.0016478	.0011916	.0010555	.001722	.004092	.027042	.0017794
%RSD	57.47361	14.92396	27.85155	8.566080	33.10395	.9327233	13.61884
#1	.0045171	.0081962	.0033278	-.021139	-.012146	2.909738	.0113450
#2	.0028627	.0067010	.0030440	-.018118	-.008382	2.919497	.0148986
#3	.0012215	.0090557	.0049975	-.021063	-.016558	2.868548	.0129544
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002742	.0002201	272.0228	.0078855	.0349498	.0313635	8.947834
Stddev	.0000930	.0000287	1.7995	.0011278	.0006425	.0012593	.111933
%RSD	33.92048	13.04228	.6615197	14.30203	1.838224	4.015119	1.250955
#1	.0001775	.0002274	273.5614	.0091372	.0350273	.0301414	9.049587
#2	.0002822	.0002445	272.4630	.0075711	.0355501	.0326570	8.965979
#3	.0003630	.0001885	270.0441	.0069483	.0342722	.0312921	8.827937
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5065541	40.56664	.0141856	-.000795	.1634799	.0093692	.0361974
Stddev	.0040413	.28545	.0003321	.000611	.3709517	.0012023	.0036632
%RSD	.7978040	.7036519	2.340924	76.80176	226.9097	12.83224	10.11994
#1	.5099851	40.85340	.0145071	-.001250	.5827314	.0105520	.0394450
#2	.5075778	40.56401	.0142058	-.000101	-.122148	.0081483	.0322266
#3	.5020994	40.28252	.0138438	-.001034	.029856	.0094074	.0369205
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.139623	.3792637	-.019776	-.000781	.5189821	.3914192	-.002669
Stddev	.086421	.0007413	.000847	.000396	.0041879	.0005903	.000405
%RSD	61.89600	.1954568	4.280677	50.70920	.8069485	.1508091	15.18862
#1	-.136649	.3800710	-.018802	-.000324	.5144996	.3911482	-.002939
#2	-.227493	.3786136	-.020196	-.001031	.5196519	.3920963	-.002203
#3	-.054727	.3791064	-.020332	-.000988	.5227947	.3910130	-.002866

Sample Name: P4977-03LX5 Acquired: 12/10/2024 19:27:47 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ME29F8L Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Sr4077	Li6707
Units	ppm	ppm	ppm
Avg	.0945555	.2148845	-.037308
Stddev	.0024405	.0016491	.003828
%RSD	2.581063	.7674359	10.26010
#1	.0973698	.2156094	-.035677
#2	.0932761	.2160470	-.034566
#3	.0930208	.2129972	-.041681

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2456.756	26879.14	2688.953	1908.141	3610.063
Stddev	5.999	131.89	7.888	12.474	12.082
%RSD	.2441969	.4906729	.2933602	.6537072	.3346783
#1	2449.830	26809.48	2684.490	1906.937	3596.433
#2	2460.099	27031.26	2684.308	1921.172	3619.456
#3	2460.339	26796.70	2698.061	1896.312	3614.300

Sample Name: P4977-05 Acquired: 12/10/2024 19:31:47 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ME29F8S Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0953931	.1048117	.0717050	.1346839	.1643813	18.09933
Stddev	.0015185	.0029982	.0036049	.0080156	.0059456	.07626
%RSD	1.591873	2.860559	5.027374	5.951391	3.616982	.4213142
#1	.0945407	.1051849	.0697461	.1341974	.1638043	18.07030
#2	.0944922	.1076059	.0758652	.1429316	.1705944	18.04184
#3	.0971463	.1016444	.0695038	.1269227	.1587452	18.18583

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.003864	.1010746	.0992275	F 1285.531	.4451658	1.090208
Stddev	.007830	.0004166	.0062730	1.640	.0031568	.069191
%RSD	.1955726	.4122085	6.321872	.1275982	.7091230	6.346604
#1	4.000335	.1013605	.0977139	1284.796	.4475955	1.077211
#2	3.998420	.1012667	.1061189	1284.386	.4463042	1.164976
#3	4.012838	.1005966	.0938498	1287.410	.4415977	1.028437

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5192062	43.68773	3.317240	189.0780	1.101692	.0901801
Stddev	.0057488	.14154	.013728	.0810	.072001	.0010649
%RSD	1.107236	.3239830	.4138242	.0428313	6.535483	1.180894
#1	.5205707	43.54443	3.303924	189.1479	1.085614	.0889505
#2	.5128979	43.69132	3.331345	189.0969	1.180373	.0908012
#3	.5241501	43.82744	3.316450	188.9893	1.039090	.0907887

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3904774	1.062655	.9957305	.9366562	2.036975	-.089005
Stddev	.6174638	.001744	.0111885	.3665443	.133602	.001235
%RSD	158.1305	.1641127	1.123649	39.13328	6.558823	1.387783
#1	-.303687	1.063222	1.002478	.7601443	2.012950	-.087978
#2	.878497	1.064044	1.001898	1.358060	2.180959	-.090375
#3	.596622	1.060698	.982815	.691765	1.917016	-.088662

Sample Name: P4977-05 Acquired: 12/10/2024 19:31:47 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ME29F8S Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0045718	2.867857	1.969741	.0385081	.4577228	1.027613
Stddev	.0002357	.180153	.012974	.0022260	.0017377	.001163
%RSD	5.155181	6.281802	.6586439	5.780521	.3796328	.1132121
#1	.0043474	2.822129	1.973506	.0392401	.4594505	1.026451
#2	.0045507	3.066468	1.980415	.0402760	.4577426	1.028778
#3	.0048173	2.714975	1.955301	.0360084	.4559753	1.027611

Elem	Li6707
Units	ppm
Avg	-.029137
Stddev	.001706
%RSD	5.854324
#1	-.027625
#2	-.030986
#3	-.028800

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2400.234	26561.20	2761.474	1883.737	3208.356
Stddev	121.652	58.96	4.779	16.718	181.039
%RSD	5.068320	.2219837	.1730702	.8874659	5.642728
#1	2422.296	26519.03	2756.235	1871.379	3237.647
#2	2269.061	26535.99	2762.593	1877.073	3014.458
#3	2509.344	26628.57	2765.595	1902.758	3372.963

Sample Name: P4976-09 Acquired: 12/10/2024 19:35:35 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ME29E4D Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1392199	.0093157	.0373771	-.037828	-.015700	19.00518
Stddev	.0022868	.0017875	.0018947	.004583	.001838	.20222
%RSD	1.642603	19.18824	5.069050	12.11588	11.70924	1.064024
#1	.1385691	.0072539	.0357747	-.039965	-.017404	19.08505
#2	.1373290	.0102627	.0394683	-.032566	-.013751	18.77523
#3	.1417615	.0104304	.0368883	-.040952	-.015944	19.15528
Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0893084	.0017511	.0010623	F 1212.068	.0504120	.0791808
Stddev	.0013535	.0001137	.0000423	14.348	.0006177	.0001254
%RSD	1.515542	6.491889	3.977931	1.183801	1.225363	.1583639
#1	.0896525	.0018730	.0011101	1217.172	.0500151	.0791108
#2	.0878160	.0016480	.0010300	1195.865	.0511237	.0791060
#3	.0904566	.0017322	.0010468	1223.166	.0500971	.0793255
Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0710250	61.89210	2.599354	183.0021	.0920637	-.006246
Stddev	.0034643	.68861	.036410	2.4549	.0003150	.000912
%RSD	4.877598	1.112591	1.400724	1.341458	.3421622	14.60814
#1	.0723682	62.08657	2.614571	184.3675	.0917227	-.007296
#2	.0736167	61.12718	2.557804	180.1680	.0923437	-.005650
#3	.0670903	62.46256	2.625687	184.4707	.0921249	-.005792
Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5537688	.0635562	.1803677	.9710127	1.857735	-.149678
Stddev	.5633796	.0084901	.0031118	.0751315	.003959	.001071
%RSD	101.7355	13.35832	1.725256	7.737438	.2131044	.7155910
#1	.0944023	.0612909	.1771772	1.057401	1.862223	-.150581
#2	1.182367	.0564286	.1805316	.934717	1.856244	-.149958
#3	.384537	.0729492	.1833943	.920921	1.854738	-.148495

Sample Name: P4976-09 Acquired: 12/10/2024 19:35:35 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ME29E4D Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0131714	14.60892	2.227650	.0041016	.7002656	1.068431
Stddev	.0003380	.06204	.027326	.0002746	.0088778	.015922
%RSD	2.566233	.4246618	1.226672	6.694788	1.267779	1.490259
#1	.0134173	14.67051	2.251919	.0042931	.7074711	1.073323
#2	.0127860	14.54644	2.198052	.0042247	.6903481	1.050637
#3	.0133108	14.60982	2.232979	.0037870	.7029777	1.081333

Elem	Li6707
Units	ppm
Avg	-.022022
Stddev	.004115
%RSD	18.68359
#1	-.018938
#2	-.020435
#3	-.026694

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2435.940	26559.29	2793.445	1895.680	3248.364
Stddev	15.333	37.93	30.440	5.034	19.996
%RSD	.6294577	.1428265	1.089689	.2655492	.6155668
#1	2418.625	26590.80	2775.047	1893.345	3225.622
#2	2441.397	26569.89	2828.581	1901.458	3256.283
#3	2447.799	26517.19	2776.707	1892.238	3263.188

Sample Name: P4976-08L Acquired: 12/10/2024 19:39:26 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ME29E4L Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0271997	.0095381	.0054718	-.021720	-.014047	3.930555	.0177175
Stddev	.0004531	.0020508	.0008835	.002614	.001223	.044991	.0016462
%RSD	1.666018	21.50131	16.14712	12.03461	8.706200	1.144636	9.291431
#1	.0274666	.0087407	.0054730	-.023049	-.012990	3.958310	.0161447
#2	.0266765	.0118679	.0063548	-.023403	-.015387	3.878646	.0175794
#3	.0274560	.0080058	.0045877	-.018709	-.013766	3.954709	.0194284
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0004014	.0002545	255.2171	.0108906	.0365831	.0156652	13.22677
Stddev	.0000180	.0000363	2.4736	.0004460	.0003948	.0050020	.14107
%RSD	4.475709	14.25539	.9692157	4.095489	1.079224	31.93090	1.066581
#1	.0004196	.0002871	256.4484	.0106440	.0361583	.0163141	13.28814
#2	.0003837	.0002610	252.3695	.0114055	.0366523	.0103704	13.06540
#3	.0004007	.0002154	256.8335	.0106223	.0369387	.0203111	13.32676
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5539006	38.72186	.0177013	-.001231	-.299703	.0141863	.0396995
Stddev	.0058126	.44593	.0004787	.001067	.578087	.0084096	.0016995
%RSD	1.049392	1.151619	2.704468	86.73947	192.8867	59.28020	4.280911
#1	.5582569	38.98114	.0171501	-.002380	.312051	.0238386	.0395366
#2	.5473005	38.20695	.0179406	-.000271	-.374275	.0084403	.0414745
#3	.5561443	38.97748	.0180132	-.001040	-.836885	.0102799	.0380872
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.187912	.3468666	-.035053	.0005316	2.702554	.5547748	-.008374
Stddev	.138274	.0020003	.001232	.0001848	.010360	.0013667	.000592
%RSD	73.58461	.5766760	3.514015	34.75415	.3833260	.2463610	7.073884
#1	-.267659	.3449184	-.035035	.0007032	2.690616	.5551051	-.008927
#2	-.267831	.3489152	-.036294	.0005556	2.707864	.5559460	-.008445
#3	-.028247	.3467660	-.033831	.0003360	2.709182	.5532731	-.007749

Sample Name: P4976-08L Acquired: 12/10/2024 19:39:26 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ME29E4L Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Sr4077	Li6707
Units	ppm	ppm	ppm
Avg	.1502225	.2213202	-.044604
Stddev	.0032046	.0018057	.003432
%RSD	2.133260	.8158564	7.693187
#1	.1521457	.2220801	-.043004
#2	.1465231	.2192587	-.048544
#3	.1519987	.2226216	-.042265

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2486.079	27252.27	2742.320	1935.509	3643.266
Stddev	16.682	228.28	15.613	13.279	25.791
%RSD	.6710306	.8376548	.5693428	.6860491	.7079123
#1	2502.359	27291.48	2739.508	1936.825	3669.275
#2	2486.857	27458.40	2759.148	1948.081	3642.824
#3	2469.021	27006.92	2728.304	1921.622	3617.699

Sample Name: P4976-10 Acquired: 12/10/2024 19:43:23 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ME29E4S Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2156361	.1021860	.0795526	.1308681	.1600943	22.90204
Stddev	.0023484	.0014030	.0024362	.0042514	.0030968	.19884
%RSD	1.089041	1.373011	3.062347	3.248611	1.934364	.8682239
#1	.2172839	.1033811	.0779464	.1309319	.1568841	23.12685
#2	.2129472	.1025357	.0823557	.1265852	.1630637	22.83006
#3	.2166773	.1006412	.0783557	.1350873	.1603352	22.74921

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.032282	.1019428	.0967985	F 1203.479	.4680124	1.075608
Stddev	.022877	.0004756	.0006863	7.537	.0101362	.008014
%RSD	.5673390	.4665630	.7089716	.6262759	2.165791	.7450647
#1	4.057363	.1024415	.0961497	1211.545	.4624293	1.069836
#2	4.026922	.1014942	.0967289	1202.275	.4618952	1.072230
#3	4.012561	.1018925	.0975169	1196.616	.4797125	1.084758

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5286961	63.32057	3.572638	183.0764	1.095572	.0890700
Stddev	.0017038	.42166	.026222	1.2507	.008367	.0012199
%RSD	.3222706	.6659110	.7339669	.6831316	.7636861	1.369553
#1	.5271331	63.79466	3.592209	184.4235	1.087838	.0881404
#2	.5284429	63.17954	3.582861	182.8535	1.094424	.0886183
#3	.5305124	62.98750	3.542845	181.9522	1.104453	.0904513

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.249673	1.075830	1.059341	.9759569	1.811119	-.155561
Stddev	.283825	.009638	.022004	.0154624	.020969	.001551
%RSD	22.71197	.8958450	2.077100	1.584329	1.157792	.9970905
#1	1.576232	1.081466	1.050170	.9586422	1.800136	-.157340
#2	1.062392	1.081322	1.043406	.9808410	1.797922	-.154852
#3	1.110394	1.064701	1.084446	.9883874	1.835298	-.154491

Sample Name: P4976-10 Acquired: 12/10/2024 19:43:23 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: ME29E4S Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0129732	14.11294	2.469358	.0052995	.7083326	1.062306
Stddev	.0002777	.07169	.002592	.0004695	.0058738	.006861
%RSD	2.140636	.5079843	.1049708	8.859124	.8292483	.6458462
#1	.0132594	14.05673	2.467802	.0051969	.7148946	1.068191
#2	.0129553	14.08842	2.472351	.0048898	.7065375	1.063957
#3	.0127048	14.19368	2.467922	.0058118	.7035659	1.054770

Elem	Li6707
Units	ppm
Avg	-.022993
Stddev	.003628
%RSD	15.77903
#1	-.023867
#2	-.019007
#3	-.026104

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2442.782	26035.18	2745.866	1852.264	3267.087
Stddev	16.424	457.07	12.635	34.517	20.720
%RSD	.6723371	1.755600	.4601323	1.863514	.6342091
#1	2458.953	26249.18	2731.795	1867.083	3289.432
#2	2443.274	26346.00	2749.562	1876.898	3263.318
#3	2426.117	25510.37	2756.240	1812.812	3248.509

Sample Name: P5040-01 Acquired: 12/10/2024 19:47:11 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHKD6 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961	Ba4934
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0247386	.0076033	.2486966	-.018645	-.011294	53.50545	.8876287
Stddev	.0024365	.0032107	.0010958	.004747	.001588	.56028	.0108418
%RSD	9.848812	42.22781	.4406059	25.46024	14.05765	1.047153	1.221432
#1	.0226172	.0039136	.2498760	-.023445	-.009502	53.13623	.8846709
#2	.0241989	.0091350	.2485038	-.018539	-.011858	54.15014	.8996424
#3	.0273996	.0097614	.2477101	-.013953	-.012524	53.22998	.8785727
Elem	Be2348	Cd2144	Ca3736	Cr2677	Co2286	Cu3247	Fe2598
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0040868	.0030742	568.8245	.0852587	.1002602	.1534119	132.4700
Stddev	.0001680	.0000408	5.9765	.0021060	.0001826	.0038113	1.4016
%RSD	4.109938	1.325597	1.050681	2.470134	.1821097	2.484345	1.058077
#1	.0039767	.0030925	565.9645	.0828298	.1000675	.1498527	132.0756
#2	.0042801	.0030275	575.6936	.0863692	.1004307	.1574331	134.0265
#3	.0040037	.0031026	564.8153	.0865771	.1002824	.1529498	131.3078
Elem	Mn2576	Mg2790	Ni2316	Ag3280	Na8183	V_2924	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	7.741337	132.5268	.1538312	-.011679	1.050359	.1482565	.4260388
Stddev	.069099	1.1151	.0018995	.000930	.695771	.0059319	.0129188
%RSD	.8925924	.8414454	1.234791	7.959327	66.24129	4.001082	3.032305
#1	7.703128	131.9785	.1546533	-.010644	.470660	.1414091	.4137065
#2	7.821102	133.8100	.1516591	-.011950	1.821934	.1518261	.4394734
#3	7.699782	131.7921	.1551812	-.012442	.858482	.1515344	.4249364
Elem	K_7698	P_1774	B_2496	Mo2020	S_1820	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.696525	8.564021	-.342769	.0021918	1.152232	3.678304	.0452870
Stddev	.210099	.037371	.006745	.0003018	.005371	.051151	.0014018
%RSD	3.688189	.4363773	1.967931	13.77163	.4661135	1.390627	3.095459
#1	5.739646	8.604098	-.334992	.0018497	1.156549	3.628611	.0463064
#2	5.881718	8.530127	-.347033	.0023049	1.146218	3.730799	.0436884
#3	5.468211	8.557837	-.346282	.0024208	1.153929	3.675502	.0458662

Sample Name: P5040-01 Acquired: 12/10/2024 19:47:11 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: MBHKD6 Custom ID2: Custom ID3:
Comment:

Elem	Ti3361	Sr4077	Li6707
Units	ppm	ppm	ppm
Avg	.9655599	.5371474	.0473804
Stddev	.0080162	.0043158	.0036156
%RSD	.8302146	.8034585	7.631065
#1	.9563230	.5345508	.0475611
#2	.9706982	.5421293	.0509023
#3	.9696583	.5347620	.0436778

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2720.235	29573.13	3007.952	2103.364	3442.572
Stddev	3.690	291.77	23.996	23.513	12.691
%RSD	.1356401	.9865963	.7977578	1.117857	.3686448
#1	2715.975	29909.45	3027.556	2129.882	3428.896
#2	2722.326	29422.09	2981.192	2085.062	3453.969
#3	2722.404	29387.84	3015.108	2095.149	3444.852

Sample Name: CCV091 Acquired: 12/10/2024 19:51:01 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV091 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.848926	4.883780	24.70205	4.718395	4.806889	395.8415
Stddev	.006798	.008294	.11882	.015009	.025770	3.6940
%RSD	.1402032	.1698235	.4810066	.3180895	.5361032	.9332115
#1	4.850054	4.878343	24.64044	4.703757	4.780642	397.9580
#2	4.841635	4.879670	24.62669	4.717677	4.807871	397.9904
#3	4.855090	4.893326	24.83902	4.733749	4.832154	391.5760

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.03114	.5018246	2.485248	399.6508	15.42519	2.516646
Stddev	.10286	.0079700	.010912	3.7093	.04208	.008880
%RSD	1.025368	1.588195	.4390797	.9281331	.2727954	.3528471
#1	10.09389	.5061761	2.480279	401.9091	15.47249	2.513939
#2	10.08710	.5066716	2.477705	401.6734	15.39191	2.509436
#3	9.91244	.4926261	2.497761	395.3698	15.41117	2.526565

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	14.85878	402.4583	14.60206	397.2928	2.505510	1.236762
Stddev	.11838	3.7706	.12521	3.0912	.009672	.004837
%RSD	.7966844	.9368800	.8574752	.7780626	.3860421	.3911266
#1	14.92747	405.0449	14.66217	399.1020	2.502324	1.242320
#2	14.92677	404.1980	14.68588	399.0530	2.497832	1.234466
#3	14.72209	398.1320	14.45813	393.7236	2.516373	1.233500

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	394.6370	2.509915	14.20221	150.2906	4.966641	F 4.137039
Stddev	3.4621	.033989	.09791	1.3518	.019807	.073046
%RSD	.8772924	1.354195	.6894249	.8994345	.3988023	1.765671
#1	396.5745	2.524869	14.16067	151.1444	4.958845	4.184189
#2	396.6966	2.533862	14.13190	150.9952	4.951918	4.174031
#3	390.6399	2.471012	14.31404	148.7321	4.989160	4.052896

Sample Name: CCV091 Acquired: 12/10/2024 19:51:01 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCV091 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.793485	4.978112	4.860699	4.980226	4.923233	4.741233
Stddev	.019881	.027473	.077998	.018114	.041211	.036453
%RSD	.4147604	.5518824	1.604663	.3637251	.8370658	.7688548
#1	4.774779	4.982775	4.910865	4.978512	4.960405	4.759060
#2	4.791313	4.948606	4.900394	4.963029	4.930377	4.765343
#3	4.814364	5.002956	4.770838	4.999136	4.878917	4.699297

Elem	Li6707
Units	ppm
Avg	4.998456
Stddev	.050452
%RSD	1.009349
#1	5.027081
#2	5.028084
#3	4.940202

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2093.720	24164.31	2581.307	1599.809	3084.021
Stddev	7.459	73.11	35.130	9.097	8.293
%RSD	.3562463	.3025442	1.360943	.5686558	.2689021
#1	2102.244	24127.47	2563.231	1598.501	3089.129
#2	2090.526	24248.50	2558.896	1609.490	3088.482
#3	2088.391	24116.95	2621.795	1591.437	3074.452

Sample Name: CCB091 Acquired: 12/10/2024 19:54:39 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB091 Custom ID2: Custom ID3:
Comment:

Elem	As1890	Tl1908	Pb2203	Se1960	Sb2068	Al3961
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.001422	.0016286	.0012843	.0023636	.0008839	.0418470
Stddev	.002345	.0009893	.0007954	.0066752	.0016915	.0155014
%RSD	164.8568	60.74406	61.93790	282.4186	191.3668	37.04301

#1	-.004103	.0025885	.0017825	.0016944	.0023648	.0241768
#2	-.000409	.0006123	.0003669	.0093482	.0012464	.0482089
#3	.000246	.0016852	.0017034	-.003952	-.000959	.0531553

Elem	Ba4934	Be2348	Cd2144	Ca3736	Cr2677	Co2286
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0004034	-.000003	.0001326	.0271364	-.000507	.0000797
Stddev	.0014549	.000072	.0000585	.0445572	.000261	.0000932
%RSD	360.7009	2098.089	44.09545	164.1973	51.44774	116.9419

#1	-.001277	-.000069	.0000708	.0784247	-.000599	-.000021
#2	.001256	.000073	.0001870	.0050244	-.000710	.000163
#3	.001231	-.000014	.0001399	-.002040	-.000213	.000098

Elem	Cu3247	Fe2598	Mn2576	Mg2790	Ni2316	Ag3280
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0017463	.0238855	.0009725	-.078008	-.000877	-.000221
Stddev	.0054830	.0218527	.0009907	.060726	.000614	.000680
%RSD	313.9826	91.48931	101.8653	77.84624	70.06030	307.6914

#1	.0080710	.0487224	-.000148	-.101477	-.001006	-.000287
#2	-.001168	.0153252	.001733	-.123496	-.001416	-.000866
#3	-.001664	.0076089	.001332	-.009049	-.000208	.000489

Elem	Na8183	V_2924	Zn2138	K_7698	P_1774	B_2496
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0060779	-.004064	.0022649	-.102331	.0004357	.0111053
Stddev	.8275941	.008523	.0052654	.160693	.0011264	.0011455
%RSD	13616.41	209.7105	232.4723	157.0316	258.5512	10.31509

#1	-.426155	-.013382	.0031652	-.286239	.0011738	.0124261
#2	-.515906	-.002148	.0070221	-.031728	-.000861	.0103832
#3	.960295	.003337	-.003393	.010972	.000994	.0105065

Sample Name: CCB091 Acquired: 12/10/2024 19:54:39 Type: Unk
Method: SFAM01.1 INSTRUMENT P5 WITH 6 POINT ICAL-2(v6) Mode: CONC Corr. Factor: 1.000000
User: Kareem Custom ID1: CCB091 Custom ID2: Custom ID3:
Comment:

Elem	Mo2020	S_1820	Si2516	Sn1899	Ti3361	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.000318	-0.002639	-0.000471	F -0.010386	.0058498	.0001982
Stddev	.000383	.002423	.000231	.000905	.0024694	.0001963
%RSD	120.1443	91.80611	49.11425	8.710425	42.21377	99.00858
#1	-0.000371	-0.002823	-0.000662	-0.010741	.0034970	.0001452
#2	-0.000672	-0.000130	-0.000537	-0.011059	.0084213	.0004155
#3	.000088	-0.004964	-0.000214	-0.009357	.0056311	.0000339

Elem	Li6707
Units	ppm
Avg	F -0.033566
Stddev	.004619
%RSD	13.75977
#1	-0.034644
#2	-0.028503
#3	-0.037550

Int. Std.	Y_2243	Y_3600	Y_3710	Y_2243	In2306
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2516.498	27786.29	2695.770	1961.358	3937.028
Stddev	17.777	158.43	25.067	7.852	24.139
%RSD	.7064354	.5701837	.9298504	.4003159	.6131316
#1	2517.050	27959.51	2689.628	1969.921	3939.174
#2	2498.451	27750.65	2723.337	1959.653	3911.888
#3	2533.993	27648.71	2674.345	1954.498	3960.023

Prep Standard - Chemical Standard Summary

Order ID : P5043

Test : Metals CLP Full

Prepbatch ID : PB165364,

Sequence ID/Qc Batch ID: LB133883,

Standard ID :

MP83122,MP83134,MP83141,MP83147,MP83500,MP83501,MP83502,MP83503,MP83504,MP83505,MP83506,MP83507,MP83508,MP83509,MP83510,MP83511,MP83513,MP83514,

Chemical ID :

M5130,M5218,M5223,M5289,M5295,M5296,M5390,M5393,M5429,M5473,M5476,M5496,M5497,M5498,M5513,M5515,M5519,M5658,M5697,M5698,M5751,M5768,M5769,M5798,M5799,M5800,M5801,M5802,M5806,M5815,M5816,M5817,M5818,M5819,M5820,M5875,M5959,M5960,M5962,M5970,M5976,M5978,M5982,M5985,M5990,M5999,M6021,M6023,M6025,M6028,M6030,M6033,M6111,M6116,M6117,M6121,M6125,M6126,W3112,

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
169	1:1HNO3	MP83122	11/07/2024	12/06/2024	Janvi Patel	None	None	Sarabjit Jaswal
								11/07/2024

FROM 1000.00000ml of M6116 + 1000.00000ml of W3112 = 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>
902	ICP AES CAL BLK (SO/ICB/CCB)	MP83134	10/30/2024	12/06/2024	Kareem Khairalla	None	None	Mohan Bera
								11/08/2024

FROM 125.00000ml of M6111 + 2350.00000ml of W3112 + 25.00000ml of M6117 = Final Quantity: 2500.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
994	ICPAES ISM01.2 S1 (CONC.)	MP83141	10/30/2024	12/06/2024	Kareem Khairalla	None	None	Mohan Bera
								11/08/2024

FROM 0.02000ml of M5815 + 0.03000ml of M5429 + 0.10000ml of M5798 + 0.10000ml of M6028 + 0.14000ml of M5799 + 0.20000ml of M5476 + 0.20000ml of M5515 + 0.20000ml of M5658 + 0.20000ml of M5801 + 0.20000ml of M5817 + 0.20000ml of M5976 + 0.20000ml of M6025 + 0.20000ml of M6030 + 0.30000ml of M5698 + 0.40000ml of M6033 + 0.50000ml of M5751 + 0.50000ml of M6023 + 0.70000ml of M5962 + 0.80000ml of M5960 + 1.00000ml of M5800 + 1.00000ml of M6021 + 1.20000ml of M5802 + 1.20000ml of M5819 + 10.00000ml of M5498 + 10.00000ml of M5519 + 10.00000ml of M5768 + 10.00000ml of M5806 + 10.00000ml of M5818 + 2.00000ml of M5978 + 4.00000ml of M5390 + 34.24000ml of MP83134 = Final Quantity: 100.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
921	ICPAES SPIKE SOL#6	MP83147	10/30/2024	12/06/2024	Kareem Khairalla	None	None	Mohan Bera
								11/08/2024

FROM 2.50000ml of M5962 + 50.00000ml of M5990 + 50.00000ml of M5999 + 147.50000ml of MP83134 = Final Quantity: 250.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
902	ICP AES CAL BLK (SO/ICB/CCB)	MP83500	12/06/2024	01/06/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								12/09/2024

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

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
2480	ICP AES STD 6 ISM01.3	MP83501	12/06/2024	01/06/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								12/09/2024

FROM 4.00000ml of M5289 + 4.00000ml of M5498 + 4.00000ml of M5515 + 4.00000ml of M5768 + 4.00000ml of M5806 + 30.00000ml of MP83500 = Final Quantity: 50.000 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>
1004	ICPAES ISM01.2 (S5)	MP83502	12/06/2024	01/06/2025	Kareem Khairalla	None	None	Sarabjit Jaswal 12/09/2024

FROM	0.25000ml of M5798 + 0.50000ml of M5429 + 0.50000ml of M5473 + 0.50000ml of M5815 + 0.50000ml of M5817 + 12.50000ml of M5519 + 12.50000ml of M5698 + 12.50000ml of M5806 + 12.50000ml of M5819 + 13.75000ml of M5697 + 14.50000ml of M5496 + 14.50000ml of M5515 + 14.50000ml of M5658 + 2.00000ml of M5513 + 22.50000ml of M5497 + 22.50000ml of M5768 + 5.00000ml of M5296 + 5.00000ml of M5393 + 5.00000ml of M5802 + 5.00000ml of M5818 + 5.00000ml of M5875 + 303.50000ml of MP83500 = Final Quantity: 500.000 ml
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<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1005	ICPAES ISM01.2(S4)	MP83503	12/09/2024	01/06/2025	Kareem Khairalla	None	None	Sarabjit Jaswal 12/09/2024

<u>FROM</u>	250.00000ml of MP83500 + 250.00000ml of MP83502 = Final Quantity: 500.000 ml
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Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1007	ICPAES ISM01.2(S3)	MP83504	12/09/2024	01/06/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								12/09/2024

FROM 25.00000ml of MP83502 + 75.00000ml of MP83500 = Final Quantity: 100.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1008	ICPAES ISM01.2(S2)	MP83505	12/09/2024	01/06/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								12/09/2024

FROM 12.50000ml of MP83502 + 87.50000ml of MP83500 = Final Quantity: 100.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
994	ICPAES ISM01.2 S1 (CONC.)	MP83506	12/09/2024	01/06/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								12/09/2024

FROM 0.02000ml of M5815 + 0.03000ml of M5429 + 0.10000ml of M5798 + 0.10000ml of M6028 + 0.14000ml of M5799 + 0.20000ml of M5473 + 0.20000ml of M5515 + 0.20000ml of M5658 + 0.20000ml of M5801 + 0.20000ml of M5817 + 0.20000ml of M5976 + 0.20000ml of M6025 + 0.20000ml of M6030 + 0.30000ml of M5698 + 0.40000ml of M5496 + 0.50000ml of M5697 + 0.50000ml of M6023 + 0.70000ml of M5962 + 0.80000ml of M5960 + 1.00000ml of M5800 + 1.00000ml of M6021 + 1.20000ml of M5802 + 1.20000ml of M5819 + 10.00000ml of M5498 + 10.00000ml of M5519 + 10.00000ml of M5769 + 10.00000ml of M5806 + 10.00000ml of M5818 + 2.00000ml of M5978 + 4.00000ml of M5390 + 34.24000ml of MP83500 = Final Quantity: 100.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1003	ICPAES ISM01.2 S1	MP83507	12/09/2024	01/06/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								12/09/2024

FROM 0.50000ml of MP83506 + 99.50000ml of MP83500 = Final Quantity: 100.000 ml

[illegible]

<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	MP83509	12/09/2024	01/06/2025	Kareem Khairalla	None	METALS_PIPETTE_3 (A)	Sarabjit Jaswal 12/09/2024
<u>FROM</u> 10.00000ml of M5130 + 90.00000ml of MP83500 = Final Quantity: 250.000 ml								

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
905	ICP AES ICSAB SOLN	MP83510	12/09/2024	01/06/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								12/09/2024

FROM 10.00000ml of M5130 + 10.00000ml of M5223 + 80.00000ml of MP83500 = Final Quantity: 250.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1119	ICPAES ISM01.2(CCV)	MP83511	12/09/2024	01/06/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								12/09/2024

FROM 0.75000ml of M5497 + 0.75000ml of M5769 + 1.22500ml of M5496 + 1.25000ml of M5515 + 1.25000ml of M5806 + 19.77500ml of MP83500 + 25.00000ml of MP83502 = Final Quantity: 50.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
919	ICP AES INTERNAL STD	MP83513	12/09/2024	01/06/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								12/09/2024

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

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
513	RINSE SOLN	MP83514	12/09/2024	01/06/2025	Kareem Khairalla	None	None	Sarabjit Jaswal
								12/09/2024

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

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
EPA	PART A / ICSA (ICP) STOCK SOLN	ICSA-1211	12/28/2024	05/20/2024 / jaswal	04/20/2021 / bin	M5130

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
EPA	PART B / ICSAB (ICP) STOCK SOLN	ICSB-0710	12/28/2024	05/20/2024 / jaswal	04/20/2021 / bin	M5223

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

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

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

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57056 / Ba, 1000 PPM, 125 ml	072122	07/21/2025	08/07/2024 / jaswal	09/18/2022 / bin	M5390

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

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57138 / Sr, 10000 PPM, 125 ml	082922	08/29/2025	03/16/2023 / jaswal	03/16/2023 / jaswal	M5473

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57138 / Sr, 10000 PPM, 125 ml	082922	08/09/2025	07/29/2024 / jaswal	03/16/2023 / jaswal	M5476

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

CHEMICAL RECEIPT LOG BOOK

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

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57182 / Pb, 10000 PPM, 125 ml	061522	06/15/2025	03/19/2023 / bin	03/17/2023 / bin	M5513

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58126 / Fe, 10000 PPM, 500 ml	092122	09/21/2025	08/01/2024 / Jaswal	03/17/2023 / bin	M5515

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

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

CHEMICAL RECEIPT LOG BOOK

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58025 / Mn, 1000 PPM, 500 ml	102623	10/26/2026	04/18/2024 / jaswal	10/27/2023 / jaswal	M5698

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	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 #
Absolute Standards, Inc.	58112 / Mg, 10000 PPM, 500 ml	091823	09/18/2026	01/08/2024 / bin	01/03/2024 / bin	M5768

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58112 / Mg, 10000 PPM, 500 ml	091823	09/18/2026	05/24/2024 / Jaswal	01/03/2024 / bin	M5769

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

CHEMICAL RECEIPT LOG BOOK

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

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

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

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58111 / Na, 10000 PPM, 500 ml	122223	12/22/2026	08/01/2024 / Jaswal	01/03/2024 / jaswal	M5806

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

CHEMICAL RECEIPT LOG BOOK

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

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57014 / Si, 1000 PPM, 125 ml	122023	12/20/2026	03/06/2024 / jaswal	02/09/2024 / jaswal	M5818

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

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

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 #
Inorganic Ventures	CGY10-1 / YTTRIUM 125mL 10,000ug/mL	V2-Y740548	02/20/2029	07/01/2024 / Jaswal	06/14/2024 / Jaswal	M5959

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57028 / Ni, 1000 PPM, 125 ml	041124	04/11/2027	07/03/2024 / kareem	06/11/2024 / kareem	M5960

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

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	CGMO1-1 / MOLYBDENUM 125mL 1000ug/mL	T2-MO720876	07/17/2027	08/07/2024 / jaswal	02/22/2024 / Jaswal	M5976

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

CHEMICAL RECEIPT LOG BOOK

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	031524	03/15/2027	07/01/2024 / Jaswal	06/11/2024 / Jaswal	M5982

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	CLPP-SPK-5 / CLP Spike Standard 5	V2-MEB742037	03/12/2029	10/04/2024 / Jaswal	02/22/2024 / Jaswal	M5990

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

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

CHEMICAL RECEIPT LOG BOOK

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

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

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58113 / Al, 10000 PPM, 500 ml	011623	01/16/2026	08/07/2024 / Jaswal	01/03/2024 / Jaswal	M6033

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)	22F0762009	05/09/2027	11/04/2024 / Eman	09/29/2024 / Janvi	M6111

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)	24B1362001	05/03/2025	11/04/2024 / Janvi	09/29/2024 / Eman	M6116

CHEMICAL RECEIPT LOG BOOK

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)	24B1362001	05/06/2025	11/06/2024 / Janvi	09/29/2024 / Eman	M6117

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	1403 / Hydrogen Peroxide, 30% 1 gal	820803	05/25/2025	11/26/2024 / Eman	11/22/2024 / Eman	M6125

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

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

Certificate of Analysis

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

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 Christiansburg, VA 24073 USA
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info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

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

3.0 CERTIFIED VALUES AND UNCERTAINTIES

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

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

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
As	ICP Assay	3103a	100818
Cd	ICP Assay	3108	130116
Cd	EDTA	928	928
Cd	Calculated		See Sec. 4.2
Pb	ICP Assay	3128	101026
Pb	EDTA	928	928
Pb	Calculated		See Sec. 4.2
Sb	ICP Assay	3102a	140911
Se	ICP Assay	3149	100901
Se	Calculated		See Sec. 4.2
Tl	ICP Assay	3158	151215
Tl	Calculated		See Sec. 4.2

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

N/A

6.0 INTENDED USE

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

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.
- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.
- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 12, 2024

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

11.2 Lot Expiration Date

- **March 12, 2029**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Joseph Burns
Custom VS Manager



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57048
070124
Cadmium (Cd)

Solvent: 24002546 Nitric Acid

R: 815/24

Lot #

2% 40.0 Nitric Acid (mL)

Expiration Date: 070127

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL): 1000

NIST Test Number: 6UTB

SE-05 Balance Uncertainty

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

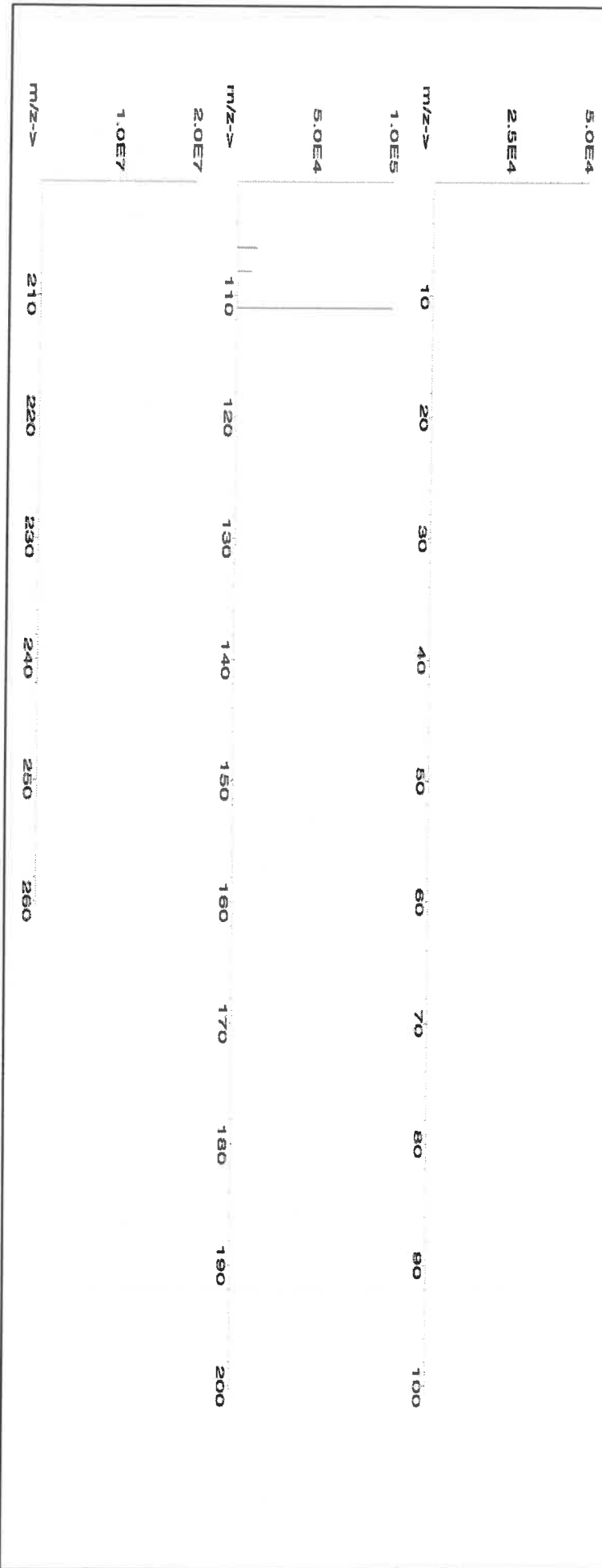
<i>Aleah O'Brady</i>	
Formulated By:	Aleah O'Brady
	070124
<i>Pedro L. Rentas</i>	
Reviewed By:	Pedro L. Rentas
	070124

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. 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
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[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

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

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

3.0 CERTIFIED VALUES AND UNCERTAINTIES

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

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

Assay Information:

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

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

November 02, 2021

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

11.2 Lot Expiration Date

- **November 02, 2026**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





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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

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 13, 2022

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

11.2 Lot Expiration Date

- **January 13, 2027**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





Certified Reference Material CRM

Lot #

R: 815/24

M6025



CERTIFIED WEIGHT REPORT:

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

Solvent: **24002546 Nitric Acid**

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

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

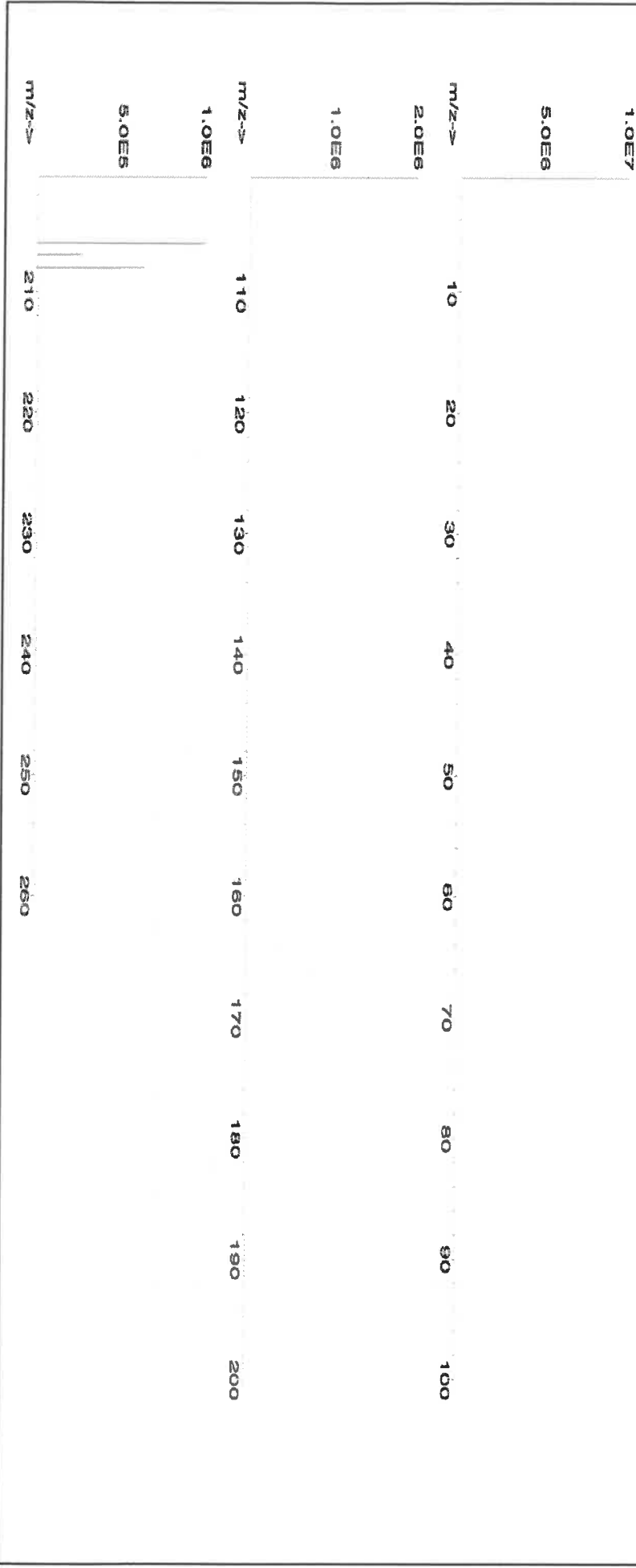
Weight shown below was diluted to (mL): **2000.02** **0.058** **Flask Uncertainty**

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

Compound	SDS Information									
	RM#	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)

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

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





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

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

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

Physical Characterization:

(T)= Target analyte

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).



Instructions for QATS Reference Material: *ICP-AES ICS*

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

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

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

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

Contains Heavy Metals
HAZARDOUS MATERIAL

Safety Data Sheets
Available Upon Request

(A) SAMPLE DESCRIPTION

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

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

(B) BREAKAGE OR MISSING ITEMS

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

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

(C) ANALYSIS OF SAMPLES

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



Instructions for QATS Reference Material: ICP-AES ICS

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

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

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

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

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

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

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

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

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

ICSA
M5126
M5127
M5128
M5129
M5130

ICSB
M5219
M5220
M5221
M5222
M5223

Certificate of Analysis

300 Technology Drive
 Christiansburg, VA 24073 USA
 inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

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

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

3.0 CERTIFIED VALUES AND UNCERTAINTIES

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

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

Assay Information:

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

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

November 02, 2021

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

11.2 Lot Expiration Date

- **November 02, 2026**

- The date after which this CRM/RM should not be used.
- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





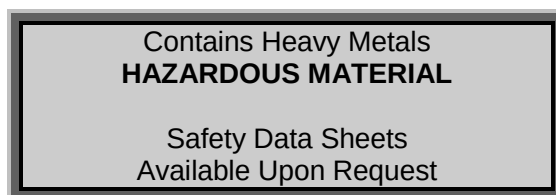
Instructions for QATS Reference Material: ICP-AES ICS

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

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

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

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



(A) SAMPLE DESCRIPTION

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

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

(B) BREAKAGE OR MISSING ITEMS

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

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

(C) ANALYSIS OF SAMPLES

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





Instructions for QATS Reference Material: ICP-AES ICS

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

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

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

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

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

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

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

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

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

ICSA
M5126
M5127
M5128
M5129
M5130

ICSB
M5219
M5220
M5221
M5222
M5223



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

(B4)



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

CERTIFIED WEIGHT REPORT:

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

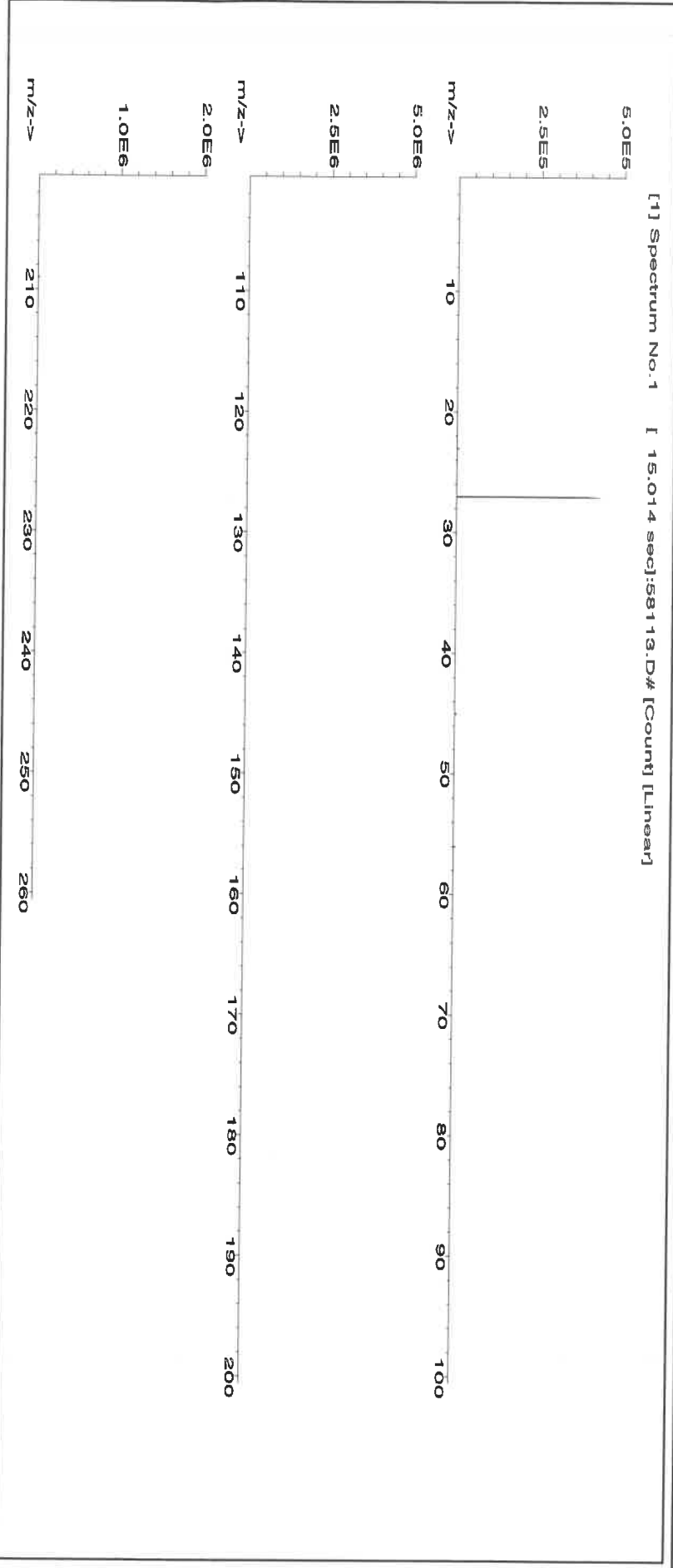
Lot #
Solvent: 20370011 Nitric Acid

Expiration Date: 070625
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 10000
NIST Test Number: 6UTB
Weight shown below was diluted to (mL): 2000.02
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

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

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

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





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



R: 4/20/21

Instructions for QATS Reference Material: *Inorganic ICV Solutions*

QATS LABORATORY INORGANIC REFERENCE MATERIAL
INITIAL CALIBRATION VERIFICATION SOLUTIONS
(ICV1, ICV5, AND ICV6)

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

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

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

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

Safety Data Sheets
Available Upon Request

M5291
M15292
M15293
M15294
M15295

(A) SAMPLE DESCRIPTION

Enclosed is a set of one (1) or more Aqueous Inorganic Reference Materials containing various analyte concentrations. ICV1 and ICV5 are in a matrix of dilute nitric acid. ICV6 is in a matrix of dilute basic solution. **For the reference material source in reporting ICVs use "USEPA". For the reference material lot number for the ICV1, ICV5, and ICV6 solutions use "ICV1-1014", "ICV5-0415", and "ICV6-0400", respectively.**

(B) BREAKAGE OR MISSING ITEMS

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

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

(C) ANALYSIS OF SAMPLES

The Initial Calibration Verification Solutions (ICVs) are to be used to evaluate the accuracy of the initial calibrations of ICP, AA, and Cyanide colorimetric instruments, and are to be used with the CLP SOWs and revisions. The values for each element in the ICVs are listed below in µg/L (ppb) for the resulting solution(s) after the dilution of the concentrate(s) according to the following instructions. Use Class 'A' glassware to prepare the solution(s).

ICV1-1014 For ICP-AES analysis, use a 10-fold dilution by pipetting 10 mL of the ICV1 concentrate into a 100 mL volumetric flask and dilute to volume with 2% (v/v) nitric acid.





QUALITY ASSURANCE TECHNICAL SUPPORT LABORATORY
"An ISO 9001:2015 Certified Program"

Instructions for QATS Reference Material: *Inorganic ICV Solutions*

- ICV1-1014** For ICP-MS analysis, use a 50-fold dilution by pipetting 2 mL of the ICV1 concentrate into a 100 mL volumetric flask and dilute to volume with 1% (v/v) nitric acid.
- ICV5-0415** For the cold vapor analysis of mercury by AA, use a 100-fold dilution by pipetting 1 mL of the ICV5 concentrate into a 100 mL volumetric flask and dilute to volume with 2% (v/v) nitric acid. The ICV5 concentrate is prepared in 0.05% (w/v) $K_2Cr_2O_7$ and 5% (v/v) nitric acid.
- ICV6-0400** For the analysis of cyanide, use a 100-fold dilution by pipetting 1 mL of the ICV6 concentrate into a 100 mL volumetric flask and dilute to volume with Type II water. Distill this solution along with the samples before analysis. The cyanide concentrate is prepared from $K_3Fe(CN)_6$, Type II water, and 0.1 % sodium hydroxide, and will decompose rapidly if exposed to light.

NOTE: USE TYPE II WATER AND HIGH-PURITY ACIDS FOR ALL DILUTIONS.

(D) CERTIFIED CONCENTRATIONS OF QATS ICV1, ICV5, AND ICV6 SOLUTIONS

ICV1-1014		
Element	Concentration (µg/L) (after 10-fold dilution)	Concentration (µg/L) (after 50-fold dilution)
Al	2500	500
Sb	1000	200
As	1000	200
Ba	520	100
Be	510	100
Cd	510	100
Ca	10000	2000
Cr	520	100
Co	520	100
Cu	510	100
Fe	10000	2000
Pb	1000	200
Mg	6000	1200
Mn	520	100
Ni	530	110
K	9900	2000
Se	1000	200
Ag	250	50
Na	10000	2000
Tl	1000	210
V	500	100
Zn	1000	200

ICV5-0415		ICV6-0400	
Element	Concentration (µg/L) (after 100-fold dilution)	Analyte	Concentration (µg/L) (after 100-fold dilution)
Hg	4.0	CN ⁻	99



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

Certified Reference Material CRM

CERTIFIED WEIGHT REPORT:

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

Solvent: 20510011 Nitric Acid

Lot #

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

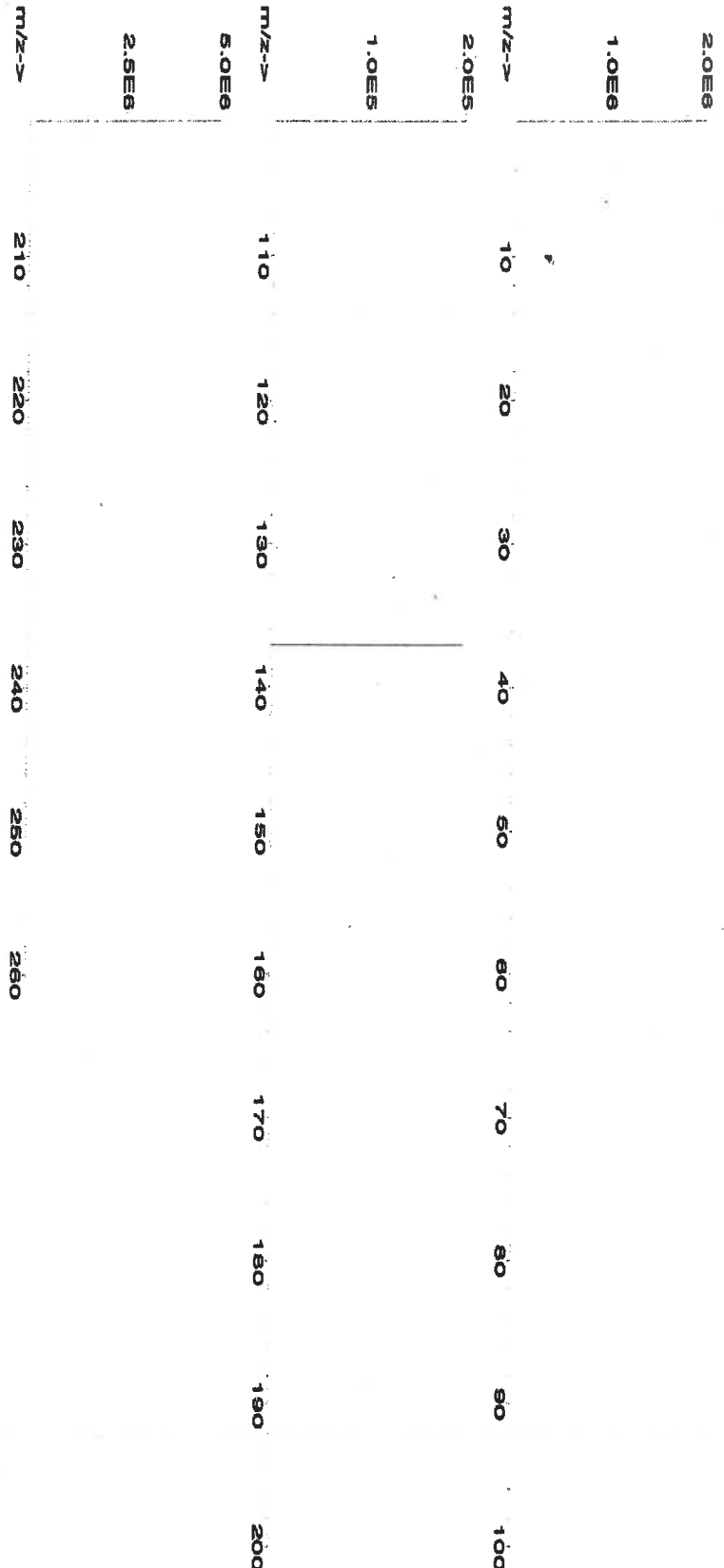
2% 40.0 (mL) Nitric Acid

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

SDS Information									
Compound	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)
1. Barium nitrate (Ba)	IN023 BA022019A1	1000	99.899	0.10	52.3	3.82417	3.82426	1000.0	2.0

1. Barium nitrate (Ba) IN023 BA022019A1 1000 99.899 0.10 52.3 3.82417 3.82426 1000.0 2.0 10022-31-8 0.5 mg/m3 or-ral 355 mg/kg 31046

[1] Spectrum No. 1 [12.514 sec]:58156.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

Ben. L. R.

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



Certified Reference Material CRM

M5429 R1 0126/23 (B)

CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57103
070622
Lithium (Li)

Solvent: 20510011 Nitric Acid

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

070625
Ambient (20 °C)
10000
6UTB

2% 20.0 (mL)

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

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

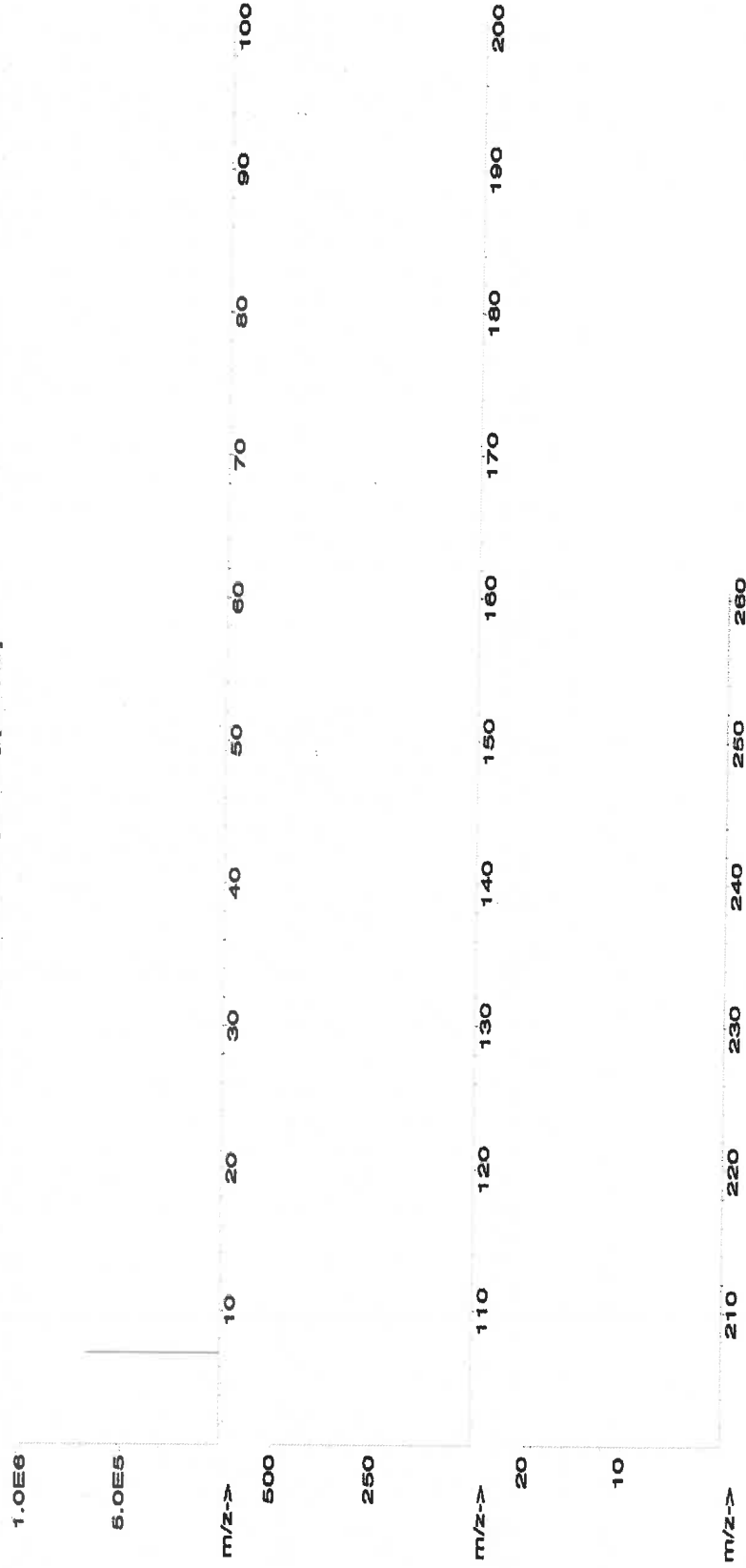
Compound	SDS Information											NIST SRM
	(Solvent Safety Info. On Attached pg.)										LD50	
	RM#	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)		

1. Lithium nitrate (Li)	IN019	L2042019A1	10000	99.999	0.10	10.0	100.0134	100.0173	10000.4	20.0	7790-69-4	5 mg/m3	of-rat 1426 mg/kg	NA
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SDS Information

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

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





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



15497-15498 R: 03/17/23 (2)

CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

58120
031523
Calcium (Ca)

Solvent: 21110221 Nitric Acid

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

031526
Ambient (20 °C)
10000
6UTB
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

2%
60.0
Nitric Acid
(mL)

Weight shown below was diluted to (mL): 3000.41

<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito 031523
<i>Pedro L. Rentas</i>	
Reviewed By:	Pedro L. Rentas 031523

SDS Information

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

Expanded
Uncertainty

Actual
Conc. (µg/mL)

Actual
Weight (g)

Target
Weight (g)

Assay
(%)

Purity
(%)

Nominal
Conc. (µg/mL)

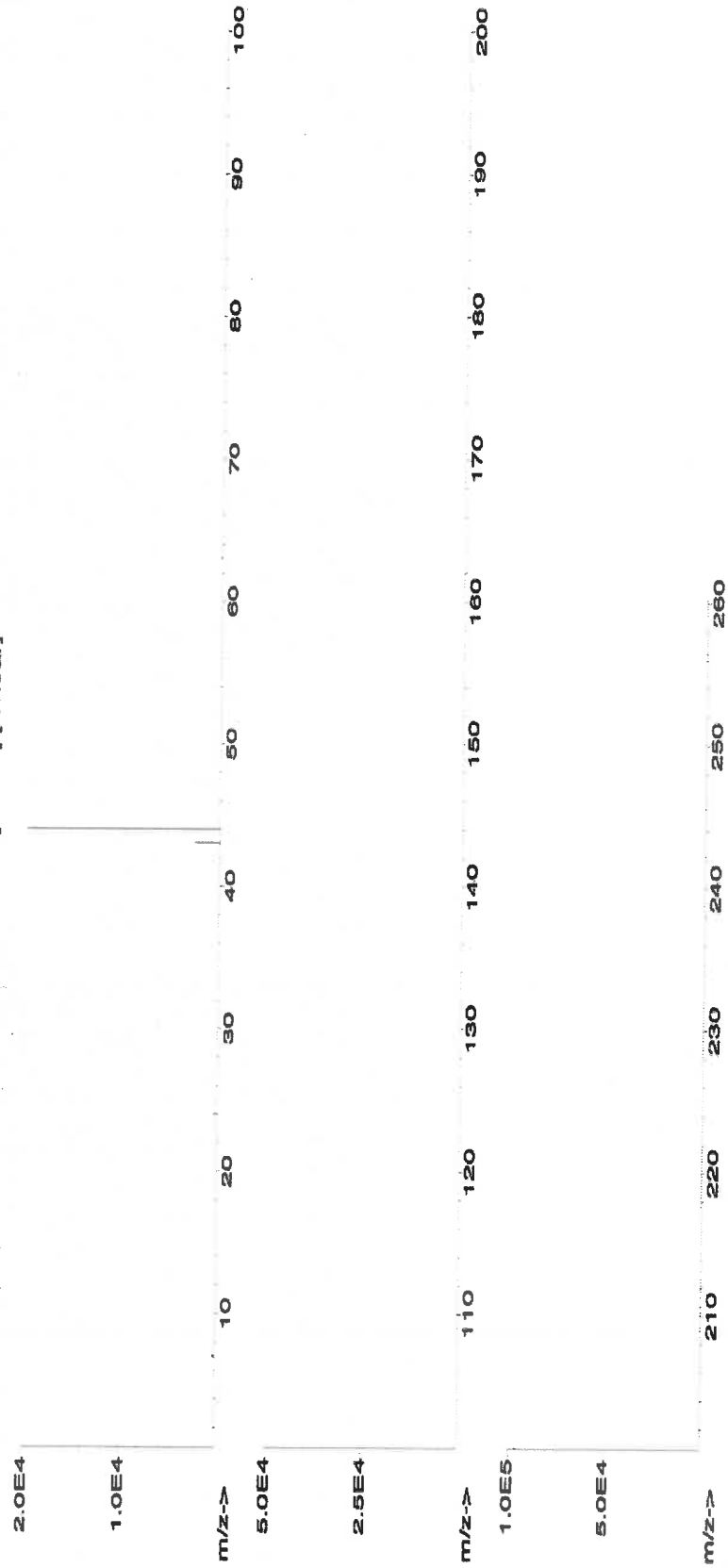
Lot
Number

RM#

Compound

1. Calcium carbonate (Ca)	IN014	CAD072022A1	10000	99.999	0.10	39.9	75.1990	75.2093	10001.4	20.0	471-34-1	5 mg/m3	or: rat >2000mg/kg	3109a
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[1] Spectrum No.1 [12.514 sec]:58120.D# [Count] [Linear]





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

Trace Metals Verification by ICP-MS (µg/mL)																	
Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pt	<0.02	Se	<0.2	Tb	<0.02
Sb	<0.02	Ca	<0.02	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Tc	<0.02
As	<0.2	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.02	Os	<0.01	Rh	<0.02	Ag	<0.02	Ti	<0.02
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
Be	<0.01	Cr	<0.02	Ga	<0.2	Fe	<0.02	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	<0.02	Tm	<0.02
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
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	Tl	<0.02
																W	<0.02
																U	<0.02
																V	<0.02
																Yb	<0.02
																Y	<0.02
																Zn	<0.02
																Zr	<0.02

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



15497-15498 R: 03/17/23 (2)

CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

58120
031523
Calcium (Ca)

Solvent: 21110221 Nitric Acid

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

031526
Ambient (20 °C)
10000
6UTB
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

2%
60.0
Nitric Acid
(mL)

Weight shown below was diluted to (mL): 3000.41

<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito 031523
<i>Pedro L. Rentas</i>	
Reviewed By:	Pedro L. Rentas 031523

SDS Information

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

Expanded
Uncertainty

Actual
Conc. (µg/mL)

Actual
Weight (g)

Target
Weight (g)

Assay
(%)

Purity
(%)

Nominal
Conc. (µg/mL)

Lot
Number

RM#

Compound

1. Calcium carbonate (Ca)

IN014 CAD072022A1

10000

99.999

0.10

39.9

75.1990

75.2093

10001.4

20.0

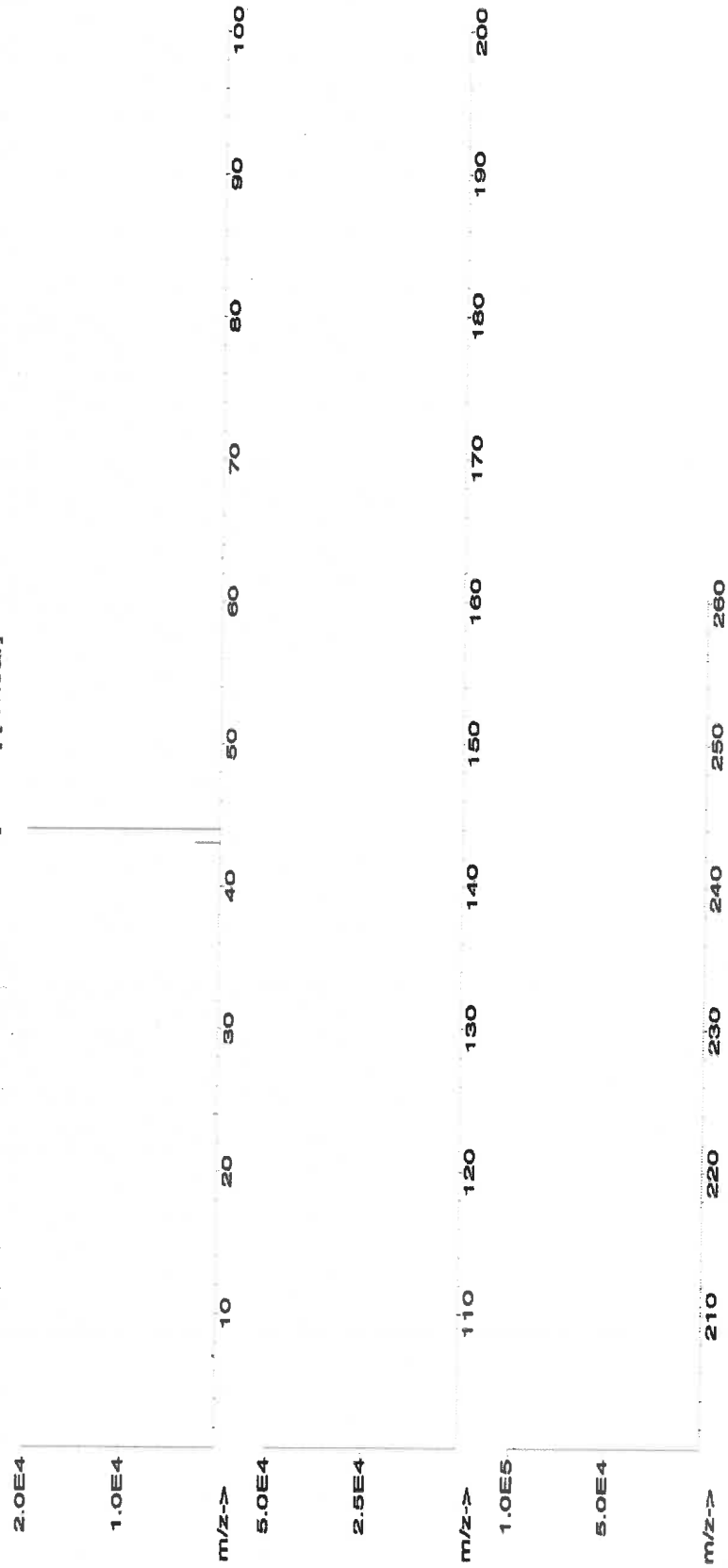
471-34-1

5 mg/m3

or: rat >2000mg/kg

3109a

[1] Spectrum No.1 [12.514 sec]:58120.D# [Count] [Linear]





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

Trace Metals Verification by ICP-MS (µg/mL)																	
Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pt	<0.02	Se	<0.2	Tb	<0.02
Sb	<0.02	Ca	<0.02	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Tc	<0.02
As	<0.2	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.02	Os	<0.01	Rh	<0.02	Ag	<0.02	Ti	<0.02
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
Be	<0.01	Cr	<0.02	Ga	<0.2	Fe	<0.02	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	<0.02	Tm	<0.02
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
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	Tl	<0.02
																W	<0.02
																U	<0.02
																V	<0.02
																Yb	<0.02
																Y	<0.02
																Zn	<0.02
																Zr	<0.02

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



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

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

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

(T)= Target analyte

Physical Characterization:

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

Certified by:

- * 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:

M5514, M5515
Lot #

R: 03/12/23

Part Number:

Solvent:

Lot Number:

Nitric Acid

Description:

Nitric Acid

Expiration Date:

7.0%

Recommended Storage:

350.0 (mL)

Nominal Concentration (µg/mL):

10000

NIST Test Number:

6UTB

Weight shown below was diluted to (mL):

5000.1

0.12

Balance Uncertainty

Flask Uncertainty

Compound

Lot

Number

Nominal Conc. (µg/mL)

Purity (%)

Uncertainty (%)

Assay (%)

Target Weight (g)

Actual Weight (g)

Actual Conc. (µg/mL)

1. Iron (Fe)

IN346

2224912-500

10000

99.995

0.10

100.0

50.0034

50.0111

10001.5

20.0

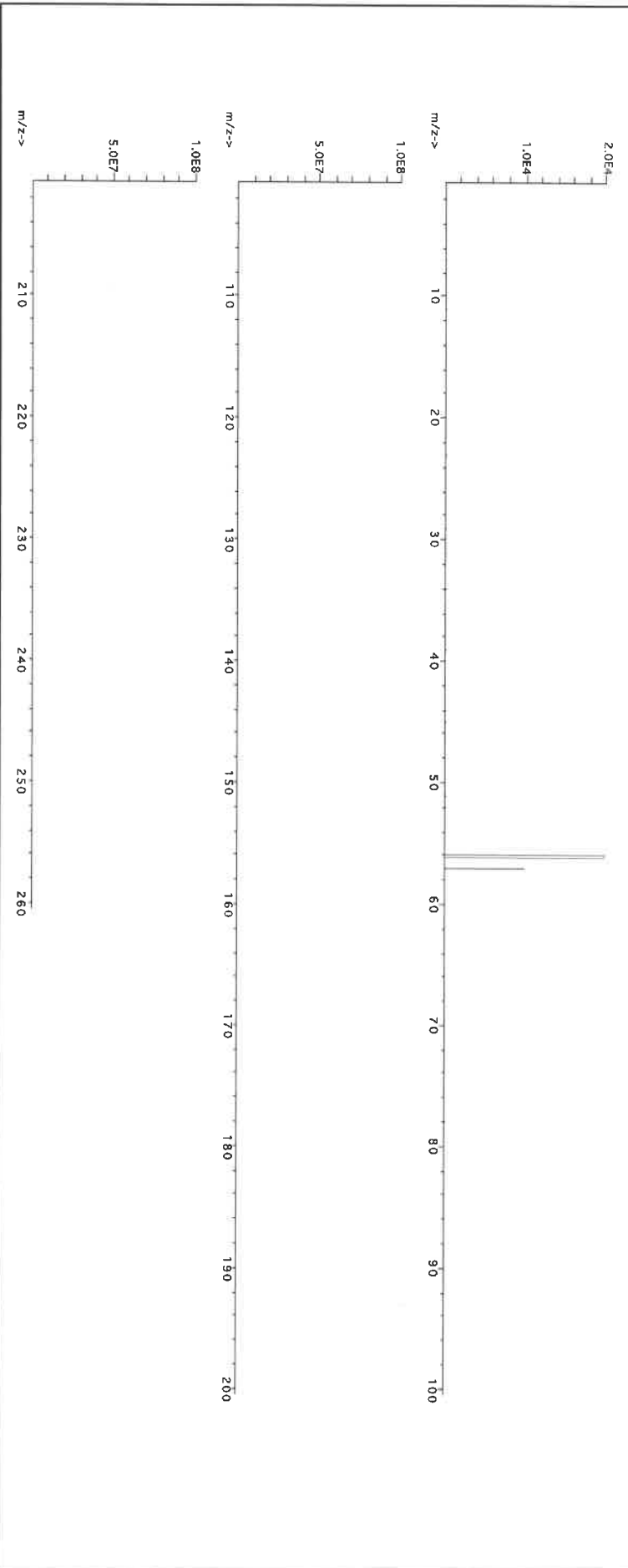
7439-89-6

5 mg/mL

or-hal 7500mg/kg

3126a

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





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

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

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

(T)= Target analyte

Physical Characterization:

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

Certified by:

Ben P. Galt

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



Certified Reference Material CRM

CERTIFIED WEIGHT REPORT:

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

Solvent: 20510011 Nitric Acid

Lot #

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

2% 60.0 (mL) Nitric Acid

Weight shown below was diluted to (mL): 3000.4

5E-05 Balance Uncertainty
0.06 Flask Uncertainty

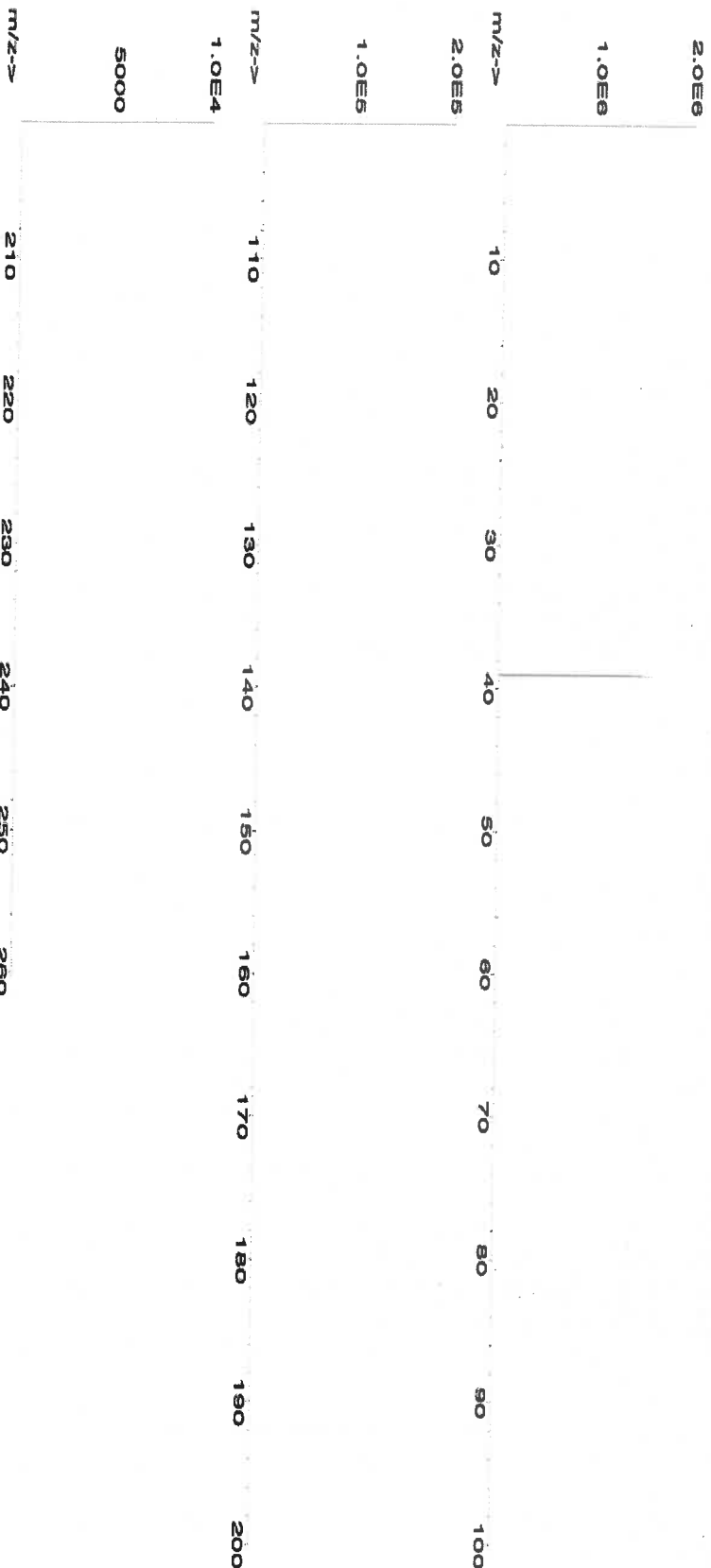
<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito
Reviewed By:	Pedro L. Rentas
	120822

Compound

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

1. Potassium nitrate (K) IN034 KD022021A1 10000 99.989 0.10 37.6 79.7990 79.8075 10001.1 20.0 7757-79-1 5 mg/m3 or/air 3015 mg/kg 3141a

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





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

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

Lot #
21110221
Solvent: Nitric Acid

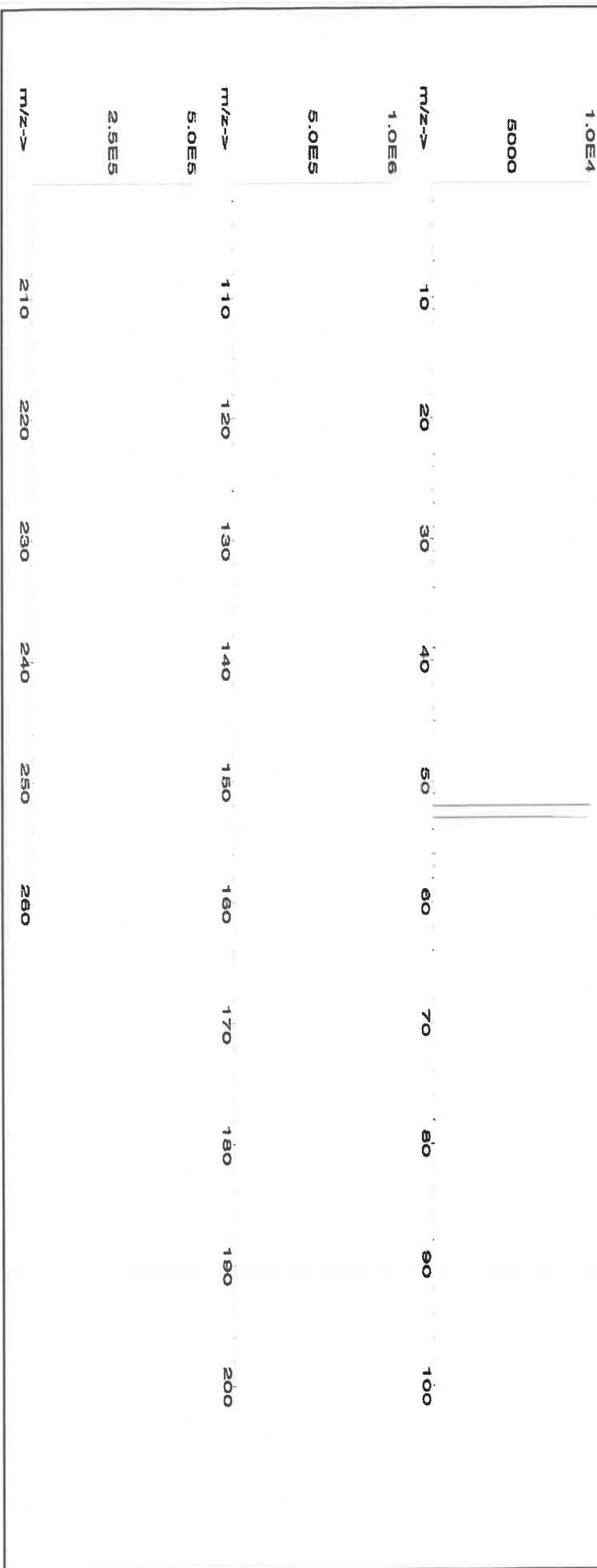
Formulated By:	Lawrence Barry
	060523
Reviewed By:	Pedro L. Ruelas
	060523

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

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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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: 58029
Lot Number: 102523
Description: Copper (Cu)

Lot # 24002546
Solvent: Nitric Acid

Expiration Date: 102526
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Volume shown below was diluted to (mL): 2000.02
Balance Uncertainty: 5E-05
Flask Uncertainty: 0.058

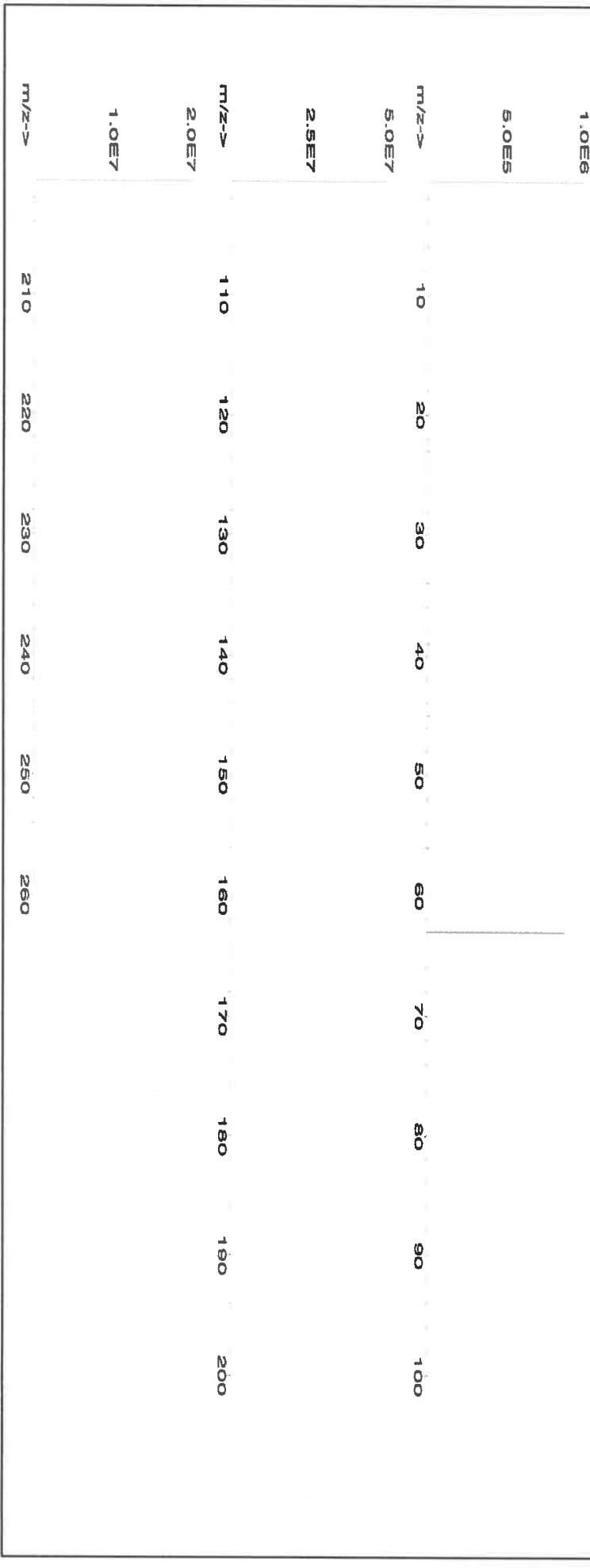
Formulated By:	Benson Chan
Reviewed By:	Pedro L. Rentas

SDS Information

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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1. Copper(II) nitrate trihydrate (Cu) 58129 100223 0.1000 200.0 0.084 1000 10000.1 1000.0 2.2 10031-43-3 1 mg/m3 or-rat 794 mg/kg 3114

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





CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

58025
102623
Manganese (Mn)

Lot #
Solvent:

24002546
Nitric Acid

Expiration Date:

102626

Recommended Storage:

Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

Volume shown below was diluted to (mL):

3000.41

5E-05 Balance Uncertainty

0.058 Flask Uncertainty

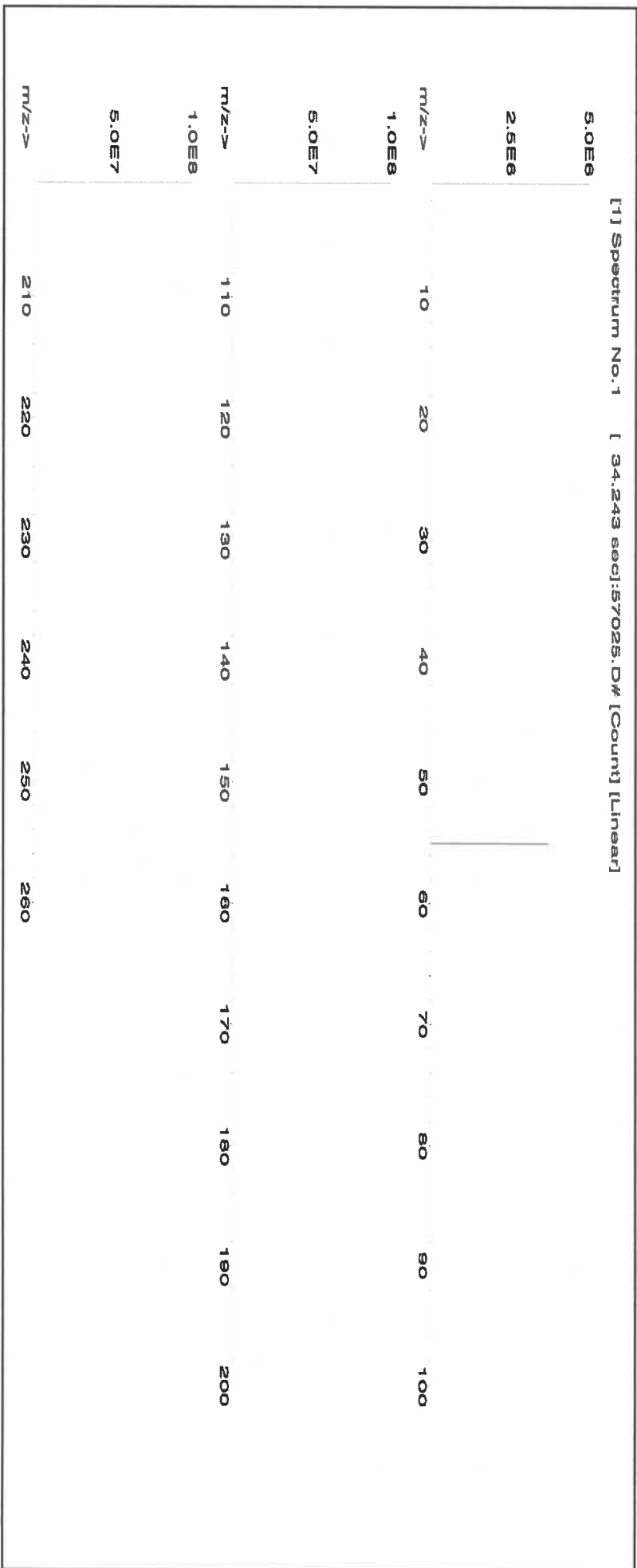
Formulated By:	Benson Chan	102623
Reviewed By:	Pedro L. Ruelas	102623

Compound

Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.)	NIST SRM
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1. Manganese(II) nitrate tetrahydrate (Mn) 58125 071123 0.1000 300.0 0.084 1000 10000.1 1000.0 2.1 20694-39-7 5 mg/m3 or-rel >300mg/kg 3132

[1] Spectrum No.1 [34.243 sec]:57025.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



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: **6UTB**

Volume shown below was diluted to (mL): **2000.02**

5E-05 Balance Uncertainty
0.058 Flask Uncertainty

SDS Information

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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1. 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											
5.0E7	m/z-->	110	120	130	140	150	160	170	180	190	200
2.0E7											
2.5E7											
1.0E7	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	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.
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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).



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



CERTIFIED WEIGHT REPORT:

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

Solvent: 24002546 Nitric Acid

Lot #

Expiration Date: 091826

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL): 10000

NIST Test Number: 6UTB

Weight shown below was diluted to (mL): 2000.02

2% 40.0 (mL) Nitric Acid

M5768 M5769

BP R: 1/13/24

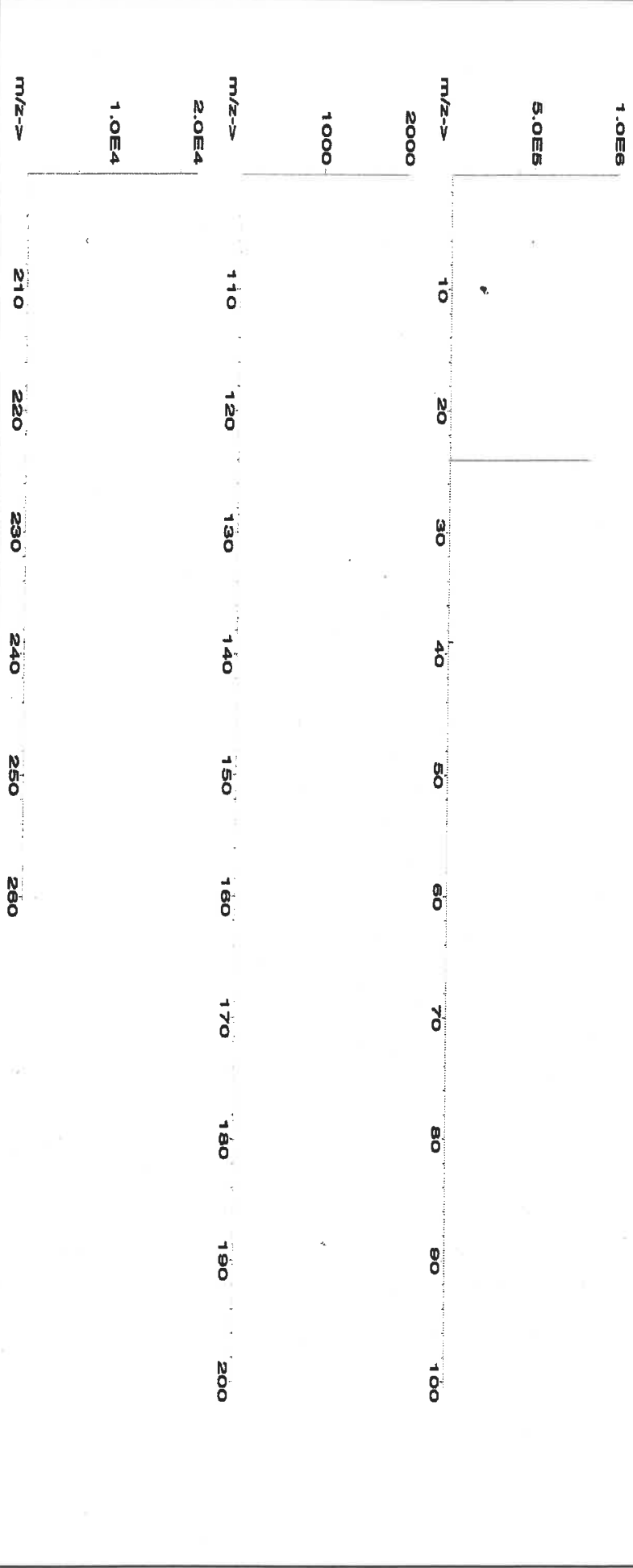
Formulated By: <i>Lawrence Barry</i>		091823
Reviewed By: <i>Pedro L. Rentas</i>		091823

Compound

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

1. Magnesium nitrate hexahydrate (Mg) IN030 M500222A1 10000 99.999 0.10 8.51 234.9118 234.9126 10000.0 20.0 13446-18-9 NA or-rat 5440 mg/kg 3131a

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





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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



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



CERTIFIED WEIGHT REPORT:

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

Solvent: 24002546 Nitric Acid

Lot #

Expiration Date: 091826

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL): 10000

NIST Test Number: 6UTB

Weight shown below was diluted to (mL): 2000.02

2% 40.0 (mL) Nitric Acid

M5768 M5769

BP R: 1/13/24

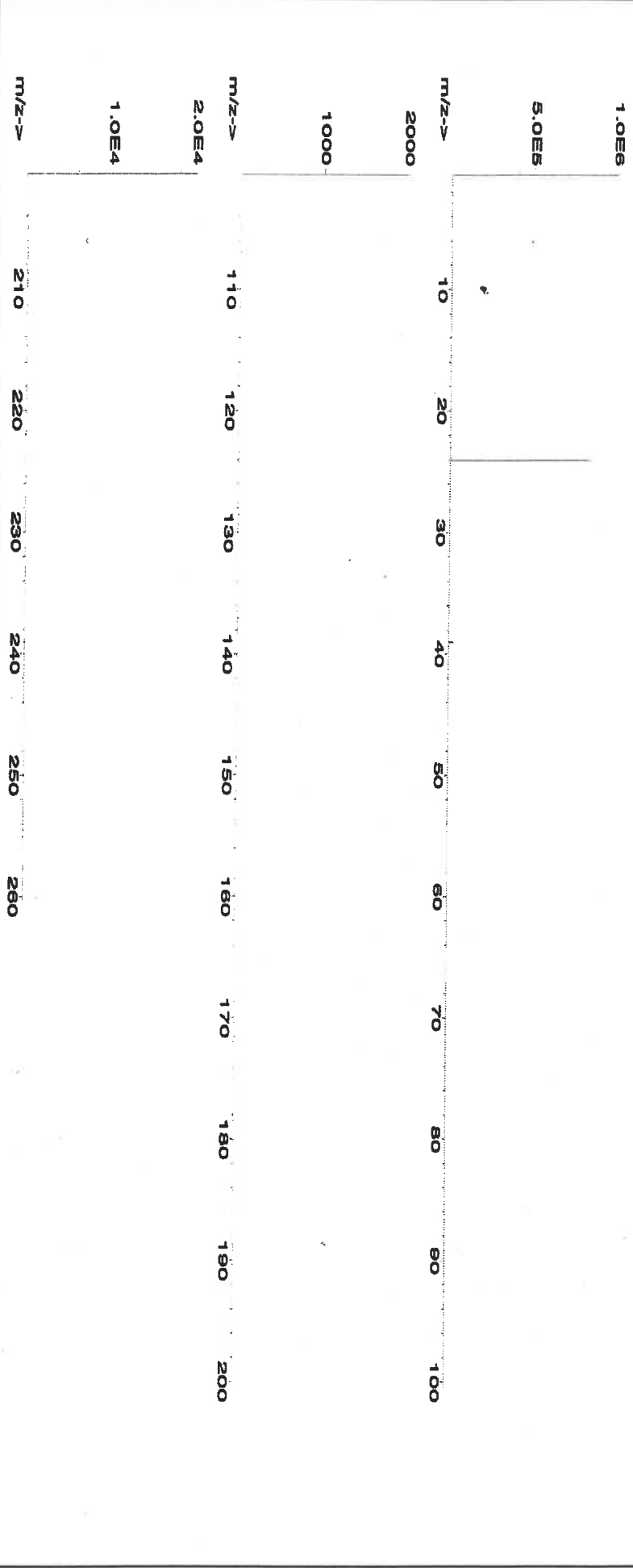
Formulated By: <i>Lawrence Barry</i>		091823
Reviewed By: <i>Pedro L. Rentas</i>		091823

Compound

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

1. Magnesium nitrate hexahydrate (Mg) IN030 M500222A1 10000 99.999 0.10 8.51 234.9118 234.9126 10000.0 20.0 13446-18-9 NA or-rat 5440 mg/kg 3131a

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





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

Part Number: 57004
Lot Number: 102523
Description: Beryllium (Be)

Lot # 24002546
Solvent: Nitric Acid

Expiration Date:

102526

2.0%

40.0 (mL)

Nitric Acid

Recommended Storage:

Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

Volume shown below was diluted to (mL):

2000.02

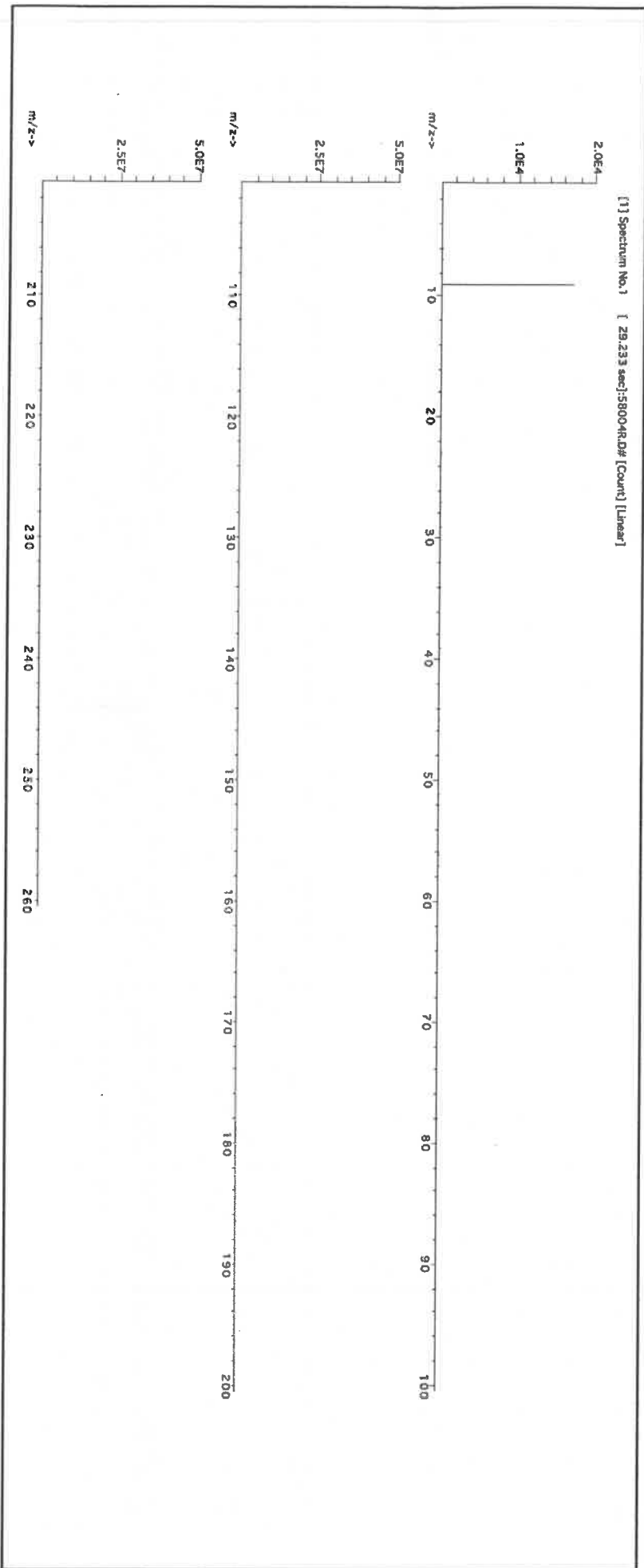
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

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

SDS Information

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

1. Beryllium nitrate (Be)	58104	091423	0.1000	200.0	0.084	1000	10001.5	1000.0	2.2	13597-99-4	0.2µg/m3	intrinsc-rat 3.16mg/kg	NA
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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

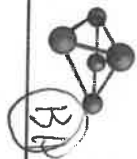
CERTIFIED WEIGHT REPORT:

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

Solvents: 21110221 Nitric Acid
22D0562008 Hydrochloric acid

Lot #

15.02509124
M599



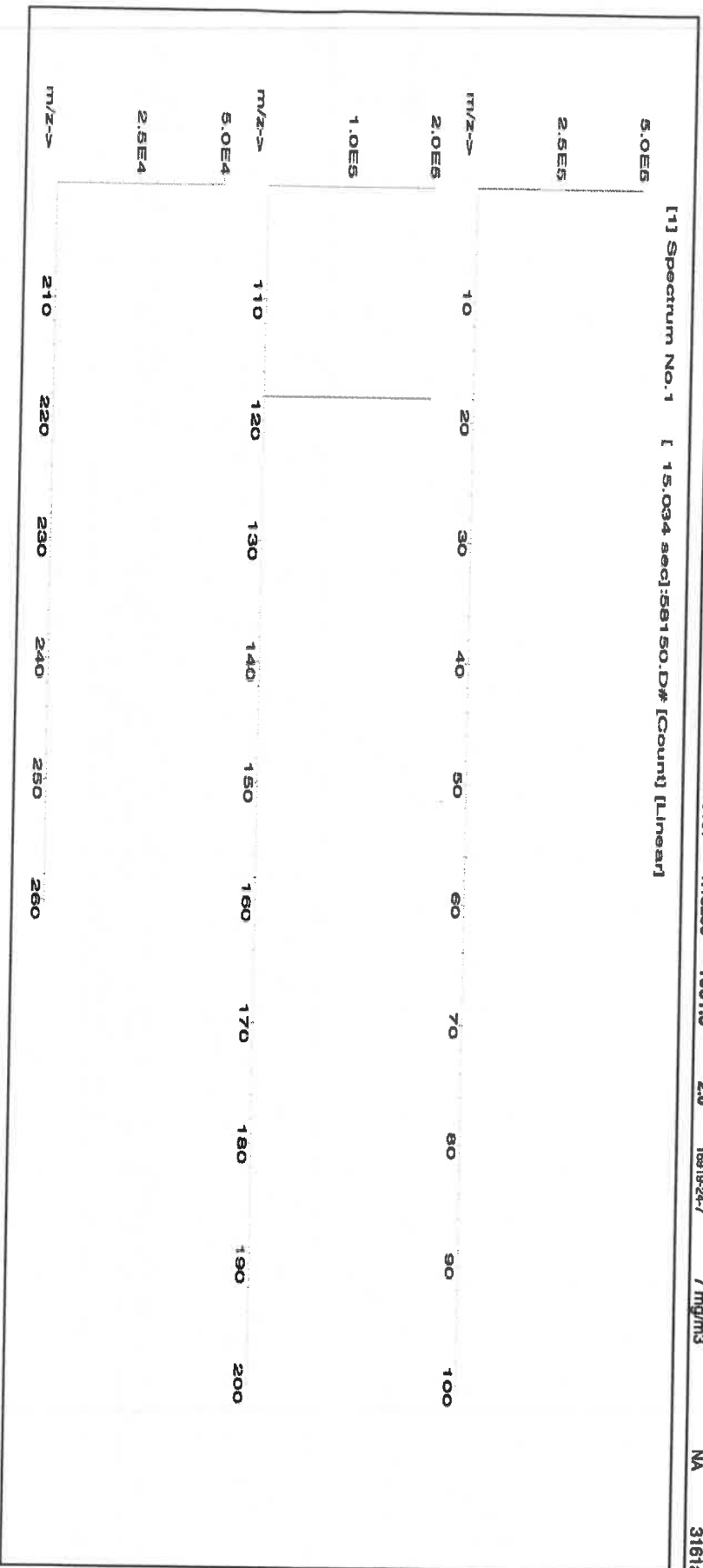
Expiration Date: 071126
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Weight shown below was diluted to (mL): 499.93
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

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

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

1. Ammonium hexafluoroantimonate(V) (Sn) INO10 SMD042023A1 1000 99.999 0.10 44.2 1.13107 1.13286 1001.6 2.0 16919-24-7 7 mg/m3 NA 3161a

[1] Spectrum No. 1 [15.034 sec]:56150.D# [Count] [Linear]





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

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

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pr	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Te	<0.02	U	<0.02
As	<0.2	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.01	Os	<0.02	Rh	<0.02	Ag	<0.02	Ti	<0.02	V	<0.02
Ba	<0.02	Cs	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.02	Pd	<0.02	Rb	<0.02	Na	<500	Th	<0.02	Yb	<0.02
Be	<0.01	Cr	<0.02	Ga	<0.02	Fe	<0.2	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	<0.02	Tm	<0.02	Y	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	Ta	<0.02	Zn	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	Ti	<0.02	Zr	<0.02

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



R: 02/09/24 115800 (54)

CERTIFIED WEIGHT REPORT:

Part Number: 57027
Lot Number: 091923
Description: Cobalt (Co)

Expiration Date: 091926
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB

Volume shown below was diluted to (mL): 2000.02

5E-05 Balance Uncertainty
0.058 Flask Uncertainty

Lot # 24002546
Solvent: Nitric Acid

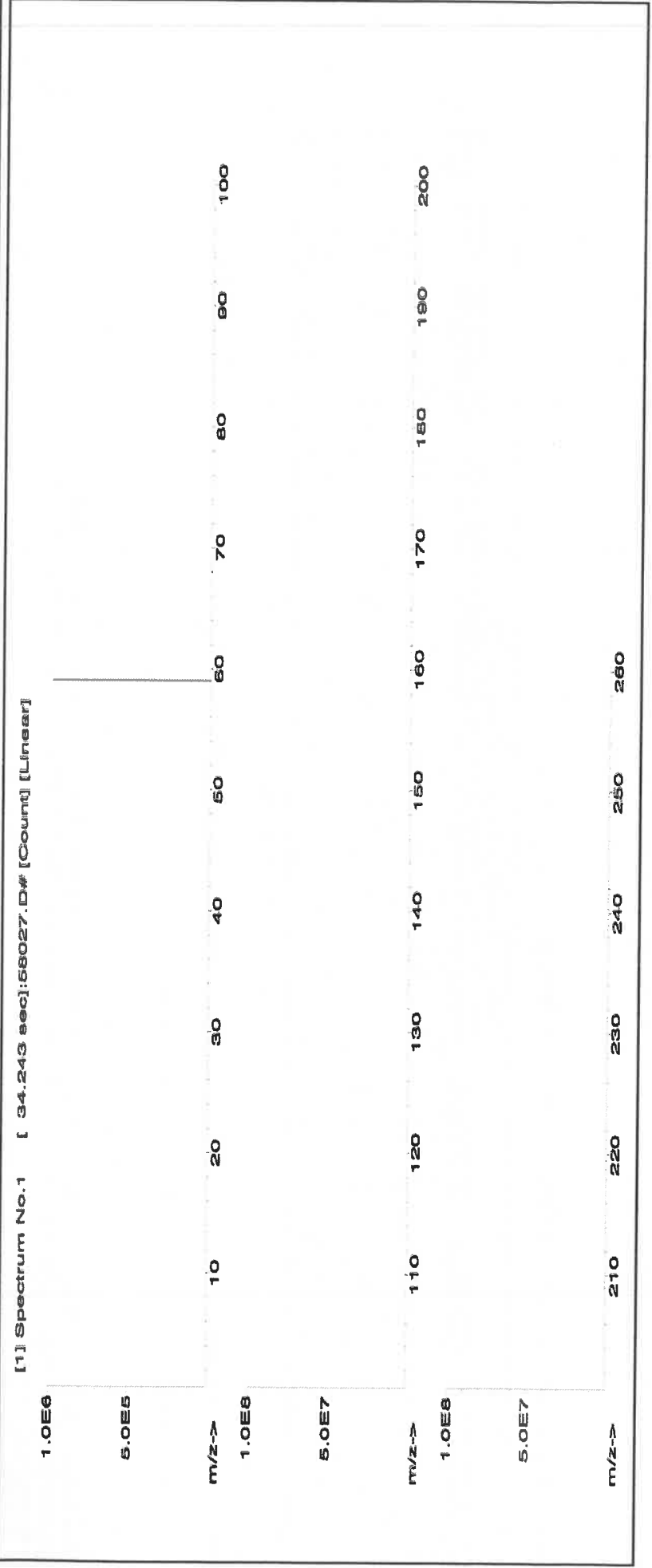
2.0% Nitric Acid
40.0 (mL)

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

SDS Information

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

1. Cobalt(II) nitrate hexahydrate (Co) 58127 050923 0.1000 200.0 0.084 1000 10000.0 1000.0 2.2 10026-22-9 0.02 mg/m3 orl-rat 691 mg/kg 3113





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

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

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

(T)= Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57033
111323
Arsenic (As)

Lot #
Solvent:

24002546
Nitric Acid

2.0%

80.0

Nitric Acid

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

111326
Ambient (20 °C)
1000

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

6UTB
4000.0

5E-05
Balance Uncertainty
0.06
Flask Uncertainty

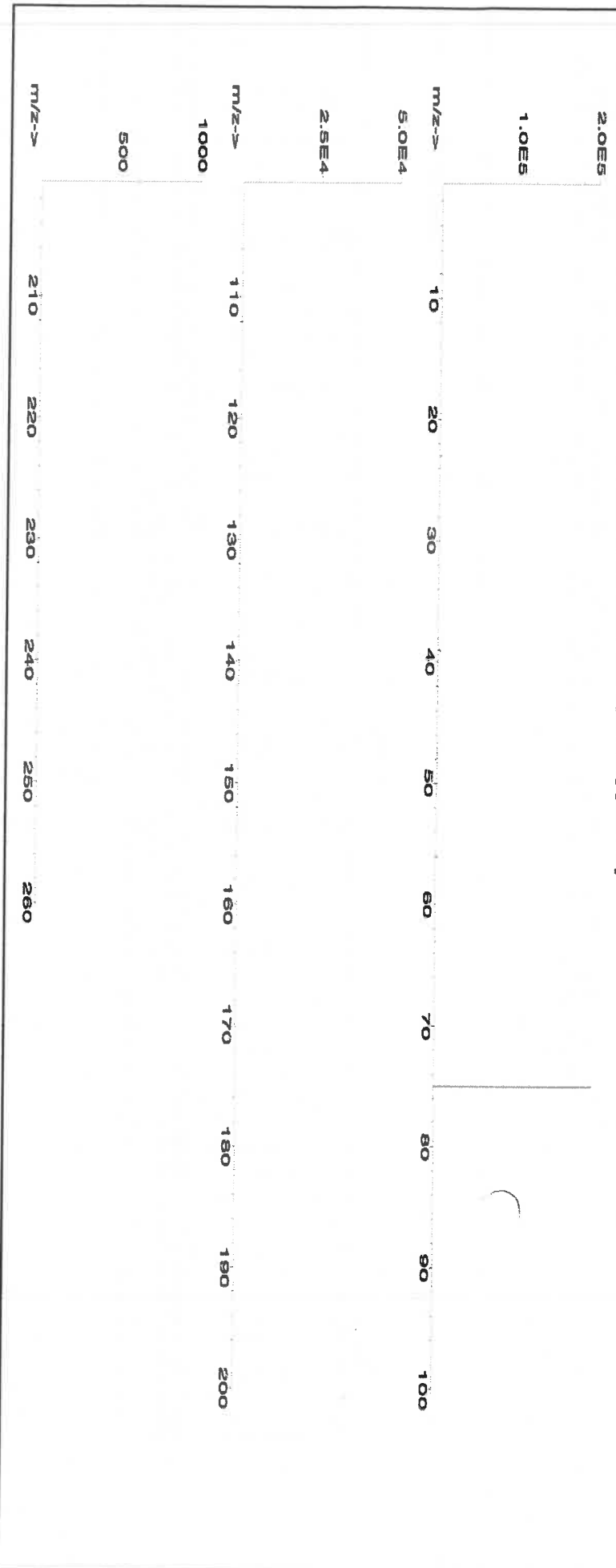
Formulated By:	Lawrence Barry	111323
Reviewed By:	Pedro L. Rendas	111323

Compound

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





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

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

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Te	<0.02	U	<0.02
As	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	Sa	<0.02	Zn	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	Ti	<0.02	Zr	<0.02

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

Part Number: 57115
Lot Number: 041723
Description: Phosphorous (P)

Solvent: 21110221 Nitric Acid

Lot #

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

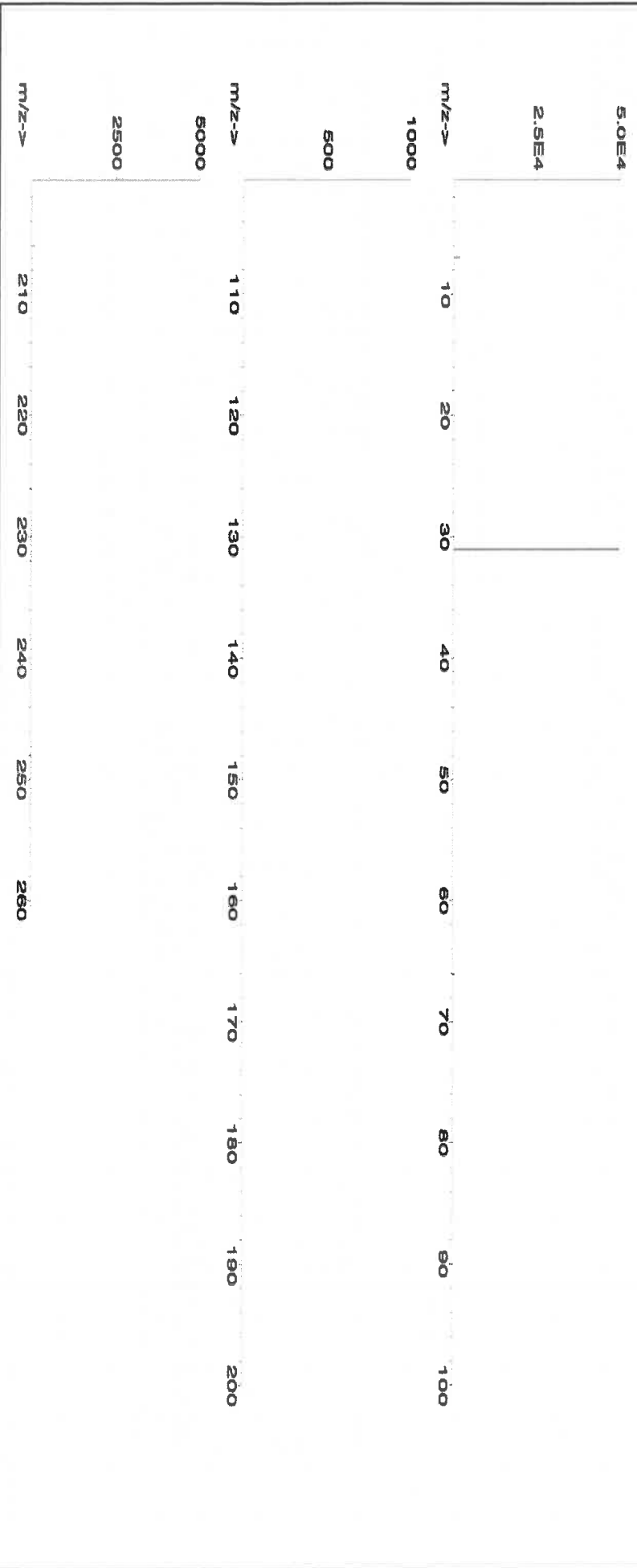
Weight shown below was diluted to (mL): 2000.02 0.058 Balance Uncertainty Flask Uncertainty

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

Compound										SDS Information		NIST SRM
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)	(Solvent Safety Info. On Attached pg.)	LD50	

1. Ammonium dihydrogen phosphate (P) IN008 PVR2019A1 10000 99.999 0.10 27.5 72.7287 72.7289 10000.0 20.0 7722-76-1 5 mg/m3 or-hal->2000mg/kg 3186

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





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

- * The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- * Purified acids, 18.2 megohm deionized water, calibrated Class A glassware and the highest purity raw materials are used in the preparation of all standards.
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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: 57016
Lot Number: 122923
Description: Sulfur (S)

Lot #

Solvent: 122923

ASTM Type 1 Water

Expiration Date: 122926
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6LUTB

Weight shown below was diluted to (mL): 4000.0
SE-05 Balance Uncertainty
0.06 Flask Uncertainty

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

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)
Ammonium sulfate (S)	IN117 SLBR725V	1000	99.9	0.10	24.3	16.4979	16.4980	1000.0	2.0

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 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)

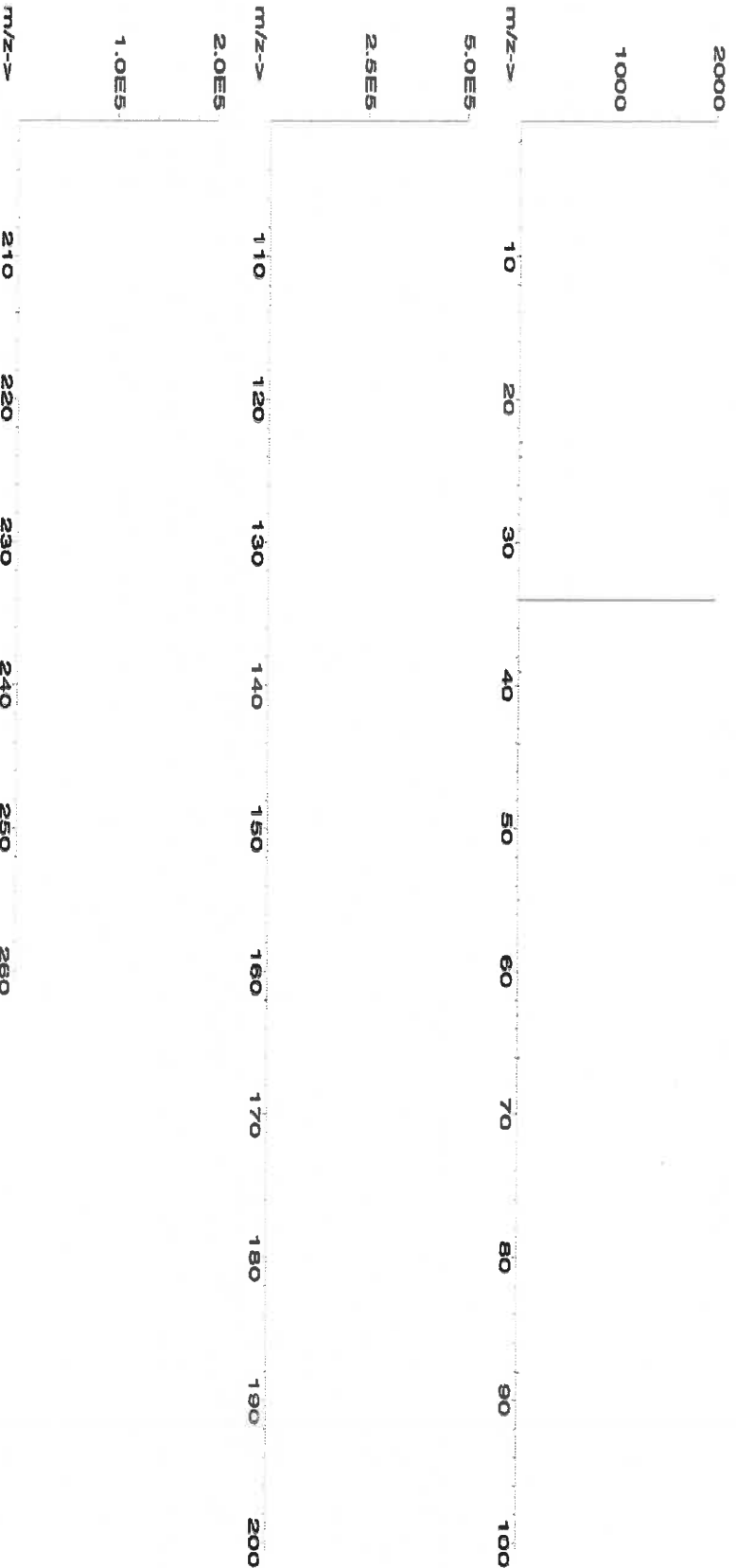
Lot #
Solvent: 071123
ASTM Type 1 Water

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

SDS Information									
Compound	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)
Ammonium sulfate (S)	IN117 SLBR725V	10000	99.9	0.10	24.3	82.4675	82.4692	10000.1	20.0
						7763-20-2	NA		oral 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	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	T	Ti	<0.02	Zn	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02			Zr	<0.02

Physical Characterization:

(T)= Target analyte

Certified by:

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

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



CERTIFIED WEIGHT REPORT:

Part Number: **57014**
Lot Number: **122023**
Description: **Silicon (Si)**

Solvent: **24002546 Nitric Acid**

Lot #

R: 02/09/24 M5818

Expiration Date: **122026**

2% 40.0 (mL) Nitric Acid

Recommended Storage: **Ambient (20 °C)**

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

NIST Test Number: **6UTB**

5E-05 Balance Uncertainty

Weight shown below was diluted to (mL): **1999.48 0.058 Flask Uncertainty**

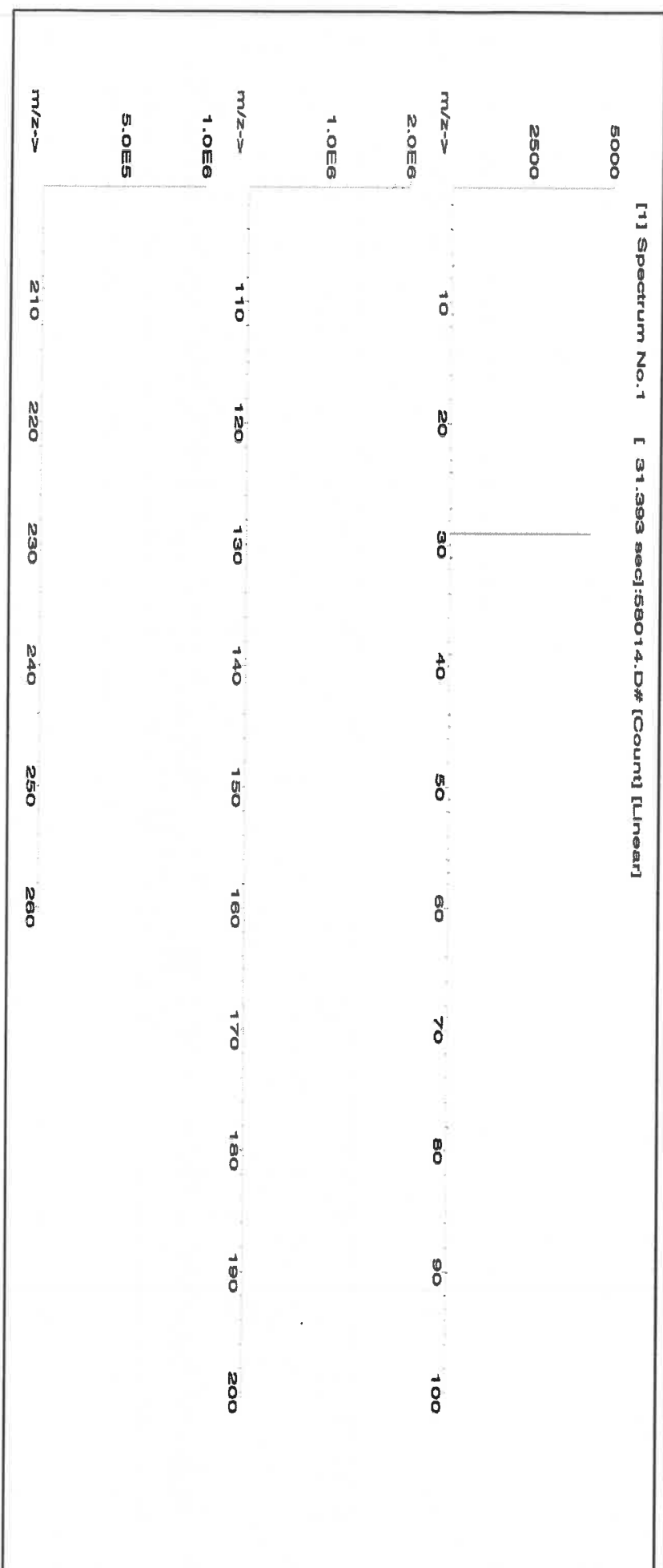
<i>Aleah O Brady</i>	
Formulated By:	Aleah O Brady
Reviewed By:	<i>Pedro L. Rentas</i>
	Pedro L. Rentas
	122023

SDS Information

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

1. Ammonium hexafluorosilicate (Si) IN009 S1D08022A1 1000 99.999 0.10 14.4 13.8854 13.8855 1000.0 2.0 18919-19-0 2.5 mg/m3 off-mus 70 mg/kg NA

[1] Spectrum No. 1 [31.393 sec; 158014.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

Part Number: 58030
Lot Number: 111623
Description: Zinc (Zn)

Solvent: 24002546 Nitric Acid

Lot # R: 02109124 MS819

2% 60.0 (mL) Nitric Acid

Expiration Date: 111626

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL): 1000

NIST Test Number: 6UTB

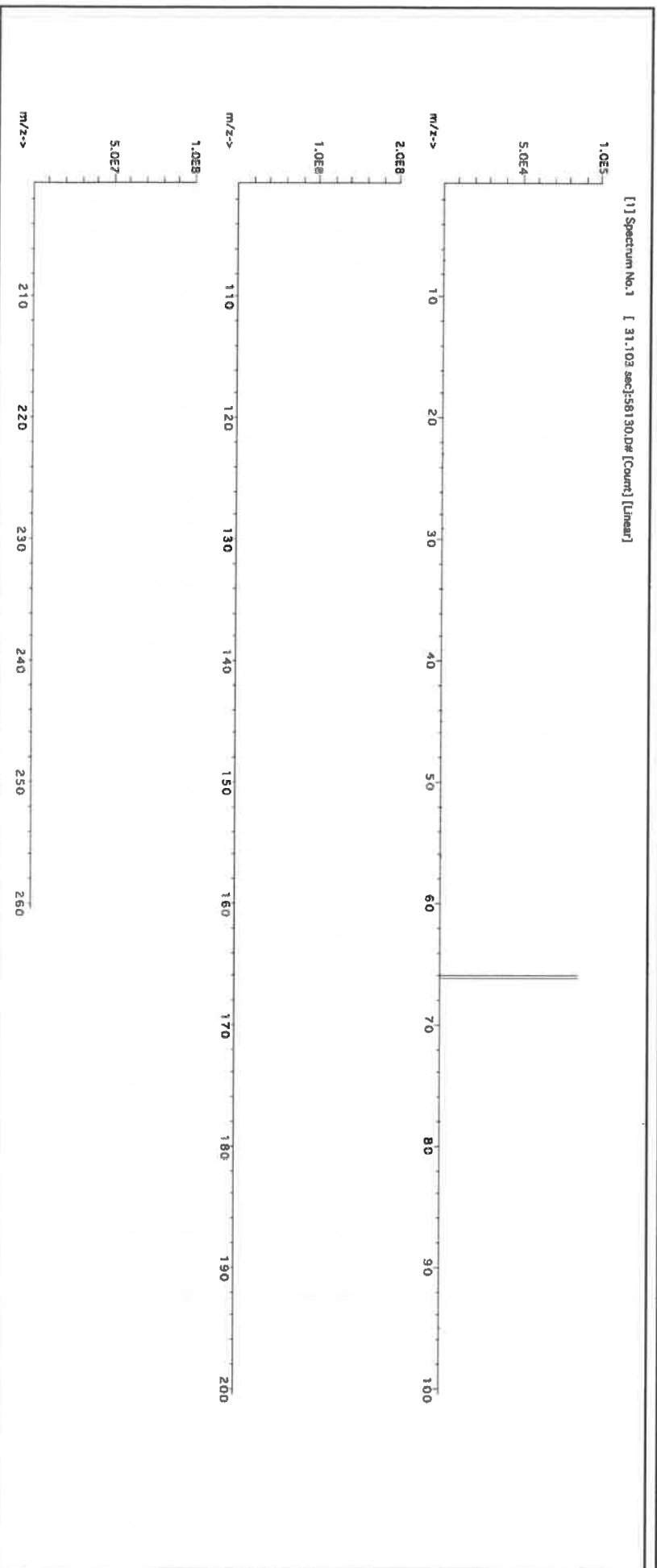
Weight shown below was diluted to (mL): 3000.4

Formulated By:	Benson Chan	111623
Reviewed By:	Pedro L. Reintas	111623

Compound

Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LDSO	NIST SRM
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1. Zinc nitrate hexahydrate (Zn) IN016 ZNE03021A1 1000 99.999 0.10 24.3 12.3475 12.3502 1000.2 2.0 10196-16-6 1 mg/mL 3168 on-rat 1190mg/kg





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

Part Number: **57015**
Lot Number: **091123**
Description: **Phosphorous (P)**

Solvent: **24002546 Nitric Acid**

Lot #

R: 02109124 M5820

Expiration Date: **091126**
Recommended Storage: **Ambient (20 °C)**
Nominal Concentration (µg/mL): **1000**
NIST Test Number: **6LJB**

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

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

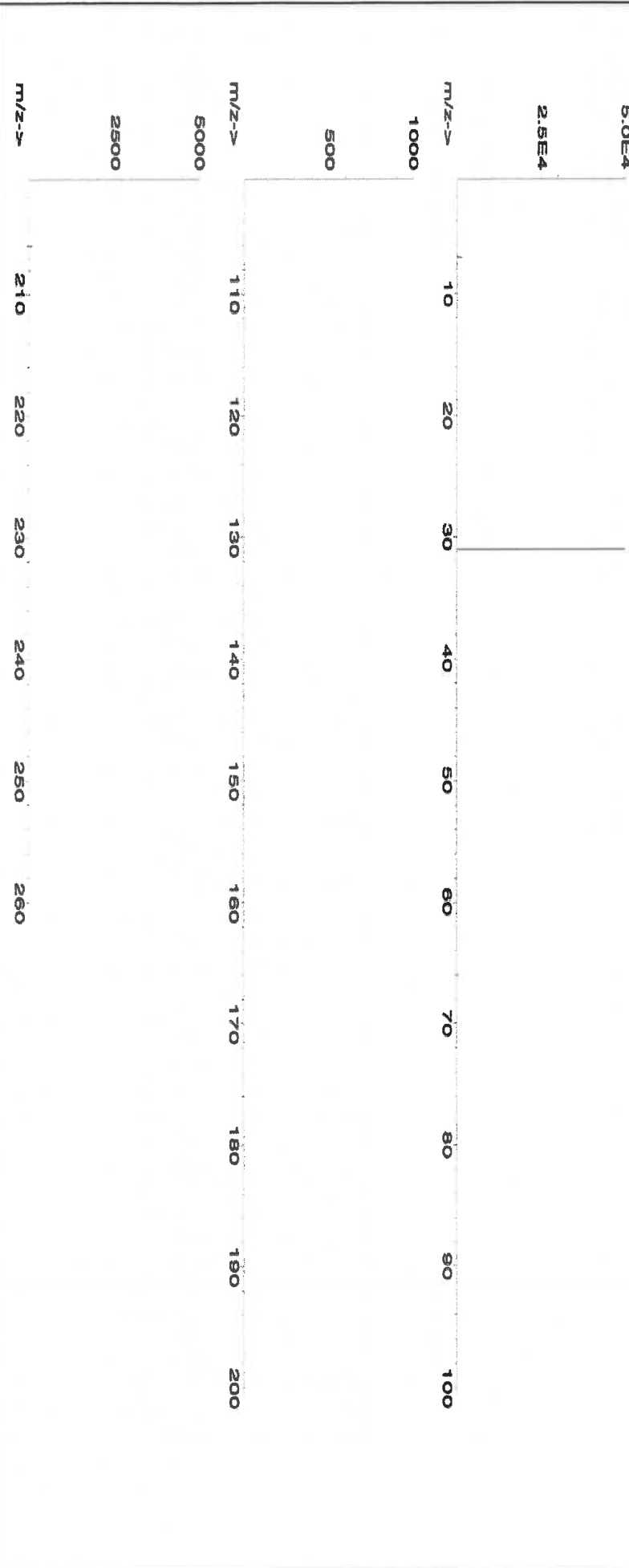
Formulated By:	Lawrence Barry
Reviewed By:	Pedro L. Rentas
091123	

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. Ammonium dihydrogen phosphate (P) IN008 PY062019A1 1000 99.999 0.10 27.5 7.2729 7.2730 1000.0 2.0 7722-76-1 5 mg/m3 xH-rat >2000mg/kg 3186

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





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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

Certificate of Analysis

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 Reference Material CRM

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

M5960 KK R. 6/11/24

CERTIFIED WEIGHT REPORT:

Part Number:

57028

Lot Number:

041124

Description:

Nickel (Ni)

Lot #

Solvent: 24002546 Nitric Acid

Expiration Date:

041127

Recommended Storage:

Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

5E-05 Balance Uncertainty

0.002 Flask Uncertainty

Weight shown below was diluted to (mL):

249.85

2% Nitric Acid

5.0 (mL)

Formulated By: Brian Geddes 041124

Reviewed By: Pedro L. Rentas 041124

SDS Information

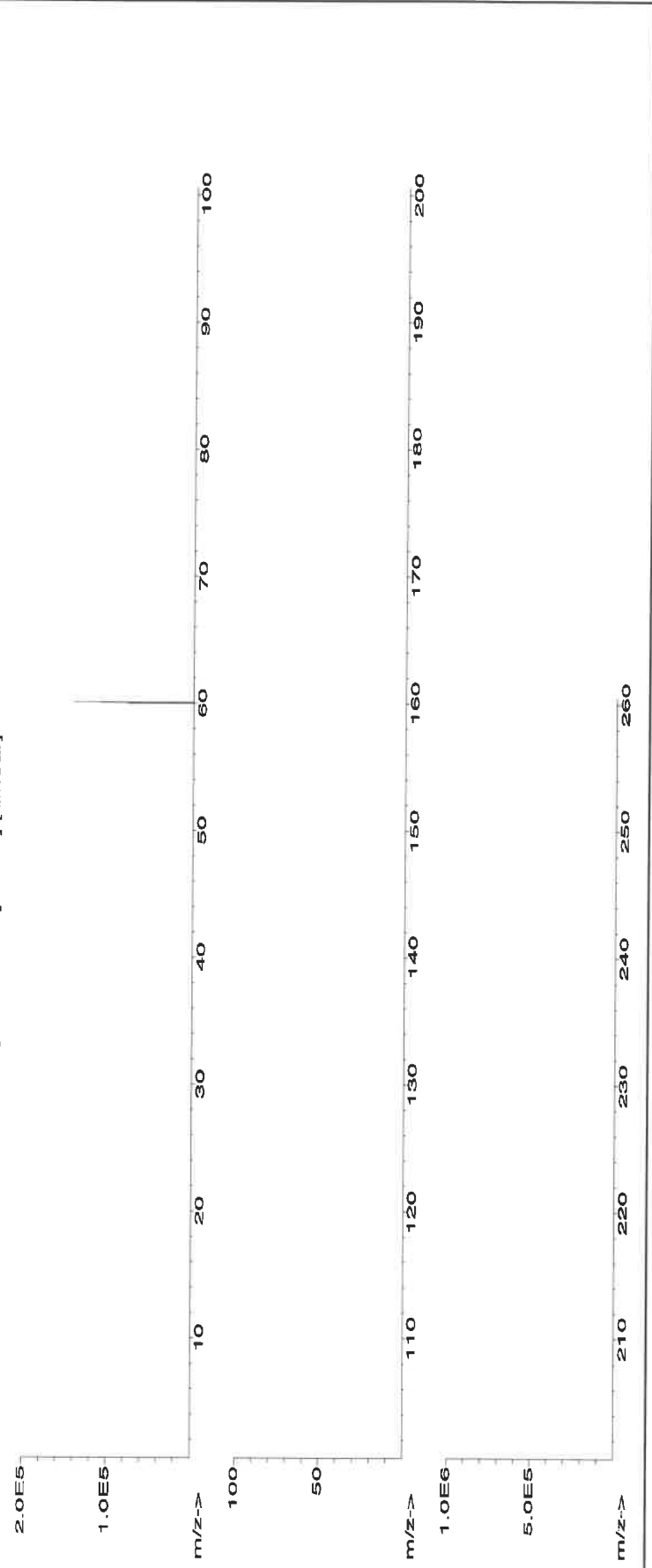
Expanded

Uncertainty (Solvent Safety Info. On Attached pg.) NIST
+/- (µg/mL) CAS# OSHA PEL (TWA) LD50 SRM

Compound

1. Nickel(II) nitrate hexahydrate (Ni) IN033 NIM052023A1 1000 99.999 0.10 20.2 1.2369 1000.0 2.0 13478-00-7 1 mg/m3 or-rat 1620 mg/kg 3136

[1] Spectrum No.1 [12.374 sec]:58128.D# [Count] [Linear]





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

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

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pr	<0.02	Sc	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.02	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	<0.2	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	<0.02	Tm	<0.02	Y	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	Sn	<0.02	Zn	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Se	<0.02	Ta	<0.02	Ti	<0.02	Zr	<0.02

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

MS962 **R10614124**

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

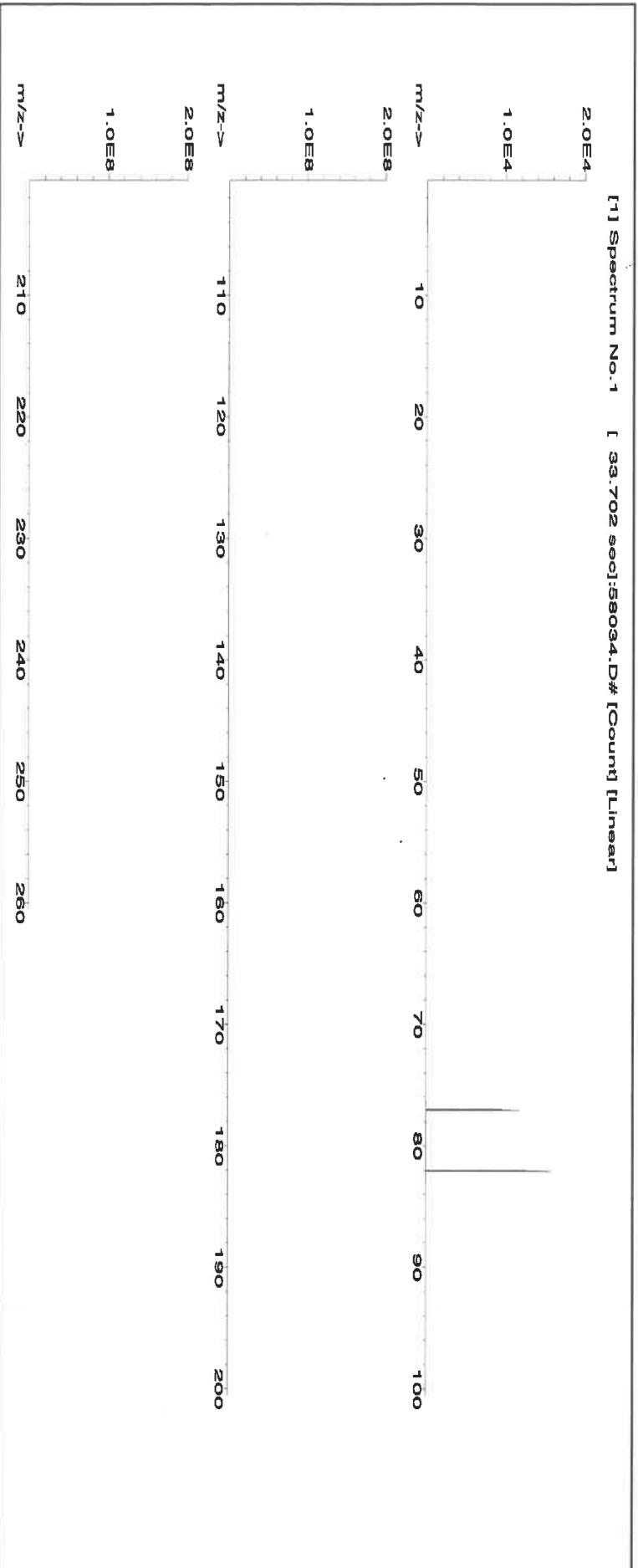
Part Number: **57034**
Lot Number: **060624**
Description: **Selenium (Se)**

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)	Uncertainty Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)
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	31.49





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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

Absolute Standards, Inc.
800-368-1131
www.absolute-standards.com



Certified Reference Material CRM

M5970 M5971



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

CERTIFIED WEIGHT REPORT:

Part Number: **57003**
Lot Number: **062124**
Description: **Lithium (Li)**
Expiration Date: **06/12/27**
Recommended Storage: **Ambient (20 °C)**
Nominal Concentration (µg/mL): **1000**
NIST Test Number: **6UTB**
Volume shown below was diluted to (mL): **250.11**
SE-05 Balance Uncertainty
0.016 Flask Uncertainty

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

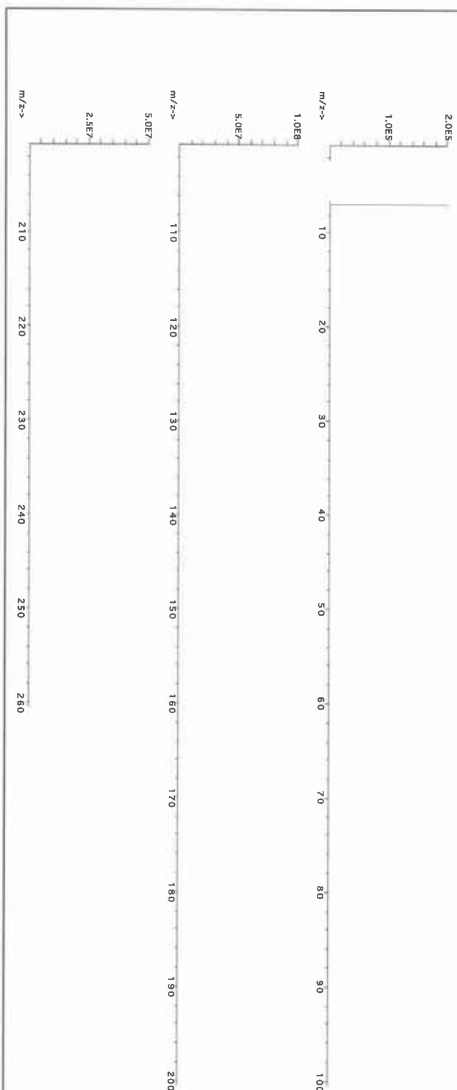
2.0% 5.0 (mL) Nitric Acid

Microvial Capable	
Formulated By:	Giovanni Esposito
Reviewed By:	Pedro L. Parias
CAS#	OSHA PEL (TWA)
LD50	
SN#	

Compound		Part		Lot		Dilution		Initial		Uncertainty		Nominal		Initial		Final		Expanded		SDS Information		NIST	
Number	Factor	Number	Factor	Number	Factor	Vol. (mL)	Pipette (mL)	Conc. (µg/mL)	Conc. (µg/mL)	Vol. (mL)	Pipette (mL)	Conc. (µg/mL)	Conc. (µg/mL)	Vol. (mL)	Pipette (mL)	Conc. (µg/mL)	Conc. (µg/mL)	Uncertainty	± (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	SN#

1. Lithium nitrate (Li)	58103	070622	0.1000	25.0	0.004	1000	10000.4	1000.0	2.0	7790-68-4	5 mg/m3	or-hal 1428 mg/kg	NA
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[1] Spectrum No. 1 [32.093 sec; 15000.0Hz Count [Lines]



Certificate of Analysis

M5976, M5977

R: 02/22/24

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
Catalog Number: CGMO1
Lot Number: T2-MO720876
Matrix: H2O
tr. NH4OH
Value / Analyte(s): 1 000 µg/mL ea:
Molybdenum
Starting Material: Ammonium Molybdate
Starting Material Lot#: 2361
Starting Material Purity: 99.9893%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 998 ± 7 µg/mL
Density: 1.000 g/mL (measured at 20 ± 4 °C)
Assay Information:

Assay Method #1 998 ± 4 µg/mL
ICP Assay NIST SRM 3134 Lot Number: 130418

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

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

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

M	Ag	<	0.000590	M	Eu	<	0.000300	M	Na		0.000879	M	Se	<	0.008000	M	Zn		0.000598
M	Al		0.000563	M	Fe	<	0.006500	M	Nb	<	0.029000	i	Si	<		M	Zr	<	0.001800
M	As	<	0.002100	M	Ga	<	0.000300	i	Nd	<		M	Sm	<	0.000300				
M	Au	<	0.000300	M	Gd	<	0.000300	M	Ni	<	0.008000	M	Sn	<	0.008900				
M	B	<	0.003300	M	Ge	<	0.000300	M	Os	<	0.000590	M	Sr		0.000175				
M	Ba		0.001689	M	Hf	<	0.001800	i	P	<		M	Ta	<	0.004200				
M	Be	<	0.000890	M	Hg	<	0.003300	M	Pb	<	0.000300	M	Tb	<	0.000300				
M	Bi	<	0.000890	M	Ho	<	0.000300	M	Pd	<	0.001800	M	Te	<	0.021000				
O	Ca		0.006334	M	In	<	0.032000	M	Pr	<	0.013000	M	Th	<	0.000300				
O	Cd	<	0.026000	M	Ir	<	0.000300	M	Pt	<	0.000300	O	Ti	<	0.032000				
M	Ce	<	0.008300	M	K		0.130213	M	Rb		0.004575	M	Tl		0.001266				
M	Co		0.000598	M	La	<	0.000300	M	Re	<	0.000300	M	Tm	<	0.000300				
M	Cr		0.000527	O	Li		0.000059	M	Rh	<	0.000300	M	U	<	0.005300				
M	Cs		0.000527	M	Lu	<	0.000300	M	Ru	<	0.079000	M	V	<	0.000890				
M	Cu		0.002252	M	Mg		0.000563	i	S	<		M	W		0.087982				
M	Dy	<	0.000300	M	Mn	<	0.005900	M	Sb		0.001513	M	Y	<	0.000300				
M	Er	<	0.000300	s	Mo	<		M	Sc	<	0.001200	M	Yb	<	0.000300				

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

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 95.94 +6 6,7,8,9

[MoO4]-2(chemical form as received)

Chemical Compatibility -Mo is received in a NH4OH matrix giving the operator the option of using HCl or HF to stabilize acidic solutions. The [MoO4]-2 is soluble in concentrated HCl [MoOCl5]-2, dilute HF / HNO3 [MoOF5]-2 and basic media [MoO4]-2. Stable at ppm levels with some metals provided it is fluorinated. Do not mix with Alkaline or Rare Earths when HF is present. Stable with most inorganic anions provided it is in the [MoO4]-2 chemical form.

Stability - 2-100 ppb levels stable (alone or mixed with all other metals that are at comparable levels) as the [MoOF5]-2 for months in 1% HNO3 / LDPE container. 1-10,000 ppm single element solutions as the [MoO4]-2 chemically stable for years in 1% NH4OH in a LDPE container.

Mo Containing Samples (Preparation and Solution) -Metal (Soluble in HF / HNO3 or hot dilute HCl); Oxide (soluble in HF or NH4OH) ; Organic Matrices (Dry ash at 450EC in Pt0 and dissolve oxide with HF or HCl).

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

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 95 amu	3 ppt	n/a	40Ar39K16O,79Br16O,190Os2+,190Pt2+
ICP-OES 202.030 nm	0.008 / 0.0002 µg/mL	1	Os, Hf
ICP-OES 203.844 nm	0.012 / 0.002 µg/mL	1	
ICP-OES 204.598 nm	0.012 / 0.001 µg/mL	1	Ir, Ta

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.569.6799; 540.585.3030, Fax: 540.585.3012; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

July 17, 2022

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

11.2 Lot Expiration Date

- July 17, 2027

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:

Uyen Truong
Supervisor, Product Documentation



Certificate Approved By:

Michael Booth
Director, Technical



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Certificate of Analysis

MS978, MS979



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Christiansburg, VA 24073 USA
inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution

Catalog Number: CGT1

Lot Number: T2-T1719972

Matrix: 2% (v/v) HNO₃

Value / Analyte(s): tr. HF

1 000 µg/mL ea.

Titanium

Ti Metal

Starting Material Lot#: 2094

Starting Material Purity: 99.9975%

Certified Value: 1002 ± 5 µg/mL

Density: 1.012 g/mL (measured at 20 ± 4 °C)

Assay 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:

$X_{CRM/RM} = (k_p) (U_{char})$
 X_p = mean of Assay Method A with
 $U_{char} A$ = the standard uncertainty of characterization Method A

$w_1 = (1/U_{char}^2) / \sum (1/U_{char}^2)$
the variance
 X_1 = mean of Assay Method 1 with standard uncertainty $U_{char} 1$
 w_1 = the weighting factors for each method calculated using the inverse square of

CRM/RM Expanded Uncertainty (E) = $(U_{char}^2 + U_{pb}^2 + U_{tr}^2 + U_{sp}^2)^{1/2}$
k = coverage factor = 2
 $U_{char} = [(2/(n-1)) (U_{char}^2)]^{1/2}$ where $U_{char} 1$ are the errors from each characterization method

U_{pb} = bottle to bottle homogeneity standard uncertainty
 U_{tr} = long term stability standard uncertainty (storage)
 U_{sp} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

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

M Ag	<	0.000536	M Eu	<	0.000268	O Na	<	0.032670	M Se	<	0.001204	O Zn	<	0.003267
M Al	<	0.000872	O Fe	<	0.003225	O Nb	<	0.043560	O Si	<	0.004735	O Zr	<	0.043560
M As	<	0.008586	M Ga	<	0.000268	M Nd	<	0.000268	M Sm	<	0.000268			
M Au	<	0.004577	M Gd	<	0.000268	O Ni	<	0.010890	M Sn	<	0.000986			
O B	<	0.008929	M Ge	<	0.002146	M Os	<	0.000269	O Sr	<	0.000986			
M Ba	<	0.002683	M Hf	<	0.002161	O P	<	0.054450	M Ta	<	0.010560			
M Be	<	0.005366	M Hg	<	0.003231	M Pb	<	0.001073	M Tb	<	0.000268			
M Bi	<	0.001609	M Ho	<	0.000268	M Pd	<	0.000268	M Th	<	0.001341			
O Ca	<	0.000676	M In	<	0.002683	M Pr	<	0.000268	M Tl	<	0.053663			
M Cd	<	0.000268	M Ir	<	0.000269	M Pt	<	0.000536	S Tl	<				
M Co	<	0.000268	M K	<	0.001172	M Rb	<	0.000268	M Ti	<	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

Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

Paul Gaines

80978



Certified Reference Material CRM



45982

R: 6/11/24

CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57038
031524
Strontium (Sr)

Solvent: 24002546 Nitric Acid

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

031527
Ambient (20 °C)
1000
6UTB
5E-05 Balance Uncertainty
0.100 Flask Uncertainty

Weight shown below was diluted to (mL): 2000.07

Lot #

2% 40.0 Nitric Acid (mL)

Formulated By:	Benson Chan	031524
Reviewed By:	Pedro L. Rentas	031524

SDS Information

Expanded

Uncertainty

(Solvent Safety Info. On Attached pg.)

NIST

LD50

SRM

CAS#

OSHA PEL (TWA)

LD50

SRM

+/- (µg/mL)

Actual

Weight (g)

Target

Assay

Purity (%)

Uncertainty

(%)

Nominal

Conc. (µg/mL)

Lot

Number

RM#

1. Strontium nitrate (Sr)	IN017	SR2022018A1	1000	89.997	0.10	41.2	4.85470	4.85502	1000.1	2.0	10042-76-9	NA	orl-rat >2000mg/kg 3153a
---------------------------	-------	-------------	------	--------	------	------	---------	---------	--------	-----	------------	----	--------------------------

[1] Spectrum No.1 [14.495 sec]:58136.D# [Count] [Linear]

5.0E6

2.5E6

m/z-->

1.0E6

5.0E5

m/z-->

5.0E6

2.5E6

m/z-->



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
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
As	<0.2	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.02	Os	<0.01	Rh	<0.02	Ag	<0.02	Ti	<0.02
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
Be	<0.01	Cr	<0.02	Ga	<0.02	Fe	<0.02	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	T	Tm	<0.02
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
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
																W	<0.02
																U	<0.02
																V	<0.02
																Yb	<0.02
																Y	<0.02
																Zn	<0.02
																Zr	<0.02

(T) = Target analyte

Physical Characterization:

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

Certified by:

[Signature]

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

2024 JUN 7 3:58 PM



Refine your results. Redefine your industry.

Certificate of Analysis

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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

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

February 21, 2023

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

11.2 Lot Expiration Date

- February 21, 2028

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Certificate of Analysis

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1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: CLPP-SPK-1
Lot Number: T2-MEB721963
Matrix: 7% (v/v) HNO₃
Value / Analyte(s):
2 000 µg/mL ea: Aluminum, Barium,
1 000 µg/mL ea: Iron,
500 µg/mL ea: Manganese, Nickel,
Vanadium, Zinc,
Cobalt,
250 µg/mL ea: Copper,
200 µg/mL ea: Chromium,
50 µg/mL ea: Beryllium, Silver

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Aluminum, Al	2 000 ± 7 µg/mL	Barium, Ba	2 000 ± 9 µg/mL
Beryllium, Be	50.00 ± 0.26 µg/mL	Chromium, Cr	200.0 ± 1.1 µg/mL
Cobalt, Co	500.0 ± 2.4 µg/mL	Copper, Cu	250.0 ± 1.0 µg/mL
Iron, Fe	1 000 ± 4 µg/mL	Manganese, Mn	500.0 ± 2.0 µg/mL
Nickel, Ni	500.0 ± 2.2 µg/mL	Silver, Ag	50.00 ± 0.22 µg/mL
Vanadium, V	500.0 ± 2.2 µg/mL	Zinc, Zn	500.0 ± 2.2 µg/mL

Density: 1.070 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ag	ICP Assay	3151	160729
Ag	Volhard	999c	999c
Ag	Calculated		See Sec. 4.2
Al	ICP Assay	3101a	140903
Al	EDTA	928	928
Ba	ICP Assay	3104a	140909
Ba	Gravimetric		See Sec. 4.2
Be	ICP Assay	3105a	090514
Be	Calculated		See Sec. 4.2
Co	ICP Assay	3113	190630
Co	EDTA	928	928
Cr	ICP Assay	3112a	170630
Cu	ICP Assay	3114	121207
Cu	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
Mn	ICP Assay	3132	050429
Mn	EDTA	928	928
Ni	ICP Assay	3136	120619
Ni	EDTA	928	928
V	IC Assay	3165	160906
V	EDTA	928	928
Zn	ICP Assay	3168a	120629
Zn	EDTA	928	928

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.
- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.
- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

July 27, 2022

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

11.2 Lot Expiration Date

- July 27, 2027

- The date after which this CRM/RM should not be used.
- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





Certified Reference Material CRM
R: 01/03/24 M6033



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

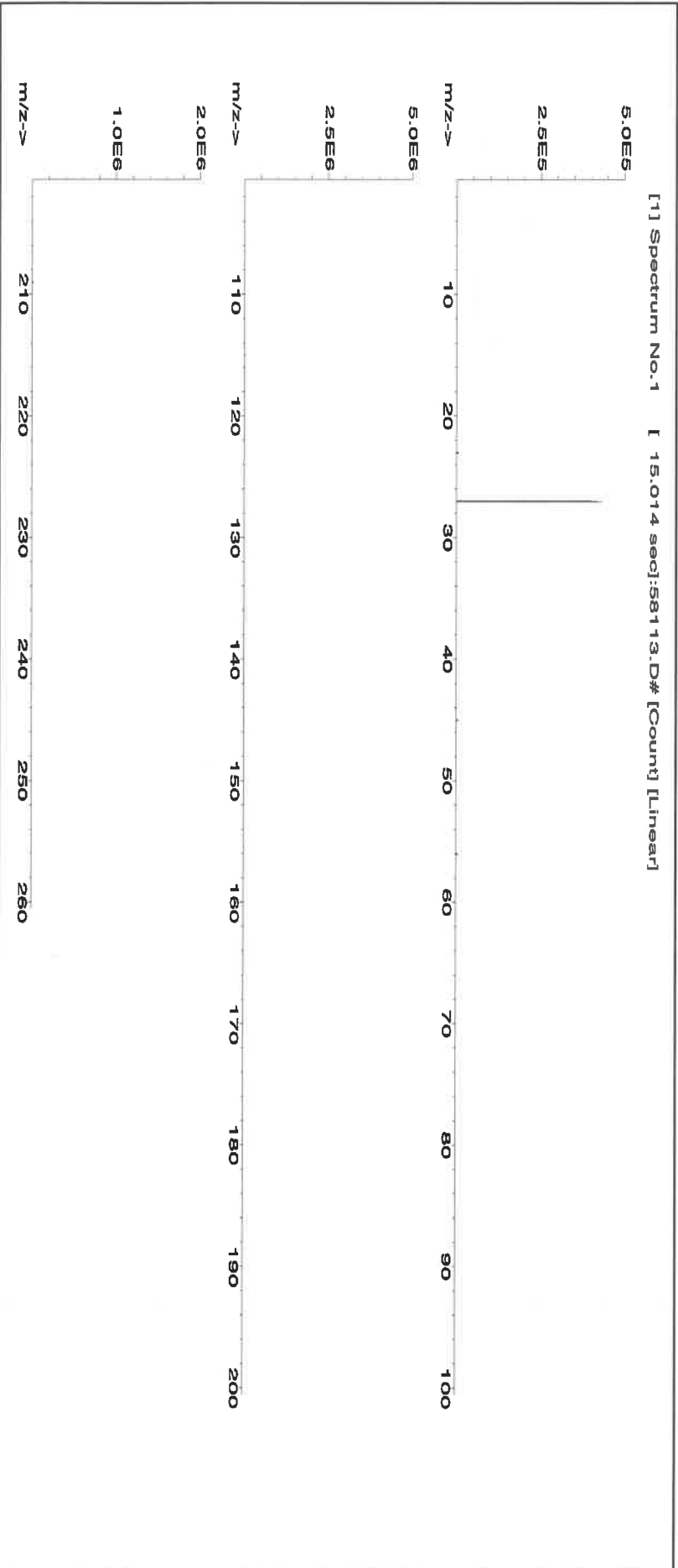
CERTIFIED WEIGHT REPORT:

Part Number: 58113
Lot Number: 011623
Description: Aluminum (Al)
Expiration Date: 011626
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 10000
NIST Test Number: 6LUTB
Weight shown below was diluted to (mL): 2000.02
Solvent: 20510011 Nitric Acid
Lot #
2% 40.0 (mL) Nitric Acid
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito
Reviewed By:	<i>Pedro L. Rentas</i>
	Pedro L. Rentas
	011623

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. Aluminum nitrate nonahydrate (Al) IN022 ALUM12021A1 10000 99.999 0.10 7.30 273.9779 274.0078 10001.1 20.0 7784-27-2 2 mg/m³ or rat 3671 mg/kg 3101a



Hydrochloric Acid, 36.5–38.0%
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis

Receive date
9/29/24
Met diag.

 avantor™



Material No.: 9530-33
Batch No.: 22F0762009
Manufactured Date: 2022-05-10
Retest Date: 2027-05-09
Revision No.: 0

M6109
M6110
M6111

Certificate of Analysis

Test	Specification	Result
ACS – Assay (as HCl) (by acid–base titrn)	36.5 – 38.0 %	37.6 %
ACS – Color (APHA)	≤ 10	5
ACS – Residue after Ignition	≤ 3 ppm	< 1 ppm
ACS – Specific Gravity at 60°/60°F	1.185 – 1.192	1.190
ACS – Bromide (Br)	≤ 0.005 %	< 0.005 %
ACS – Extractable Organic Substances	≤ 5 ppm	< 1 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	0.8 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	14.9 ppb
Trace Impurities – Chromium (Cr)	≤ 1.0 ppb	< 0.4 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	0.2 ppb
Heavy Metals (as Pb)	≤ 100 ppb	< 50 ppb
Trace Impurities – Iron (Fe)	≤ 15 ppb	6 ppb

>>> Continued on page 2 >>>

Hydrochloric Acid, 36.5–38.0%
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis



Material No.: 9530-33
Batch No.: 22F0762009

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	0.8 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	< 0.2 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	1.0 ppb
Trace Impurities – Silver (Ag)	≤ 1.0 ppb	< 0.3 ppb
Trace Impurities – Sodium (Na)	≤ 100.0 ppb	0.7 ppb
Trace Impurities – Strontium (Sr)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Tantalum (Ta)	≤ 1.0 ppb	< 0.9 ppb
Trace Impurities – Thallium (Tl)	≤ 5.0 ppb	< 2.0 ppb
Trace Impurities – Tin (Sn)	≤ 5.0 ppb	< 0.8 ppb
Trace Impurities – Titanium (Ti)	≤ 1.0 ppb	0.2 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	< 0.1 ppb

>>> Continued on page 3 >>>

Hydrochloric Acid, 36.5–38.0%
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis

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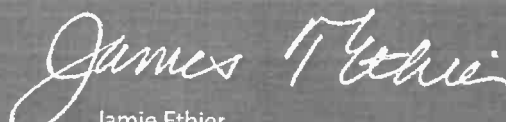


Material No.: 9530-33
Batch No.: 22F0762009

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

Nitric Acid 69%
CMOS

avantor™



Receive:
9/29/24
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Material No.: 9606-03
Batch No.: 24B1362001
Manufactured Date: 2024-01-25
Retest Date: 2029-01-23
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
Assay (HNO ₃)	69.0 – 70.0 %	69.6 %
Appearance	Passes Test	Passes Test
Color (APHA)	≤ 10	5
Residue after Ignition	≤ 2 ppm	< 1 ppm
Chloride (Cl)	≤ 0.08 ppm	< 0.03 ppm
Phosphate (PO ₄)	≤ 0.10 ppm	< 0.03 ppm
Sulfate (SO ₄)	≤ 0.2 ppm	< 0.2 ppm
Trace Impurities – Aluminum (Al)	≤ 40.0 ppb	< 1.0 ppb
Arsenic and Antimony (as As)	≤ 5.0 ppb	< 2.0 ppb
Trace Impurities – Barium (Ba)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Beryllium (Be)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Bismuth (Bi)	≤ 20.0 ppb	< 10.0 ppb
Trace Impurities – Boron (B)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities – Cadmium (Cd)	≤ 50 ppb	< 1 ppb
Trace Impurities – Calcium (Ca)	≤ 50.0 ppb	< 0.2 ppb
Trace Impurities – Chromium (Cr)	≤ 30.0 ppb	< 1.0 ppb
Trace Impurities – Cobalt (Co)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Copper (Cu)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Gallium (Ga)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Germanium (Ge)	≤ 20 ppb	< 10 ppb
Trace Impurities – Gold (Au)	≤ 20 ppb	< 5 ppb
Heavy Metals (as Pb)	≤ 100 ppb	< 50 ppb
Trace Impurities – Iron (Fe)	≤ 40.0 ppb	< 1.0 ppb
Trace Impurities – Lead (Pb)	≤ 20.0 ppb	< 10.0 ppb
Trace Impurities – Lithium (Li)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Magnesium (Mg)	≤ 20 ppb	< 1 ppb
Trace Impurities – Manganese (Mn)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Nickel (Ni)	≤ 20.0 ppb	< 5.0 ppb

>>> Continued on page 2 >>>

Nitric Acid 69%
CMOS

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Material No.: 9606-03
Batch No.: 24B1362001

Test	Specification	Result
Trace Impurities – Niobium (Nb)	≤ 50.0 ppb	< 1.0 ppb
Trace Impurities – Potassium (K)	≤ 50 ppb	< 10 ppb
Trace Impurities – Silicon (Si)	≤ 50 ppb	< 10 ppb
Trace Impurities – Silver (Ag)	≤ 20.0 ppb	< 1.0 ppb
Trace Impurities – Sodium (Na)	≤ 150.0 ppb	< 5.0 ppb
Trace Impurities – Strontium (Sr)	≤ 30.0 ppb	< 1.0 ppb
Trace Impurities – Tantalum (Ta)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities – Thallium (Tl)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities – Tin (Sn)	≤ 20.0 ppb	< 10.0 ppb
Trace Impurities – Titanium (Ti)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Vanadium (V)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Zinc (Zn)	≤ 20.0 ppb	< 1.0 ppb
Trace Impurities – Zirconium (Zr)	≤ 10.0 ppb	< 1.0 ppb
Particle Count – 0.5 µm and greater	≤ 60 par/ml	3 par/ml
Particle Count – 1.0 µm and greater	≤ 10 par/ml	1 par/ml

>>> Continued on page 3 >>>

Nitric Acid 69%
CMOS

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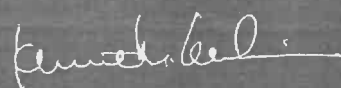


Material No.: 9606-03
Batch No.: 24B1362001

Test	Specification	Result
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For Microelectronic Use

Country of Origin: USA
Packaging Site: Phillipsburg Mfg Ctr & DC



Ken Koehnlein
Sr. Manager, Quality Assurance

Nitric Acid 69%
CMOS

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Receive:
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Material No.: 9606-03
Batch No.: 24B1362001
Manufactured Date: 2024-01-25
Retest Date: 2029-01-23
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
Assay (HNO ₃)	69.0 – 70.0 %	69.6 %
Appearance	Passes Test	Passes Test
Color (APHA)	≤ 10	5
Residue after Ignition	≤ 2 ppm	< 1 ppm
Chloride (Cl)	≤ 0.08 ppm	< 0.03 ppm
Phosphate (PO ₄)	≤ 0.10 ppm	< 0.03 ppm
Sulfate (SO ₄)	≤ 0.2 ppm	< 0.2 ppm
Trace Impurities – Aluminum (Al)	≤ 40.0 ppb	< 1.0 ppb
Arsenic and Antimony (as As)	≤ 5.0 ppb	< 2.0 ppb
Trace Impurities – Barium (Ba)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Beryllium (Be)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Bismuth (Bi)	≤ 20.0 ppb	< 10.0 ppb
Trace Impurities – Boron (B)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities – Cadmium (Cd)	≤ 50 ppb	< 1 ppb
Trace Impurities – Calcium (Ca)	≤ 50.0 ppb	< 0.2 ppb
Trace Impurities – Chromium (Cr)	≤ 30.0 ppb	< 1.0 ppb
Trace Impurities – Cobalt (Co)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Copper (Cu)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Gallium (Ga)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Germanium (Ge)	≤ 20 ppb	< 10 ppb
Trace Impurities – Gold (Au)	≤ 20 ppb	< 5 ppb
Heavy Metals (as Pb)	≤ 100 ppb	< 50 ppb
Trace Impurities – Iron (Fe)	≤ 40.0 ppb	< 1.0 ppb
Trace Impurities – Lead (Pb)	≤ 20.0 ppb	< 10.0 ppb
Trace Impurities – Lithium (Li)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Magnesium (Mg)	≤ 20 ppb	< 1 ppb
Trace Impurities – Manganese (Mn)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Nickel (Ni)	≤ 20.0 ppb	< 5.0 ppb

>>> Continued on page 2 >>>

Nitric Acid 69%
CMOS

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Material No.: 9606-03
Batch No.: 24B1362001

Test	Specification	Result
Trace Impurities – Niobium (Nb)	≤ 50.0 ppb	< 1.0 ppb
Trace Impurities – Potassium (K)	≤ 50 ppb	< 10 ppb
Trace Impurities – Silicon (Si)	≤ 50 ppb	< 10 ppb
Trace Impurities – Silver (Ag)	≤ 20.0 ppb	< 1.0 ppb
Trace Impurities – Sodium (Na)	≤ 150.0 ppb	< 5.0 ppb
Trace Impurities – Strontium (Sr)	≤ 30.0 ppb	< 1.0 ppb
Trace Impurities – Tantalum (Ta)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities – Thallium (Tl)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities – Tin (Sn)	≤ 20.0 ppb	< 10.0 ppb
Trace Impurities – Titanium (Ti)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Vanadium (V)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Zinc (Zn)	≤ 20.0 ppb	< 1.0 ppb
Trace Impurities – Zirconium (Zr)	≤ 10.0 ppb	< 1.0 ppb
Particle Count – 0.5 µm and greater	≤ 60 par/ml	3 par/ml
Particle Count – 1.0 µm and greater	≤ 10 par/ml	1 par/ml

>>> Continued on page 3 >>>

Nitric Acid 69%
CMOS

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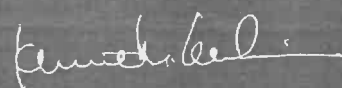


Material No.: 9606-03
Batch No.: 24B1362001

Test	Specification	Result
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For Microelectronic Use

Country of Origin: USA
Packaging Site: Phillipsburg Mfg Ctr & DC



Ken Koehnlein
Sr. Manager, Quality Assurance

Hydrochloric Acid, 36.5-38.0%
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis

avantor™



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M 6121

Material No.: 9530-33
Batch No.: 0000275677
Manufactured Date: 2020/12/16
Retest Date: 2025/12/15
Revision No: 1

Certificate of Analysis

Test	Specification	Result
ACS - Assay (as HCl) (by acid-base titrn)	36.5 - 38.0 %	37.6
ACS - Color (APHA)	<= 10	5
ACS - Residue after Ignition	<= 3 ppm	1
ACS - Specific Gravity at 60°/60°F	1.185 - 1.192	1.190
ACS - Bromide (Br)	<= 0.005 %	< 0.005
ACS - Extractable Organic Substances	<= 5 ppm	1
ACS - Free Chlorine (as Cl ₂)	<= 0.5 ppm	< 0.5
Phosphate (PO ₄)	<= 0.05 ppm	< 0.03
Sulfate (SO ₄)	<= 0.5 ppm	< 0.3
Sulfite (SO ₃)	<= 0.8 ppm	0.3
Ammonium (NH ₄)	<= 3 ppm	< 1
Trace Impurities - Arsenic (As)	<= 0.010 ppm	< 0.003
Trace Impurities - Aluminum (Al)	<= 10.0 ppb	< 0.2
Arsenic and Antimony (as As)	<= 5 ppb	< 3
Trace Impurities - Barium (Ba)	<= 1.0 ppb	< 0.2
Trace Impurities - Beryllium (Be)	<= 1.0 ppb	< 0.2
Trace Impurities - Bismuth (Bi)	<= 10.0 ppb	< 1.0
Trace Impurities - Boron (B)	<= 20.0 ppb	< 5.0
Trace Impurities - Cadmium (Cd)	<= 1.0 ppb	< 0.3
Trace Impurities - Calcium (Ca)	<= 50.0 ppb	29.7
Trace Impurities - Chromium (Cr)	<= 1.0 ppb	< 0.4
Trace Impurities - Cobalt (Co)	<= 1.0 ppb	< 0.3
Trace Impurities - Copper (Cu)	<= 1.0 ppb	< 0.1
Trace Impurities - Gallium (Ga)	<= 1.0 ppb	< 0.2

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700

Avantor Performance Materials, LLC

100 Matsonford Rd, Suite 200, Radnor, PA 19087. U.S.A. Phone: 610.386.1700

Material No.: 9530-33
Batch No.: 0000275677

Test	Specification	Result
Trace Impurities – Germanium (Ge)	<= 3.0 ppb	< 2.0
Trace Impurities – Gold (Au)	<= 4.0 ppb	< 0.2
Heavy Metals (as Pb)	<= 100 ppb	< 50
Trace Impurities – Iron (Fe)	<= 15.0 ppb	< 1
Trace Impurities – Lead (Pb)	<= 1.0 ppb	< 0.5
Trace Impurities – Lithium (Li)	<= 1.0 ppb	0.2
Trace Impurities – Magnesium (Mg)	<= 10.0 ppb	0.4
Trace Impurities – Manganese (Mn)	<= 1.0 ppb	< 0.4
Trace Impurities – Mercury (Hg)	<= 0.5 ppb	0.1
Trace Impurities – Molybdenum (Mo)	<= 10.0 ppb	< 5.0
Trace Impurities – Nickel (Ni)	<= 4.0 ppb	< 0.3
Trace Impurities – Niobium (Nb)	<= 1.0 ppb	< 0.2
Trace Impurities – Potassium (K)	<= 9.0 ppb	< 2.0
Trace Impurities – Selenium (Se), For Information Only	ppb	1.0
Trace Impurities – Silicon (Si)	<= 100.0 ppb	< 10.0
Trace Impurities – Silver (Ag)	<= 1.0 ppb	< 0.3
Trace Impurities – Sodium (Na)	<= 100.0 ppb	< 5.0
Trace Impurities – Strontium (Sr)	<= 1.0 ppb	< 0.2
Trace Impurities – Tantalum (Ta)	<= 1.0 ppb	< 0.9
Trace Impurities – Thallium (Tl)	<= 5.0 ppb	< 2.0
Trace Impurities – Tin (Sn)	<= 5.0 ppb	< 0.8
Trace Impurities – Titanium (Ti)	<= 1.0 ppb	0.2
Trace Impurities – Vanadium (V)	<= 1.0 ppb	< 0.2
Trace Impurities – Zinc (Zn)	<= 5.0 ppb	0.3
Trace Impurities – Zirconium (Zr)	<= 1.0 ppb	< 0.1

For Laboratory, Research or Manufacturing Use

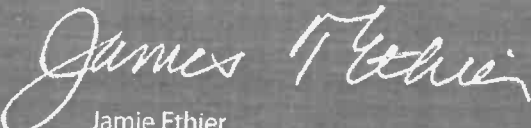
Product Information (not specifications):

Appearance (clear, fuming liquid)

Meets ACS Specifications

Country of Origin: US

Packaging Site: Phillipsburg Mfg Ctr & DC


Jamie Ethier

Vice President Global Quality

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700

Avantor Performance Materials, LLC

100 Matsonford Rd, Suite 200, Radnor, PA 19087. U.S.A. Phone: 610.386.1700

M612 S

Receive → 11/22/24

CORCO CHEMICAL CORPORATION

Manufacturers of ACS Reagents and Semiconductor Grade Chemicals

Office and Plant
299 Cedar Lane
Fairless Hills, PA 19030

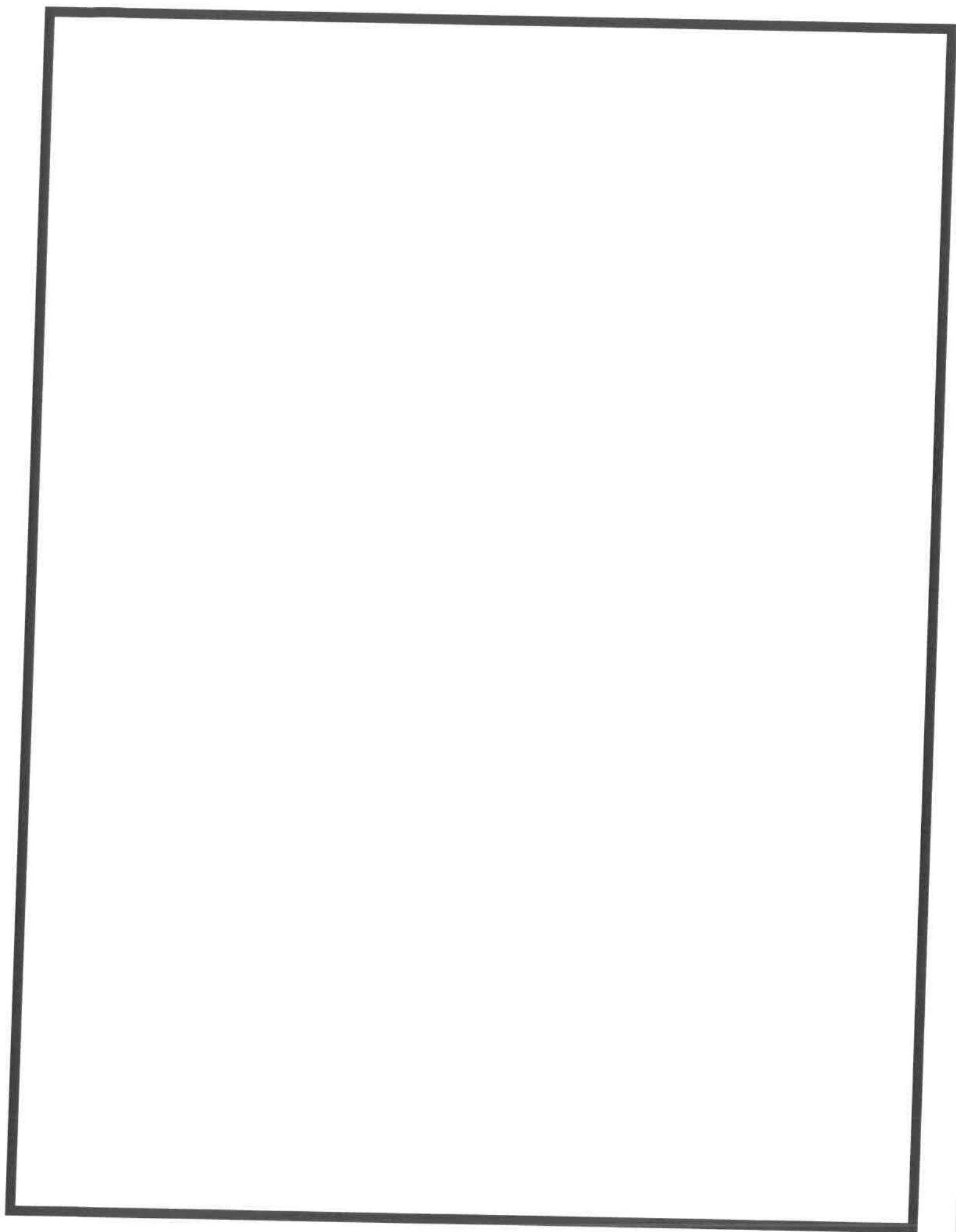
Phone: 215-295-5006
Fax: 215-295-0781

Hydrogen Peroxide 30%, ACS Reagent Grade

SPECIFICATION

MAXIMUM LIMITS

Appearance	Colorless and free from suspended matter or sediment
Assay	29-32%
Color (APHA)	10
Residue after Evaporation	0.002%
Titrateable Acid	0.0006 meq/g
Chloride (Cl)	3 ppm
Nitrate (NO ₃)	2 ppm
Phosphate	2 ppm
Sulfate (SO ₄)	5 ppm
Ammonium (NH ₄)	5 ppm
Heavy Metals (as Pb)	1 ppm
Iron (Fe)	0.5 ppm



Nitric Acid 69%
CMOS



R → 11/12/24

M6126

Material No.: 9606-03
Batch No.: 24D1062002
Manufactured Date: 2024-03-26
Retest Date: 2029-03-25
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
Assay (HNO ₃)	69.0 – 70.0 %	69.7 %
Appearance	Passes Test	Passes Test
Color (APHA)	≤ 10	5
Residue after Ignition	≤ 2 ppm	1 ppm
Chloride (Cl)	≤ 0.08 ppm	< 0.03 ppm
Phosphate (PO ₄)	≤ 0.10 ppm	< 0.03 ppm
Sulfate (SO ₄)	≤ 0.2 ppm	< 0.2 ppm
Trace Impurities – Aluminum (Al)	≤ 40.0 ppb	< 1.0 ppb
Arsenic and Antimony (as As)	≤ 5.0 ppb	< 2.0 ppb
Trace Impurities – Barium (Ba)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Beryllium (Be)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Bismuth (Bi)	≤ 20.0 ppb	< 10.0 ppb
Trace Impurities – Boron (B)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities – Cadmium (Cd)	≤ 50 ppb	< 1 ppb
Trace Impurities – Calcium (Ca)	≤ 50.0 ppb	2.3 ppb
Trace Impurities – Chromium (Cr)	≤ 30.0 ppb	< 1.0 ppb
Trace Impurities – Cobalt (Co)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Copper (Cu)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Gallium (Ga)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Germanium (Ge)	≤ 20 ppb	< 10 ppb
Trace Impurities – Gold (Au)	≤ 20 ppb	< 5 ppb
Heavy Metals (as Pb)	≤ 100 ppb	100 ppb
Trace Impurities – Iron (Fe)	≤ 40.0 ppb	< 1.0 ppb
Trace Impurities – Lead (Pb)	≤ 20.0 ppb	< 10.0 ppb
Trace Impurities – Lithium (Li)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Magnesium (Mg)	≤ 20 ppb	< 1 ppb
Trace Impurities – Manganese (Mn)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Nickel (Ni)	≤ 20.0 ppb	< 5.0 ppb

>>> Continued on page 2 >>>

Nitric Acid 69%
CMOS

 **avantor**TM



Material No.: 9606-03
Batch No.: 24D1062002

Test	Specification	Result
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For Microelectronic Use

Country of Origin: USA
Packaging Site: Phillipsburg Mfg Ctr & DC



Jamie Croak
Director Quality Operations, Bioscience Production



CERTIFIED WEIGHT REPORT:

Part Number: 58111
Lot Number: 122223
Description: Sodium (Na)

Solvent: 24002546 Nitric Acid

Lot #

<i>Aleah O Brady</i>	
Formulated By:	Aleah O Brady
	122223
<i>Pedro L Rentas</i>	
Reviewed By:	Pedro L Rentas
	122223

Expiration Date: 122226
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 10000
NIST Test Number: 6UTB

SE-05 Balance Uncertainty

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

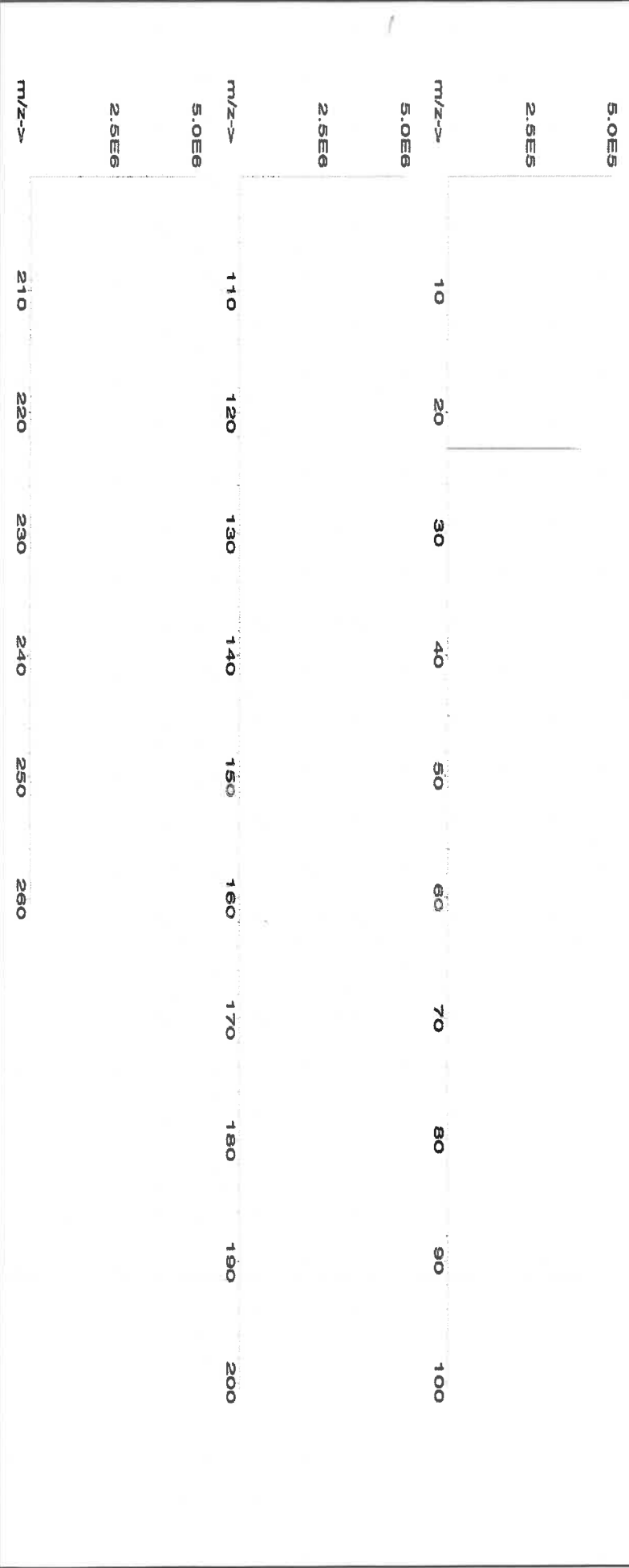
Expanded

SDS Information

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

1. Sodium nitrate (Na)	IND36 NAV01201511	10000	99.999	0.10	26.9	111.5406	111.5479	10000.7	20.0	7631-99-4	5 mg/m3	or-trat 3430 mg/kg 3152a
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[1] Spectrum No.1 [8.935 sec]:58111.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57051
120523
Antimony (Sb)

Lot #
Solvent:

24002546
Nitric Acid

2.0%
60.0
Nitric Acid
(mL)

Expiration Date:

120526

Recommended Storage:

Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6U7B

Volume shown below was diluted to (mL):

3000.41

5E-05 Balance Uncertainty
0.058 Flask Uncertainty

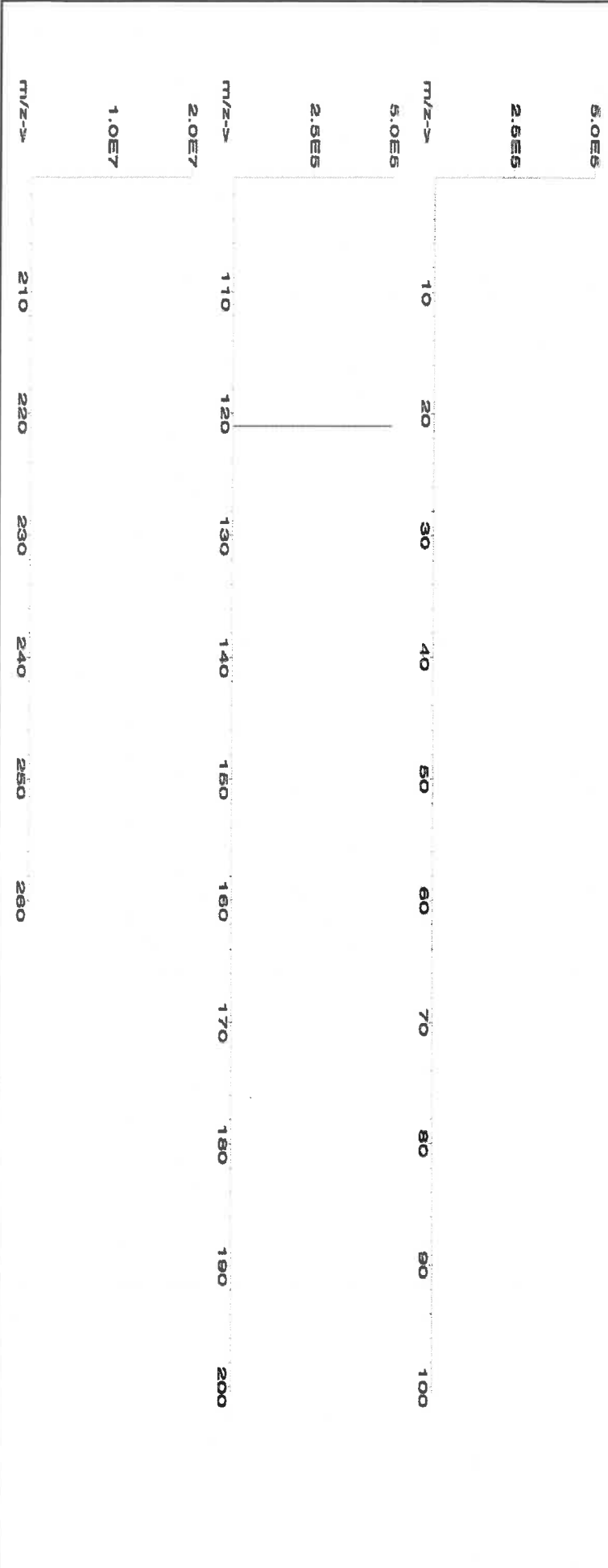
Formulated By:	Lawrence Barry	120523
Reviewed By:	Pedro L. Renteria	120523

SDS Information

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

1. Antimony (Sb)	58151	100923	0.1000	300.0	0.084	1000	10001.4	1000.0	2.1	7440-36-0	0.5 mg/m3	or-rel 7000 mg/kg	3102a
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[1] Spectrum No.1 [17.964 sec]:58051.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



Certified Reference Material CRM

M6030



CERTIFIED WEIGHT REPORT:

Part Number: **57047**
Lot Number: **122823**
Description: **Silver (Ag)**

Lot #
Solvent: 24002546 Nitric Acid

Expiration Date: 122826
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB

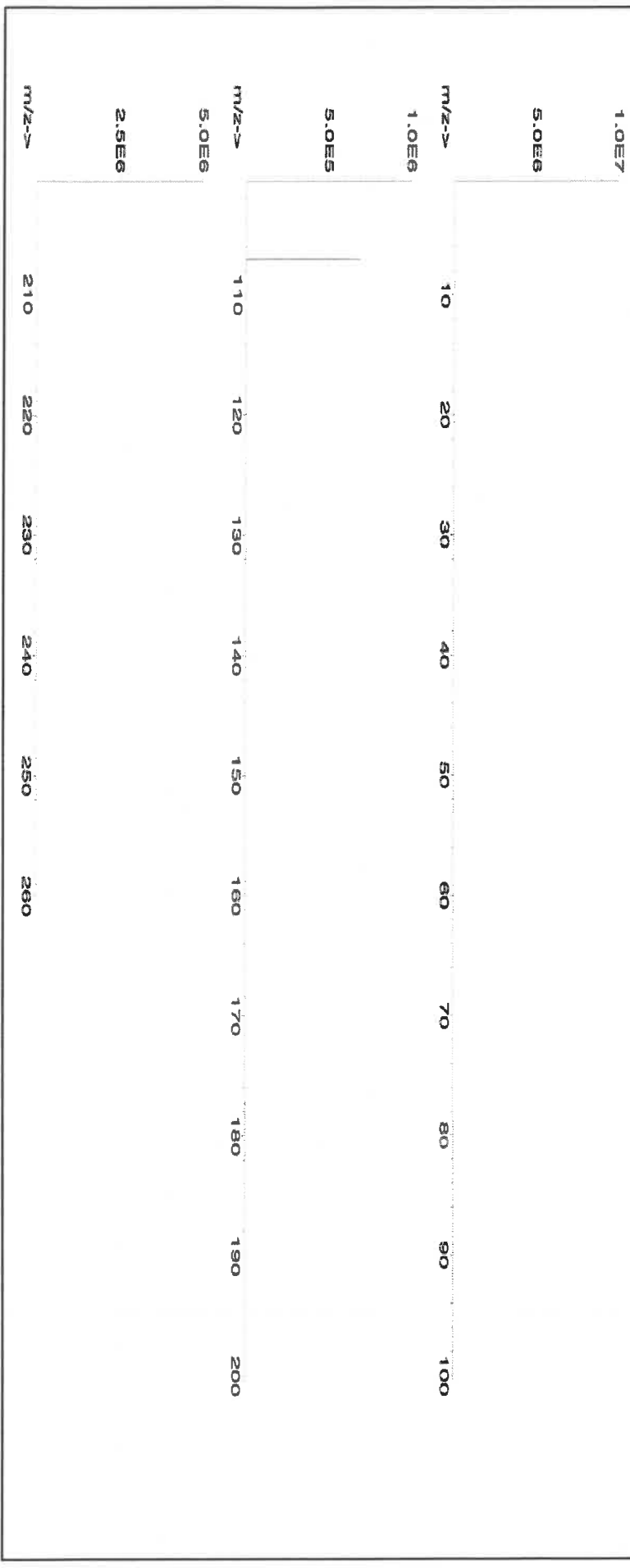
2% 80.0 (mL) Nitric Acid

Weight shown below was diluted to (mL): 4000.30
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

Formulated By:	Benson Chan
Reviewed By:	Pedro L. Rentas
122823	

SDS Information									
Compound	RM#	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)
1. Silver nitrate (Ag)	IN035	J0612A01	1000.0	99.999	0.10	63.7	6.27992	6.27998	1000.0
							2.0	7761-88-8	10 µg/mL
									NA
									3151

[1] Spectrum No. 1 [14.044 sec]:58147.D# [Count] [Linear]





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

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

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

(T)= Target analyte

Physical Characterization:

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

Certified by:

- * The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- * Purified acids, 18.2 meghom 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 Reference Material CRM

CERTIFIED WEIGHT REPORT:

R: 03/16/23 MS473 MS474 MS475 MS476

Lot #

Part Number:

56138

Solvent: 20510011

Nitric Acid

Lot Number:

082922

Description:

Strontium (Sr)

2% 20.0

Nitric Acid

Expiration Date:

082925

(mL)

Recommended Storage:

Ambient (20 °C)

Nominal Concentration (µg/mL):

10000

NIST Test Number:

6UTB

Weight shown below was diluted to (mL):

1000.12

0.058 Balance Uncertainty
Flask Uncertainty

Formulated By:	Lawrence Barry
	082922
Reviewed By:	Pedro L. Renteria
	082922

SDS Information

Compound

RM#

Lot

Number

Nominal

Purity

Uncertainty

Assay

Target

Actual

Actual

Conc. (µg/mL)

Expanded

Uncertainty

CAS#

OSHA PEL (TWA)

LD50

NIST

SRM

or-rat >2000mg/kg

3153a

20.0

10042-76-9

NA

10000.1

24.2756

24.2758

99.997

0.10

41.2

24.2756

24.2758

10000.1

20.0

10042-76-9

NA

10000.1

20.0

1. Strontium nitrate (Sr)

IN017 SR2022018A1

10000

99.997 0.10 41.2

24.2756

24.2758

10000.1

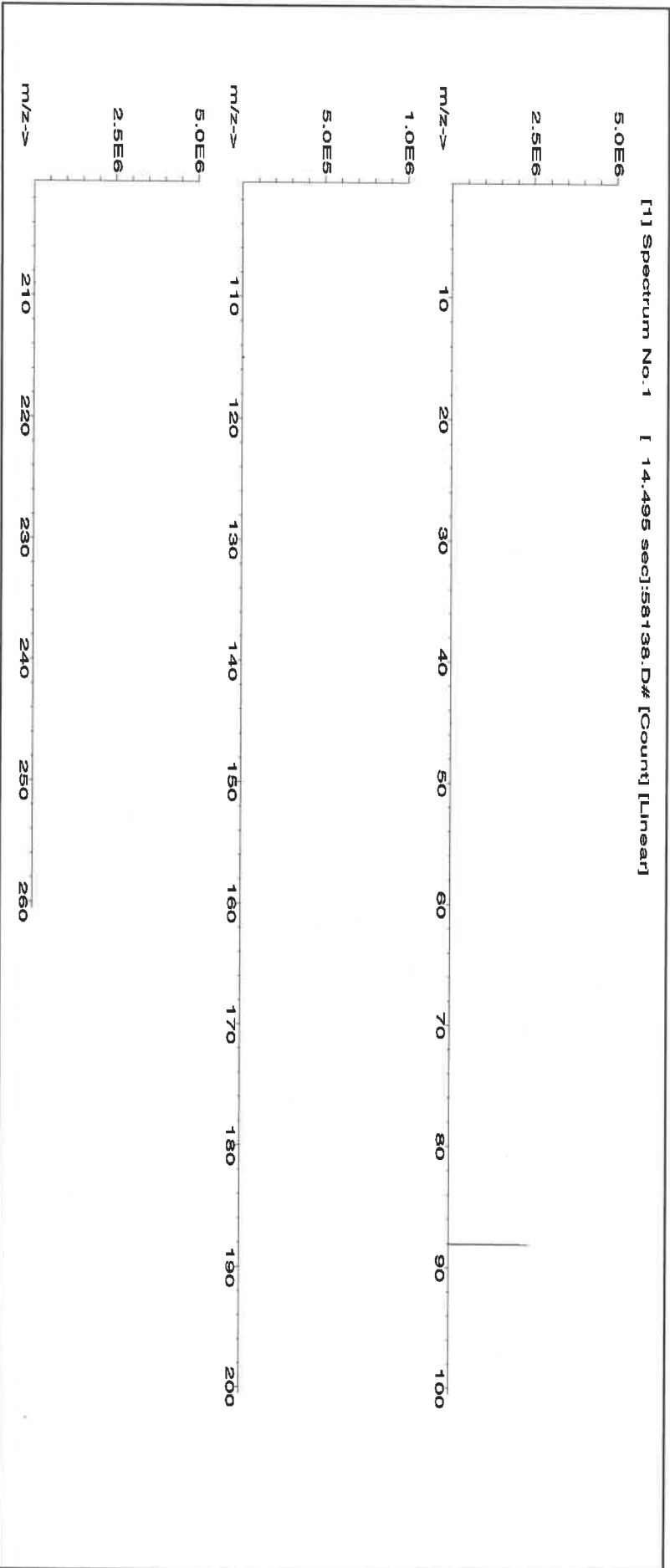
20.0

10042-76-9

NA

or-rat >2000mg/kg 3153a

[1] Spectrum No. 1 [14.495 sec]: 56138.D# [Count] [Linear]





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

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

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	T	Tm	<0.02	Y	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	Sn	<0.02	Zn	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	Ti	<0.02	Zr	<0.02

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



Certified Reference Material CRM

CERTIFIED WEIGHT REPORT:

R: 03/16/23 MS473 MS474 MS475 MS476

Lot #

Part Number:

Solvent: 20510011 Nitric Acid

Lot Number:

2% 20.0 Nitric Acid

Description:

2% 20.0 Nitric Acid

Expiration Date:

2% 20.0 Nitric Acid

Recommended Storage:

2% 20.0 Nitric Acid

Nominal Concentration (µg/mL):

2% 20.0 Nitric Acid

NIST Test Number:

2% 20.0 Nitric Acid

Weight shown below was diluted to (mL):

2% 20.0 Nitric Acid

Formulated By:	Lawrence Barry	082922
Reviewed By:	Pedro L. Renteria	082922

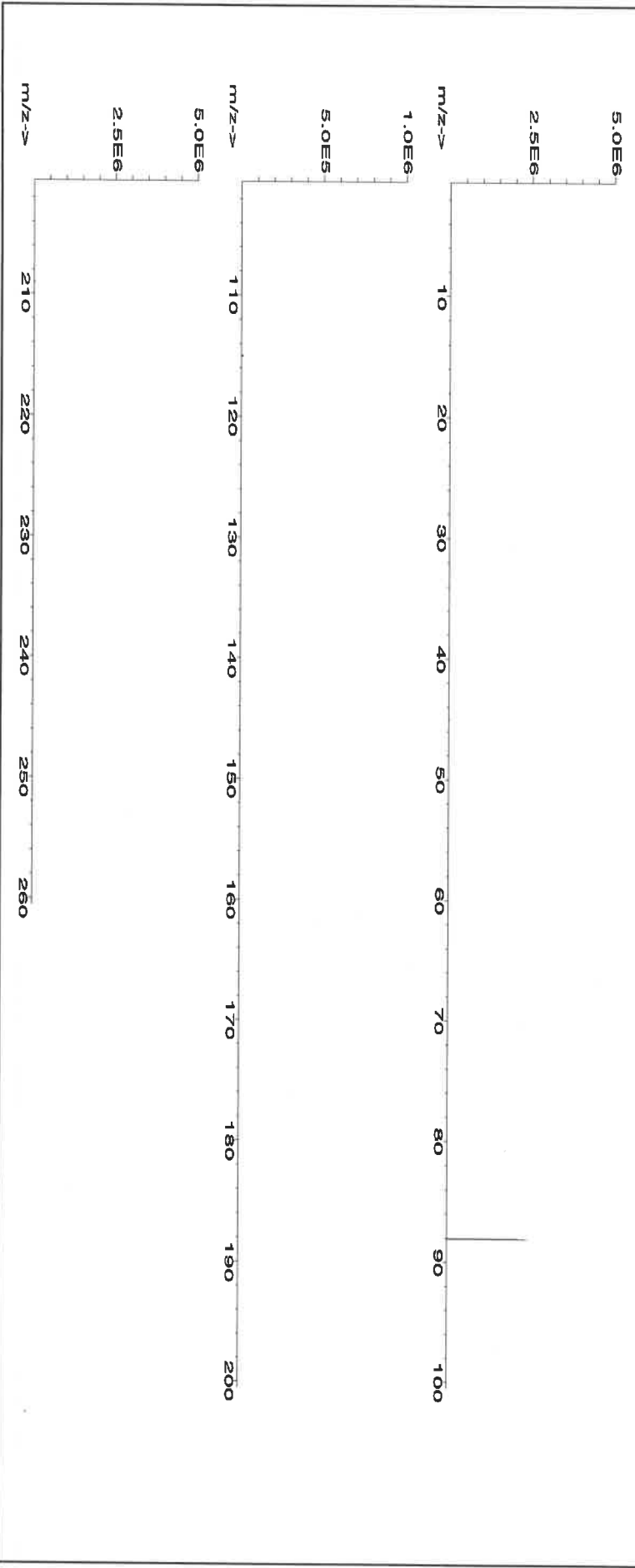
SDS Information

Compound

RM#	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM
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1. Strontium nitrate (Sr) IN017 SR2022018A1 10000 99.997 0.10 41.2 24.2756 24.2758 10000.1 20.0 10042-76-9 NA or-rat >2000mg/kg 3153a

[1] Spectrum No. 1 [14.495 sec]: 58138.D# [Count] [Linear]





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

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

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	T	Tm	<0.02	Y	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	Sn	<0.02	Zn	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	Ti	<0.02	Zr	<0.02

(T) = Target analyte

Physical Characterization:

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

Certified by:

- * The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- * Purified acids, 18.2 megohm deionized water, calibrated Class A glassware and the highest purity raw materials are used in the preparation of all standards.
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- * Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, D.C. (1994).



CERTIFIED WEIGHT REPORT:

Part Number: 57081
Lot Number: 062724
Description: Thallium (TI)

Solvent: 24002546 Nitric Acid
Lot #

Expiration Date:

062727

2% 40.0 Nitric Acid (mL)

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

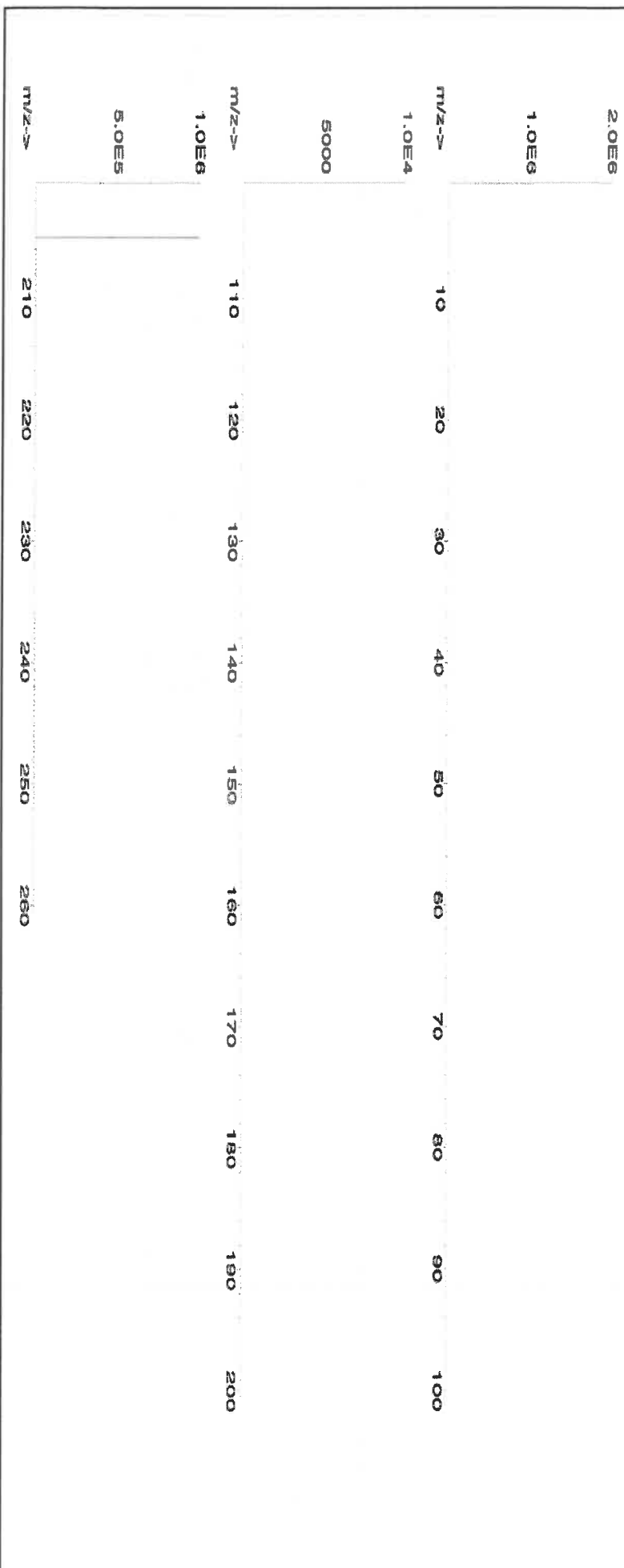
<i>Aleah O'Brady</i>	
Formulated By:	Aleah O'Brady
	062724
Reviewed By:	<i>Pedro L. Renias</i>
	Pedro L. Renias
	062724

SDS Information

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

1. Thallium nitrate (TI) IN037 BCCF4399 1000 99.999 0.10 77.0 2.5975 2.5977 1000.1 2.0 10102-45-1 0.1 mg/m3 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:

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

Certified by:

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



Certified Reference Material CRM

M6021



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

CERTIFIED WEIGHT REPORT:

Part Number: 57023
Lot Number: 062424
Description: Vanadium (V)

Lot # 24002546
Solvent: Nitric Acid

2.0%

40.0 (mL)

Nitric Acid

Formulated By: Aleah O'Brady
Reviewed By: Pedro L. Rantas

062424

Aleah O'Brady

Expiration Date: 062427
Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL): 1000

NIST Test Number: 6UTB

5E-05 Balance Uncertainty

Volume shown below was diluted to (mL): 2000.3

0.06 Flask Uncertainty

Expanded

SDS Information

(Solvent Safety Info. On Attached pg.)

CAS# 05814 PEL (TWA)

LD50

NIST

SRM

1. Ammonium metavanadate (V)

58123 021224 0.1000 200.0 0.084 1000 10000.3 1000.0 2.2 7803-55-6 0.05 mg/m3 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
5.0E6	10	20	30	40	50	60	70	80	90	100
2.5E6	10	20	30	40	50	60	70	80	90	100
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	Pt	<0.02	Se	<0.2
Sb	<0.02	Ca	<0.2	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02
As	<0.2	Ce	<0.02	Eu	<0.02	In	<0.02	Mg	<0.01	Os	<0.02	Rh	<0.02	Ag	<0.02
Ba	<0.02	Cs	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.02	Pd	<0.02	Ru	<0.02	Na	<0.2
Be	<0.01	Cr	<0.02	Ga	<0.02	Fe	<0.2	Hg	<0.2	P	<0.02	Sr	<0.02	S	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	Ta	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ti	<0.02
														Tb	<0.02
														Te	<0.02
														Tl	<0.02
														Tm	<0.02
														Sn	<0.02
														Ti	<0.02
														W	<0.02
														U	<0.02
														V	T
														Yb	<0.02
														Y	<0.02
														Zn	<0.02
														Zr	<0.02

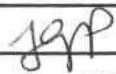
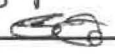
(T) = Target analyte

Physical Characterization:

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

Certified by:

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

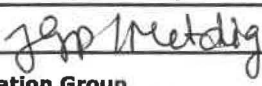
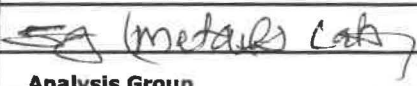
SOP ID : M3050B-Digestion-20, MSFAM01.1-Trace Metals-2
SDG No : MBHKD6, MBHK78, ~~MBHK~~ MBHKB0, MBHKM2 **Start Digest Date:** 12/04/2024 **Time :** 13:50 **Temp :** 95 °C
Matrix : SOIL **End Digest Date:** 12/04/2024 **Time :** 16:00 **Temp :** 96 °C
Pipette ID: ICP A **Digestion tube ID:** M6054
Balance ID : M SC-2 **Block thermometer ID:** MET-DIG. #2
Filter paper ID : N/A **Dig Technician Signature:** 
pH Strip ID : N/A **Supervisor Signature:** 
Hood ID : #3 **Temp :** 1. 95°C 2. N/A
Block ID: 1. HOT BLOCK #2 2. N/A

Standard Name	MLS USED	STD REF. # FROM LOG
LCSS	1.00	MP83141
Spike Sol 6	1.00	MP83147
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	MP83122
Conc. HNO3	5.00	M6126
30% H2O2	3.00	M6125
Conc. HCL	10.00	M6121
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

Extraction Conformance/Non-Conformance Comments:

HOT BLOCK #2 CELL #34 : 96 C

Date / Time	Prepped Sample Relinquished By/Location	Received By/Location
12/4/24 16:10		
	Preparation Group	Analysis Group

Lab Sample ID	Client Sample ID	pH	Initial Weight (g)	Final Vol (ml)	Color Before	Color After	Texture	Artifact	Comment	Prep Pos
P5040-01	MBHKD6	N/A	1.34	100	Brown	Yellow	Medium	N/A	N/A	1
P5040-02	MBHKD6D	N/A	1.22	100	Brown	Yellow	Medium	N/A	N/A	2
P5040-03	MBHKD6S	N/A	1.19	100	Brown	Yellow	Medium	N/A	MP83147	3
P5041-01	MBHK78	N/A	1.43	100	Brown	Yellow	Medium	N/A	N/A	4
P5041-02	MBHK78D	N/A	1.27	100	Brown	Yellow	Medium	N/A	N/A	5
P5041-03	MBHK78S	N/A	1.31	100	Brown	Yellow	Medium	N/A	MP83147	6
P5042-01	MBHKB0	N/A	1.46	100	Brown	Yellow	Medium	N/A	N/A	7
P5042-02	MBHKB0D	N/A	1.17	100	Brown	Yellow	Medium	N/A	N/A	8
P5042-03	MBHKB0S	N/A	1.39	100	Brown	Yellow	Medium	N/A	MP83147	9
P5043-01	MBHKM2	N/A	1.42	100	Brown	Yellow	Medium	N/A	N/A	10
P5043-02	MBHKM2D	N/A	1.36	100	Brown	Yellow	Medium	N/A	N/A	11
P5043-03	MBHKM2S	N/A	1.47	100	Brown	Yellow	Medium	N/A	MP83147	12
PB165364BL	PBS364	N/A	1.00	100	Colorless	Colorless	Fine	N/A	N/A	13
PB165364BS	LCS364	N/A	1.00	100	Colorless	Colorless	Fine	N/A	MP83141	14

Instrument ID: P5

Daily Analysis Runlog For Sequence/QC Batch ID # LB133883

Review By	Sarabjit Jaswal	Review On	12/12/2024 8:19:04 AM
Supervise By	Kareem Khairalla	Supervise On	12/13/2024 7:24:03 PM
STD. NAME	STD REF.#		
ICAL Standard	MP83500,MP83507,MP83505,MP83504,MP83503,MP83502,MP83501		
ICV Standard	MP83508		
CCV Standard	MP83511		
ICSA Standard	MP83509,MP83510		
CRI Standard			
LCS Standard			
Chk Standard	MP83513,MP83514		

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	S0	S0	CAL1	12/10/24 15:54		Kareem	OK
2	S1	S01	CAL2	12/10/24 15:58		Kareem	OK
3	S2	S02	CAL3	12/10/24 16:02		Kareem	OK
4	S3	S03	CAL4	12/10/24 16:06		Kareem	OK
5	S4	S04	CAL5	12/10/24 16:09		Kareem	OK
6	S5	S05	CAL6	12/10/24 16:13		Kareem	OK
7	S6	S06	CAL7	12/10/24 16:17		Kareem	OK
8	ICV014	ICV014	ICV	12/10/24 16:45	Inst. paused for Calibration review	Kareem	OK
9	ICB014	ICB014	ICB	12/10/24 16:51	Inst. paused for review	Kareem	OK
10	ICSA014	ICSA014	ICSA	12/10/24 17:21	Inst. paused for review	Kareem	OK
11	ICSAB014	ICSAB014	ICSAB	12/10/24 17:27		Kareem	OK
12	CCV089	CCV089	CCV	12/10/24 17:48	Inst. paused for review	Kareem	OK
13	CCB089	CCB089	CCB	12/10/24 17:52		Kareem	OK
14	PB165364BL	PBS364	MB	12/10/24 17:56		Kareem	OK
15	PB165351BL	PBS351	MB	12/10/24 18:04		Kareem	OK
16	PB165364BS	LCS364	LCS	12/10/24 18:09		Kareem	OK
17	PB165351BS	LCS351	LCS	12/10/24 18:13		Kareem	OK
18	PB165350BL	PBS350	MB	12/10/24 18:17		Kareem	OK

Instrument ID: P5

Daily Analysis Runlog For Sequence/QC Batch ID # LB133883

Review By	Sarabjit Jaswal	Review On	12/12/2024 8:19:04 AM
Supervise By	Kareem Khairalla	Supervise On	12/13/2024 7:24:03 PM

STD. NAME	STD REF.#
ICAL Standard	MP83500,MP83507,MP83505,MP83504,MP83503,MP83502,MP83501
ICV Standard	MP83508
CCV Standard	MP83511
ICSA Standard	MP83509,MP83510
CRI Standard	
LCS Standard	
Chk Standard	MP83513,MP83514

19	PB165350BS	LCS350	LCS	12/10/24 18:22		Kareem	OK
20	CCV090	CCV090	CCV	12/10/24 18:26		Kareem	OK
21	CCB090	CCB090	CCB	12/10/24 18:29		Kareem	OK
22	P5041-01	MBHK78	SAM	12/10/24 18:33		Kareem	OK
23	P5041-02	MBHK78D	DUP	12/10/24 18:37		Kareem	OK
24	P5041-01L	MBHK78L	SD	12/10/24 18:41		Kareem	OK
25	P5041-03	MBHK78S	MS	12/10/24 18:45	MS Fail For Se(Below RL)	Kareem	OK
26	P5042-01	MBHKB0	SAM	12/10/24 18:49	Not Use	Kareem	Not Ok
27	P5042-02	MBHKB0D	DUP	12/10/24 18:53	Not Use	Kareem	Not Ok
28	P5042-01L	MBHKB0L	SD	12/10/24 18:56	Not Use	Kareem	Not Ok
29	P5042-03	MBHKB0S	MS	12/10/24 19:00	Not Use	Kareem	Not Ok
30	P5043-01	MBHKM2	SAM	12/10/24 19:04		Kareem	OK
31	P5043-02	MBHKM2D	DUP	12/10/24 19:08		Kareem	OK
32	P5043-01L	MBHKM2L	SD	12/10/24 19:12		Kareem	OK
33	P5043-03	MBHKM2S	MS	12/10/24 19:16	MS Fail For Ag	Kareem	OK
34	P4977-03	ME29F8	SAM	12/10/24 19:20	Ca High	Kareem	Dilution
35	P4977-04	ME29F8D	DUP	12/10/24 19:23	Ca High	Kareem	Dilution
36	P4977-03L	ME29F8L	SD	12/10/24 19:27	Ca High	Kareem	Dilution
37	P4977-05	ME29F8S	MS	12/10/24 19:31		Kareem	OK
38	P4976-09	ME29E4D	DUP	12/10/24 19:35	Ca High	Kareem	Dilution

Instrument ID: P5

Daily Analysis Runlog For Sequence/QC Batch ID # LB133883

Review By	Sarabjit Jaswal	Review On	12/12/2024 8:19:04 AM
Supervise By	Kareem Khairalla	Supervise On	12/13/2024 7:24:03 PM

STD. NAME	STD REF.#
ICAL Standard	MP83500,MP83507,MP83505,MP83504,MP83503,MP83502,MP83501
ICV Standard	MP83508
CCV Standard	MP83511
ICSA Standard	MP83509,MP83510
CRI Standard	
LCS Standard	
Chk Standard	MP83513,MP83514

39	P4976-08L	ME29E4L	SD	12/10/24 19:39	Ca High	Kareem	Dilution
40	P4976-10	ME29E4S	MS	12/10/24 19:43		Kareem	OK
41	P5040-01	MBHKD6	SAM	12/10/24 19:47		Kareem	OK
42	CCV091	CCV091	CCV	12/10/24 19:51		Kareem	OK
43	CCB091	CCB091	CCB	12/10/24 19:54		Kareem	OK
44	P5040-02	MBHKD6D	DUP	12/10/24 19:58		Kareem	OK
45	P5040-01L	MBHKD6L	SD	12/10/24 20:02		Kareem	OK
46	P5040-03	MBHKD6S	MS	12/10/24 20:06	MS Fail For Se(Below RL)	Kareem	OK
47	P4977-01	ME29F6	SAM	12/10/24 20:10	Ca High	Kareem	Dilution
48	P4977-02	ME29F7	SAM	12/10/24 20:14	Ca High	Kareem	Dilution
49	P4977-06	ME29F9	SAM	12/10/24 20:18	Ca High	Kareem	Dilution
50	P4977-07	ME29G0	SAM	12/10/24 20:21	Ca High	Kareem	Dilution
51	P4977-08	ME29G1	SAM	12/10/24 20:25	Ca High	Kareem	Dilution
52	P4977-09	ME29G2	SAM	12/10/24 20:29	Ca High	Kareem	Dilution
53	P4976-01	ME29D7	SAM	12/10/24 20:33	Ca High	Kareem	Dilution
54	P4976-02	ME29D8	SAM	12/10/24 20:37	Ca High	Kareem	Dilution
55	P4976-03	ME29D9	SAM	12/10/24 20:41	Ca High	Kareem	Dilution
56	P4976-04	ME29E0	SAM	12/10/24 20:45		Kareem	OK
57	P4976-05	ME29E1	SAM	12/10/24 20:48	Ca High	Kareem	Dilution
58	P4976-06	ME29E2	SAM	12/10/24 20:52	Ca High	Kareem	Dilution

Instrument ID: P5

Daily Analysis Runlog For Sequence/QC Batch ID # LB133883

Review By	Sarabjit Jaswal	Review On	12/12/2024 8:19:04 AM
Supervise By	Kareem Khairalla	Supervise On	12/13/2024 7:24:03 PM

STD. NAME	STD REF.#
ICAL Standard	MP83500,MP83507,MP83505,MP83504,MP83503,MP83502,MP83501
ICV Standard	MP83508
CCV Standard	MP83511
ICSA Standard	MP83509,MP83510
CRI Standard	
LCS Standard	
Chk Standard	MP83513,MP83514

59	P4976-07	ME29E3	SAM	12/10/24 20:56	Ca High	Kareem	Dilution
60	P4976-08	ME29E4	SAM	12/10/24 21:00	Ca High	Kareem	Dilution
61	P4976-11	ME29E5	SAM	12/10/24 21:04	Ca High	Kareem	Dilution
62	P4976-12	ME29E6	SAM	12/10/24 21:08	Ca High	Kareem	Dilution
63	P4976-13	ME29E7	SAM	12/10/24 21:12	Ca High	Kareem	Dilution
64	CCV092	CCV092	CCV	12/10/24 21:29		Kareem	OK
65	CCB092	CCB092	CCB	12/10/24 21:52	Inst. paused for review	Kareem	OK
66	P4976-14	ME29E8	SAM	12/10/24 21:56	Ca High	Kareem	Dilution
67	P4976-15	ME29E9	SAM	12/10/24 22:00	Ca High	Kareem	Dilution
68	P4976-16	ME29F0	SAM	12/10/24 22:04	Ca High	Kareem	Dilution
69	P4976-17	ME29F1	SAM	12/10/24 22:08	Ca High	Kareem	Dilution
70	P4976-18	ME29F2	SAM	12/10/24 22:12	Ca High	Kareem	Dilution
71	P4976-19	ME29F3	SAM	12/10/24 22:16	Ca High	Kareem	Dilution
72	P4976-20	ME29F4	SAM	12/10/24 22:20	Ca High	Kareem	Dilution
73	P4976-21	ME29F5	SAM	12/10/24 22:23	Ca High	Kareem	Dilution
74	P4880-14	MBHH91	SAM	12/10/24 22:27		Kareem	OK
75	P4880-15	MBHH91D	DUP	12/10/24 22:31		Kareem	OK
76	P4880-14L	MBHH91L	SD	12/10/24 22:35		Kareem	OK
77	P4880-16	MBHH91S	MS	12/10/24 22:39	MS Fail For Ag,Se(Below RL)	Kareem	OK

Instrument ID: P5

Daily Analysis Runlog For Sequence/QC Batch ID # LB133883

Review By	Sarabjit Jaswal	Review On	12/12/2024 8:19:04 AM
Supervise By	Kareem Khairalla	Supervise On	12/13/2024 7:24:03 PM
STD. NAME	STD REF.#		
ICAL Standard	MP83500,MP83507,MP83505,MP83504,MP83503,MP83502,MP83501		
ICV Standard	MP83508		
CCV Standard	MP83511		
ICSA Standard	MP83509,MP83510		
CRI Standard			
LCS Standard			
Chk Standard	MP83513,MP83514		

78	P4880-12DL	MBHH89	SAM	12/10/24 22:43	2X For Ca	Kareem	Confirms
79	P4905-02	MBHHA6	SAM	12/10/24 22:46		Kareem	OK
80	P4905-03	MBHHA6D	DUP	12/10/24 22:50		Kareem	OK
81	P4905-02L	MBHHA6L	SD	12/10/24 22:54		Kareem	OK
82	P4905-04	MBHHA6S	MS	12/10/24 22:58	MS Fail For Sb,As(115.87ppb),Ba(2331 .33ppb),Cu(457.90),Se(Bel ow RL),Ag,Zn(2281.14ppb)	Kareem	OK
83	CCV093	CCV093	CCV	12/10/24 23:02		Kareem	OK
84	CCB093	CCB093	CCB	12/10/24 23:05		Kareem	OK
85	P4907-01A	MBHHE1A	PS	12/10/24 23:09	Not Use	Kareem	Not Ok
86	P4912-04A	MBHHJ4A	PS	12/10/24 23:13	PS For Cu(0.012ml m5751,Se-0.07ml mp83617,Zn-0.068ml m5819	Kareem	OK
87	P4912-14	MBHHK2	SAM	12/10/24 23:17		Kareem	OK
88	P4912-15	MBHHK3	SAM	12/10/24 23:21		Kareem	OK
89	P4912-16	MBHHL8	SAM	12/10/24 23:24		Kareem	OK
90	P4912-17	MBHHL9	SAM	12/10/24 23:28		Kareem	OK
91	P4912-18	MBHHM0	SAM	12/10/24 23:32		Kareem	OK
92	P4912-19	MBHHM1	SAM	12/10/24 23:36		Kareem	OK
93	P4912-20	MBHHM2	SAM	12/10/24 23:40		Kareem	OK
94	P4912-21	MBHHM3	SAM	12/10/24 23:43		Kareem	OK

Instrument ID: P5

Daily Analysis Runlog For Sequence/QC Batch ID # LB133883

Review By	Sarabjit Jaswal	Review On	12/12/2024 8:19:04 AM
Supervise By	Kareem Khairalla	Supervise On	12/13/2024 7:24:03 PM

STD. NAME	STD REF.#
ICAL Standard	MP83500,MP83507,MP83505,MP83504,MP83503,MP83502,MP83501
ICV Standard	MP83508
CCV Standard	MP83511
ICSA Standard	MP83509,MP83510
CRI Standard	
LCS Standard	
Chk Standard	MP83513,MP83514

95	P4912-22	MBHBM4	SAM	12/10/24 23:47		Kareem	OK
96	P4914-11A	MBHHK4A	PS	12/10/24 23:51	PS For Cu(0.01ML M5751-10ML SAMPLE)	Kareem	OK
97	P4915-08A	MBHBM8A	PS	12/10/24 23:55	PS For Se - 0.07ml mp83567-10ml sample	Kareem	OK
98	P4915-01	MBHHL4	SAM	12/10/24 23:58		Kareem	OK
99	P4915-02	MBHHL5	SAM	12/11/24 00:02		Kareem	OK
100	P4915-03	MBHHL6	SAM	12/11/24 00:06		Kareem	OK
101	P4915-04	MBHHL7	SAM	12/11/24 00:10		Kareem	OK
102	P4915-05	MBHBM5	SAM	12/11/24 00:14		Kareem	OK
103	P4915-06	MBHBM6	SAM	12/11/24 00:18	Not Use	Kareem	Not Ok
104	P4932-02	MBHHQ2	SAM	12/11/24 00:22	Not Use	Kareem	Not Ok
105	CCV094	CCV094	CCV	12/11/24 00:25		Kareem	OK
106	CCB094	CCB094	CCB	12/11/24 00:29		Kareem	OK
107	P4932-01	MBHHQ1	SAM	12/11/24 00:33	Not Use	Kareem	Not Ok
108	P4932-05	MBHHQ3	SAM	12/11/24 00:37	Not Use	Kareem	Not Ok
109	P4932-06	MBHHQ4	SAM	12/11/24 00:41	Not Use	Kareem	Not Ok
110	P4932-07	MBHHQ5	SAM	12/11/24 00:44	Not Use	Kareem	Not Ok
111	P4932-08	MBHHQ6	SAM	12/11/24 00:48	Not Use	Kareem	Not Ok
112	P4932-09	MBHHQ7	SAM	12/11/24 00:52	Not Use	Kareem	Not Ok
113	P4932-10	MBHHQ8	SAM	12/11/24 00:56	Not Use	Kareem	Not Ok

Instrument ID: P5

Daily Analysis Runlog For Sequence/QC Batch ID # LB133883

Review By	Sarabjit Jaswal	Review On	12/12/2024 8:19:04 AM
Supervise By	Kareem Khairalla	Supervise On	12/13/2024 7:24:03 PM

STD. NAME	STD REF.#
ICAL Standard	MP83500,MP83507,MP83505,MP83504,MP83503,MP83502,MP83501
ICV Standard	MP83508
CCV Standard	MP83511
ICSA Standard	MP83509,MP83510
CRI Standard	
LCS Standard	
Chk Standard	MP83513,MP83514

114	P4932-11	MBHHQ9	SAM	12/11/24 00:59	Not Use	Kareem	Not Ok
115	P4932-12	MBHHP1	SAM	12/11/24 01:03	Not Use	Kareem	Not Ok
116	P4932-13	MBHHP2	SAM	12/11/24 01:07	Not Use	Kareem	Not Ok
117	P4932-14	MBHHP3	SAM	12/11/24 01:11	Not Use	Kareem	Not Ok
118	P4932-15	MBHHP4	SAM	12/11/24 01:15	Not Use	Kareem	Not Ok
119	P4932-16	MBHHP5	SAM	12/11/24 01:18	Not Use	Kareem	Not Ok
120	P4932-17	MBHHP6	SAM	12/11/24 01:22	Not Use	Kareem	Not Ok
121	P4932-18	MBHHP7	SAM	12/11/24 01:26	Not Use	Kareem	Not Ok
122	P4932-19	MBHHP8	SAM	12/11/24 01:30	Not Use	Kareem	Not Ok
123	P4932-20	MBHHP9	SAM	12/11/24 01:34	Not Use	Kareem	Not Ok
124	P4932-21	MBHHQ0	SAM	12/11/24 01:37	Not Use	Kareem	Not Ok
125	P4932-22	MBHHR0	SAM	12/11/24 01:41	Not Use	Kareem	Not Ok
126	P4933-05DL	MBHHR5	SAM	12/11/24 01:45	5X For Mn	Kareem	Confirms
127	CCV095	CCV095	CCV	12/11/24 01:49		Kareem	OK
128	CCB095	CCB095	CCB	12/11/24 01:52		Kareem	OK
129	P4933-18	MBHHX2	SAM	12/11/24 01:56		Kareem	OK
130	P4933-19	MBHHX3	SAM	12/11/24 02:00		Kareem	OK
131	P4933-20	MBHHX4	SAM	12/11/24 02:04		Kareem	OK
132	P4933-21	MBHHX4D	DUP	12/11/24 02:08		Kareem	OK
133	P4933-20L	MBHHX4L	SD	12/11/24 02:12		Kareem	OK

Instrument ID: P5

Daily Analysis Runlog For Sequence/QC Batch ID # LB133883

Review By	Sarabjit Jaswal	Review On	12/12/2024 8:19:04 AM
Supervise By	Kareem Khairalla	Supervise On	12/13/2024 7:24:03 PM

STD. NAME	STD REF.#
ICAL Standard	MP83500,MP83507,MP83505,MP83504,MP83503,MP83502,MP83501
ICV Standard	MP83508
CCV Standard	MP83511
ICSA Standard	MP83509,MP83510
CRI Standard	
LCS Standard	
Chk Standard	MP83513,MP83514

134	P4933-22	MBHHX4S	MS	12/11/24 02:15	MS Fail for Se(Below RL),Zn(1944.24ppb)	Kareem	OK
135	P4939-10A	MBHHW8A	PS	12/11/24 02:19	PS For Se 0.07ml mp83617	Kareem	OK
136	P4939-22DL	MBHHZ2	SAM	12/11/24 02:23	2X For Cu	Kareem	Confirms
137	P5007-15DL	MBHK00	SAM	12/11/24 02:27	2X For Ca	Kareem	Confirms
138	P5007-10A	MBHJZ7A	PS	12/11/24 02:31	PS For As 0.01ml mp83618	Kareem	OK
139	P5014-12A	MBHJY0A	PS	12/11/24 02:34	PS For As-0.015ml mp83618, Se-0.07ml mp83617	Kareem	OK
140	P5015-17A	MBHKQ6A	PS	12/11/24 02:38	PS For As,Se,Tl,Zn	Kareem	OK
141	P5015-05DL	MBHKK0	SAM	12/11/24 02:42	2X For Pb	Kareem	Confirms
142	P5015-08DL	MBHKK3	SAM	12/11/24 02:46	2X For Ca	Kareem	Confirms
143	P5015-09DL	MBHKK4	SAM	12/11/24 02:50	2X For Ca	Kareem	Confirms
144	P5015-14DL	MBHKQ2	SAM	12/11/24 02:54	2X For Ca	Kareem	Confirms
145	CCV096	CCV096	CCV	12/11/24 02:57		Kareem	OK
146	CCB096	CCB096	CCB	12/11/24 03:01		Kareem	OK