

DATA REPORTING QUALIFIERS- INORGANIC

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

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

LAB CHRONICLE

OrderID:	Q3741	OrderDate:	11/26/2025 4:57:55 PM
Client:	Core Environmental Consultants and Services, Inc.	Project:	Brooklyn Navy Yard Building 50 SI
Contact:	Roland Scardino	Location:	--Select--,VOA Lab

LabID	ClientID	Matrix	Test	Method	Sample Date	Prep Date	Anal Date	Received
Q3741-01	B50-SP3-111925	SOIL			11/19/25			11/26/25
			Mercury	7471B		12/05/25	12/09/25	
			Metals ICP-TAL	6010D		12/02/25	12/02/25	
Q3741-02	B50-SP13-112025	SOIL			11/20/25			11/26/25
			Mercury	7471B		12/05/25	12/09/25	
			Metals ICP-TAL	6010D		12/02/25	12/02/25	
Q3741-03	B50-SP14-112025	SOIL			11/20/25			11/26/25
			Mercury	7471B		12/05/25	12/09/25	
			Metals ICP-TAL	6010D		12/02/25	12/02/25	
Q3741-04	B50-SP9-112425	SOIL			11/24/25			11/26/25
			Mercury	7471B		12/05/25	12/09/25	
			Metals ICP-TAL	6010D		12/02/25	12/02/25	
Q3741-05	B50-SP11-112525	SOIL			11/25/25			11/26/25
			Mercury	7471B		12/05/25	12/05/25	
			Metals ICP-TAL	6010D		12/02/25	12/02/25	
Q3741-06	B50-SP4-112525	SOIL			11/25/25			11/26/25
			Mercury	7471B		12/05/25	12/09/25	
			Metals ICP-TAL	6010D		12/02/25	12/02/25	

Hit Summary Sheet
SW-846

SDG No.: Q3741

Order ID: Q3741

Client: Core Environmental Consultants and Services, Inc.

Project ID: Brooklyn Navy Yard Building 50 SI

Sample ID	Client ID	Matrix	Parameter	Concentration	C	MDL	RDL	Units
Client ID : B50-SP3-111925								
Q3741-01	B50-SP3-111925	SOIL	Aluminum	5730		0.80	4.79	mg/Kg
Q3741-01	B50-SP3-111925	SOIL	Arsenic	12.4		0.18	0.96	mg/Kg
Q3741-01	B50-SP3-111925	SOIL	Barium	129		0.70	4.79	mg/Kg
Q3741-01	B50-SP3-111925	SOIL	Beryllium	0.56		0.024	0.29	mg/Kg
Q3741-01	B50-SP3-111925	SOIL	Cadmium	0.83		0.023	0.29	mg/Kg
Q3741-01	B50-SP3-111925	SOIL	Calcium	8260		10.6	95.8	mg/Kg
Q3741-01	B50-SP3-111925	SOIL	Chromium	9.34		0.045	0.48	mg/Kg
Q3741-01	B50-SP3-111925	SOIL	Cobalt	7.22		0.096	1.44	mg/Kg
Q3741-01	B50-SP3-111925	SOIL	Copper	108		0.21	0.96	mg/Kg
Q3741-01	B50-SP3-111925	SOIL	Iron	13500		3.82	4.79	mg/Kg
Q3741-01	B50-SP3-111925	SOIL	Lead	286		0.12	0.57	mg/Kg
Q3741-01	B50-SP3-111925	SOIL	Magnesium	2430		11.5	95.8	mg/Kg
Q3741-01	B50-SP3-111925	SOIL	Manganese	218		0.13	0.96	mg/Kg
Q3741-01	B50-SP3-111925	SOIL	Mercury	0.49	D	0.014	0.026	mg/Kg
Q3741-01	B50-SP3-111925	SOIL	Nickel	22.8		0.12	1.92	mg/Kg
Q3741-01	B50-SP3-111925	SOIL	Potassium	1400		26.5	95.8	mg/Kg
Q3741-01	B50-SP3-111925	SOIL	Silver	0.98		0.12	0.48	mg/Kg
Q3741-01	B50-SP3-111925	SOIL	Sodium	1130		17.0	95.8	mg/Kg
Q3741-01	B50-SP3-111925	SOIL	Vanadium	18.4		0.24	1.92	mg/Kg
Q3741-01	B50-SP3-111925	SOIL	Zinc	184		0.22	1.92	mg/Kg
Client ID : B50-SP13-112025								
Q3741-02	B50-SP13-112025	SOIL	Aluminum	5850		0.86	5.14	mg/Kg
Q3741-02	B50-SP13-112025	SOIL	Arsenic	28.4		0.20	1.03	mg/Kg
Q3741-02	B50-SP13-112025	SOIL	Barium	181		0.75	5.14	mg/Kg
Q3741-02	B50-SP13-112025	SOIL	Beryllium	0.65		0.026	0.31	mg/Kg
Q3741-02	B50-SP13-112025	SOIL	Cadmium	0.96		0.025	0.31	mg/Kg
Q3741-02	B50-SP13-112025	SOIL	Calcium	9310		11.4	103	mg/Kg
Q3741-02	B50-SP13-112025	SOIL	Chromium	10.2		0.048	0.51	mg/Kg
Q3741-02	B50-SP13-112025	SOIL	Cobalt	8.80		0.10	1.54	mg/Kg
Q3741-02	B50-SP13-112025	SOIL	Copper	146		0.23	1.03	mg/Kg
Q3741-02	B50-SP13-112025	SOIL	Iron	17200		4.10	5.14	mg/Kg
Q3741-02	B50-SP13-112025	SOIL	Lead	674		0.13	0.62	mg/Kg
Q3741-02	B50-SP13-112025	SOIL	Magnesium	2360		12.3	103	mg/Kg
Q3741-02	B50-SP13-112025	SOIL	Manganese	270		0.14	1.03	mg/Kg
Q3741-02	B50-SP13-112025	SOIL	Mercury	1.08	D	0.041	0.074	mg/Kg
Q3741-02	B50-SP13-112025	SOIL	Nickel	27.6		0.13	2.06	mg/Kg
Q3741-02	B50-SP13-112025	SOIL	Potassium	1780		28.5	103	mg/Kg

Hit Summary Sheet
SW-846

SDG No.: Q3741

Order ID: Q3741

Client: Core Environmental Consultants and Services, Inc.

Project ID: Brooklyn Navy Yard Building 50 SI

Sample ID	Client ID	Matrix	Parameter	Concentration	C	MDL	RDL	Units
Q3741-02	B50-SP13-112025	SOIL	Silver	1.35		0.12	0.51	mg/Kg
Q3741-02	B50-SP13-112025	SOIL	Sodium	1360		18.3	103	mg/Kg
Q3741-02	B50-SP13-112025	SOIL	Vanadium	20.1		0.26	2.06	mg/Kg
Q3741-02	B50-SP13-112025	SOIL	Zinc	207		0.24	2.06	mg/Kg
Client ID : B50-SP14-112025								
Q3741-03	B50-SP14-112025	SOIL	Aluminum	6160		0.91	5.43	mg/Kg
Q3741-03	B50-SP14-112025	SOIL	Arsenic	29.4		0.21	1.09	mg/Kg
Q3741-03	B50-SP14-112025	SOIL	Barium	134		0.79	5.43	mg/Kg
Q3741-03	B50-SP14-112025	SOIL	Beryllium	0.79		0.027	0.33	mg/Kg
Q3741-03	B50-SP14-112025	SOIL	Cadmium	1.23		0.026	0.33	mg/Kg
Q3741-03	B50-SP14-112025	SOIL	Calcium	17300		12.1	109	mg/Kg
Q3741-03	B50-SP14-112025	SOIL	Chromium	9.00		0.051	0.54	mg/Kg
Q3741-03	B50-SP14-112025	SOIL	Cobalt	9.42		0.11	1.63	mg/Kg
Q3741-03	B50-SP14-112025	SOIL	Copper	167		0.24	1.09	mg/Kg
Q3741-03	B50-SP14-112025	SOIL	Iron	20100		4.33	5.43	mg/Kg
Q3741-03	B50-SP14-112025	SOIL	Lead	676		0.14	0.65	mg/Kg
Q3741-03	B50-SP14-112025	SOIL	Magnesium	2610		13.0	109	mg/Kg
Q3741-03	B50-SP14-112025	SOIL	Manganese	222		0.15	1.09	mg/Kg
Q3741-03	B50-SP14-112025	SOIL	Mercury	1.62	D	0.039	0.070	mg/Kg
Q3741-03	B50-SP14-112025	SOIL	Nickel	24.9		0.14	2.17	mg/Kg
Q3741-03	B50-SP14-112025	SOIL	Potassium	2030		30.1	109	mg/Kg
Q3741-03	B50-SP14-112025	SOIL	Silver	1.54		0.13	0.54	mg/Kg
Q3741-03	B50-SP14-112025	SOIL	Sodium	2560		19.3	109	mg/Kg
Q3741-03	B50-SP14-112025	SOIL	Vanadium	21.0		0.27	2.17	mg/Kg
Q3741-03	B50-SP14-112025	SOIL	Zinc	245		0.25	2.17	mg/Kg
Client ID : B50-SP9-112425								
Q3741-04	B50-SP9-112425	SOIL	Aluminum	4980		0.87	5.19	mg/Kg
Q3741-04	B50-SP9-112425	SOIL	Arsenic	18.1		0.20	1.04	mg/Kg
Q3741-04	B50-SP9-112425	SOIL	Barium	164		0.76	5.19	mg/Kg
Q3741-04	B50-SP9-112425	SOIL	Beryllium	0.68		0.026	0.31	mg/Kg
Q3741-04	B50-SP9-112425	SOIL	Cadmium	1.07		0.025	0.31	mg/Kg
Q3741-04	B50-SP9-112425	SOIL	Calcium	12400		11.5	104	mg/Kg
Q3741-04	B50-SP9-112425	SOIL	Chromium	7.29		0.049	0.52	mg/Kg
Q3741-04	B50-SP9-112425	SOIL	Cobalt	7.58		0.10	1.56	mg/Kg
Q3741-04	B50-SP9-112425	SOIL	Copper	290		0.23	1.04	mg/Kg
Q3741-04	B50-SP9-112425	SOIL	Iron	18300		4.14	5.19	mg/Kg
Q3741-04	B50-SP9-112425	SOIL	Lead	301		0.14	0.62	mg/Kg
Q3741-04	B50-SP9-112425	SOIL	Magnesium	2500		12.5	104	mg/Kg
Q3741-04	B50-SP9-112425	SOIL	Manganese	218		0.14	1.04	mg/Kg

Hit Summary Sheet
SW-846

SDG No.: Q3741

Order ID: Q3741

Client: Core Environmental Consultants and Services, Inc.

Project ID: Brooklyn Navy Yard Building 50 SI

Sample ID	Client ID	Matrix	Parameter	Concentration	C	MDL	RDL	Units
Q3741-04	B50-SP9-112425	SOIL	Mercury	2.01	D	0.039	0.070	mg/Kg
Q3741-04	B50-SP9-112425	SOIL	Nickel	20.8		0.14	2.08	mg/Kg
Q3741-04	B50-SP9-112425	SOIL	Potassium	1720		28.8	104	mg/Kg
Q3741-04	B50-SP9-112425	SOIL	Silver	1.26		0.13	0.52	mg/Kg
Q3741-04	B50-SP9-112425	SOIL	Sodium	1590		18.5	104	mg/Kg
Q3741-04	B50-SP9-112425	SOIL	Vanadium	15.7		0.26	2.08	mg/Kg
Q3741-04	B50-SP9-112425	SOIL	Zinc	256		0.24	2.08	mg/Kg
Client ID : B50-SP11-112525								
Q3741-05	B50-SP11-112525	SOIL	Aluminum	4200		0.96	5.71	mg/Kg
Q3741-05	B50-SP11-112525	SOIL	Arsenic	20.4		0.22	1.14	mg/Kg
Q3741-05	B50-SP11-112525	SOIL	Barium	53.2		0.83	5.71	mg/Kg
Q3741-05	B50-SP11-112525	SOIL	Beryllium	0.78		0.029	0.34	mg/Kg
Q3741-05	B50-SP11-112525	SOIL	Cadmium	3.96		0.027	0.34	mg/Kg
Q3741-05	B50-SP11-112525	SOIL	Calcium	31500		12.7	114	mg/Kg
Q3741-05	B50-SP11-112525	SOIL	Chromium	15.9		0.054	0.57	mg/Kg
Q3741-05	B50-SP11-112525	SOIL	Cobalt	5.41		0.11	1.71	mg/Kg
Q3741-05	B50-SP11-112525	SOIL	Copper	44.3		0.25	1.14	mg/Kg
Q3741-05	B50-SP11-112525	SOIL	Iron	25800		4.56	5.71	mg/Kg
Q3741-05	B50-SP11-112525	SOIL	Lead	119		0.15	0.69	mg/Kg
Q3741-05	B50-SP11-112525	SOIL	Magnesium	1650		13.7	114	mg/Kg
Q3741-05	B50-SP11-112525	SOIL	Manganese	162		0.16	1.14	mg/Kg
Q3741-05	B50-SP11-112525	SOIL	Mercury	0.16		0.0080	0.015	mg/Kg
Q3741-05	B50-SP11-112525	SOIL	Nickel	11.6		0.15	2.28	mg/Kg
Q3741-05	B50-SP11-112525	SOIL	Potassium	1100		31.6	114	mg/Kg
Q3741-05	B50-SP11-112525	SOIL	Silver	1.43		0.14	0.57	mg/Kg
Q3741-05	B50-SP11-112525	SOIL	Sodium	1450		20.3	114	mg/Kg
Q3741-05	B50-SP11-112525	SOIL	Vanadium	14.2		0.29	2.28	mg/Kg
Q3741-05	B50-SP11-112525	SOIL	Zinc	125		0.26	2.28	mg/Kg
Client ID : B50-SP4-112525								
Q3741-06	B50-SP4-112525	SOIL	Aluminum	5990		0.81	4.81	mg/Kg
Q3741-06	B50-SP4-112525	SOIL	Arsenic	8.81		0.18	0.96	mg/Kg
Q3741-06	B50-SP4-112525	SOIL	Barium	97.3		0.70	4.81	mg/Kg
Q3741-06	B50-SP4-112525	SOIL	Beryllium	0.55		0.024	0.29	mg/Kg
Q3741-06	B50-SP4-112525	SOIL	Cadmium	0.78		0.023	0.29	mg/Kg
Q3741-06	B50-SP4-112525	SOIL	Calcium	10700		10.7	96.2	mg/Kg
Q3741-06	B50-SP4-112525	SOIL	Chromium	11.7		0.045	0.48	mg/Kg
Q3741-06	B50-SP4-112525	SOIL	Cobalt	7.04		0.096	1.44	mg/Kg
Q3741-06	B50-SP4-112525	SOIL	Copper	88.8		0.21	0.96	mg/Kg
Q3741-06	B50-SP4-112525	SOIL	Iron	13600		3.84	4.81	mg/Kg

Hit Summary Sheet
SW-846

SDG No.: Q3741

Order ID: Q3741

Client: Core Environmental Consultants and Services, Inc.

Project ID: Brooklyn Navy Yard Building 50 SI

Sample ID	Client ID	Matrix	Parameter	Concentration	C	MDL	RDL	Units
Q3741-06	B50-SP4-112525	SOIL	Lead	315		0.13	0.58	mg/Kg
Q3741-06	B50-SP4-112525	SOIL	Magnesium	2510		11.5	96.2	mg/Kg
Q3741-06	B50-SP4-112525	SOIL	Manganese	215		0.14	0.96	mg/Kg
Q3741-06	B50-SP4-112525	SOIL	Mercury	2.97	D	0.043	0.077	mg/Kg
Q3741-06	B50-SP4-112525	SOIL	Nickel	20.5		0.13	1.92	mg/Kg
Q3741-06	B50-SP4-112525	SOIL	Potassium	1330		26.7	96.2	mg/Kg
Q3741-06	B50-SP4-112525	SOIL	Silver	1.02		0.12	0.48	mg/Kg
Q3741-06	B50-SP4-112525	SOIL	Sodium	513		17.1	96.2	mg/Kg
Q3741-06	B50-SP4-112525	SOIL	Thallium	0.31	J	0.22	1.92	mg/Kg
Q3741-06	B50-SP4-112525	SOIL	Vanadium	18.7		0.24	1.92	mg/Kg
Q3741-06	B50-SP4-112525	SOIL	Zinc	209		0.22	1.92	mg/Kg



SAMPLE DATA

Report of Analysis

Client: Core Environmental Consultants and Services, Inc.
Project: Brooklyn Navy Yard Building 50 SI
Client Sample ID: B50-SP3-111925
Lab Sample ID: Q3741-01
Level (low/med): low

Date Collected: 11/19/25
Date Received: 11/26/25
SDG No.: Q3741
Matrix: SOIL
% Solid: 91.6

Cas	Parameter	Conc.	Qua.	DF	MDL	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.	Prep Met.
7429-90-5	Aluminum	5730	*	1	0.80	4.79	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7440-36-0	Antimony	0.21	UN	1	0.21	2.39	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7440-38-2	Arsenic	12.4		1	0.18	0.96	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7440-39-3	Barium	129	N*	1	0.70	4.79	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7440-41-7	Beryllium	0.56		1	0.024	0.29	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7440-43-9	Cadmium	0.83		1	0.023	0.29	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7440-70-2	Calcium	8260	*	1	10.6	95.8	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7440-47-3	Chromium	9.34		1	0.045	0.48	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7440-48-4	Cobalt	7.22		1	0.096	1.44	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7440-50-8	Copper	108	N	1	0.21	0.96	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7439-89-6	Iron	13500	*	1	3.82	4.79	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7439-92-1	Lead	286	N*	1	0.12	0.57	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7439-95-4	Magnesium	2430		1	11.5	95.8	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7439-96-5	Manganese	218		1	0.13	0.96	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7439-97-6	Mercury	0.49	DN	2	0.014	0.026	mg/Kg	12/05/25 08:35	12/09/25 12:45	7471B	M7471B
7440-02-0	Nickel	22.8		1	0.12	1.92	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7440-09-7	Potassium	1400		1	26.5	95.8	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7782-49-2	Selenium	0.25	U	1	0.25	0.96	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7440-22-4	Silver	0.98		1	0.12	0.48	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7440-23-5	Sodium	1130	N	1	17.0	95.8	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7440-28-0	Thallium	0.22	U	1	0.22	1.92	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7440-62-2	Vanadium	18.4	N	1	0.24	1.92	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050
7440-66-6	Zinc	184	*	1	0.22	1.92	mg/Kg	12/02/25 09:30	12/02/25 14:03	6010D	SW3050

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

D = Dilution

Q = indicates LCS control criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

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

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

OR = Over Range

N = Spiked sample recovery not within control limits

Report of Analysis

Client: Core Environmental Consultants and Services, Inc.
Project: Brooklyn Navy Yard Building 50 SI
Client Sample ID: B50-SP13-112025
Lab Sample ID: Q3741-02
Level (low/med): low

Date Collected: 11/20/25
Date Received: 11/26/25
SDG No.: Q3741
Matrix: SOIL
% Solid: 86.4

Cas	Parameter	Conc.	Qua.	DF	MDL	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.	Prep Met.
7429-90-5	Aluminum	5850	*	1	0.86	5.14	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7440-36-0	Antimony	0.23	UN	1	0.23	2.57	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7440-38-2	Arsenic	28.4		1	0.20	1.03	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7440-39-3	Barium	181	N*	1	0.75	5.14	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7440-41-7	Beryllium	0.65		1	0.026	0.31	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7440-43-9	Cadmium	0.96		1	0.025	0.31	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7440-70-2	Calcium	9310	*	1	11.4	103	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7440-47-3	Chromium	10.2		1	0.048	0.51	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7440-48-4	Cobalt	8.80		1	0.10	1.54	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7440-50-8	Copper	146	N	1	0.23	1.03	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7439-89-6	Iron	17200	*	1	4.10	5.14	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7439-92-1	Lead	674	N*	1	0.13	0.62	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7439-95-4	Magnesium	2360		1	12.3	103	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7439-96-5	Manganese	270		1	0.14	1.03	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7439-97-6	Mercury	1.08	DN	5	0.041	0.074	mg/Kg	12/05/25 08:35	12/09/25 13:06	7471B	M7471B
7440-02-0	Nickel	27.6		1	0.13	2.06	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7440-09-7	Potassium	1780		1	28.5	103	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7782-49-2	Selenium	0.27	U	1	0.27	1.03	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7440-22-4	Silver	1.35		1	0.12	0.51	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7440-23-5	Sodium	1360	N	1	18.3	103	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7440-28-0	Thallium	0.24	U	1	0.24	2.06	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7440-62-2	Vanadium	20.1	N	1	0.26	2.06	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050
7440-66-6	Zinc	207	*	1	0.24	2.06	mg/Kg	12/02/25 09:30	12/02/25 14:07	6010D	SW3050

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

D = Dilution

Q = indicates LCS control criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

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

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

OR = Over Range

N = Spiked sample recovery not within control limits

Report of Analysis

Client: Core Environmental Consultants and Services, Inc.
Project: Brooklyn Navy Yard Building 50 SI
Client Sample ID: B50-SP14-112025
Lab Sample ID: Q3741-03
Level (low/med): low

Date Collected: 11/20/25
Date Received: 11/26/25
SDG No.: Q3741
Matrix: SOIL
% Solid: 87.3

Cas	Parameter	Conc.	Qua.	DF	MDL	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.	Prep Met.
7429-90-5	Aluminum	6160	*	1	0.91	5.43	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7440-36-0	Antimony	0.24	UN	1	0.24	2.71	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7440-38-2	Arsenic	29.4		1	0.21	1.09	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7440-39-3	Barium	134	N*	1	0.79	5.43	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7440-41-7	Beryllium	0.79		1	0.027	0.33	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7440-43-9	Cadmium	1.23		1	0.026	0.33	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7440-70-2	Calcium	17300	*	1	12.1	109	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7440-47-3	Chromium	9.00		1	0.051	0.54	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7440-48-4	Cobalt	9.42		1	0.11	1.63	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7440-50-8	Copper	167	N	1	0.24	1.09	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7439-89-6	Iron	20100	*	1	4.33	5.43	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7439-92-1	Lead	676	N*	1	0.14	0.65	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7439-95-4	Magnesium	2610		1	13.0	109	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7439-96-5	Manganese	222		1	0.15	1.09	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7439-97-6	Mercury	1.62	DN	5	0.039	0.070	mg/Kg	12/05/25 08:35	12/09/25 13:08	7471B	M7471B
7440-02-0	Nickel	24.9		1	0.14	2.17	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7440-09-7	Potassium	2030		1	30.1	109	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7782-49-2	Selenium	0.28	U	1	0.28	1.09	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7440-22-4	Silver	1.54		1	0.13	0.54	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7440-23-5	Sodium	2560	N	1	19.3	109	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7440-28-0	Thallium	0.25	U	1	0.25	2.17	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7440-62-2	Vanadium	21.0	N	1	0.27	2.17	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050
7440-66-6	Zinc	245	*	1	0.25	2.17	mg/Kg	12/02/25 09:30	12/02/25 14:24	6010D	SW3050

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MDL = Method Detection Limit

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Q = indicates LCS control criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

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

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

OR = Over Range

N = Spiked sample recovery not within control limits

Report of Analysis

Client: Core Environmental Consultants and Services, Inc.
Project: Brooklyn Navy Yard Building 50 SI
Client Sample ID: B50-SP9-112425
Lab Sample ID: Q3741-04
Level (low/med): low

Date Collected: 11/24/25
Date Received: 11/26/25
SDG No.: Q3741
Matrix: SOIL
% Solid: 85.2

Cas	Parameter	Conc.	Qua.	DF	MDL	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.	Prep Met.
7429-90-5	Aluminum	4980	*	1	0.87	5.19	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7440-36-0	Antimony	0.23	UN	1	0.23	2.60	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7440-38-2	Arsenic	18.1		1	0.20	1.04	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7440-39-3	Barium	164	N*	1	0.76	5.19	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7440-41-7	Beryllium	0.68		1	0.026	0.31	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7440-43-9	Cadmium	1.07		1	0.025	0.31	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7440-70-2	Calcium	12400	*	1	11.5	104	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7440-47-3	Chromium	7.29		1	0.049	0.52	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7440-48-4	Cobalt	7.58		1	0.10	1.56	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7440-50-8	Copper	290	N	1	0.23	1.04	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7439-89-6	Iron	18300	*	1	4.14	5.19	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7439-92-1	Lead	301	N*	1	0.14	0.62	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7439-95-4	Magnesium	2500		1	12.5	104	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7439-96-5	Manganese	218		1	0.14	1.04	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7439-97-6	Mercury	2.01	DN	5	0.039	0.070	mg/Kg	12/05/25 08:35	12/09/25 13:10	7471B	M7471B
7440-02-0	Nickel	20.8		1	0.14	2.08	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7440-09-7	Potassium	1720		1	28.8	104	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7782-49-2	Selenium	0.27	U	1	0.27	1.04	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7440-22-4	Silver	1.26		1	0.13	0.52	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7440-23-5	Sodium	1590	N	1	18.5	104	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7440-28-0	Thallium	0.24	U	1	0.24	2.08	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7440-62-2	Vanadium	15.7	N	1	0.26	2.08	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050
7440-66-6	Zinc	256	*	1	0.24	2.08	mg/Kg	12/02/25 09:30	12/02/25 14:28	6010D	SW3050

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Q = indicates LCS control criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

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

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

OR = Over Range

N = Spiked sample recovery not within control limits

Report of Analysis

Client: Core Environmental Consultants and Services, Inc.
Project: Brooklyn Navy Yard Building 50 SI
Client Sample ID: B50-SP11-112525
Lab Sample ID: Q3741-05
Level (low/med): low

Date Collected: 11/25/25
Date Received: 11/26/25
SDG No.: Q3741
Matrix: SOIL
% Solid: 84.6

Cas	Parameter	Conc.	Qua.	DF	MDL	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.	Prep Met.
7429-90-5	Aluminum	4200	*	1	0.96	5.71	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7440-36-0	Antimony	0.25	UN	1	0.25	2.86	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7440-38-2	Arsenic	20.4		1	0.22	1.14	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7440-39-3	Barium	53.2	N*	1	0.83	5.71	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7440-41-7	Beryllium	0.78		1	0.029	0.34	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7440-43-9	Cadmium	3.96		1	0.027	0.34	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7440-70-2	Calcium	31500	*	1	12.7	114	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7440-47-3	Chromium	15.9		1	0.054	0.57	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7440-48-4	Cobalt	5.41		1	0.11	1.71	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7440-50-8	Copper	44.3	N	1	0.25	1.14	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7439-89-6	Iron	25800	*	1	4.56	5.71	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7439-92-1	Lead	119	N*	1	0.15	0.69	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7439-95-4	Magnesium	1650		1	13.7	114	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7439-96-5	Manganese	162		1	0.16	1.14	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7439-97-6	Mercury	0.16	N	1	0.0080	0.015	mg/Kg	12/05/25 08:35	12/05/25 15:03	7471B	M7471B
7440-02-0	Nickel	11.6		1	0.15	2.28	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7440-09-7	Potassium	1100		1	31.6	114	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7782-49-2	Selenium	0.30	U	1	0.30	1.14	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7440-22-4	Silver	1.43		1	0.14	0.57	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7440-23-5	Sodium	1450	N	1	20.3	114	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7440-28-0	Thallium	0.26	U	1	0.26	2.28	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7440-62-2	Vanadium	14.2	N	1	0.29	2.28	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050
7440-66-6	Zinc	125	*	1	0.26	2.28	mg/Kg	12/02/25 09:30	12/02/25 14:33	6010D	SW3050

U = Not Detected

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D = Dilution

Q = indicates LCS control criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

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

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

OR = Over Range

N = Spiked sample recovery not within control limits

Report of Analysis

Client: Core Environmental Consultants and Services, Inc.
Project: Brooklyn Navy Yard Building 50 SI
Client Sample ID: B50-SP4-112525
Lab Sample ID: Q3741-06
Level (low/med): low

Date Collected: 11/25/25
Date Received: 11/26/25
SDG No.: Q3741
Matrix: SOIL
% Solid: 85.9

Cas	Parameter	Conc.	Qua.	DF	MDL	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.	Prep Met.
7429-90-5	Aluminum	5990	*	1	0.81	4.81	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7440-36-0	Antimony	0.21	UN	1	0.21	2.41	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7440-38-2	Arsenic	8.81		1	0.18	0.96	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7440-39-3	Barium	97.3	N*	1	0.70	4.81	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7440-41-7	Beryllium	0.55		1	0.024	0.29	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7440-43-9	Cadmium	0.78		1	0.023	0.29	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7440-70-2	Calcium	10700	*	1	10.7	96.2	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7440-47-3	Chromium	11.7		1	0.045	0.48	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7440-48-4	Cobalt	7.04		1	0.096	1.44	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7440-50-8	Copper	88.8	N	1	0.21	0.96	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7439-89-6	Iron	13600	*	1	3.84	4.81	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7439-92-1	Lead	315	N*	1	0.13	0.58	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7439-95-4	Magnesium	2510		1	11.5	96.2	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7439-96-5	Manganese	215		1	0.14	0.96	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7439-97-6	Mercury	2.97	DN	5	0.043	0.077	mg/Kg	12/05/25 08:35	12/09/25 13:13	7471B	M7471B
7440-02-0	Nickel	20.5		1	0.13	1.92	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7440-09-7	Potassium	1330		1	26.7	96.2	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7782-49-2	Selenium	0.25	U	1	0.25	0.96	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7440-22-4	Silver	1.02		1	0.12	0.48	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7440-23-5	Sodium	513	N	1	17.1	96.2	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7440-28-0	Thallium	0.31	J	1	0.22	1.92	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7440-62-2	Vanadium	18.7	N	1	0.24	1.92	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050
7440-66-6	Zinc	209	*	1	0.22	1.92	mg/Kg	12/02/25 09:30	12/02/25 14:47	6010D	SW3050

U = Not Detected

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METAL CALIBRATION DATA

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Core Environmental Consultants and Services, Inc.

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Initial Calibration Source: EPA

Continuing Calibration Source: PLASMA-PURE

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV141	Mercury	4.06	4.0	101	90 - 110	CV	12/05/2025	14:12	LB138128

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Core Environmental Consultants and Services, Inc

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Initial Calibration Source: EPA

Continuing Calibration Source: PLASMA-PURE

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CCV71	Mercury	4.93	5.0	99	90 - 110	CV	12/05/2025	14:16	LB138128
CCV72	Mercury	4.73	5.0	95	90 - 110	CV	12/05/2025	14:54	LB138128
CCV73	Mercury	4.85	5.0	97	90 - 110	CV	12/05/2025	15:23	LB138128

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Core Environmental Consultants and Services, Inc

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Initial Calibration Source: EPA

Continuing Calibration Source: PLASMA-PURE

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV147	Mercury	3.88	4.0	97	90 - 110	CV	12/09/2025	11:28	LB138165

Metals

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Core Environmental Consultants and Services, Inc

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Initial Calibration Source: EPA

Continuing Calibration Source: PLASMA-PURE

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CCV84	Mercury	5.20	5.0	104	90 - 110	CV	12/09/2025	11:33	LB138165
CCV85	Mercury	5.31	5.0	106	90 - 110	CV	12/09/2025	12:03	LB138165
CCV86	Mercury	5.28	5.0	106	90 - 110	CV	12/09/2025	12:40	LB138165
CCV87	Mercury	5.12	5.0	102	90 - 110	CV	12/09/2025	13:15	LB138165

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Core Environmental Consultants and Services, Inc

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Initial Calibration Source: EPA

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV01	Aluminum	7850	8000	98	90 - 110	P	12/02/2025	11:29	LB138085
	Antimony	3960	4000	99	90 - 110	P	12/02/2025	11:29	LB138085
	Arsenic	3880	4000	97	90 - 110	P	12/02/2025	11:29	LB138085
	Barium	8280	8000	104	90 - 110	P	12/02/2025	11:29	LB138085
	Beryllium	205	200	102	90 - 110	P	12/02/2025	11:29	LB138085
	Cadmium	1920	2000	96	90 - 110	P	12/02/2025	11:29	LB138085
	Calcium	19900	20000	100	90 - 110	P	12/02/2025	11:29	LB138085
	Chromium	781	800	98	90 - 110	P	12/02/2025	11:29	LB138085
	Cobalt	1930	2000	97	90 - 110	P	12/02/2025	11:29	LB138085
	Copper	999	1000	100	90 - 110	P	12/02/2025	11:29	LB138085
	Iron	3940	4000	99	90 - 110	P	12/02/2025	11:29	LB138085
	Lead	3790	4000	95	90 - 110	P	12/02/2025	11:29	LB138085
	Magnesium	19600	20000	98	90 - 110	P	12/02/2025	11:29	LB138085
	Manganese	2050	2000	102	90 - 110	P	12/02/2025	11:29	LB138085
	Nickel	1940	2000	97	90 - 110	P	12/02/2025	11:29	LB138085
	Potassium	19600	20000	98	90 - 110	P	12/02/2025	11:29	LB138085
	Selenium	3970	4000	99	90 - 110	P	12/02/2025	11:29	LB138085
	Silver	1080	1000	108	90 - 110	P	12/02/2025	11:29	LB138085
	Sodium	20300	20000	101	90 - 110	P	12/02/2025	11:29	LB138085
	Thallium	4060	4000	102	90 - 110	P	12/02/2025	11:29	LB138085
	Vanadium	1970	2000	99	90 - 110	P	12/02/2025	11:29	LB138085
	Zinc	2020	2000	101	90 - 110	P	12/02/2025	11:29	LB138085

Metals

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Core Environmental Consultants and Services, Inc

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Initial Calibration Source: EPA

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
LLICV01	Aluminum	112	100	112	80 - 120	P	12/02/2025	11:34	LB138085
	Antimony	50.1	50.0	100	80 - 120	P	12/02/2025	11:34	LB138085
	Arsenic	22.6	20.0	113	80 - 120	P	12/02/2025	11:34	LB138085
	Barium	104	100	104	80 - 120	P	12/02/2025	11:34	LB138085
	Beryllium	6.61	6.0	110	80 - 120	P	12/02/2025	11:34	LB138085
	Cadmium	6.22	6.0	104	80 - 120	P	12/02/2025	11:34	LB138085
	Calcium	2050	2000	102	80 - 120	P	12/02/2025	11:34	LB138085
	Chromium	9.91	10.0	99	80 - 120	P	12/02/2025	11:34	LB138085
	Cobalt	29.9	30.0	100	80 - 120	P	12/02/2025	11:34	LB138085
	Copper	21.9	20.0	110	80 - 120	P	12/02/2025	11:34	LB138085
	Iron	103	100	103	80 - 120	P	12/02/2025	11:34	LB138085
	Lead	11.3	12.0	94	80 - 120	P	12/02/2025	11:34	LB138085
	Magnesium	2170	2000	109	80 - 120	P	12/02/2025	11:34	LB138085
	Manganese	21.9	20.0	110	80 - 120	P	12/02/2025	11:34	LB138085
	Nickel	40.7	40.0	102	80 - 120	P	12/02/2025	11:34	LB138085
	Potassium	1900	2000	95	80 - 120	P	12/02/2025	11:34	LB138085
	Selenium	18.8	20.0	94	80 - 120	P	12/02/2025	11:34	LB138085
	Silver	10.3	10.0	103	80 - 120	P	12/02/2025	11:34	LB138085
	Sodium	2010	2000	100	80 - 120	P	12/02/2025	11:34	LB138085
	Thallium	44.2	40.0	111	80 - 120	P	12/02/2025	11:34	LB138085
	Vanadium	40.2	40.0	100	80 - 120	P	12/02/2025	11:34	LB138085
	Zinc	40.6	40.0	102	80 - 120	P	12/02/2025	11:34	LB138085

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Core Environmental Consultants and Services, Inc

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Initial Calibration Source: EPA

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CCV01	Aluminum	10100	10000	101	90 - 110	P	12/02/2025	12:10	LB138085
	Antimony	4970	5000	99	90 - 110	P	12/02/2025	12:10	LB138085
	Arsenic	4950	5000	99	90 - 110	P	12/02/2025	12:10	LB138085
	Barium	10200	10000	102	90 - 110	P	12/02/2025	12:10	LB138085
	Beryllium	254	250	102	90 - 110	P	12/02/2025	12:10	LB138085
	Cadmium	2470	2500	99	90 - 110	P	12/02/2025	12:10	LB138085
	Calcium	25300	25000	101	90 - 110	P	12/02/2025	12:10	LB138085
	Chromium	1000	1000	100	90 - 110	P	12/02/2025	12:10	LB138085
	Cobalt	2470	2500	99	90 - 110	P	12/02/2025	12:10	LB138085
	Copper	1250	1250	100	90 - 110	P	12/02/2025	12:10	LB138085
	Iron	4950	5000	99	90 - 110	P	12/02/2025	12:10	LB138085
	Lead	4950	5000	99	90 - 110	P	12/02/2025	12:10	LB138085
	Magnesium	25100	25000	101	90 - 110	P	12/02/2025	12:10	LB138085
	Manganese	2540	2500	101	90 - 110	P	12/02/2025	12:10	LB138085
	Nickel	2480	2500	99	90 - 110	P	12/02/2025	12:10	LB138085
	Potassium	24800	25000	99	90 - 110	P	12/02/2025	12:10	LB138085
	Selenium	4980	5000	100	90 - 110	P	12/02/2025	12:10	LB138085
	Silver	1250	1250	100	90 - 110	P	12/02/2025	12:10	LB138085
	Sodium	25400	25000	101	90 - 110	P	12/02/2025	12:10	LB138085
	Thallium	4980	5000	100	90 - 110	P	12/02/2025	12:10	LB138085
	Vanadium	2520	2500	101	90 - 110	P	12/02/2025	12:10	LB138085
	Zinc	2520	2500	101	90 - 110	P	12/02/2025	12:10	LB138085
CCV02	Aluminum	10100	10000	100	90 - 110	P	12/02/2025	13:13	LB138085
	Antimony	5120	5000	102	90 - 110	P	12/02/2025	13:13	LB138085
	Arsenic	5050	5000	101	90 - 110	P	12/02/2025	13:13	LB138085
	Barium	9890	10000	99	90 - 110	P	12/02/2025	13:13	LB138085
	Beryllium	249	250	100	90 - 110	P	12/02/2025	13:13	LB138085
	Cadmium	2500	2500	100	90 - 110	P	12/02/2025	13:13	LB138085
	Calcium	25000	25000	100	90 - 110	P	12/02/2025	13:13	LB138085
	Chromium	1020	1000	102	90 - 110	P	12/02/2025	13:13	LB138085
	Cobalt	2500	2500	100	90 - 110	P	12/02/2025	13:13	LB138085
	Copper	1280	1250	103	90 - 110	P	12/02/2025	13:13	LB138085
	Iron	5090	5000	102	90 - 110	P	12/02/2025	13:13	LB138085
	Lead	5020	5000	100	90 - 110	P	12/02/2025	13:13	LB138085

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Core Environmental Consultants and Services, Inc

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Initial Calibration Source: EPA

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CCV02	Magnesium	24800	25000	99	90 - 110	P	12/02/2025	13:13	LB138085
	Manganese	2480	2500	99	90 - 110	P	12/02/2025	13:13	LB138085
	Nickel	2520	2500	101	90 - 110	P	12/02/2025	13:13	LB138085
	Potassium	25900	25000	104	90 - 110	P	12/02/2025	13:13	LB138085
	Selenium	5180	5000	104	90 - 110	P	12/02/2025	13:13	LB138085
	Silver	1280	1250	103	90 - 110	P	12/02/2025	13:13	LB138085
	Sodium	26300	25000	105	90 - 110	P	12/02/2025	13:13	LB138085
	Thallium	4690	5000	94	90 - 110	P	12/02/2025	13:13	LB138085
	Vanadium	2490	2500	100	90 - 110	P	12/02/2025	13:13	LB138085
	Zinc	2590	2500	104	90 - 110	P	12/02/2025	13:13	LB138085
CCV03	Aluminum	10100	10000	101	90 - 110	P	12/02/2025	14:11	LB138085
	Antimony	5100	5000	102	90 - 110	P	12/02/2025	14:11	LB138085
	Arsenic	5040	5000	101	90 - 110	P	12/02/2025	14:11	LB138085
	Barium	10100	10000	102	90 - 110	P	12/02/2025	14:11	LB138085
	Beryllium	247	250	99	90 - 110	P	12/02/2025	14:11	LB138085
	Cadmium	2470	2500	99	90 - 110	P	12/02/2025	14:11	LB138085
	Calcium	25000	25000	100	90 - 110	P	12/02/2025	14:11	LB138085
	Chromium	987	1000	99	90 - 110	P	12/02/2025	14:11	LB138085
	Cobalt	2470	2500	99	90 - 110	P	12/02/2025	14:11	LB138085
	Copper	1280	1250	102	90 - 110	P	12/02/2025	14:11	LB138085
	Iron	5060	5000	101	90 - 110	P	12/02/2025	14:11	LB138085
	Lead	4970	5000	100	90 - 110	P	12/02/2025	14:11	LB138085
	Magnesium	24800	25000	99	90 - 110	P	12/02/2025	14:11	LB138085
	Manganese	2500	2500	100	90 - 110	P	12/02/2025	14:11	LB138085
	Nickel	2500	2500	100	90 - 110	P	12/02/2025	14:11	LB138085
	Potassium	25200	25000	101	90 - 110	P	12/02/2025	14:11	LB138085
	Selenium	5230	5000	105	90 - 110	P	12/02/2025	14:11	LB138085
	Silver	1260	1250	100	90 - 110	P	12/02/2025	14:11	LB138085
	Sodium	25900	25000	104	90 - 110	P	12/02/2025	14:11	LB138085
	Thallium	4900	5000	98	90 - 110	P	12/02/2025	14:11	LB138085
	Vanadium	2500	2500	100	90 - 110	P	12/02/2025	14:11	LB138085
	Zinc	2530	2500	101	90 - 110	P	12/02/2025	14:11	LB138085
CCV04	Aluminum	10200	10000	102	90 - 110	P	12/02/2025	15:15	LB138085
	Antimony	5200	5000	104	90 - 110	P	12/02/2025	15:15	LB138085

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Core Environmental Consultants and Services, Inc

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Initial Calibration Source: EPA

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CCV04	Arsenic	5140	5000	103	90 - 110	P	12/02/2025	15:15	LB138085
	Barium	10500	10000	105	90 - 110	P	12/02/2025	15:15	LB138085
	Beryllium	250	250	100	90 - 110	P	12/02/2025	15:15	LB138085
	Cadmium	2500	2500	100	90 - 110	P	12/02/2025	15:15	LB138085
	Calcium	25500	25000	102	90 - 110	P	12/02/2025	15:15	LB138085
	Chromium	990	1000	99	90 - 110	P	12/02/2025	15:15	LB138085
	Cobalt	2520	2500	101	90 - 110	P	12/02/2025	15:15	LB138085
	Copper	1300	1250	104	90 - 110	P	12/02/2025	15:15	LB138085
	Iron	5230	5000	105	90 - 110	P	12/02/2025	15:15	LB138085
	Lead	5050	5000	101	90 - 110	P	12/02/2025	15:15	LB138085
	Magnesium	24900	25000	100	90 - 110	P	12/02/2025	15:15	LB138085
	Manganese	2590	2500	104	90 - 110	P	12/02/2025	15:15	LB138085
	Nickel	2550	2500	102	90 - 110	P	12/02/2025	15:15	LB138085
	Potassium	26000	25000	104	90 - 110	P	12/02/2025	15:15	LB138085
	Selenium	5330	5000	107	90 - 110	P	12/02/2025	15:15	LB138085
	Silver	1280	1250	102	90 - 110	P	12/02/2025	15:15	LB138085
	Sodium	26900	25000	108	90 - 110	P	12/02/2025	15:15	LB138085
	Thallium	5220	5000	104	90 - 110	P	12/02/2025	15:15	LB138085
	Vanadium	2520	2500	101	90 - 110	P	12/02/2025	15:15	LB138085
	Zinc	2570	2500	103	90 - 110	P	12/02/2025	15:15	LB138085
CCV05	Aluminum	10200	10000	102	90 - 110	P	12/02/2025	16:05	LB138085
	Antimony	5110	5000	102	90 - 110	P	12/02/2025	16:05	LB138085
	Arsenic	5040	5000	101	90 - 110	P	12/02/2025	16:05	LB138085
	Barium	10600	10000	106	90 - 110	P	12/02/2025	16:05	LB138085
	Beryllium	249	250	100	90 - 110	P	12/02/2025	16:05	LB138085
	Cadmium	2460	2500	98	90 - 110	P	12/02/2025	16:05	LB138085
	Calcium	25600	25000	102	90 - 110	P	12/02/2025	16:05	LB138085
	Chromium	968	1000	97	90 - 110	P	12/02/2025	16:05	LB138085
	Cobalt	2480	2500	99	90 - 110	P	12/02/2025	16:05	LB138085
	Copper	1280	1250	102	90 - 110	P	12/02/2025	16:05	LB138085
	Iron	5170	5000	103	90 - 110	P	12/02/2025	16:05	LB138085
	Lead	4950	5000	99	90 - 110	P	12/02/2025	16:05	LB138085
	Magnesium	24900	25000	100	90 - 110	P	12/02/2025	16:05	LB138085
	Manganese	2640	2500	106	90 - 110	P	12/02/2025	16:05	LB138085

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Core Environmental Consultants and Services, Inc

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Initial Calibration Source: EPA

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CCV05	Nickel	2520	2500	101	90 - 110	P	12/02/2025	16:05	LB138085
	Potassium	25600	25000	102	90 - 110	P	12/02/2025	16:05	LB138085
	Selenium	5220	5000	104	90 - 110	P	12/02/2025	16:05	LB138085
	Silver	1250	1250	100	90 - 110	P	12/02/2025	16:05	LB138085
	Sodium	27100	25000	108	90 - 110	P	12/02/2025	16:05	LB138085
	Thallium	5160	5000	103	90 - 110	P	12/02/2025	16:05	LB138085
	Vanadium	2530	2500	101	90 - 110	P	12/02/2025	16:05	LB138085
	Zinc	2510	2500	100	90 - 110	P	12/02/2025	16:05	LB138085
CCV06	Aluminum	10100	10000	101	90 - 110	P	12/02/2025	16:55	LB138085
	Antimony	5130	5000	102	90 - 110	P	12/02/2025	16:55	LB138085
	Arsenic	5050	5000	101	90 - 110	P	12/02/2025	16:55	LB138085
	Barium	10400	10000	104	90 - 110	P	12/02/2025	16:55	LB138085
	Beryllium	251	250	100	90 - 110	P	12/02/2025	16:55	LB138085
	Cadmium	2470	2500	99	90 - 110	P	12/02/2025	16:55	LB138085
	Calcium	25500	25000	102	90 - 110	P	12/02/2025	16:55	LB138085
	Chromium	983	1000	98	90 - 110	P	12/02/2025	16:55	LB138085
	Cobalt	2500	2500	100	90 - 110	P	12/02/2025	16:55	LB138085
	Copper	1290	1250	103	90 - 110	P	12/02/2025	16:55	LB138085
	Iron	5170	5000	103	90 - 110	P	12/02/2025	16:55	LB138085
	Lead	5000	5000	100	90 - 110	P	12/02/2025	16:55	LB138085
	Magnesium	24800	25000	99	90 - 110	P	12/02/2025	16:55	LB138085
	Manganese	2610	2500	104	90 - 110	P	12/02/2025	16:55	LB138085
	Nickel	2540	2500	102	90 - 110	P	12/02/2025	16:55	LB138085
	Potassium	25800	25000	103	90 - 110	P	12/02/2025	16:55	LB138085
	Selenium	5220	5000	104	90 - 110	P	12/02/2025	16:55	LB138085
	Silver	1260	1250	101	90 - 110	P	12/02/2025	16:55	LB138085
	Sodium	26700	25000	107	90 - 110	P	12/02/2025	16:55	LB138085
	Thallium	4600	5000	92	90 - 110	P	12/02/2025	16:55	LB138085
	Vanadium	2510	2500	101	90 - 110	P	12/02/2025	16:55	LB138085
	Zinc	2550	2500	102	90 - 110	P	12/02/2025	16:55	LB138085



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

Metals

- 2b -

CRDL STANDARD FOR AA & ICP

Client: Core Environmental Consultants and Services, Inc.

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Initial Calibration Source:

Continuing Calibration Source:

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CRI01	Aluminum	108	100	108	65 - 135	P	12/02/2025	11:42	LB138085
	Antimony	52.1	50.0	104	65 - 135	P	12/02/2025	11:42	LB138085
	Arsenic	20.2	20.0	101	65 - 135	P	12/02/2025	11:42	LB138085
	Barium	102	100	102	65 - 135	P	12/02/2025	11:42	LB138085
	Beryllium	6.67	6.0	111	65 - 135	P	12/02/2025	11:42	LB138085
	Cadmium	6.34	6.0	106	65 - 135	P	12/02/2025	11:42	LB138085
	Calcium	2050	2000	102	65 - 135	P	12/02/2025	11:42	LB138085
	Chromium	10.6	10.0	106	65 - 135	P	12/02/2025	11:42	LB138085
	Cobalt	30.0	30.0	100	65 - 135	P	12/02/2025	11:42	LB138085
	Copper	21.5	20.0	108	65 - 135	P	12/02/2025	11:42	LB138085
	Iron	110	100	110	65 - 135	P	12/02/2025	11:42	LB138085
	Lead	10.2	12.0	85	65 - 135	P	12/02/2025	11:42	LB138085
	Magnesium	2160	2000	108	65 - 135	P	12/02/2025	11:42	LB138085
	Manganese	21.6	20.0	108	65 - 135	P	12/02/2025	11:42	LB138085
	Nickel	41.1	40.0	103	65 - 135	P	12/02/2025	11:42	LB138085
	Potassium	1980	2000	99	65 - 135	P	12/02/2025	11:42	LB138085
	Selenium	19.3	20.0	96	65 - 135	P	12/02/2025	11:42	LB138085
	Silver	10.1	10.0	101	65 - 135	P	12/02/2025	11:42	LB138085
	Sodium	1990	2000	100	65 - 135	P	12/02/2025	11:42	LB138085
	Thallium	49.9	40.0	125	65 - 135	P	12/02/2025	11:42	LB138085
	Vanadium	42.0	40.0	105	65 - 135	P	12/02/2025	11:42	LB138085
	Zinc	41.5	40.0	104	65 - 135	P	12/02/2025	11:42	LB138085
CRA	Mercury	0.24	0.2	119	70 - 130	CV	12/05/2025	14:21	LB138128
CRA	Mercury	0.17	0.2	83	70 - 130	CV	12/09/2025	11:40	LB138165



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

Metals

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Core Environmental Consultants and Services, Inc.

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
ICB141	Mercury	0.076	+/-0.2	U	0.20	CV	12/05/2025	14:14	LB138128

Metals

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Core Environmental Consultants and Services, Inc.

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
CCB71	Mercury	0.076	+/-0.2	U	0.20	CV	12/05/2025	14:19	LB138128
CCB72	Mercury	0.076	+/-0.2	U	0.20	CV	12/05/2025	14:56	LB138128
CCB73	Mercury	0.076	+/-0.2	U	0.20	CV	12/05/2025	15:25	LB138128

Metals

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Core Environmental Consultants and Services, Inc.

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
ICB147	Mercury	0.076	+/-0.2	U	0.20	CV	12/09/2025	11:30	LB138165

Metals

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Core Environmental Consultants and Services, Inc.

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
CCB84	Mercury	0.076	+/-0.2	U	0.20	CV	12/09/2025	11:35	LB138165
CCB85	Mercury	0.076	+/-0.2	U	0.20	CV	12/09/2025	12:05	LB138165
CCB86	Mercury	0.076	+/-0.2	U	0.20	CV	12/09/2025	12:43	LB138165
CCB87	Mercury	0.076	+/-0.2	U	0.20	CV	12/09/2025	13:17	LB138165

Metals

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Core Environmental Consultants and Services, Inc.

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
ICB01	Aluminum	11.3	+/-50	U	100	P	12/02/2025	11:38	LB138085
	Antimony	6.76	+/-25	U	50.0	P	12/02/2025	11:38	LB138085
	Arsenic	5.12	+/-10	U	20.0	P	12/02/2025	11:38	LB138085
	Barium	14.6	+/-50	U	100	P	12/02/2025	11:38	LB138085
	Beryllium	0.56	+/-3	U	6.00	P	12/02/2025	11:38	LB138085
	Cadmium	0.50	+/-3	U	6.00	P	12/02/2025	11:38	LB138085
	Calcium	234	+/-1000	U	2000	P	12/02/2025	11:38	LB138085
	Chromium	2.12	+/-5	U	10.0	P	12/02/2025	11:38	LB138085
	Cobalt	2.26	+/-15	U	30.0	P	12/02/2025	11:38	LB138085
	Copper	4.60	+/-10	U	20.0	P	12/02/2025	11:38	LB138085
	Iron	23.4	+/-50	U	100	P	12/02/2025	11:38	LB138085
	Lead	2.30	+/-6	U	12.0	P	12/02/2025	11:38	LB138085
	Magnesium	244	+/-1000	U	2000	P	12/02/2025	11:38	LB138085
	Manganese	5.94	+/-10	U	20.0	P	12/02/2025	11:38	LB138085
	Nickel	3.06	+/-20	U	40.0	P	12/02/2025	11:38	LB138085
	Potassium	918	+/-1000	U	2000	P	12/02/2025	11:38	LB138085
	Selenium	9.64	+/-10	U	20.0	P	12/02/2025	11:38	LB138085
	Silver	1.62	+/-5	U	10.0	P	12/02/2025	11:38	LB138085
	Sodium	868	+/-1000	U	2000	P	12/02/2025	11:38	LB138085
	Thallium	5.65	+/-20	J	40.0	P	12/02/2025	11:38	LB138085
	Vanadium	6.26	+/-20	U	40.0	P	12/02/2025	11:38	LB138085
	Zinc	16.7	+/-20	U	40.0	P	12/02/2025	11:38	LB138085

Metals

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Core Environmental Consultants and Services, Inc.

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
CCB01	Aluminum	11.3	+/-50	U	100	P	12/02/2025	12:14	LB138085
	Antimony	6.76	+/-25	U	50.0	P	12/02/2025	12:14	LB138085
	Arsenic	5.12	+/-10	U	20.0	P	12/02/2025	12:14	LB138085
	Barium	14.6	+/-50	U	100	P	12/02/2025	12:14	LB138085
	Beryllium	0.56	+/-3	U	6.00	P	12/02/2025	12:14	LB138085
	Cadmium	0.50	+/-3	U	6.00	P	12/02/2025	12:14	LB138085
	Calcium	234	+/-1000	U	2000	P	12/02/2025	12:14	LB138085
	Chromium	2.12	+/-5	U	10.0	P	12/02/2025	12:14	LB138085
	Cobalt	2.26	+/-15	U	30.0	P	12/02/2025	12:14	LB138085
	Copper	4.60	+/-10	U	20.0	P	12/02/2025	12:14	LB138085
	Iron	23.4	+/-50	U	100	P	12/02/2025	12:14	LB138085
	Lead	2.30	+/-6	U	12.0	P	12/02/2025	12:14	LB138085
	Magnesium	244	+/-1000	U	2000	P	12/02/2025	12:14	LB138085
	Manganese	5.94	+/-10	U	20.0	P	12/02/2025	12:14	LB138085
	Nickel	3.06	+/-20	U	40.0	P	12/02/2025	12:14	LB138085
	Potassium	918	+/-1000	U	2000	P	12/02/2025	12:14	LB138085
	Selenium	9.64	+/-10	U	20.0	P	12/02/2025	12:14	LB138085
	Silver	1.62	+/-5	U	10.0	P	12/02/2025	12:14	LB138085
	Sodium	868	+/-1000	U	2000	P	12/02/2025	12:14	LB138085
	Thallium	4.38	+/-20	U	40.0	P	12/02/2025	12:14	LB138085
	Vanadium	6.26	+/-20	U	40.0	P	12/02/2025	12:14	LB138085
	Zinc	16.7	+/-20	U	40.0	P	12/02/2025	12:14	LB138085
CCB02	Aluminum	11.3	+/-50	U	100	P	12/02/2025	13:17	LB138085
	Antimony	6.76	+/-25	U	50.0	P	12/02/2025	13:17	LB138085
	Arsenic	5.12	+/-10	U	20.0	P	12/02/2025	13:17	LB138085
	Barium	14.6	+/-50	U	100	P	12/02/2025	13:17	LB138085
	Beryllium	0.56	+/-3	U	6.00	P	12/02/2025	13:17	LB138085
	Cadmium	0.50	+/-3	U	6.00	P	12/02/2025	13:17	LB138085
	Calcium	234	+/-1000	U	2000	P	12/02/2025	13:17	LB138085
	Chromium	2.12	+/-5	U	10.0	P	12/02/2025	13:17	LB138085
	Cobalt	2.26	+/-15	U	30.0	P	12/02/2025	13:17	LB138085
	Copper	4.60	+/-10	U	20.0	P	12/02/2025	13:17	LB138085
	Iron	23.4	+/-50	U	100	P	12/02/2025	13:17	LB138085
	Lead	2.30	+/-6	U	12.0	P	12/02/2025	13:17	LB138085
	Magnesium	244	+/-1000	U	2000	P	12/02/2025	13:17	LB138085
	Manganese	5.94	+/-10	U	20.0	P	12/02/2025	13:17	LB138085
	Nickel	3.06	+/-20	U	40.0	P	12/02/2025	13:17	LB138085
	Potassium	918	+/-1000	U	2000	P	12/02/2025	13:17	LB138085
	Selenium	9.64	+/-10	U	20.0	P	12/02/2025	13:17	LB138085

Metals

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Core Environmental Consultants and Services, Inc.

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
CCB02	Silver	1.62	+/-5	U	10.0	P	12/02/2025	13:17	LB138085
	Sodium	868	+/-1000	U	2000	P	12/02/2025	13:17	LB138085
	Thallium	7.81	+/-20	J	40.0	P	12/02/2025	13:17	LB138085
	Vanadium	6.26	+/-20	U	40.0	P	12/02/2025	13:17	LB138085
	Zinc	16.7	+/-20	U	40.0	P	12/02/2025	13:17	LB138085
CCB03	Aluminum	13.3	+/-50	J	100	P	12/02/2025	14:15	LB138085
	Antimony	6.76	+/-25	U	50.0	P	12/02/2025	14:15	LB138085
	Arsenic	5.12	+/-10	U	20.0	P	12/02/2025	14:15	LB138085
	Barium	14.6	+/-50	U	100	P	12/02/2025	14:15	LB138085
	Beryllium	0.56	+/-3	U	6.00	P	12/02/2025	14:15	LB138085
	Cadmium	0.50	+/-3	U	6.00	P	12/02/2025	14:15	LB138085
	Calcium	234	+/-1000	U	2000	P	12/02/2025	14:15	LB138085
	Chromium	2.12	+/-5	U	10.0	P	12/02/2025	14:15	LB138085
	Cobalt	2.26	+/-15	U	30.0	P	12/02/2025	14:15	LB138085
	Copper	4.60	+/-10	U	20.0	P	12/02/2025	14:15	LB138085
	Iron	25.1	+/-50	J	100	P	12/02/2025	14:15	LB138085
	Lead	2.30	+/-6	U	12.0	P	12/02/2025	14:15	LB138085
	Magnesium	244	+/-1000	U	2000	P	12/02/2025	14:15	LB138085
	Manganese	5.94	+/-10	U	20.0	P	12/02/2025	14:15	LB138085
	Nickel	3.06	+/-20	U	40.0	P	12/02/2025	14:15	LB138085
	Potassium	918	+/-1000	U	2000	P	12/02/2025	14:15	LB138085
	Selenium	9.64	+/-10	U	20.0	P	12/02/2025	14:15	LB138085
	Silver	1.62	+/-5	U	10.0	P	12/02/2025	14:15	LB138085
	Sodium	868	+/-1000	U	2000	P	12/02/2025	14:15	LB138085
	Thallium	4.38	+/-20	U	40.0	P	12/02/2025	14:15	LB138085
	Vanadium	6.26	+/-20	U	40.0	P	12/02/2025	14:15	LB138085
	Zinc	16.7	+/-20	U	40.0	P	12/02/2025	14:15	LB138085
CCB04	Aluminum	22.4	+/-50	J	100	P	12/02/2025	15:20	LB138085
	Antimony	6.76	+/-25	U	50.0	P	12/02/2025	15:20	LB138085
	Arsenic	5.12	+/-10	U	20.0	P	12/02/2025	15:20	LB138085
	Barium	14.6	+/-50	U	100	P	12/02/2025	15:20	LB138085
	Beryllium	0.56	+/-3	U	6.00	P	12/02/2025	15:20	LB138085
	Cadmium	0.50	+/-3	U	6.00	P	12/02/2025	15:20	LB138085
	Calcium	234	+/-1000	U	2000	P	12/02/2025	15:20	LB138085
	Chromium	2.12	+/-5	U	10.0	P	12/02/2025	15:20	LB138085
	Cobalt	2.26	+/-15	U	30.0	P	12/02/2025	15:20	LB138085
	Copper	4.60	+/-10	U	20.0	P	12/02/2025	15:20	LB138085
	Iron	23.4	+/-50	U	100	P	12/02/2025	15:20	LB138085
	Lead	2.30	+/-6	U	12.0	P	12/02/2025	15:20	LB138085

Metals

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Core Environmental Consultants and Services, Inc.

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
CCB04	Magnesium	244	+/-1000	U	2000	P	12/02/2025	15:20	LB138085
	Manganese	5.94	+/-10	U	20.0	P	12/02/2025	15:20	LB138085
	Nickel	3.06	+/-20	U	40.0	P	12/02/2025	15:20	LB138085
	Potassium	918	+/-1000	U	2000	P	12/02/2025	15:20	LB138085
	Selenium	9.64	+/-10	U	20.0	P	12/02/2025	15:20	LB138085
	Silver	1.62	+/-5	U	10.0	P	12/02/2025	15:20	LB138085
	Sodium	868	+/-1000	U	2000	P	12/02/2025	15:20	LB138085
	Thallium	5.38	+/-20	J	40.0	P	12/02/2025	15:20	LB138085
	Vanadium	6.26	+/-20	U	40.0	P	12/02/2025	15:20	LB138085
	Zinc	16.7	+/-20	U	40.0	P	12/02/2025	15:20	LB138085
CCB05	Aluminum	11.3	+/-50	U	100	P	12/02/2025	16:09	LB138085
	Antimony	6.76	+/-25	U	50.0	P	12/02/2025	16:09	LB138085
	Arsenic	5.12	+/-10	U	20.0	P	12/02/2025	16:09	LB138085
	Barium	14.6	+/-50	U	100	P	12/02/2025	16:09	LB138085
	Beryllium	0.56	+/-3	U	6.00	P	12/02/2025	16:09	LB138085
	Cadmium	0.50	+/-3	U	6.00	P	12/02/2025	16:09	LB138085
	Calcium	234	+/-1000	U	2000	P	12/02/2025	16:09	LB138085
	Chromium	2.12	+/-5	U	10.0	P	12/02/2025	16:09	LB138085
	Cobalt	2.26	+/-15	U	30.0	P	12/02/2025	16:09	LB138085
	Copper	4.60	+/-10	U	20.0	P	12/02/2025	16:09	LB138085
	Iron	23.4	+/-50	U	100	P	12/02/2025	16:09	LB138085
	Lead	2.30	+/-6	U	12.0	P	12/02/2025	16:09	LB138085
	Magnesium	244	+/-1000	U	2000	P	12/02/2025	16:09	LB138085
	Manganese	5.94	+/-10	U	20.0	P	12/02/2025	16:09	LB138085
	Nickel	3.06	+/-20	U	40.0	P	12/02/2025	16:09	LB138085
	Potassium	918	+/-1000	U	2000	P	12/02/2025	16:09	LB138085
	Selenium	9.64	+/-10	U	20.0	P	12/02/2025	16:09	LB138085
	Silver	1.62	+/-5	U	10.0	P	12/02/2025	16:09	LB138085
	Sodium	868	+/-1000	U	2000	P	12/02/2025	16:09	LB138085
	Thallium	5.53	+/-20	J	40.0	P	12/02/2025	16:09	LB138085
	Vanadium	6.26	+/-20	U	40.0	P	12/02/2025	16:09	LB138085
	Zinc	16.7	+/-20	U	40.0	P	12/02/2025	16:09	LB138085
CCB06	Aluminum	11.3	+/-50	U	100	P	12/02/2025	16:59	LB138085
	Antimony	6.76	+/-25	U	50.0	P	12/02/2025	16:59	LB138085
	Arsenic	5.12	+/-10	U	20.0	P	12/02/2025	16:59	LB138085
	Barium	14.6	+/-50	U	100	P	12/02/2025	16:59	LB138085
	Beryllium	0.56	+/-3	U	6.00	P	12/02/2025	16:59	LB138085
	Cadmium	0.50	+/-3	U	6.00	P	12/02/2025	16:59	LB138085
	Calcium	234	+/-1000	U	2000	P	12/02/2025	16:59	LB138085

Metals

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Core Environmental Consultants and Services, Inc.

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
CCB06	Chromium	2.12	+/-5	U	10.0	P	12/02/2025	16:59	LB138085
	Cobalt	2.26	+/-15	U	30.0	P	12/02/2025	16:59	LB138085
	Copper	4.60	+/-10	U	20.0	P	12/02/2025	16:59	LB138085
	Iron	23.4	+/-50	U	100	P	12/02/2025	16:59	LB138085
	Lead	2.30	+/-6	U	12.0	P	12/02/2025	16:59	LB138085
	Magnesium	244	+/-1000	U	2000	P	12/02/2025	16:59	LB138085
	Manganese	5.94	+/-10	U	20.0	P	12/02/2025	16:59	LB138085
	Nickel	3.06	+/-20	U	40.0	P	12/02/2025	16:59	LB138085
	Potassium	918	+/-1000	U	2000	P	12/02/2025	16:59	LB138085
	Selenium	9.64	+/-10	U	20.0	P	12/02/2025	16:59	LB138085
	Silver	1.62	+/-5	U	10.0	P	12/02/2025	16:59	LB138085
	Sodium	868	+/-1000	U	2000	P	12/02/2025	16:59	LB138085
	Thallium	4.85	+/-20	J	40.0	P	12/02/2025	16:59	LB138085
	Vanadium	6.26	+/-20	U	40.0	P	12/02/2025	16:59	LB138085
	Zinc	16.7	+/-20	U	40.0	P	12/02/2025	16:59	LB138085

Metals
- 3b -
PREPARATION BLANK SUMMARY

Client: Core Environmental Consultants and Services, **SDG No.:** Q3741

Instrument: CV1

Sample ID	Analyte	Result (mg/Kg)	Acceptance Limit	Conc Qual	CRQL mg/Kg	M	Analysis Date	Analysis Time	Run
PB170840BL		SOLID		Batch Number:	PB170840		Prep Date:	12/05/2025	
	Mercury	0.0080	<0.013	U	0.013	CV	12/05/2025	14:28	LB138128

Metals
- 3b -
PREPARATION BLANK SUMMARY

Client: Core Environmental Consultants and Services,

SDG No.: Q3741

Instrument: P4

Sample ID	Analyte	Result (mg/Kg)	Acceptance Limit	Conc Qual	CRQL mg/Kg	M	Analysis Date	Analysis Time	Run
PB170777BL	SOLID			Batch Number:	PB170777		Prep Date:	12/02/2025	
	Aluminum	0.84	<2.5	U	5.00	P	12/02/2025	13:26	LB138085
	Antimony	0.22	<1.25	U	2.50	P	12/02/2025	13:26	LB138085
	Arsenic	0.19	<0.5	U	1.00	P	12/02/2025	13:26	LB138085
	Barium	0.73	<2.5	U	5.00	P	12/02/2025	13:26	LB138085
	Beryllium	0.025	<0.15	U	0.30	P	12/02/2025	13:26	LB138085
	Cadmium	0.024	<0.15	U	0.30	P	12/02/2025	13:26	LB138085
	Calcium	11.1	<50	U	100	P	12/02/2025	13:26	LB138085
	Chromium	0.047	<0.25	U	0.50	P	12/02/2025	13:26	LB138085
	Cobalt	0.10	<0.75	U	1.50	P	12/02/2025	13:26	LB138085
	Copper	0.22	<0.5	U	1.00	P	12/02/2025	13:26	LB138085
	Iron	3.99	<2.5	U	5.00	P	12/02/2025	13:26	LB138085
	Lead	0.13	<0.3	U	0.60	P	12/02/2025	13:26	LB138085
	Magnesium	12.0	<50	U	100	P	12/02/2025	13:26	LB138085
	Manganese	0.14	<0.5	U	1.00	P	12/02/2025	13:26	LB138085
	Nickel	0.13	<1	U	2.00	P	12/02/2025	13:26	LB138085
	Potassium	27.7	<50	U	100	P	12/02/2025	13:26	LB138085
	Selenium	0.26	<0.5	U	1.00	P	12/02/2025	13:26	LB138085
	Silver	0.12	<0.25	U	0.50	P	12/02/2025	13:26	LB138085
	Sodium	17.8	<50	U	100	P	12/02/2025	13:26	LB138085
	Thallium	0.34	<1	J	2.00	P	12/02/2025	13:26	LB138085
	Vanadium	0.25	<1	U	2.00	P	12/02/2025	13:26	LB138085
	Zinc	0.23	<1	U	2.00	P	12/02/2025	13:26	LB138085

Metals
- 4 -
INTERFERENCE CHECK SAMPLE

Client: Core Environmental Consultants and Services, Inc.

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

ICS Source: EPA

Instrument ID: P4

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Low Limit (ug/L)	High Limit (ug/L)	Analysis Date	Analysis Time	Run Number
ICSA01	Aluminum	268000	255000	105	216000	294000	12/02/2025	11:52	LB138085
	Antimony	-6.65			-50	50	12/02/2025	11:52	LB138085
	Arsenic	2.54			-20	20	12/02/2025	11:52	LB138085
	Barium	4.18	6.0	70	-94	106	12/02/2025	11:52	LB138085
	Beryllium	1.60			-6	6	12/02/2025	11:52	LB138085
	Cadmium	4.20	1.0	420	-5	7	12/02/2025	11:52	LB138085
	Calcium	256000	245000	104	208000	282000	12/02/2025	11:52	LB138085
	Chromium	46.6	52.0	90	42	62	12/02/2025	11:52	LB138085
	Cobalt	2.36			-30	30	12/02/2025	11:52	LB138085
	Copper	0.50	2.0	25	-18	22	12/02/2025	11:52	LB138085
	Iron	103000	101000	102	85600	116500	12/02/2025	11:52	LB138085
	Lead	5.64			-12	12	12/02/2025	11:52	LB138085
	Magnesium	274000	255000	108	216000	294000	12/02/2025	11:52	LB138085
	Manganese	9.91	7.0	142	-13	27	12/02/2025	11:52	LB138085
	Nickel	6.08	2.0	304	-38	42	12/02/2025	11:52	LB138085
	Potassium	41.4			0	0	12/02/2025	11:52	LB138085
	Selenium	-2.16			-20	20	12/02/2025	11:52	LB138085
	Silver	8.41			-10	10	12/02/2025	11:52	LB138085
	Sodium	133			0	0	12/02/2025	11:52	LB138085
	Thallium	17.4			-40	40	12/02/2025	11:52	LB138085
	Vanadium	5.74			-40	40	12/02/2025	11:52	LB138085
	Zinc	3.36			-40	40	12/02/2025	11:52	LB138085
ICSAB01	Aluminum	251000	247000	102	209000	285000	12/02/2025	11:57	LB138085
	Antimony	600	618	97	525	711	12/02/2025	11:57	LB138085
	Arsenic	108	104	104	88.4	120	12/02/2025	11:57	LB138085
	Barium	500	537	93	437	637	12/02/2025	11:57	LB138085
	Beryllium	505	495	102	420	570	12/02/2025	11:57	LB138085
	Cadmium	1000	972	103	826	1120	12/02/2025	11:57	LB138085
	Calcium	240000	235000	102	199000	271000	12/02/2025	11:57	LB138085
	Chromium	538	542	99	460	624	12/02/2025	11:57	LB138085
	Cobalt	499	476	105	404	548	12/02/2025	11:57	LB138085
	Copper	480	511	94	434	588	12/02/2025	11:57	LB138085
	Iron	92700	99300	93	84400	114500	12/02/2025	11:57	LB138085
	Lead	52.6	49.0	107	37	61	12/02/2025	11:57	LB138085
	Magnesium	257000	248000	104	210000	286000	12/02/2025	11:57	LB138085
	Manganese	499	507	98	430	584	12/02/2025	11:57	LB138085
	Nickel	994	954	104	810	1100	12/02/2025	11:57	LB138085
	Potassium	19.2			0	0	12/02/2025	11:57	LB138085
	Selenium	41.4	46.0	90	26	66	12/02/2025	11:57	LB138085
	Silver	185	201	92	170	232	12/02/2025	11:57	LB138085
	Sodium	101			0	0	12/02/2025	11:57	LB138085
	Thallium	128	108	118	68	148	12/02/2025	11:57	LB138085

Metals

- 4 -

INTERFERENCE CHECK SAMPLE

Client: Core Environmental Consultants and Services, Inc.

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

ICS Source: EPA

Instrument ID: P4

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Low Limit (ug/L)	High Limit (ug/L)	Analysis Date	Analysis Time	Run Number
ICSAB01	Vanadium	486	491	99	417	565	12/02/2025	11:57	LB138085
	Zinc	1030	952	108	809	1095	12/02/2025	11:57	LB138085



METAL

QC

DATA

metals
- 5a -
MATRIX SPIKE SUMMARY

client: Core Environmental Consultants and Service **level:** low **sdg no.:** Q3741
contract: CORE02 **lab code:** ACE
matrix: Solid **sample id:** Q3741-01 **client id:** B50-SP3-111925MS
Percent Solids for Sample: 91.6 **Spiked ID:** Q3741-01MS **Percent Solids for Spike Sample:** 91.6

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Mercury	mg/Kg	80 - 120	0.52	D	0.49	D	0.27	15	N	CV

metals
- 5a -
MATRIX SPIKE DUPLICATE SUMMARY

client: Core Environmental Consultants and Service **level:** low **sdg no.:** Q3741
contract: CORE02 **lab code:** ACE
matrix: Solid **sample id:** Q3741-01 **client id:** B50-SP3-111925MSD
Percent Solids for Sample: 91.6 **Spiked ID:** Q3741-01MSD **Percent Solids for Spike Sample:** 91.6

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Mercury	mg/Kg	80 - 120	0.55	D	0.49	D	0.28	22	N	CV

metals
- 5a -
MATRIX SPIKE SUMMARY

client: Core Environmental Consultants and Service **level:** low **sdg no.:** Q3741
contract: CORE02 **lab code:** ACE
matrix: Solid **sample id:** Q3750-01 **client id:** FENCE WC-1MS

Percent Solids for Sample: 86.8 **Spiked ID:** Q3750-01MS **Percent Solids for Spike Sample:** 86.8

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Aluminum	mg/Kg	75 - 125	6080		3380		110	2459		P
Antimony	mg/Kg	75 - 125	20.3		2.63	U	42.9	47	N	P
Arsenic	mg/Kg	75 - 125	46.7		6.04		42.9	95		P
Barium	mg/Kg	75 - 125	48.7		24.4		10.7	226	N	P
Beryllium	mg/Kg	75 - 125	9.52		0.28	J	10.7	86		P
Cadmium	mg/Kg	75 - 125	11.2		0.37		10.7	101		P
Calcium	mg/Kg	75 - 125	1180		788		53.6	740		P
Chromium	mg/Kg	75 - 125	34.6		9.32		21.4	118		P
Cobalt	mg/Kg	75 - 125	15.1		2.65		10.7	116		P
Copper	mg/Kg	75 - 125	37.2		14.3		16.1	142	N	P
Iron	mg/Kg	75 - 125	11000		8530		160	1554		P
Lead	mg/Kg	75 - 125	277		114		53.6	303	N	P
Magnesium	mg/Kg	75 - 125	1250		720		110	483		P
Manganese	mg/Kg	75 - 125	240		174		10.7	617		P
Nickel	mg/Kg	75 - 125	37.6		6.28		26.8	117		P
Potassium	mg/Kg	75 - 125	886		282		540	112		P
Selenium	mg/Kg	75 - 125	93.8		1.05	U	110	85		P
Silver	mg/Kg	75 - 125	4.17		0.58		4.0	90		P
Sodium	mg/Kg	75 - 125	409		103	J	160	191	N	P
Thallium	mg/Kg	75 - 125	99.9		2.10	U	110	91		P
Vanadium	mg/Kg	75 - 125	32.0		10.8		16.1	132	N	P
Zinc	mg/Kg	75 - 125	135		65.2		10.7	652		P

metals
- 5a -
MATRIX SPIKE DUPLICATE SUMMARY

client: Core Environmental Consultants and Service **level:** low **sdg no.:** Q3741
contract: CORE02 **lab code:** ACE
matrix: Solid **sample id:** Q3750-01 **client id:** FENCE WC-1MSD

Percent Solids for Sample: 86.8 **Spiked ID:** Q3750-01MSD **Percent Solids for Spike Sample:** 86.8

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Aluminum	mg/Kg	75 - 125	4600		3380		110	1113		P
Antimony	mg/Kg	75 - 125	21.6		2.63	U	42.5	51	N	P
Arsenic	mg/Kg	75 - 125	45.3		6.04		42.5	92		P
Barium	mg/Kg	75 - 125	38.3		24.4		10.6	130	N	P
Beryllium	mg/Kg	75 - 125	9.58		0.28	J	10.6	88		P
Cadmium	mg/Kg	75 - 125	10.8		0.37		10.6	99		P
Calcium	mg/Kg	75 - 125	927		788		53.1	263		P
Chromium	mg/Kg	75 - 125	30.8		9.32		21.2	101		P
Cobalt	mg/Kg	75 - 125	13.9		2.65		10.6	106		P
Copper	mg/Kg	75 - 125	32.1		14.3		15.9	112		P
Iron	mg/Kg	75 - 125	8930		8530		160	253		P
Lead	mg/Kg	75 - 125	204		114		53.1	170	N	P
Magnesium	mg/Kg	75 - 125	1020		720		110	277		P
Manganese	mg/Kg	75 - 125	196		174		10.6	202		P
Nickel	mg/Kg	75 - 125	34.5		6.28		26.5	107		P
Potassium	mg/Kg	75 - 125	816		282		530	101		P
Selenium	mg/Kg	75 - 125	96.4		1.05	U	110	88		P
Silver	mg/Kg	75 - 125	4.01		0.58		4.0	86		P
Sodium	mg/Kg	75 - 125	346		103	J	160	152	N	P
Thallium	mg/Kg	75 - 125	104		2.10	U	110	94		P
Vanadium	mg/Kg	75 - 125	27.7		10.8		15.9	107		P
Zinc	mg/Kg	75 - 125	98.6		65.2		10.6	315		P

Metals
- 5b -
POST DIGEST SPIKE SUMMARY

Client: Core Environmental Consultants and Service **SDG No.:** Q3741
Contract: CORE02 **Lab Code:** ACE
Matrix: Solid **Level:** LOW **Client ID:** B50-SP3-111925A
Sample ID: Q3741-01 **Spiked ID:** Q3741-01A

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Mercury	mg/Kg	80 - 120	0.53	D	0.49	D	0.52	8	N	CV

Metals
- 5b -
POST DIGEST SPIKE SUMMARY

Client:	<u>Core Environmental Consultants and Service</u>	SDG No.:	<u>Q3741</u>
Contract:	<u>CORE02</u>	Lab Code:	<u>ACE</u>
Matrix:	<u>Solid</u>	Level:	<u>LOW</u>
Client ID:	<u>FENCE WC-1A</u>		
Sample ID:	<u>Q3750-01</u>	Spiked ID:	<u>Q3750-01A</u>

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Antimony	mg/Kg	75 - 125	40.6		2.63	U	42.1	96		P
Barium	mg/Kg	75 - 125	31.7		24.4		10.5	69	N	P
Copper	mg/Kg	75 - 125	28.5		14.3		15.8	90		P
Lead	mg/Kg	75 - 125	157		114		52.6	82		P
Sodium	mg/Kg	75 - 125	251		103	J	160	92		P
Vanadium	mg/Kg	75 - 125	25.0		10.8		15.8	90		P

Metals

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DUPLICATE SAMPLE SUMMARY

Client: Core Environmental Consultants and Service **Level:** LOW **SDG No.:** Q3741
Contract: CORE02 **Lab Code:** ACE
Matrix: Solid **Sample ID:** Q3741-01 **Client ID:** B50-SP3-111925DUP
Percent Solids for Sample: 91.6 **Duplicate ID** Q3741-01DUP **Percent Solids for Spike Sample:** 91.6

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Mercury	mg/Kg	20	0.68	OR	0.67		2		CV

Metals

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DUPLICATE SAMPLE SUMMARY

Client:	<u>Core Environmental Consultants and Service</u>	Level:	<u>LOW</u>	SDG No.:	<u>Q3741</u>
Contract:	<u>CORE02</u>			Lab Code:	<u>ACE</u>
Matrix:	<u>Solid</u>	Sample ID:	<u>Q3741-01MS</u>	Client ID:	<u>B50-SP3-111925MSD</u>
Percent Solids for Sample:	91.6	Duplicate ID	Q3741-01MSD	Percent Solids for Spike Sample:	91.6

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Mercury	mg/Kg	20	0.52	D	0.55	D	4		CV

Metals

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DUPLICATE SAMPLE SUMMARY

Client: Core Environmental Consultants and Service **Level:** LOW **SDG No.:** Q3741
Contract: CORE02 **Lab Code:** ACE
Matrix: Solid **Sample ID:** Q3750-01 **Client ID:** FENCE WC-1DUP

Percent Solids for Sample: 86.8 **Duplicate ID** Q3750-01DUP **Percent Solids for Spike Sample:** 86.8

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Aluminum	mg/Kg	20	3380		3750		10		P
Antimony	mg/Kg	20	2.63	U	0.76	J	200.0		P
Arsenic	mg/Kg	20	6.04		5.98		1		P
Barium	mg/Kg	20	24.4		24.0		2		P
Beryllium	mg/Kg	20	0.28	J	0.30	J	7		P
Cadmium	mg/Kg	20	0.37		0.36		3		P
Calcium	mg/Kg	20	788		874		10		P
Chromium	mg/Kg	20	9.32		9.14		2		P
Cobalt	mg/Kg	20	2.65		2.88		8		P
Copper	mg/Kg	20	14.3		14.2		1		P
Iron	mg/Kg	20	8530		8150		5		P
Lead	mg/Kg	20	114		106		7		P
Magnesium	mg/Kg	20	720		850		17		P
Manganese	mg/Kg	20	174		173		1		P
Nickel	mg/Kg	20	6.28		6.52		4		P
Potassium	mg/Kg	20	282		305		8		P
Selenium	mg/Kg	20	1.05	U	1.06	U			P
Silver	mg/Kg	20	0.58		0.52	J	12		P
Sodium	mg/Kg	20	103	J	132		25		P
Thallium	mg/Kg	20	2.10	U	2.11	U			P
Vanadium	mg/Kg	20	10.8		11.8		9		P
Zinc	mg/Kg	20	65.2		65.7		1		P

Metals

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DUPLICATE SAMPLE SUMMARY

Client: Core Environmental Consultants and Service **Level:** LOW **SDG No.:** Q3741
Contract: CORE02 **Lab Code:** ACE
Matrix: Solid **Sample ID:** Q3750-01MS **Client ID:** FENCE WC-1MSD

Percent Solids for Sample: 86.8 **Duplicate ID** Q3750-01MSD **Percent Solids for Spike Sample:** 86.8

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Aluminum	mg/Kg	20	6080		4600		28	*	P
Antimony	mg/Kg	20	20.3		21.6		6		P
Arsenic	mg/Kg	20	46.7		45.3		3		P
Barium	mg/Kg	20	48.7		38.3		24	*	P
Beryllium	mg/Kg	20	9.52		9.58		1		P
Cadmium	mg/Kg	20	11.2		10.8		3		P
Calcium	mg/Kg	20	1180		927		24	*	P
Chromium	mg/Kg	20	34.6		30.8		12		P
Cobalt	mg/Kg	20	15.1		13.9		8		P
Copper	mg/Kg	20	37.2		32.1		15		P
Iron	mg/Kg	20	11000		8930		21	*	P
Lead	mg/Kg	20	277		204		30	*	P
Magnesium	mg/Kg	20	1250		1020		20		P
Manganese	mg/Kg	20	240		196		20		P
Nickel	mg/Kg	20	37.6		34.5		9		P
Potassium	mg/Kg	20	886		816		8		P
Selenium	mg/Kg	20	93.8		96.4		3		P
Silver	mg/Kg	20	4.17		4.01		4		P
Sodium	mg/Kg	20	409		346		17		P
Thallium	mg/Kg	20	99.9		104		4		P
Vanadium	mg/Kg	20	32.0		27.7		14		P
Zinc	mg/Kg	20	135		98.6		31	*	P

Metals

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LABORATORY CONTROL SAMPLE SUMMARY

Client: Core Environmental Consultants and Service

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
PB170777BS							
Aluminum	mg/Kg	100	101		101	80 - 120	P
Antimony	mg/Kg	40.0	39.8		100	80 - 120	P
Arsenic	mg/Kg	40.0	39.1		98	80 - 120	P
Barium	mg/Kg	10.0	10.1		101	80 - 120	P
Beryllium	mg/Kg	10.0	10.2		102	80 - 120	P
Cadmium	mg/Kg	10.0	9.61		96	80 - 120	P
Calcium	mg/Kg	50.0	47.6	J	95	80 - 120	P
Chromium	mg/Kg	20.0	19.6		98	80 - 120	P
Cobalt	mg/Kg	10.0	9.61		96	80 - 120	P
Copper	mg/Kg	15.0	15.4		103	80 - 120	P
Iron	mg/Kg	150	147		98	80 - 120	P
Lead	mg/Kg	50.0	47.3		95	80 - 120	P
Magnesium	mg/Kg	100	99.5	J	100	80 - 120	P
Manganese	mg/Kg	10.0	10.4		104	80 - 120	P
Nickel	mg/Kg	25.0	24.5		98	80 - 120	P
Potassium	mg/Kg	500	479		96	80 - 120	P
Selenium	mg/Kg	100	102		102	80 - 120	P
Silver	mg/Kg	3.8	3.56		94	80 - 120	P
Sodium	mg/Kg	150	154		103	80 - 120	P
Thallium	mg/Kg	100	92.3		92	80 - 120	P
Vanadium	mg/Kg	15.0	15.0		100	80 - 120	P
Zinc	mg/Kg	10.0	10.4		104	80 - 120	P

Metals

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LABORATORY CONTROL SAMPLE SUMMARY

Client: Core Environmental Consultants and Service

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
PB170840BS Mercury	mg/Kg	0.25	0.25		101	80 - 120	CV

Metals

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ICP SERIAL DILUTIONS

SAMPLE NO.

B50-SP3-111925L

Lab Name: Alliance

Contract: CORE02

Lab Code: ACE

Lb No.: lb138128

Lab Sample ID : Q3741-01L

SDG No.: Q3741

Matrix (soil/water): Solid

Level (low/med): LOW

Concentration Units: mg/Kg

Analyte	Initial Sample Result (I) C	Serial Dilution Result (S) C	% Differ- ence	Q	M
Mercury	0.68 OR	0.62	9		CV

Metals
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ICP SERIAL DILUTIONS

SAMPLE NO.

FENCE WC-1L

Lab Name: Alliance Contract: CORE02
Lab Code: ACE Lb No.: lb138085 Lab Sample ID : Q3750-01L SDG No.: Q3741
Matrix (soil/water): Solid Level (low/med): LOW
Concentration Units: mg/Kg

Analyte	Initial Sample Result (I)		Serial Dilution Result (S)		% Differ- ence	Q	M
Aluminum	3380		3780		12		P
Antimony	2.63	U	13.2	U			P
Arsenic	6.04		6.74		12		P
Barium	24.4		26.7		9		P
Beryllium	0.28	J	0.29	J	3		P
Cadmium	0.37		0.30	J	20		P
Calcium	788		861		9		P
Chromium	9.32		10.3		10		P
Cobalt	2.65		2.76	J	4		P
Copper	14.3		16.1		12		P
Iron	8530		9500		11		P
Lead	114		120		5		P
Magnesium	720		805		12		P
Manganese	174		196		12		P
Nickel	6.28		6.42	J	2		P
Potassium	282		310	J	10		P
Selenium	1.05	U	5.26	U			P
Silver	0.58		2.63	U	100.0		P
Sodium	103	J	124	J	20		P
Thallium	2.10	U	10.5	U			P
Vanadium	10.8		12.4		15		P
Zinc	65.2		74.4		14		P



METAL PREPARATION & INSTRUMENT DATA

Metals

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ICP INTERELEMEN CORRECTION FACTORS

Client: Core Environmental Consultants and Service

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Instrument ID:

Date:

Interement Correction Factors (apparent ppb analyte/ppm interferent)

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

Metals

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ICP INTERELEMENT CORRECTION FACTORS

Client: Core Environmental Consultants and Service

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Instrument ID:

Date:

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

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

Metals

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ICP INTERELEMEN CORRECTION FACTORS

Client: Core Environmental Consultants and Service

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Instrument ID:

Date:

Interement Correction Factors (apparent ppb analyte/ppm interferent)

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

Metals

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ICP INTERELEMENT CORRECTION FACTORS

Client: Core Environmental Consultants and Service

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Instrument ID:

Date:

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

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

Metals

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ICP INTERELEMENT CORRECTION FACTORS

Client: Core Environmental Consultants and Service

SDG No.: Q3741

Contract: CORE02

Lab Code: ACE

Instrument ID:

Date:

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

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



METAL PREPARATION & ANALYICAL SUMMARY

Metals

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SAMPLE PREPARATION SUMMARY

Client: Core Environmental Consultants and Service **SDG No.:** Q3741
Contract: CORE02 **Lab Code:** ACE **Method:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(g)	Final Sample Volume (mL)	Percent Solids
Batch Number: PB170777							
PB170777BL	PB170777BL	MB	SOLID	12/02/2025	2.00	100.0	100.00
PB170777BS	PB170777BS	LCS	SOLID	12/02/2025	2.00	100.0	100.00
Q3741-01	B50-SP3-111925	SAM	SOLID	12/02/2025	2.28	100.0	91.60
Q3741-02	B50-SP13-112025	SAM	SOLID	12/02/2025	2.25	100.0	86.40
Q3741-03	B50-SP14-112025	SAM	SOLID	12/02/2025	2.11	100.0	87.30
Q3741-04	B50-SP9-112425	SAM	SOLID	12/02/2025	2.26	100.0	85.20
Q3741-05	B50-SP11-112525	SAM	SOLID	12/02/2025	2.07	100.0	84.60
Q3741-06	B50-SP4-112525	SAM	SOLID	12/02/2025	2.42	100.0	85.90
Q3750-01DUP	FENCE WC-1DUP	DUP	SOLID	12/02/2025	2.18	100.0	86.80
Q3750-01MS	FENCE WC-1MS	MS	SOLID	12/02/2025	2.15	100.0	86.80
Q3750-01MSD	FENCE WC-1MSD	MSD	SOLID	12/02/2025	2.17	100.0	86.80

Metals

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SAMPLE PREPARATION SUMMARY

Client: Core Environmental Consultants and Service **SDG No.:** Q3741
Contract: CORE02 **Lab Code:** ACE **Method:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(g)	Final Sample Volume (mL)	Percent Solids
Batch Number: PB170840							
PB170840BL	PB170840BL	MB	SOLID	12/05/2025	0.52	35.0	100.00
PB170840BS	PB170840BS	LCS	SOLID	12/05/2025	0.57	35.0	100.00
Q3741-01	B50-SP3-111925	SAM	SOLID	12/05/2025	0.59	35.0	91.60
Q3741-01DUP	B50-SP3-111925DUP	DUP	SOLID	12/05/2025	0.56	35.0	91.60
Q3741-01MS	B50-SP3-111925MS	MS	SOLID	12/05/2025	0.57	35.0	91.60
Q3741-01MSD	B50-SP3-111925MSD	MSD	SOLID	12/05/2025	0.55	35.0	91.60
Q3741-02	B50-SP13-112025	SAM	SOLID	12/05/2025	0.55	35.0	86.40
Q3741-03	B50-SP14-112025	SAM	SOLID	12/05/2025	0.57	35.0	87.30
Q3741-04	B50-SP9-112425	SAM	SOLID	12/05/2025	0.59	35.0	85.20
Q3741-05	B50-SP11-112525	SAM	SOLID	12/05/2025	0.57	35.0	84.60
Q3741-06	B50-SP4-112525	SAM	SOLID	12/05/2025	0.53	35.0	85.90

metals
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ANALYSIS RUN LOG

Client: Core Environmental Consultants and Servic

Contract: CORE02

Lab code: ACE

Sdg no.: Q3741

Instrument id number:

Method:

Run number: LB138085

Start date: 12/02/2025

End date: 12/02/2025

Lab sample id.	Client Sample Id	d/f	Time	Parameter list
S0	S0	1	1104	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
S1	S1	1	1108	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
S2	S2	1	1112	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
S3	S3	1	1116	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
S4	S4	1	1121	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
S5	S5	1	1125	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
ICV01	ICV01	1	1129	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
LLICV01	LLICV01	1	1134	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
ICB01	ICB01	1	1138	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
CRI01	CRI01	1	1142	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
ICSA01	ICSA01	1	1152	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
ICSAB01	ICSAB01	1	1157	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
CCV01	CCV01	1	1210	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
CCB01	CCB01	1	1214	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
CCV02	CCV02	1	1313	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
CCB02	CCB02	1	1317	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
PB170777BL	PB170777BL	1	1326	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
PB170777BS	PB170777BS	1	1330	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
Q3741-01	B50-SP3-111925	1	1403	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
Q3741-02	B50-SP13-112025	1	1407	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
CCV03	CCV03	1	1411	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
CCB03	CCB03	1	1415	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
Q3741-03	B50-SP14-112025	1	1424	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
Q3741-04	B50-SP9-112425	1	1428	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
Q3741-05	B50-SP11-112525	1	1433	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
Q3741-06	B50-SP4-112525	1	1447	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
Q3750-01DUP	FENCE WC-1DUP	1	1455	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
Q3750-01L	FENCE WC-1L	5	1459	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
Q3750-01MS	FENCE WC-1MS	1	1503	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
Q3750-01MSD	FENCE WC-1MSD	1	1507	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
Q3750-01A	FENCE WC-1A	1	1511	Ba,Cu,Na,Pb,Sb,V
CCV04	CCV04	1	1515	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
CCB04	CCB04	1	1520	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
CCV05	CCV05	1	1605	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
CCB05	CCB05	1	1609	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
CCV06	CCV06	1	1655	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn
CCB06	CCB06	1	1659	Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn

metals
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ANALYSIS RUN LOG

Client: Core Environmental Consultants and Service

Contract: CORE02

Lab code: ACE

Sdg no.: Q3741

Instrument id number: _____

Method: _____

Run number: LB138128

Start date: 12/05/2025

End date: 12/05/2025

Lab sample id.	Client Sample Id	d/f	Time	Parameter list
S0	S0	1	1353	HG
S0.2	S0.2	1	1355	HG
S2.5	S2.5	1	1358	HG
S5	S5	1	1400	HG
S7.5	S7.5	1	1402	HG
S10	S10	1	1405	HG
ICV141	ICV141	1	1412	HG
ICB141	ICB141	1	1414	HG
CCV71	CCV71	1	1416	HG
CCB71	CCB71	1	1419	HG
CRA	CRA	1	1421	HG
PB170840BL	PB170840BL	1	1428	HG
PB170840BS	PB170840BS	1	1432	HG
Q3741-01DUP	B50-SP3-111925DUP	1	1437	HG
CCV72	CCV72	1	1454	HG
CCB72	CCB72	1	1456	HG
Q3741-05	B50-SP11-112525	1	1503	HG
Q3741-01L	B50-SP3-111925L	5	1515	HG
CCV73	CCV73	1	1523	HG
CCB73	CCB73	1	1525	HG

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ANALYSIS RUN LOG

Client: Core Environmental Consultants and Service

Contract: CORE02

Lab code: ACE

Sdg no.: Q3741

Instrument id number: _____

Method: _____

Run number: LB138165

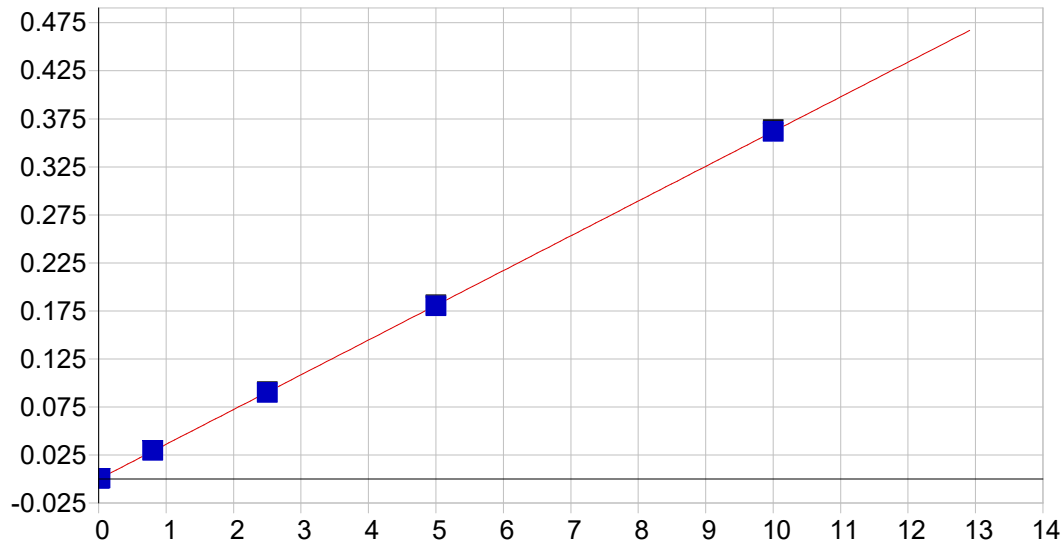
Start date: 12/09/2025

End date: 12/09/2025

Lab sample id.	Client Sample Id	d/f	Time	Parameter list
S0	S0	1	1110	HG
S0.2	S0.2	1	1113	HG
S2.5	S2.5	1	1115	HG
S5	S5	1	1117	HG
S7.5	S7.5	1	1119	HG
S10	S10	1	1125	HG
ICV147	ICV147	1	1128	HG
ICB147	ICB147	1	1130	HG
CCV84	CCV84	1	1133	HG
CCB84	CCB84	1	1135	HG
CRA	CRA	1	1140	HG
CCV85	CCV85	1	1203	HG
CCB85	CCB85	1	1205	HG
CCV86	CCV86	1	1240	HG
CCB86	CCB86	1	1243	HG
Q3741-01	B50-SP3-111925	2	1245	HG
Q3741-01MS	B50-SP3-111925MS	2	1252	HG
Q3741-01MSD	B50-SP3-111925MSD	2	1255	HG
Q3741-01A	B50-SP3-111925A	2	1303	HG
Q3741-02	B50-SP13-112025	5	1306	HG
Q3741-03	B50-SP14-112025	5	1308	HG
Q3741-04	B50-SP9-112425	5	1310	HG
Q3741-06	B50-SP4-112525	5	1313	HG
CCV87	CCV87	1	1315	HG
CCB87	CCB87	1	1317	HG



METAL RAW DATA

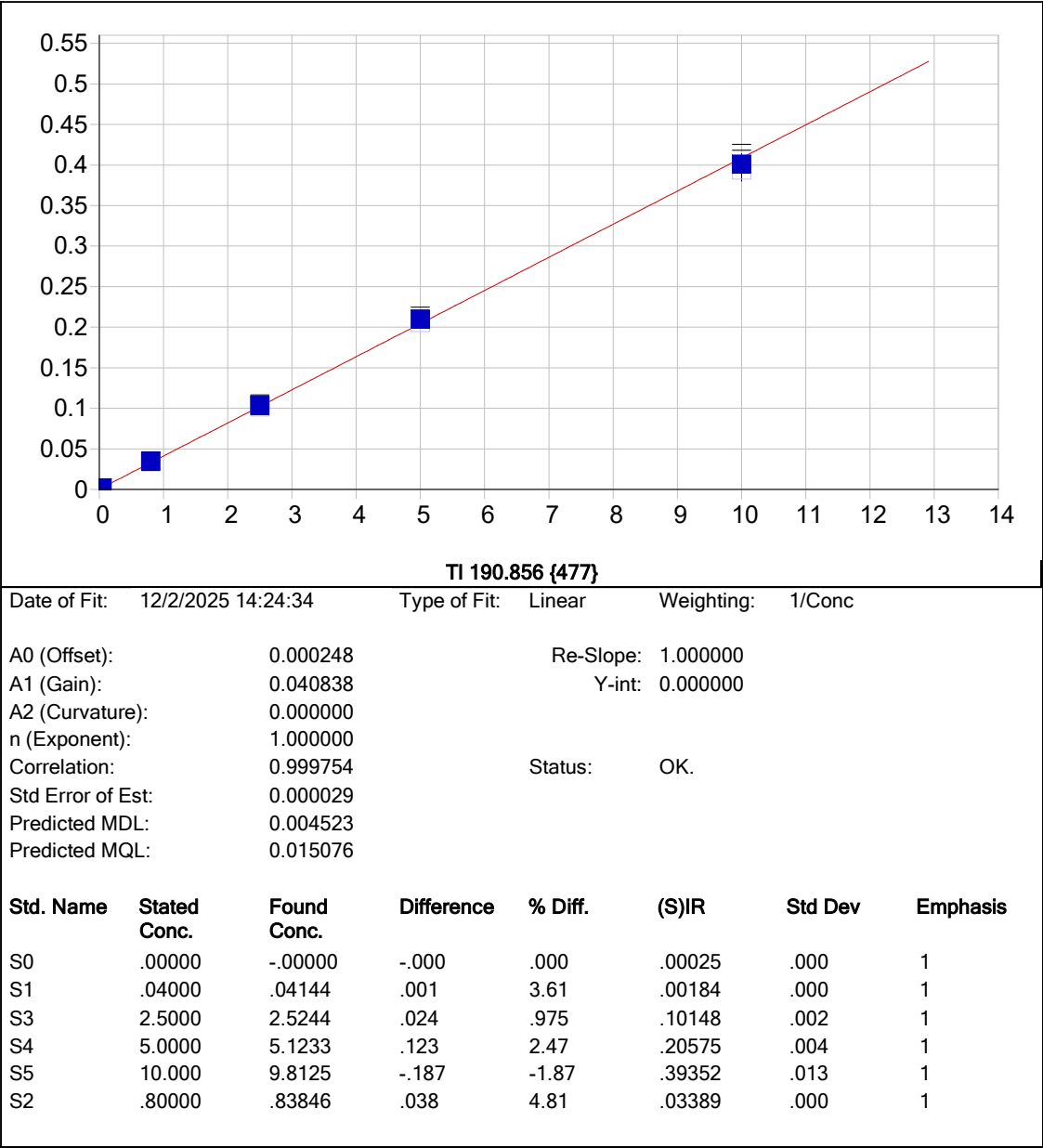


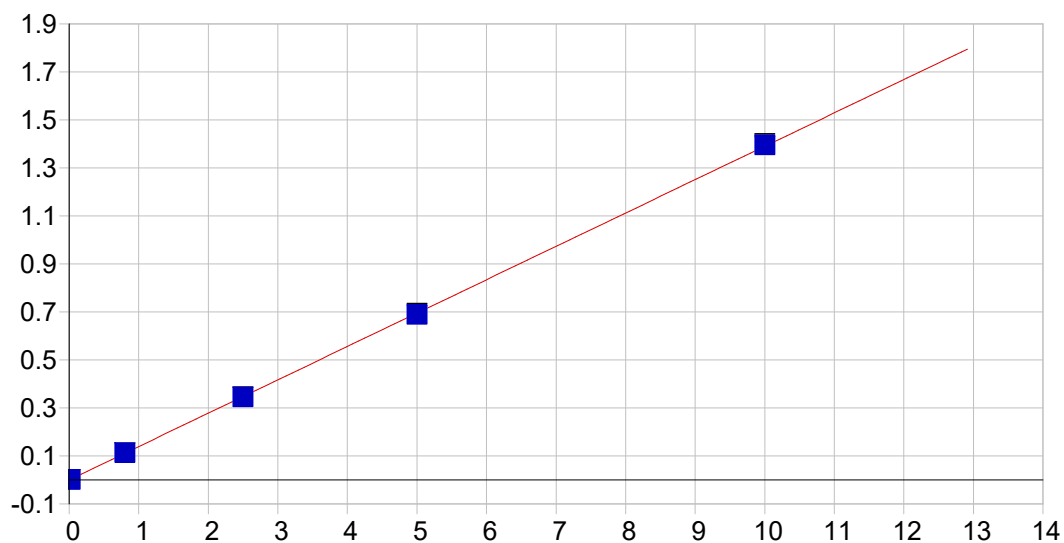
As 189.042 {479}

Date of Fit: 12/2/2025 14:24:34 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.000086 Re-Slope: 1.000000
A1 (Gain): 0.036179 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999972 Status: OK.
Std Error of Est: 0.000006
Predicted MDL: 0.004118
Predicted MQL: 0.013727

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	-.00009	.000	1
S1	.02000	.02290	.003	14.5	.00074	.000	1
S3	2.5000	2.4920	-.008	-.320	.08998	.001	1
S4	5.0000	4.9809	-.019	-.383	.17994	.001	1
S5	10.000	10.004	.004	.040	.36150	.002	1
S2	.80000	.82019	.020	2.52	.02956	.000	1



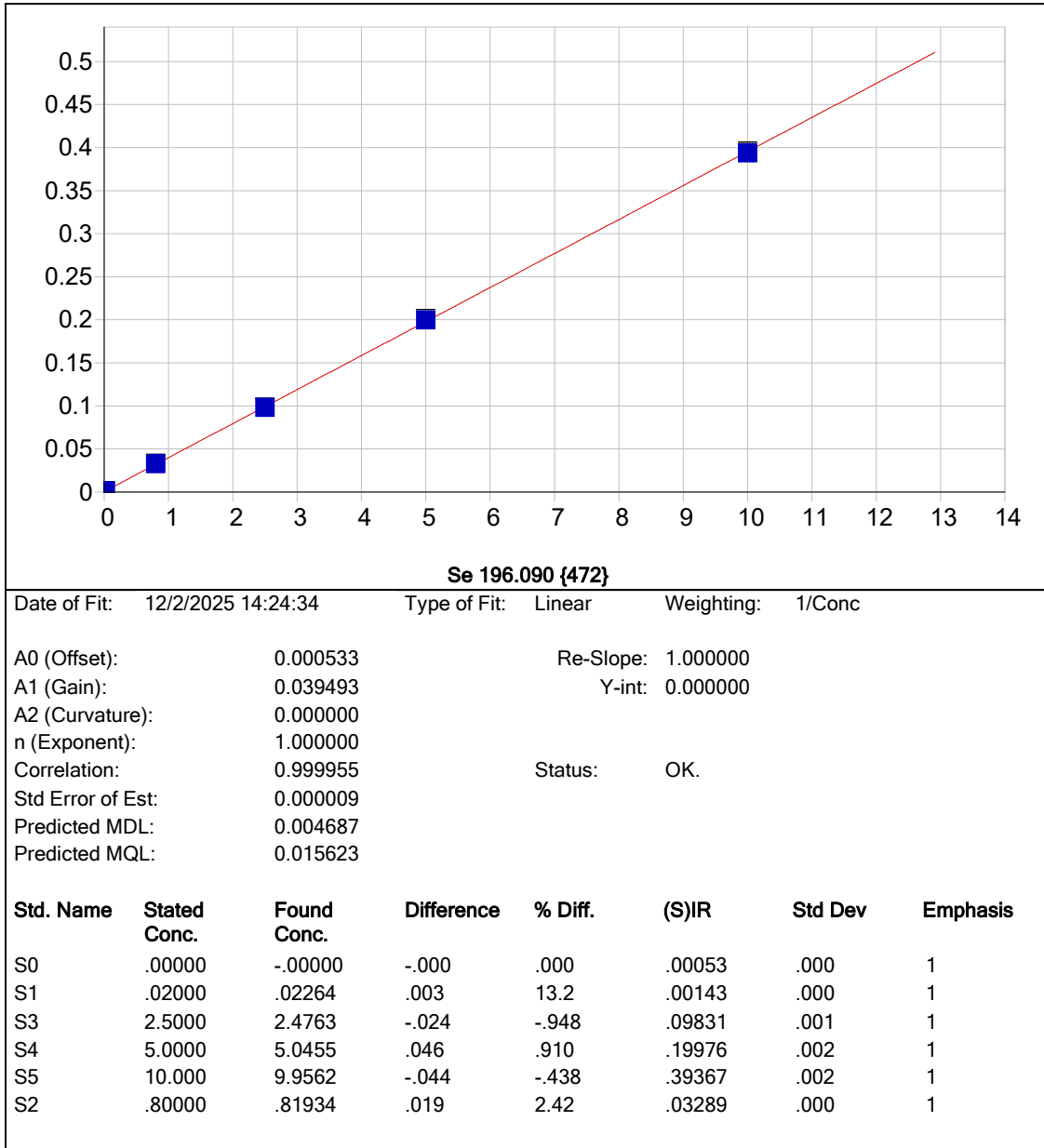


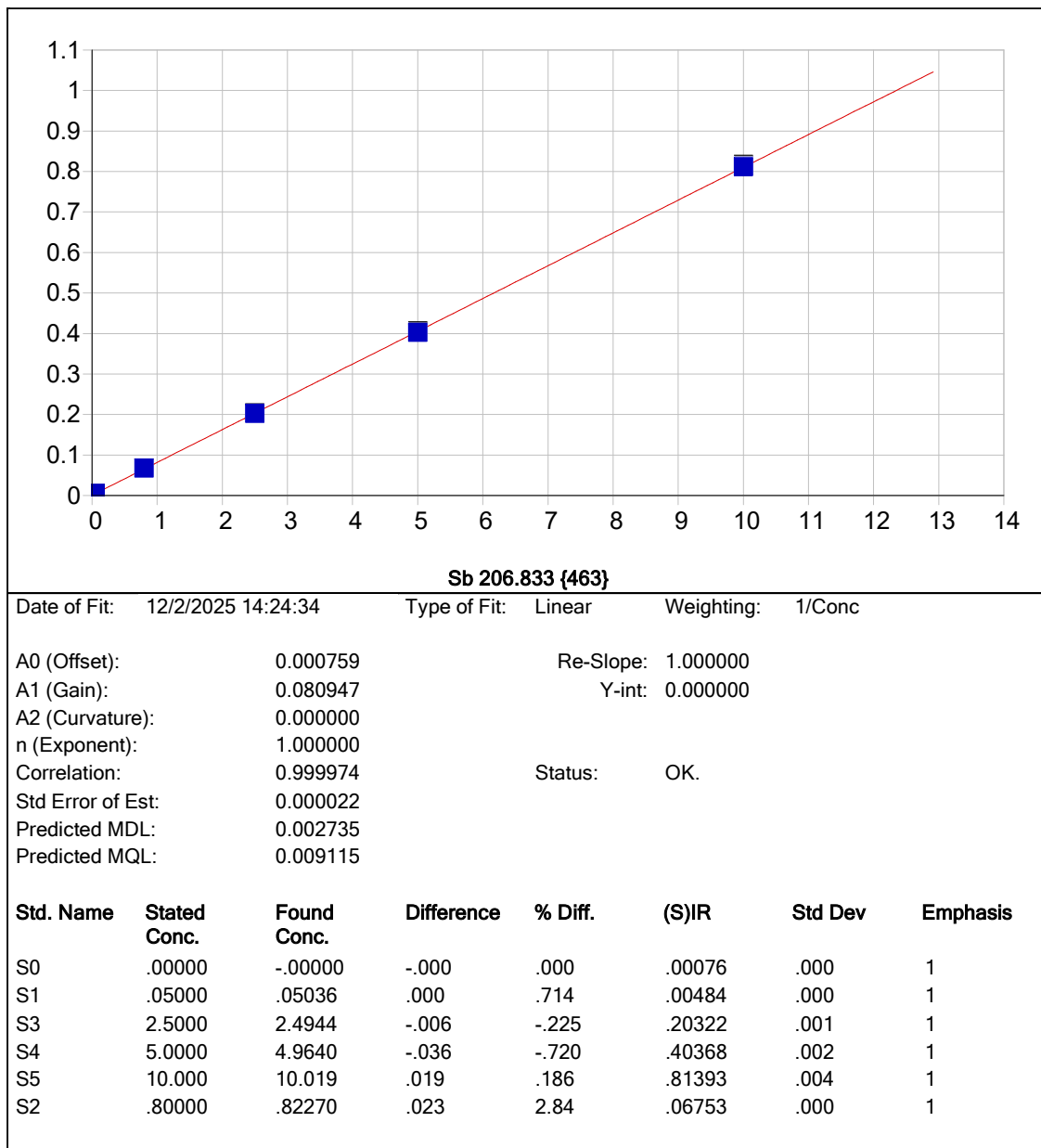
Pb 220.353 {453}

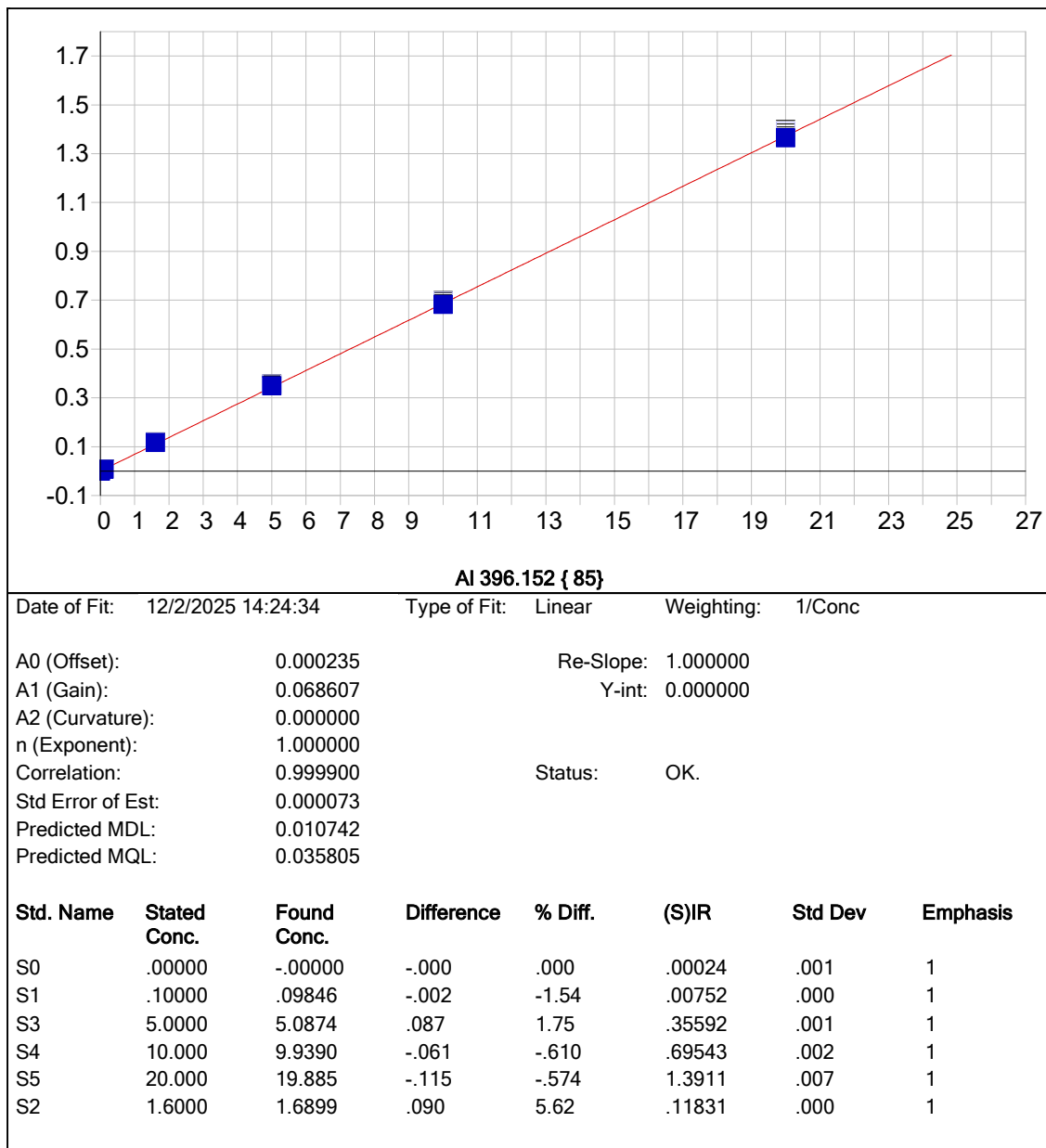
Date of Fit: 12/2/2025 14:24:34 Type of Fit: Linear Weighting: 1/Conc

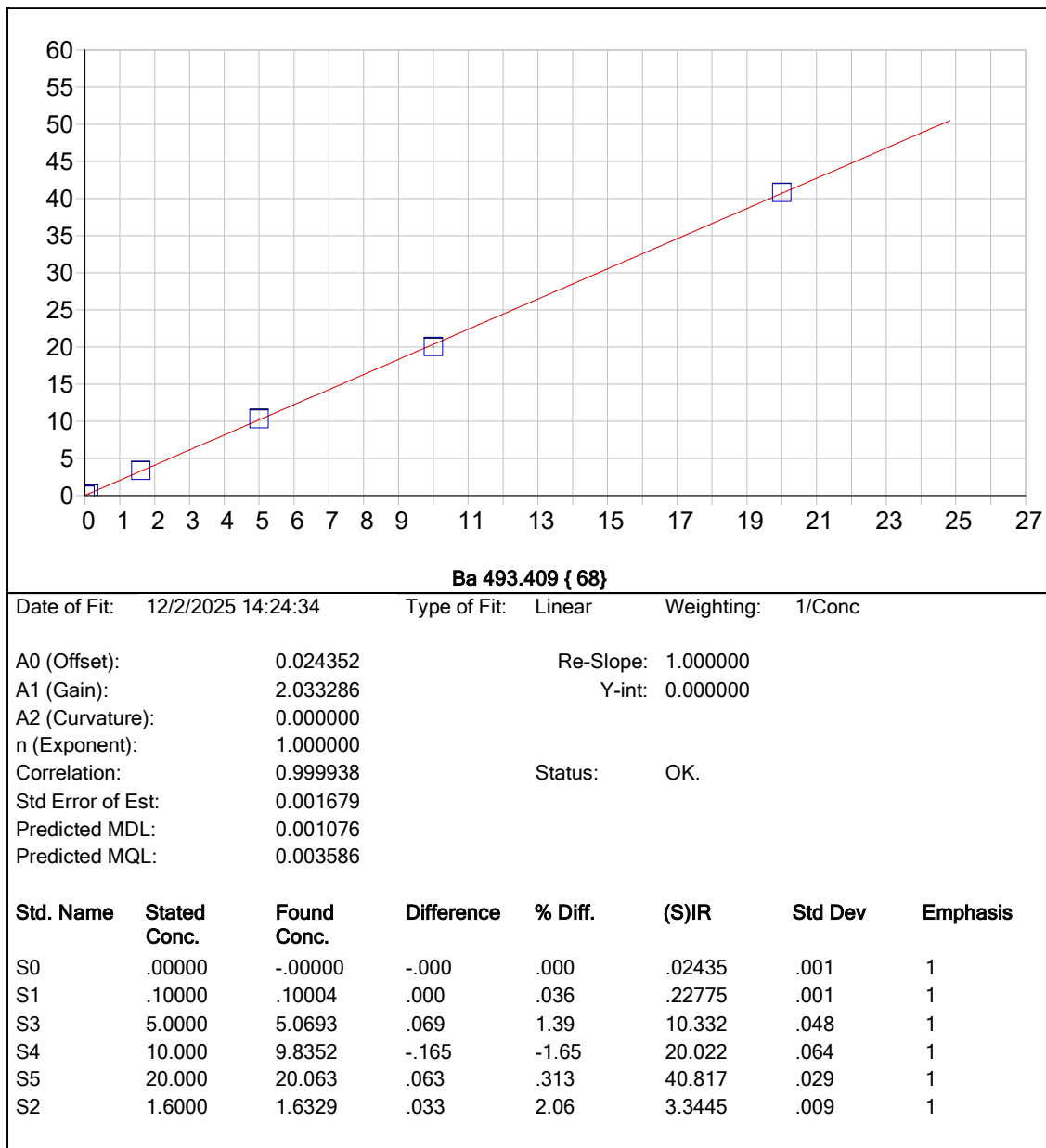
A0 (Offset): -0.000053 Re-Slope: 1.000000
A1 (Gain): 0.139020 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999979 Status: OK.
Std Error of Est: 0.000016
Predicted MDL: 0.002080
Predicted MQL: 0.006934

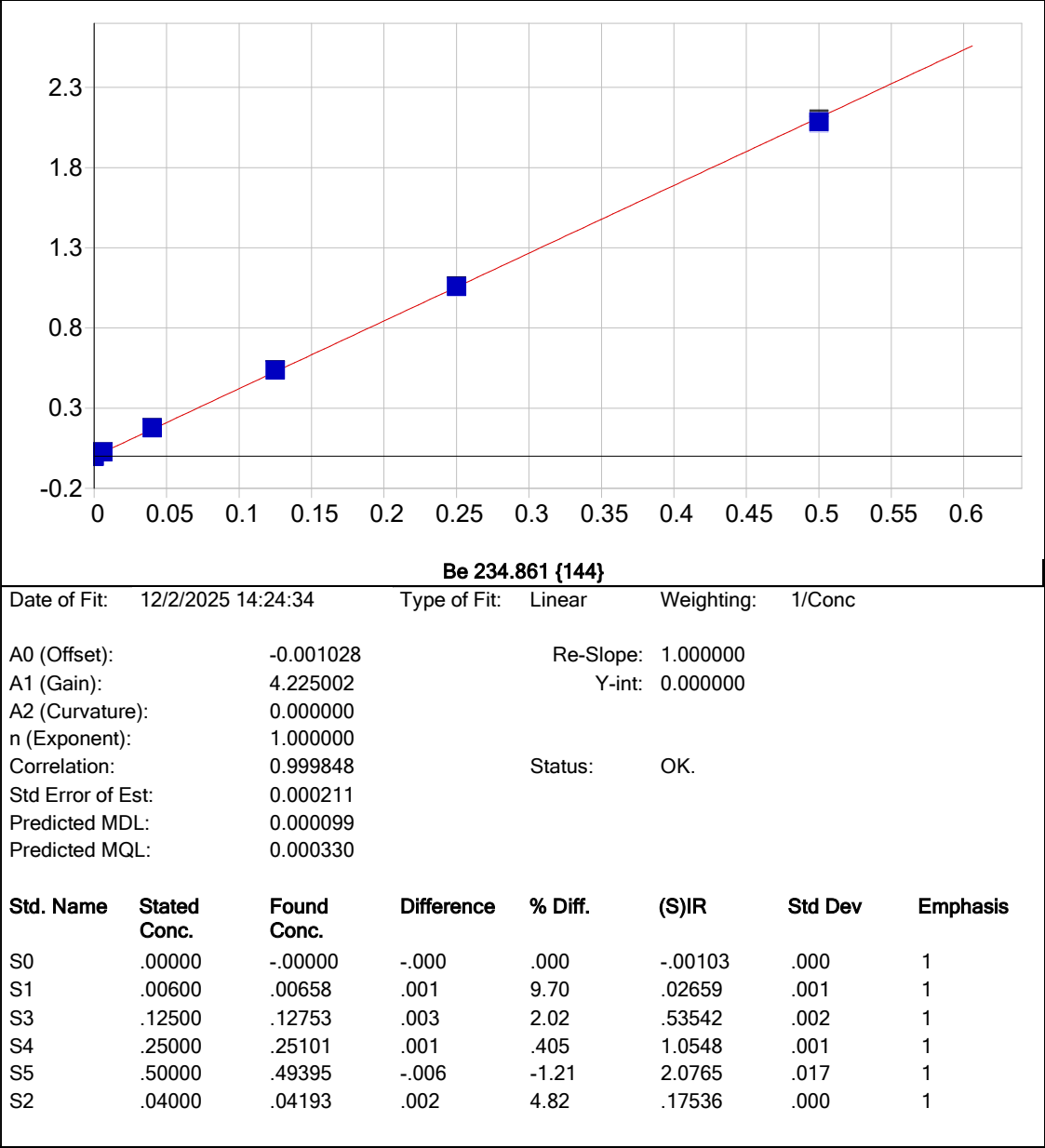
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	.00000	.000	.000	-.00005	.000	1
S1	.01200	.01154	-.000	-3.83	.00152	.000	1
S3	2.5000	2.4854	-.015	-.583	.34508	.001	1
S4	5.0000	4.9628	-.037	-.745	.68910	.005	1
S5	10.000	10.038	.038	.380	1.3939	.006	1
S2	.80000	.81430	.014	1.79	.11303	.000	1

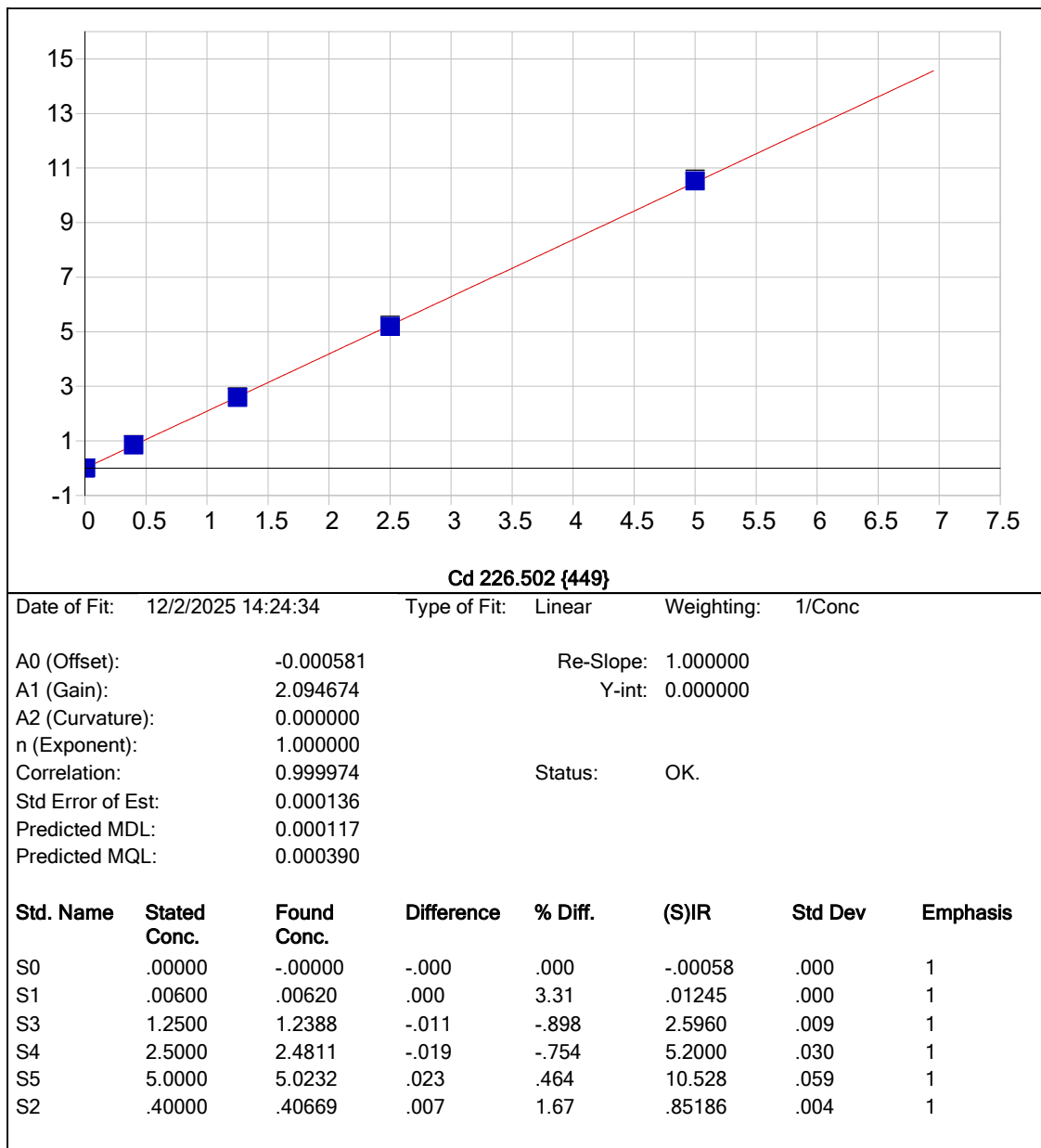


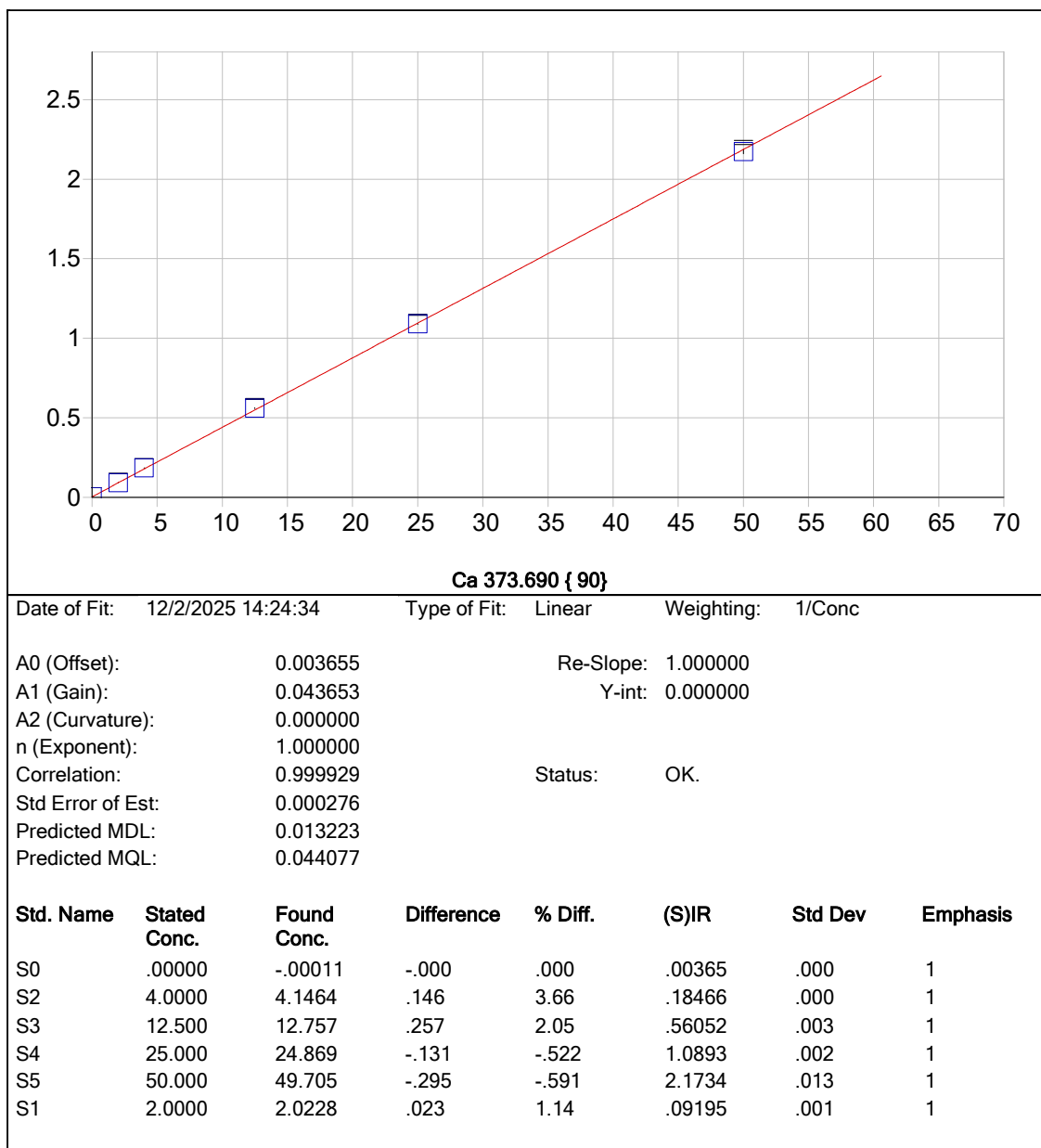


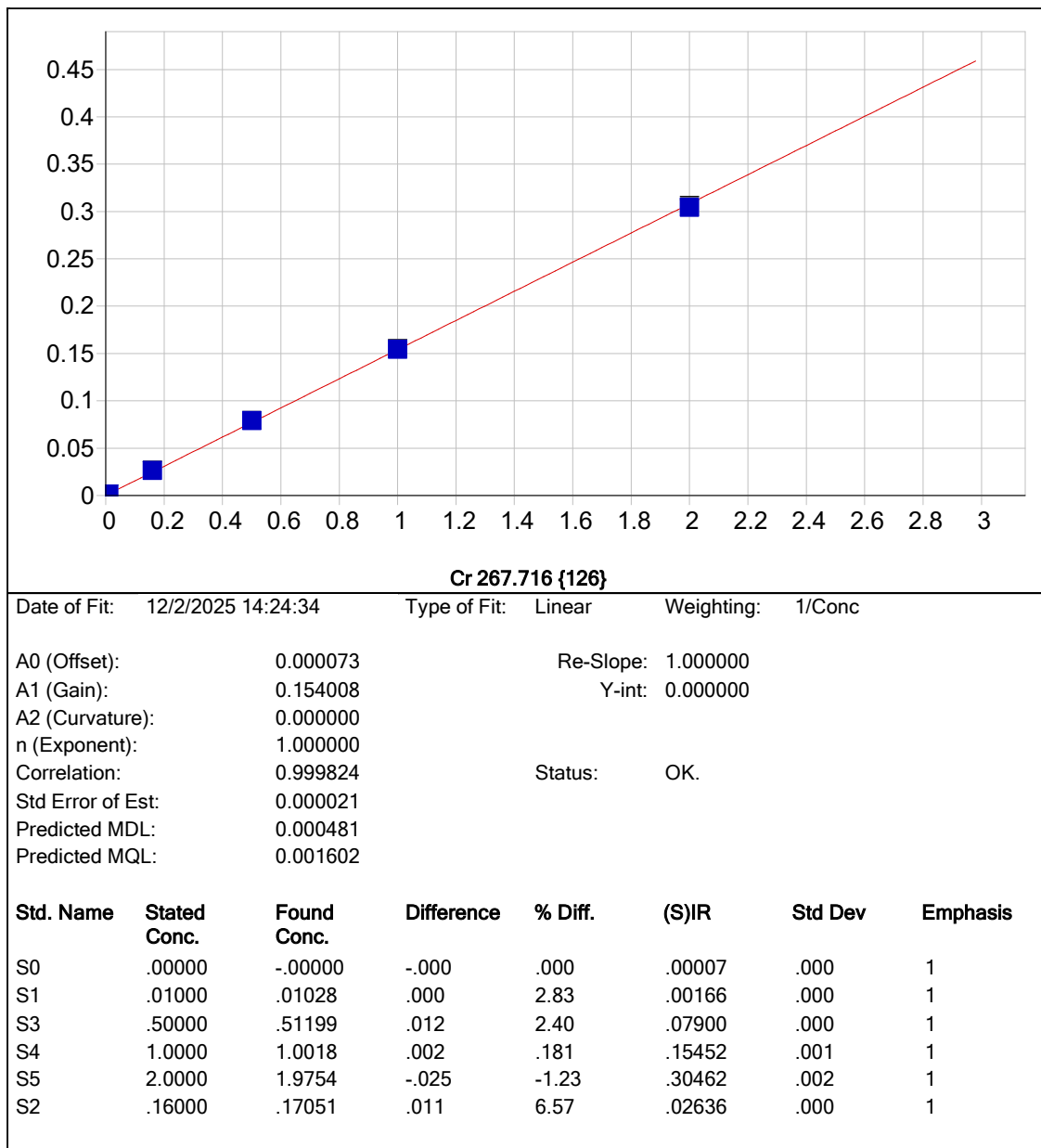


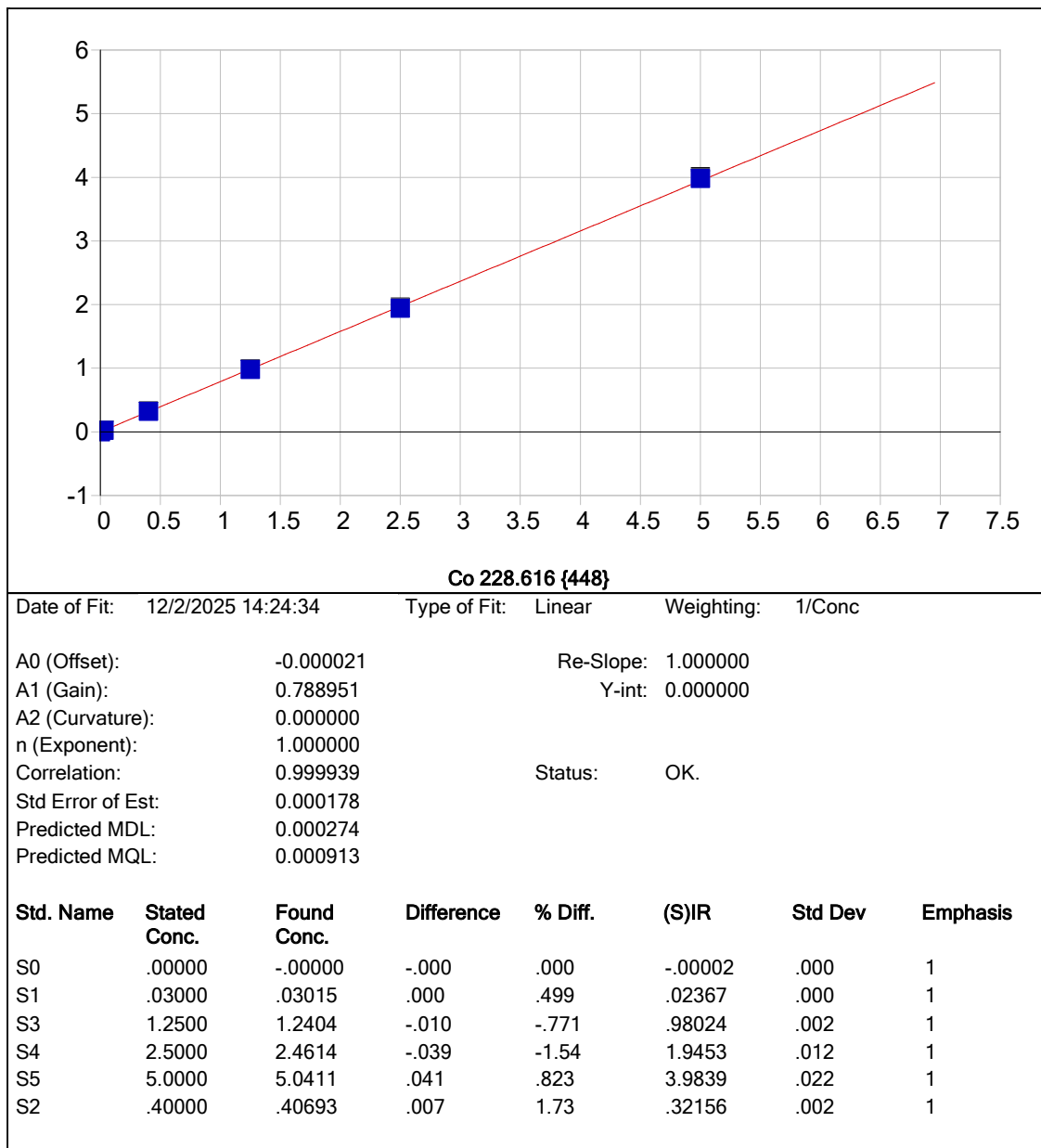


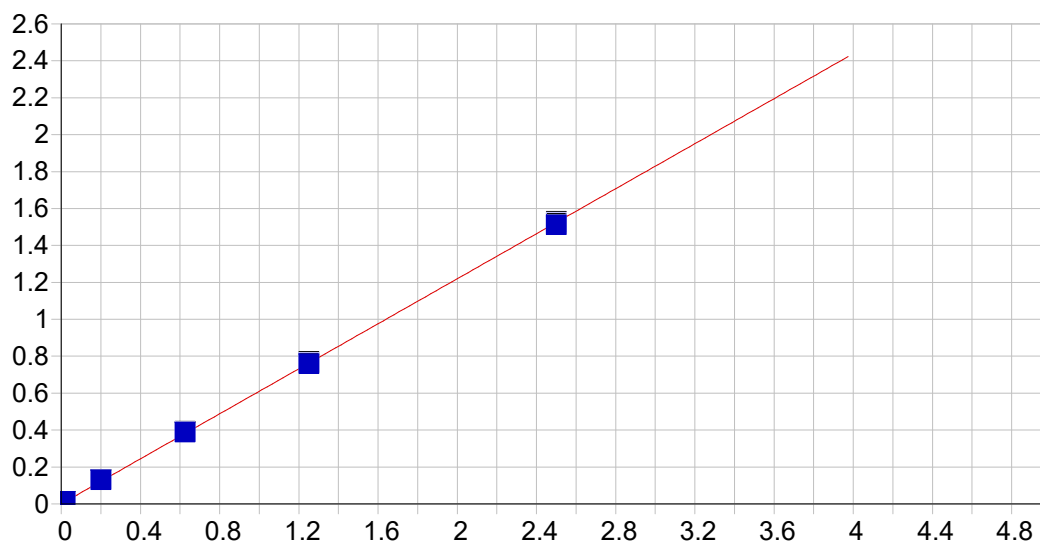










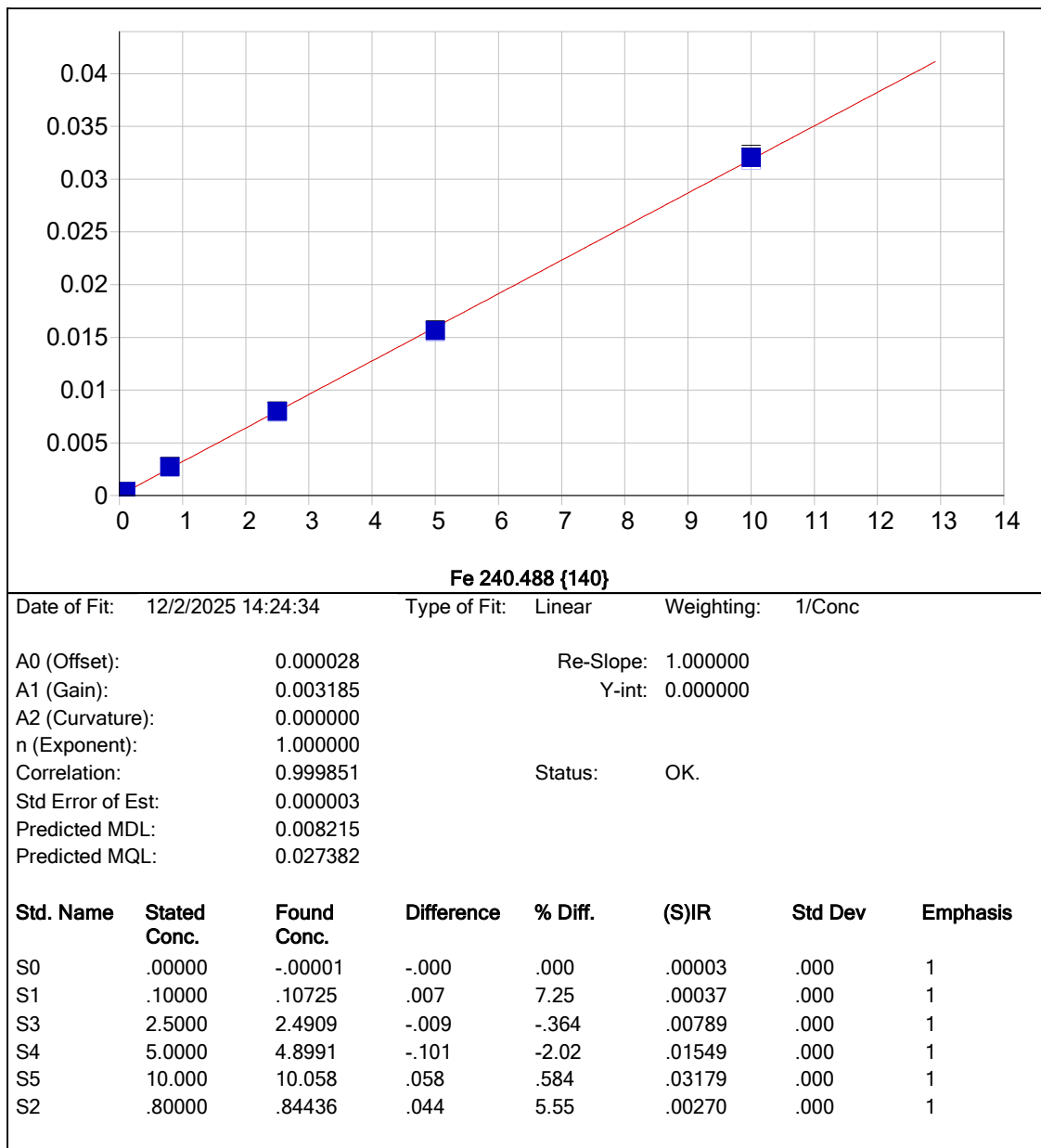


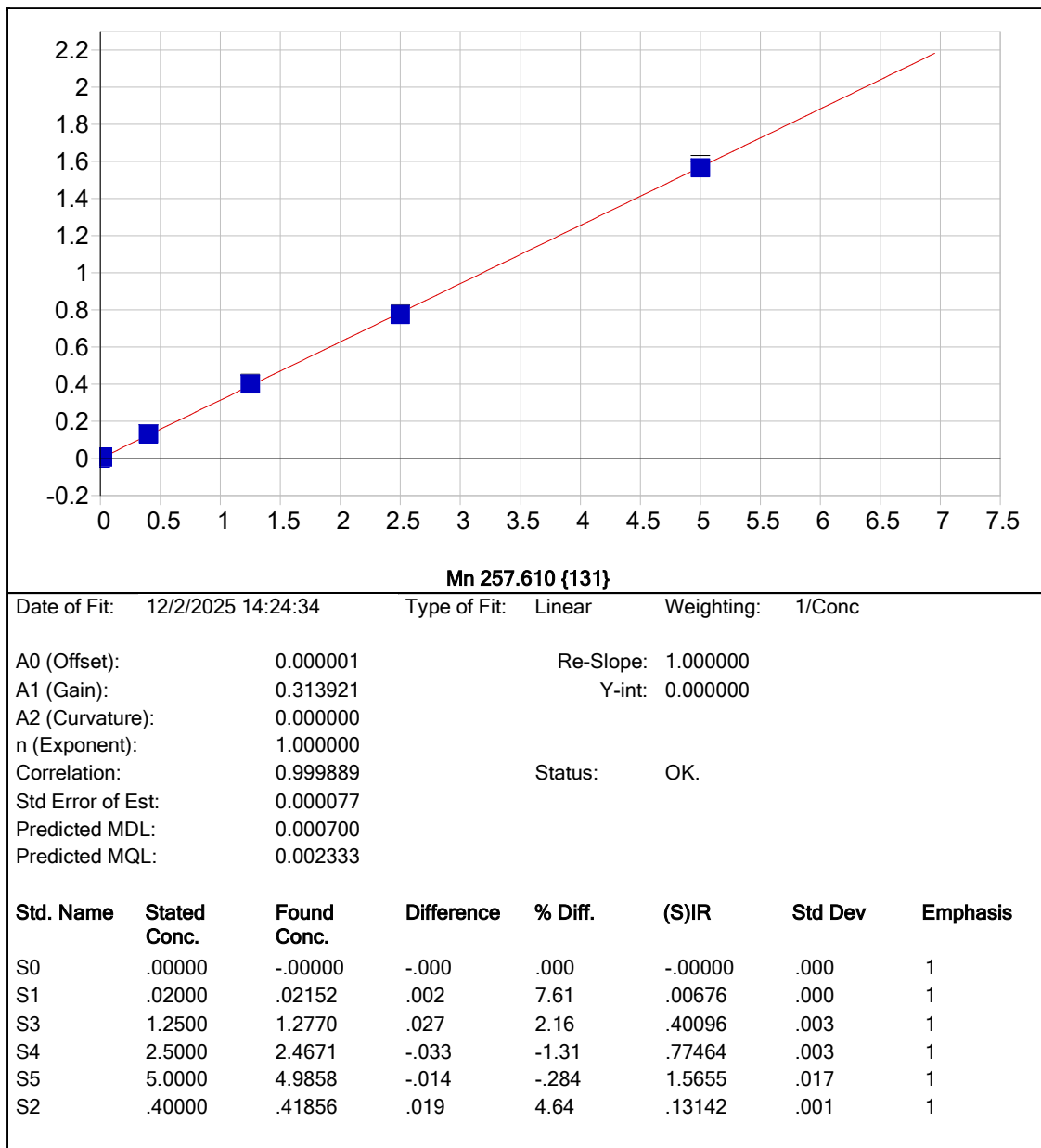
Cu 224.700 {450}

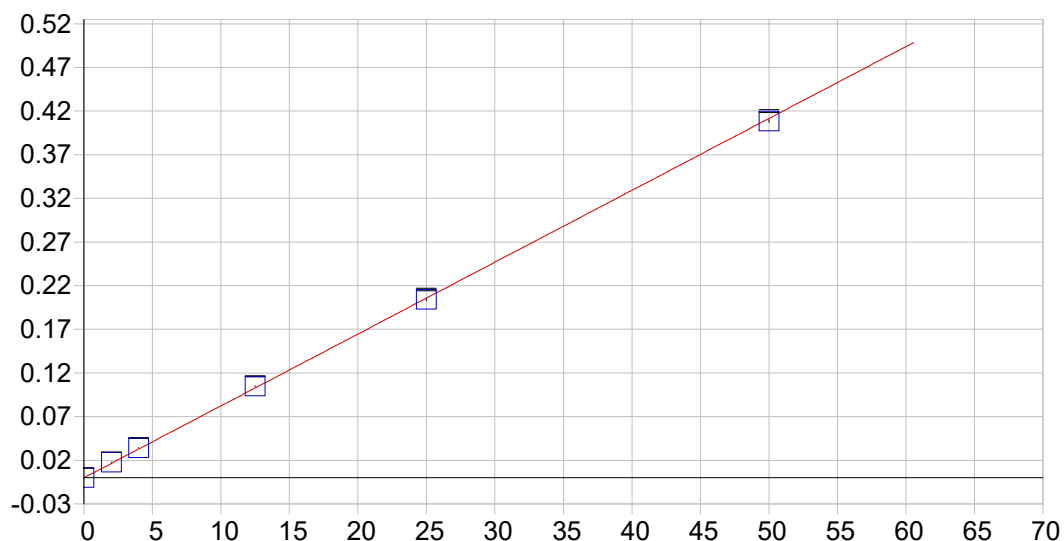
Date of Fit: 12/2/2025 14:24:34 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset):	0.000561	Re-Slope:	1.000000
A1 (Gain):	0.609590	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999860	Status:	OK.
Std Error of Est:	0.000121		
Predicted MDL:	0.000551		
Predicted MQL:	0.001836		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	.00056	.000	1
S1	.02000	.02178	.002	8.91	.01398	.000	1
S3	.62500	.63655	.012	1.85	.39186	.001	1
S4	1.2500	1.2459	-.004	-.332	.76655	.005	1
S5	2.5000	2.4786	-.021	-.854	1.5246	.006	1
S2	.20000	.21217	.012	6.09	.13094	.001	1





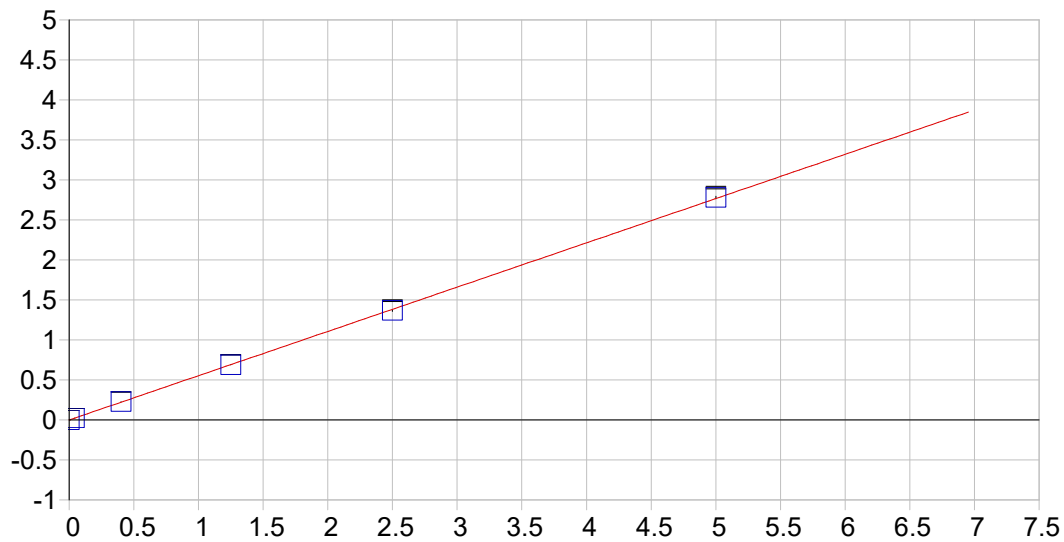


Mg 279.079 {121}

Date of Fit: 12/2/2025 14:24:34 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.000037 Re-Slope: 1.000000
A1 (Gain): 0.008232 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999843 Status: OK.
Std Error of Est: 0.000077
Predicted MDL: 0.034030
Predicted MQL: 0.113432

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00026	-.000	.000	-.00004	.000	1
S2	4.0000	4.1630	.163	4.08	.03423	.000	1
S3	12.500	12.728	.228	1.82	.10474	.001	1
S4	25.000	24.809	-.191	-.763	.20419	.002	1
S5	50.000	49.631	-.369	-.738	.40852	.002	1
S1	2.0000	2.1691	.169	8.45	.01782	.000	1

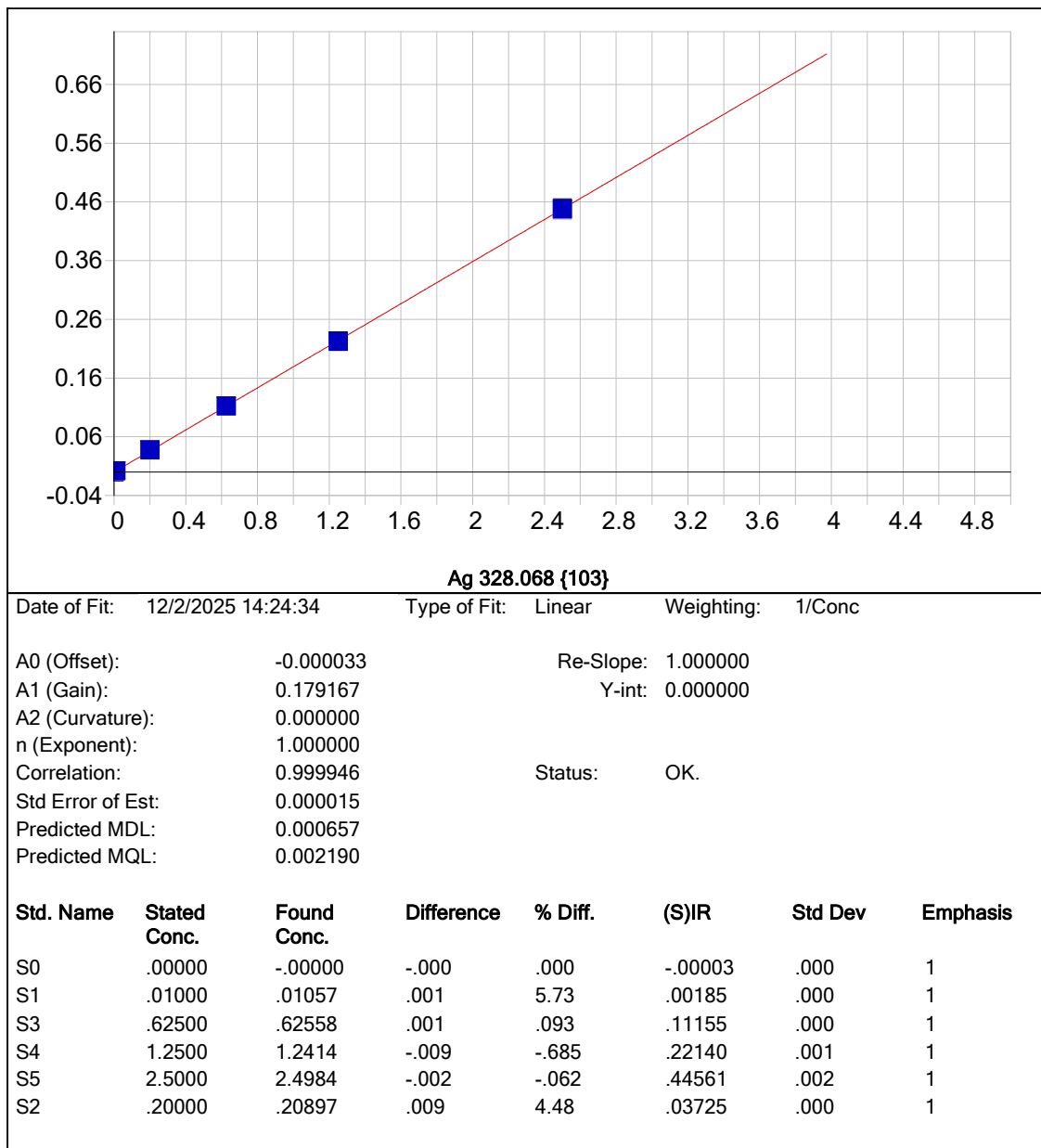


Ni 231.604 {446}

Date of Fit: 12/2/2025 14:24:34 Type of Fit: Linear Weighting: 1/Conc

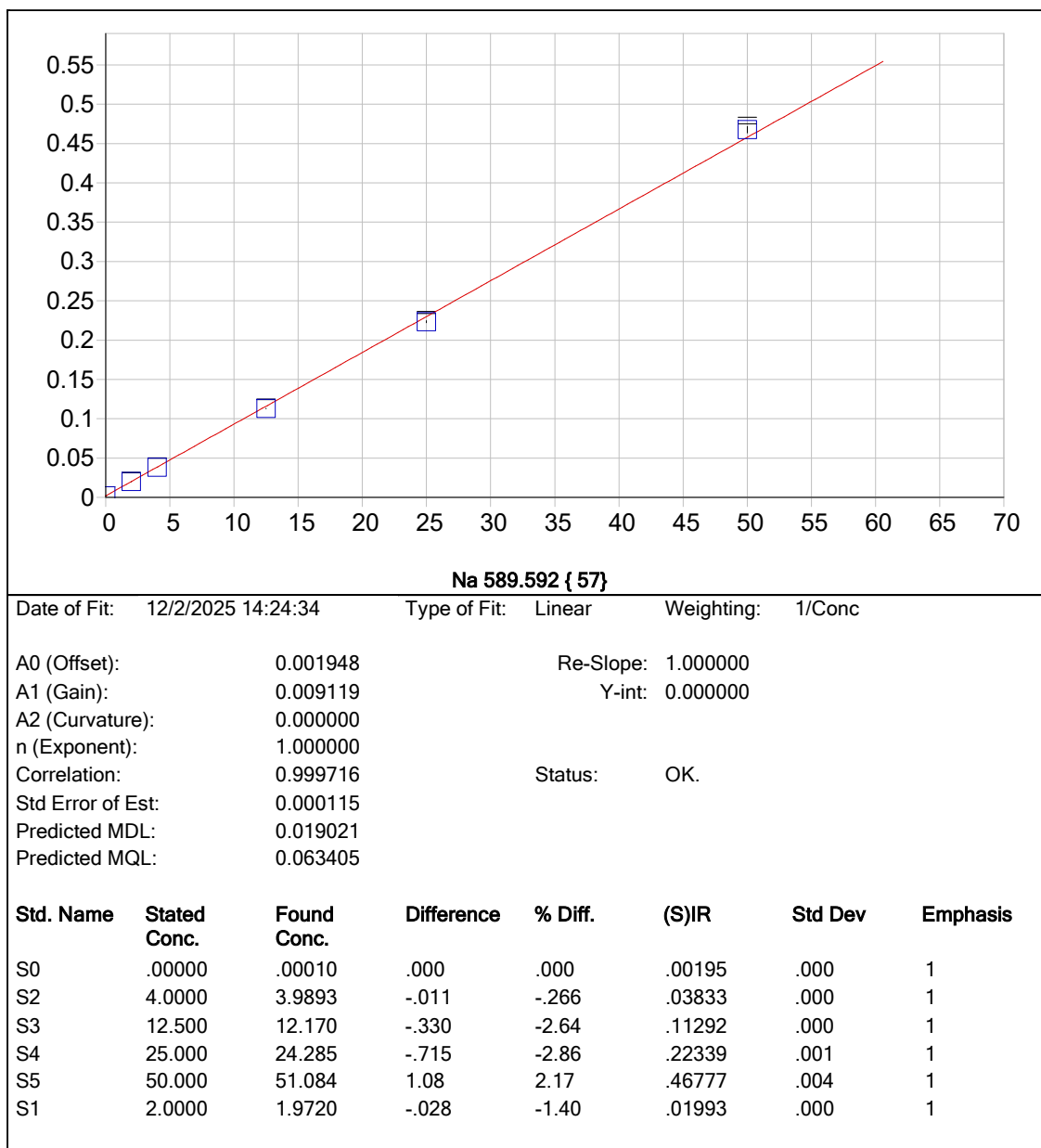
A0 (Offset): -0.000714 Re-Slope: 1.000000
A1 (Gain): 0.553457 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999957 Status: OK.
Std Error of Est: 0.000120
Predicted MDL: 0.000441
Predicted MQL: 0.001470

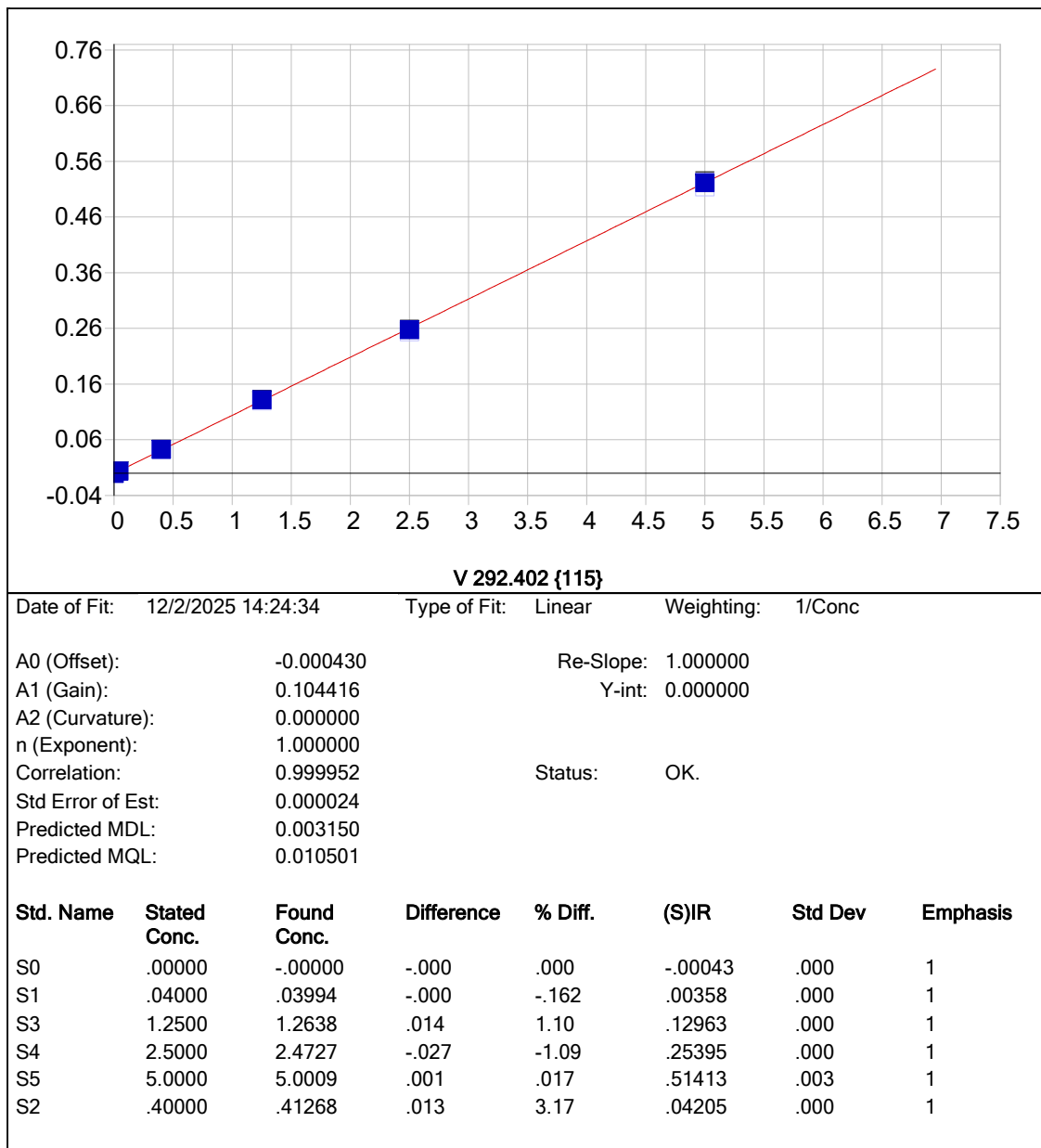
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	-.00071	.000	1
S1	.04000	.04115	.001	2.86	.02206	.000	1
S3	1.2500	1.2458	-.004	-.333	.68880	.002	1
S4	2.5000	2.4696	-.030	-1.22	1.3661	.008	1
S5	5.0000	5.0232	.023	.465	2.7794	.016	1
S2	.40000	.41019	.010	2.55	.22631	.001	1

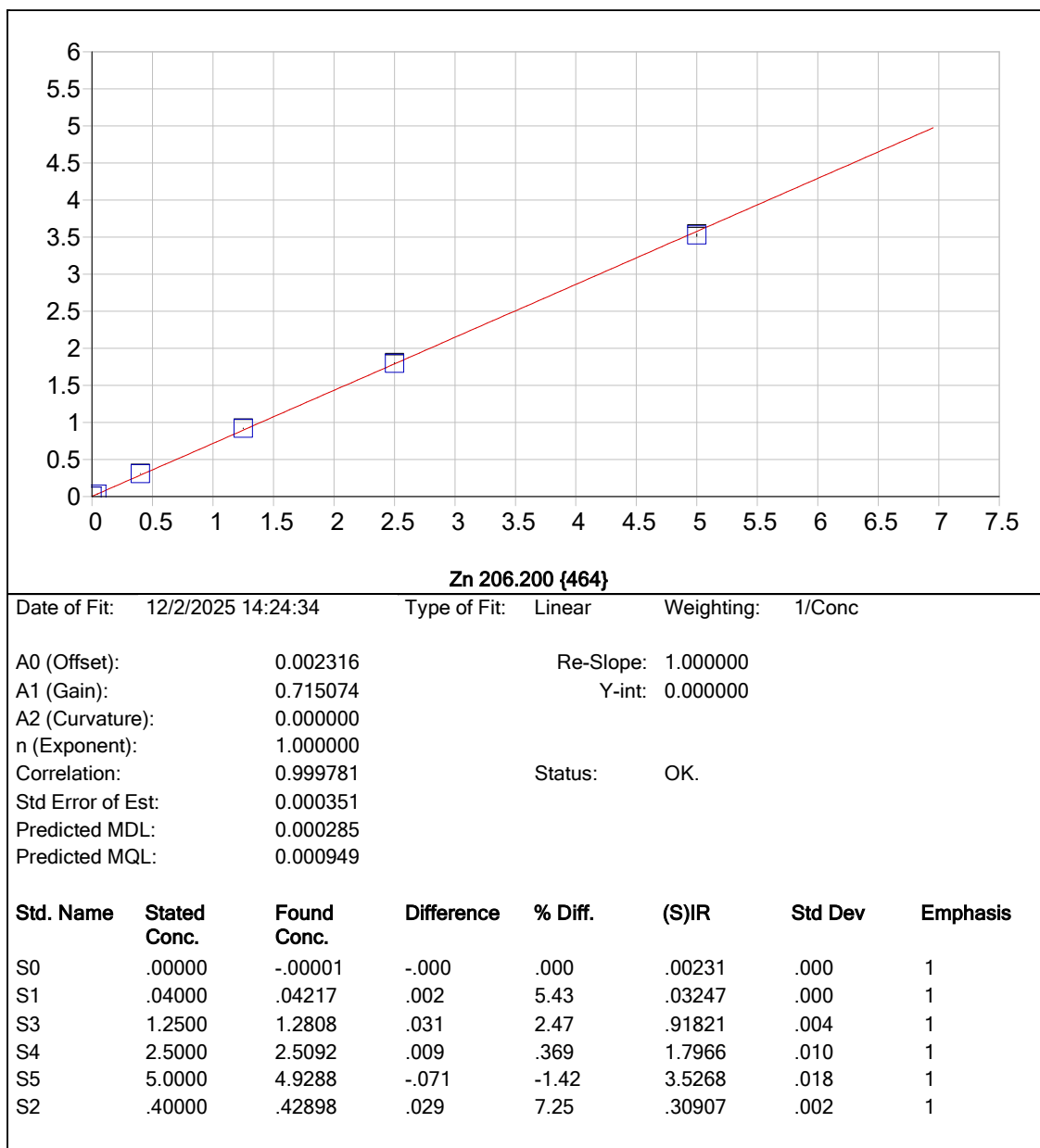


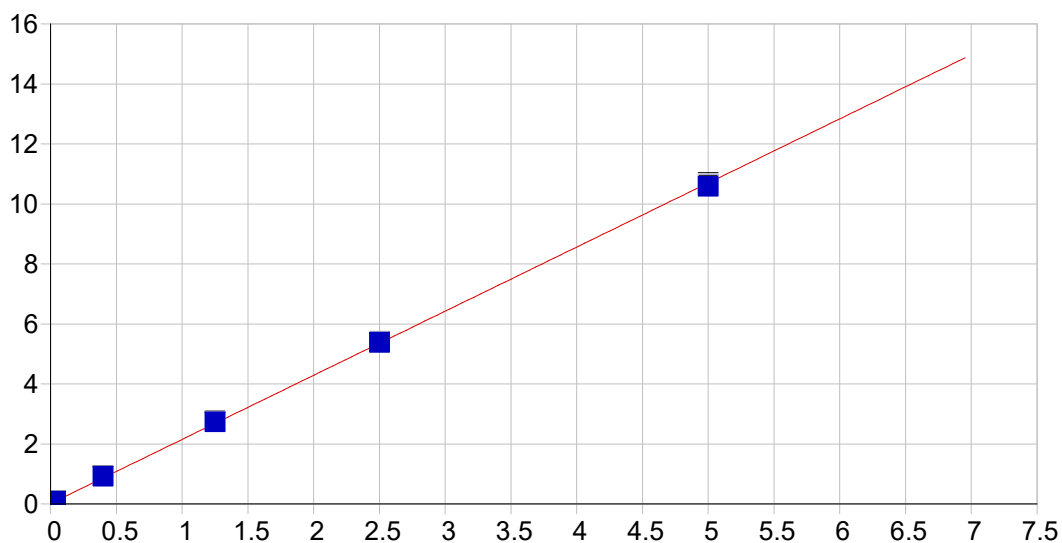
Date of Fit: 12/2/2025 14:24:34 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.000033 Re-Slope: 1.000000
A1 (Gain): 0.179167 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999946 Status: OK.
Std Error of Est: 0.000015
Predicted MDL: 0.000657
Predicted MQL: 0.002190







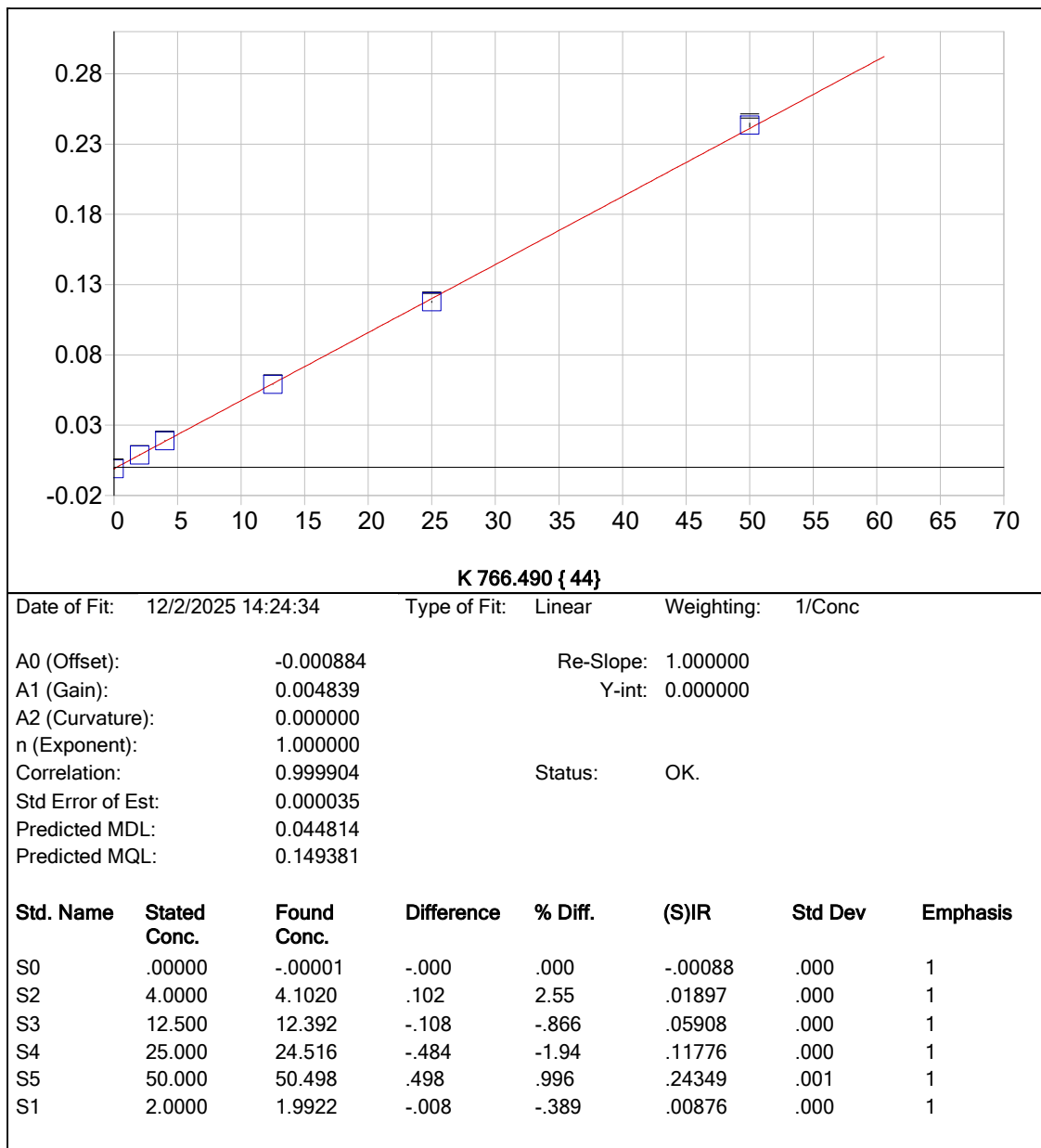


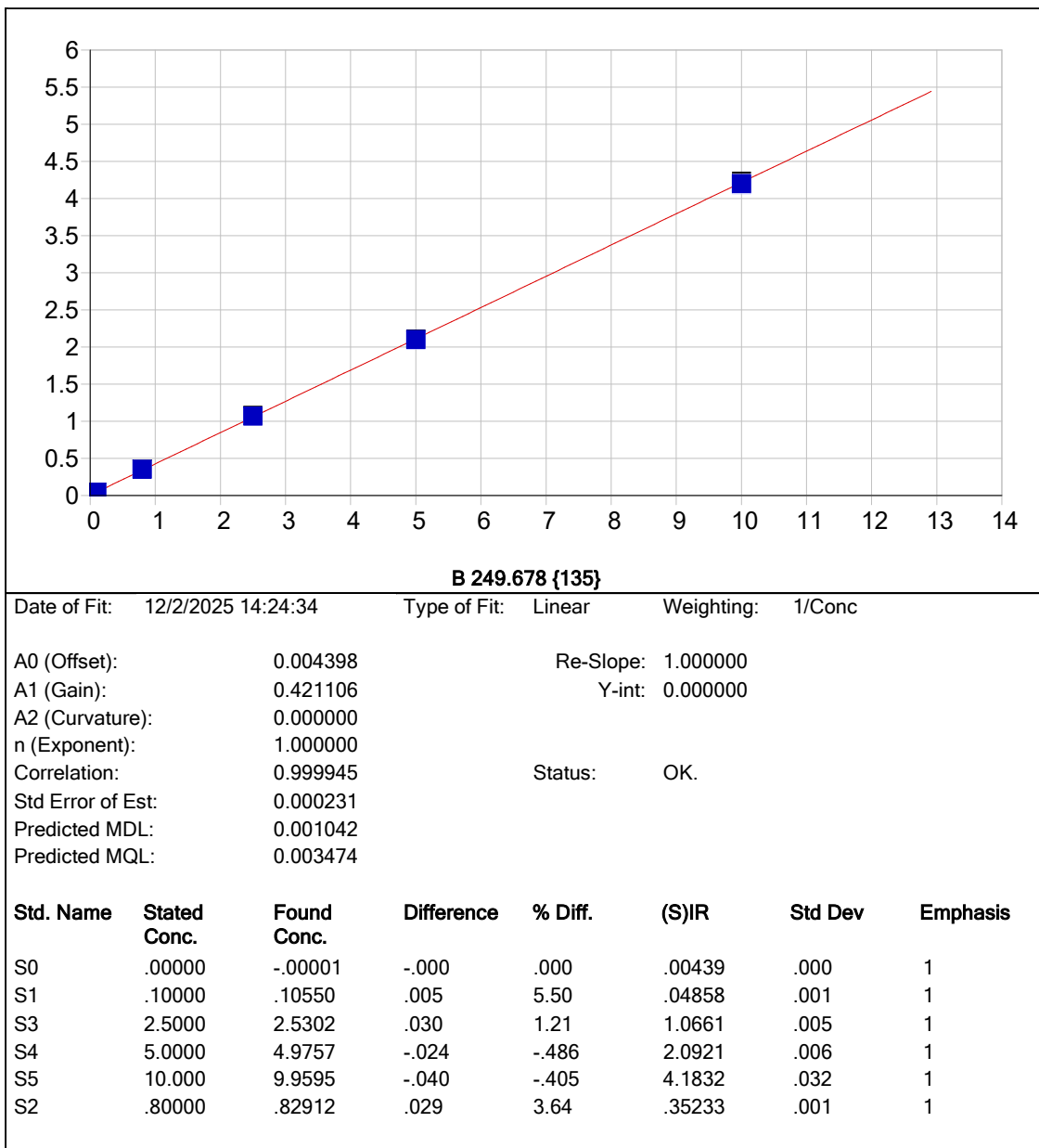
Zn 213.856 {158}

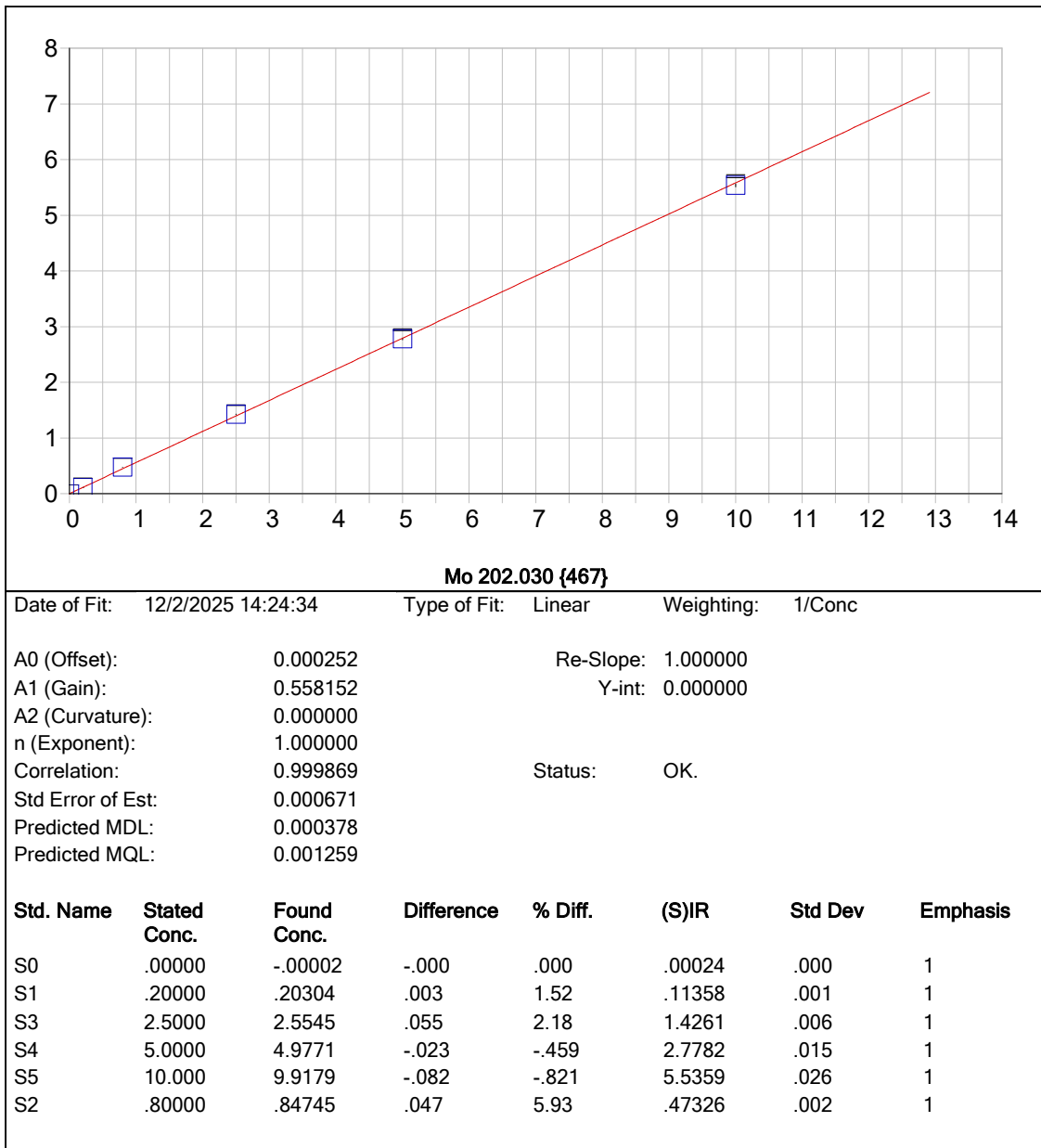
Date of Fit: 12/2/2025 14:24:34 Type of Fit: Linear Weighting: 1/Conc

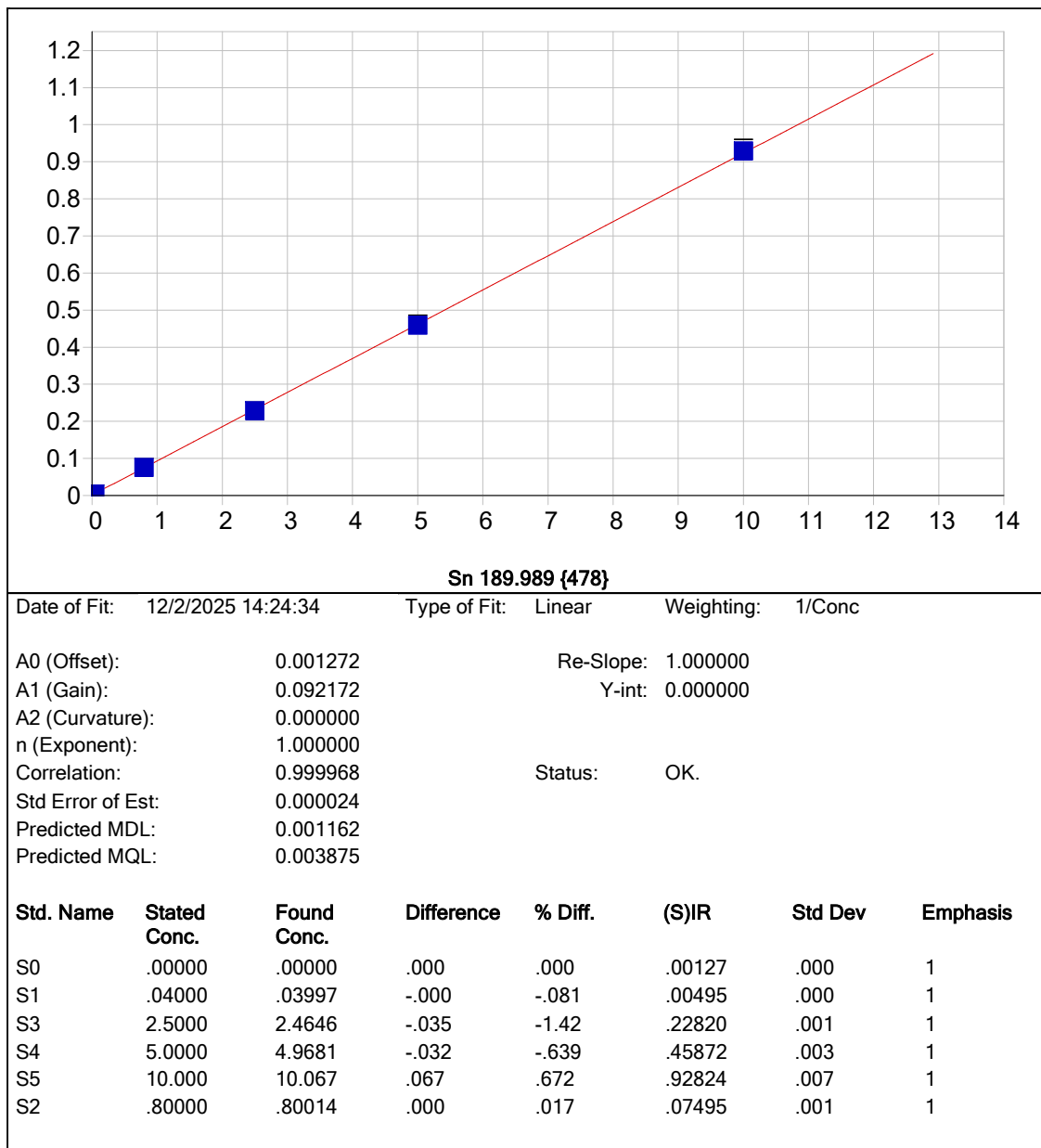
A0 (Offset): 0.011998 Re-Slope: 1.000000
A1 (Gain): 2.137339 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999860 Status: OK.
Std Error of Est: 0.000846
Predicted MDL: 0.000359
Predicted MQL: 0.001195

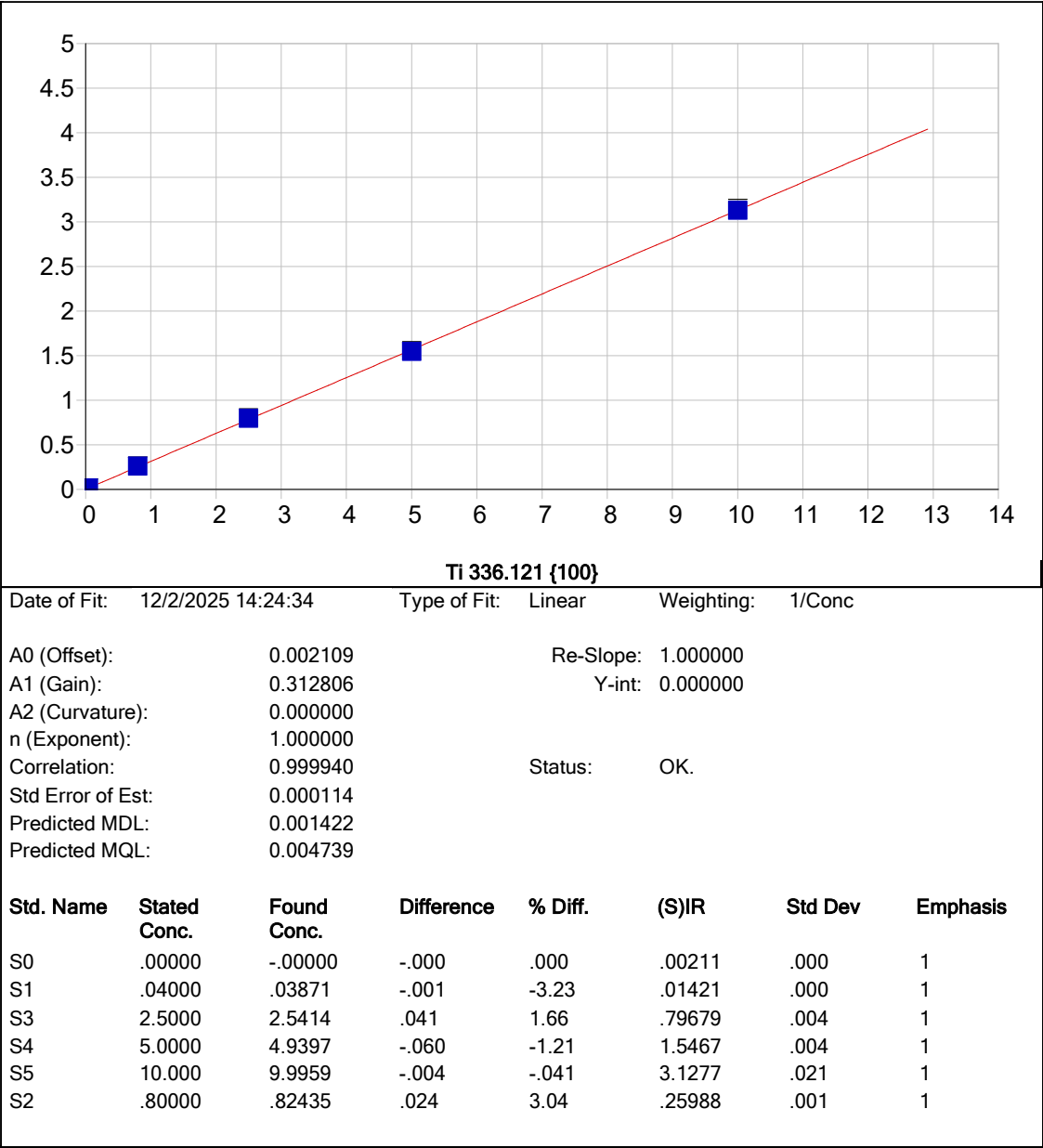
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	.01199	.001	1
S1	.04000	.04161	.002	4.02	.10153	.000	1
S3	1.2500	1.2700	.020	1.60	2.7450	.020	1
S4	2.5000	2.5077	.008	.307	5.4089	.012	1
S5	5.0000	4.9454	-.055	-1.09	10.656	.054	1
S2	.40000	.42535	.025	6.34	.92707	.006	1

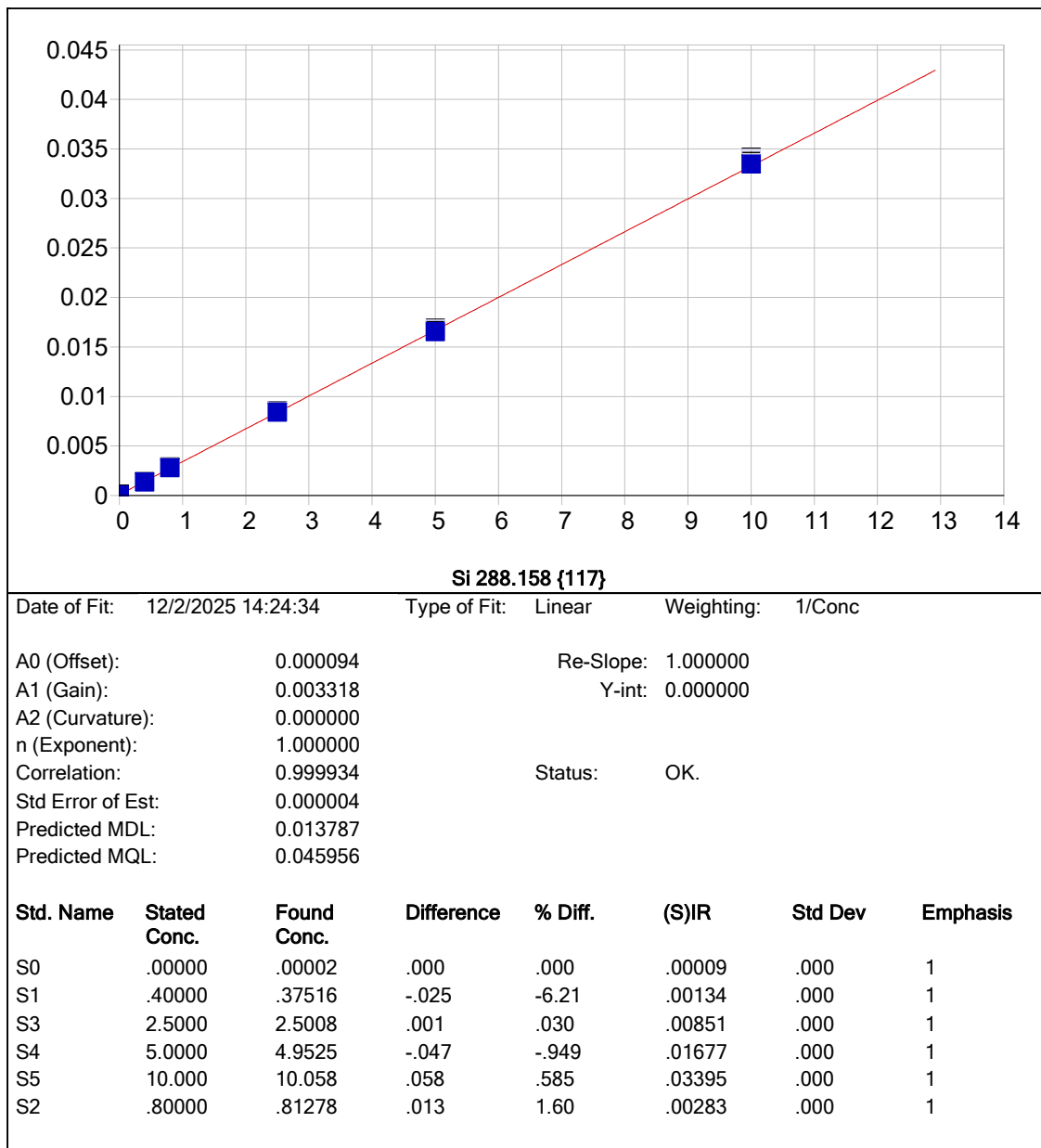


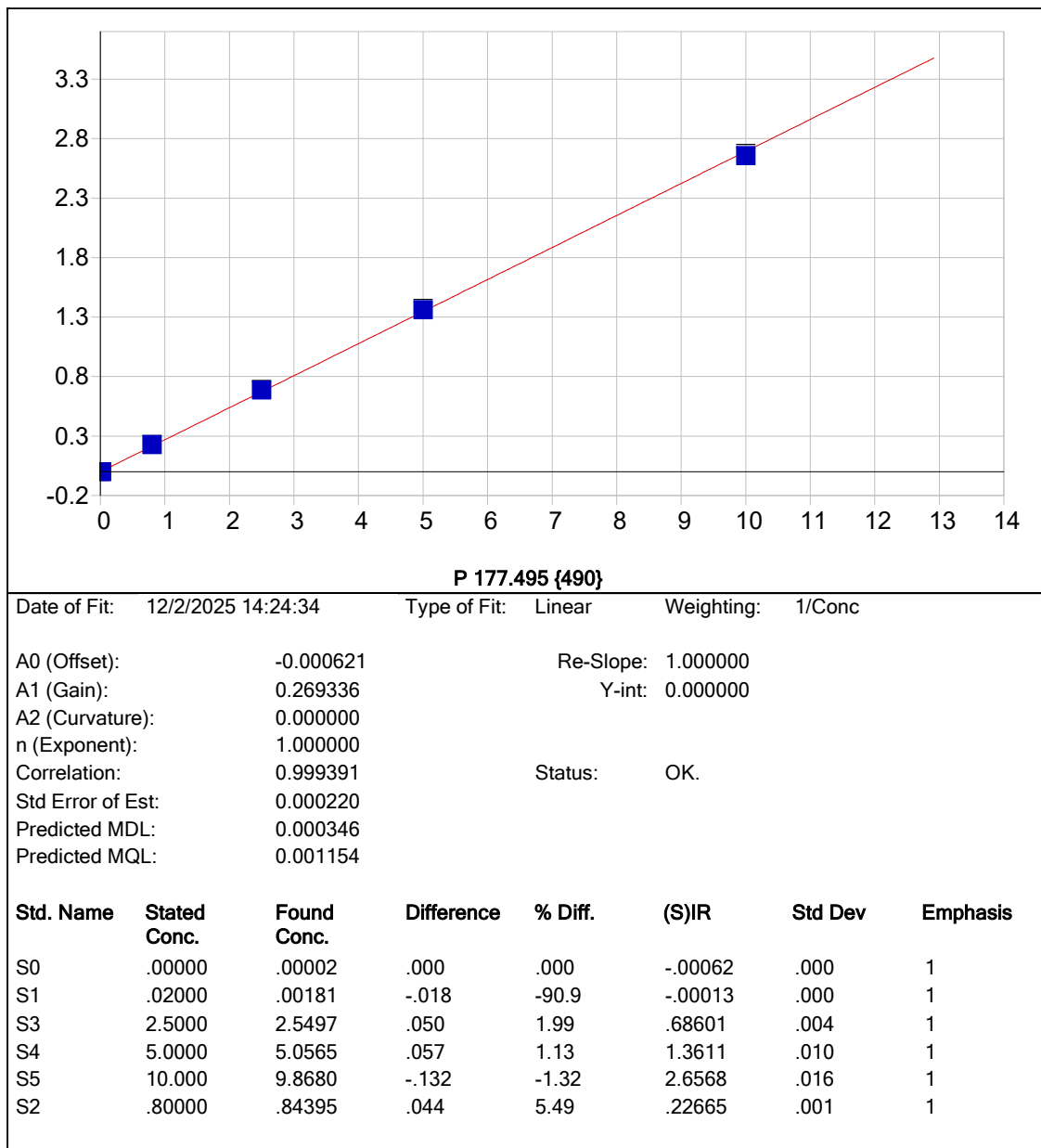






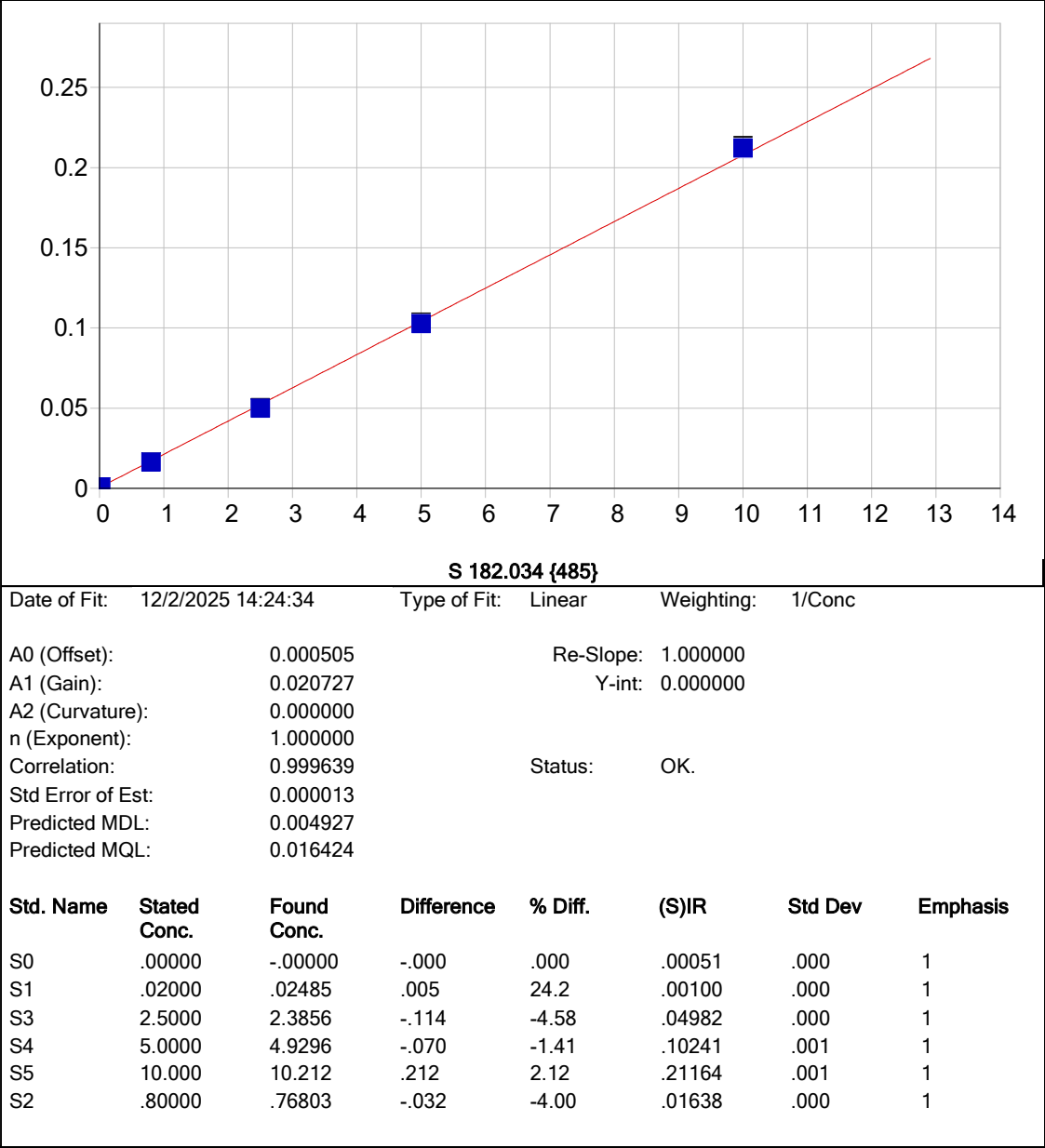


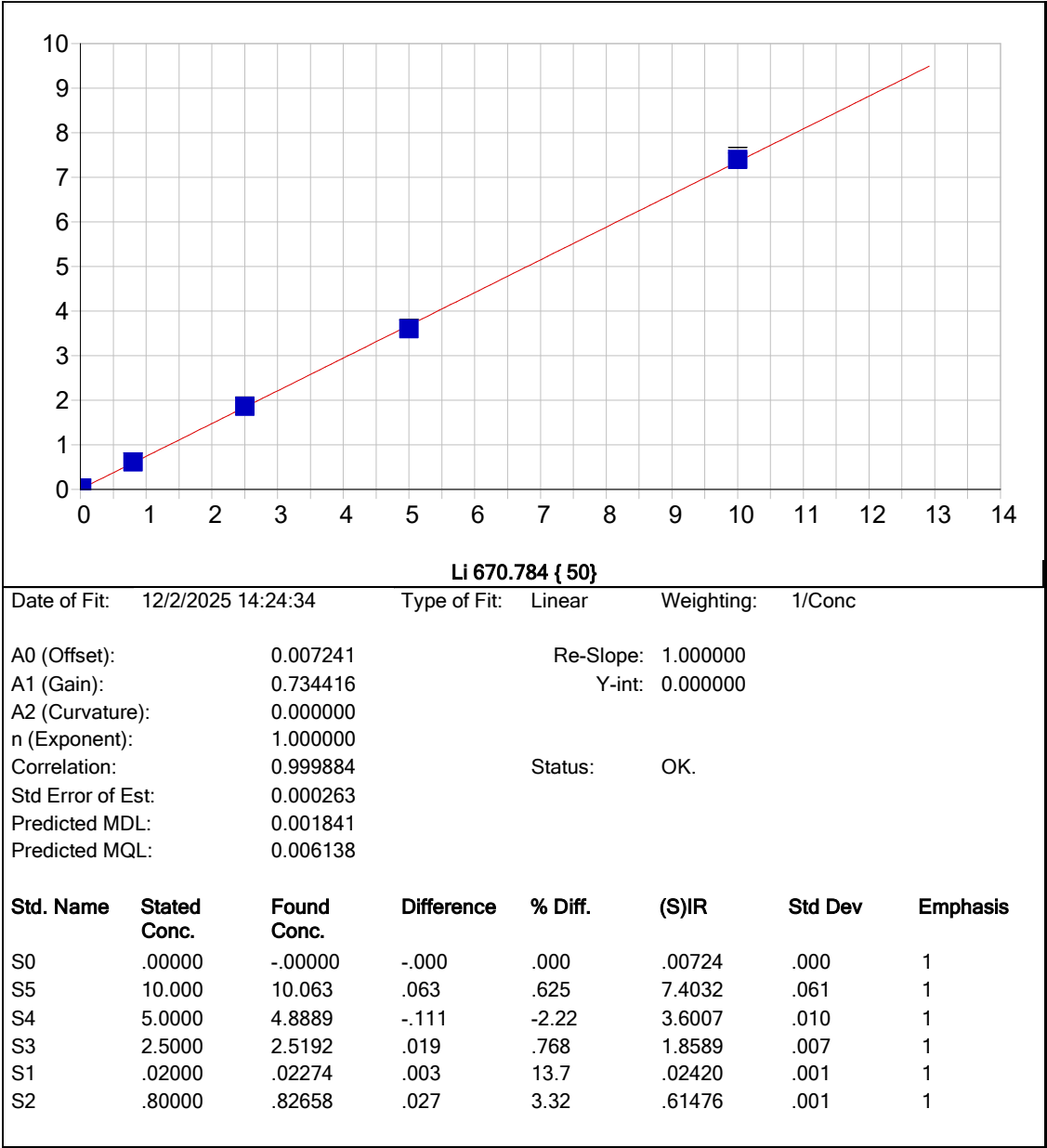




Date of Fit: 12/2/2025 14:24:34 Type of Fit: Linear Weighting: 1/Conc

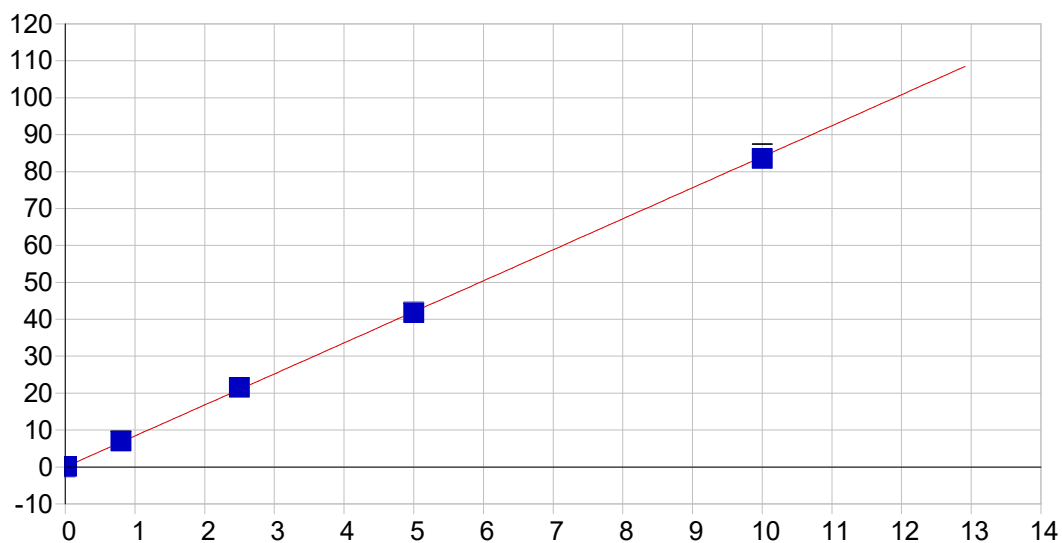
A0 (Offset): -0.000621 Re-Slope: 1.000000
A1 (Gain): 0.269336 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999391 Status: OK.
Std Error of Est: 0.000220
Predicted MDL: 0.000346
Predicted MQL: 0.001154





Date of Fit: 12/2/2025 14:24:34 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.007241 Re-Slope: 1.000000
A1 (Gain): 0.734416 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999884 Status: OK.
Std Error of Est: 0.000263
Predicted MDL: 0.001841
Predicted MQL: 0.006138

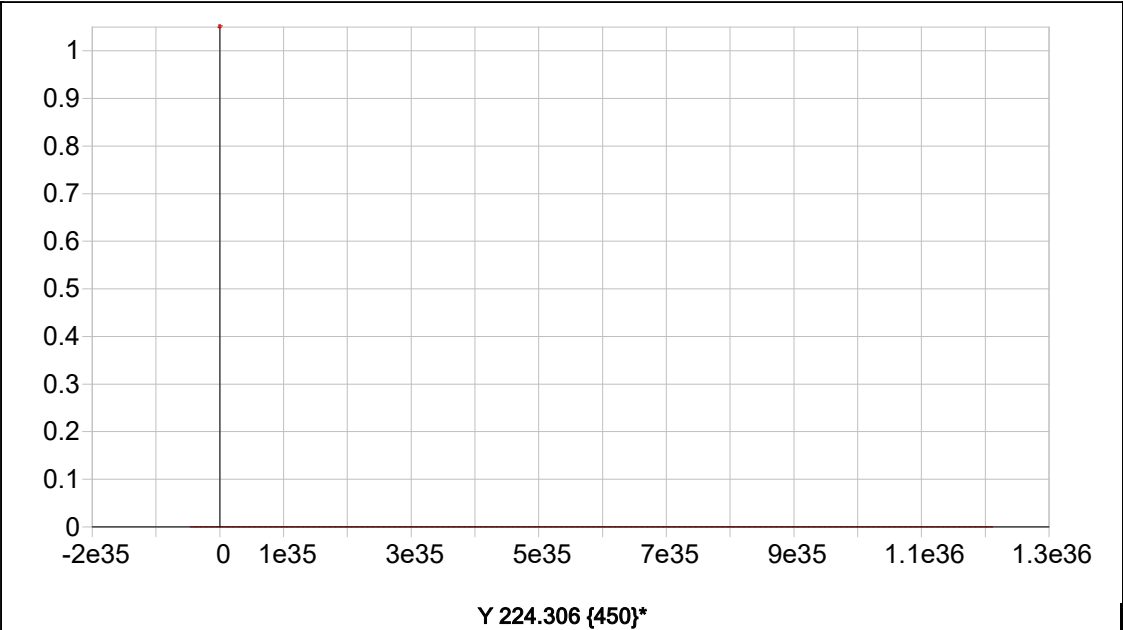


Sr 407.771 { 83}

Date of Fit: 12/2/2025 14:24:34 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.000149 Re-Slope: 1.000000
A1 (Gain): 8.402244 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999906 Status: OK.
Std Error of Est: 0.002700
Predicted MDL: 0.000089
Predicted MQL: 0.000298

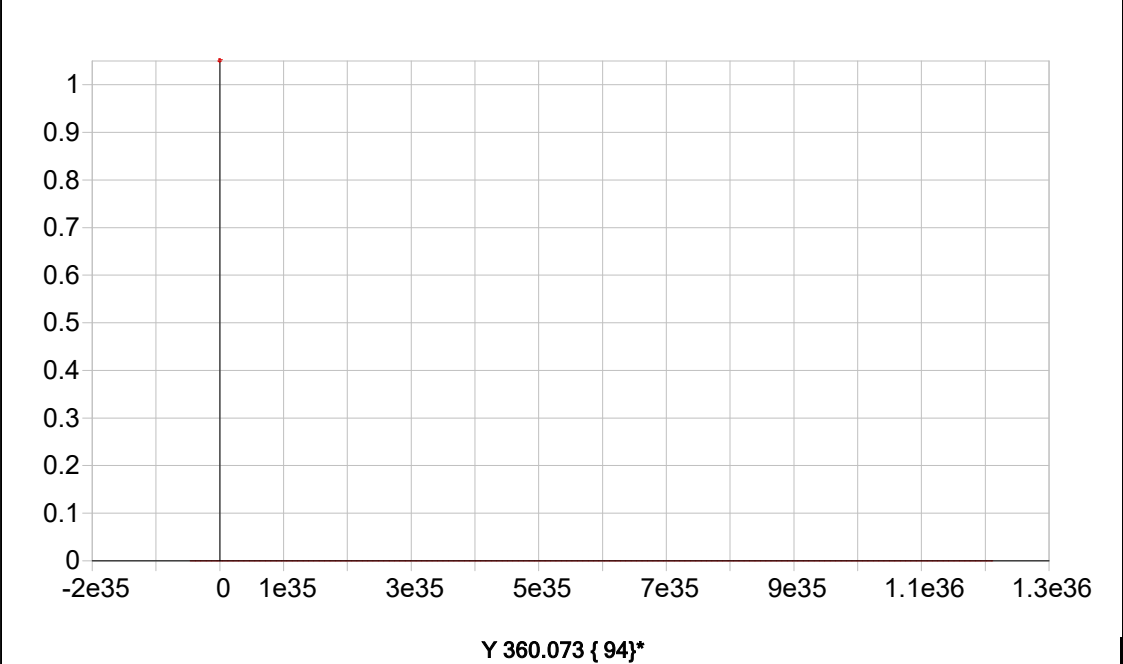
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	-.00017	.000	1
S1	.02000	.02135	.001	6.75	.18004	.002	1
S3	2.5000	2.5607	.061	2.43	21.536	.030	1
S4	5.0000	4.9709	-.029	-.581	41.807	.120	1
S5	10.000	9.9349	-.065	-.651	83.556	1.26	1
S2	.80000	.83207	.032	4.01	6.9976	.013	1



Date of Fit: 12/2/2025 14:24:34 Type of Fit: Linear Weighting: 1/Conc

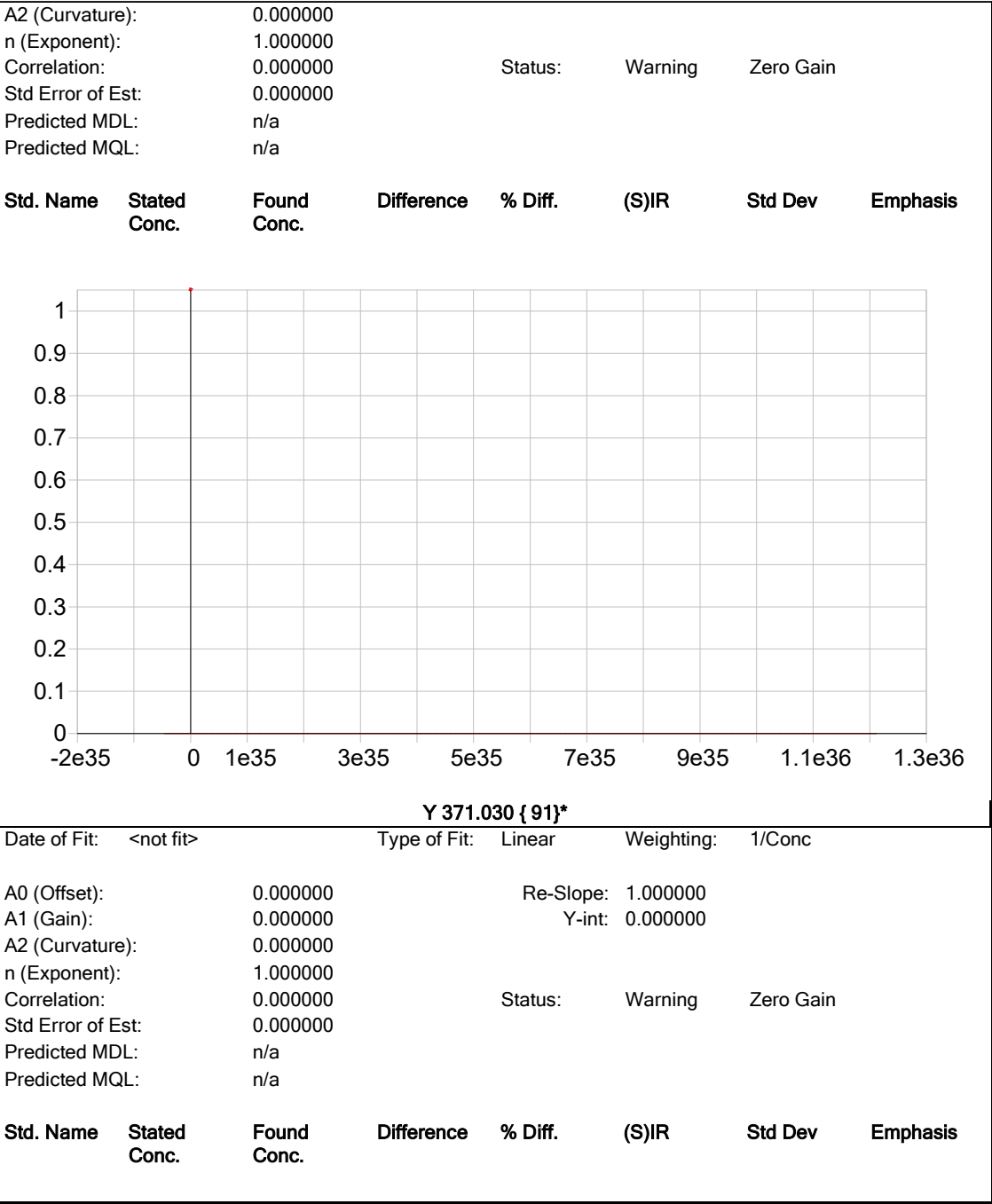
A0 (Offset):	0.000000	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.000000	Status:	Warning Zero Gain
Std Error of Est:	0.000000		
Predicted MDL:	n/a		
Predicted MQL:	n/a		

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

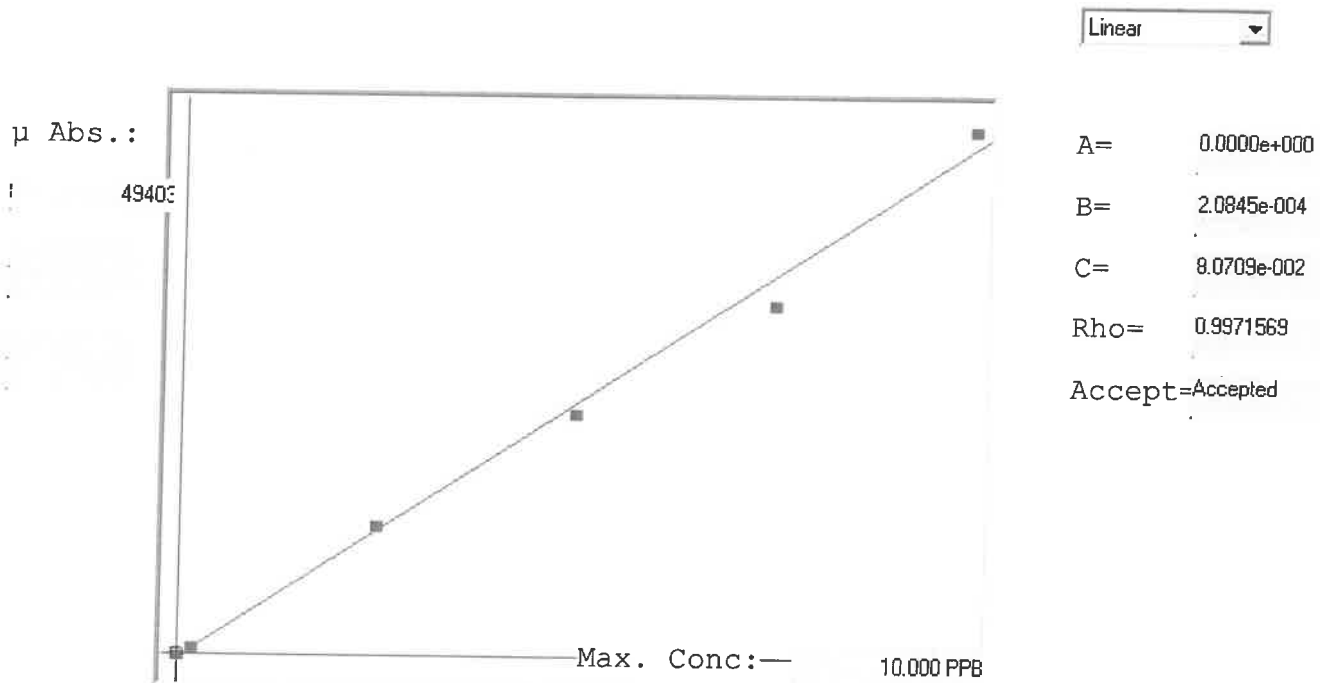


A2 (Curvature):		0.000000		Status:	Warning	Zero Gain	
n (Exponent):		1.000000					
Correlation:		0.000000					
Std Error of Est:		0.000000					
Predicted MDL:		n/a					
Predicted MQL:		n/a					
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis

LB138128 INSTRUMENT ID: CV1

Reviewed By: jaswal
On: 12/9/2025 10:55:17 PM
Inst Id: CV1
LB: LB138128

7471B



Std ID	Conc.	Calc.	Dev.	Mean	SD or %RSD	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0.0	0.000	0.087	0.087	32	0.000	32				
0.2	0.200	0.257	0.057	846	0.0 %	846				
2.5	2.500	2.640	0.140	12280	0.0 %	12280				
5.0	5.000	4.855	-0.145	22902	0.0 %	22902				
7.5	7.500	6.982	-0.518	33106	0.0 %	33106				
10.0	10.000	10.379	0.379	49403	0.0 %	49403				

LB138128 INSTRUMENT ID : CV1

Method: 7471B

Operator: Admin

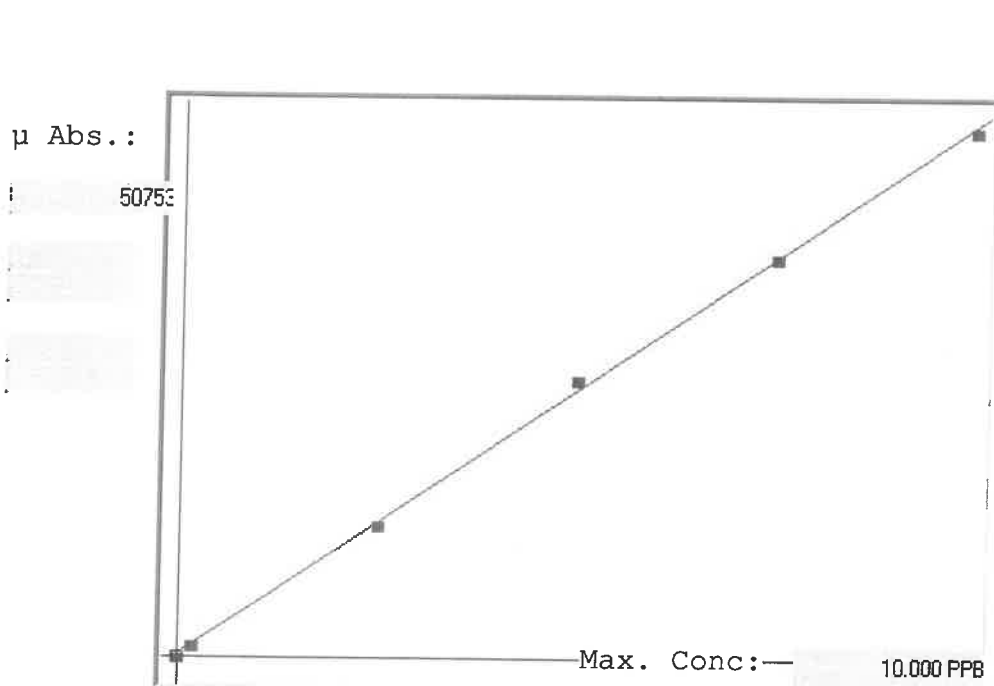
Date of Analysis: 05 Dec 2025 13:20:38

Type	Sample ID	Extended ID	Conc.	μ Abs.	Units	Method	Std Conc	Date
S	0.0 - 1	50	-	32	PPB	7471B	0.0000	05 Dec 2025 13:53:25
S	0.2 - 1	50.2	-	846	PPB	7471B	0.2000	05 Dec 2025 13:55:52
S	2.5 - 1	52.5	-	12280	PPB	7471B	2.5000	05 Dec 2025 13:58:09
S	5.0 - 1	55.0	-	22902	PPB	7471B	5.0000	05 Dec 2025 14:00:26
S	7.5 - 1	57.5	-	33106	PPB	7471B	7.5000	05 Dec 2025 14:02:42
S	10.0 - 1	510.0	-	49403	PPB	7471B	10.0000	05 Dec 2025 14:05:00
U	ICV141 - 1	ICV141	4.5684	21529	PPB	7471B		05 Dec 2025 14:09:36
U	ICB141 - 1	ICB141	0.0807	0	PPB	7471B		05 Dec 2025 14:11:58
U	ICV141 - 1	ICV141	4.0575	19078	PPB	7471B		05 Dec 2025 14:12:20
U	ICB141 - 1	ICB141	0.0638	-81	PPB	7471B		05 Dec 2025 14:14:35
U	CCV71 - 1	CCV71	4.9336	23281	PPB	7471B		05 Dec 2025 14:16:51
U	CCB71 - 1	CCB71	0.0582	-108	PPB	7471B		05 Dec 2025 14:19:06
U	CRA - 1	CRA	0.2375	752	PPB	7471B		05 Dec 2025 14:21:23
U	HighStd - 1	HighStd	10.4661	49822	PPB	7471B		05 Dec 2025 14:23:38
U	ChkStd - 1	ChkStd	6.3390	30023	PPB	7471B		05 Dec 2025 14:25:53
U	PB170840BL - 1	PBS	0.0501	-147	PPB	7471B		05 Dec 2025 14:28:11
U	PB170840BS - 1	LCSS	0.0807	0	PPB	7471B		05 Dec 2025 14:30:29
U	PB170840BS - 1	LCSS	4.1115	19337	PPB	7471B		05 Dec 2025 14:32:57
U	Q3741-01 - 1	B50-SP3-111925	10.5447	50199	PPB	7471B		05 Dec 2025 14:35:13
U	Q3741-01DUP - 1	B50-SP3-111925DUP	9.7987	46620	PPB	7471B		05 Dec 2025 14:37:31
U	Q3741-01MS - 1	B50-SP3-111925MS	9.3184	44316	PPB	7471B		05 Dec 2025 14:39:50
U	Q3741-01MS - 1	B50-SP3-111925MS	0.0807	0	PPB	7471B		05 Dec 2025 14:42:33
U	Q3741-01MS - 1	B50-SP3-111925MS	17.8728	85354	PPB	7471B		05 Dec 2025 14:44:16
U	Q3741-01MSD - 1	B50-SP3-111925MSD	0.0807	0	PPB	7471B		05 Dec 2025 14:46:34
U	Q3741-01MS - 1	B50-SP3-111925MS	13.2931	63384	PPB	7471B		05 Dec 2025 14:47:27
U	Q3741-01MSD - 1	B50-SP3-111925MSD	12.3580	58898	PPB	7471B		05 Dec 2025 14:49:44
U	Q3741-02 - 1	B50-SP13-112025	25.4683	121792	PPB	7471B		05 Dec 2025 14:52:02
U	CCV72 - 1	CCV72	4.7312	22310	PPB	7471B		05 Dec 2025 14:54:27
U	CCB72 - 1	CCB72	0.0565	-116	PPB	7471B		05 Dec 2025 14:56:47
U	Q3741-03 - 1	B50-SP14-112025	19.2196	91815	PPB	7471B		05 Dec 2025 14:59:04
U	Q3741-04 - 1	B50-SP9-112425	23.6162	112907	PPB	7471B		05 Dec 2025 15:01:19
U	Q3741-05 - 1	B50-SP11-112525	2.1848	10094	PPB	7471B		05 Dec 2025 15:03:38
U	Q3741-06 - 1	B50-SP4-112525	23.0461	110172	PPB	7471B		05 Dec 2025 15:06:01
U	Q3779-01 - 1	OILY STONE DRUM	-0.0423	-590	PPB	7471B		05 Dec 2025 15:08:18
U	Q3780-01 - 1	PLASTIC SHEETING	0.0569	-114	PPB	7471B		05 Dec 2025 15:10:38
U	Q3781-01 - 1	OK-1242025-1	0.3031	1067	PPB	7471B		05 Dec 2025 15:12:54
U	Q3741-01LX5 - 1		1.9217	8832	PPB	7471B		05 Dec 2025 15:15:11
U	Q3741-01A - 1		12.5440	59790	PPB	7471B		05 Dec 2025 15:17:28
U	CCV73 - 1	CCV73	5.8204	27535	PPB	7471B		05 Dec 2025 15:19:49
U	CCB73 - 1	CCB73	0.0807	0	PPB	7471B		05 Dec 2025 15:22:07
U	CCV73 - 1	CCV73	4.8515	22887	PPB	7471B		05 Dec 2025 15:23:10
U	CCB73 - 1	CCB73	0.0576	-111	PPB	7471B		05 Dec 2025 15:25:25

LB138165

7471B

INSTRUMENT ID: CV1



Linear

A= 0.0000e+000

B= 1.9607e-004

C= -4.7152e-002

Rho= 0.9996349

Accept=Accepted

Std ID	Conc.	Calc.	Dev.	Mean	SD or %RSD	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0.0	0.000	-0.029	-0.029	94	0.000	94				
0.2	0.200	0.174	-0.026	1126	0.0 %	1126				
2.5	2.500	2.439	-0.061	12681	0.0 %	12681				
5.0	5.000	5.213	0.213	26826	0.0 %	26826				
7.5	7.500	7.499	-0.001	38490	0.0 %	38490				
10.0	10.000	9.904	-0.096	50753	0.0 %	50753				

LB138165 INSTRUMENT ID :: CV1

Method: 7471B

Operator: Admin

Date of Analysis: 09 Dec 2025 11:00:51

Type	Sample ID	Extended ID	Conc.	μ Abs	Units	Method	Std Conc	Date
S	0.0 - 1	50	-	94	PPB	7471B	0.0000	09 Dec 2025 11:10:34
S	0.2 - 1	50.2	-	1126	PPB	7471B	0.2000	09 Dec 2025 11:13:00
S	2.5 - 1	50.5	-	12681	PPB	7471B	2.5000	09 Dec 2025 11:15:17
S	5.0 - 1	50.5	-	26826	PPB	7471B	5.0000	09 Dec 2025 11:17:34
S	7.5 - 1	50.5	-	38490	PPB	7471B	7.5000	09 Dec 2025 11:19:50
S	10.0 - 1	50.5	-	50753	PPB	7471B	10.0000	09 Dec 2025 11:25:11
U	ICV147 - 1	ICV147	3.8826	20043	PPB	7471B		09 Dec 2025 11:28:38
U	ICB147 - 1	ICB147	-0.0677	-105	PPB	7471B		09 Dec 2025 11:30:53
U	CCV84 - 1	CCV84	5.2031	26778	PPB	7471B		09 Dec 2025 11:33:09
U	CCB84 - 1	CCB84	-0.0766	-150	PPB	7471B		09 Dec 2025 11:35:24
U	CRA - 1	CRA	0.1662	1088	PPB	7471B		09 Dec 2025 11:40:20
U	HighStd - 1	HighStd	10.1356	51935	PPB	7471B		09 Dec 2025 11:42:35
U	ChkStd - 1	ChkStd	7.0791	36346	PPB	7471B		09 Dec 2025 11:44:50
U	PB170867BL - 1	PBS	-0.0913	-225	PPB	7471B		09 Dec 2025 11:47:09
U	PB170867BS - 1	LCSS	3.2268	16698	PPB	7471B		09 Dec 2025 11:49:26
U	Q3790-01 - 1	304 FURMAN SOIL	0.9206	4936	PPB	7471B		09 Dec 2025 11:51:42
U	Q3795-01 - 1	72-11966	0.6326	3467	PPB	7471B		09 Dec 2025 11:54:00
U	Q3795-05 - 1	RBR 200059	0.0699	597	PPB	7471B		09 Dec 2025 11:56:17
U	Q3801-01 - 1	SOIL#1	0.2179	1352	PPB	7471B		09 Dec 2025 11:58:34
U	Q3801-06 - 1	SOIL#2	0.3603	2078	PPB	7471B		09 Dec 2025 12:00:49
U	CCV85 - 1	CCV85	5.3116	27331	PPB	7471B		09 Dec 2025 12:03:05
U	CCB85 - 1	CCB85	-0.0583	-57	PPB	7471B		09 Dec 2025 12:05:20
U	Q3806-01 - 1	TR-01-12-5-2025	0.1511	1011	PPB	7471B		09 Dec 2025 12:07:36
U	Q3806-04 - 1	TR-05-12-5-2025	0.4871	2725	PPB	7471B		09 Dec 2025 12:14:52
U	Q3806-04DUP - 1	TR-05-12-5-2025DUP	0.4579	2576	PPB	7471B		09 Dec 2025 12:17:07
U	Q3806-04MS - 1	TR-05-12-5-2025MS	3.7820	19530	PPB	7471B		09 Dec 2025 12:19:23
U	Q3806-04MSD - 1	TR-05-12-5-2025MSD	3.5148	18167	PPB	7471B		09 Dec 2025 12:21:38
U	Q3812-01 - 1	OR-02-120825	7.4515	38245	PPB	7471B		09 Dec 2025 12:23:57
U	Q3806-04LX5 - 1		0.0526	509	PPB	7471B		09 Dec 2025 12:32:52
U	Q3806-04A - 1		4.0142	20714	PPB	7471B		09 Dec 2025 12:38:34
U	CCV86 - 1	CCV86	5.2780	27160	PPB	7471B		09 Dec 2025 12:40:51
U	CCB86 - 1	CCB86	-0.0846	-191	PPB	7471B		09 Dec 2025 12:43:07
U	Q3741-01DLX2 - 1		3.7419	19325	PPB	7471B		09 Dec 2025 12:45:25
U	Q3741-01DUPDLX2 - 1		4.2803	22071	PPB	7471B		09 Dec 2025 12:47:40
U	Q3741-01MSDLX2 - 1		3.9115	20190	PPB	7471B		09 Dec 2025 12:52:45
U	Q3741-01MSDDLX2 - 1		3.9416	20344	PPB	7471B		09 Dec 2025 12:55:00
U	Q3741-01LDLX10 - 1		0.5728	3162	PPB	7471B		09 Dec 2025 12:58:40
U	Q3741-01ADLX2 - 1		4.0820	21060	PPB	7471B		09 Dec 2025 13:03:48
U	Q3741-02DLX5 - 1		2.9427	15249	PPB	7471B		09 Dec 2025 13:06:04
U	Q3741-03DLX5 - 1		4.6120	23763	PPB	7471B		09 Dec 2025 13:08:21
U	Q3741-04DLX5 - 1		5.7827	29734	PPB	7471B		09 Dec 2025 13:10:41
U	Q3741-06DLX5 - 1		7.7363	39698	PPB	7471B		09 Dec 2025 13:13:01
U	CCV87 - 1	CCV87	5.1232	26370	PPB	7471B		09 Dec 2025 13:15:21
U	CCB87 - 1	CCB87	-0.0685	-109	PPB	7471B		09 Dec 2025 13:17:39

SOP ID : M3050B-Digestion-20

SDG No : N/A

Matrix : SOIL

Pipette ID: ICP A

Balance ID : M SC-2

Filter paper ID : N/A

pH Strip ID : N/A

Hood ID : #3

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

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

End Digest Date: 12/02/2025 Time : 11:30 Temp : 96 °C

Digestion tube ID: M6054

Block thermometer ID: MET-DIG. #2

Dig Technician Signature: *S. J. S.*

Supervisor Signature: *[Signature]*

Temp : 1. 96°C 2. N/A

Standard Name	MLS USED	STD REF. # FROM LOG
LFS-1	1.00	M6209
LFS-2	1.00	M6201
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

Chemical Used	ML/SAMPLE USED	Lot Number
Conc. HNO3	5.00	M6187
1:1 HNO3	10.00	MP88081
30% H2O2	3.00	M6170
Conc. HCL	10.00	M6151
PTFE Boiling Stones	N/A	M5581
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

Extraction Conformance/Non-Conformance Comments:

HOT BLOCK#2 CELL#35 96 C

Date / Time	Prepped Sample Relinquished By/Location	Received By/Location
12/02/25 12:30	<i>SKS met dig</i>	<i>[Signature]</i> Met Lab
	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
PB170777BL	PBS777	N/A	2.00	100	Colorless	Colorless	Fine	No	N/A	1
PB170777BS	LCS777	N/A	2.00	100	Colorless	Colorless	Fine	No	M6209,M6201	2
Q3741-01	B50-SP3-111925	N/A	2.28	100	Brown	Yellow	Medium	No	N/A	3
Q3741-02	B50-SP13-112025	N/A	2.25	100	Brown	Yellow	Medium	No	N/A	4
Q3741-03	B50-SP14-112025	N/A	2.11	100	Brown	Yellow	Medium	No	N/A	5
Q3741-04	B50-SP9-112425	N/A	2.26	100	Black	Yellow	Medium	No	N/A	6
Q3741-05	B50-SP11-112525	N/A	2.07	100	Black	Yellow	Medium	No	N/A	7
Q3741-06	B50-SP4-112525	N/A	2.42	100	Black	Yellow	Medium	No	N/A	8
Q3746-01	ROW	N/A	2.41	100	Brown	Yellow	Medium	No	N/A	9
Q3748-01	AU-05-12-1-2025	N/A	2.36	100	Brown	Yellow	Medium	No	N/A	10
Q3750-01	FENCE WC-1	N/A	2.19	100	Brown	Yellow	Medium	No	N/A	11
Q3750-01MS	FENCE WC-1MS	N/A	2.15	100	Brown	Yellow	Medium	No	M6209,M6201	13
Q3750-01MSD	FENCE WC-1MSD	N/A	2.17	100	Brown	Yellow	Medium	No	M6209,M6201	14
Q3750-01DUP	FENCE WC-1DUP	N/A	2.18	100	Brown	Yellow	Medium	No	N/A	12
Q3750-04	FENCE WC-2	N/A	2.18	100	Brown	Yellow	Medium	No	N/A	15

WORKLIST(Hardcopy Internal Chain)

Worklist Name : PB170777

Worklist ID : 193414

Department : Digestion

Date : 12-02-2025 08:34:06

Sample	Customer Sample	Matrix	Test	Preservative	Customer	Raw Sample Storage Location	Collect Date	Method
Q3741-01	B50-SP3-111925	Solid	Metals ICP-TAL	Cool 4 deg C	CORE02	--Sele	11/19/2025	6010D
Q3741-02	B50-SP13-112025	Solid	Metals ICP-TAL	Cool 4 deg C	CORE02	--Sele	11/20/2025	6010D
Q3741-03	B50-SP14-112025	Solid	Metals ICP-TAL	Cool 4 deg C	CORE02	--Sele	11/20/2025	6010D
Q3741-04	B50-SP9-112425	Solid	Metals ICP-TAL	Cool 4 deg C	CORE02	--Sele	11/20/2025	6010D
Q3741-05	B50-SP11-112525	Solid	Metals ICP-TAL	Cool 4 deg C	CORE02	--Sele	11/24/2025	6010D
Q3741-06	B50-SP4-112525	Solid	Metals ICP-TAL	Cool 4 deg C	CORE02	--Sele	11/25/2025	6010D
Q3746-01	ROW	Solid	Metals ICP-TAL	Cool 4 deg C	CORE02	--Sele	11/25/2025	6010D
Q3748-01	AU-05-12-1-2025	Solid	Metals ICP-TAL	Cool 4 deg C	PSEG05	A11	12/02/2025	6010D
Q3750-01	FENCE WC-1	Solid	Metals ICP-TAL	Cool 4 deg C	PSEG05	A12	12/01/2025	6010D
Q3750-04	FENCE WC-2	Solid	Metals ICP-TAL	Cool 4 deg C	PSEG05	A11	12/01/2025	6010D

Date/Time 12/02/2025 09:03

Raw Sample Received by: SP3 mct dig.

Raw Sample Relinquished by: SP4 SH

Date/Time 12/02/25 10:030

Raw Sample Received by: SP3 mct dig.

Raw Sample Relinquished by: SP4 SH

SOP ID : M7471B-Mercury-19

SDG No : N/A

Matrix : SOIL

Pipette ID: HG A

Balance ID : M SC-3

Filter paper ID : N/A

pH Strip ID : NA

Hood ID : #1

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

Start Digest Date: 12/05/2025 Time : 08:35 Temp : 94 °C

End Digest Date: 12/05/2025 Time : 09:05 Temp : 95 °C

Digestion tube ID: M5595

Block thermometer ID: HG-DIG#3

Dig Technician Signature: *mb*

Supervisor Signature: *MB1*

Temp : 1. 94°C 2. N/A

Standard Name	MLS USED	STD REF. # FROM LOG
ICV	30mL	MP88222
CCV	30mL	MP88224
CRA	30mL	MP88226
Blank Spike	0.48mL	MP88214
Matrix Spike	0.48mL	MP88214

Chemical Used	ML/SAMPLE USED	Lot Number
AQUA REGIA	1.5MI	MP88228
KMnO4 (5%)	4.5mL	MP87634
Hydroxylamine HCL (12%)	2.0MI	MP87636
PTFE Boiling Stones	-----	M5582
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

LAB SAMPLE ID	CLIENT SAMPLE ID	Wt(g)/Vol(ml)	Comment
0.0 ppb	S0	30mL	MP88215
0.05 ppb	S0.05	N/A	N/A
0.2 ppb	S0.2	30mL	MP88217
2.5 ppb	S2.5	30mL	MP88218
5.0 ppb	S5.0	30mL	MP88219
7.5 ppb	S7.5	30mL	MP88220
10.0 ppb	S10.0	30mL	MP88221
ICV	ICV	30mL	MP88222
ICB	ICB	30mL	MP88223
CCV	CCV	30mL	MP88224
CCB	CCB	30mL	MP88225
CRI	CRI	30mL	MP88226
CHK STD	CHK STD	30mL	MP88227

Extraction Conformance/Non-Conformance Comments:

N/A		
Date / Time	Prepped Sample Relinquished By/Location	Received By/Location
12/05/25 10:05	<i>mb met dig</i>	<i>mb met dig</i>
	Preparation Group	Analysis Group

Lab Sample ID	Client Sample ID	Initial Weight (g)	Final Vol (ml)	pH	Comment	Prep Pos
PB170840BL	PBS840	0.52	35	NA	N/A	3-1
PB170840BS	LCS840	0.57	35	NA	MP88214	2
Q3741-01DUP	B50-SP3-111925DUP	0.56	35	NA	N/A	4
Q3741-01MS	B50-SP3-111925MS	0.57	35	NA	MP88214	5
Q3741-01MSD	B50-SP3-111925MSD	0.55	35	NA	MP88214	6
Q3741-01	B50-SP3-111925	0.59	35	NA	N/A	3
Q3741-02	B50-SP13-112025	0.55	35	NA	N/A	7
Q3741-03	B50-SP14-112025	0.57	35	NA	N/A	8
Q3741-04	B50-SP9-112425	0.59	35	NA	N/A	9
Q3741-05	B50-SP11-112525	0.57	35	NA	N/A	10
Q3741-06	B50-SP4-112525	0.53	35	NA	N/A	11
Q3779-01	OILY STONE DRUM	0.50	35	NA	N/A	12
Q3780-01	PLASTIC SHEETING	0.54	35	NA	N/A	13
Q3781-01	OK-1242025-1	0.53	35	NA	N/A	14

WORKLIST(Hardcopy Internal Chain)

WorkList Name : 120525_7471 WorkList ID : 193486 Department : Digestion Date : 12-05-2025 07:35:08

Sample	Customer Sample	Matrix	Test	Preservative	Customer	Raw Sample Storage Location	Collect Date	Method
Q3741-01	B50-SP3-111925	Solid	Mercury	Cool 4 deg C	CORE02	--Sele	11/19/2025	7471B
Q3741-02	B50-SP13-112025	Solid	Mercury	Cool 4 deg C	CORE02	--Sele	11/20/2025	7471B
Q3741-03	B50-SP14-112025	Solid	Mercury	Cool 4 deg C	CORE02	--Sele	11/20/2025	7471B
Q3741-04	B50-SP9-112425	Solid	Mercury	Cool 4 deg C	CORE02	--Sele	11/20/2025	7471B
Q3741-05	B50-SP11-112525	Solid	Mercury	Cool 4 deg C	CORE02	--Sele	11/24/2025	7471B
Q3741-06	B50-SP4-112525	Solid	Mercury	Cool 4 deg C	CORE02	--Sele	11/25/2025	7471B
Q3779-01	OILY STONE DRUM	Solid	Mercury	Cool 4 deg C	CORE02	--Sele	11/25/2025	7471B
Q3780-01	PLASTIC SHEETING	Solid	Mercury	Cool 4 deg C	PSEG03	A11	12/04/2025	7471B
Q3781-01	OK-1242025-1	Solid	Mercury	Cool 4 deg C	PSEG03	A11	12/04/2025	7471B
					PSEG05	A11	12/04/2025	7471B

Date/Time 12/05/25 08:05
 Raw Sample Received by: Sanner dig
 Raw Sample Relinquished by: CP CS mt

Date/Time 12/05/25 9:05
 Raw Sample Received by: CCS mt
 Raw Sample Relinquished by: Sanner dig



PERCENT SOLID

Supervisor: Iwona
Analyst: jignesh
Date: 12/2/2025

OVENTEMP IN Celsius(°C): 107
Time IN: 17:30
In Date: 12/01/2025
Weight Check 1.0g: 1.00
Weight Check 10g: 10.00
OvenID: M OVEN#1

OVENTEMP OUT Celsius(°C): 104
Time OUT: 08:25
Out Date: 12/02/2025
Weight Check 1.0g: 1.00
Weight Check 10g: 10.00
BalanceID: M SC-4
Thermometer ID: % SOLID-OVEN

QC:LB138066

Lab ID	Client SampleID	Dish #	Dish Wt(g) (A)	Sample Wt(g)	Dish + Sample Wt(g) (B)	Dish+Dry Sample Wt(g) (C)	% Solid	Comments
Q3741-01	B50-SP3-111925	1	1.15	10.38	11.53	10.66	91.6	
Q3741-02	B50-SP13-112025	2	1.18	10.33	11.51	10.1	86.4	
Q3741-03	B50-SP14-112025	3	1.19	10.25	11.44	10.14	87.3	
Q3741-04	B50-SP9-112425	4	1.16	10.61	11.77	10.2	85.2	
Q3741-05	B50-SP11-112525	5	1.16	10.47	11.63	10.02	84.6	
Q3741-06	B50-SP4-112525	6	1.18	10.50	11.68	10.2	85.9	
Q3742-01	SB-1125-23	7	1.11	10.61	11.72	8.55	70.1	
Q3742-02	SB-1125-19	8	1.19	11.07	12.26	5.72	40.9	
Q3742-03	SB-1125-8	9	1.17	10.55	11.72	10.16	85.2	
Q3742-04	SB-1125-9	10	1.19	10.57	11.76	9.5	78.6	
Q3742-05	SB-1125-21	11	1.16	10.61	11.77	9.6	79.5	
Q3742-06	SB-1125-13	12	1.18	10.18	11.36	9.88	85.5	
Q3742-07	SB-1125-18	13	1.11	10.19	11.3	8.07	68.3	
Q3742-08	SB-1125-20	14	1.15	10.84	11.99	9.86	80.4	
Q3742-09	SB-1125-22	15	1.12	10.90	12.02	9.05	72.8	
Q3742-10	SB-1125-2	16	1.16	10.76	11.92	9.38	76.4	
Q3742-11	SB-1125-3A	17	1.19	10.58	11.77	8.93	73.2	
Q3742-12	SB-1125-3B	18	1.17	10.50	11.67	10.55	89.3	
Q3742-13	SB-1125-3C	19	1.16	10.50	11.66	9.31	77.6	
Q3742-14	SB-1125-3D	20	1.13	10.45	11.58	8.5	70.5	
Q3742-14D	SB-1125-3DDUP	21	1.15	10.45	11.6	8.53	70.6	
Q3742-15	SB-1125-3E	22	1.13	10.39	11.52	8.05	66.6	
Q3742-16	SB-1125-1	23	1.19	10.33	11.52	8.78	73.5	
Q3742-17	SB-1125-25	24	1.18	11.18	12.36	8.26	63.3	
Q3742-18	SB-1125-24	25	1.15	10.90	12.05	7.99	62.8	
Q3745-05	SVOC-GPC-BLANK	31	1.00	1.00	2.00	2.00	100.0	
Q3745-06	PEST-GPC-BLANK	32	1.00	1.00	2.00	2.00	100.0	
Q3745-07	PEST-GPC-BLANK-SPIKE	33	1.00	1.00	2.00	2.00	100.0	



PERCENT SOLID

Supervisor: Iwona
Analyst: jignesh
Date: 12/2/2025

OVENTEMP IN Celsius(°C): 107
Time IN: 17:30
In Date: 12/01/2025
Weight Check 1.0g: 1.00
Weight Check 10g: 10.00
OvenID: M OVEN#1

OVENTEMP OUT Celsius(°C): 104
Time OUT: 08:25
Out Date: 12/02/2025
Weight Check 1.0g: 1.00
Weight Check 10g: 10.00
BalanceID: M SC-4
Thermometer ID: % SOLID-OVEN

QC:LB138066

Lab ID	Client SampleID	Dish #	Dish Wt(g) (A)	Sample Wt(g)	Dish + Sample Wt(g) (B)	Dish+Dry Sample Wt(g) (C)	% Solid	Comments
Q3745-08	SVOC-GPC2-BLANK	34	1.00	1.00	2.00	2.00	100.0	
Q3745-09	PEST-GPC2-BLANK	35	1.00	1.00	2.00	2.00	100.0	
Q3745-10	PEST -GPC2-BLANK-SPIKE	36	1.00	1.00	2.00	2.00	100.0	
Q3746-01	ROW	26	1.15	10.84	11.99	8.59	68.6	
Q3746-02	ROW-E2	27	1.14	10.58	11.72	5.2	38.4	
Q3747-01	1	28	1.00	1.00	2.00	2.00	100.0	WIPE SAMPLE
Q3747-02	2	29	1.00	1.00	2.00	2.00	100.0	WIPE SAMPLE
Q3747-03	3	30	1.00	1.00	2.00	2.00	100.0	WIPE SAMPLE
Q3748-01	AU-05-12-1-2025	37	1.18	10.75	11.93	11.03	91.6	
Q3748-02	AU-05-12-1-2025	38	1.18	10.55	11.73	10.88	91.9	
Q3750-01	FENCE WC-1	39	1.15	10.77	11.92	10.5	86.8	
Q3750-02	FENCE WC-1-EPH	40	1.19	10.31	11.5	10.15	86.9	
Q3750-03	FENCE WC-1-VOC	41	1.16	10.58	11.74	9.72	80.9	
Q3750-04	FENCE WC-2	42	1.11	10.51	11.62	10.2	86.5	
Q3750-05	FENCE WC-2-EPH	43	1.13	10.21	11.34	9.97	86.6	
Q3750-06	FENCE WC-2-VOC	44	1.19	10.38	11.57	10.52	89.9	

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

WORKLIST(Hardcopy Internal Chain)

128066

WorkList Name : %1-120125 WorkList ID : 193391 Department : Wet-Chemistry Date : 12-01-2025 08:55:16

Sample	Customer Sample	Matrix	Test	Preservative	Customer	Raw Sample Storage Location	Collect Date	Method
Q3741-01	B50-SP3-111925	Solid	Percent Solids	Cool 4 deg C	CORE02	--Sele	11/19/2025	Chemtech -SO
Q3741-02	B50-SP13-112025	Solid	Percent Solids	Cool 4 deg C	CORE02	--Sele	11/20/2025	Chemtech -SO
Q3741-03	B50-SP14-112025	Solid	Percent Solids	Cool 4 deg C	CORE02	--Sele	11/20/2025	Chemtech -SO
Q3741-04	B50-SP9-112425	Solid	Percent Solids	Cool 4 deg C	CORE02	--Sele	11/24/2025	Chemtech -SO
Q3741-05	B50-SP11-112525	Solid	Percent Solids	Cool 4 deg C	CORE02	--Sele	11/25/2025	Chemtech -SO
Q3741-06	B50-SP4-112525	Solid	Percent Solids	Cool 4 deg C	CORE02	--Sele	11/25/2025	Chemtech -SO
Q3742-01	SB-1125-23	Solid	Percent Solids	Cool 4 deg C	REMI01	A21	11/25/6025	Chemtech -SO
Q3742-02	SB-1125-19	Solid	Percent Solids	Cool 4 deg C	REMI01	A21	11/25/2025	Chemtech -SO
Q3742-03	SB-1125-8	Solid	Percent Solids	Cool 4 deg C	REMI01	A21	11/25/2025	Chemtech -SO
Q3742-04	SB-1125-9	Solid	Percent Solids	Cool 4 deg C	REMI01	A21	11/25/2025	Chemtech -SO
Q3742-05	SB-1125-21	Solid	Percent Solids	Cool 4 deg C	REMI01	A21	11/25/2025	Chemtech -SO
Q3742-06	SB-1125-13	Solid	Percent Solids	Cool 4 deg C	REMI01	A21	11/25/2025	Chemtech -SO
Q3742-07	SB-1125-18	Solid	Percent Solids	Cool 4 deg C	REMI01	A21	11/25/2025	Chemtech -SO
Q3742-08	SB-1125-20	Solid	Percent Solids	Cool 4 deg C	REMI01	A21	11/25/2025	Chemtech -SO
Q3742-09	SB-1125-22	Solid	Percent Solids	Cool 4 deg C	REMI01	A21	11/25/2025	Chemtech -SO
Q3742-10	SB-1125-2	Solid	Percent Solids	Cool 4 deg C	REMI01	A21	11/25/2025	Chemtech -SO
Q3742-11	SB-1125-3A	Solid	Percent Solids	Cool 4 deg C	REMI01	A21	11/25/2025	Chemtech -SO
Q3742-12	SB-1125-3B	Solid	Percent Solids	Cool 4 deg C	REMI01	A21	11/25/2025	Chemtech -SO
Q3742-13	SB-1125-3C	Solid	Percent Solids	Cool 4 deg C	REMI01	A21	11/25/2025	Chemtech -SO
Q3742-14	SB-1125-3D	Solid	Percent Solids	Cool 4 deg C	REMI01	A21	11/25/2025	Chemtech -SO
Q3742-15	SB-1125-3E	Solid	Percent Solids	Cool 4 deg C	REMI01	A21	11/25/2025	Chemtech -SO

Date/Time 12/01/25 15:13
 Raw Sample Received by: [Signature]
 Raw Sample Relinquished by: [Signature]
 Date/Time 12/01/25 17:40
 Raw Sample Received by: [Signature]
 Raw Sample Relinquished by: [Signature]

WORKLIST(Hardcopy Internal Chain)

g 172066

WorkList Name : %1-120125

WorkList ID : 193391

Department : Wet-Chemistry

Date : 12-01-2025 08:55:16

Sample	Customer Sample	Matrix	Test	Preservative	Customer	Raw Sample Storage Location	Collect Date	Method
Q3742-16	SB-1125-1	Solid	Percent Solids	Cool 4 deg C	REMI01	A21	11/25/2025	Chemtech -SO
Q3742-17	SB-1125-25	Solid	Percent Solids	Cool 4 deg C	REMI01	A21	11/25/2025	Chemtech -SO
Q3742-18	SB-1125-24	Solid	Percent Solids	Cool 4 deg C	REMI01	A21	11/25/2025	Chemtech -SO
Q3745-05	SVOC-GPC-BLANK	Solid	Percent Solids	Cool 4 deg C	CHEM02	A12	11/21/2025	Chemtech -SO
Q3745-06	PEST-GPC-BLANK	Solid	Percent Solids	Cool 4 deg C	CHEM02	A12	11/21/2025	Chemtech -SO
Q3745-07	PEST-GPC-BLANK-SPIKE	Solid	Percent Solids	Cool 4 deg C	CHEM02	A12	11/21/2025	Chemtech -SO
Q3745-08	SVOC-GPC2-BLANK	Solid	Percent Solids	Cool 4 deg C	CHEM02	A12	11/21/2025	Chemtech -SO
Q3745-09	PEST-GPC2-BLANK	Solid	Percent Solids	Cool 4 deg C	CHEM02	A12	11/21/2025	Chemtech -SO
Q3745-10	PEST -GPC2-BLANK-SPIKE	Solid	Percent Solids	Cool 4 deg C	CHEM02	A12	11/21/2025	Chemtech -SO
Q3746-01	ROW	Solid	Percent Solids	Cool 4 deg C	PSEG05	A11	12/02/2025	Chemtech -SO
Q3746-02	ROW-E2	Solid	Percent Solids	Cool 4 deg C	PSEG05	A11	12/02/2025	Chemtech -SO
Q3747-01	1	Solid	Percent Solids	Cool 4 deg C	PSEG03	A11	12/01/2025	Chemtech -SO
Q3747-02	2	Solid	Percent Solids	Cool 4 deg C	PSEG03	A11	12/01/2025	Chemtech -SO
Q3747-03	3	Solid	Percent Solids	Cool 4 deg C	PSEG03	A11	12/01/2025	Chemtech -SO
Q3748-01	AU-05-12-1-2025	Solid	Percent Solids	Cool 4 deg C	PSEG03	A11	12/01/2025	Chemtech -SO
Q3748-02	AU-05-12-1-2025	Solid	Percent Solids	Cool 4 deg C	PSEG05	A12	12/01/2025	Chemtech -SO
Q3750-01	FENCE WC-1	Solid	Percent Solids	Cool 4 deg C	PSEG05	A11	12/01/2025	Chemtech -SO
Q3750-02	FENCE WC-1-EPH	Solid	Percent Solids	Cool 4 deg C	PSEG05	A11	12/01/2025	Chemtech -SO
Q3750-03	FENCE WC-1-VOC	Solid	Percent Solids	Cool 4 deg C	PSEG05	A11	12/01/2025	Chemtech -SO
Q3750-04	FENCE WC-2	Solid	Percent Solids	Cool 4 deg C	PSEG05	A11	12/01/2025	Chemtech -SO
Q3750-05	FENCE WC-2-EPH	Solid	Percent Solids	Cool 4 deg C	PSEG05	A11	12/01/2025	Chemtech -SO

Date/Time 12/01/25 15:15
 Raw Sample Received by: [Signature]
 Raw Sample Relinquished by: [Signature]

Date/Time 12/01/25 17:40
 Raw Sample Received by: [Signature]
 Raw Sample Relinquished by: [Signature]

WORKLIST(Hardcopy Internal Chain)

138066

WorkList Name : %1-120125

WorkList ID : 193391

Department : Wet-Chemistry

Date : 12-01-2025 08:55:16

Sample	Customer Sample	Matrix	Test	Preservative	Customer	Raw Sample Storage Location	Collect Date	Method
Q3750-06	FENCE WC-2-VOC	Solid	Percent Solids	Cool 4 deg C	PSEG05	A11	12/01/2025	Chemtech -SO

Date/Time 12/01/25 13:15
 Raw Sample Received by: SB WCL
 Raw Sample Relinquished by: CR 8

Date/Time 12/01/25 17:40
 Raw Sample Received by: CR 8
 Raw Sample Relinquished by: SB WCL

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB138085

Review By	Janvi	Review On	12/3/2025 10:09:18 AM
Supervise By	jaswal	Supervise On	12/5/2025 9:46:28 PM

STD. NAME	STD REF.#
ICAL Standard	MP88101,MP88123,MP88121,MP88120,MP88119,MP88118
ICV Standard	MP88124,MP88123
CCV Standard	MP88127
ICSA Standard	MP88125,MP88126
CRI Standard	MP88120
LCS Standard	
Chk Standard	MP88128,MP88129,MP88130,MP88131,MP88132

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	S0	S0	CAL1	12/02/25 11:04		Jaswal	OK
2	S1	S1	CAL2	12/02/25 11:08		Jaswal	OK
3	S2	S2	CAL3	12/02/25 11:12		Jaswal	OK
4	S3	S3	CAL4	12/02/25 11:16		Jaswal	OK
5	S4	S4	CAL5	12/02/25 11:21		Jaswal	OK
6	S5	S5	CAL6	12/02/25 11:25		Jaswal	OK
7	ICV01	ICV01	ICV	12/02/25 11:29		Jaswal	OK
8	LLICV01	LLICV01	LLICV	12/02/25 11:34		Jaswal	OK
9	ICB01	ICB01	ICB	12/02/25 11:38		Jaswal	OK
10	CRI01	CRI01	CRDL	12/02/25 11:42		Jaswal	OK
11	ICSA01	ICSA01	ICSA	12/02/25 11:52		Jaswal	OK
12	ICSAB01	ICSAB01	ICSAB	12/02/25 11:57		Jaswal	OK
13	ICSADL	ICSADL	ICSA	12/02/25 12:01		Jaswal	OK
14	ICSABDL	ICSABDL	ICSAB	12/02/25 12:05		Jaswal	OK
15	CCV01	CCV01	CCV	12/02/25 12:10		Jaswal	OK
16	CCB01	CCB01	CCB	12/02/25 12:14		Jaswal	OK
17	Q3739-01DL2	GSB1ADL2	SAM	12/02/25 12:19	NOT USE	Jaswal	Not Ok
18	Q3739-02DL2	GSB1BDL2	SAM	12/02/25 12:23	25x for Cr	Jaswal	Confirms

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB138085

Review By	Janvi	Review On	12/3/2025 10:09:18 AM
Supervise By	jaswal	Supervise On	12/5/2025 9:46:28 PM
STD. NAME	STD REF.#		
ICAL Standard	MP88101,MP88123,MP88121,MP88120,MP88119,MP88118		
ICV Standard	MP88124,MP88123		
CCV Standard	MP88127		
ICSA Standard	MP88125,MP88126		
CRI Standard	MP88120		
LCS Standard			
Chk Standard	MP88128,MP88129,MP88130,MP88131,MP88132		

19	Q3740-01DL2	WC1DL2	SAM	12/02/25 12:27	25x for Cr	Jaswal	Confirms
20	Q3740-01DUPDL2	WC1DUPDL2	DUP	12/02/25 12:31	25x for Cr	Jaswal	Confirms
21	Q3740-01LDL2	WC1LDL2	SD	12/02/25 12:36	Not Required	Jaswal	Not Ok
22	Q3740-01MSDL2	WC1MSDL2	MS	12/02/25 12:40	25x for Cr	Jaswal	Confirms
23	Q3740-01MSDDL2	WC1MSDDL2	MSD	12/02/25 12:44	25x for Cr	Jaswal	Confirms
24	Q3740-01ADL2	WC1ADL2	PS	12/02/25 12:48	Not Required (0.1 ML OF EACH M6008 AND M6017 IN 10ML SAMPLE BEFORE DILUTION)	Jaswal	Not Ok
25	LR-2	LR-2	HIGH STD	12/02/25 12:57		Jaswal	OK
26	LR-1	LR-1	HIGH STD	12/02/25 13:08		Jaswal	OK
27	CCV02	CCV02	CCV	12/02/25 13:13		Jaswal	OK
28	CCB02	CCB02	CCB	12/02/25 13:17		Jaswal	OK
29	LR-3	LR-3	HIGH STD	12/02/25 13:21		Jaswal	OK
30	PB170777BL	PB170777BL	MB	12/02/25 13:26		Jaswal	OK
31	PB170777BS	PB170777BS	LCS	12/02/25 13:30		Jaswal	OK
32	PB170778BL	PB170778BL	MB	12/02/25 13:34		Jaswal	OK
33	PB170778BS	PB170778BS	LCS	12/02/25 13:39		Jaswal	OK
34	Q3746-01	ROW	SAM	12/02/25 13:51		Jaswal	OK
35	Q3748-01	AU-05-12-1-2025	SAM	12/02/25 13:55		Jaswal	OK
36	Q3750-04	FENCE WC-2	SAM	12/02/25 13:59		Jaswal	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB138085

Review By	Janvi	Review On	12/3/2025 10:09:18 AM
Supervise By	jaswal	Supervise On	12/5/2025 9:46:28 PM
STD. NAME	STD REF.#		
ICAL Standard	MP88101,MP88123,MP88121,MP88120,MP88119,MP88118		
ICV Standard	MP88124,MP88123		
CCV Standard	MP88127		
ICSA Standard	MP88125,MP88126		
CRI Standard	MP88120		
LCS Standard			
Chk Standard	MP88128,MP88129,MP88130,MP88131,MP88132		

37	Q3741-01	B50-SP3-111925	SAM	12/02/25 14:03		Jaswal	OK
38	Q3741-02	B50-SP13-112025	SAM	12/02/25 14:07		Jaswal	OK
39	CCV03	CCV03	CCV	12/02/25 14:11		Jaswal	OK
40	CCB03	CCB03	CCB	12/02/25 14:15		Jaswal	OK
41	Q3741-03	B50-SP14-112025	SAM	12/02/25 14:24		Jaswal	OK
42	Q3741-04	B50-SP9-112425	SAM	12/02/25 14:28		Jaswal	OK
43	Q3741-05	B50-SP11-112525	SAM	12/02/25 14:33		Jaswal	OK
44	Q3741-06	B50-SP4-112525	SAM	12/02/25 14:47		Jaswal	OK
45	Q3750-01	FENCE WC-1	SAM	12/02/25 14:51		Jaswal	OK
46	Q3750-01DUP	FENCE WC-1DUP	DUP	12/02/25 14:55		Jaswal	OK
47	Q3750-01L	FENCE WC-1L	SD	12/02/25 14:59		Jaswal	OK
48	Q3750-01MS	FENCE WC-1MS	MS	12/02/25 15:03		Jaswal	OK
49	Q3750-01MSD	FENCE WC-1MSD	MSD	12/02/25 15:07		Jaswal	OK
50	Q3750-01A	FENCE WC-1A	PS	12/02/25 15:11	0.1 ML OF EACH M6008 AND M6017 IN 10ML SAMPLE.	Jaswal	OK
51	CCV04	CCV04	CCV	12/02/25 15:15		Jaswal	OK
52	CCB04	CCB04	CCB	12/02/25 15:20		Jaswal	OK
53	Q3742-01	SB-1125-23	SAM	12/02/25 15:24		Jaswal	OK
54	Q3742-02	SB-1125-19	SAM	12/02/25 15:28		Jaswal	OK
55	Q3742-03	SB-1125-8	SAM	12/02/25 15:33		Jaswal	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB138085

Review By	Janvi	Review On	12/3/2025 10:09:18 AM
Supervise By	jaswal	Supervise On	12/5/2025 9:46:28 PM
STD. NAME	STD REF.#		
ICAL Standard	MP88101,MP88123,MP88121,MP88120,MP88119,MP88118		
ICV Standard	MP88124,MP88123		
CCV Standard	MP88127		
ICSA Standard	MP88125,MP88126		
CRI Standard	MP88120		
LCS Standard			
Chk Standard	MP88128,MP88129,MP88130,MP88131,MP88132		

56	Q3742-04	SB-1125-9	SAM	12/02/25 15:37		Jaswal	OK
57	Q3742-05	SB-1125-21	SAM	12/02/25 15:41		Jaswal	OK
58	Q3742-06	SB-1125-13	SAM	12/02/25 15:45		Jaswal	OK
59	Q3742-07	SB-1125-18	SAM	12/02/25 15:49		Jaswal	OK
60	Q3742-08	SB-1125-20	SAM	12/02/25 15:53		Jaswal	OK
61	Q3742-09	SB-1125-22	SAM	12/02/25 15:57		Jaswal	OK
62	Q3742-10	SB-1125-2	SAM	12/02/25 16:01		Jaswal	OK
63	CCV05	CCV05	CCV	12/02/25 16:05		Jaswal	OK
64	CCB05	CCB05	CCB	12/02/25 16:09		Jaswal	OK
65	Q3742-16	SB-1125-1	SAM	12/02/25 16:14		Jaswal	OK
66	Q3742-17	SB-1125-25	SAM	12/02/25 16:18		Jaswal	OK
67	Q3742-18	SB-1125-24	SAM	12/02/25 16:22		Jaswal	OK
68	Q3742-18DUP	SB-1125-24DUP	DUP	12/02/25 16:26		Jaswal	OK
69	Q3742-18L	SB-1125-24L	SD	12/02/25 16:30		Jaswal	OK
70	Q3742-18MS	SB-1125-24MS	MS	12/02/25 16:34		Jaswal	OK
71	Q3742-18MSD	SB-1125-24MSD	MSD	12/02/25 16:38		Jaswal	OK
72	Q3742-18A	SB-1125-24A	PS	12/02/25 16:42	0.1 ML OF EACH M6008 AND M6017 IN 10ML SAMPLE.	Jaswal	OK
73	PB170754TB	PB170754TB	MB	12/02/25 16:46		Jaswal	OK
74	PB170755TB	PB170755TB	MB	12/02/25 16:51		Jaswal	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB138085

Review By	Janvi	Review On	12/3/2025 10:09:18 AM
Supervise By	jaswal	Supervise On	12/5/2025 9:46:28 PM

STD. NAME	STD REF.#
ICAL Standard	MP88101,MP88123,MP88121,MP88120,MP88119,MP88118
ICV Standard	MP88124,MP88123
CCV Standard	MP88127
ICSA Standard	MP88125,MP88126
CRI Standard	MP88120
LCS Standard	
Chk Standard	MP88128,MP88129,MP88130,MP88131,MP88132

75	CCV06	CCV06	CCV	12/02/25 16:55		Jaswal	OK
76	CCB06	CCB06	CCB	12/02/25 16:59		Jaswal	OK

Instrument ID: CV1

Daily Analysis Runlog For Sequence/QC Batch ID # LB138128

Review By	mohan	Review On	12/9/2025 4:59:29 PM
Supervise By	jaswal	Supervise On	12/9/2025 10:55:17 PM
STD. NAME	STD REF.#		
ICAL Standard	MP88215,MP88217,MP88218,MP88219,MP88220,MP88221		
ICV Standard	MP88222		
CCV Standard	MP88224		
ICSA Standard			
CRI Standard	MP88206		
LCS Standard			
Chk Standard	MP88223,MP88225,MP88229		

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	S0	S0	CAL1	12/05/25 13:53		mohan	OK
2	S0.2	S0.2	CAL2	12/05/25 13:55		mohan	OK
3	S2.5	S2.5	CAL3	12/05/25 13:58		mohan	OK
4	S5	S5	CAL4	12/05/25 14:00		mohan	OK
5	S7.5	S7.5	CAL5	12/05/25 14:02		mohan	OK
6	S10	S10	CAL6	12/05/25 14:05		mohan	OK
7	ICV141	ICV141	ICV	12/05/25 14:12		mohan	OK
8	ICB141	ICB141	ICB	12/05/25 14:14		mohan	OK
9	CCV71	CCV71	CCV	12/05/25 14:16		mohan	OK
10	CCB71	CCB71	CCB	12/05/25 14:19		mohan	OK
11	CRA	CRA	CRDL	12/05/25 14:21		mohan	OK
12	HighStd	HighStd	HIGH STD	12/05/25 14:23		mohan	OK
13	ChkStd	ChkStd	SAM	12/05/25 14:25		mohan	OK
14	PB170840BL	PB170840BL	MB	12/05/25 14:28		mohan	OK
15	PB170840BS	PB170840BS	LCS	12/05/25 14:32		mohan	OK
16	Q3741-01	B50-SP3-111925	SAM	12/05/25 14:35	Hg High , need dilution	mohan	Dilution
17	Q3741-01DUP	B50-SP3-111925DUP	DUP	12/05/25 14:37		mohan	OK
18	Q3741-01MS	B50-SP3-111925MS	MS	12/05/25 14:47	Hg High , need dilution	mohan	Dilution

Instrument ID: CV1

Daily Analysis Runlog For Sequence/QC Batch ID # LB138128

Review By	mohan	Review On	12/9/2025 4:59:29 PM
Supervise By	jaswal	Supervise On	12/9/2025 10:55:17 PM

STD. NAME	STD REF.#
ICAL Standard	MP88215,MP88217,MP88218,MP88219,MP88220,MP88221
ICV Standard	MP88222
CCV Standard	MP88224
ICSA Standard	
CRI Standard	MP88206
LCS Standard	
Chk Standard	MP88223,MP88225,MP88229

19	Q3741-01MSD	B50-SP3-111925MSD	MSD	12/05/25 14:49	Hg High , need dilution	mohan	Dilution
20	Q3741-02	B50-SP13-112025	SAM	12/05/25 14:52	Hg High , need dilution	mohan	Dilution
21	CCV72	CCV72	CCV	12/05/25 14:54		mohan	OK
22	CCB72	CCB72	CCB	12/05/25 14:56		mohan	OK
23	Q3741-03	B50-SP14-112025	SAM	12/05/25 14:59	Hg High , need dilution	mohan	Dilution
24	Q3741-04	B50-SP9-112425	SAM	12/05/25 15:01	Hg High , need dilution	mohan	Dilution
25	Q3741-05	B50-SP11-112525	SAM	12/05/25 15:03		mohan	OK
26	Q3741-06	B50-SP4-112525	SAM	12/05/25 15:06	Hg High , need dilution	mohan	Dilution
27	Q3779-01	OILY STONE DRUM	SAM	12/05/25 15:08		mohan	OK
28	Q3780-01	PLASTIC SHEETING	SAM	12/05/25 15:10		mohan	OK
29	Q3781-01	OK-1242025-1	SAM	12/05/25 15:12		mohan	OK
30	Q3741-01L	B50-SP3-111925L	SD	12/05/25 15:15		mohan	OK
31	Q3741-01A	B50-SP3-111925A	PS	12/05/25 15:17	Hg High , need dilution	mohan	Dilution
32	CCV73	CCV73	CCV	12/05/25 15:23		mohan	OK
33	CCB73	CCB73	CCB	12/05/25 15:25		mohan	OK

Instrument ID: CV1

Daily Analysis Runlog For Sequence/QC Batch ID # LB138165

Review By	Sagar	Review On	12/10/2025 2:18:10 PM
Supervise By		Supervise On	

STD. NAME	STD REF.#
ICAL Standard	MP88232,MP88234,MP88235,MP88236,MP88237,MP882388
ICV Standard	MP88239
CCV Standard	MP88241
ICSA Standard	
CRI Standard	MP88243
LCS Standard	
Chk Standard	MP88240,MP88242,MP88244,MP88246

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	S0	S0	CAL1	12/09/25 11:10		mohan	OK
2	S0.2	S0.2	CAL2	12/09/25 11:13		mohan	OK
3	S2.5	S2.5	CAL3	12/09/25 11:15		mohan	OK
4	S5	S5	CAL4	12/09/25 11:17		mohan	OK
5	S7.5	S7.5	CAL5	12/09/25 11:19		mohan	OK
6	S10	S10	CAL6	12/09/25 11:25		mohan	OK
7	ICV147	ICV147	ICV	12/09/25 11:28		mohan	OK
8	ICB147	ICB147	ICB	12/09/25 11:30		mohan	OK
9	CCV84	CCV84	CCV	12/09/25 11:33		mohan	OK
10	CCB84	CCB84	CCB	12/09/25 11:35		mohan	OK
11	CRA	CRA	CRDL	12/09/25 11:40		mohan	OK
12	HighStd	HighStd	HIGH STD	12/09/25 11:42		mohan	OK
13	ChkStd	ChkStd	SAM	12/09/25 11:44		mohan	OK
14	PB170867BL	PB170867BL	MB	12/09/25 11:47		mohan	OK
15	PB170867BS	PB170867BS	LCS	12/09/25 11:49		mohan	OK
16	Q3790-01	304 FURMAN SOIL	SAM	12/09/25 11:51		mohan	OK
17	Q3795-01	72-11966	SAM	12/09/25 11:54		mohan	OK
18	Q3795-05	RBR 200059	SAM	12/09/25 11:56		mohan	OK

Instrument ID: CV1

Daily Analysis Runlog For Sequence/QC Batch ID # LB138165

Review By	Sagar	Review On	12/10/2025 2:18:10 PM
Supervise By		Supervise On	
STD. NAME	STD REF.#		
ICAL Standard	MP88232,MP88234,MP88235,MP88236,MP88237,MP882388		
ICV Standard	MP88239		
CCV Standard	MP88241		
ICSA Standard			
CRI Standard	MP88243		
LCS Standard			
Chk Standard	MP88240,MP88242,MP88244,MP88246		

19	Q3801-01	SOIL#1	SAM	12/09/25 11:58		mohan	OK
20	Q3801-06	SOIL#2	SAM	12/09/25 12:00		mohan	OK
21	CCV85	CCV85	CCV	12/09/25 12:03		mohan	OK
22	CCB85	CCB85	CCB	12/09/25 12:05		mohan	OK
23	Q3806-01	TR-01-12-5-2025	SAM	12/09/25 12:07		mohan	OK
24	Q3806-04	TR-05-12-5-2025	SAM	12/09/25 12:14		mohan	OK
25	Q3806-04DUP	TR-05-12-5-2025DUP	DUP	12/09/25 12:17		mohan	OK
26	Q3806-04MS	TR-05-12-5-2025MS	MS	12/09/25 12:19		mohan	OK
27	Q3806-04MSD	TR-05-12-5-2025MSD	MSD	12/09/25 12:21		mohan	OK
28	Q3812-01	OR-02-120825	SAM	12/09/25 12:23		mohan	OK
29	Q3806-04L	TR-05-12-5-2025L	SD	12/09/25 12:32		mohan	OK
30	Q3806-04A	TR-05-12-5-2025A	PS	12/09/25 12:38		mohan	OK
31	CCV86	CCV86	CCV	12/09/25 12:40		mohan	OK
32	CCB86	CCB86	CCB	12/09/25 12:43		mohan	OK
33	Q3741-01DL	B50-SP3-111925DL	SAM	12/09/25 12:45	2X For Hg	mohan	Confirms
34	Q3741-01DUPDL	B50-SP3-111925DUP	DUP	12/09/25 12:47	2X For Hg	mohan	Confirms
35	Q3741-01MSDL	B50-SP3-111925MSD	MS	12/09/25 12:52	2X For Hg	mohan	Confirms
36	Q3741-01MSDDL	B50-SP3-111925MSD	MSD	12/09/25 12:55	2X For Hg	mohan	Confirms
37	Q3741-01LDL	B50-SP3-111925LDL	SD	12/09/25 12:58	10X For Hg	mohan	Confirms
38	Q3741-01ADL	B50-SP3-111925ADL	PS	12/09/25 13:03	2X For Hg	mohan	Confirms

Instrument ID: CV1

Daily Analysis Runlog For Sequence/QC Batch ID # LB138165

Review By	Sagar	Review On	12/10/2025 2:18:10 PM
Supervise By		Supervise On	
STD. NAME	STD REF.#		
ICAL Standard	MP88232,MP88234,MP88235,MP88236,MP88237,MP882388		
ICV Standard	MP88239		
CCV Standard	MP88241		
ICSA Standard			
CRI Standard	MP88243		
LCS Standard			
Chk Standard	MP88240,MP88242,MP88244,MP88246		

39	Q3741-02DL	B50-SP13-112025DL	SAM	12/09/25 13:06	5X For Hg	mohan	Confirms
40	Q3741-03DL	B50-SP14-112025DL	SAM	12/09/25 13:08	5X For Hg	mohan	Confirms
41	Q3741-04DL	B50-SP9-112425DL	SAM	12/09/25 13:10	5X For Hg	mohan	Confirms
42	Q3741-06DL	B50-SP4-112525DL	SAM	12/09/25 13:13	5X For Hg	mohan	Confirms
43	CCV87	CCV87	CCV	12/09/25 13:15		mohan	OK
44	CCB87	CCB87	CCB	12/09/25 13:17		mohan	OK

Prep Standard - Chemical Standard Summary

Order ID : Q3741

Test : Mercury, Metals ICP-TAL

Prepbatch ID : PB170777, PB170840,

Sequence ID/Qc Batch ID: LB138085, LB138128, LB138165,

Standard ID :

MP87634, MP87636, MP88081, MP88101, MP88118, MP88119, MP88120, MP88121, MP88122, MP88123, MP88124, MP88125, MP88126, MP88127, MP88128, MP88129, MP88130, MP88131, MP88132, MP88195, MP88206, MP88214, MP88215, MP88217, MP88218, MP88219, MP88220, MP88221, MP88222, MP88223, MP88224, MP88225, MP88226, MP88228, MP88229, MP88231, MP88232, MP88234, MP88235, MP88236, MP88237, MP88238, MP88239, MP88240, MP88241, MP88242, MP88243, MP88244, MP88246,

Chemical ID :

M4916, M5062, M5467, M5501, M5581, M5582, M5658, M5697, M5798, M5799, M5800, M5801, M5814, M5816, M5820, M5882, M5962, M5971, M5979, M5985, M5998, M6021, M6023, M6026, M6027, M6028, M6030, M6032, M6058, M6077, M6086, M6128, M6137, M6140, M6142, M6145, M6146, M6151, M6156, M6159, M6161, M6163, M6164, M6165, M6170, M6171, M6172, M6174, M6176, M6177, M6179, M6182, M6184, M6187, M6196, M6200, M6201, M6209, W 3112,



Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
65	POTASSIUM PERMANGANATE SOLUTION 5 %	MP87634	10/17/2025	03/31/2026	Sagar Kanani	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal 10/28/2025

FROM 100.00000gram of M4916 + 2000.00000ml 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>
67	SODIUM CHLORIDE - HYDROXYL- CHLORIDE SOLUTION	MP87636	10/17/2025	02/03/2026	Sagar Kanani	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal 10/28/2025

FROM 2000.00000ml of W3112 + 240.00000gram of M5501 + 240.00000ml of M6196 = Final Quantity: 2000.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
169	1:1HNO3	MP88081	11/25/2025	01/28/2026	Sagar Kanani	None	None	Sarabjit Jaswal
								12/04/2025

FROM 1250.00000ml of M6187 + 1250.00000ml of W3112 = Final Quantity: 2500.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
902	ICP AES CAL BLK (SO/ICB/CCB)	MP88101	11/25/2025	01/25/2026	Sarabjit Jaswal	None	None	Mohan Bera
								12/09/2025

FROM 125.00000ml of M6200 + 2350.00000ml of W3112 + 25.00000ml of M6187 = 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>
907	ICP AES STD S (S5)	MP88118	11/25/2025	01/25/2026	Sarabjit Jaswal	None	None	Mohan Bera
12/09/2025								

<u>FROM</u>	5.00000ml of M5467 + 5.00000ml of M5816 + 5.00000ml of M5820 + 5.00000ml of M5971 + 5.00000ml of M5998 + 5.00000ml of M6077 + 5.00000ml of M6146 + 5.00000ml of M6174 + 5.00000ml of M6176 + 455.00000ml of MP88101 = Final Quantity: 500.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
909	ICP AES STD S3	MP88120	11/25/2025	01/25/2026	Sarabjit Jaswal	None	None	Mohan Bera
								12/09/2025

FROM 25.00000ml of MP88118 + 75.00000ml of MP88101 = 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>
908	ICP AES S2/CRI MINERALS ONLY STD	MP88121	11/25/2025	01/25/2026	Sarabjit Jaswal	None	None	Mohan Bera
								12/09/2025

FROM 4.00000ml of MP88118 + 96.00000ml of MP88101 = 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>
2950	ICP AES S1/CRI STOCK STD	MP88122	11/25/2025	01/25/2026	Sarabjit Jaswal	None	METALS_PIPETTE_3 (A)	Mohan Bera 12/09/2025

FROM 0.03000ml of M5798 + 0.03000ml of M6028 + 0.04000ml of M6137 + 0.05000ml of M5658 + 0.05000ml of M6030 + 0.05000ml of M6140 + 0.05000ml of M6159 + 0.06000ml of M6177 + 0.10000ml of M5697 + 0.10000ml of M5801 + 0.10000ml of M5820 + 0.10000ml of M5962 + 0.10000ml of M5971 + 0.10000ml of M6128 + 0.10000ml of M6176 + 0.15000ml of M5800 + 0.20000ml of M5799 + 0.20000ml of M6021 + 0.20000ml of M6023 + 0.20000ml of M6027 + 0.20000ml of M6145 + 0.25000ml of M5467 + 0.25000ml of M6146 + 0.50000ml of M5814 + 0.50000ml of M6032 + 1.00000ml of M5979 + 1.00000ml of M6086 + 1.00000ml of M6142 + 1.00000ml of M6156 + 1.00000ml of M6171 + 1.00000ml of M6172 + 2.00000ml of M5816 + 88.47000ml of MP88101 = 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>
2951	ICP AES S1/CRI WORK STD	MP88123	11/25/2025	01/25/2026	Sarabjit Jaswal	None	None	Mohan Bera 12/09/2025

FROM 2.00000ml of MP88122 + 98.00000ml of MP88101 = 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>
4163	NEW ICV-060925	MP88124	11/25/2025	01/25/2026	Sarabjit Jaswal	None	METALS_PIPETTE_3 (A)	Mohan Bera 12/09/2025

FROM 0.20000ml of M6058 + 0.40000ml of M6163 + 0.40000ml of M6164 + 0.40000ml of M6165 + 48.60000ml of MP88101 = 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>
904	ICP AES ICSA SOLN	MP88125	11/25/2025	01/25/2026	Sarabjit Jaswal	None	None	Mohan Bera 12/09/2025

FROM 5.00000ml of M6182 + 45.00000ml of MP88101 = 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	MP88126	11/25/2025	01/25/2026	Sarabjit Jaswal	None	METALS_PIPETTE_3 (A)	Mohan Bera 12/09/2025

FROM 0.05000ml of M6077 + 5.00000ml of M6182 + 5.00000ml of M6184 + 39.95000ml of MP88101 = 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>
911	ICP AES CCV SOLN	MP88127	11/25/2025	01/25/2026	Sarabjit Jaswal	None	None	Mohan Bera 12/09/2025

FROM 50.00000ml of MP88101 + 50.00000ml of MP88118 = 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>
919	ICP AES INTERNAL STD	MP88128	11/25/2025	01/25/2026	Sarabjit Jaswal	None	METALS_PIPETTE_3 (A)	Mohan Bera 12/09/2025

FROM	
	1.00000ml of M6179 + 10.00000ml of M5985 + 1969.00000ml of W3112 + 20.00000ml of M6187 = Final Quantity: 2000.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
903	ICP AES RINSE SOLN	MP88129	11/25/2025	01/25/2026	Sarabjit Jaswal	None	None	Mohan Bera 12/09/2025

FROM	200.00000ml of M6187 + 9800.00000ml of W3112 = Final Quantity: 10000.000 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>
4225	LR-1	MP88130	11/25/2025	01/25/2026	Sarabjit Jaswal	None	METALS_PIPETTE_3 (A)	Mohan Bera 12/09/2025

FROM 11.50000ml of M6086 + 11.50000ml of M6171 + 11.50000ml of M6172 + 15.50000ml of MP88101 = 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>
4226	LR-2	MP88131	11/25/2025	01/25/2026	Sarabjit Jaswal	None	METALS_PIPETTE_3 (A)	Mohan Bera 12/09/2025

FROM 13.50000ml of M6140 + 9.00000ml of M6142 + 9.50000ml of M6159 + 18.00000ml of MP88101 = 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>
4227	LR-3	MP88132	11/25/2025	01/25/2026	Sarabjit Jaswal	None	METALS_PIPETTE_3 (A)	Mohan Bera 12/09/2025

FROM 1.15000ml of M6026 + 1.25000ml of M5658 + 1.25000ml of M6027 + 1.50000ml of M6145 + 2.50000ml of M5697 + 2.50000ml of M6128 + 39.85000ml of MP88101 = 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>
871	MERCURY INTERMEDIATE B 250PPB WORKING STD.	MP88195	12/04/2025	12/05/2025	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Sarabjit Jaswal 12/04/2025

FROM 1.00000ml of M6187 + 2.50000ml of M5062 + 96.50000ml of W3112 = 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>
1349	CRA/CRI (Hg 0.2 PPB SOLUTION)	MP88206	12/04/2025	12/05/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG A)	Sarabjit Jaswal 12/04/2025
<u>FROM</u>	2.50000ml of M6187 + 247.30000ml of W3112 + 0.20000ml of MP88195 = 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>
871	MERCURY INTERMEDIATE B 250PPB WORKING STD.	MP88214	12/05/2025	12/06/2025	Mohan Bera	None	None	Sarabjit Jaswal 12/09/2025
<u>FROM</u>	1.00000ml of M6187 + 2.50000ml of M5062 + 96.50000ml of W3112 = 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>
1340	Hg 0.00 PPB STD	MP88215	12/05/2025	12/06/2025	Mohan Bera	None	None	Sarabjit Jaswal
								12/09/2025

FROM 2.50000ml of M6187 + 247.50000ml of W3112 = Final Quantity: 250.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1341	Hg 0.2 PPB STD	MP88217	12/05/2025	12/06/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG A)	Sarabjit Jaswal
								12/09/2025

FROM 2.50000ml of M6187 + 247.30000ml of W3112 + 0.20000ml of MP88214 = 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>
1342	Hg 2.5 PPB STD	MP88218	12/05/2025	12/06/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG)	Sarabjit Jaswal
A) FROM 2.50000ml of M6187 + 245.00000ml of W3112 + 2.50000ml of MP88214 = Final Quantity: 250.000 ml								

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1343	Hg 5.0 PPB STD	MP88219	12/05/2025	12/06/2025	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Sarabjit Jaswal 12/09/2025
<u>FROM</u>	2.50000ml of M6187 + 242.50000ml of W3112 + 5.00000ml of MP88214 = Final Quantity: 250.000 ml							



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1344	Hg 7.5 PPB STD	MP88220	12/05/2025	12/06/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG)	Sarabjit Jaswal
FROM 2.50000ml of M6187 + 240.00000ml of W3112 + 7.50000ml of MP88214 = Final Quantity: 250.000 ml								

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1345	Hg 10.0 PPB STD	MP88221	12/05/2025	12/06/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG)	Sarabjit Jaswal
A) <u>FROM</u> 2.50000ml of M6187 + 237.50000ml of W3112 + 10.00000ml of MP88214 = 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>
1346	Hg ICV SOLUTION	MP88222	12/05/2025	12/06/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG)	Sarabjit Jaswal
A) FROM 2.50000ml of M6161 + 2.50000ml of M6187 + 245.00000ml of W3112 = Final Quantity: 250.000 ml								

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1351	ICB (Hg 0.00 PPB SOLUTION)	MP88223	12/05/2025	12/06/2025	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Sarabjit Jaswal 12/09/2025
<u>FROM</u> 2.50000ml of M6187 + 247.50000ml of W3112 = Final Quantity: 250.000 ml								



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1358	CCV (Hg 5.0 PPB SOLUTION)	MP88224	12/05/2025	12/06/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG)	Sarabjit Jaswal
A) FROM 485.00000ml of W3112 + 5.00000ml of M6187 + 10.00000ml of MP88214 = Final Quantity: 500.000 ml								

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1352	CCB (Hg 0.00 PPB SOLUTION)	MP88225	12/05/2025	12/06/2025	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Sarabjit Jaswal 12/09/2025
<u>FROM</u> 495.00000ml of W3112 + 5.00000ml of M6187 = Final Quantity: 500.000 ml								



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1349	CRA/CRI (Hg 0.2 PPB SOLUTION)	MP88226	12/05/2025	12/06/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG A)	Sarabjit Jaswal 12/09/2025
<u>FROM</u>	2.50000ml of M6187 + 247.30000ml of W3112 + 0.20000ml of MP88214 = 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>
887	AQUA REGIA FOR HG ON 7471A	MP88228	12/05/2025	12/06/2025	Mohan Bera	None	None	Sarabjit Jaswal 12/09/2025
<u>FROM</u> 150.00000ml of M6200 + 50.00000ml of M6187 = Final Quantity: 200.000 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>
68	STANNOUS CHLORIDE SOLUTION	MP88229	12/05/2025	12/06/2025	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal
								12/09/2025

FROM 450.00000ml of W3112 + 50.00000gram of M5882 + 50.00000ml of M6200 = Final Quantity: 500.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
871	MERCURY INTERMEDIATE B 250PPB WORKING STD.	MP88231	12/08/2025	12/09/2025	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Sarabjit Jaswal
								12/09/2025

FROM 1.00000ml of M6187 + 2.50000ml of M5062 + 96.50000ml of W3112 = Final Quantity: 100.000 ml



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1340	Hg 0.00 PPB STD	MP88232	12/08/2025	12/09/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG	Sarabjit Jaswal 12/09/2025

FROM	TO	REMARKS
2.50000ml of M6187 + 247.50000ml of W3112	= Final Quantity: 250.000 ml	A)

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1341	Hg 0.2 PPB STD	MP88234	12/08/2025	12/09/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG	Sarabjit Jaswal 12/09/2025

FROM		A)
2.50000ml of M6187 + 247.30000ml of W3112 + 0.20000ml of MP88231	= 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>
1342	Hg 2.5 PPB STD	MP88235	12/08/2025	12/09/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG)	Sarabjit Jaswal 12/09/2025
FROM 2.50000ml of M6187 + 245.00000ml of W3112 + 2.50000ml of MP88231 = Final Quantity: 250.000 ml 								

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1343	Hg 5.0 PPB STD	MP88236	12/08/2025	12/09/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG)	Sarabjit Jaswal 12/09/2025
FROM 2.50000ml of M6187 + 242.50000ml of W3112 + 5.00000ml of MP88231 = 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>
1344	Hg 7.5 PPB STD	MP88237	12/08/2025	12/09/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG)	Sarabjit Jaswal 12/09/2025
FROM 2.50000ml of M6187 + 240.00000ml of W3112 + 7.50000ml of MP88231 = 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>
1346	Hg ICV SOLUTION	MP88239	12/08/2025	12/09/2025	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Sarabjit Jaswal 12/09/2025
<u>FROM</u>	2.50000ml of M6161 + 2.50000ml of M6187 + 245.00000ml of W3112 = Final Quantity: 250.000 ml							



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1351	ICB (Hg 0.00 PPB SOLUTION)	MP88240	12/08/2025	12/09/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG A)	Sarabjit Jaswal 12/09/2025
<u>FROM</u>	2.50000ml of M6187 + 247.50000ml of W3112 = Final Quantity: 250.000 ml							

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1358	CCV (Hg 5.0 PPB SOLUTION)	MP88241	12/08/2025	12/09/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG A)	Sarabjit Jaswal 12/09/2025
<u>FROM</u>	485.00000ml of W3112 + 5.00000ml of M6187 + 10.00000ml of MP88231 = Final Quantity: 500.000 ml							



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1352	CCB (Hg 0.00 PPB SOLUTION)	MP88242	12/08/2025	12/09/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG A)	Sarabjit Jaswal 12/09/2025
FROM 495.00000ml of W3112 + 5.00000ml of M6187 = Final Quantity: 500.000 ml								

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1349	CRA/CRI (Hg 0.2 PPB SOLUTION)	MP88243	12/08/2025	12/09/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG A)	Sarabjit Jaswal 12/09/2025
<u>FROM</u>	2.50000ml of M6187 + 247.30000ml of W3112 + 0.20000ml of MP88231 = 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>
1350	CHK STD (Hg 7.0 PPB SOLUTION)	MP88244	12/08/2025	12/09/2025	Mohan Bera	None	METALS_PIPETTE_5 (HG A)	Sarabjit Jaswal 12/09/2025
<u>FROM</u>	2.50000ml of M6187 + 240.50000ml of W3112 + 7.00000ml of MP88231 = Final Quantity: 250.000 ml							

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
68	STANNOUS CHLORIDE SOLUTION	MP88246	12/08/2025	12/09/2025	Mohan Bera	METALS_SCALE_3 (M SC-3)	Glass Pipette-A	Sarabjit Jaswal 12/09/2025
<u>FROM</u> 450.00000ml of W3112 + 50.00000gram of M5882 + 50.00000ml of M6200 = Final Quantity: 500.000 ml								

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-3227-05 / Potassium Permanganate (2.5kg)	210800	03/31/2026	11/30/2022 / mohan	07/28/2021 / mohan	M4916

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

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-3624-05 / Sodium Chloride, Crystal (cs/4x2.5kg)	0000281938	07/06/2026	07/24/2023 / mohan	04/14/2023 / mohan	M5501

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	26397-103 / PTFE BOILING STONES	W126678	03/19/2026	03/20/2025 /	06/12/2023 / jaswal	M5581

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	26397-103 / PTFE BOILING STONES	W126678	12/31/2025	06/17/2023 / Al-Terek	06/12/2023 / jaswal	M5582

CHEMICAL RECEIPT LOG BOOK

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

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

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

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

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

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

CHEMICAL RECEIPT LOG BOOK

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

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

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	06/06/2025 / Janvi	07/01/2024 / Jaswal	M5971

CHEMICAL RECEIPT LOG BOOK

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	08/05/2026	08/06/2025 / Janvi	02/22/2024 / Jaswal	M5979

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-CAL-3 / CLP CAL SOLUTION #3, 125mL	T2-MEB727800	07/30/2026	07/30/2025 / Janvi	02/22/2024 / kareem	M5998

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

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57182 / Pb, 10000 PPM, 125 ml	110923	11/09/2026	12/05/2024 / janvi	08/05/2024 / Jaswal	M6026

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57028 / Ni, 1000 PPM, 125 ml	062024	06/20/2027	06/04/2025 / Janvi	08/05/2024 / Jaswal	M6027

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

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

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	CHEM-QC-4 / CHEM-QC-4, Second Source, 1000 ug/ml, B, Mo, Si, Sn, Ti	V2-MEB746173	01/29/2026	01/29/2025 / JANVI	08/22/2024 / Jaswal	M6058

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

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58120 / Calcium, 500 ml, 10000 PPM	082324	08/23/2027	03/06/2025 / JANVI	10/14/2024 / jaswal	M6086

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	CGSI1-1 / SILICON 125mL 1000ug/mL	V2-SI744713	07/10/2029	01/14/2025 / Jaswal	10/03/2024 / Jaswal	M6137

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	011025	01/10/2028	06/25/2025 / Janvi	01/13/2025 / Jaswal	M6140

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	58119 / K, 10000 PPM, 500 ml	103024	10/30/2027	05/06/2025 / JANVI	01/13/2025 / Jaswal	M6142

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

CHEMICAL RECEIPT LOG BOOK

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9530-33 / Hydrochloric Acid, Instra-Analyzed (cs/6x2.5L)	22G2862015	02/17/2026	02/18/2025 / Sagar	01/15/2025 / Sagar	M6151

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	57042 / Mo, 1000 PPM, 125 ml	032123	03/21/2026	11/06/2024 / JANVI	06/12/2024 / JANVI	M6156

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	011325	03/18/2026	03/18/2025 / kareem	02/09/2025 / kareem	M6159

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
EPA	ICV-5 / ICV (HG) STOCK SOLN	ICV 5 0415	12/31/2025	05/01/2025 / mohan	03/30/2024 / mohan	M6161

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	QCP-CICV-1-125ML / EPA CLP ICP Verification Standard1	V2-MEB744107	06/08/2026	06/09/2025 / jaswal	06/06/2025 / jaswal	M6163

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	QCP-CICV-2-125ML / EPA CLP ICP Verification Standard2	U2-MEB733713	06/08/2026	06/09/2025 / jaswal	06/09/2025 / jaswal	M6164

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	QCP-CICV-3-125ML / EPA CLP ICP Verification Standard3	V2-MEB749572	06/08/2026	06/09/2025 / jaswal	06/09/2025 / jaswal	M6165

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-2186-03 / Hydrogen Peroxide (cs/4x4L)	24D1961001	12/24/2025	06/25/2025 /	05/20/2025 / Sagar	M6170

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	011525	01/15/2028	07/15/2025 /	02/13/2025 / Janvi	M6171

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	CGNA10-5 / Sodium, 500 ml, 10000 PPM	V2-NA740547	07/29/2026	07/29/2025 / Janvi	01/25/2025 / Janvi	M6172

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	V2-MEB742428	07/31/2026	07/31/2025 / Janvi	05/05/2025 / Janvi	M6174

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	092724	09/27/2027	08/06/2025 / Janvi	08/06/2025 / Janvi	M6176

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	/ Lead (Pb) 1000PPM	031525	03/15/2028	08/06/2025 / Janvi	08/06/2025 / Janvi	M6177

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	08/05/2026	08/06/2025 / Janvi	06/02/2024 / Janvi	M6179

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	02/05/2026	08/06/2025 / Janvi	03/06/2024 / Janvi	M6182

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	02/05/2026	08/06/2025 / Janvi	03/06/2024 / Janvi	M6184

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)	24H0162012	01/28/2026	08/29/2025 / Sagar	08/08/2025 / Sagar	M6187

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	H330-500 / HYDROXYLAMINE HYDROCHLORIDE ACS 500G	243373	02/03/2026	09/04/2025 / mohan	08/04/2025 / mohan	M6196

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)	24D1562005	02/10/2026	09/11/2025 / Sagar	08/25/2025 / Sagar	M6200

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	WW-LFS-2 / Laboratory Fortified Stock Solution 2, 125 ml	V2-MEB743480	10/15/2026	10/15/2025 /	07/20/2025 / janvi	M6201

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	WW-LFS-1 / Laboratory Fortified Stock Solution 1, 125 ml	V2-MEB752149	10/15/2026	10/15/2025 / Janvi	07/20/2025 / Janvi	M6209

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

M5882
 M3

Certificate of Analysis

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

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

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

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

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



Harout Sahagian - Quality Control Supervisor - Fair Lawn

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

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

*Based on suggested storage condition.



CERTIFIED WEIGHT REPORT:

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

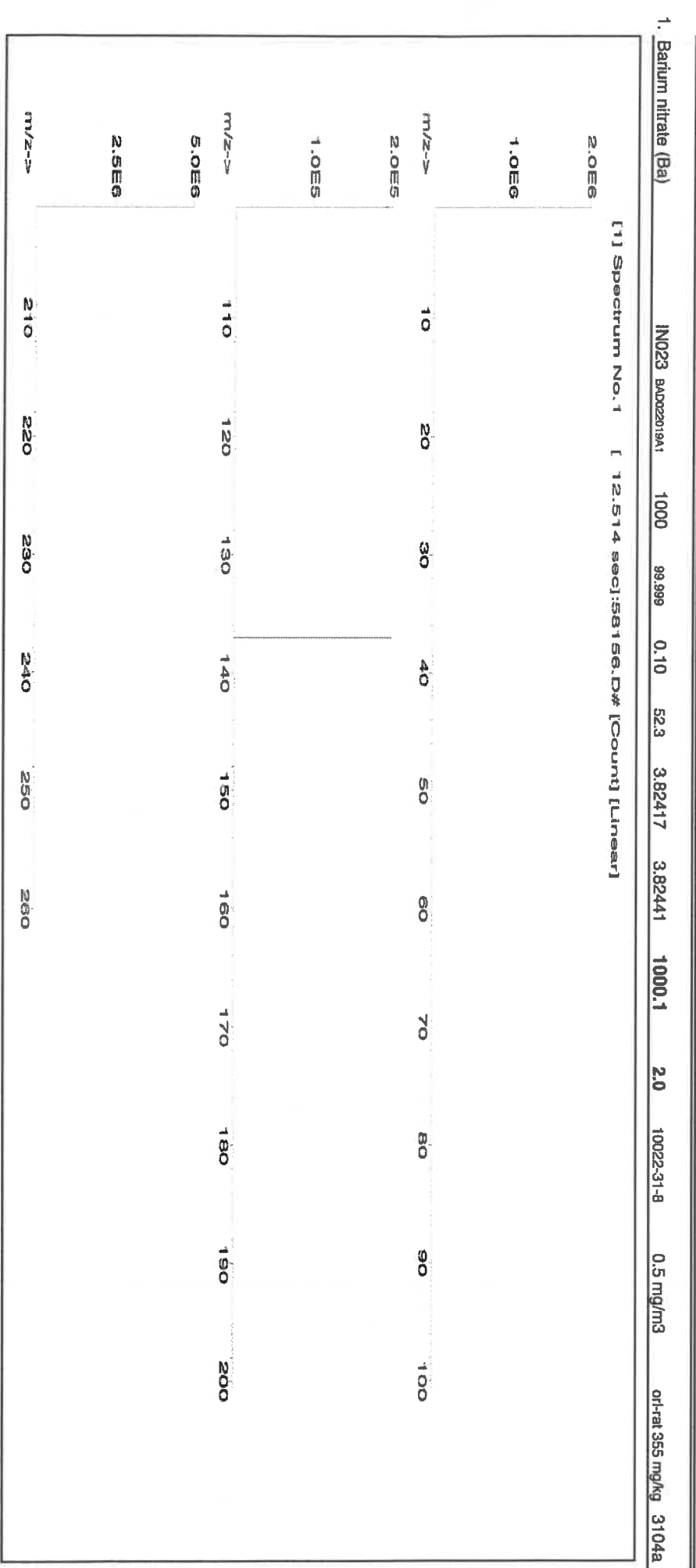
Formulated By: Giovanni Esposito

010924

Reviewed By: Pedro L. Renteria

010924

SDS Information									
Compound	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)
1. Barium nitrate (Ba)	IN023	BA0022019A1	1000	99.999	0.10	52.3	3.82417	3.82441	1000.1





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

Part Number: **58120**
Lot Number: **082324**
Description: **Calcium (Ca)**

Solvent: **24002546 Nitric Acid**

Lot #

Rev'd 20/11/2024 M6085 / M6086 / M6087

Expiration Date: **082327**

Recommended Storage: **Ambient (20 °C)**

Nominal Concentration (µg/mL): **10000**

NIST Test Number: **6UTB**

5E-05 Balance Uncertainty

Weight shown below was diluted to (mL): **4000.1** 0.15 Flask Uncertainty

<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito
Reviewed By:	<i>Pedro L. Rentas</i>
	Pedro L. Rentas
	082324

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. Calcium carbonate (Ca)	IN014	CAD03202383	10000	99.999	0.10	39.9	100.2537	100.2656	10001.2
							20.0	471.34-1	5 mg/m3
								ort-rat >2000mg/kg	3109a

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





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

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

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pt	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	T	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	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	30	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	Su	<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.
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- * All standards should be stored with caps tight and under appropriate laboratory conditions.
- * Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, D.C. (1994).



CERTIFIED WEIGHT REPORT:

Part Number:
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

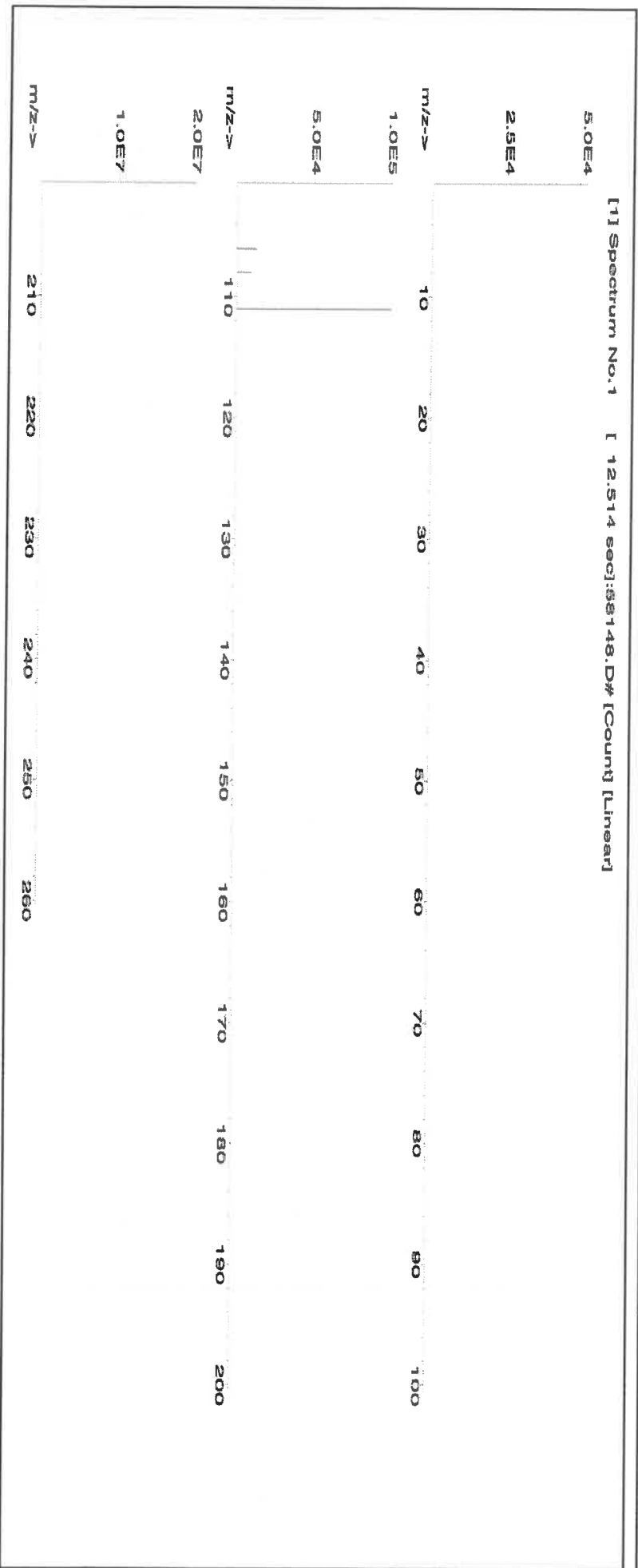
<i>Aleah O'Brady</i>	
Formulated By:	Aleah O'Brady
	070124
<i>Pedro L. Rentas</i>	
Reviewed By:	Pedro L. Rentas
	070124

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

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

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





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

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

Solvent: **24002546 Nitric Acid**
Lot #: **2%**

40.0 (mL) Nitric Acid

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

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

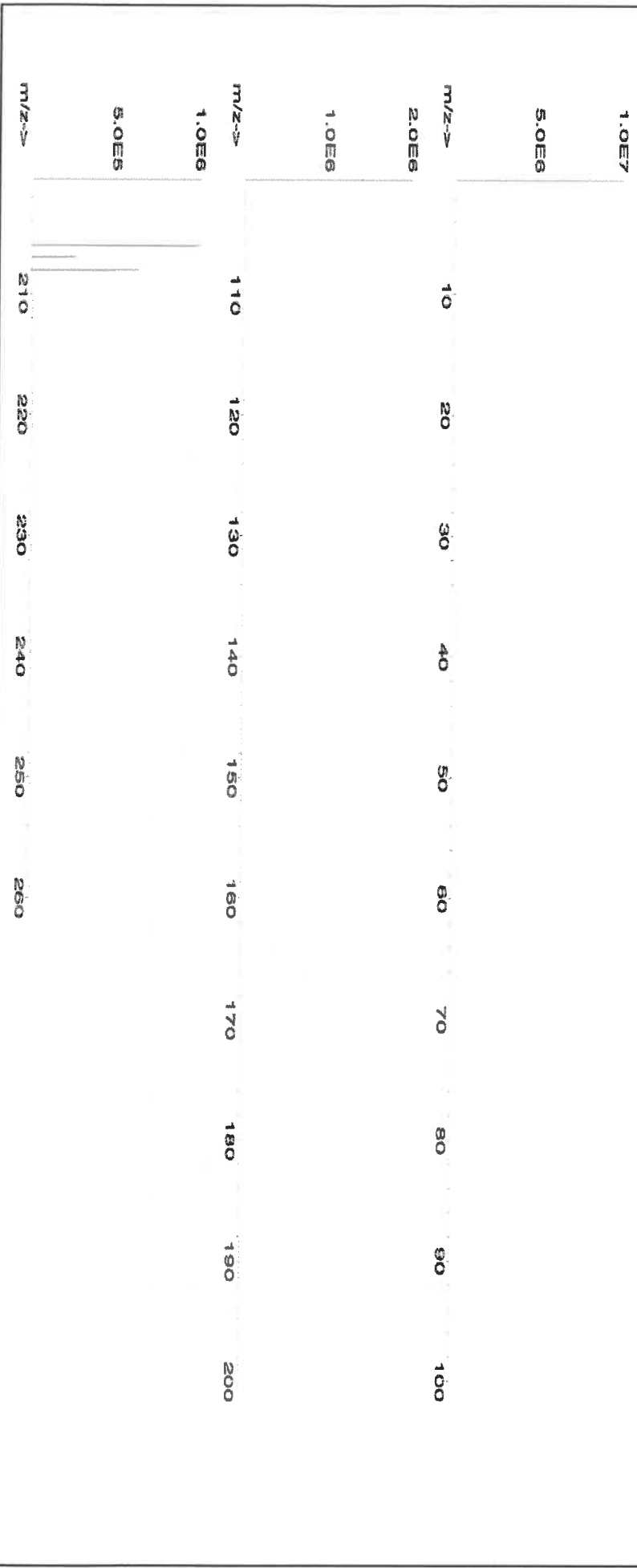
Formulated By:	Lawrence Barry
110923	
Reviewed By:	Pedro L. Rentas
110923	

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

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





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

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

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

Physical Characterization:

(T)= Target analyte

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).

M4913-16

MS

Certificate of Analysis

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

Thermo Fisher Scientific's Quality System has been found to conform to Quality Management System
 Standard ISO9001:2015 by SAI Global Certificate Number CERT – 0120632

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

Catalog Number	P279	Quality Test / Release Date	01/12/2021
Lot Number	210306		
Description	POTASSIUM PERMANGANATE, A.C.S.		
Country of Origin	United States	Suggested Retest Date	Jan/2026

N/A			
Result Name	Units	Specifications	Test Value
APPEARANCE		REPORT	Dark purple to purple green crystals
ASSAY	%	>= 99	99.3
CHLORIDE & CHLORATE	%	<= 0.005	<0.005
IDENTIFICATION	PASS/FAIL	= PASS TEST	pass test
INSOLUBLE MATTER	%	<= 0.2	<0.2
MERCURY (Hg)	ppm	<= 0.05	<0.004
SULFATE (SO4)	%	<= 0.02	<0.02

Julian Burton

Julian Burton - Quality Control Manager – Fair Lawn

Note: The data listed is valid for all package sizes of this lot of this product, expressed as an extension of this catalog number listed above.
 If there are any questions with this certificate, please call at (800) 227-6701.

*Based on suggested storage condition.

300 Technology Drive
 Christiansburg, VA 24073 USA
 inorganicventures.com

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

MS062
 MS063
 MS

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

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

3.0 CERTIFIED VALUES AND UNCERTAINTIES

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

Assay Information:

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

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

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.

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

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

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 200.59 +2 4 Hg(OH)(aq) 1+

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

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

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

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 202 amu	9 ppt	n/a	186W16O
ICP-OES 184.950 nm	0.03 / 0.005 µg/mL	1	
ICP-OES 194.227 nm	0.03 / 0.005 µg/mL	1	V
ICP-OES 253.652 nm	0.1 / 0.03 µg/mL	1	Ta, Co, Th ,Rh , Fe, U

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 22, 2021

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

11.2 Lot Expiration Date

- **September 22, 2026**

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:

Uyen Truong
Supervisor, Product Documentation



Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





N5467 R: 03/01/23 (14)

CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57058
020623
Cerium (Ce)

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

020626
Ambient (20 °C)
1000
6UTB

Weight shown below was diluted to (mL):

1000.12 0.058 Balance Uncertainty
Flask Uncertainty

Solvent: 21110221 Nitric Acid

2% 20.0 Nitric Acid (mL)

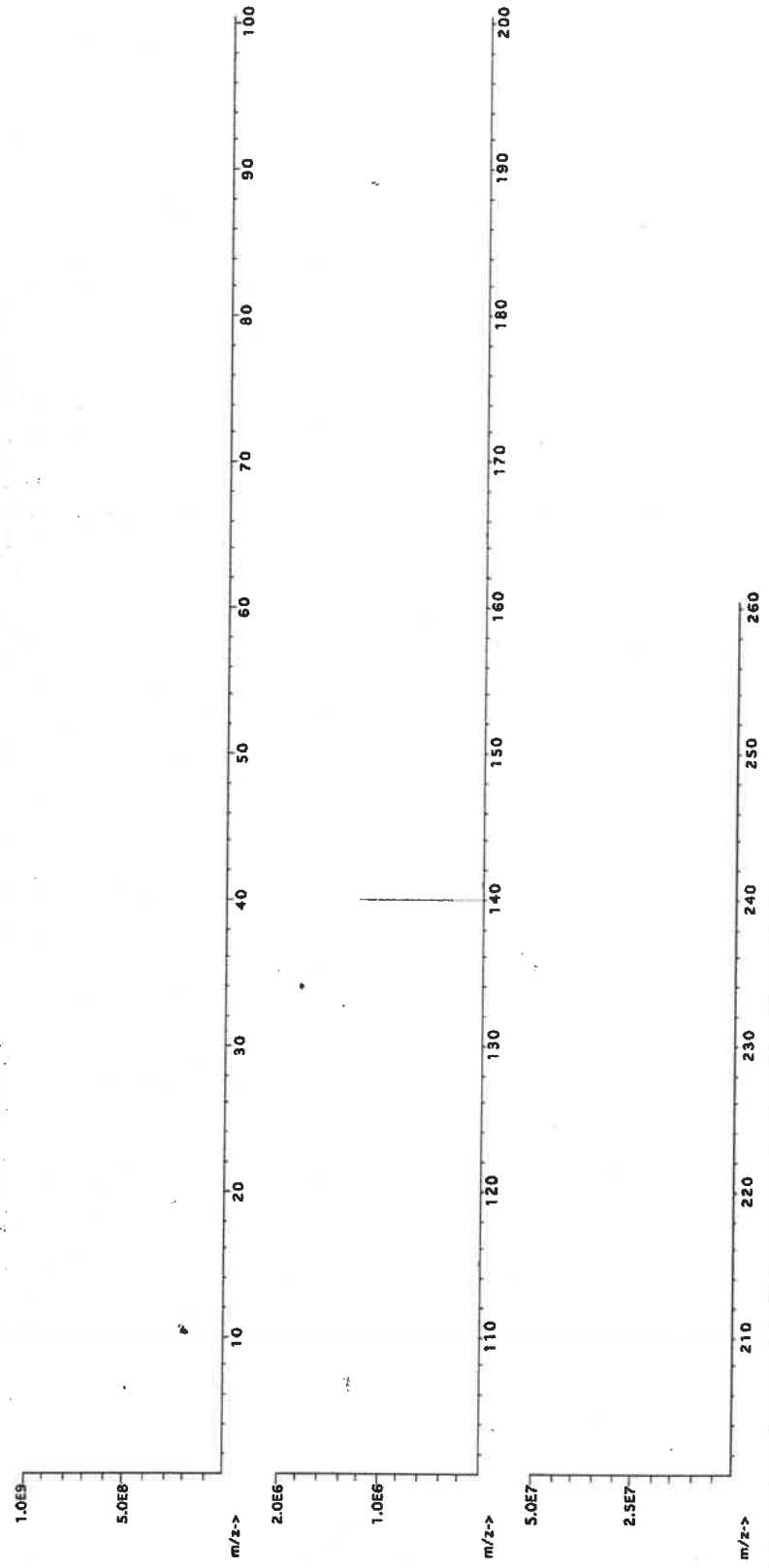
Formulated By:	Lawrence Barry 020623
Reviewed By:	Pedro L. Rentas 020623

Expanded Uncertainty
+/- (µg/mL) 2.0

SDS Information
(Solvent Safety Info. On Attached pg.)
LD50: OSHA PEL (TWA)

Compound	RM#	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	CAS#	NA	SRM
1. Cerium nitrate hexahydrate (Ce)	IN146	Z512CEB1	1000	99.999	0.10	32.8	3.04919	1000.0	10294-41-4	NA	NA

[1] Spectrum No.1 [43.472 sec]58158.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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

Sodium Chloride, Crystal
BAKER ANALYZED® A.C.S. Reagent



M5497 - M5408
And on 4/14/23
063

Material No.: 3624-01

Batch No.: 0000281938

Manufactured Date: 2021-06-07

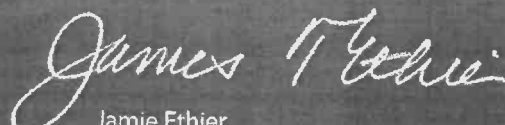
Retest Date: 2026-06-07

Revision No.: 2

Certificate of Analysis

Test	Specification	Result
Assay (NaCl) (by Ag titrn)	≥ 99.0 %	100.0 %
pH of 5% Solution at 25°C	5.0 - 9.0	6.3
Insoluble Matter	≤ 0.005 %	0.003 %
Iodide (I)	≤ 0.002 %	< 0.002 %
Bromide (Br)	≤ 0.01 %	< 0.01 %
Chlorate and Nitrate (as NO ₃)	≤ 0.003 %	< 0.001 %
ACS - Phosphate (PO ₄)	≤ 5 ppm	< 5 ppm
Sulfate (SO ₄)	≤ 0.004 %	< 0.004 %
Barium (Ba)	Passes Test	Passes Test
ACS - Heavy Metals (as Pb)	≤ 5 ppm	< 5 ppm
Iron (Fe)	≤ 2 ppm	< 1 ppm
Calcium (Ca)	≤ 0.002 %	< 0.001 %
Magnesium (Mg)	≤ 0.001 %	< 0.001 %
Potassium (K)	≤ 0.005 %	0.001 %

For Laboratory, Research, or Manufacturing Use
Meets Reagent Specifications for testing USP/NF monographs
Country of Origin: USA
Packaging Site: Paris 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



MATERIAL CERTIFICATE OF COMPLIANCE

DATE: JUNE 12, 2023

CUSTOMER: PCI SCIENTIFIC SUPPLY, INC

PURCHASE ORDER NO. 6054931

CATALOG NO. BOI5021-450L

PRODUCT DESCRIPTION: BOILING STONES, TFE, 454GMS

QUANTITY: 10 EACH

LOT NO. W126678

SPECIFICATION (S): Made from Virgin PTFE Resin

We certify that we have complied with the terms and conditions of the above Purchase Order and the Part Specifications in the manufacturing of the above product.



Laura Valencia
Quality Assurance Inspector

F:\J:\A\CF\PCISCI\COC-55118-BOI5021-061223



MATERIAL CERTIFICATE OF COMPLIANCE

DATE: JUNE 12, 2023

CUSTOMER: PCI SCIENTIFIC SUPPLY, INC

PURCHASE ORDER NO. 6054931

CATALOG NO. BOI5021-450L

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We certify that we have complied with the terms and conditions of the above Purchase Order and the Part Specifications in the manufacturing of the above product.



Laura Valencia
Quality Assurance Inspector

F:\J:\LCP\PCISCI\COC-55118-BOI5021-061223



CERTIFIED WEIGHT REPORT:

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

Lot #
21110221
Solvent: Nitric Acid

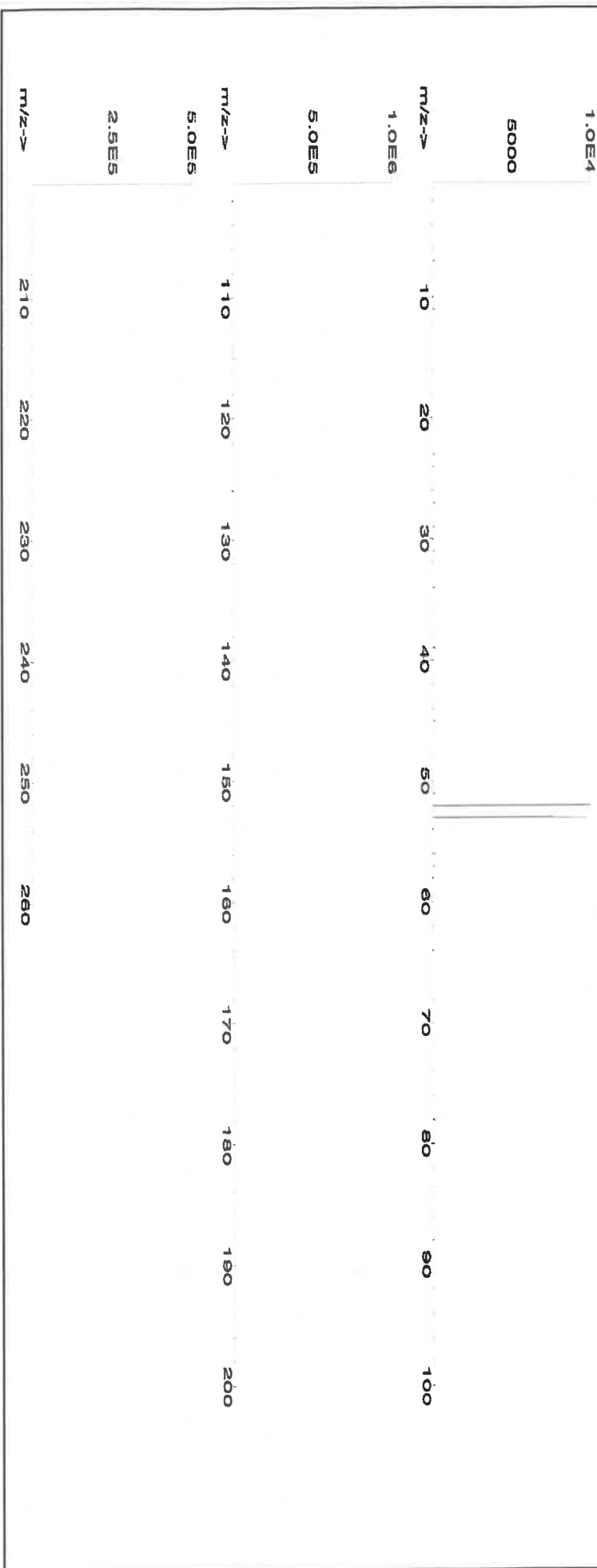
Formulated By:	Lawrence Barry
	060523
Reviewed By:	Pedro L. Ruelas
	060523

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

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

1. Chromium(III) nitrate nonahydrate (Cr) 58124 071122 0.1000 200.0 0.084 1000 10000.1 1000.0 2.2 7789-02-8 0.5 mg(Cr)/m3 or rat 3250 mg/kg 3112a

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





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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

M5697 R: 10/27/23



CERTIFIED WEIGHT REPORT:

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

Lot # 24002546
Solvent: Nitric Acid

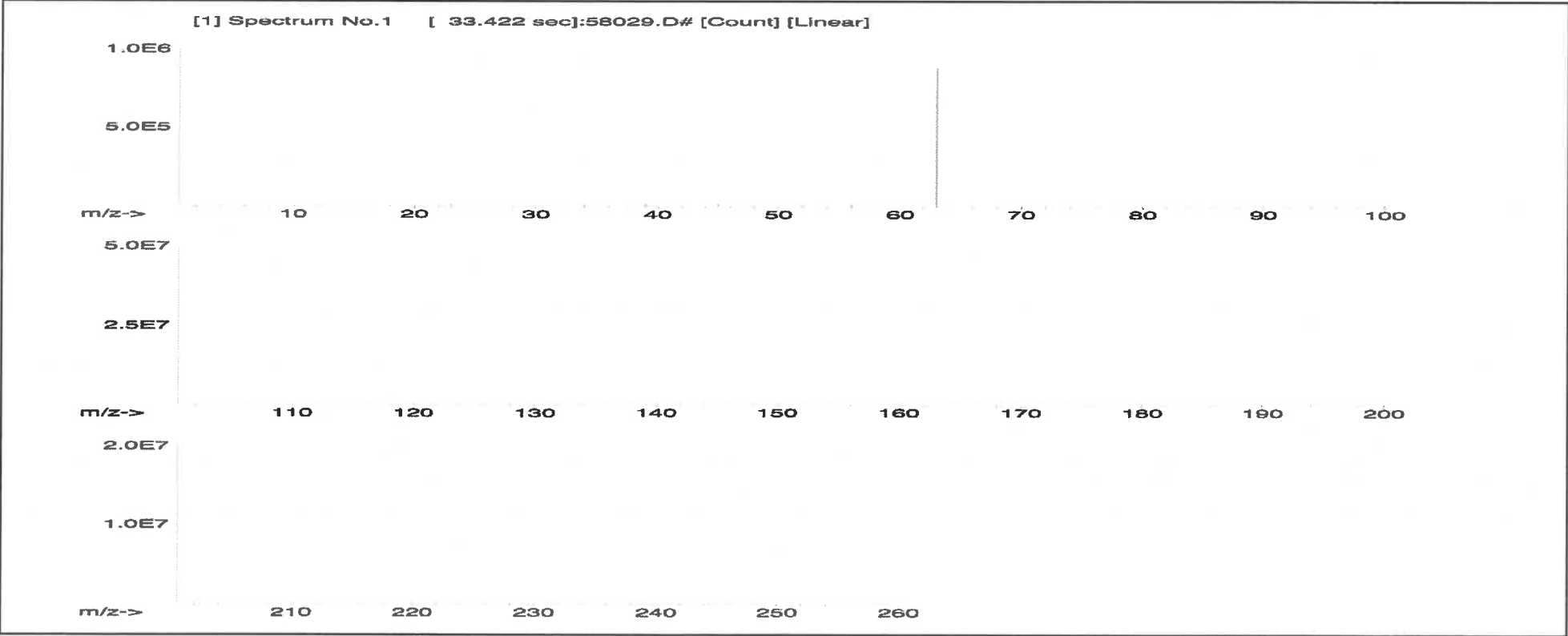
2.0% 40.0 Nitric Acid (mL)

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 5E-05 Balance Uncertainty 0.058 Flask Uncertainty

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

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				NIST SRM
										(Solvent Safety Info. On Attached pg.)				
										CAS#	OSHA PEL (TWA)	LD50		
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	ori-rat 794 mg/kg	3114	





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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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

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

Lot # 24002546
Solvent: Nitric Acid

Expiration Date:

102526

2.0%

40.0 (mL)

Nitric Acid

Recommended Storage:

Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

Volume shown below was diluted to (mL): 2000.02

5E-05 Balance Uncertainty

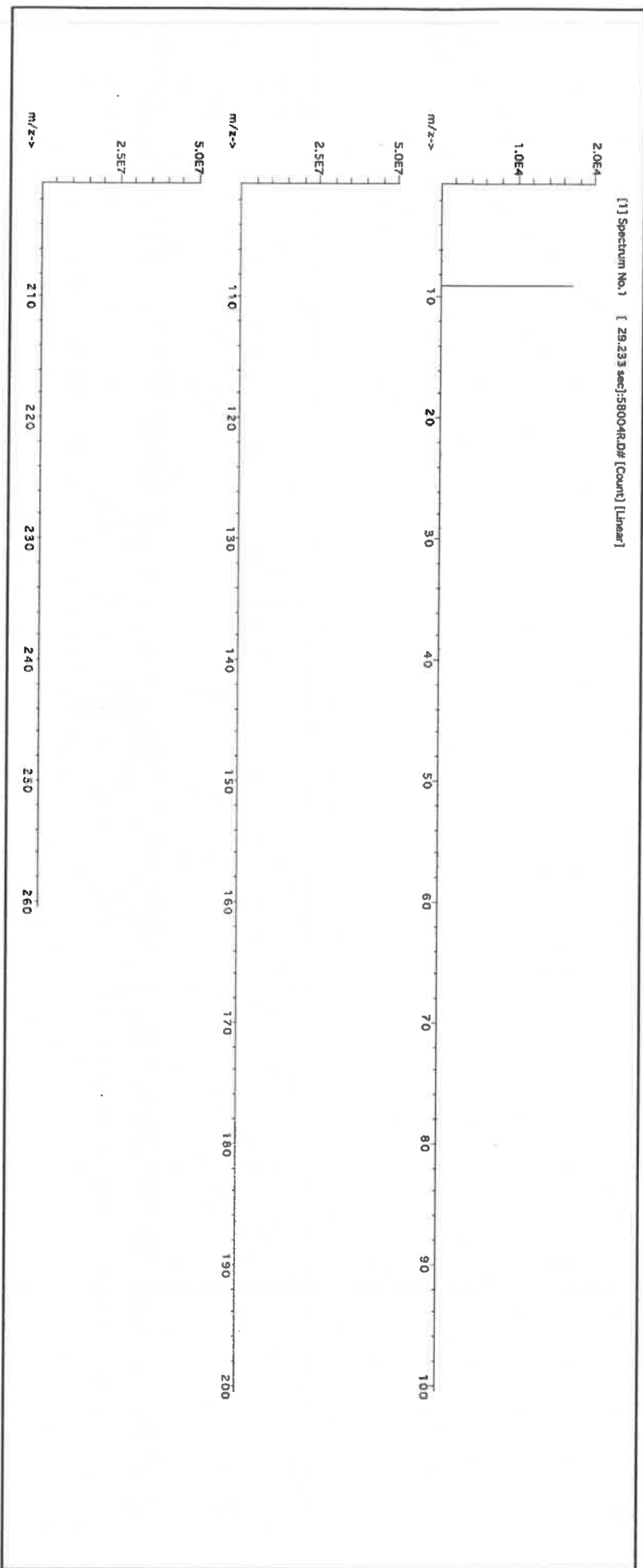
0.058 Flask Uncertainty

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

SDS Information

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

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





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.

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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 Reference Material CRM

CERTIFIED WEIGHT REPORT:

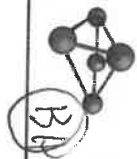
Part Number: 57050
Lot Number: 071123
Description: Tin (Sn)

Solvents: 21110221 Nitric Acid
22D0562008 Hydrochloric acid

Lot #

R-02509124

M599



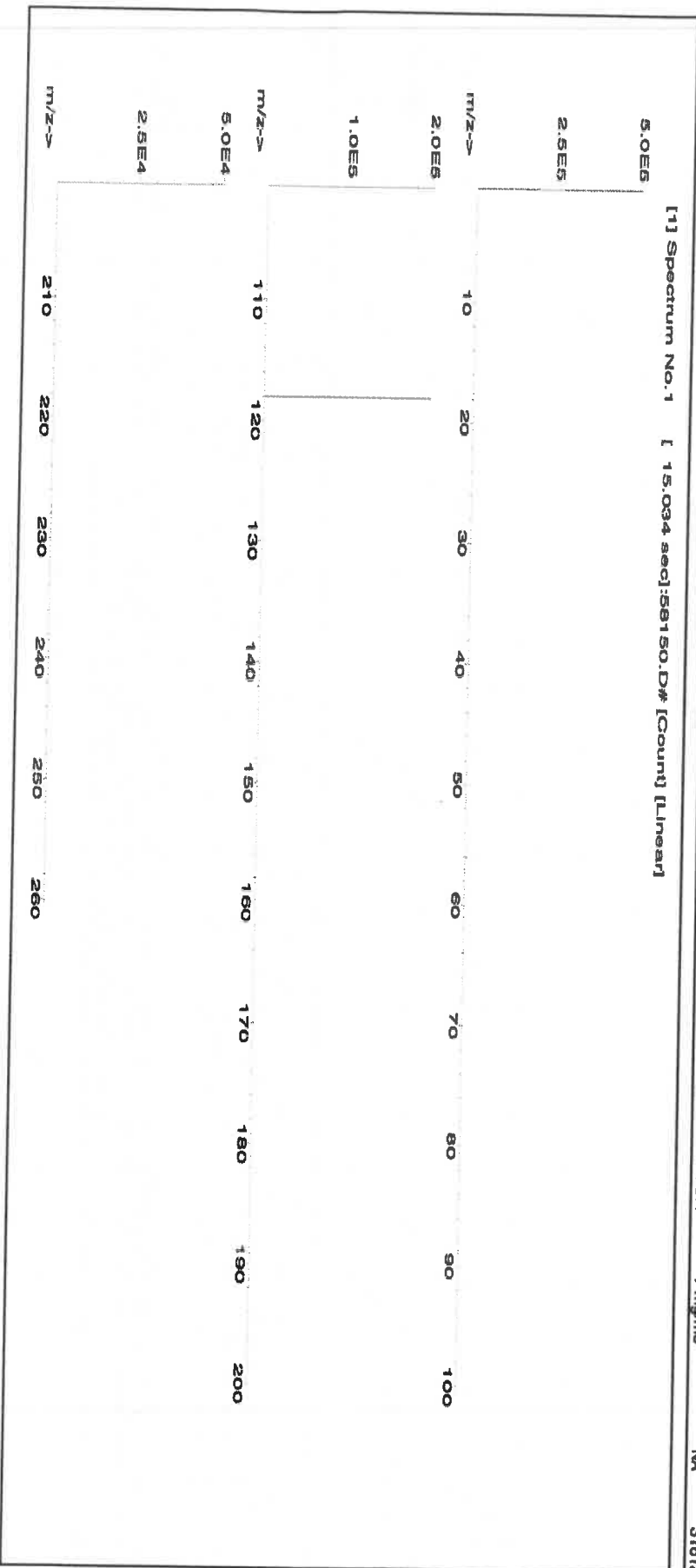
Expiration Date: 071126
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Weight shown below was diluted to (mL): 499.93
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

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

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

1. 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)

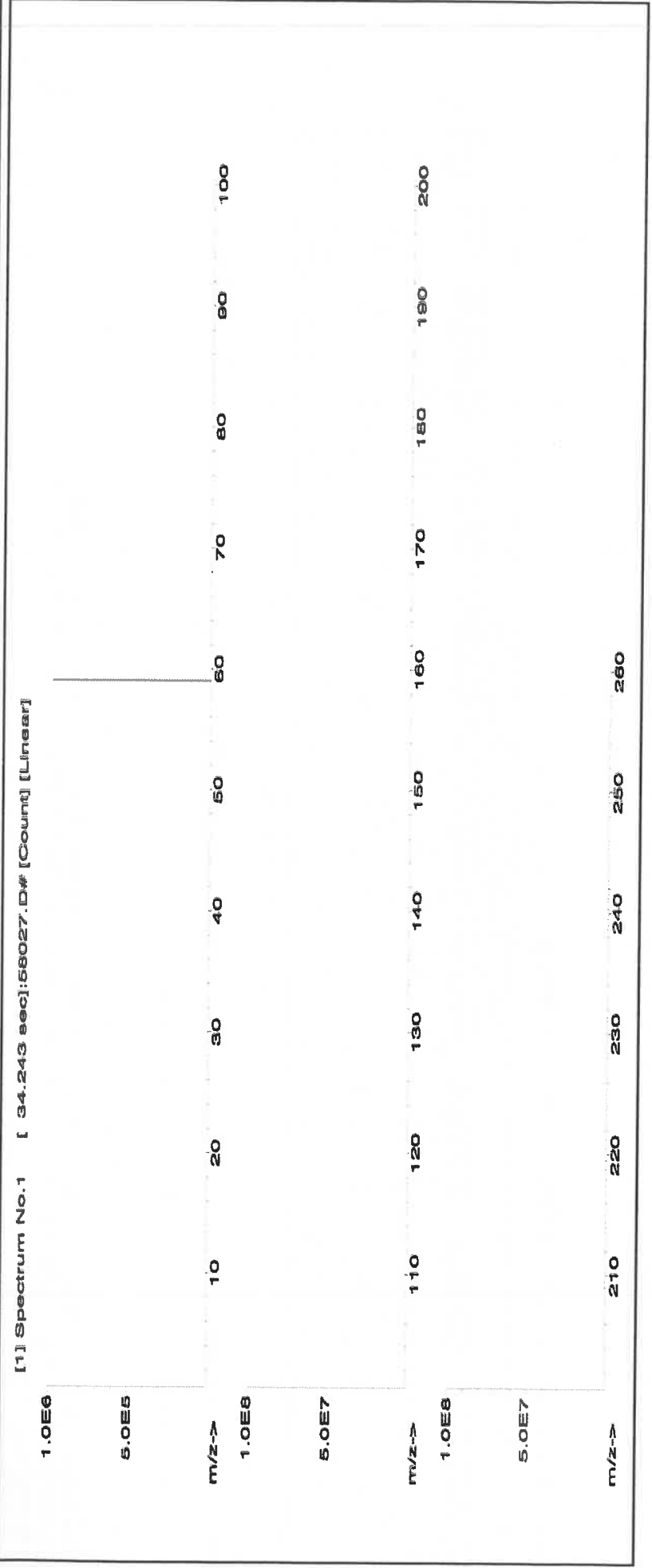
Formulated By:	Lawrence Barry
Reviewed By:	Pedro L. Rentas

SDS Information

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

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

1. Cobalt(II) nitrate hexahydrate (Co) 58127 050923 0.1000 200.0 0.084 1000 10000.0 1000.0 2.2 10026-22-9 0.02 mg/m3 orl-rat 691 mg/kg 3113





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

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

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

(T)= Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57033
111323
Arsenic (As)

Lot #
Solvent:

24002546
Nitric Acid

Expiration Date:

111326

2.0%
80.0 (mL)

Nitric Acid

Recommended Storage:

Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

Volume shown below was diluted to (mL):

4000.0

5E-05 Balance Uncertainty
0.06 Flask Uncertainty

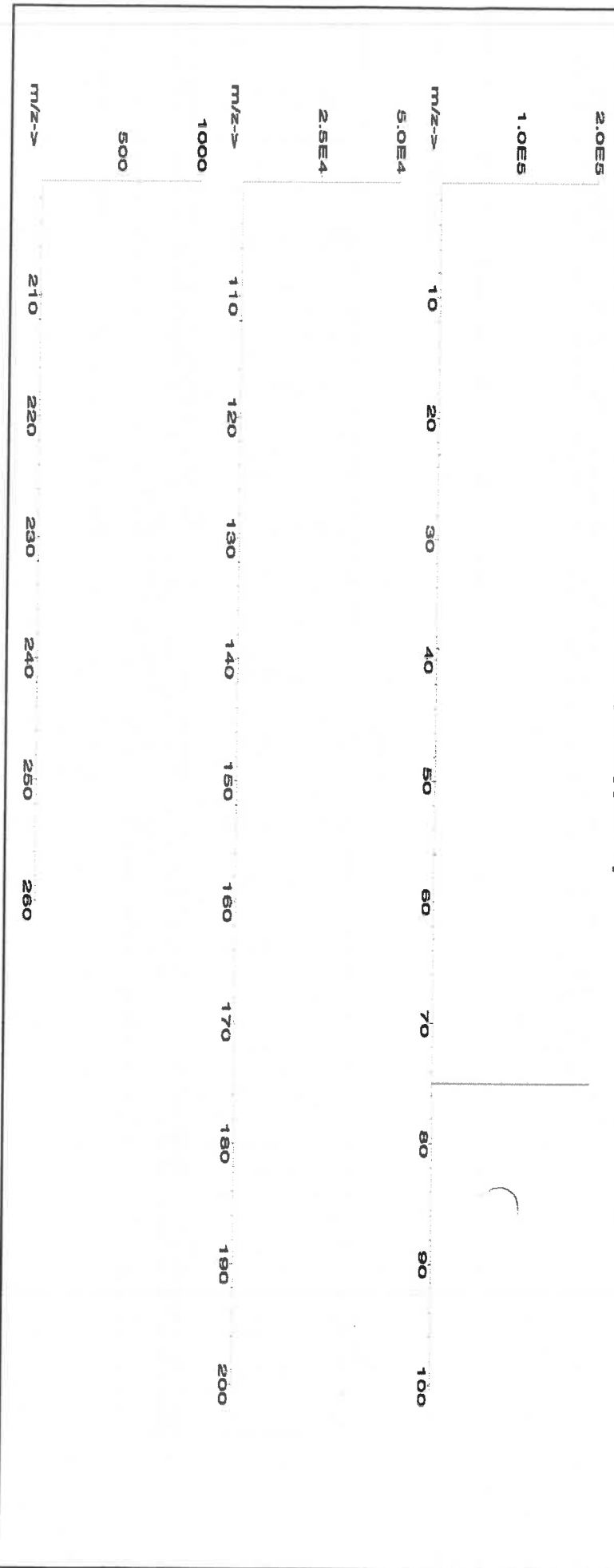
Formulated By:	Lawrence Barry
Reviewed By:	Pedro L. Rendas
	111323

Compound

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

1. Arsenic (As) 58133 020522 0.1000 400.0 0.084 1000 10001.0 1000.0 2.0 7440-38-2 0.5 mg/m3 or-lat 500 mg/kg 3103a

[1] Spectrum No.1 [34.433 sec]:57033.D# [Count] [Linear]





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

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

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	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 ₂	<0.02	Yb	<0.02
Bc	<0.01	Cr	<0.02	Ga	<0.02	Fe	<0.2	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	<0.02	Tm	<0.02	Y	<0.02
Bi	<0.02	Co	<0.02	Ge*	<0.02	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	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: **57005**
Lot Number: **071123**
Description: **Boron (B)**

Solvent: MKB0697V Ammonium hydroxide

Lot #

AI: 021009124 M5814

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

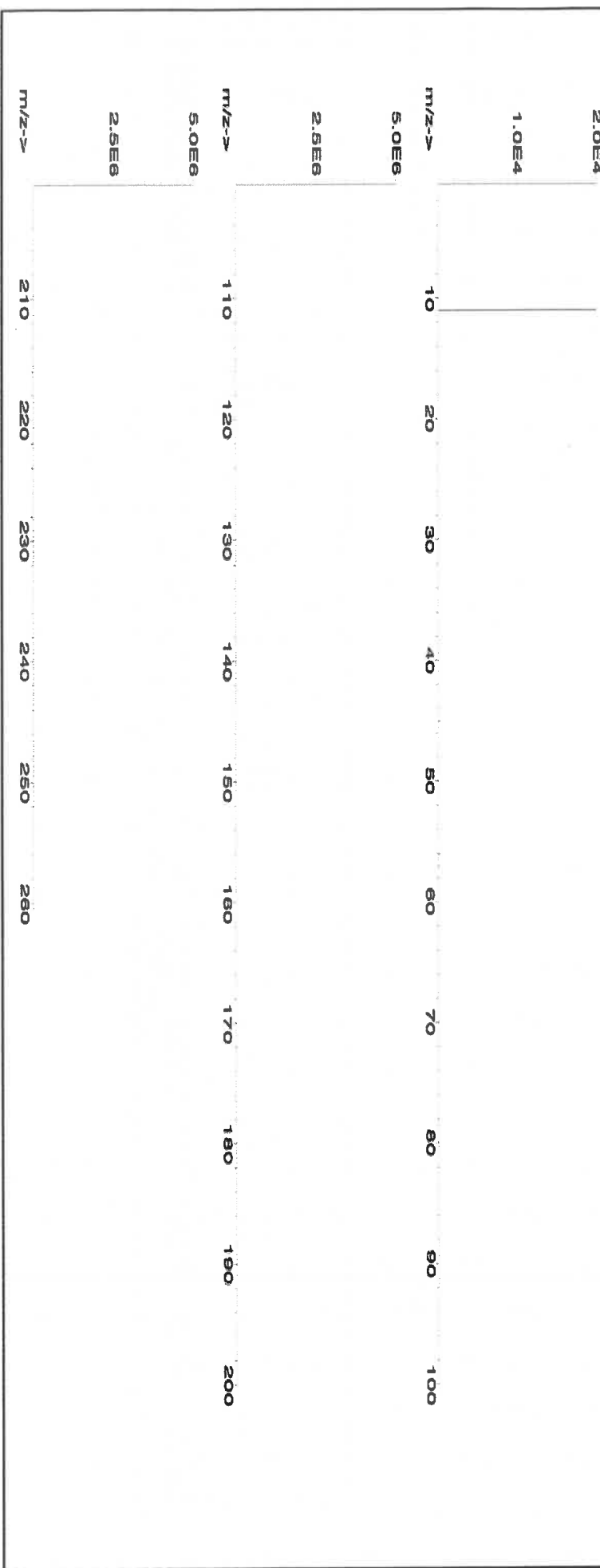
Expiration Date: 071126
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Weight shown below was diluted to (mL): 1999.48
5E-05 Balance Uncertainty
0.058 Flask Uncertainty
2.0% 40.0 Ammonium hydroxide (mL)

SDS Information

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. Boric acid (B) IN018 BV082018A1 1000 99.999 0.10 17.3 11.55772 11.56201 1000.4 2.0 10043-35-3 2 mg/m3 or-nat 2660 mg/kg 3107

[1] Spectrum No. 1 [12.275 sec]:56105.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	<0.02	Ru	<0.02	Sr	<0.02	Tm	<0.02	Y	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	Sn	<0.02	Zn	<0.02
B	T	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	Ti	<0.02	Zr	<0.02

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57016
122923
Sulfur (S)

Lot #

ASTM Type 1 Water

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

Expiration Date: 122926

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL): 1000

NIST Test Number: 6L7B

Weight shown below was diluted to (mL): 4000.0

SE-05 Balance Uncertainty
0.06 Flask Uncertainty

Compound

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

1. Ammonium sulfate (S) IN117 SLBR225V 1000 99.9 0.10 24.3 16.4979 16.4980 1000.0 2.0 7783-20-2 NA 0.01-0.1 4250mg/kg 3181

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





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

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

Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	Pr	<0.02	Se	<0.2	Tb	<0.02	W	<0.02
Sb	<0.02	Ca	<0.2	Er	<0.02	Ho	<0.02	Lu	<0.02	Nb	<0.02	Re	<0.02	Si	<0.02	Te	<0.02	U	<0.02
As	<0.2	Ce	<0.02	Ba	<0.02	In	<0.02	Mg	<0.01	Os	<0.02	Rh	<0.02	Ag	<0.02	Tl	<0.02	V	<0.02
Ba	<0.02	Cs	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.02	Pd	<0.02	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: 57015
Lot Number: 091123
Description: Phosphorous (P)

Solvent: 24002546 Nitric Acid

Lot #

R: 02109124 M5820

Formulated By: Lawrence Barry 091123

Reviewed By: Pedro L. Rentas 091123

2% 40.0 (mL) Nitric Acid

Expiration Date: 091126
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6LJB

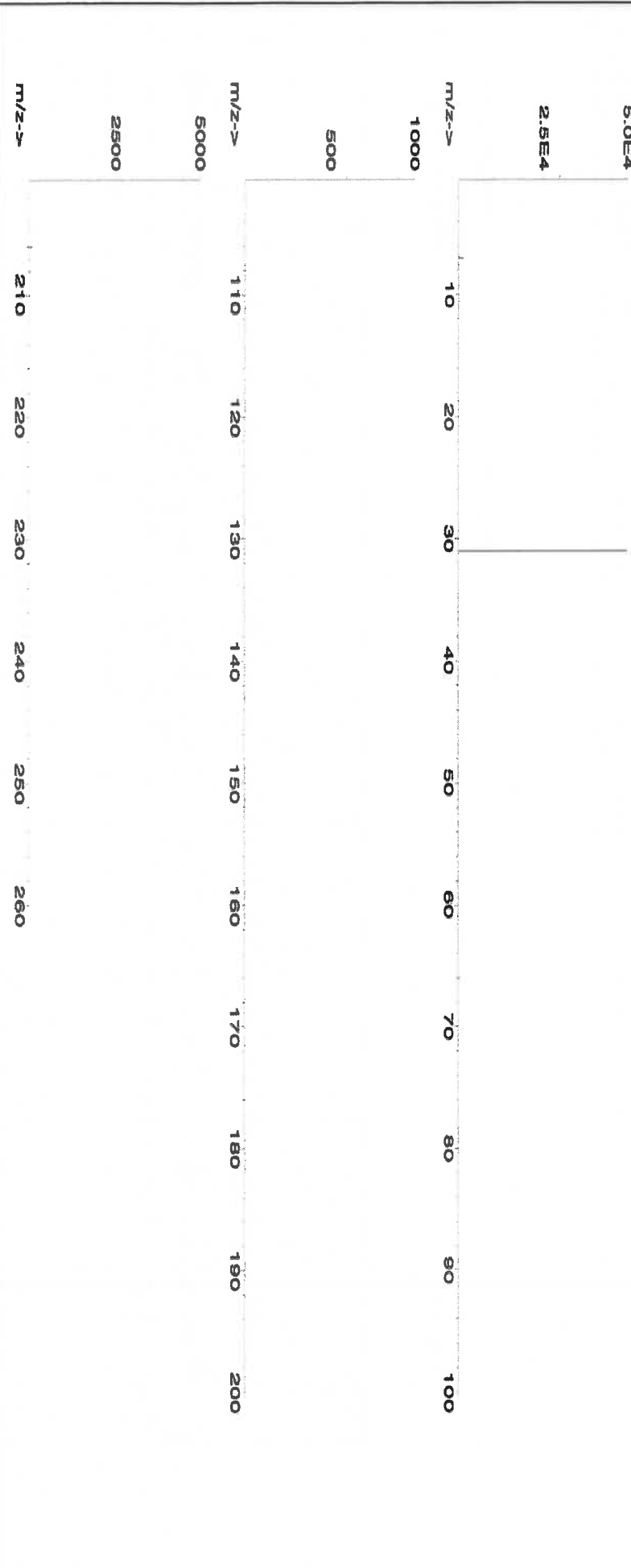
Weight shown below was diluted to (mL): 2000.02 0.058 Balance Uncertainty Flask Uncertainty

Compound

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

1. Ammonium dihydrogen phosphate (P) IN008 PVO62019A1 1000 99.999 0.10 27.5 7.2729 7.2730 1000.0 2.0 7722-76-1 5 mg/m3 xH-rat >2000mg/kg 3186

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





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

MS962 **R10614124**

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

Part Number: **57034**
Lot Number: **060624**
Description: **Selenium (Se)**

2.0% 40.0 (mL) Nitric Acid

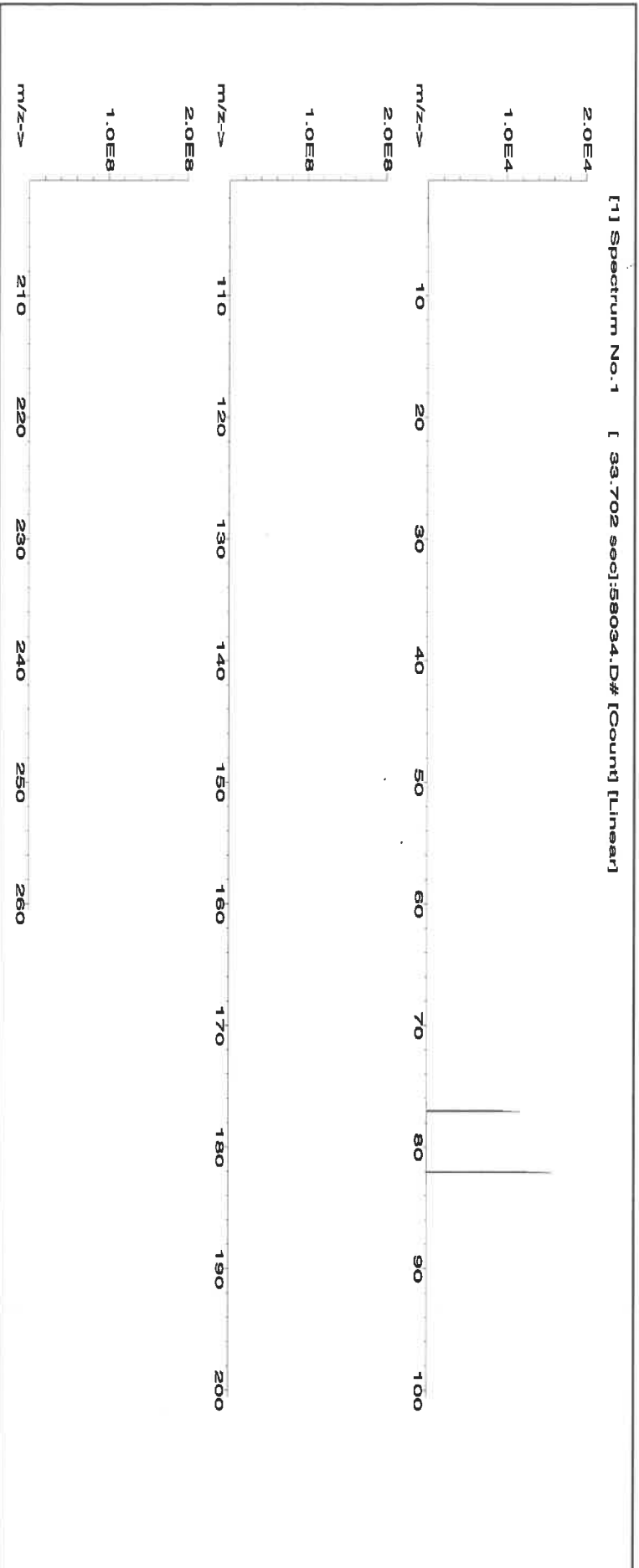
Expiration Date: **060627**
Recommended Storage: **Ambient (20 °C)**
Nominal Concentration (µg/mL): **1000**
NIST Test Number: **6UTB**
Volume shown below was diluted to (mL): **2000.07**
SE-05 Balance Uncertainty **0.100** Flask Uncertainty

Formulated By:	Benson Chan	060624
Reviewed By:	Pedro L. Rantas	060624

SDS Information

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	(Solvent Safety Info. On Attached pg.)	CAS#	OSHA PEL (TWA)	LDSO	NIST SRM

1. Selenium (Se)	58134	071223	0.1000	200.0	0.084	1000	10002.5	1000.0	2.2	7782-49-2	0.2 mg/m3	or-tral 6700 mg/kg	3149





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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

Absolute Standards, Inc.
800-368-1131
www.absolutestandards.com



Certified Reference Material CRM

M5970 M5971

R. 710124

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

CERTIFIED WEIGHT REPORT:

Part Number: 57003
Lot Number: 062124
Description: Lithium (Li)
Expiration Date: 06/127
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Volume shown below was diluted to (mL): 250.11
SE-05 Balance Uncertainty
0.016 Flask Uncertainty

Lot # 24002546
Solvent: Nitric Acid

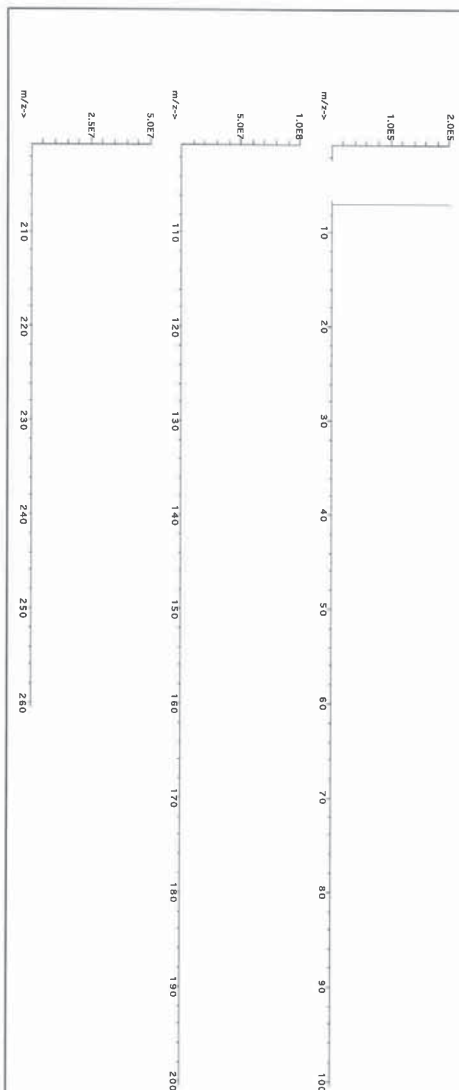
2.0% 5.0 (mL) Nitric Acid

Microvial Capable	
Formulated By:	062124
Giovanni Esposito	
Reviewed By: <i>[Signature]</i>	
Pietro L. Parias	062124

Compound		Part		Lot		Dilution		Initial		Uncertainty		Nominal		Initial		Final		Expanded		SDS Information		NIST	
Number	Factor	Number	Factor	Number	Factor	Vol. (mL)	Pipette (mL)	Conc. (µg/mL)	Conc. (µg/mL)	Vol. (mL)	Pipette (mL)	Conc. (µg/mL)	Conc. (µg/mL)	Vol. (mL)	Pipette (mL)	Conc. (µg/mL)	Conc. (µg/mL)	Uncertainty	± (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	SM

1. Lithium nitrate (Li)	58103	070622	0.1000	25.0	0.004	1000	10000.4	1000.0	2.0	7790-68-4	5 mg/m3	or-hal 1428 mg/kg	NA

[1] Spectrum No. 1 [32.093 sec; 15000.0Hz Count [Lines]





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

Trace Metals Verification by ICP-MS (µg/mL)																			
Al	<0.02	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	Ce	<0.2	Er	<0.02	Hg	<0.02	Mg	<0.02	Nb	<0.02	Rb	<0.02	Si	<0.02	Te	<0.02	U	<0.02
As	<0.2	Ce	<0.02	Eu	<0.02	In	<0.02	La	<0.01	Os	<0.02	Rh	<0.02	Ag	<0.02	Ti	<0.02	V	<0.02
Ba	<0.02	Cr	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.02	Pd	<0.02	Ru	<0.02	Na	<0.2	Tm	<0.02	Yb	<0.02
Be	<0.01	Co	<0.02	Ga	<0.02	La	<0.2	Hg	<0.2	P	<0.02	Sr	<0.02	Na	<0.02	Tm	<0.02	Y	<0.02
Bi	<0.02	Cu	<0.02	Ge	<0.02	Mo	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	Sn	<0.02	Zn	<0.02
B	<0.02	Ca	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Se	<0.02	Ta	<0.02	Tl	<0.02	Zr	<0.02
(T) = Target analyte																			

(T) = Target analyte

Physical Characterization:

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

Certified by:

[Signature]

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

Certificate of Analysis

MS978, MS979



Refine your results. Redefine your industry.

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

R: 2/22/24

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution

Catalog Number: CGT1

Lot Number: T2-T1719972

Matrix: 2% (v/v) HNO₃

Value / Analyte(s): tr. HF

Starting Material: 1 000 µg/mL ea.

Starting Material: Titanium

Starting Material: Ti Metal

Starting Material Lot#: 2094

Starting Material Purity: 99.9975%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1002 ± 5 µg/mL

Density: 1.012 g/mL (measured at 20 ± 4 °C)

Assay Method #1

1002 ± 4 µg/mL

ICP Assay NIST SRM 3162a Lot Number: 130925

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

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

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

$X_{CRM/RM} = (X_p / U_{CRM})$

X_p = mean of Assay Method A with

U_{CRM} = the standard uncertainty of characterization Method A

$U_{CRM} = (U_{CRM1}^2 + U_{CRM2}^2 + \dots + U_{CRMn}^2)^{1/2}$

$U_{CRM1} = (U_{CRM1}^2 + U_{CRM2}^2 + \dots + U_{CRMn}^2)^{1/2}$

$U_{CRM1} = (U_{CRM1}^2 + U_{CRM2}^2 + \dots + U_{CRMn}^2)^{1/2}$

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$U_{CRM1} = (U_{CRM1}^2 + U_{CRM2}^2 + \dots + U_{CRMn}^2)^{1/2}$

$U_{CRM1} = (U_{CRM1}^2 + U_{CRM2}^2 + \dots + U_{CRMn}^2)^{1/2}$

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

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

M Ag	<	0.000536	M Eu	<	0.000268	O Na	<	0.032670	M Se	<	0.001204	O Zn	<	0.003267
M Al	<	0.000872	O Fe	<	0.003225	O Nb	<	0.043560	O Si	<	0.004735	O Zr	<	0.043560
M As	<	0.008586	M Ga	<	0.000268	M Nd	<	0.000268	M Sm	<	0.000268			
M Au	<	0.004577	M Gd	<	0.000268	O Ni	<	0.010890	M Sn	<	0.000986			
O B	<	0.008929	M Ge	<	0.002146	M Os	<	0.000269	O Sr	<	0.000986			
M Ba	<	0.002683	M Hf	<	0.002161	O P	<	0.054450	M Ta	<	0.010560			
M Be	<	0.005366	M Hg	<	0.003231	M Pb	<	0.001073	M Tb	<	0.000268			
M Bi	<	0.001609	M Ho	<	0.000268	M Pd	<	0.000268	M Th	<	0.001341			
O Ca	<	0.000676	M In	<	0.002683	M Pr	<	0.000268	M Tl	<	0.053663			
M Cd	<	0.000268	M Ir	<	0.000269	M Pt	<	0.000536	S Ti	<				
M Co	<	0.000268	M K	<	0.001172	M Rb	<	0.000268	M Tl	<	0.000268			
M Cr	<	0.000752	O Li	<	0.000268	M Re	<	0.000268	M Tm	<	0.000268			
M Cs	<	0.000268	M Lu	<	0.000268	M Rh	<	0.000268	M U	<	0.000268			
O Cu	<	0.010890	O Mg	<	0.005445	I S	<	0.006976	M Y	<	0.002146			
M Dy	<	0.000268	O Mn	<	0.003267	M Sb	<	0.004900	M Yb	<	0.000536			
M Er	<	0.000268	M Mo	<	0.000774	O Sc	<							

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

Atomic Weight; Valence: Soluble in concentrated HCl, HF, H₃PO₄, H₂SO₄ and HNO₃. Avoid neutral to basic media. Unstable at ppm levels with metals that would pull F⁻ away (i.e. Do not mix with Alkaline or Rare Earths or high levels of transition elements unless they are fluorinated). Stable with most inorganic anions with a tendency to hydrolyze forming the hydrated oxide in all dilute acids except HF.

Stability: - 2-100 ppb levels stable (Alone or mixed with all other metals) as the Ti(F)₆-2 for months in 1% HNO₃ / LDPE container. - 1-10,000 ppm single element solutions as the Ti(F)₆-2 chemically stable for years in 2-5% HNO₃ / trace HF in an LDPE container.

Ti Containing Samples (Preparation and Solution) - Metal (Soluble in H₂O / HF caution - powder reacts violently): Oxide - high temperature history or rutile (Dissolved by heating in 1:1:1 H₂O / HF / H₂SO₄); K₂SiO₃ - no KF if silica not present); Organic Matrices (Dry ash at 450°C in P10 and dissolve by heating with 1:1:1 H₂O / HF / H₂SO₄ or fuse ash with pyrosulfate if oxide is as plastic pigment and likely in brookite crystaline form).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	14 ppt
ICP-MS 48 amu	N/A	
ICP-OES 323.452 nm	0.0054 / 0.00092 µg/mL	
ICP-OES 334.941 nm	0.0038 / 0.00028 µg/mL	
ICP-OES 336.121 nm	0.0053 / 0.00034 µg/mL	
HF Note: This standard should not be prepared or stored in glass.		
		W, Mo, Co
		Nb, Ta, Cr, U
		Ce, Ar, Ni
		Ru
		(where X = Zr, Mo,
		14N17N2, 36Ar12C,
		48Ca, 196X=2
		14N16O18O,
		32S16O, 32S14N,
		N/A
		Order Interferences (underlined indicates severe)

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous.

- Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, VA 24073, USA. Telephone: 800.868.6786; 540.565.3030; Fax: 540.565.3030; Email: info@inorganicventures.com

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

80978

Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

Paul Gaines

Certificate of Analysis

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

M5985
R: 6/14/24

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
Catalog Number: CGIN10
Lot Number: U2-IN729349
Matrix: 5% (v/v) HNO₃
Value / Analyte(s): 10 000 µg/mL ea:
Indium
Starting Material: Indium Metal
Starting Material Lot#: 2511
Starting Material Purity: 99.9995%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10022 ± 30 µg/mL
Density: 1.044 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1	10021 ± 56 µg/mL ICP Assay NIST SRM 3124a Lot Number: 110516
Assay Method #2	10035 ± 25 µg/mL EDTA NIST SRM 928 Lot Number: 928
Assay Method #3	10001 ± 33 µg/mL Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

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

M	Ag	<	0.000760	M	Eu	<	0.000760	O	Na	0.012771	M	Se	<	0.023000	M	Zn	<	0.006100
M	Al	0.003385	O	Fe	0.004462	M	Nb	<	0.000760	O	Si	0.024619	M	Zr	<	0.000760		
M	As	<	0.004600	M	Ga	<	0.000760	M	Nd	<	0.000760	M	Sm	<	0.000760			
M	Au	<	0.002300	M	Gd	<	0.000760	O	Ni	<	0.005100	M	Sn	<	0.000760			
O	B	0.003692	M	Ge	<	0.001600	M	Os	<	0.000760	O	Sr	<	0.000610				
M	Ba	<	0.001600	M	Hf	<	0.000760	n	P	<		M	Ta	<	0.000760			
O	Be	<	0.000130	M	Hg	<	0.003100	M	Pb	0.001400	M	Tb	<	0.000760				
M	Bi	<	0.000760	M	Ho	<	0.000760	M	Pd	<	0.001600	M	Te	<	0.000760			
O	Ca	0.004616	s	In	<			M	Pr	<	0.000760	M	Th	<	0.000760			
M	Cd	<	0.000760	M	Ir	<	0.000760	M	Pt	<	0.000760	O	Ti	<	0.001100			
M	Ce	<	0.000760	O	K	0.007078	M	Rb	<	0.000760	M	Tl	<	0.000760				
M	Co	<	0.000760	M	La	<	0.000760	M	Re	<	0.000760	M	Tm	<	0.000760			
O	Cr	<	0.001300	O	Li	<	0.000130	M	Rh	<	0.000760	M	U	<	0.000760			
M	Cs	<	0.000760	M	Lu	<	0.000760	M	Ru	<	0.000760	M	V	<	0.001600			
M	Cu	<	0.003800	O	Mg	0.000707	n	S	<		M	W	<	0.001600				
M	Dy	<	0.000760	O	Mn	0.000149	M	Sb	<	0.000760	M	Y	<	0.000760				
M	Er	<	0.000760	M	Mo	<	0.002300	M	Sc	<	0.000760	M	Yb	<	0.000760			

M - Checked by ICP-MS

O - Checked by ICP-OES

i - Spectral Interference

n - Not Checked For

s - Solution Standard Element

6.0 INTENDED USE

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

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

Atomic Weight; Valence; Coordination Number; Chemical Form In Solution - 114.82 +3 6 In(H₂O)₆+3

Chemical Compatibility -Soluble in HCl, HNO₃, and H₂SO₄. Avoid neutral and basic media. Stable with most metals and inorganic anions. The oxalate, sulfide, carbonate, hydroxide and phosphate are insoluble in water.

Stability - 2-100 ppb levels stable for months in 1% HNO₃ / LDPE container. 1-10,000 ppm solutions chemically stable for years in 2-5% HNO₃ / LDPE container.

In Containing Samples (Preparation and Solution) -Metal (Best dissolved in HCl / HNO₃); Oxide (Soluble in mineral acids); Ores (Carbonate fusion in PtO followed by HCl dissolution); Organic Matrices (Sulfuric/peroxide digestion or dry ash and dissolution in dilute HCl).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 115 amu	1 ppt	n/a	115Sn, 99Ru16O
ICP-OES 158.583 nm	0.05 / 0.002 µg/mL	1	
ICP-OES 230.606 nm	0.1 / 0.03 µg/mL	1	Ni, Os
ICP-OES 325.609 nm	0.2 / 0.05 µg/mL	1	Mn, Mo, Th

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

February 21, 2023

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

11.2 Lot Expiration Date

- February 21, 2028

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Certificate of Analysis

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

R: 2/22/24
MS-997

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

F: 540-585-3012

info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories".

Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: CLPP-CAL-3
Lot Number: T2-MEB727800
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 ± 7 µg/mL	Cadmium, Cd	500.0 ± 2.2 µg/mL
Lead, Pb	1 000 ± 4 µg/mL	Selenium, Se	1 000 ± 6 µg/mL
Thallium, Tl	1 000 ± 7 µg/mL		

Density: 1.042 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
As	ICP Assay	3103a	100818
As	Calculated		See Sec. 4.2
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:

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

N/A

6.0 INTENDED USE

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

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

December 21, 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

- **December 21, 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



Certificate of Analysis

*R: 08/22/24 M6058, M6059*300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.comP: 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: V2-MEB746172
Matrix: 3% (v/v) HNO₃
3% (v/v) HF
Value / Analyte(s): 1 000 µg/mL ea:
Boron, Molybdenum,
Silicon, Tin,
Titanium

3.0 CERTIFIED VALUES AND UNCERTAINTIES

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

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

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
B	ICP Assay	3107	190605
B	Calculated		See Sec. 4.2
Mo	ICP Assay	traceable to 3134	U2-MO739068
Si	ICP Assay	Traceable to 3150	S2-SI702546
Sn	ICP Assay	3161a	140917
Ti	ICP Assay	traceable to 3162a	T2-TI725816

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

N/A

6.0 INTENDED USE

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

6.2 For products attaining traceability through Inorganic Ventures' Primary Certified Reference Materials (PCRM™)

see the Limited License to Use PCRM™ in the Inorganic Ventures [Terms and Conditions of Sale](https://www.inorganicventures.com/terms-and-conditions-sale).

<https://www.inorganicventures.com/terms-and-conditions-sale>. The Terms and Conditions contain information on the use of materials traceable to PCRM™ certified reference materials. This Limited License agreement is especially pertinent for laboratories accredited under ISO:17034.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

August 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

- **August 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





Refine your results. Redefine your industry.

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Christiansburg, VA 24073 USA
inorganicventures.com

Certificate of Analysis

M6074
M6075
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M6077

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

F: 540-585-3012

info@inorganicventures.com

EXP: 9/6/2029

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: CHEM-CLP-4
Lot Number: V2-MEB746762
Matrix: 3% (v/v) HNO₃
3% (v/v) HF
Value / Analyte(s): 1 000 µg/mL ea:
Boron, Molybdenum,
Silicon, Tin,
Titanium

3.0 CERTIFIED VALUES AND UNCERTAINTIES

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

Density: 1.033 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
B	ICP Assay	3107	190605
B	Calculated		See Sec. 4.2
Mo	ICP Assay	traceable to 3134	U2-MO739068
Si	ICP Assay	Traceable to 3150	S2-SI702546
Sn	ICP Assay	3161a	140917
Ti	ICP Assay	traceable to 3162a	T2-TI725816

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

N/A

6.0 INTENDED USE

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

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 06, 2024

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

11.2 Lot Expiration Date

- **September 06, 2029**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Joseph Burns
Custom VS Manager



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

58025
101124
Manganese (Mn)

R-71113128

Lot #
Solvent: 24002546 Nitric Acid

Expiration Date:

101127

2% 80.0 (mL) Nitric Acid

Recommended Storage:

Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

SE-05 Balance Uncertainty

Weight shown below was diluted to (mL):

4000.2

0.10 Flask Uncertainty

<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito
Reviewed By:	<i>Pedro L. Renteria</i>
	101124

Compound

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

1. Manganese(II) nitrate hydrate (Mn) IN031 MMN032020A1 1000 99.999 0.10 20.8 19.2322 19.2344 1000.1 2.0 15710-66-4 5 mg/m3 or-rel >300mg/kg 3132

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

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



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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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

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

M6137
R-71013124

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: CGSI1
Lot Number: V2-SI744713
Matrix: tr. HNO₃
tr. HF
Value / Analyte(s): 1 000 µg/mL ea:
Silicon
Starting Material: Silica
Starting Material Lot#: 1771
Starting Material Purity: 99.9981%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 999 ± 6 µg/mL
Density: 1.003 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1	999 ± 5 µg/mL ICP Assay NIST SRM Traceable to 3150 Lot Number: S2-SI702546
Assay Method #2	1000 ± 7 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 <	0.000310	M Eu <	0.000310	O Na	0.001656	M Se <	0.022000	M Zn <	0.002500
M Al	0.010787	M Fe <	0.027000	M Nb <	0.001300	s Si <		O Zr <	0.001900
M As <	0.001900	M Ga <	0.001300	M Nd <	0.000310	M Sm <	0.000310		
M Au <	0.000910	M Gd <	0.000310	M Ni <	0.005500	M Sn	0.000096		
M B	0.016180	M Ge <	0.001900	M Os <	0.000610	O Sr	0.000092		
M Ba	0.000096	M Hf	0.000423	i P <		M Ta	0.002542		
O Be <	0.000570	M Hg <	0.000610	M Pb <	0.000310	M Tb <	0.000310		
M Bi <	0.000310	M Ho <	0.000610	M Pd <	0.000610	M Te <	0.000910		
O Ca	0.011557	M In <	0.000310	M Pr <	0.000310	M Th <	0.001900		
M Cd <	0.000310	M Ir <	0.000310	M Pt <	0.000310	M Ti	0.001078		
M Ce <	0.000610	O K	0.000577	M Rb <	0.009100	M Tl <	0.000310		
M Co <	0.001600	M La <	0.000310	M Re <	0.000310	M Tm <	0.000310		
M Cr <	0.010000	O Li <	0.000460	M Rh <	0.000310	M U <	0.000310		
M Cs <	0.000310	M Lu <	0.000310	M Ru <	0.000310	O V <	0.001300		
M Cu <	0.002500	O Mg	0.001348	O S <	0.570000	M W <	0.001900		
M Dy <	0.000310	M Mn <	0.002500	M Sb <	0.000310	M Y <	0.000310		
M Er <	0.000310	M Mo <	0.000310	O Sc <	0.000590	M Yb <	0.000310		

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 - 28.09 +4 6 Si(OH)x(F)y2-

Chemical Compatibility -Soluble in HCl, HF, H3PO4 H2SO4 and HNO3 as the Si(OH)x(F)y2-. Avoid neutral to basic media. Unstable at ppm levels with metals that would pull F- away (i.e. Do not mix with Alkaline or Rare Earths, or high levels of transition elements unless they are fluorinated. Stable with most inorganic anions with a tendency to hydrolyze forming silicic acid (silicic acid is soluble up to ∼100 ppm in water) in all dilute acids except HF.

Stability - 2-100 ppb levels - stability unknown - (alone or mixed with all other metals) as the Si(OH)x(F)y2-. 1-10,000 ppm single element solutions as the Si(OH)x(F)y2- chemically stable for years in 2-5 % HNO3 / trace HF in a LDPE container.

Si Containing Samples (Preparation and Solution) -Metal (Soluble in 1:1:1 H2O / HF / HNO3); Oxide - SiO2, amorphous (dissolve by heating in 1:1:1 H2O / HF / HNO3); Oxide - quartz (fuse in Pt0 with Na2CO3); Geological Samples(fuse in Pt0with Na2CO3 followed by HCl solution of the fuseate); Organic Matrices containing silicates and non volatile silicon compounds (dry ash at 4500C in Pt0 and dissolve by gently warming with 1:1:1 H2O / HF / H2SO4 or fuse / ash with Na2CO3 and dissolve fuseate with HCl / H2O); Silicone Oils - dimethyl silicones depolymerize to form volatile monomer units when heated (Measure directly in alcoholic KOH / xylene mixture where sample is treated first with the KOH at 60-1000C to "unzip" the Si- O-Si polymeric structure or digest with conc. H2SO4 / H2O2 followed by cooling and dissolution of the dehydrated silica with HF.) Note that the direct analysis of silicone oils in an organic solvent will result in false high results due to high vapor pressure of volatile monomer units like hexamethylcyclotrisiloxane. The KOH forms the K2+Si(CH3)2O= salt which is not volatile at room temperature.

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 28 amu	4000 - 8000 ppt	N/A	N2, 12C16O
ICP-OES 212.412 nm	0.02/0.01 µg/mL	1	Hf, Os, Mo, Ta
ICP-OES 251.611 nm	0.012/0.003 µg/mL	1	Ta, U, Zn, Th
ICP-OES 288.158 nm	0.03/0.004 µg/mL	1	Ta, Ce, Cr, Cd, Th

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; info@inorganicventures.com;

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

July 10, 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

- July 10, 2029

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:

Uyen Truong
Custom Processing Supervisor



Certificate Approved By:

Muzzammil Khan
Stock Laboratory Supervisor



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

58126
011025
Iron (Fe)

R-113125
M6140

Lot #
Solvent: 24012496
Nitric Acid

Expiration Date:

011028

2%
40.0
(mL)
Nitric Acid

Recommended Storage:

Ambient (20 °C)

Nominal Concentration (µg/mL):

10000

NIST Test Number:

6U7B

Weight shown below was diluted to (mL):

2000.07

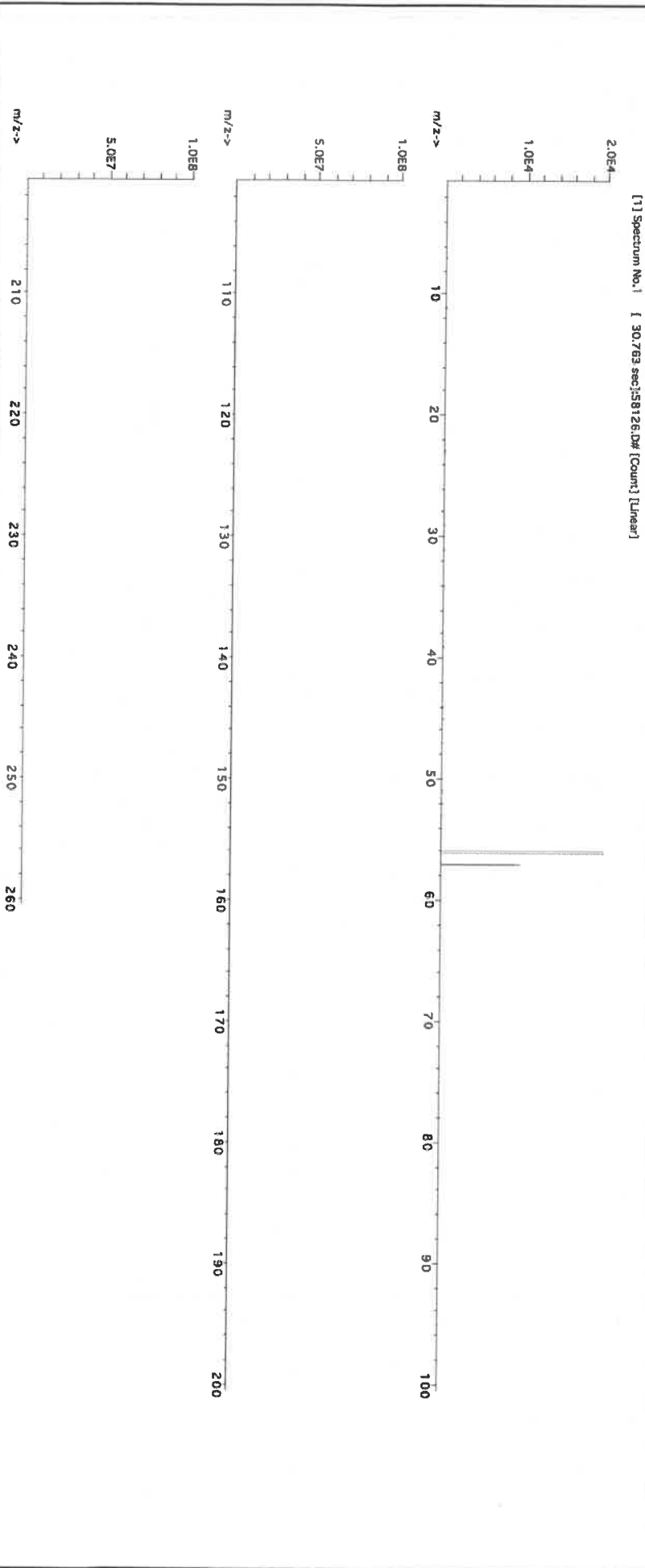
5E-05 Balance Uncertainty
0.100 Flask Uncertainty

Formulated By:	Benson Chan	011025
Reviewed By:	Pedro L. Renteria	011025

Compound

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

1. Iron(III) nitrate nonahydrate (Fe) IN028 FED082023A1 10000 99.999 0.10 13.0 153.8534 ##### 10000.2 20.0 7782-61-8 1 mg/m³ or-rel 3250mg/kg 3126A





CERTIFIED WEIGHT REPORT:

Part Number: 57119
Lot Number: 103024
Description: Potassium (K)

R-21113125

Solvent: 24002546 Nitric Acid
Lot #

Expiration Date: 103027
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 10000
NIST Test Number: 6UTB

M6141
M6142
M6143

2% 80.0 (mL) Nitric Acid

Weight shown below was diluted to (mL): 4000.1 0.15 Flask Uncertainty

<i>Giovanni Esposito</i>	
Formulated By:	Giovanni Esposito
Reviewed By:	Pedro L. Renteria
	103024

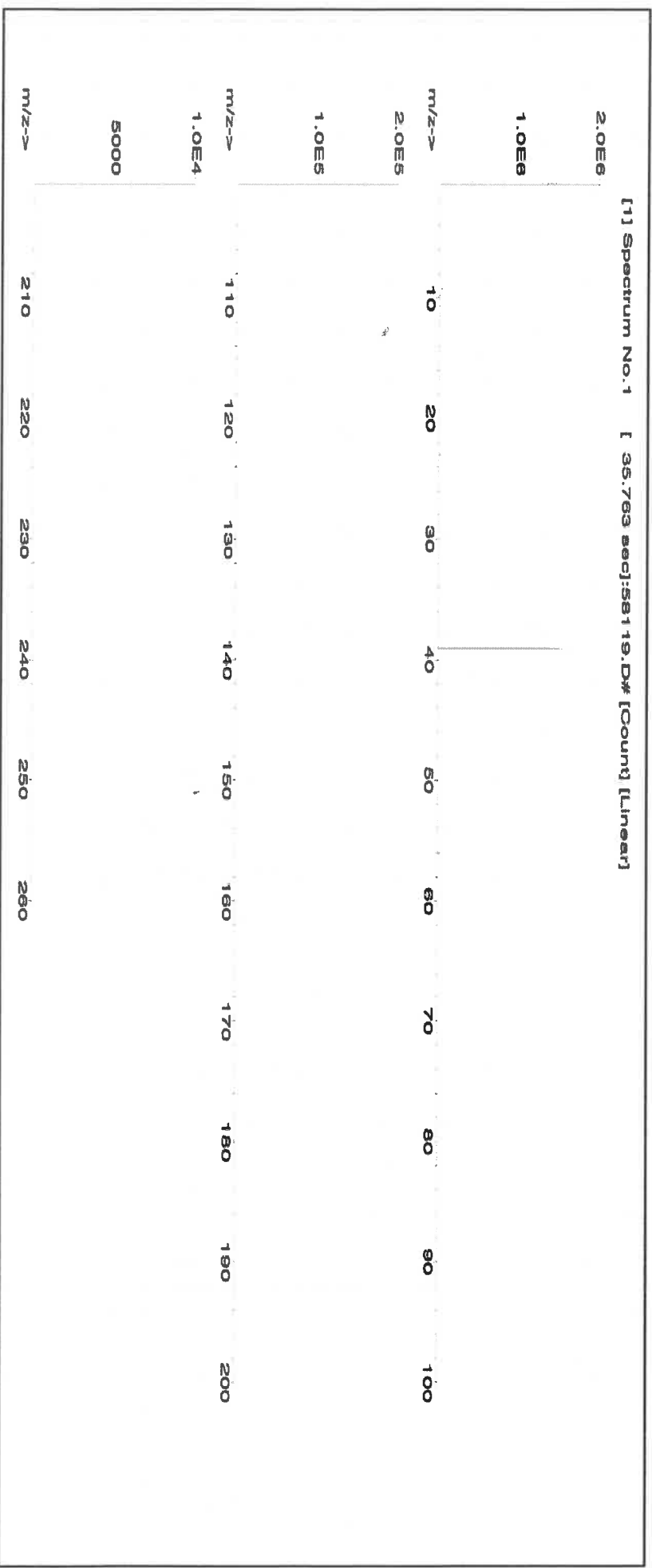
Compound	RM#	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	NIST SRM

SDS Information

(Solvent Safety Info. On Attached pg.)

1. Potassium nitrate (K) IN034 KD062022A1 10000 99.999 0.10 37.7 106.1040 ##### 10001.1 20.0 7757-79-1 5 mg/m3 orl-rat 3750 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	T	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 # **24012496**
Lot Number: **121724** Nitric Acid
Description: **Zinc (Zn)**

Expiration Date: **121727** 2% 40.0 (mL) Nitric Acid

Recommended Storage: **Ambient (20 °C)**

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

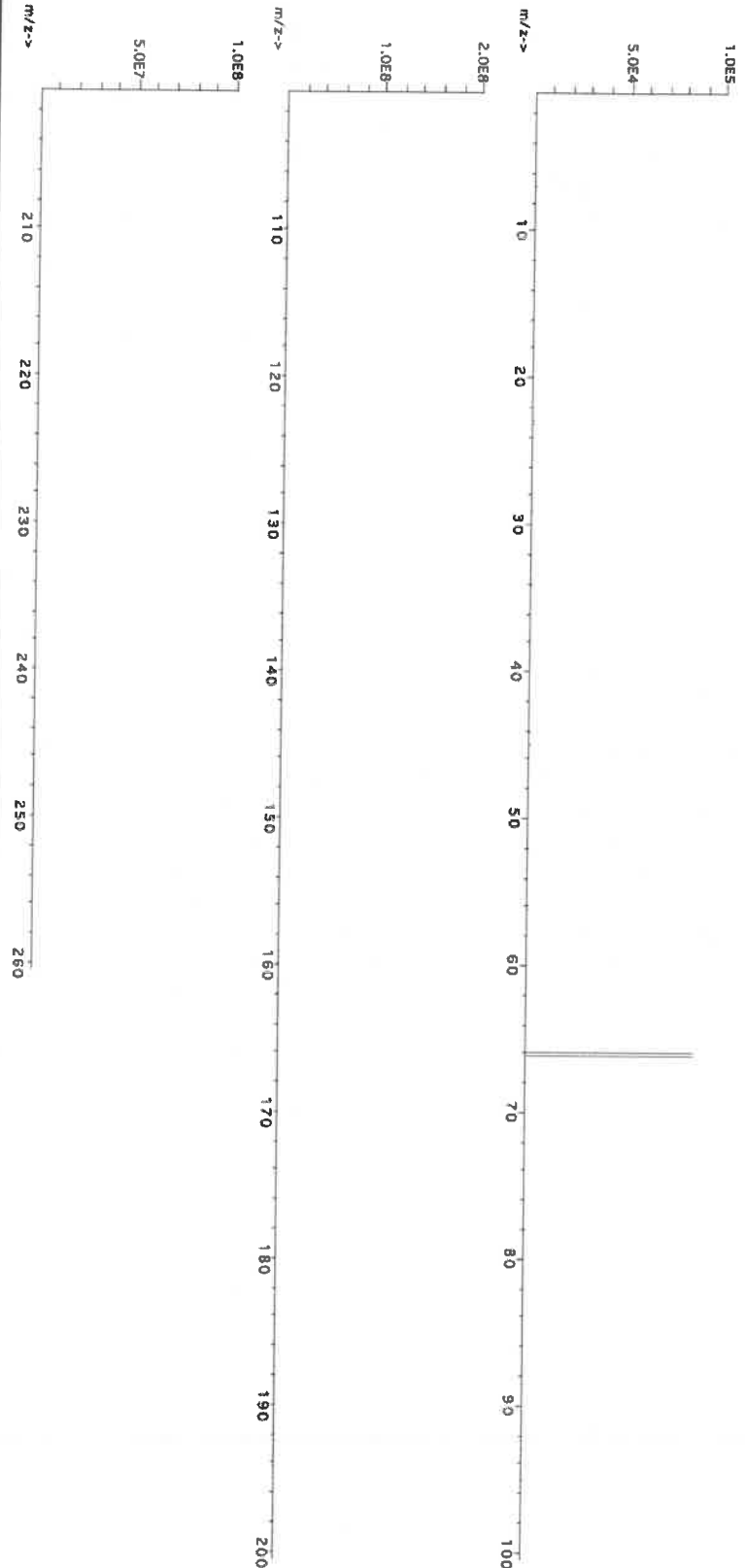
NIST Test Number: **6UTB**

Weight shown below was diluted to (mL): **2000.1** 0.10 Flask Uncertainty

<i>Aleah O'Brady</i>	
Formulated By:	Aleah O'Brady
Reviewed By:	<i>Pedro L. Rentias</i>
	Pedro L. Rentias
	121724

SDS Information									
Expanded									
(Solvent Safety Info. On Attached pg.)									
Compound	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	NIST SRM
IN016 ZNE032021A1	1000	99.999	0.10	24.3	8.2308	8.2311	1000.0	2.0	10196-18-6
									1 mg/m3
									or-rat 1190mg/kg
									3168

[1] Spectrum No.1 [31.103 sec;58130.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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

Hydrochloric Acid, 36.5–38.0%
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis

 **avantor™**



M6151

R → 11/15/25

Material No.: 9530-33
Batch No.: 22G2862015
Manufactured Date: 2022-06-15
Retest Date: 2027-06-14
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
ACS – Assay (as HCl) (by acid–base titrn)	36.5 – 38.0 %	37.9 %
ACS – Color (APHA)	≤ 10	5
ACS – Residue after Ignition	≤ 3 ppm	< 1 ppm
ACS – Specific Gravity at 60°/60°F	1.185 – 1.192	1.191
ACS – Bromide (Br)	≤ 0.005 %	< 0.005 %
ACS – Extractable Organic Substances	≤ 5 ppm	< 1 ppm
ACS – Free Chlorine (as Cl ₂)	≤ 0.5 ppm	< 0.5 ppm
Phosphate (PO ₄)	≤ 0.05 ppm	< 0.03 ppm
Sulfate (SO ₄)	≤ 0.5 ppm	< 0.3 ppm
Sulfite (SO ₃)	≤ 0.8 ppm	0.3 ppm
Ammonium (NH ₄)	≤ 3 ppm	< 1 ppm
Trace Impurities – Arsenic (As)	≤ 0.010 ppm	< 0.003 ppm
Trace Impurities – Aluminum (Al)	≤ 10.0 ppb	1.3 ppb
Arsenic and Antimony (as As)	≤ 5.0 ppb	< 3.0 ppb
Trace Impurities – Barium (Ba)	≤ 1.0 ppb	0.2 ppb
Trace Impurities – Beryllium (Be)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Bismuth (Bi)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Boron (B)	≤ 20.0 ppb	< 5.0 ppb
Trace Impurities – Cadmium (Cd)	≤ 1.0 ppb	< 0.3 ppb
Trace Impurities – Calcium (Ca)	≤ 50.0 ppb	163.0 ppb
Trace Impurities – Chromium (Cr)	≤ 1.0 ppb	0.7 ppb
Trace Impurities – Cobalt (Co)	≤ 1.0 ppb	< 0.3 ppb
Trace Impurities – Copper (Cu)	≤ 1.0 ppb	< 0.1 ppb
Trace Impurities – Gallium (Ga)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Germanium (Ge)	≤ 3.0 ppb	< 2.0 ppb
Trace Impurities – Gold (Au)	≤ 4.0 ppb	0.6 ppb
Heavy Metals (as Pb)	≤ 100 ppb	< 50 ppb
Trace Impurities – Iron (Fe)	≤ 15 ppb	6 ppb

>>> Continued on page 2 >>>

Hydrochloric Acid, 36.5–38.0%
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis

 **avantorsm**



Material No.: 9530-33
Batch No.: 22G2862015

Test	Specification	Result
Trace Impurities – Lead (Pb)	≤ 1.0 ppb	< 0.5 ppb
Trace Impurities – Lithium (Li)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Magnesium (Mg)	≤ 10.0 ppb	2.9 ppb
Trace Impurities – Manganese (Mn)	≤ 1.0 ppb	< 0.4 ppb
Trace Impurities – Mercury (Hg)	≤ 0.5 ppb	0.1 ppb
Trace Impurities – Molybdenum (Mo)	≤ 10.0 ppb	< 3.0 ppb
Trace Impurities – Nickel (Ni)	≤ 4.0 ppb	< 0.3 ppb
Trace Impurities – Niobium (Nb)	≤ 1.0 ppb	0.8 ppb
Trace Impurities – Potassium (K)	≤ 9.0 ppb	< 2.0 ppb
Trace Impurities – Selenium (Se), For Information Only		< 1.0 ppb
Trace Impurities – Silicon (Si)	≤ 100.0 ppb	< 10.0 ppb
Trace Impurities – Silver (Ag)	≤ 1.0 ppb	0.5 ppb
Trace Impurities – Sodium (Na)	≤ 100.0 ppb	2.3 ppb
Trace Impurities – Strontium (Sr)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Tantalum (Ta)	≤ 1.0 ppb	1.6 ppb
Trace Impurities – Thallium (Tl)	≤ 5.0 ppb	< 2.0 ppb
Trace Impurities – Tin (Sn)	≤ 5.0 ppb	4.0 ppb
Trace Impurities – Titanium (Ti)	≤ 1.0 ppb	1.5 ppb
Trace Impurities – Vanadium (V)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Zinc (Zn)	≤ 5.0 ppb	0.8 ppb
Trace Impurities – Zirconium (Zr)	≤ 1.0 ppb	0.3 ppb

>>> Continued on page 3 >>>

Hydrochloric Acid, 36.5–38.0%
BAKER INSTRA–ANALYZED® Reagent
For Trace Metal Analysis



Material No.: 9530-33
Batch No.: 22G2862015

Test	Specification	Result

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

A handwritten signature in cursive script that reads 'Jamie Ethier'.
Jamie Ethier
Vice President Global Quality



M6156

Certified Reference Material CRM

R → 6/12/24



CERTIFIED WEIGHT REPORT:

Part Number: 57042
Lot Number: 032123
Description: Molybdenum (Mo)

Expiration Date: 032126
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB
Volume shown below was diluted to (mL): 3000.41

Lot # MKBQ8597V
Solvent: Ammonium hydroxide

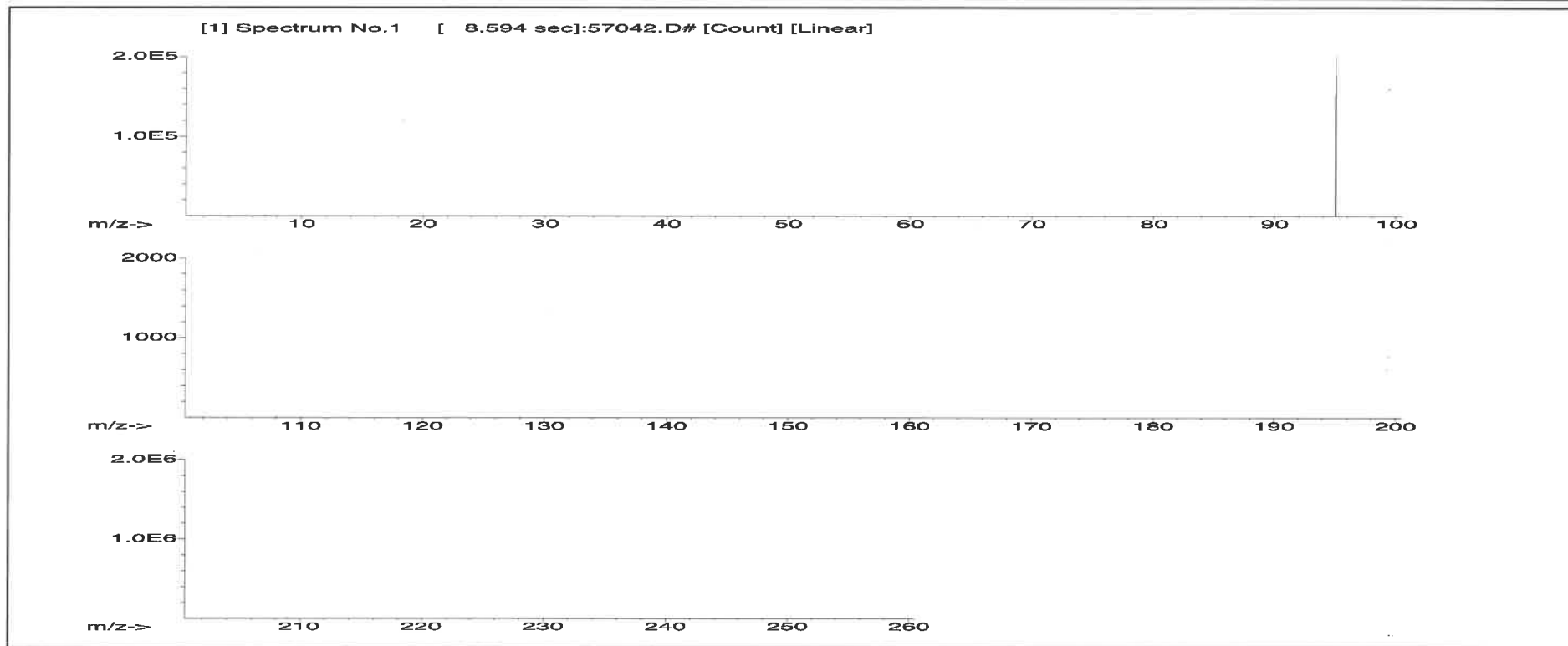
0.5% 15.0 (mL) Ammonium hydroxide

5E-05 Balance Uncertainty
0.058 Flask Uncertainty

Lawrence Barry
Formulated By: Lawrence Barry 032123

Pedro L. Rentas
Reviewed By: Pedro L. Rentas 032123

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Nominal Conc. (µg/mL)	Initial Conc. (µg/mL)	Final Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.)			NIST SRM
										CAS#	OSHA PEL (TWA)	LD50	
1. Ammonium molybdate (Mo)	58142	112322	0.1000	300.0	0.084	1000	10001.4	1000.0	2.1	13106-76-8	5 mg(Mo)/m3	ori-rat 333 mg/kg	3134





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

Trace Metals Verification by ICP-MS (µg/mL)																			
Al	<0.02	Cd	<0.02	Dy	<0.02	Hf	<0.02	Li	<0.02	Ni	<0.02	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	<0.02	Ru	<0.02	Sr	<0.02	Tm	<0.02	Y	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	La	<0.02	Mo	T	Pt	<0.02	Sm	<0.02	S	<0.02	Sn	<0.02	Zn	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	Ti	<0.02	Zr	<0.02

(T)= Target analyte

Physical Characterization:

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

Certified by:

- * The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- * Purified acids, 18.2 megohm deionized water, calibrated Class A glassware and the highest purity raw materials are used in the preparation of all standards.
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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:	QCP-CICV-1		
Lot Number:	V2-MEB744107		
Matrix:	7% (v/v) HNO ₃		
Value / Analyte(s):	2 500 µg/mL ea:		
	Calcium,		Potassium,
	Magnesium,		Sodium,
	1 000 µg/mL ea:		
	Aluminum,		Barium,
	500 µg/mL ea:		
	Iron,		
	250 µg/mL ea:		
	Nickel,		Vanadium,
	Zinc,		Cobalt,
	Manganese,		
	125 µg/mL ea:		
	Silver,		Copper,
	100 µg/mL ea:		
	Chromium,		
	25 µg/mL ea:		
	Beryllium		

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
Aluminum, Al	1 000 ± 4 µg/mL	Barium, Ba	1 000 ± 6 µg/mL
Beryllium, Be	24.98 ± 0.12 µg/mL	Calcium, Ca	2 500 ± 8 µg/mL
Chromium, Cr	99.9 ± 0.6 µg/mL	Cobalt, Co	250.2 ± 1.2 µg/mL
Copper, Cu	125.0 ± 0.5 µg/mL	Iron, Fe	500.0 ± 2.2 µg/mL
Magnesium, Mg	2 500 ± 11 µg/mL	Manganese, Mn	249.9 ± 1.1 µg/mL
Nickel, Ni	250.0 ± 1.2 µg/mL	Potassium, K	2 500 ± 11 µg/mL
Silver, Ag	125.0 ± 0.6 µg/mL	Sodium, Na	2 500 ± 11 µg/mL
Vanadium, V	250.0 ± 1.1 µg/mL	Zinc, Zn	249.9 ± 1.1 µg/mL

Density: 1.081 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
Cu	ICP Assay	3114	120618
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	200413
Na	Gravimetric		See Sec. 4.2
Ni	ICP Assay	3136	120619
Ni	EDTA	928	928
V	ICP 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

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), <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

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

May 22, 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

- **May 22, 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:

Justin Dirico
Stock Processing Supervisor



Certificate Approved By:

Jodie Wall
Stock VSM Coordinator



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



300 Technology Drive
 Christiansburg, VA 24073 USA
 inorganicventures.com

 P: 800-669-6799/540-585-3030
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2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
 Catalog Number: QCP-CICV-2
 Lot Number: U2-MEB733713
 Matrix: 3% (w/v) Tartaric acid
 1% (v/v) HNO₃
 Value / Analyte(s): 500 µg/mL ea:
 Antimony

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
Antimony, Sb	500.0 ± 2.8 µg/mL		

Density: 1.017 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Sb	ICP Assay	3102a	140911

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)

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). <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

June 01, 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

- **June 01, 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



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: QCP-CICV-3
Lot Number: V2-MEB749572
Matrix: 7% (v/v) HNO₃
Value / Analyte(s):
500 µg/mL ea:
Arsenic, Lead,
Selenium, Thallium,
250 µg/mL ea:
Cadmium

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
Arsenic, As	500.0 ± 3.1 µg/mL	Cadmium, Cd	250.1 ± 1.1 µg/mL
Lead, Pb	500.0 ± 2.3 µg/mL	Selenium, Se	500.0 ± 3.2 µg/mL
Thallium, Tl	500.0 ± 3.0 µg/mL		

Density: 1.040 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

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), <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.

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 02, 2025

- 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 02, 2030**

- 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:

Justin Dirico
Stock Processing Supervisor



Certificate Approved By:

Jodie Wall
Stock VSM Coordinator



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Hydrogen Peroxide, 30%

CMOS

(Stabilized)

M-6170

avantor™



R.Date . 8-05/20/2025

Material No.: 2190-03

Batch No.: 24D1961001

Test	Specification	Result
Trace Impurities – Manganese (Mn)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Molybdenum (Mo)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities – Nickel (Ni)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities – Niobium (Nb)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Potassium (K)	≤ 600.0 ppb	176.7 ppb
Trace Impurities – Silicon (Si)	≤ 100.0 ppb	< 10.0 ppb
Trace Impurities – Silver (Ag)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Sodium (Na)	≤ 100.0 ppb	< 5.0 ppb
Trace Impurities – Strontium (Sr)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Tantalum (Ta)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities – Thallium (Tl)	≤ 50.0 ppb	< 5.0 ppb
Trace Impurities – Tin (Sn)	190.0 – 500.0 ppb	272.3 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)	≤ 50 ppb	< 1 ppb
Trace Impurities – Zirconium (Zr)	≤ 10.0 ppb	< 1.0 ppb
Particle Count – 0.2 µm and greater	≤ 1175 par/ml	202 par/ml
Particle Count – 0.5 µm and greater	≤ 100 par/ml	33 par/ml

>>> Continued on page 3 >>>

Hydrogen Peroxide, 30%

CMOS

(Stabilized)

 **avantor™**



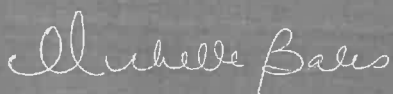
Material No.: 2190-03
Batch No.: 24D1961001

Test	Specification	Result

For Microelectronic Use

Country of Origin: USA

Packaging Site: Paris Mfg Ctr & DC



Michelle Bales
Sr. Manager, Quality Assurance

Hydrogen Peroxide, 30%
CMOS
(Stabilized)



Material No.: 2190-03
Batch No.: 24D1961001
Manufactured Date: 2024-04-17
Expiration Date: 2025-10-16
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
Assay (H ₂ O ₂)	30.0 – 32.0 %	31.6 %
Color (APHA)	≤ 10	< 5
Free Acid (μeq/g)	≤ 0.2	0.1
Residue after Evaporation	≤ 10 ppm	2 ppm
Ammonium (NH ₄)	≤ 3 ppm	< 3 ppm
Chloride (Cl)	≤ 0.2 ppm	< 0.2 ppm
Nitrate (NO ₃)	≤ 2 ppm	< 2 ppm
Phosphate (PO ₄)	≤ 1 ppm	1 ppm
Sulfate (SO ₄)	≤ 3 ppm	< 3 ppm
Trace Impurities – Aluminum (Al)	≤ 70.0 ppb	< 5.0 ppb
Arsenic and Antimony (as As)	≤ 10.0 ppb	< 10.0 ppb
Trace Impurities – Barium (Ba)	≤ 20.0 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)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Calcium (Ca)	≤ 50.0 ppb	< 1.0 ppb
Trace Impurities – Chromium (Cr)	≤ 20.0 ppb	1.5 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)	≤ 20.0 ppb	< 1.0 ppb
Trace Impurities – Germanium (Ge)	≤ 10.0 ppb	< 10.0 ppb
Trace Impurities – Gold (Au)	≤ 10.0 ppb	< 5.0 ppb
Heavy Metals (as Pb)	≤ 500.0 ppb	< 250.0 ppb
Trace Impurities – Iron (Fe)	≤ 50.0 ppb	4.6 ppb
Trace Impurities – Lead (Pb)	≤ 10.0 ppb	< 10.0 ppb
Trace Impurities – Lithium (Li)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Magnesium (Mg)	≤ 10.0 ppb	< 1.0 ppb

>>> Continued on page 2 >>>



Certified Reference Material CRM



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

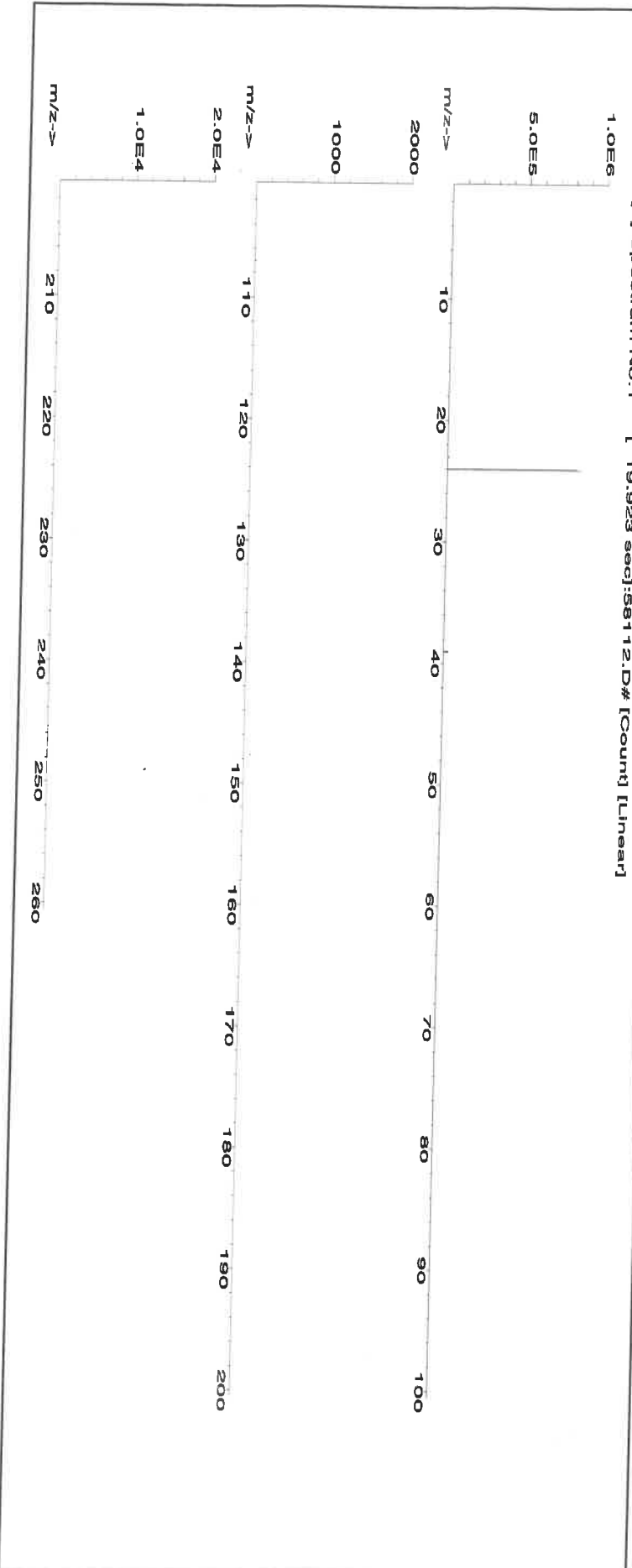
CERTIFIED WEIGHT REPORT:

Part Number: 58112 **Lot #** M 6171
Lot Number: 011525 **Solvent:** 24012496 Nitric Acid
Description: Magnesium (Mg)
Expiration Date: 011528 2% 40.0 Nitric Acid
Recommended Storage: Ambient (20 °C) (mL)
Nominal Concentration (µg/mL): 10000
NIST Test Number: 6UTB 5E-05 Balance Uncertainty
Weight shown below was diluted to (mL): 2000.07 0.100 Flask Uncertainty

Formulated By:	Benson Chan	011525
Reviewed By:	Pedro L. Rentas	011525

Compound

1. Magnesium nitrate hexahydrate (Mg) IN030 MGD05023A1 10000 99.999 0.10 8.51 234.9183 234.9195 10000.1 20.0 13446-18-9 NA off-ret 5440 mg/kg 3131a





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	Ku	<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).

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: CGNA10
Lot Number: V2-NA740547
Matrix: 2% (v/v) HNO₃
Value / Analyte(s): 10 000 µg/mL ea:
Sodium
Starting Material: Sodium Carbonate
Starting Material Lot#: 2453 and 2606
Starting Material Purity: 99.9976%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10018 ± 30 µg/mL
Density: 1.033 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1	10026 ± 18 µg/mL Gravimetric NIST SRM Lot Number: See Sec. 4.2
Assay Method #2	9986 ± 66 µg/mL ICP Assay NIST SRM 3152a Lot Number: 200413
Assay Method #3	10002 ± 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

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k = coverage factor = 2

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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 errors 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	<	0.000860	M	Eu	<	0.000860	s	Na	<		O	Se	<	0.034000	O	Zn		0.000387
O	Al		0.003121	O	Fe		0.001622	M	Nb	<	0.000860	O	Si		0.044943	M	Zr	<	0.001800
M	As	<	0.001800	M	Ga	<	0.000860	M	Nd	<	0.000860	M	Sm	<	0.000860				
M	Au	<	0.005700	M	Gd	<	0.000860	O	Ni	<	0.000980	M	Sn	<	0.000860				
O	B	<	0.025000	M	Ge	<	0.003500	M	Os	<	0.029000	M	Sr		0.000436				
M	Ba		0.004494	M	Hf	<	0.000860	O	P		0.005742	M	Ta	<	0.000086				
O	Be	<	0.000160	M	Hg	<	0.002900	M	Pb	<	0.002600	M	Tb	<	0.000860				
M	Bi	<	0.000860	M	Ho	<	0.000860	M	Pd	<	0.004300	M	Te	<	0.004300				
O	Ca		0.112358	M	In	<	0.000860	M	Pr	<	0.000860	M	Th	<	0.003500				
O	Cd	<	0.000730	M	Ir	<	0.000940	M	Pt	<	0.000860	O	Ti		0.000399				
M	Ce	<	0.000860	O	K		0.349560	M	Rb		0.000436	M	Tl	<	0.000860				
M	Co	<	0.000860	M	La	<	0.000860	M	Re	<	0.000860	M	Tm	<	0.000860				
O	Cr	<	0.002000	O	Li		0.000224	M	Rh	<	0.000860	M	U	<	0.000860				
M	Cs		0.000287	M	Lu	<	0.000860	M	Ru	<	0.000940	O	V	<	0.001500				
O	Cu	<	0.004100	M	Mg		0.097377	O	S		0.018726	M	W	<	0.007700				
M	Dy	<	0.000860	M	Mn	<	0.007700	M	Sb	<	0.000860	M	Y	<	0.000860				
M	Er	<	0.000860	O	Mo	<	0.002800	O	Sc	<	0.000610	M	Yb	<	0.000860				

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). <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 - 22.99 +1 (6) Na+(aq) largely ionic in nature

Chemical Compatibility -Soluble in HCl, HNO₃, H₂SO₄ and HF aqueous matrices. Stable with all metals and inorganic anions.

Stability - 2-100 ppb levels stable for months in 1% HNO₃ / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO₃ / LDPE container.

Na Containing Samples (Preparation and Solution) - Metal (Dissolves very rapidly in water); Ores (Lithium carbonate fusion in graphite crucible followed by HCl dissolution - blank levels of Na in lithium carbonate critical); Organic Matrices (Sulfuric / peroxide digestion or nitric/sulfuric/perchloric acid decomposition).

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 23 amu	310 ppt	n/a	46Ti+2, 46Ca+2
ICP-OES 330.237 nm	2.0 / 0.09 µg/mL	1	Pd, Zn
ICP-OES 588.995 nm	0.03 / 0.006 µg/mL	1	2nd order radiation from R.E.s on some optical designs
ICP-OES 589.595 nm	0.07 / 0.00009 µg/mL	1	2nd order radiation from R.E.s on some optical designs

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

February 23, 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 23, 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



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

M6174
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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:	V2-MEB742428	
Matrix:	5% (v/v) HNO ₃	
Value / Analyte(s):	5 000 µg/mL ea:	
	Calcium,	Potassium,
	Magnesium,	Sodium,
	2 000 µg/mL ea:	
	Aluminum,	Barium,
	1 000 µg/mL ea:	
	Iron,	
	500 µg/mL ea:	
	Nickel,	Vanadium,
	Zinc,	Cobalt,
	Manganese,	
	250 µg/mL ea:	
	Silver,	Copper,
	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	50.03 ± 0.30 µg/mL	Calcium, Ca	5 000 ± 16 µg/mL
Chromium, Cr	200.0 ± 1.1 µg/mL	Cobalt, Co	500.0 ± 2.3 µg/mL
Copper, Cu	250.0 ± 1.1 µg/mL	Iron, Fe	1 000 ± 4 µg/mL
Magnesium, Mg	5 000 ± 22 µg/mL	Manganese, Mn	499.9 ± 2.2 µg/mL
Nickel, Ni	500.1 ± 2.3 µg/mL	Potassium, K	5 000 ± 22 µg/mL
Silver, Ag	250.0 ± 1.1 µg/mL	Sodium, Na	5 000 ± 22 µg/mL
Vanadium, V	500.0 ± 2.2 µg/mL	Zinc, Zn	500.0 ± 2.2 µg/mL

Density: 1.117 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
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
Co	ICP Assay	3113	190630
Co	EDTA	928	928
Cr	ICP Assay	3112a	170630
Cu	ICP Assay	3114	120618
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	200413
Na	Gravimetric		See Sec. 4.2
Ni	ICP Assay	3136	120619
Ni	EDTA	928	928
V	ICP 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

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). <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

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; info@inorganicventures.com;

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 22, 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 22, 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:

Jodie Wall
Stock VSM Coordinator



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



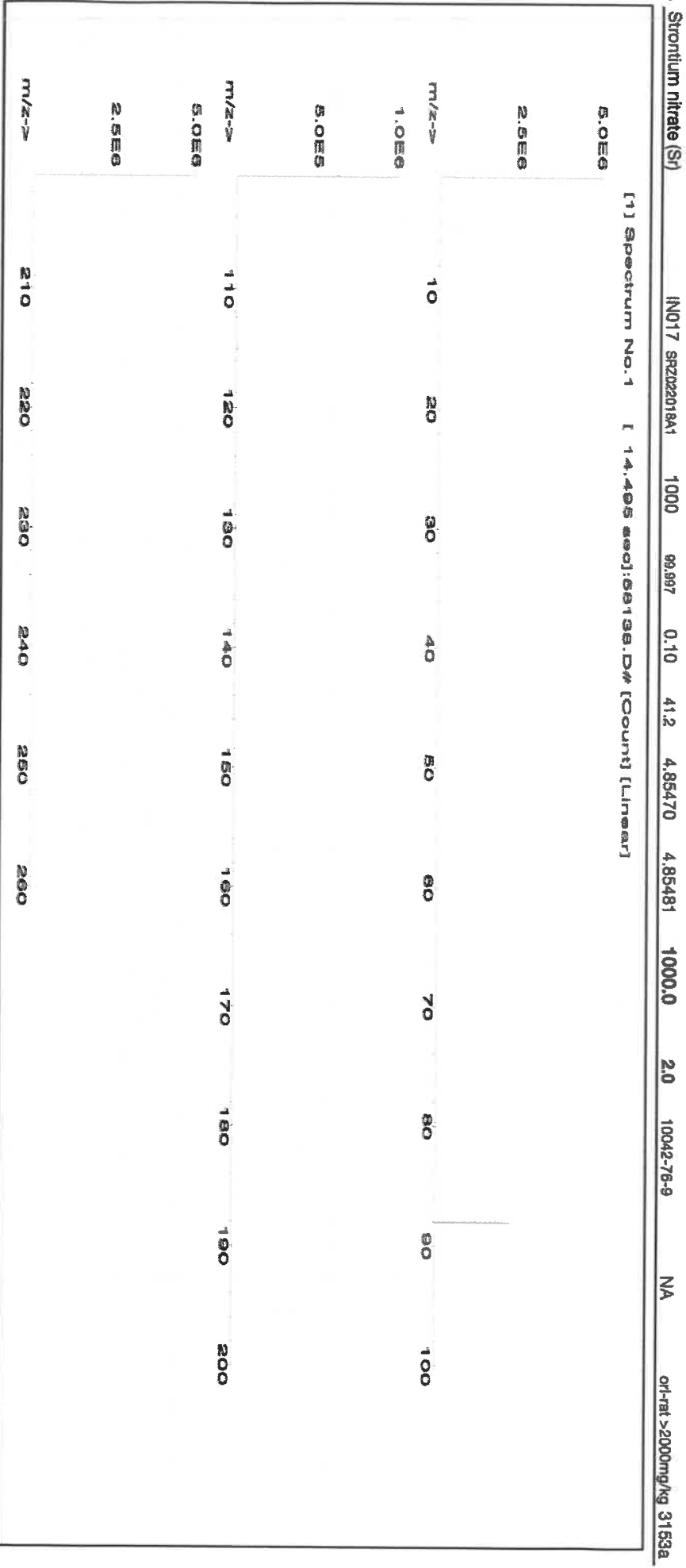


CERTIFIED WEIGHT REPORT:

Part Number: **57038** Lot # **24002546** Solvent: **Nitric Acid**
 Lot Number: **092724**
 Description: **Strontium (Sr)**
 Expiration Date: **092727** 2% 40.0 Nitric Acid (mL)
 Recommended Storage: **Ambient (20 °C)**
 Nominal Concentration (µg/mL): **1000**
 NIST Test Number: **8UTB** 5E-05 Balance Uncertainty
 Weight shown below was diluted to (mL): **2000.07** 0.100 Flask Uncertainty

<i>[Signature]</i>	
Formulated By:	Benson Chan
	092724
Reviewed By:	Pedro L. Rentas
	092724

SDS Information									
Compound	Lot	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)
Strontium nitrate (Sr)	IN017 SR2022018A1	1000	99.997	0.10	41.2	4.85470	4.85481	1000.0	2.0
						10042-76-9	NA		or -rel >2000mg/kg 3153a





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	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	T	Tim	<0.02	Y	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	La	<0.02	Mo	<0.02	Pt	<0.02	Sm	<0.02	S	<0.02	Sn	<0.02	Zn	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Ta	<0.02	Ti	<0.02	Zr	<0.02

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

57042
080525
Molybdenum (Mo)

57042
080525
Molybdenum (Mo)

57042
080525
Molybdenum (Mo)

Solvent:
Ammonium hydroxide
ASTM Type 1 Water

Expiration Date:

080528

Recommended Storage:

Ambient (15 - 30 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

Volume shown below was diluted to (mL):

1999.41

5E-05

Balance Uncertainty
Flesh Uncertainty

0.5%

10.0

Ammonium hydroxide

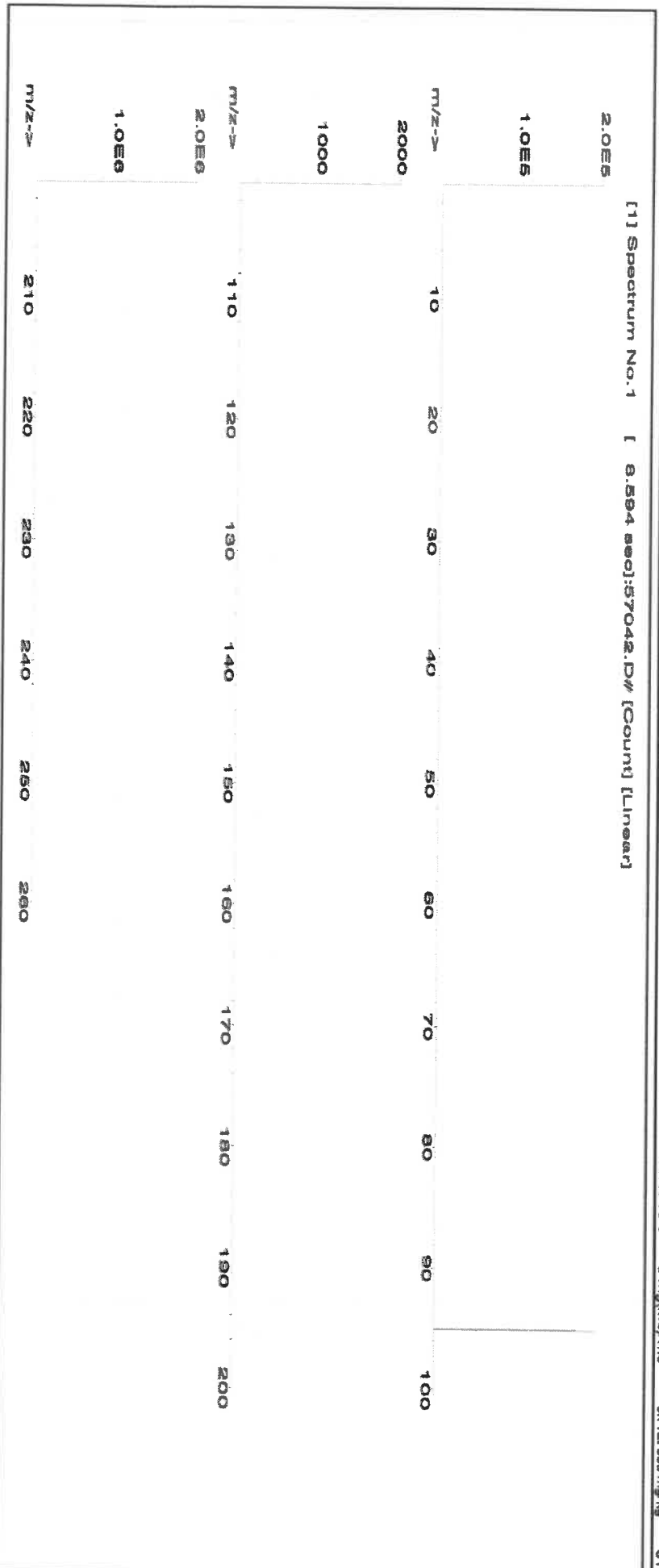
Formulated By:	Benson Chan	080525
Reviewed By:	Pedro L. Rentes	080525

SDS Information

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

1. Ammonium molybdate (Mo) 58142 112322 0.1000 200.0 0.084 1000 10001.4 1000.5 2.2 13106-76-8 5 mg(Mo)/mL 0.1-0.333 mg/kg 3134

[1] Spectrum No. 1 [8.594 sec]:57042.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
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	Ce	<0.02	Gd	<0.02	Ir	<0.02	Mn	<0.02	Pd	<0.02	Rb	<0.02	Na	<0.2
Be	<0.01	Cr	<0.02	Ga	<0.02	Fe	<0.2	Hg	<0.2	P	<0.02	Ru	<0.02	Sr	<0.02
Bi	<0.02	Co	<0.02	Ge	<0.02	La	<0.02	Mo	T	Pt	<0.02	Sm	<0.02	S	<0.02
B	<0.02	Cu	<0.02	Au	<0.02	Pb	<0.02	Nd	<0.02	K	<0.2	Sc	<0.02	Te	<0.02
														Tb	<0.02
														Ti	<0.02
														Th	<0.02
														Tm	<0.02
														Sn	<0.02
														Tl	<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 by an ISO17025 certified organization with weights traceable through NIST to the SI kilogram (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).
- Rev 1.0, 2/25/2025

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

M6179
R → 612/24

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: 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). <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





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.



M6182

(A) **SAMPLE DESCRIPTION**

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

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

(B) **BREAKAGE OR MISSING ITEMS**

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

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

(C) **ANALYSIS OF SAMPLES**

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





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

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.



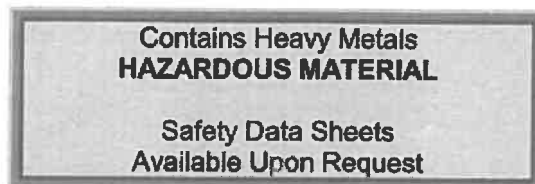
Instructions for QATS Reference Material: ICP-AES ICS

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.



M6184

(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.

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(C) **ANALYSIS OF SAMPLES**

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





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

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
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Mg	5000	255000	216000	294000	248000	210000	286000
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Se	35	(0.0)	-35.0	35.0	(46.0)	11.0	81.0
Ag	10	(0.0)	-10.0	10.0	201	170	232
Tl	25	(0.0)	-25.0	25.0	(108)	83.0	133
V	50	(0.0)	-50.0	50.0	491	417	565
Zn	60	(0.0)	-60.0	60.0	952	809	1095

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

Nitric Acid 69%
CMOS



M6187

R.D :- 08/08/25

Material No.: 9606-03
Batch No.: 24H0162012
Manufactured Date: 2024-06-28
Retest Date: 2029-06-27
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	< 1.0 ppb
Trace Impurities – Boron (B)	≤ 10.0 ppb	0.1 ppb
Trace Impurities – Cadmium (Cd)	≤ 50 ppb	< 1 ppb
Trace Impurities – Calcium (Ca)	≤ 50.0 ppb	0.3 ppb
Trace Impurities – Chromium (Cr)	≤ 30.0 ppb	0.1 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	< 1 ppb
Trace Impurities – Gold (Au)	≤ 20 ppb	< 1 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	< 1.0 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	< 1.0 ppb

>>> Continued on page 2 >>>

Nitric Acid 69%
CMOS



Material No.: 9606-03
Batch No.: 24H0162012

Test	Specification	Result
Trace Impurities – Niobium (Nb)	≤ 50.0 ppb	< 1.0 ppb
Trace Impurities – Potassium (K)	≤ 50 ppb	< 1 ppb
Trace Impurities – Silicon (Si)	≤ 50 ppb	1 ppb
Trace Impurities – Silver (Ag)	≤ 20.0 ppb	< 1.0 ppb
Trace Impurities – Sodium (Na)	≤ 150.0 ppb	< 1.0 ppb
Trace Impurities – Strontium (Sr)	≤ 30.0 ppb	< 1.0 ppb
Trace Impurities – Tantalum (Ta)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Thallium (Tl)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Tin (Sn)	≤ 20.0 ppb	< 1.0 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	13 par/ml
Particle Count – 1.0 µm and greater	≤ 10 par/ml	5 par/ml

>>> Continued on page 3 >>>

Nitric Acid 69%
CMOS

 **avantorsTM**



Material No.: 9606-03
Batch No.: 24H0162012

Test	Specification	Result

For Microelectronic Use

Country of Origin: USA
Packaging Site: Phillipsburg Mfg Ctr & DC



Jamie Croak
Director Quality Operations, Bioscience Production

Hydrochloric Acid, 36.5–38.0%
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis



M6200
R.O → 08/25/25

Material No.: 9530-33
Batch No.: 24D1562005
Manufactured Date: 2024-03-18
Retest Date: 2029-03-17
Revision No.: 0

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	1.192
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	< 5.0 ppb
Arsenic and Antimony (as As)	≤ 5.0 ppb	< 3.0 ppb
Trace Impurities – Barium (Ba)	≤ 1.0 ppb	< 1.0 ppb
Trace Impurities – Beryllium (Be)	≤ 1.0 ppb	< 1.0 ppb
Trace Impurities – Bismuth (Bi)	≤ 10.0 ppb	< 10.0 ppb
Trace Impurities – Boron (B)	≤ 20.0 ppb	2.2 ppb
Trace Impurities – Cadmium (Cd)	≤ 1.0 ppb	< 1.0 ppb
Trace Impurities – Calcium (Ca)	≤ 50.0 ppb	31.0 ppb
Trace Impurities – Chromium (Cr)	≤ 1.0 ppb	0.5 ppb
Trace Impurities – Cobalt (Co)	≤ 1.0 ppb	0.2 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	3 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.: 24D1562005

Test	Specification	Result
Trace Impurities – Lead (Pb)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Lithium (Li)	≤ 1.0 ppb	< 0.1 ppb
Trace Impurities – Magnesium (Mg)	≤ 10.0 ppb	2.2 ppb
Trace Impurities – Manganese (Mn)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Mercury (Hg)	≤ 0.5 ppb	< 0.1 ppb
Trace Impurities – Molybdenum (Mo)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities – Nickel (Ni)	≤ 4.0 ppb	0.2 ppb
Trace Impurities – Niobium (Nb)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Potassium (K)	≤ 9.0 ppb	< 1.0 ppb
Trace Impurities – Selenium (Se), For Information Only		< 1.0 ppb
Trace Impurities – Silicon (Si)	≤ 100.0 ppb	< 10.0 ppb
Trace Impurities – Silver (Ag)	≤ 1.0 ppb	< 0.3 ppb
Trace Impurities – Sodium (Na)	≤ 100.0 ppb	2.0 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	< 0.4 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	< 0.2 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



Material No.: 9530-33
Batch No.: 24D1562005

Test	Specification	Result

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

A handwritten signature in cursive script, appearing to read 'JCroak'.

Jamie Croak
Director Quality Operations, Bioscience Production

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution

Catalog Number: WW-LFS-2

Lot Number: V2-MEB743480

Matrix: 5% (v/v) HNO₃
tr. HF

Value / Analyte(s): 200 µg/mL ea:
Silica,

80 µg/mL ea:
Antimony,

70 µg/mL ea:
Tin,

40 µg/mL ea:
Molybdenum,

20 µg/mL ea:
Titanium

R-7/20/28

M6201

M6202

M6203

M6204

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Antimony, Sb	80.1 ± 0.5 µg/mL	Molybdenum, Mo	40.05 ± 0.22 µg/mL
Silica, SiO ₂	200.3 ± 1.4 µg/mL	Tin, Sn	70.1 ± 0.4 µg/mL
Titanium, Ti	20.03 ± 0.12 µg/mL		

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

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Mo	ICP Assay	3134	130418
Sb	ICP Assay	3102a	140911
SiO ₂	Calculated		See Sec. 4.2
Sn	ICP Assay	3161a	140917
Ti	ICP Assay	traceable to 3162a	T2-TI725816

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

N/A

6.0 INTENDED USE

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

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

May 07, 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

- **May 07, 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:

Justin Dirico
Stock Processing Supervisor



Certificate Approved By:

Thomas Kozikowski
Stock VS Manager



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





Refine your results. Redefine your industry.

Certificate of Analysis

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: WW-LFS-1
Lot Number: W2-MEB752149
Matrix: 5% (v/v) HNO₃

R → 7/20/28

M6209
M6210
M6211
M6212

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

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Aluminum, Al	200.2 ± 0.7 µg/mL	Arsenic, As	80.1 ± 0.5 µg/mL
Barium, Ba	20.02 ± 0.12 µg/mL	Beryllium, Be	20.02 ± 0.11 µg/mL
Boron, B	30.02 ± 0.15 µg/mL	Cadmium, Cd	20.04 ± 0.09 µg/mL
Calcium, Ca	100.1 ± 0.3 µg/mL	Cerium, Ce	200.2 ± 1.0 µg/mL
Chromium, Cr	40.02 ± 0.26 µg/mL	Cobalt, Co	20.03 ± 0.09 µg/mL
Copper, Cu	30.03 ± 0.13 µg/mL	Iron, Fe	300.3 ± 1.3 µg/mL
Lead, Pb	100.1 ± 0.5 µg/mL	Lithium, Li	20.03 ± 0.09 µg/mL
Magnesium, Mg	200.2 ± 0.9 µg/mL	Manganese, Mn	19.99 ± 0.09 µg/mL
Mercury, Hg	70.0 ± 0.3 µg/mL	Nickel, Ni	50.05 ± 0.22 µg/mL
Phosphorus, P	600.5 ± 2.9 µg/mL	Potassium, K	1 001 ± 4 µg/mL
Selenium, Se	200.2 ± 1.1 µg/mL	Silver, Ag	7.52 ± 0.03 µg/mL
Sodium, Na	300.3 ± 1.3 µg/mL	Strontium, Sr	20.02 ± 0.10 µg/mL
Thallium, Tl	200.2 ± 1.0 µg/mL	Vanadium, V	30.02 ± 0.13 µg/mL
Zinc, Zn	20.05 ± 0.09 µg/mL		

Density: 1.037 g/mL (measured at 20 ± 5 °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
As	ICP Assay	3103a	100818
B	ICP Assay	3107	190605
B	Calculated		See Sec. 4.2
Ba	ICP Assay	3104a	140909
Ba	Gravimetric		See Sec. 4.2
Be	ICP Assay	3105a	090514
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
Cd	ICP Assay	3108	130116
Cd	EDTA	928	928
Ce	ICP Assay	3110	160830
Ce	EDTA	928	928
Co	ICP Assay	3113	190630
Co	EDTA	928	928
Cr	ICP Assay	3112a	170630
Cu	ICP Assay	3114	120618
Cu	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
Hg	ICP Assay	3133	160921
Hg	EDTA	928	928
K	ICP Assay	3141a	140813
K	Gravimetric		See Sec. 4.2
Li	ICP Assay	3129a	100714
Li	Gravimetric		See Sec. 4.2
Mg	ICP Assay	3131a	14Q110
Mg	EDTA	928	928
Mn	ICP Assay	3132	050429
Mn	EDTA	928	928
Na	ICP Assay	3152a	200413
Na	Gravimetric		See Sec. 4.2
Ni	ICP Assay	3136	120619
Ni	EDTA	928	928
P	ICP Assay	3139a	060717
P	Acidimetric	84L	84L
Pb	ICP Assay	3128	101026
Pb	EDTA	928	928
Se	ICP Assay	3149	100901
Sr	EDTA	928	928
Sr	ICP Assay	Traceable to 3153a	K2-SR650985
Tl	ICP Assay	3158	151215
V	ICP 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:

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ls} = 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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ls} = 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). <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° - 25° C to minimize the effects of transpiration. Use at 20° ± 5° 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

April 08, 2025

- 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

- April 08, 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:

Justin Dirico
Stock Processing Supervisor



Certificate Approved By:

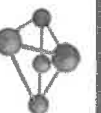
Jodie Wall
Stock VSM Coordinator



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





CERTIFIED WEIGHT REPORT:

Part Number: **57028**
Lot Number: **062024**
Description: **Nickel (NI)**

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

Formulated By: *Benson Chan*
Reviewed By: *Pedro L. Rentes*

Benson Chan

062024

Expiration Date: **062027**

Recommended Storage: **Ambient (20 °C)**

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

NIST Test Number: **6UTB**

Balance Uncertainty

Volume shown below was diluted to (mL): **2000.07**

Flask Uncertainty

Expanded

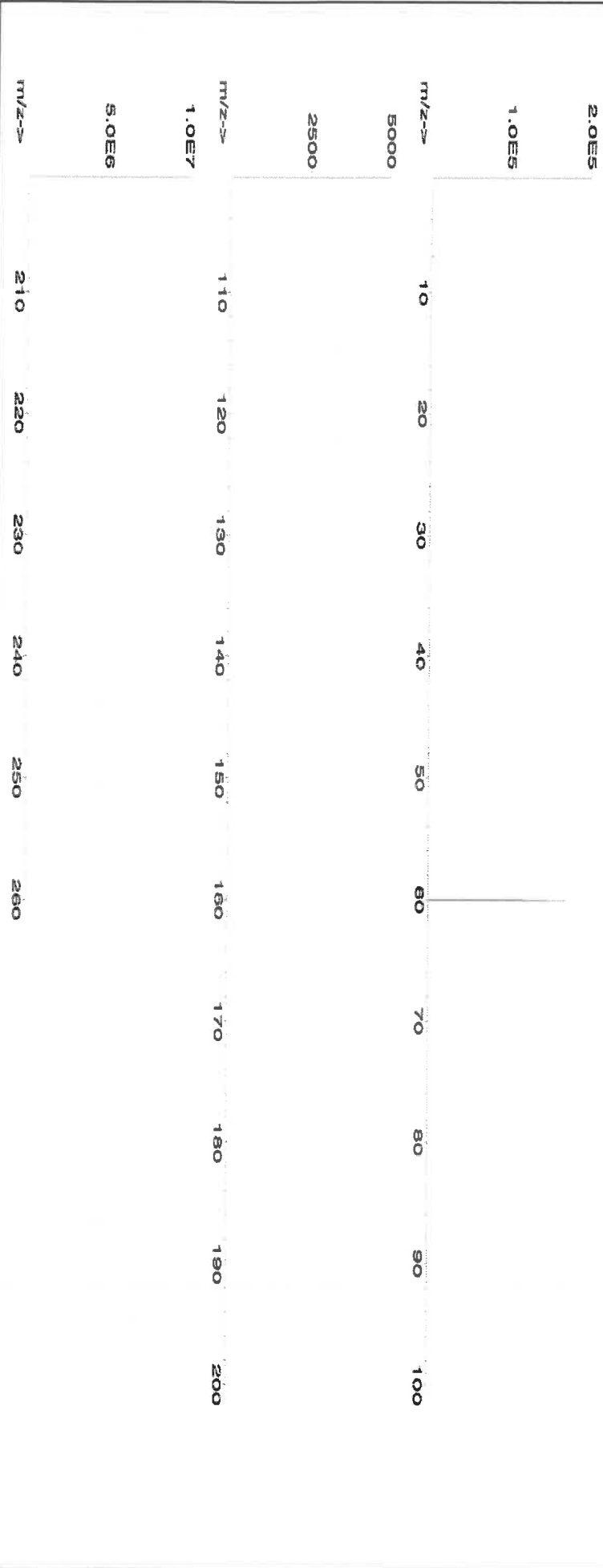
SDS Information

Compound

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

1. Nickel(II) nitrate hexahydrate (NI) 58128 062023 0.1000 200.0 0.084 1000 10000.4 1000.0 2.2 13478-00-7 1 mg/m3 orl-rat 1620 mg/kg 3136

[1] Spectrum No.1 [9.136 sec]:58028.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

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

Certified by:

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



Certified Reference Material CRM

M6030



CERTIFIED WEIGHT REPORT:

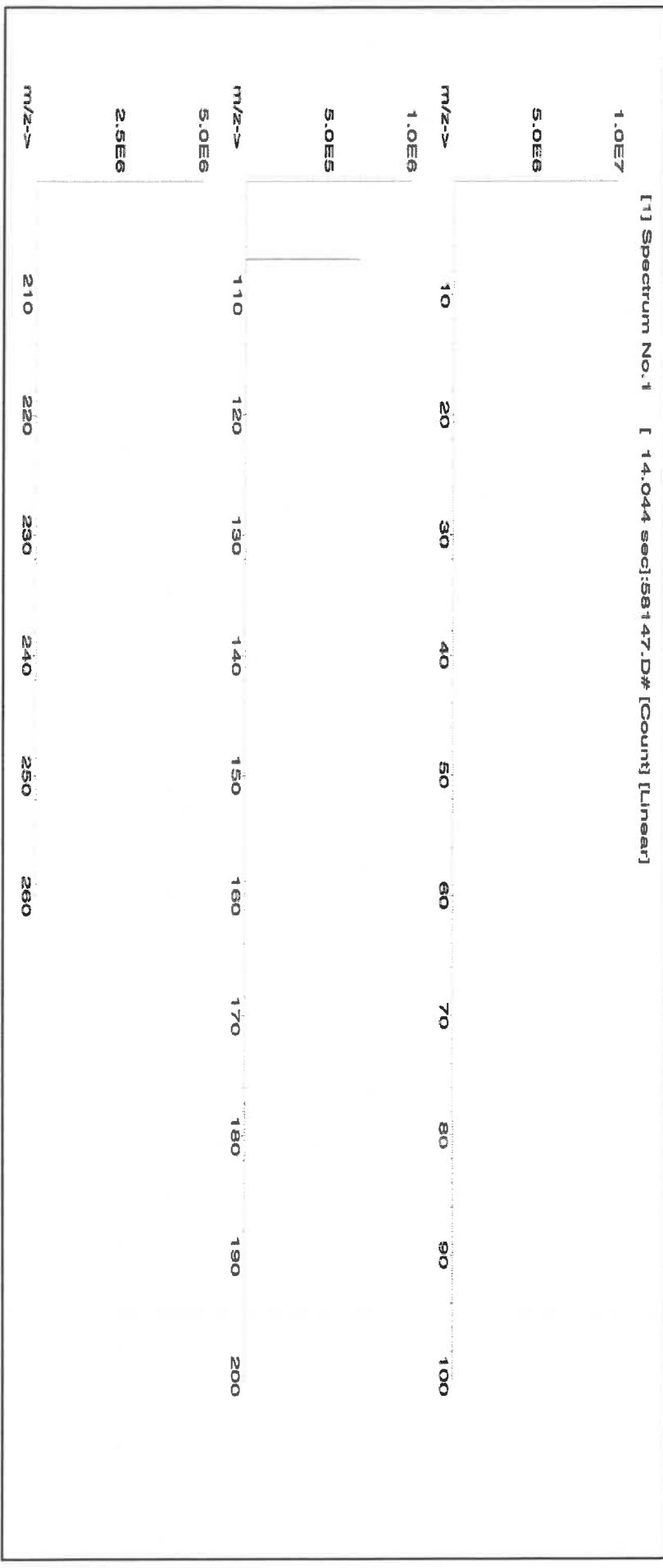
Part Number: **57047**
Lot Number: **122823**
Description: **Silver (Ag)**
Solvent: 24002546 Nitric Acid
Lot #

Expiration Date: 122826
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test Number: 6UTB

Weight shown below was diluted to (mL): 4000.30
5E-05 Balance Uncertainty
0.058 Flask Uncertainty

Formulated By:	Benson Chan
Reviewed By:	Pedro L. Rentas
122823	

SDS Information									
Compound	RM#	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)
1. Silver nitrate (Ag)	IN035	J0612AGA1	1000.0	99.999	0.10	63.7	6.27992	6.27998	1000.0
							2.0	7761-88-8	10 µg/mL
									NA
									3151





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

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

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

(T)= Target analyte

Physical Characterization:

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

Certified by:

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



R: 10/18/24
Certified Reference Material CRM



CERTIFIED WEIGHT REPORT:

Part Number:

57051

Lot #
24002546

Solvent:
Nitric Acid

Lot Number:

071724

Description:

Antimony (Sb)

Expiration Date:

071727

Recommended Storage:
Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6LJB

Volume shown below was diluted to (mL):

2000.26

Balance Uncertainty
0.058

Flask Uncertainty

2.0%

40.0
(mL)

Nitric Acid

Formulated By:

Giovanni Esposito

071724

Reviewed By:

Pedro L. Rentas

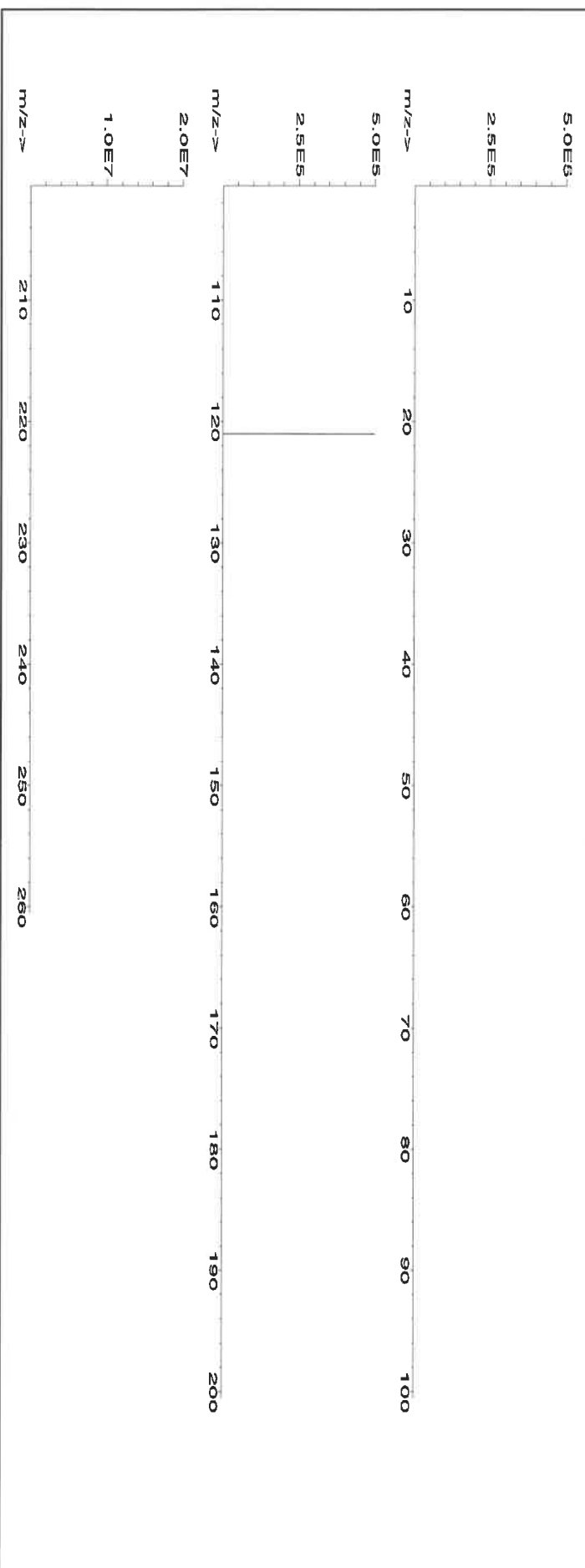
071724

SDS Information

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

1. Antimony (Sb) 58151 060324 0.1000 200.0 0.084 1000 10001.4 1000.0 2.2 7440-36-0 0.5 mg/m3 or-rat 7000 mg/kg 3102a

[1] Spectrum No.1 [17.964 sec]:58051.D# [Count] [Linear]





Har P. R.



CERTIFIED WEIGHT REPORT:

Part Number: 57081
Lot Number: 062724
Description: Thallium (TI)

Lot #

Solvent: 24002546 Nitric Acid

2% 40.0 Nitric Acid (mL)

Expiration Date:

062727

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL):

1000

NIST Test Number:

6UTB

Weight shown below was diluted to (mL): 2000.1

5E-05 Balance Uncertainty
0.10 Flask Uncertainty

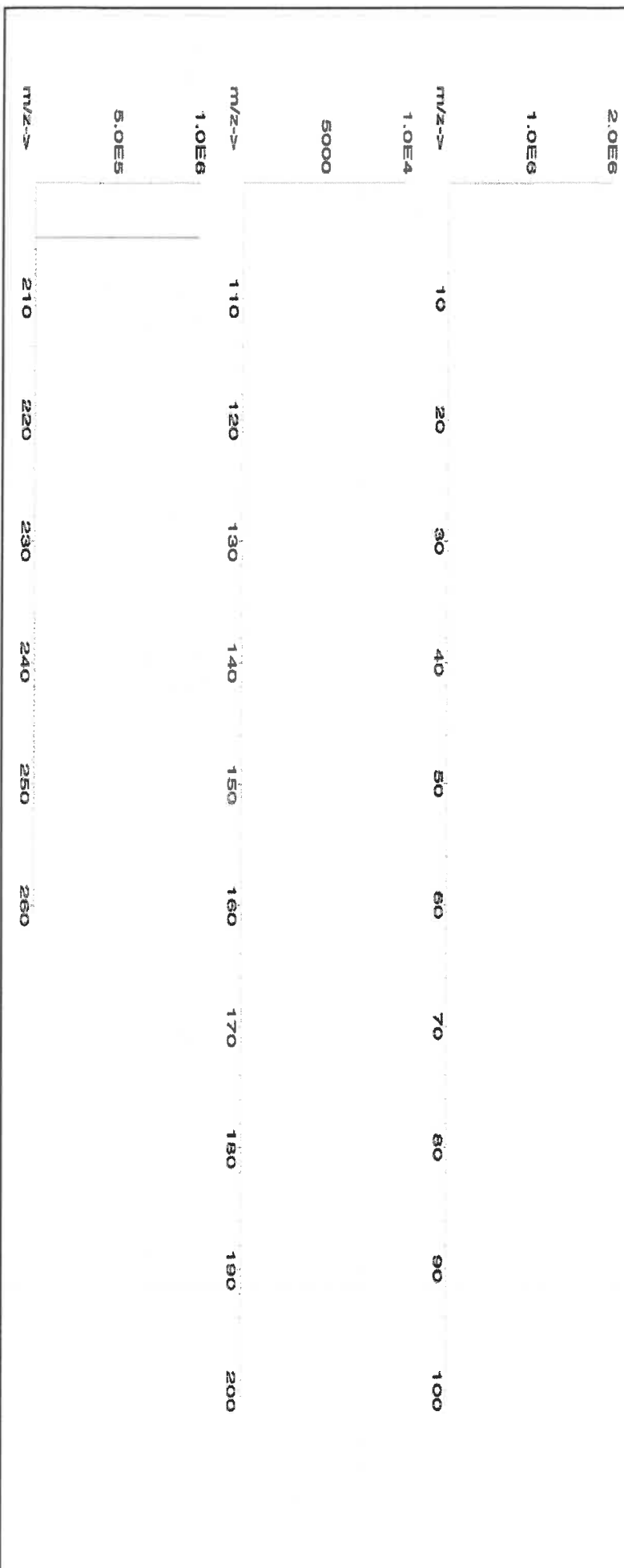
<i>Aleah O'Brady</i>	
Formulated By:	Aleah O'Brady
	062724
Reviewed By:	<i>Pedro L. Renias</i>
	Pedro L. Renias
	062724

SDS Information

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

1. Thallium nitrate (TI) IN037 BCCF4399 1000 99.999 0.10 77.0 2.5975 2.5977 1000.1 2.0 10102-45-1 0.1 mg/m3 orl-mus 15mg/kg 3158

[1] Spectrum No.1 [14.044 sec]:57081.D# [Count] [Linear]





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

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

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

(T) = Target analyte

Physical Characterization:

Certified by:

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

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



Certified Reference Material CRM

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

Aleah O'Brady

062424

Expiration Date: 062427

Recommended Storage: Ambient (20 °C)

Nominal Concentration (µg/mL): 1000

NIST Test Number: 6UTB

5E-05 Balance Uncertainty

Volume shown below was diluted to (mL): 2000.3

0.06 Flask Uncertainty

Aleah O'Brady	
Formulated By:	Aleah O'Brady
Reviewed By:	Pedro L. Rantas

SDS Information

(Solvent Safety Info. On Attached pg.)

CAS# 05814 PEL (TWA)

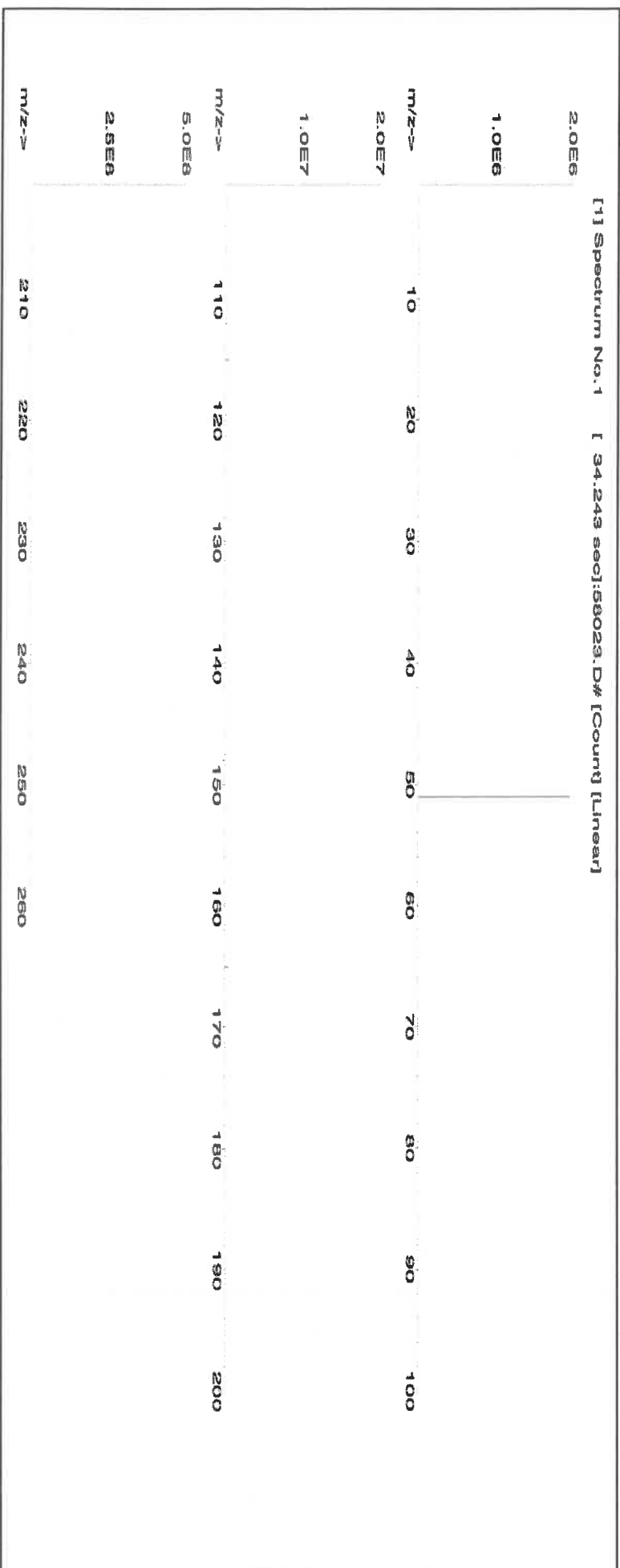
LD50

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]





SHIPPING DOCUMENTS



284 Sheffield Street, Mountainside, NJ 07092

(908) 789-8900 Fax: (908) 788-9222

www.chemtech.net

CHAIN OF CUSTODY RECORD

Alliance Project Number:

23741

COC Number:

CLIENT INFORMATION

COMPANY: CORE ENVIRONMENTAL CONSULTANTS

ADDRESS: 22-48 119TH STREET

CITY: COLLEGE POINT STATE: NY ZIP: 11356

ATTENTION: ROLAND SCARDINO

PHONE: 609-781-8074

FAX:

PROJECT INFORMATION

PROJECT NAME: BNY - Building 50 Probe Investigation

PROJECT #:

LOCATION: Bldg 50. 63 Flushing Ave.
Brooklyn, NY

PROJECT MANAGER: ROLAND SCARDINO

E-MAIL: rscardino@coreenv.com

PHONE: 609-781-8074

FAX:

BILLING INFORMATION

BILL TO: CORE ENVIRONMENTAL CONSULTANTS PO#

ADDRESS: 2312 WEHRLE DR

CITY: BUFFALO

STATE: NY ZIP: 14221

ATTENTION: JOSEPH ZAHEER

PHONE: 716-204-8054

DATA TURNAROUND INFORMATION

FAX: STANDARD DAYS*
HARD COPY: STANDARD DAYS*
EDD STANDARD DAYS*

* TO BE APPROVED BY ALLIANCE

STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

- ☐ RESULTS ONLY ☐ USEPA CLP
☐ RESULTS + QC ☐ New York State ASP "B"
☐ New Jersey REDUCED ☐ New York State ASP "A"
☐ New Jersey CLP ☐ Other _____
☐ EDD Format _____

ANALYSIS

GRO	DRO	VOCs	SVOCs	TAL Metals	PCBs				
1	2	3	4	5	6	7	8	9	

If any metals exceed the 20x
rule, run the TCLP analysis
on 72-hr TAT

PRESERVATIVES

1	2	3	4	5	6	7	8	9
✓	✓	✓	✓	✓	✓			
✓	✓	✓	✓	✓	✓			
✓	✓	✓	✓	✓	✓			
✓	✓	✓	✓	✓	✓			
✓	✓	✓	✓	✓	✓			

COMMENTS

← Specify Preservatives
A-HCl B-HNO3
C-H2SO4 D-NaOH
E-ICE F-Other

CHEMTECH
SAMPLE
IDPROJECT
SAMPLE IDENTIFICATIONSAMPLE
MATRIXSAMPLE
TYPESAMPLE
COLLECTION

of Bottles

COMP

GRAB

DATE

TIME

1.	B50-SP3-111925	SOIL	✓		11/19/25	13:00	
2.	B50-SP3-112025	SOIL	✓		11/20/25	13:00	
3.	B50-SP4-112025	SOIL	✓		11/20/25	13:15	
4.	B50-SP9-112425	SOIL	✓		11/24/25	13:30	
5.	B50-SP11-112525	SOIL	✓		11/25/25	13:30	
6.	B50-SP4-112525	SOIL	✓		11/25/25	14:00	
7.							
8.							
9.							
10.							

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER

DATE/TIME

RECEIVED BY

1. [Signature]
RELINQUISHED BY

DATE/TIME

RECEIVED BY

2. [Signature]
RELINQUISHED BY

DATE/TIME

RECEIVED BY

3. [Signature]
RELINQUISHED BY

DATE/TIME

RECEIVED FOR LAB BY

Conditions of bottles or coolers at receipt:

☐ Compliant ☐ Non Compliant☐ Cooler Temp 3.1°C

MeOH extraction requires an additional 4oz. Jar for percent solid

☐ Ice in Cooler?: _____

Comments:

Page _____ of _____

SHIPPED VIA: CLIENT: ☐ Hand Delivered ☐ OvernightALLIANCE: ☐ Picked Up ☐ Overnight

Shipment Complete

☐ YES ☐ NO

WHITE - ALLIANCE COPY FOR RETURN TO CLIENT

YELLOW - ALLIANCE COPY

PINK - SAMPLER COPY

Shreena

From: Roland Scardino <rscardino@coreenv.com>
Sent: Monday, December 01, 2025 10:47 AM
Subject: RE: TB SAMPLES

EXTERNAL EMAIL - This email was sent by a person from outside your organization. Exercise caution when clicking links, opening attachments or taking further action, before validating its authenticity.

Secured by Check Point

Good morning Deepak,

We received 2 TB's in the cooler, so two were sent back to the lab. Please use one of them for the analysis.

Thank you,

Roland Scardino
Project Manager
CORE Environmental Consultants, Inc.
C: 609-781-8074
O: 718-786-4730 ext 114

22-48 119 th Street	2312 Wehrle Drive
College Point, NY 11356	Buffalo, NY 14221
P: 718.786.4730	P: 716.204.8054
F: 718.786.4764	F: 716.204.8557



www.COREenv.com

Innovative Engineering and Environmental Solutions

Laboratory Certification

Certified By	License No.
Connecticut	PH-0830
DOD ELAP (ANAB)	L2219
Maine	2024021
Maryland	296
New Hampshire	255425
New Jersey	20012
New York	11376
Pennsylvania	68-00548
Soil Permit	525-24-234-08441
Texas	TX-C25-00189
Virginia	460312

LOGIN REPORT/SAMPLE TRANSFER

Order ID : Q3741	CORE02	Order Date : 11/26/2025 4:57:55 PM	Project Mgr :
Client Name : Core Environmental Consul		Project Name : Building 50 Probe Investiga	Report Type : Results+QC
Client Contact : Roland Scardino		Receive DateTime : 11/26/2025 6:20:00 PM	EDD Type : Excel NY
Invoice Name : Core Environmental Consul		Purchase Order :	Hard Copy Date :
Invoice Contact : Roland Scardino			Date Signoff :

LAB ID	CLIENT ID	MATRIX	SAMPLE DATE	SAMPLE TIME	TEST	TEST GROUP	METHOD	FAX DATE	DUE DATES
Q3741-01	B50-SP3-111925	Solid	11/19/2025	13:00					
					VOC-TCLVOA-10		8260C		10 Bus. Days
Q3741-02	B50-SP13-112025	Solid	11/20/2025	13:00					
					VOC-TCLVOA-10		8260C		10 Bus. Days
Q3741-03	B50-SP14-112025	Solid	11/20/2025	13:15					
					VOC-TCLVOA-10		8260C		10 Bus. Days
Q3741-04	B50-SP9-112425	Solid	11/24/2025	13:30					
					VOC-TCLVOA-10		8260C		10 Bus. Days
Q3741-05	B50-SP11-112525	Solid	11/25/2025	13:30					
					VOC-TCLVOA-10		8260C		10 Bus. Days
Q3741-06	B50-SP4-112525	Solid	11/25/2025	14:00					
					VOC-TCLVOA-10		8260C		10 Bus. Days
Q3741-07	TB-1	Water	11/25/2025	14:00					
					VOC-TCLVOA-10		8260-Low		10 Bus. Days

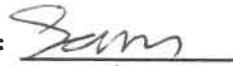
LOGIN REPORT/SAMPLE TRANSFER

Order ID : Q3741	CORE02	Order Date : 11/26/2025 4:57:55 PM	Project Mgr :
Client Name : Core Environmental Consul		Project Name : Building 50 Probe Investiga	Report Type : Results+QC
Client Contact : Roland Scardino		Receive DateTime : 11/26/2025 6:20:00 PM	EDD Type : Excel NY
Invoice Name : Core Environmental Consul		Purchase Order :	Hard Copy Date :
Invoice Contact : Roland Scardino			Date Signoff :

LAB ID	CLIENT ID	MATRIX	SAMPLE DATE	SAMPLE TIME	TEST	TEST GROUP	METHOD	FAX DATE	DUE DATES

Relinquished By : 

Date / Time : 12/1/25 11:05

Received By : 

Date / Time : 12/01/25 11:05

Storage Area : VOA Refridgerator Room