

Cover Page

Order ID : P5192

Project ID : PVSC Monthly 2024

Client : Ardmore Chemical

Lab Sample Number

P5192-01
P5192-02

Client Sample Number

EFF-WASTE WATER
EFF-WASTE WATER

I certify that the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the laboratory manager or his designee, as verified by the following signature.

Signature : _____

Date: 12/19/2024

NYDOH CERTIFICATION NO - 11376

NJDEP CERTIFICATION NO - 20012

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

APPENDIX A

QA REVIEW GENERAL DOCUMENTATION

Project #: P5192

Completed

For thorough review, the report must have the following:

GENERAL:

Are all original paperwork present (chain of custody, record of communication,airbill, sample management lab chronicle, login page)

✓

Check chain-of-custody for proper relinquish/return of samples

✓

Is the chain of custody signed and complete

✓

Check internal chain-of-custody for proper relinquish/return of samples /sample extracts

✓

Collect information for each project id from server. Were all requirements followed

✓

COVER PAGE:

Do numbers of samples correspond to the number of samples in the Chain of Custody on login page

✓

Do lab numbers and client Ids on cover page agree with the Chain of Custody

✓

CHAIN OF CUSTODY:

Do requested analyses on Chain of Custody agree with form I results

✓

Do requested analyses on Chain of Custody agree with the log-in page

✓

Were the correct method log-in for analysis according to the Analytical Request and Chain of Custody

✓

Were the samples received within hold time

✓

Were any problems found with the samples at arrival recorded in the Sample Management Laboratory Chronicle

✓

ANALYTICAL:

Was method requirement followed?

✓

Was client requirement followed?

✓

Does the case narrative summarize all QC failure?

✓

All runlogs and manual integration are reviewed for requirements

✓

All manual calculations and /or hand notations verified

✓

QA Review Signature: MAYUR DESAI

Date: 12/19/2024

LAB CHRONICLE

OrderID:	P5192	OrderDate:	12/6/2024 2:34:00 PM
Client:	Ardmore Chemical	Project:	PVSC Monthly 2024
Contact:	Michael Sharphouse	Location:	M11,VOA Ref. #3 Water

LabID	ClientID	Matrix	Test	Method	Sample Date	Prep Date	Anal Date	Received
P5192-02	EFF-WASTE WATER	Water			12/06/24			12/06/24
			Mercury	245.1		12/10/24	12/10/24	
			Metals ICP-Group	200.7		12/19/24	12/20/24	



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Hit Summary Sheet
SW-846

SDG No.: P5192

Order ID: P5192

Client: Ardmore Chemical

Project ID: PVSC Monthly 2024

Sample ID	Client ID	Matrix	Parameter	Concentration	C	MDL	RDL	Units
Client ID : EFF-WASTE WATER								
P5192-02	EFF-WASTE WATER	Water	Copper	56.2		1.52	10.0	ug/L
P5192-02	EFF-WASTE WATER	Water	Lead	1.78	J	1.57	6.00	ug/L
P5192-02	EFF-WASTE WATER	Water	Nickel	1.76	J	1.28	20.0	ug/L
P5192-02	EFF-WASTE WATER	Water	Zinc	107		1.44	20.0	ug/L



SAMPLE DATA

Report of Analysis

Client:	Ardmore Chemical	Date Collected:	12/06/24
Project:	PVSC Monthly 2024	Date Received:	12/06/24
Client Sample ID:	EFF-WASTE WATER	SDG No.:	P5192
Lab Sample ID:	P5192-02	Matrix:	Water
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.	Prep Met.
7440-43-9	Cadmium	0.21	U	1	0.21	3.00	ug/L	12/19/24 09:30	12/20/24 17:21	EPA 200.7	
7440-50-8	Copper	56.2		1	1.52	10.0	ug/L	12/19/24 09:30	12/20/24 17:21	EPA 200.7	
7439-92-1	Lead	1.78	J	1	1.57	6.00	ug/L	12/19/24 09:30	12/20/24 17:21	EPA 200.7	
7439-97-6	Mercury	0.022	U	1	0.022	0.20	ug/L	12/10/24 09:00	12/10/24 11:21	E245.1	
7440-02-0	Nickel	1.76	J	1	1.28	20.0	ug/L	12/19/24 09:30	12/20/24 17:21	EPA 200.7	
7440-66-6	Zinc	107		1	1.44	20.0	ug/L	12/19/24 09:30	12/20/24 17:21	EPA 200.7	

Color Before:	Colorless	Clarity Before:	Clear	Texture:
Color After:	Colorless	Clarity After:	Clear	Artifacts:
Comments:	Metals Group2			

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



METAL CALIBRATION DATA

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Ardmore Chemical **SDG No.:** P5192
Contract: ARDM01 **Lab Code:** CHEM **Case No.:** P5192 **SAS No.:** P5192
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
ICV14	Mercury	4.03	4.0	101	95 - 105	CV	12/10/2024	10:09	LB133852

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Ardmore Chemical **SDG No.:** P5192
Contract: ARDM01 **Lab Code:** CHEM **Case No.:** P5192 **SAS No.:** P5192
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
CCV10	Mercury	5.46	5.0	109	90 - 110	CV	12/10/2024	10:29	LB133852
CCV11	Mercury	4.69	5.0	94	90 - 110	CV	12/10/2024	11:26	LB133852
CCV12	Mercury	5.35	5.0	107	90 - 110	CV	12/10/2024	11:44	LB133852

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Ardmore Chemical **SDG No.:** P5192
Contract: ARDM01 **Lab Code:** CHEM **Case No.:** P5192 **SAS No.:** P5192
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	Cadmium	502	510	98	95 - 105	P	12/20/2024	16:07	LB134054
	Copper	522	510	102	95 - 105	P	12/20/2024	16:07	LB134054
	Lead	1000	1000	100	95 - 105	P	12/20/2024	16:07	LB134054
	Nickel	510	530	96	95 - 105	P	12/20/2024	16:07	LB134054
	Zinc	1010	1000	101	95 - 105	P	12/20/2024	16:07	LB134054

Metals

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Ardmore Chemical **SDG No.:** P5192
Contract: ARDM01 **Lab Code:** CHEM **Case No.:** P5192 **SAS No.:** P5192
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	Cadmium	5.80	6.0	97	80 - 120	P	12/20/2024	16:11	LB134054
	Copper	21.8	20.0	109	80 - 120	P	12/20/2024	16:11	LB134054
	Lead	12.1	12.0	101	80 - 120	P	12/20/2024	16:11	LB134054
	Nickel	38.9	40.0	97	80 - 120	P	12/20/2024	16:11	LB134054
	Zinc	38.9	40.0	97	80 - 120	P	12/20/2024	16:11	LB134054

Metals

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Ardmore Chemical **SDG No.:** P5192
Contract: ARDM01 **Lab Code:** CHEM **Case No.:** P5192 **SAS No.:** P5192
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	Cadmium	2420	2500	97	90 - 110	P	12/20/2024	16:47	LB134054
	Copper	1220	1250	97	90 - 110	P	12/20/2024	16:47	LB134054
	Lead	4830	5000	96	90 - 110	P	12/20/2024	16:47	LB134054
	Nickel	2410	2500	96	90 - 110	P	12/20/2024	16:47	LB134054
	Zinc	2440	2500	98	90 - 110	P	12/20/2024	16:47	LB134054
CCV02	Cadmium	2490	2500	100	90 - 110	P	12/20/2024	17:29	LB134054
	Copper	1260	1250	101	90 - 110	P	12/20/2024	17:29	LB134054
	Lead	4970	5000	99	90 - 110	P	12/20/2024	17:29	LB134054
	Nickel	2480	2500	99	90 - 110	P	12/20/2024	17:29	LB134054
	Zinc	2500	2500	100	90 - 110	P	12/20/2024	17:29	LB134054
CCV03	Cadmium	2480	2500	99	90 - 110	P	12/20/2024	18:12	LB134054
	Copper	1250	1250	100	90 - 110	P	12/20/2024	18:12	LB134054
	Lead	4950	5000	99	90 - 110	P	12/20/2024	18:12	LB134054
	Nickel	2480	2500	99	90 - 110	P	12/20/2024	18:12	LB134054
	Zinc	2500	2500	100	90 - 110	P	12/20/2024	18:12	LB134054
CCV04	Cadmium	2440	2500	98	90 - 110	P	12/20/2024	19:02	LB134054
	Copper	1240	1250	99	90 - 110	P	12/20/2024	19:02	LB134054
	Lead	4890	5000	98	90 - 110	P	12/20/2024	19:02	LB134054
	Nickel	2440	2500	98	90 - 110	P	12/20/2024	19:02	LB134054
	Zinc	2470	2500	99	90 - 110	P	12/20/2024	19:02	LB134054
CCV05	Cadmium	2510	2500	100	90 - 110	P	12/20/2024	19:57	LB134054
	Copper	1270	1250	102	90 - 110	P	12/20/2024	19:57	LB134054
	Lead	5020	5000	100	90 - 110	P	12/20/2024	19:57	LB134054
	Nickel	2510	2500	100	90 - 110	P	12/20/2024	19:57	LB134054
	Zinc	2520	2500	101	90 - 110	P	12/20/2024	19:57	LB134054
CCV06	Cadmium	2410	2500	96	90 - 110	P	12/20/2024	20:47	LB134054
	Copper	1220	1250	98	90 - 110	P	12/20/2024	20:47	LB134054
	Lead	4800	5000	96	90 - 110	P	12/20/2024	20:47	LB134054
	Nickel	2400	2500	96	90 - 110	P	12/20/2024	20:47	LB134054
	Zinc	2420	2500	97	90 - 110	P	12/20/2024	20:47	LB134054
CCV07	Cadmium	2430	2500	97	90 - 110	P	12/20/2024	21:37	LB134054
	Copper	1230	1250	99	90 - 110	P	12/20/2024	21:37	LB134054
	Lead	4860	5000	97	90 - 110	P	12/20/2024	21:37	LB134054
	Nickel	2430	2500	97	90 - 110	P	12/20/2024	21:37	LB134054

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Ardmore Chemical **SDG No.:** P5192
Contract: ARDM01 **Lab Code:** CHEM **Case No.:** P5192 **SAS No.:** P5192
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
CCV07	Zinc	2460	2500	98	90 - 110	P	12/20/2024	21:37	LB134054
CCV08	Cadmium	2480	2500	99	90 - 110	P	12/20/2024	23:01	LB134054
	Copper	1260	1250	101	90 - 110	P	12/20/2024	23:01	LB134054
	Lead	4960	5000	99	90 - 110	P	12/20/2024	23:01	LB134054
	Nickel	2480	2500	99	90 - 110	P	12/20/2024	23:01	LB134054
	Zinc	2480	2500	99	90 - 110	P	12/20/2024	23:01	LB134054
CCV09	Cadmium	2450	2500	98	90 - 110	P	12/20/2024	23:55	LB134054
	Copper	1250	1250	100	90 - 110	P	12/20/2024	23:55	LB134054
	Lead	4900	5000	98	90 - 110	P	12/20/2024	23:55	LB134054
	Nickel	2450	2500	98	90 - 110	P	12/20/2024	23:55	LB134054
	Zinc	2460	2500	98	90 - 110	P	12/20/2024	23:55	LB134054



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Metals

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CRDL STANDARD FOR AA & ICP

Client: Ardmore Chemical **SDG No.:** P5192
Contract: ARDM01 **Lab Code:** CHEM **Case No.:** P5192 **SAS No.:** P5192
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
CRA	Mercury	0.038	0.05	76	40 - 160	CV	12/10/2024	10:39	LB133852
CRI01	Cadmium	5.88	6.0	98	40 - 160	P	12/20/2024	16:26	LB134054
	Copper	21.8	20.0	109	40 - 160	P	12/20/2024	16:26	LB134054
	Lead	11.1	12.0	93	40 - 160	P	12/20/2024	16:26	LB134054
	Nickel	39.0	40.0	98	40 - 160	P	12/20/2024	16:26	LB134054
	Zinc	38.8	40.0	97	40 - 160	P	12/20/2024	16:26	LB134054



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Metals

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client:	Ardmore Chemical				SDG No.:	P5192			
Contract:	ARDM01	Lab Code:	CHEM		Case No.:	P5192	SAS No.:	P5192	
Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
ICB14	Mercury	0.20	+/-0.20	U	0.20	CV	12/10/2024	10:17	LB133852

Metals

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Ardmore Chemical

SDG No.: P5192

Contract: ARDM01

Lab Code: CHEM

Case No.: P5192

SAS No.: P5192

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
CCB10	Mercury	0.20	+/-0.20	U	0.20	CV	12/10/2024	10:34	LB133852
CCB11	Mercury	0.20	+/-0.20	U	0.20	CV	12/10/2024	11:31	LB133852
CCB12	Mercury	0.20	+/-0.20	U	0.20	CV	12/10/2024	11:49	LB133852

Metals

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Ardmore Chemical

SDG No.: P5192

Contract: ARDM01

Lab Code: CHEM

Case No.: P5192

SAS No.: P5192

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
ICB01	Cadmium	6.00	+/-6.00	U	6.00	P	12/20/2024	16:21	LB134054
	Copper	20.0	+/-20.0	U	20.0	P	12/20/2024	16:21	LB134054
	Lead	12.0	+/-12.0	U	12.0	P	12/20/2024	16:21	LB134054
	Nickel	40.0	+/-40.0	U	40.0	P	12/20/2024	16:21	LB134054
	Zinc	40.0	+/-40.0	U	40.0	P	12/20/2024	16:21	LB134054

Metals

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: <u>Ardmore Chemical</u>		SDG No.: <u>P5192</u>							
Contract: <u>ARDM01</u>	Lab Code: <u>CHEM</u>	Case No.: <u>P5192</u>	SAS No.: <u>P5192</u>						
Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
CCB01	Cadmium	6.00	+/-6.00	U	6.00	P	12/20/2024	16:51	LB134054
	Copper	20.0	+/-20.0	U	20.0	P	12/20/2024	16:51	LB134054
	Lead	12.0	+/-12.0	U	12.0	P	12/20/2024	16:51	LB134054
	Nickel	40.0	+/-40.0	U	40.0	P	12/20/2024	16:51	LB134054
	Zinc	40.0	+/-40.0	U	40.0	P	12/20/2024	16:51	LB134054
CCB02	Cadmium	6.00	+/-6.00	U	6.00	P	12/20/2024	17:34	LB134054
	Copper	20.0	+/-20.0	U	20.0	P	12/20/2024	17:34	LB134054
	Lead	12.0	+/-12.0	U	12.0	P	12/20/2024	17:34	LB134054
	Nickel	40.0	+/-40.0	U	40.0	P	12/20/2024	17:34	LB134054
	Zinc	40.0	+/-40.0	U	40.0	P	12/20/2024	17:34	LB134054
CCB03	Cadmium	6.00	+/-6.00	U	6.00	P	12/20/2024	18:16	LB134054
	Copper	20.0	+/-20.0	U	20.0	P	12/20/2024	18:16	LB134054
	Lead	12.0	+/-12.0	U	12.0	P	12/20/2024	18:16	LB134054
	Nickel	40.0	+/-40.0	U	40.0	P	12/20/2024	18:16	LB134054
	Zinc	40.0	+/-40.0	U	40.0	P	12/20/2024	18:16	LB134054
CCB04	Cadmium	6.00	+/-6.00	U	6.00	P	12/20/2024	19:11	LB134054
	Copper	20.0	+/-20.0	U	20.0	P	12/20/2024	19:11	LB134054
	Lead	12.0	+/-12.0	U	12.0	P	12/20/2024	19:11	LB134054
	Nickel	40.0	+/-40.0	U	40.0	P	12/20/2024	19:11	LB134054
	Zinc	40.0	+/-40.0	U	40.0	P	12/20/2024	19:11	LB134054
CCB05	Cadmium	6.00	+/-6.00	U	6.00	P	12/20/2024	20:01	LB134054
	Copper	20.0	+/-20.0	U	20.0	P	12/20/2024	20:01	LB134054
	Lead	12.0	+/-12.0	U	12.0	P	12/20/2024	20:01	LB134054
	Nickel	40.0	+/-40.0	U	40.0	P	12/20/2024	20:01	LB134054
	Zinc	40.0	+/-40.0	U	40.0	P	12/20/2024	20:01	LB134054
CCB06	Cadmium	6.00	+/-6.00	U	6.00	P	12/20/2024	20:51	LB134054
	Copper	20.0	+/-20.0	U	20.0	P	12/20/2024	20:51	LB134054
	Lead	12.0	+/-12.0	U	12.0	P	12/20/2024	20:51	LB134054
	Nickel	40.0	+/-40.0	U	40.0	P	12/20/2024	20:51	LB134054
	Zinc	40.0	+/-40.0	U	40.0	P	12/20/2024	20:51	LB134054
CCB07	Cadmium	6.00	+/-6.00	U	6.00	P	12/20/2024	22:04	LB134054
	Copper	20.0	+/-20.0	U	20.0	P	12/20/2024	22:04	LB134054
	Lead	12.0	+/-12.0	U	12.0	P	12/20/2024	22:04	LB134054
	Nickel	40.0	+/-40.0	U	40.0	P	12/20/2024	22:04	LB134054
	Zinc	40.0	+/-40.0	U	40.0	P	12/20/2024	22:04	LB134054
CCB08	Cadmium	6.00	+/-6.00	U	6.00	P	12/20/2024	23:12	LB134054
	Copper	20.0	+/-20.0	U	20.0	P	12/20/2024	23:12	LB134054
	Lead	12.0	+/-12.0	U	12.0	P	12/20/2024	23:12	LB134054
	Nickel	40.0	+/-40.0	U	40.0	P	12/20/2024	23:12	LB134054

Metals

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: <u>Ardmore Chemical</u>		SDG No.: <u>P5192</u>							
Contract: <u>ARDM01</u>	Lab Code: <u>CHEM</u>	Case No.: <u>P5192</u>	SAS No.: <u>P5192</u>						
Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
CCB08	Zinc	40.0	+/-40.0	U	40.0	P	12/20/2024	23:12	LB134054
CCB09	Cadmium	6.00	+/-6.00	U	6.00	P	12/21/2024	00:05	LB134054
	Copper	20.0	+/-20.0	U	20.0	P	12/21/2024	00:05	LB134054
	Lead	12.0	+/-12.0	U	12.0	P	12/21/2024	00:05	LB134054
	Nickel	40.0	+/-40.0	U	40.0	P	12/21/2024	00:05	LB134054
	Zinc	40.0	+/-40.0	U	40.0	P	12/21/2024	00:05	LB134054

Metals
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PREPARATION BLANK SUMMARY

Client: Ardmore Chemical

SDG No.: P5192

Instrument: CV1

Sample ID	Analyte	Result (ug/L)	Acceptance Limit	Conc Qual	CRQL ug/L	M	Analysis Date	Analysis Time	Run
PB165519BL		WATER		Batch Number:	PB165519		Prep Date:	12/10/2024	
	Mercury	0.20	<0.20	U	0.20	CV	12/10/2024	10:53	LB133852

Metals
- 3b -
PREPARATION BLANK SUMMARY

Client: Ardmore Chemical

SDG No.: P5192

Instrument: P4

Sample ID	Analyte	Result (ug/L)	Acceptance Limit	Conc Qual	CRQL ug/L	M	Analysis Date	Analysis Time	Run
PB165738BL	WATER			Batch Number:	PB165738		Prep Date:	12/19/2024	
	Cadmium	3.00	<3.00	U	3.00	P	12/20/2024	17:38	LB134054
	Copper	10.0	<10.0	U	10.0	P	12/20/2024	17:38	LB134054
	Lead	6.00	<6.00	U	6.00	P	12/20/2024	17:38	LB134054
	Nickel	20.0	<20.0	U	20.0	P	12/20/2024	17:38	LB134054
	Zinc	20.0	<20.0	U	20.0	P	12/20/2024	17:38	LB134054

Metals
- 4 -
INTERFERENCE CHECK SAMPLE

Client: Ardmore Chemical **SDG No.:** P5192
Contract: ARDM01 **Lab Code:** CHEM **Case No.:** P5192 **SAS No.:** P5192
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	Cadmium	-0.99	1.0	99	-5	7	12/20/2024	16:30	LB134054
	Copper	16.4	2.0	820	-18	22	12/20/2024	16:30	LB134054
	Lead	6.97			-12	12	12/20/2024	16:30	LB134054
	Nickel	2.13	2.0	106	-38	42	12/20/2024	16:30	LB134054
	Zinc	0.10			-40	40	12/20/2024	16:30	LB134054
ICSAB01	Cadmium	1040	972	107	826	1120	12/20/2024	16:34	LB134054
	Copper	520	511	102	434	588	12/20/2024	16:34	LB134054
	Lead	56.2	49.0	115	37	61	12/20/2024	16:34	LB134054
	Nickel	1040	954	109	810	1100	12/20/2024	16:34	LB134054
	Zinc	1080	952	113	809	1095	12/20/2024	16:34	LB134054
ICSA	Cadmium	-2.22	1.0	222	-5	7	12/20/2024	16:38	LB134054
	Copper	18.5	2.0	925	-18	22	12/20/2024	16:38	LB134054
	Lead	-1.48			-12	12	12/20/2024	16:38	LB134054
	Nickel	-0.44	2.0	22	-38	42	12/20/2024	16:38	LB134054
	Zinc	-51.8			-40	40	12/20/2024	16:38	LB134054
ICSAB	Cadmium	1050	972	108	826	1120	12/20/2024	16:43	LB134054
	Copper	561	511	110	434	588	12/20/2024	16:43	LB134054
	Lead	59.9	49.0	122	37	61	12/20/2024	16:43	LB134054
	Nickel	1060	954	111	810	1100	12/20/2024	16:43	LB134054
	Zinc	1040	952	109	809	1095	12/20/2024	16:43	LB134054



METAL

QC

DATA

metals
- 5a -
MATRIX SPIKE SUMMARY

client: Ardmore Chemical **level:** low **sdg no.:** P5192
contract: ARDM01 **lab code:** CHEM **case no.:** P5192 **sas no.:** P5192
matrix: Water **sample id:** P5192-02 **client id:** EFF-WASTE WATERMS
Percent Solids for Sample: NA **Spiked ID:** P5192-02MS **Percent Solids for Spike Sample:** NA

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Mercury	ug/L	-	3.62		0.20	U	4.0	90		CV

metals
- 5a -
MATRIX SPIKE DUPLICATE SUMMARY

client: Ardmore Chemical **level:** low **sdg no.:** P5192
contract: ARDM01 **lab code:** CHEM **case no.:** P5192 **sas no.:** P5192
matrix: Water **sample id:** P5192-02 **client id:** EFF-WASTE WATERMSD
Percent Solids for Sample: NA **Spiked ID:** P5192-02MSD **Percent Solids for Spike Sample:** NA

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Mercury	ug/L	-	3.93		0.20	U	4.0	98		CV

metals
- 5a -
MATRIX SPIKE SUMMARY

client: Ardmore Chemical **level:** low **sdg no.:** P5192
contract: ARDM01 **lab code:** CHEM **case no.:** P5192 **sas no.:** P5192
matrix: Water **sample id:** P5327-01 **client id:** 12175-12176-12177-12178MS
Percent Solids for Sample: NA **Spiked ID:** P5327-01MS **Percent Solids for Spike Sample:** NA

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Cadmium	ug/L	75 - 125	99.3		3.00	U	100	99		P
Copper	ug/L	75 - 125	544		370		150	116		P
Lead	ug/L	75 - 125	520		19.9		500	100		P
Nickel	ug/L	75 - 125	265		11.2	J	250	101		P
Zinc	ug/L	75 - 125	259		147		100	112		P

metals
- 5a -
MATRIX SPIKE DUPLICATE SUMMARY

client: <u>Ardmore Chemical</u>	level: <u>low</u>	sdg no.: <u>P5192</u>
contract: <u>ARDM01</u>	lab code: <u>CHEM</u>	case no.: <u>P5192</u> sas no.: <u>P5192</u>
matrix: <u>Water</u>	sample id: <u>P5327-01</u>	client id: <u>12175-12176-12177-12178MSD</u>
Percent Solids for Sample: <u>NA</u>	Spiked ID: <u>P5327-01MSD</u>	Percent Solids for Spike Sample: <u>NA</u>

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Cadmium	ug/L	75 - 125	99.1		3.00	U	100	99		P
Copper	ug/L	75 - 125	542		370		150	115		P
Lead	ug/L	75 - 125	519		19.9		500	100		P
Nickel	ug/L	75 - 125	264		11.2	J	250	101		P
Zinc	ug/L	75 - 125	259		147		100	112		P

Metals

- 5b -

Client: Ardmore Chemical **SDG No.:** P5192
Contract: ARDM01 **Lab Code:** CHEM **Case No.:** P5192 **SAS No.:** P5192
Matrix: **Level:** LOW **Client ID:**
Sample ID: **Spiked ID:**

Analyte	Units	Acceptance Limit %R	C	Sample Result	C	Spike Added	% Recovery	Qual	M
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Metals

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DUPLICATE SAMPLE SUMMARY

Client: Ardmore Chemical **Level:** LOW **SDG No.:** P5192
Contract: ARDM01 **Lab Code:** CHEM **Case No.:** P5192 **SAS No.:** P5192
Matrix: Water **Sample ID:** P5192-02 **Client ID:** EFF-WASTE WATERDUP
Percent Solids for Sample: NA **Duplicate ID** P5192-02DUP **Percent Solids for Spike Sample:** NA

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Mercury	ug/L	20	0.20	U	0.20	U			CV

Metals

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DUPLICATE SAMPLE SUMMARY

Client: Ardmore Chemical **Level:** LOW **SDG No.:** P5192
Contract: ARDM01 **Lab Code:** CHEM **Case No.:** P5192 **SAS No.:** P5192
Matrix: Water **Sample ID:** P5192-02MS **Client ID:** EFF-WASTE WATERMSD
Percent Solids for Sample: NA **Duplicate ID** P5192-02MSD **Percent Solids for Spike Sample:** NA

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Mercury	ug/L	20	3.62		3.93		8		CV

Metals

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DUPLICATE SAMPLE SUMMARY

Client: Ardmore Chemical **Level:** LOW **SDG No.:** P5192
Contract: ARDM01 **Lab Code:** CHEM **Case No.:** P5192 **SAS No.:** P5192
Matrix: Water **Sample ID:** P5327-01 **Client ID:** 12175-12176-12177-12178DUP
Percent Solids for Sample: NA **Duplicate ID** P5327-01DUP **Percent Solids for Spike Sample:** NA

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Cadmium	ug/L	20	3.00	U	3.00	U			P
Copper	ug/L	20	370		374		1		P
Lead	ug/L	20	19.9		19.8		1		P
Nickel	ug/L	20	11.2	J	11.5	J	3		P
Zinc	ug/L	20	147		148		1		P

Metals

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DUPLICATE SAMPLE SUMMARY

Client: Ardmore Chemical **Level:** LOW **SDG No.:** P5192
Contract: ARDM01 **Lab Code:** CHEM **Case No.:** P5192 **SAS No.:** P5192
Matrix: Water **Sample ID:** P5327-01MS **Client ID:** 12175-12176-12177-12178MSD
Percent Solids for Sample: NA **Duplicate ID** P5327-01MSD **Percent Solids for Spike Sample:** NA

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Cadmium	ug/L	20	99.3		99.1		0		P
Copper	ug/L	20	544		542		0		P
Lead	ug/L	20	520		519		0		P
Nickel	ug/L	20	265		264		0		P
Zinc	ug/L	20	259		259		0		P

Metals

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LABORATORY CONTROL SAMPLE SUMMARY

Client: Ardmore Chemical

SDG No.: P5192

Contract: ARDM01

Lab Code: CHEM

Case No.: P5192

SAS No.: P5192

Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
PB165519BS Mercury	ug/L	4.0	3.96		99	-	CV

Metals

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LABORATORY CONTROL SAMPLE SUMMARY

Client: Ardmore Chemical

SDG No.: P5192

Contract: ARDM01

Lab Code: CHEM

Case No.: P5192

SAS No.: P5192

Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
PB165738BS							
Cadmium	ug/L	100	97.1		97	85 - 115	P
Copper	ug/L	150	154		103	85 - 115	P
Lead	ug/L	500	487		97	85 - 115	P
Nickel	ug/L	250	247		99	85 - 115	P
Zinc	ug/L	100	99.9		100	85 - 115	P

Metals

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ICP SERIAL DILUTIONS

SAMPLE NO.

EFF-WASTE WATERL

Lab Name: Chemtech Consulting Group

Contract: ARDM01

Lab Code: CHEM

Lb No.: lb133852

Lab Sample ID : P5192-02L

SDG No.: P5192

Matrix (soil/water): Water

Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I) C	Serial Dilution Result (S) C	% Differ- ence	Q	M
Mercury	0.20 U	1.00 U			CV

Metals
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ICP SERIAL DILUTIONS

SAMPLE NO.

12175-12176-12177-12178L

Lab Name: Chemtech Consulting Group

Contract: ARDM01

Lab Code: CHEM **Lb No.:** lb134054 **Lab Sample ID :** P5327-01L **SDG No.:** P5192

Matrix (soil/water): Water **Level (low/med):** LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)			Serial Dilution Result (S)			% Differ- ence	Q	M
			C			C			
Cadmium		3.00	U		15.0	U			P
Copper		370			385		4		P
Lead		19.9			19.1	J	4		P
Nickel		11.2	J		10.8	J	4		P
Zinc		147			141		4		P



METAL PREPARATION & INSTRUMENT DATA

Metals

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ICP INTERELEMENT CORRECTION FACTORS

Client: Ardmore Chemical

SDG No.: P5192

Contract: ARDM01

Lab Code: CHEM

Case No.: P5192

SAS No.: P5192

Instrument ID: _____

Date: _____

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave- Length (nm)	ICP Interelement Correction Factors For:				
		Al	Ca	Fe	Mg	Ag
Cadmium	226.502	0.0000000	0.0000000	0.0000930	0.0000000	0.0000000
Copper	224.700	0.0000000	0.0000000	0.0007850	0.0000000	0.0000000
Lead	220.353	-0.0000920	0.0000000	0.0000380	0.0000000	0.0000000
Nickel	231.604	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: Ardmore Chemical

SDG No.: P5192

Contract: ARDM01

Lab Code: CHEM

Case No.: P5192

SAS No.: P5192

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
Cadmium	226.502	0.0000000	0.0000000	0.0000000	0.0000000	0.0002870
Copper	224.700	0.0000000	0.0000000	0.0000000	0.0000000	0.0009530
Lead	220.353	0.0000000	0.0003170	0.0000000	0.0000000	0.0000000
Nickel	231.604	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 INTERELEMENT CORRECTION FACTORS

Client: Ardmore Chemical

SDG No.: P5192

Contract: ARDM01

Lab Code: CHEM

Case No.: P5192

SAS No.: P5192

Instrument ID: _____

Date: _____

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave- Length (nm)	ICP Interelement Correction Factors For:				
		Cr	Cu	K	Mn	Mo
Cadmium	226.502	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	224.700	0.0000000	0.0000000	0.0000000	0.0006510	0.0020500
Lead	220.353	0.0000000	0.0000000	0.0000000	0.0001400	-0.0008600
Nickel	231.604	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	213.800	0.0000000	0.0009010	0.0000000	0.0000000	0.0000000

Metals

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ICP INTERELEMENT CORRECTION FACTORS

Client: Ardmore Chemical

SDG No.: P5192

Contract: ARDM01

Lab Code: CHEM

Case No.: P5192

SAS No.: P5192

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
Cadmium	226.502	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	224.700	0.0000000	-0.0047000	0.0036100	0.0000000	0.0000000
Lead	220.353	0.0000000	0.0006580	0.0000000	0.0000000	0.0001290
Nickel	231.604	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: Ardmore Chemical

SDG No.: P5192

Contract: ARDM01

Lab Code: CHEM

Case No.: P5192

SAS No.: P5192

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
Cadmium	226.502	0.0000000	0.0000630	0.0001280	0.0000000	0.0000000
Copper	224.700	0.0000000	0.0003840	0.0000000	0.0000000	0.0000000
Lead	220.353	0.0000000	-0.0003610	0.0000000	0.0000000	0.0000000
Nickel	231.604	0.0000000	0.0000000	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:	<u>Ardmore Chemical</u>	SDG No.:	<u>P5192</u>
Contract:	<u>ARDM01</u>	Lab Code:	<u>CHEM</u>
		Method:	<u></u>
		Case No.:	<u>P5192</u>
		SAS No.:	<u>P5192</u>

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(mL)	Final Sample Volume (mL)	Percent Solids
Batch Number: PB165519							
P5192-02	EFF-WASTE WATER	SAM	WATER	12/10/2024	30.0	30.0	
P5192-02DUP	EFF-WASTE WATERDUP	DUP	WATER	12/10/2024	30.0	30.0	
P5192-02MS	EFF-WASTE WATERMS	MS	WATER	12/10/2024	30.0	30.0	
P5192-02MSD	EFF-WASTE WATERMSD	MSD	WATER	12/10/2024	30.0	30.0	
PB165519BL	PB165519BL	MB	WATER	12/10/2024	30.0	30.0	
PB165519BS	PB165519BS	LCS	WATER	12/10/2024	30.0	30.0	

Metals

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SAMPLE PREPARATION SUMMARY

Client: Ardmore Chemical **SDG No.:** P5192
Contract: ARDM01 **Lab Code:** CHEM **Method:**
Case No.: P5192 **SAS No.:** P5192

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(mL)	Final Sample Volume (mL)	Percent Solids
Batch Number: PB165738							
P5192-02	EFF-WASTE WATER	SAM	WATER	12/19/2024	50.0	25.0	
P5327-01DUP	12175-12176-12177-12178DUP	DUP	WATER	12/19/2024	50.0	25.0	
P5327-01MS	12175-12176-12177-12178MS	MS	WATER	12/19/2024	50.0	25.0	
P5327-01MSD	12175-12176-12177-12178MSD	MSD	WATER	12/19/2024	50.0	25.0	
PB165738BL	PB165738BL	MB	WATER	12/19/2024	50.0	25.0	
PB165738BS	PB165738BS	LCS	WATER	12/19/2024	50.0	25.0	

metals
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ANALYSIS RUN LOG

Client: Ardmore Chemical **Contract:** ARDM01

Lab code: CHEM **Case no.:** P5192 **Sas no.:** P5192 **Sdg no.:** P5192

Instrument id number: **Method:** **Run number:** LB133852

Start date: 12/10/2024 **End date:** 12/10/2024

Lab sample id.	Client Sample Id	d/f	Time	Parameter list
S0	S0	1	0937	HG
S0.05	S0.05	1	0942	HG
S0.2	S0.2	1	0944	HG
S2.5	S2.5	1	0947	HG
S5	S5	1	0949	HG
S7.5	S7.5	1	0951	HG
S10	S10	1	0959	HG
ICV14	ICV14	1	1009	HG
ICB14	ICB14	1	1017	HG
CCV10	CCV10	1	1029	HG
CCB10	CCB10	1	1034	HG
CRA	CRA	1	1039	HG
PB165519BL	PB165519BL	1	1053	HG
PB165519BS	PB165519BS	1	1102	HG
P5192-02	EFF-WASTE WATER	1	1121	HG
CCV11	CCV11	1	1126	HG
CCB11	CCB11	1	1131	HG
P5192-02DUP	EFF-WASTE WATERDUP	1	1133	HG
P5192-02MS	EFF-WASTE WATERMS	1	1135	HG
P5192-02MSD	EFF-WASTE WATERMSD	1	1137	HG
P5192-02L	EFF-WASTE WATERL	5	1140	HG
CCV12	CCV12	1	1144	HG
CCB12	CCB12	1	1149	HG

metals
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ANALYSIS RUN LOG

Client: Ardmore Chemical

Contract: ARDM01

Lab code: CHEM **Case no.:** P5192 **Sas no.:** P5192

Sdg no.: P5192

Instrument id number: **Method:**

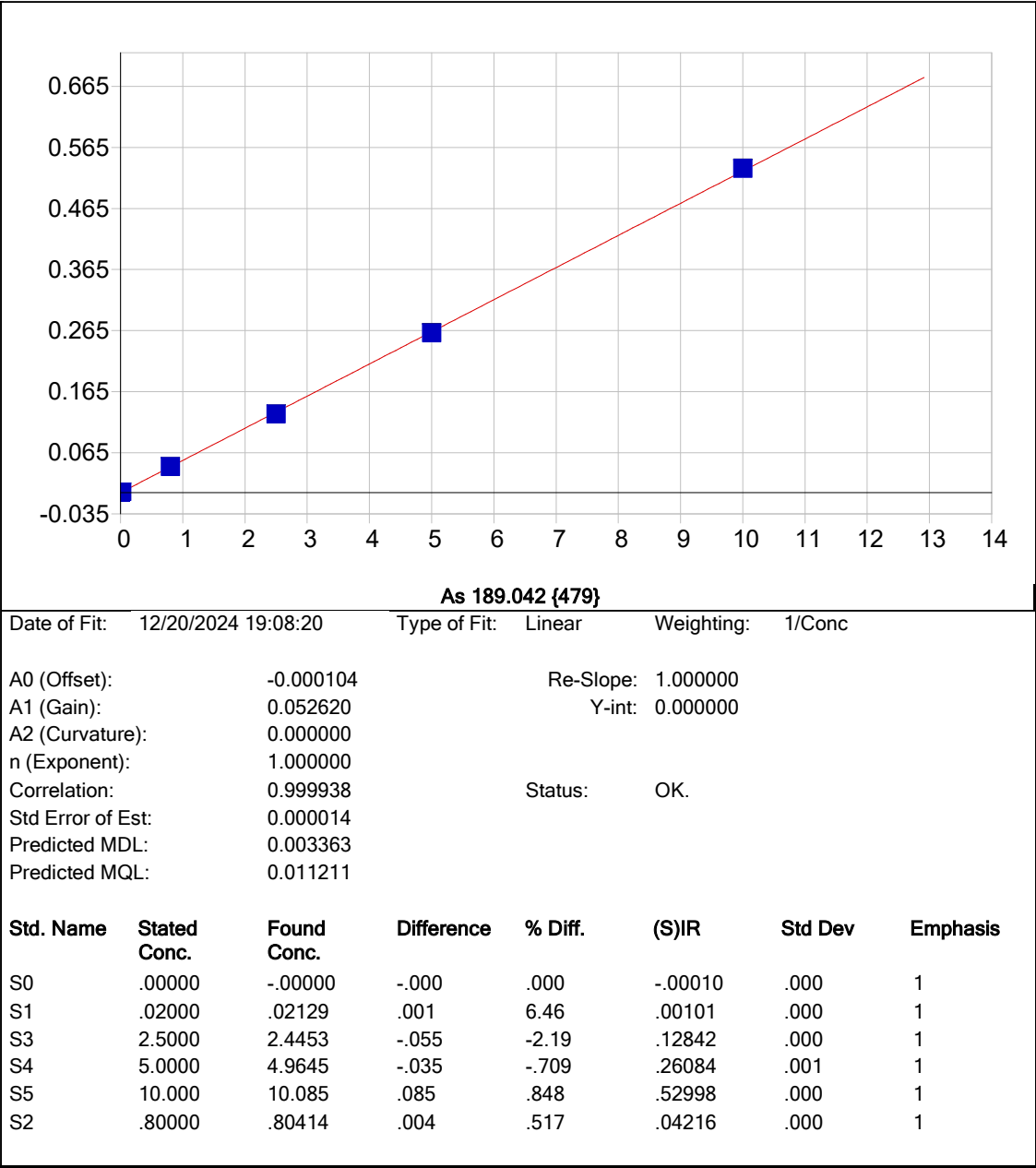
Run number: LB134054

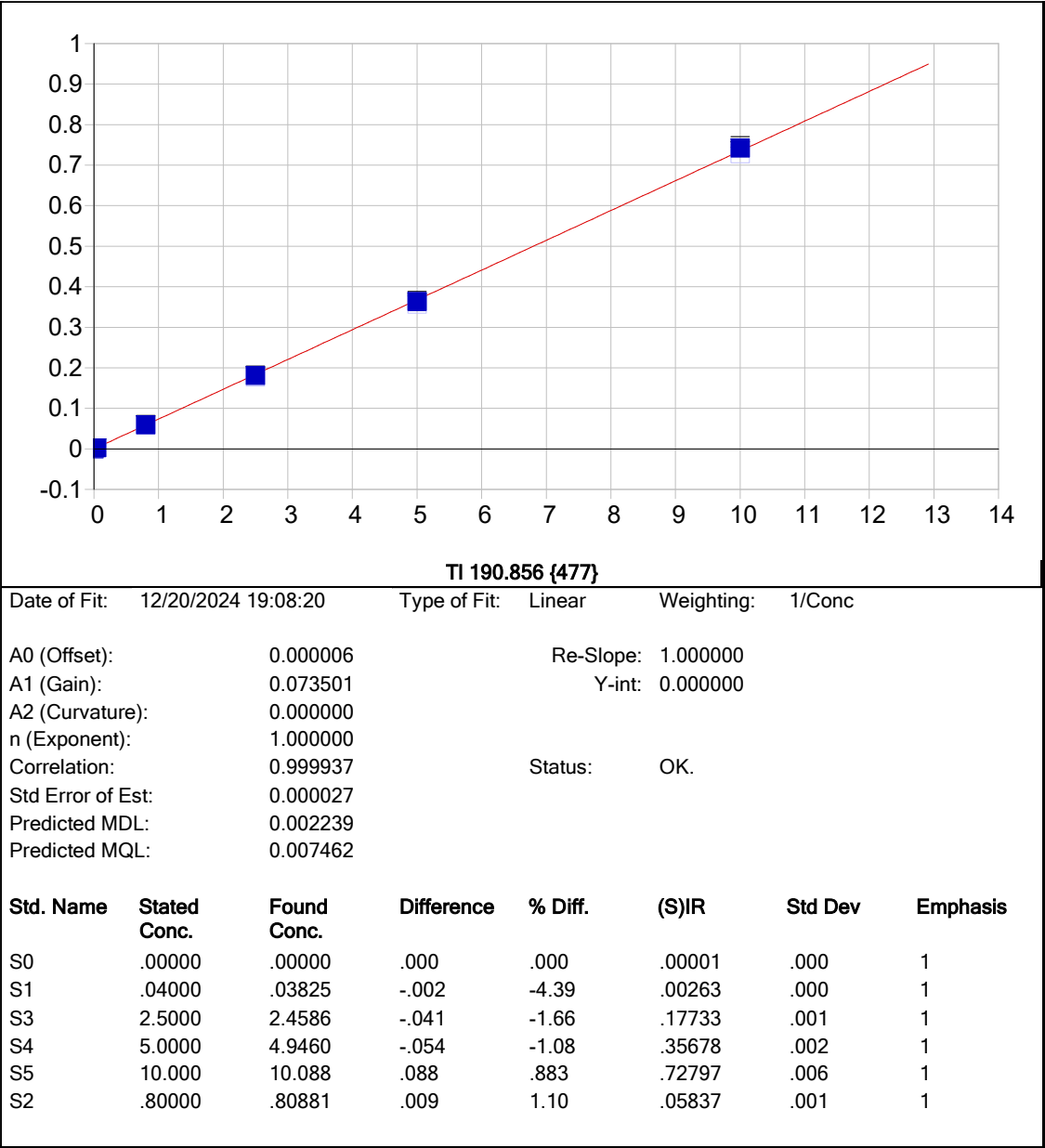
Start date: 12/20/2024 **End date:** 12/21/2024

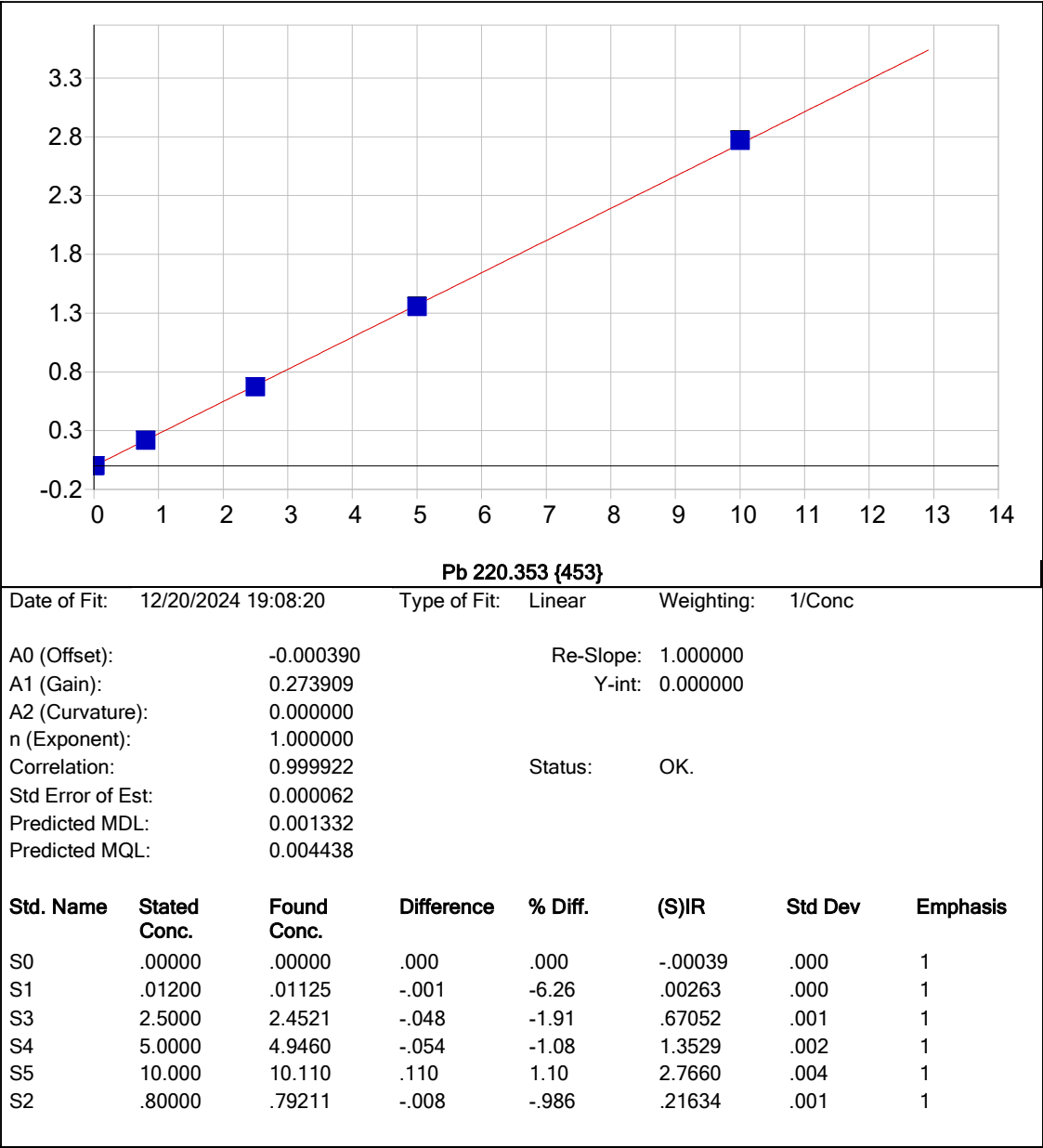
Lab sample id.	Client Sample Id	d/f	Time	Parameter list
S0	S0	1	1541	Cd,Cu,Ni,Pb,Zn
S1	S1	1	1546	Cd,Cu,Ni,Pb,Zn
S2	S2	1	1550	Cd,Cu,Ni,Pb,Zn
S3	S3	1	1554	Cd,Cu,Ni,Pb,Zn
S4	S4	1	1558	Cd,Cu,Ni,Pb,Zn
S5	S5	1	1603	Cd,Cu,Ni,Pb,Zn
ICV01	ICV01	1	1607	Cd,Cu,Ni,Pb,Zn
LLICV01	LLICV01	1	1611	Cd,Cu,Ni,Pb,Zn
ICB01	ICB01	1	1621	Cd,Cu,Ni,Pb,Zn
CRI01	CRI01	1	1626	Cd,Cu,Ni,Pb,Zn
ICSA01	ICSA01	1	1630	Cd,Cu,Ni,Pb,Zn
ICSAB01	ICSAB01	1	1634	Cd,Cu,Ni,Pb,Zn
ICSA	ICSA	20	1638	Cd,Cu,Ni,Pb,Zn
ICSAB	ICSAB	20	1643	Cd,Cu,Ni,Pb,Zn
CCV01	CCV01	1	1647	Cd,Cu,Ni,Pb,Zn
CCB01	CCB01	1	1651	Cd,Cu,Ni,Pb,Zn
P5192-02	EFF-WASTE WATER	1	1721	Cd,Cu,Ni,Pb,Zn
CCV02	CCV02	1	1729	Cd,Cu,Ni,Pb,Zn
CCB02	CCB02	1	1734	Cd,Cu,Ni,Pb,Zn
PB165738BL	PB165738BL	1	1738	Cd,Cu,Ni,Pb,Zn
PB165738BS	PB165738BS	1	1742	Cd,Cu,Ni,Pb,Zn
CCV03	CCV03	1	1812	Cd,Cu,Ni,Pb,Zn
CCB03	CCB03	1	1816	Cd,Cu,Ni,Pb,Zn
P5327-01DUP	12175-12176-12177-12178DUP	1	1842	Cd,Cu,Ni,Pb,Zn
P5327-01L	12175-12176-12177-12178L	5	1846	Cd,Cu,Ni,Pb,Zn
P5327-01MS	12175-12176-12177-12178MS	1	1850	Cd,Cu,Ni,Pb,Zn
P5327-01MSD	12175-12176-12177-12178MSD	1	1854	Cd,Cu,Ni,Pb,Zn
CCV04	CCV04	1	1902	Cd,Cu,Ni,Pb,Zn
CCB04	CCB04	1	1911	Cd,Cu,Ni,Pb,Zn
CCV05	CCV05	1	1957	Cd,Cu,Ni,Pb,Zn
CCB05	CCB05	1	2001	Cd,Cu,Ni,Pb,Zn
CCV06	CCV06	1	2047	Cd,Cu,Ni,Pb,Zn
CCB06	CCB06	1	2051	Cd,Cu,Ni,Pb,Zn
CCV07	CCV07	1	2137	Cd,Cu,Ni,Pb,Zn
CCB07	CCB07	1	2204	Cd,Cu,Ni,Pb,Zn
CCV08	CCV08	1	2301	Cd,Cu,Ni,Pb,Zn
CCB08	CCB08	1	2312	Cd,Cu,Ni,Pb,Zn
CCV09	CCV09	1	2355	Cd,Cu,Ni,Pb,Zn
CCB09	CCB09	1	0005	Cd,Cu,Ni,Pb,Zn

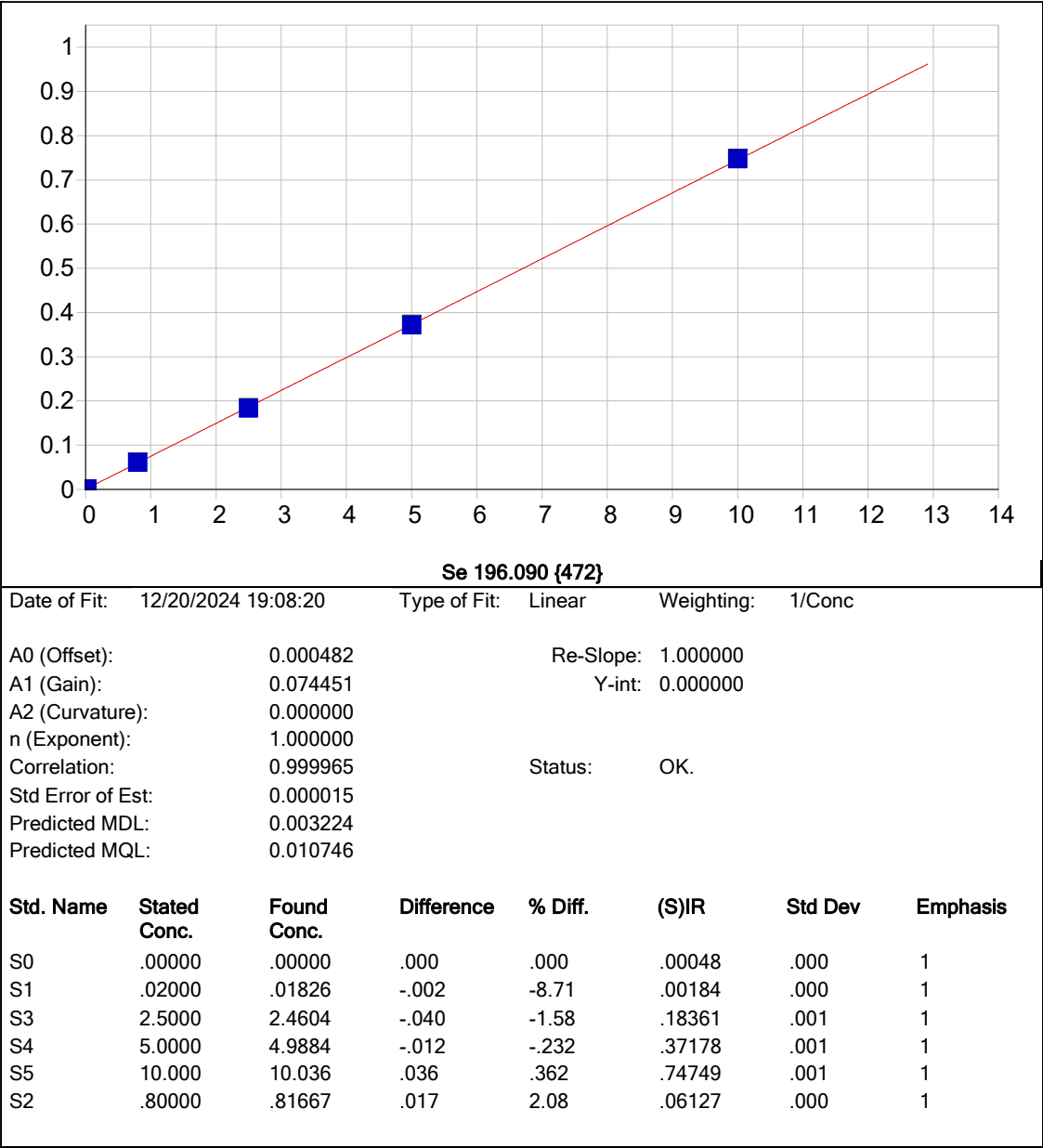


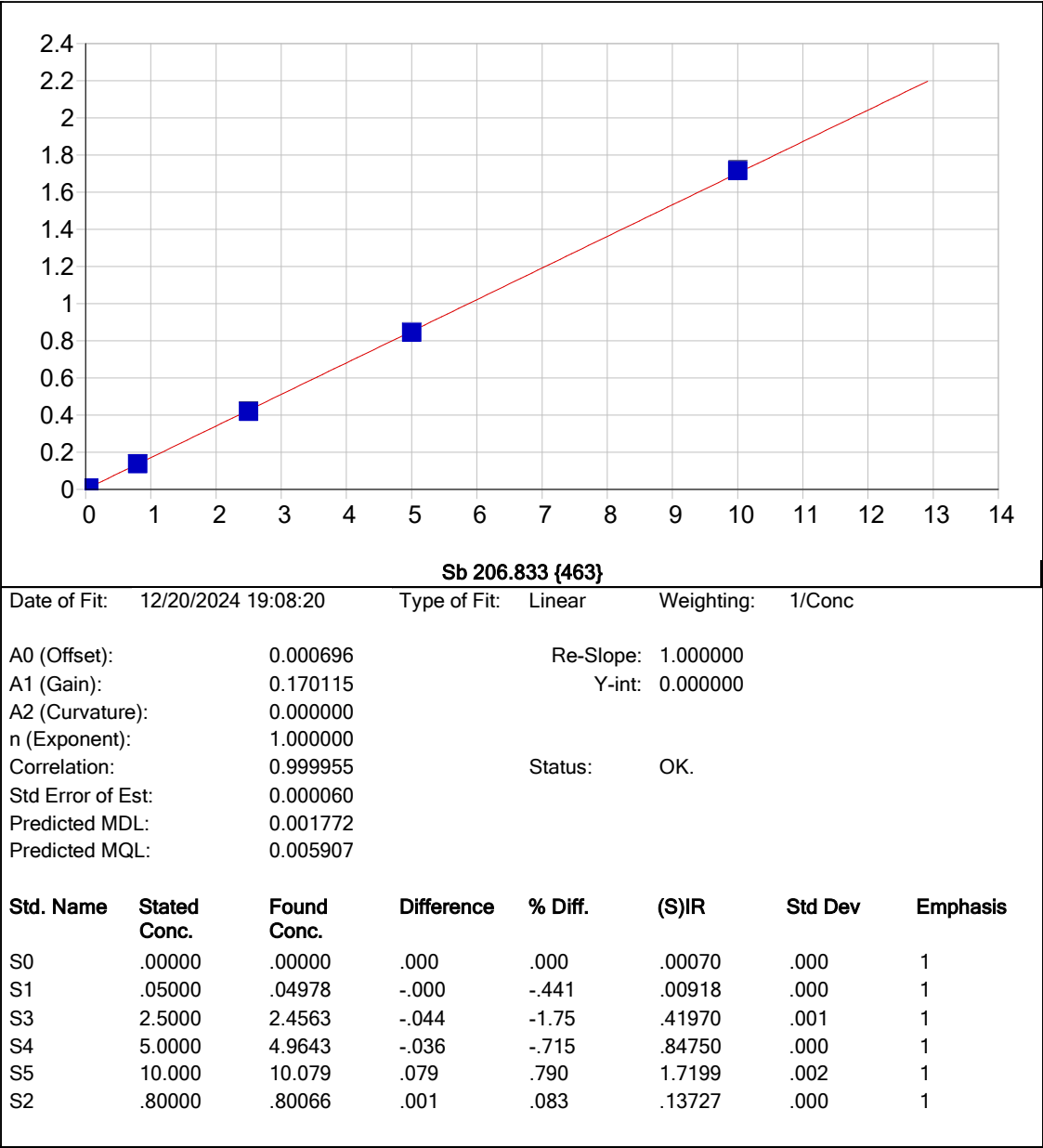
METAL RAW DATA

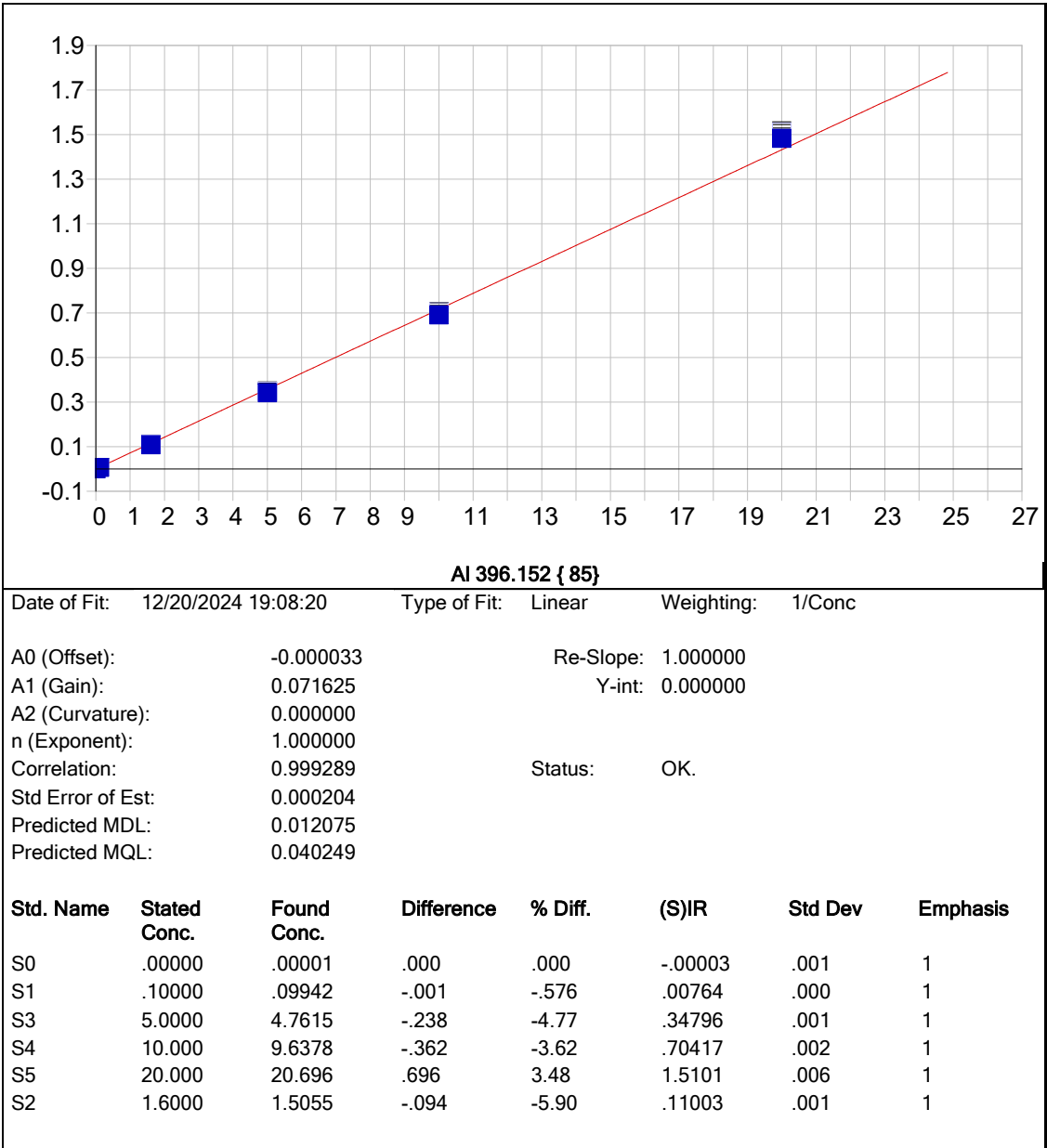


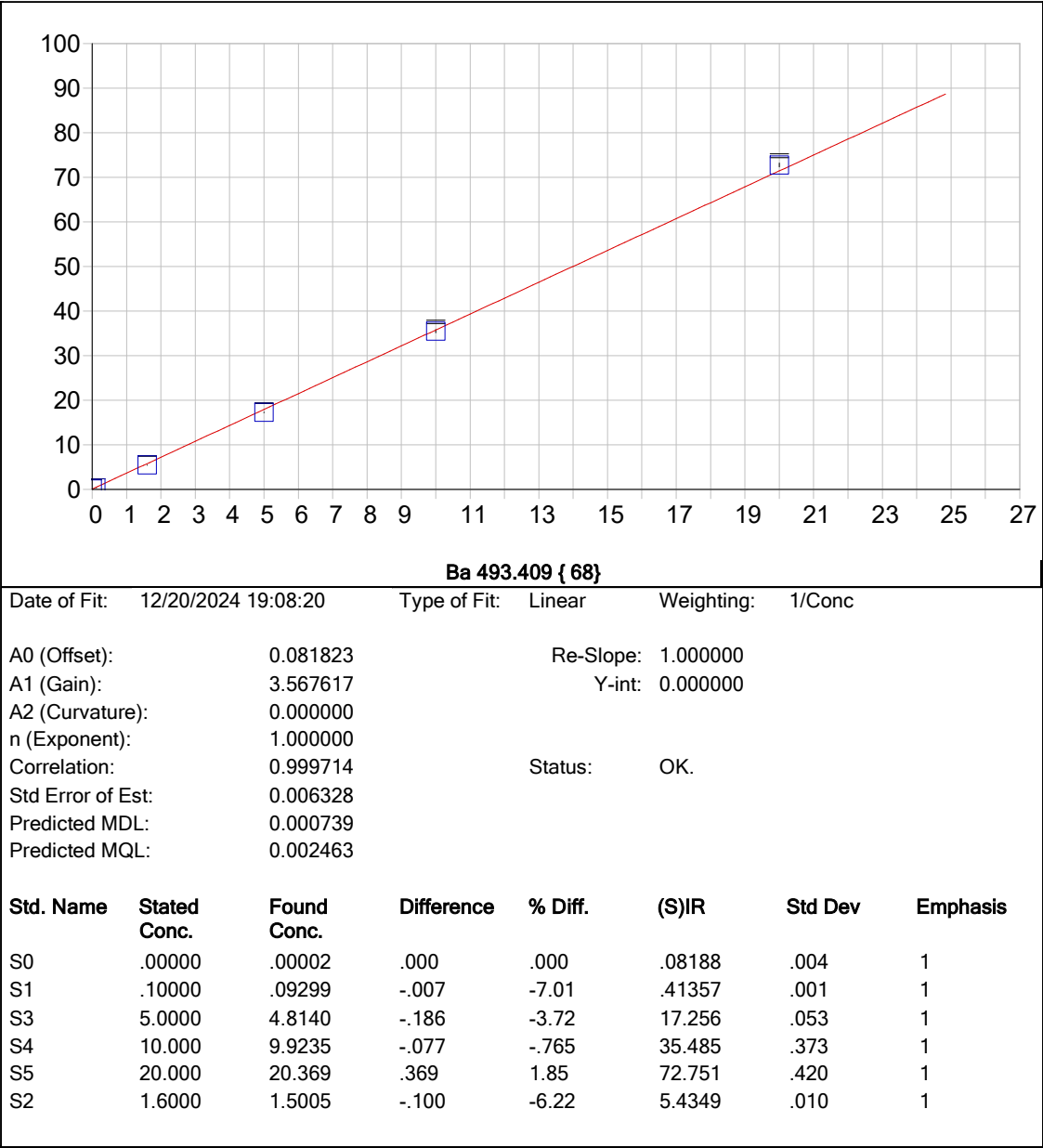


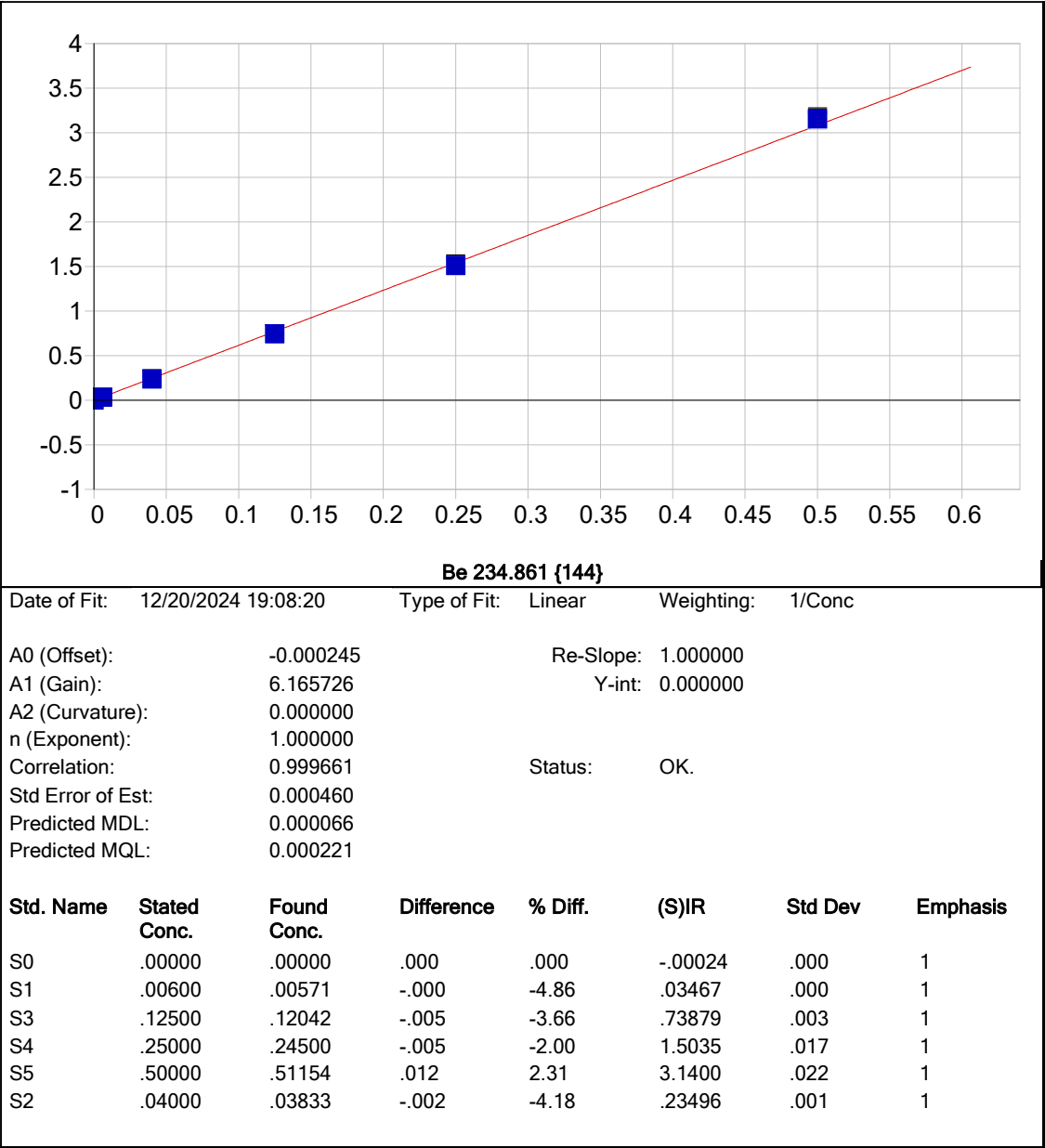


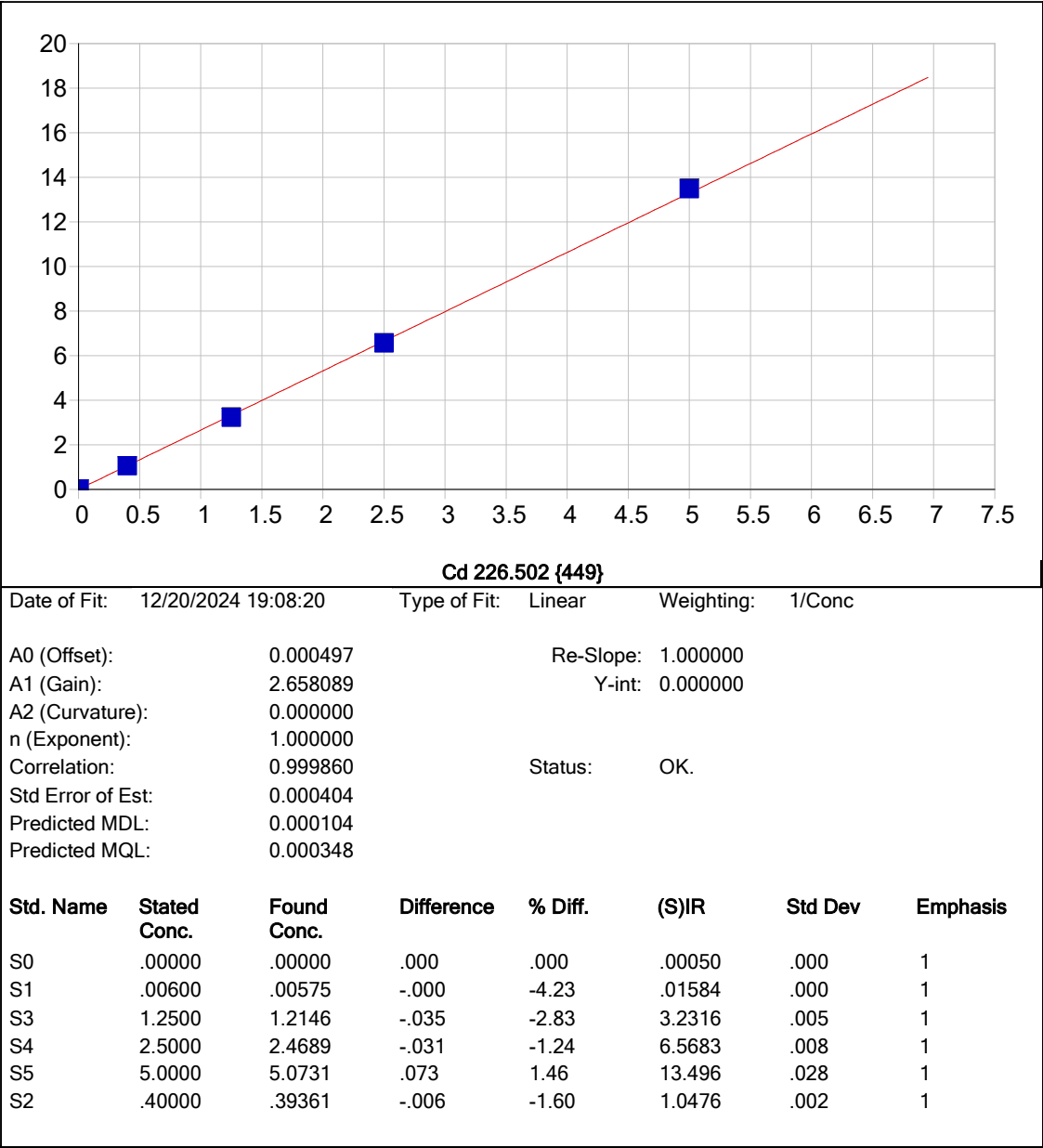


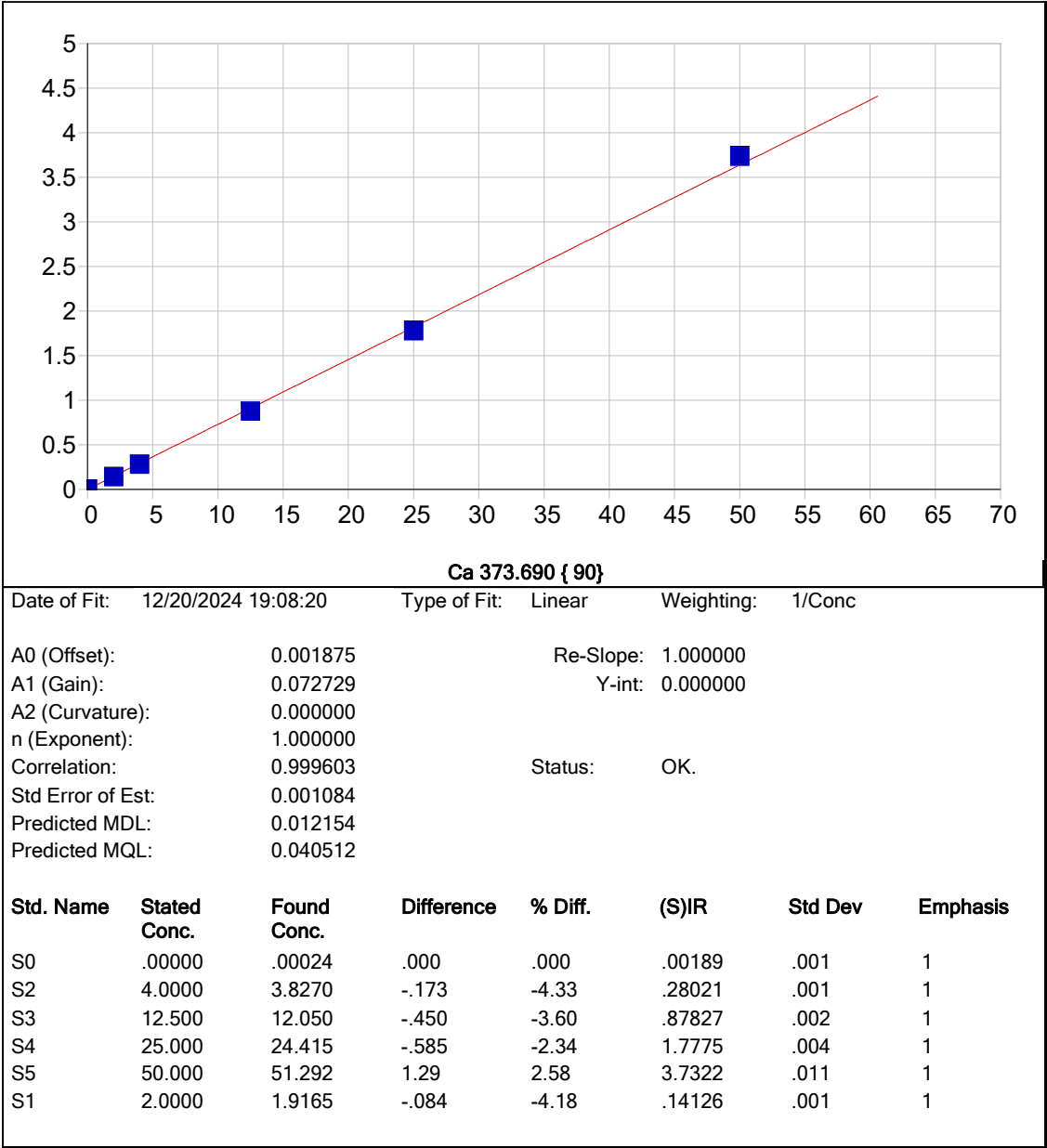


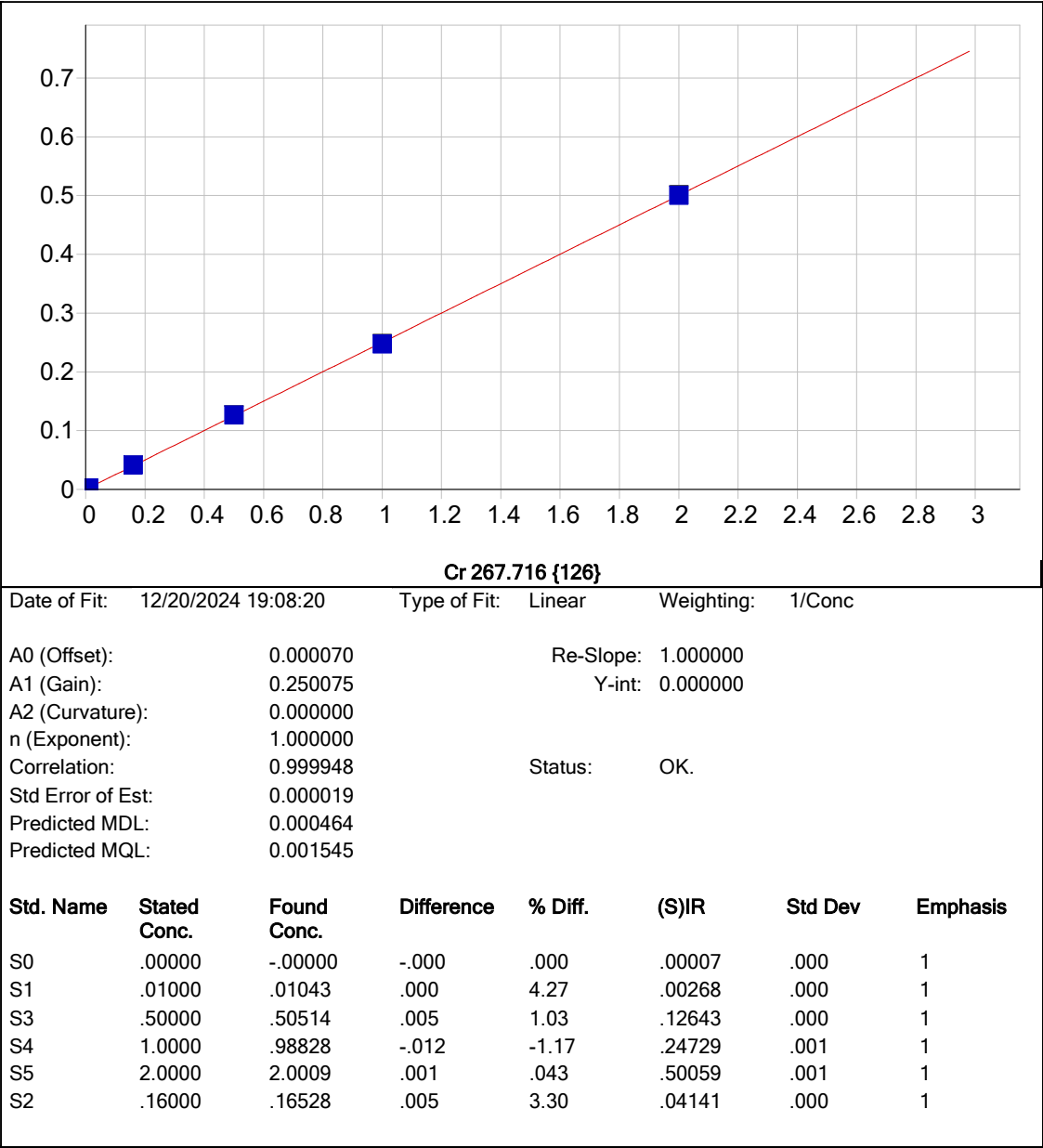


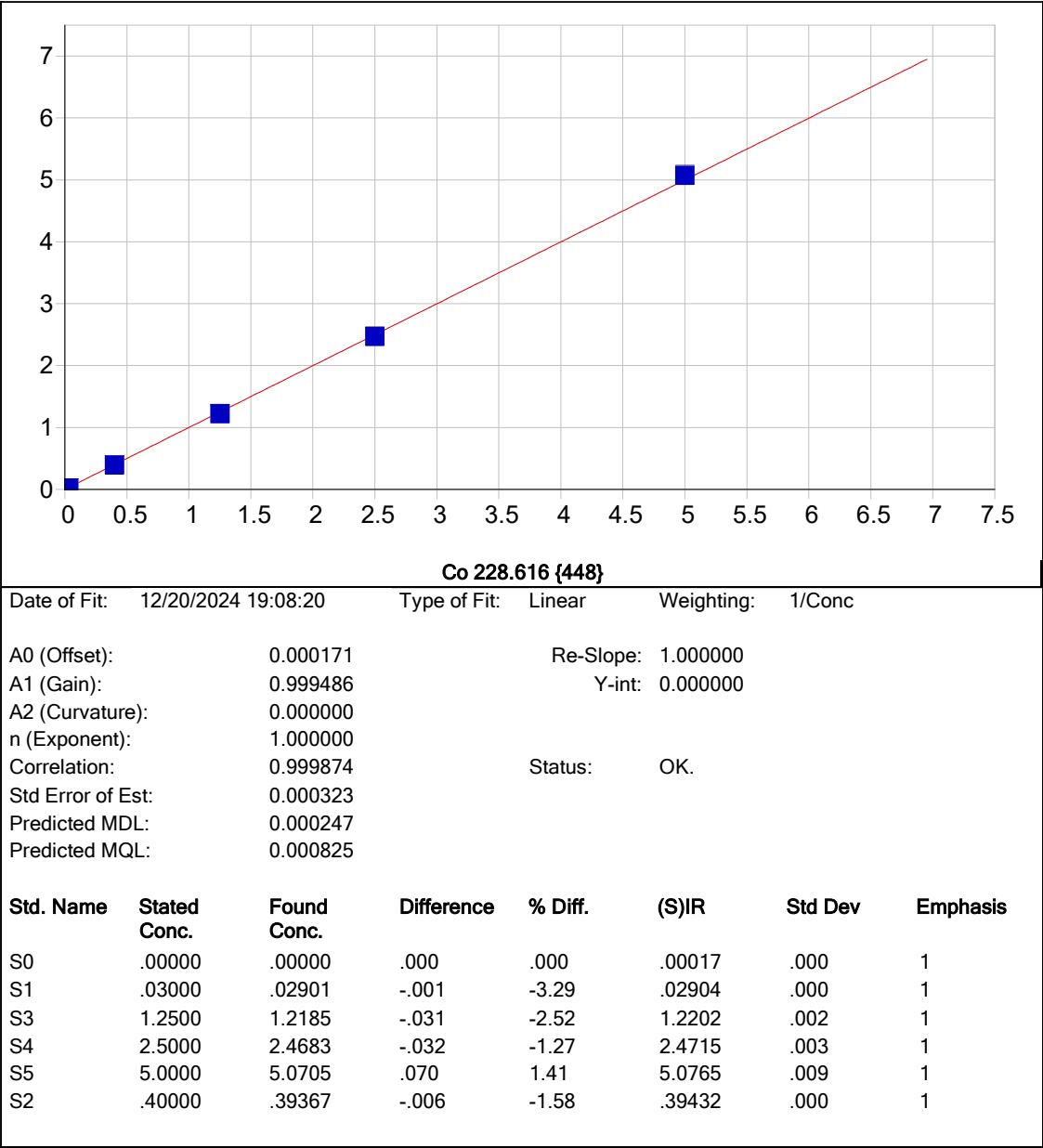


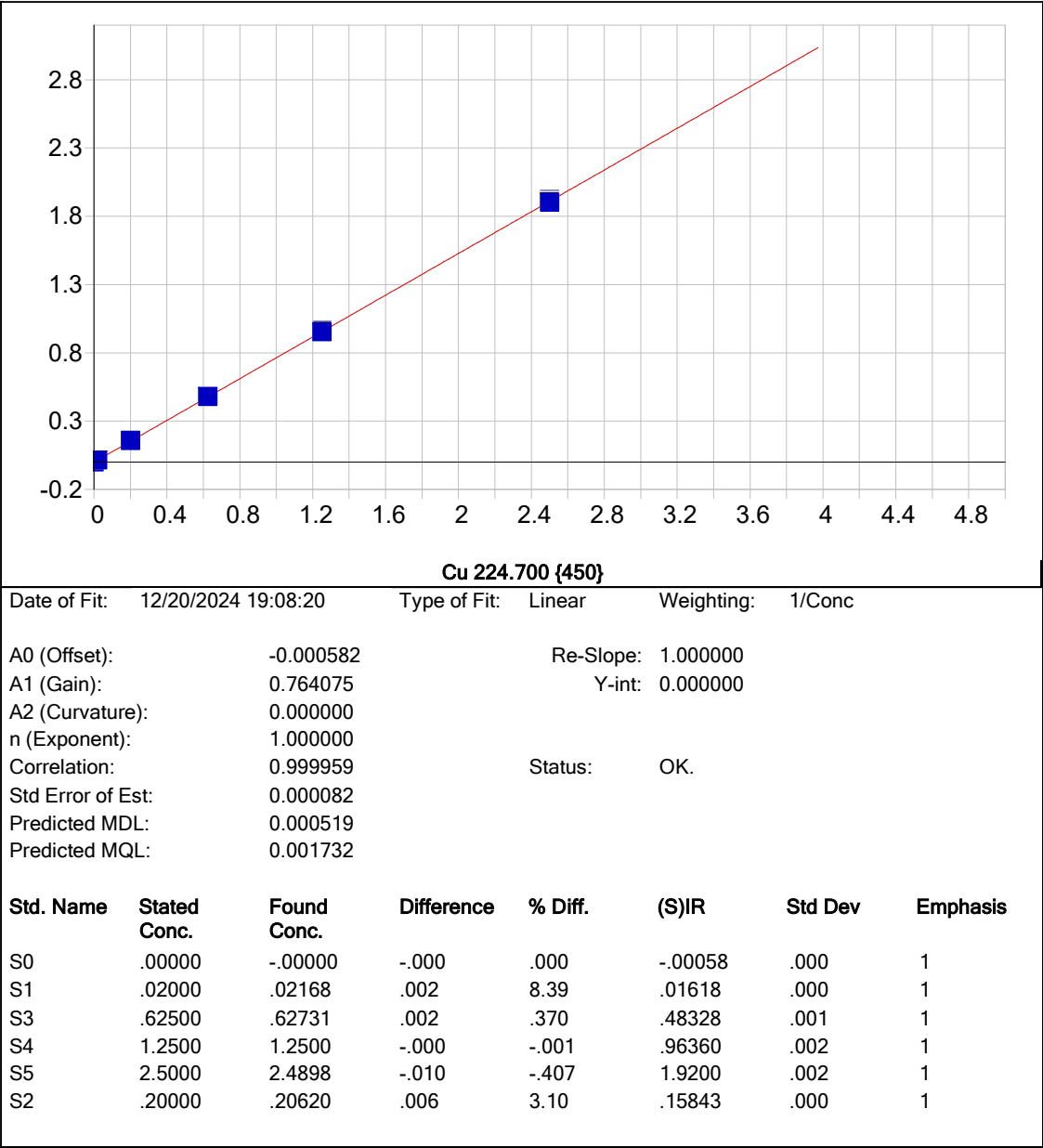


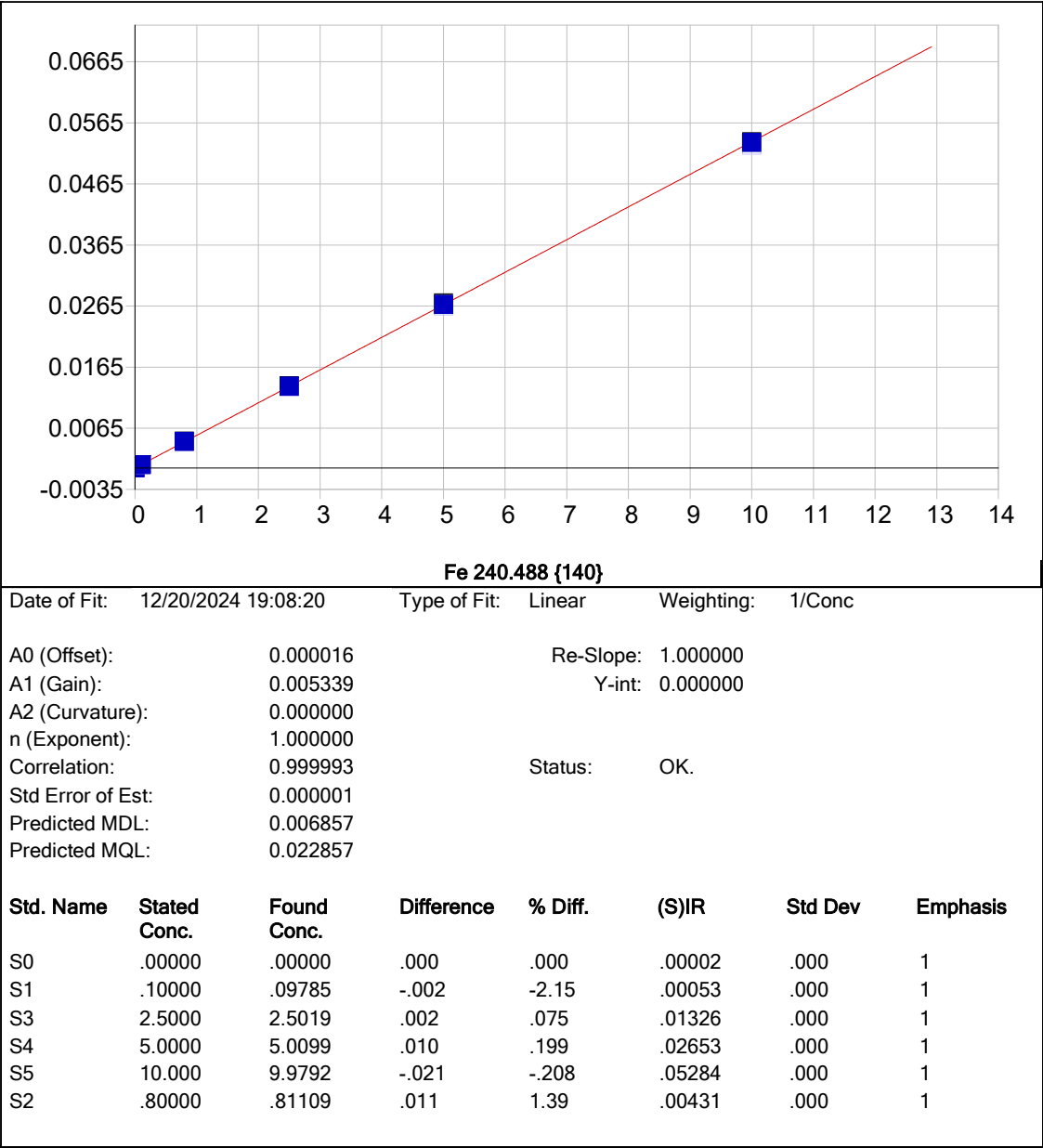


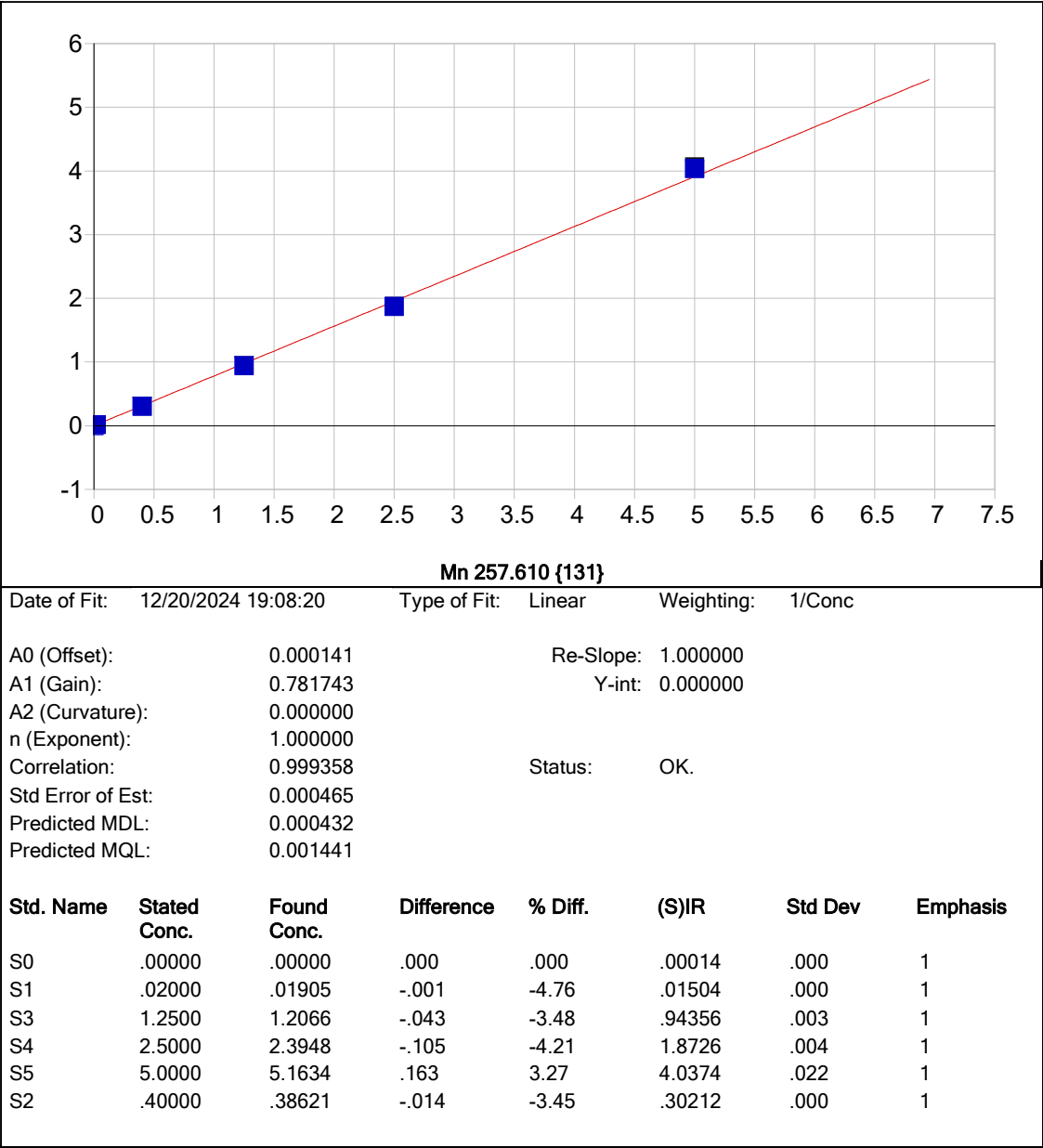


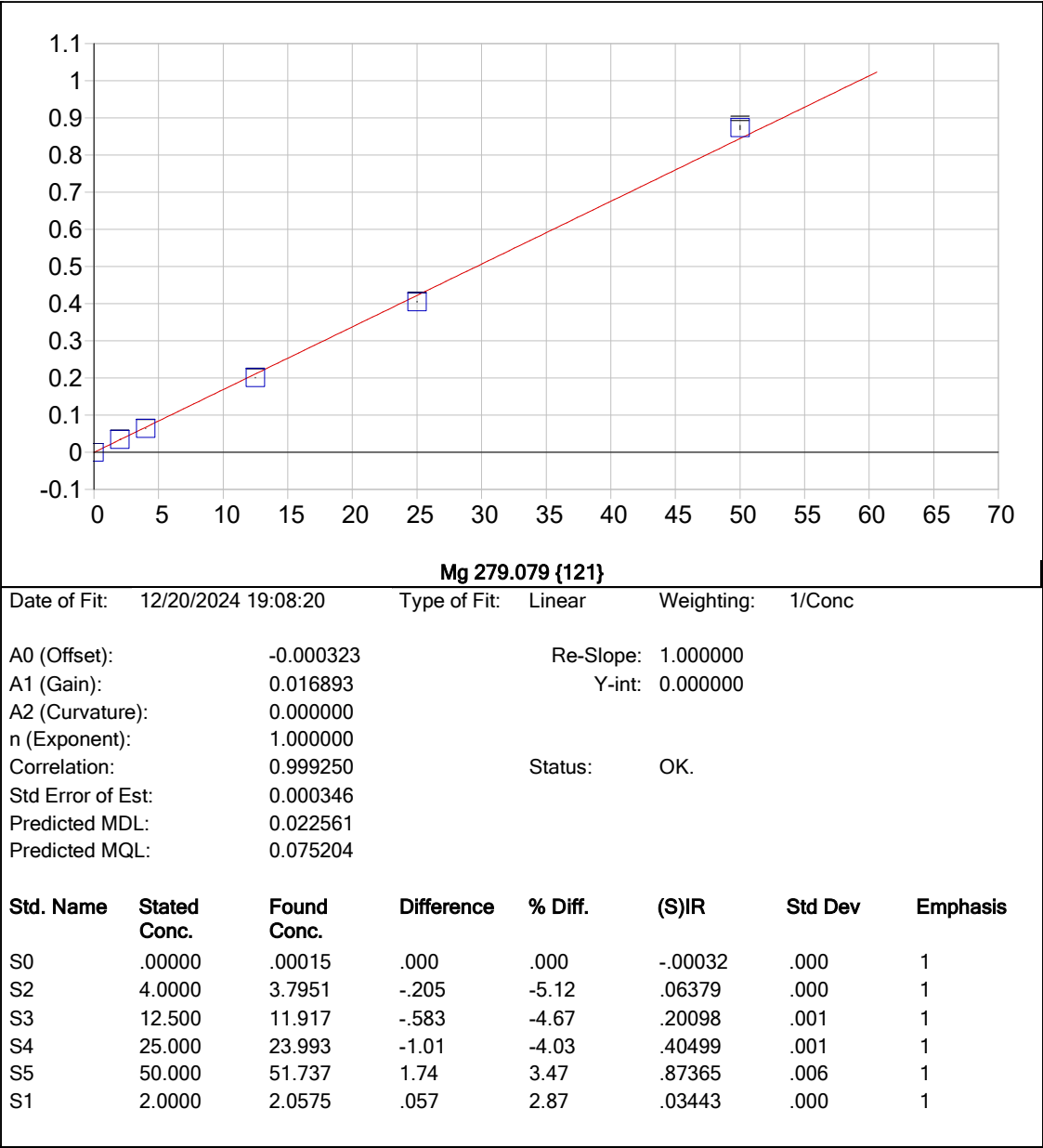


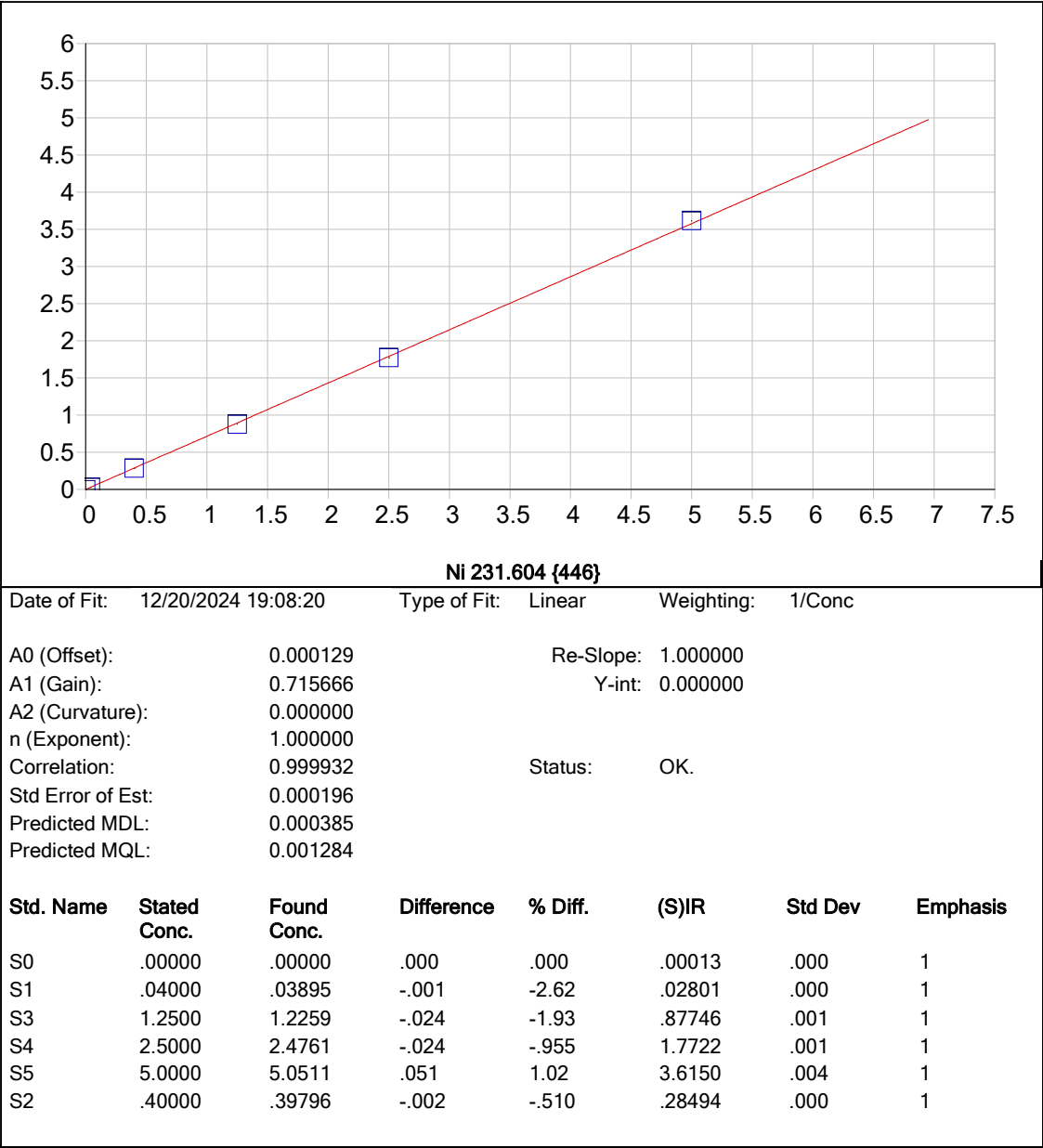


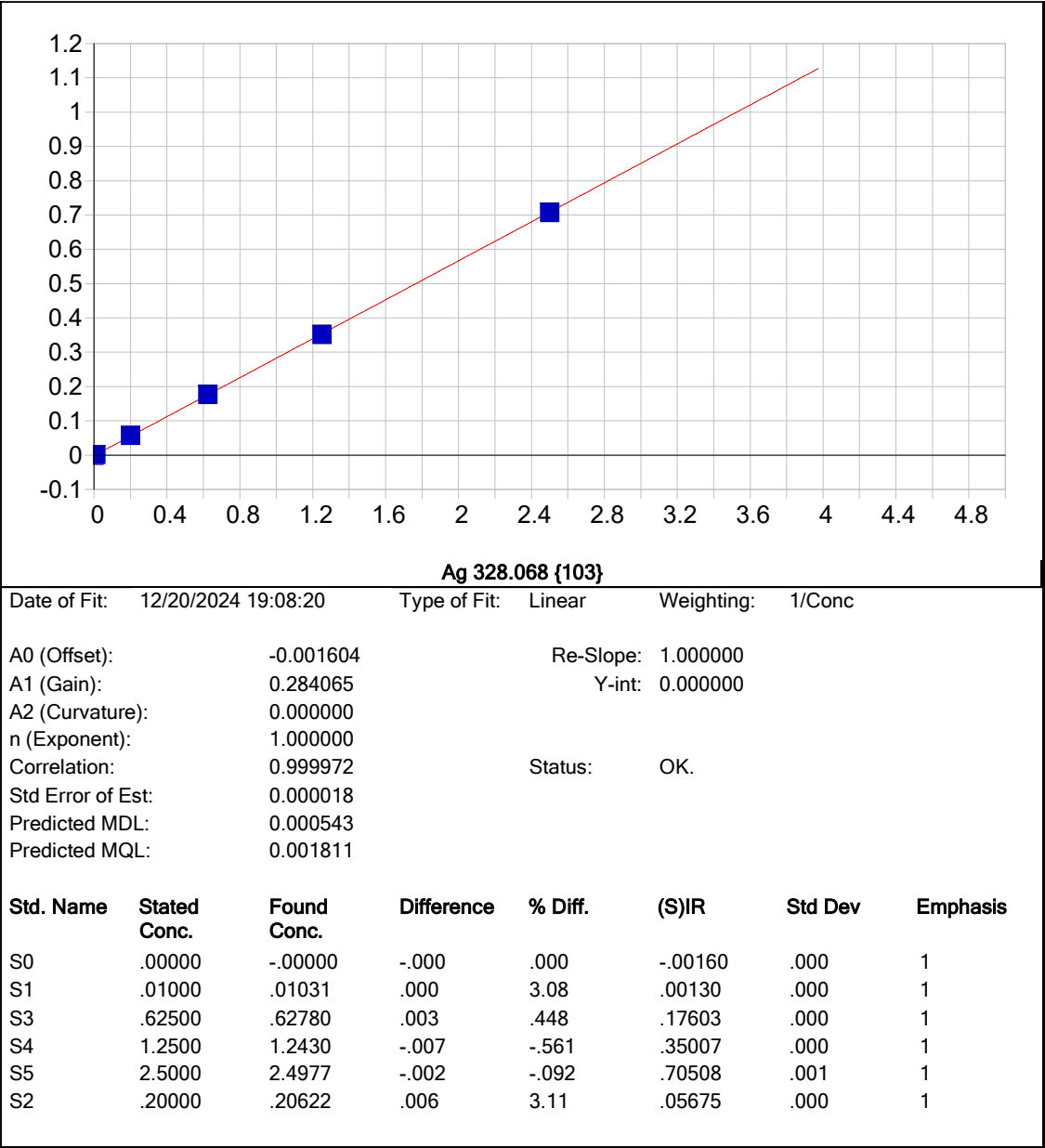


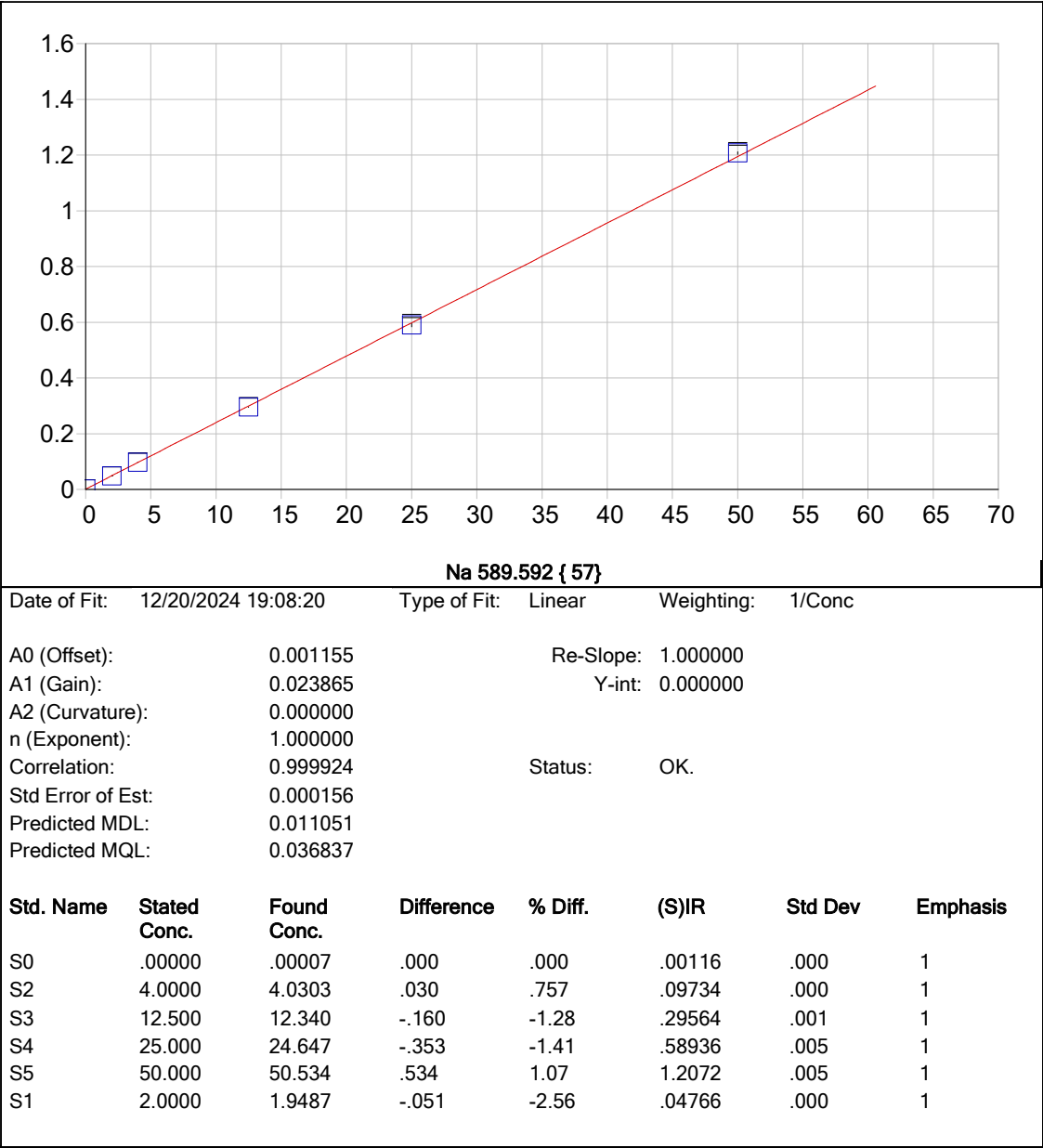


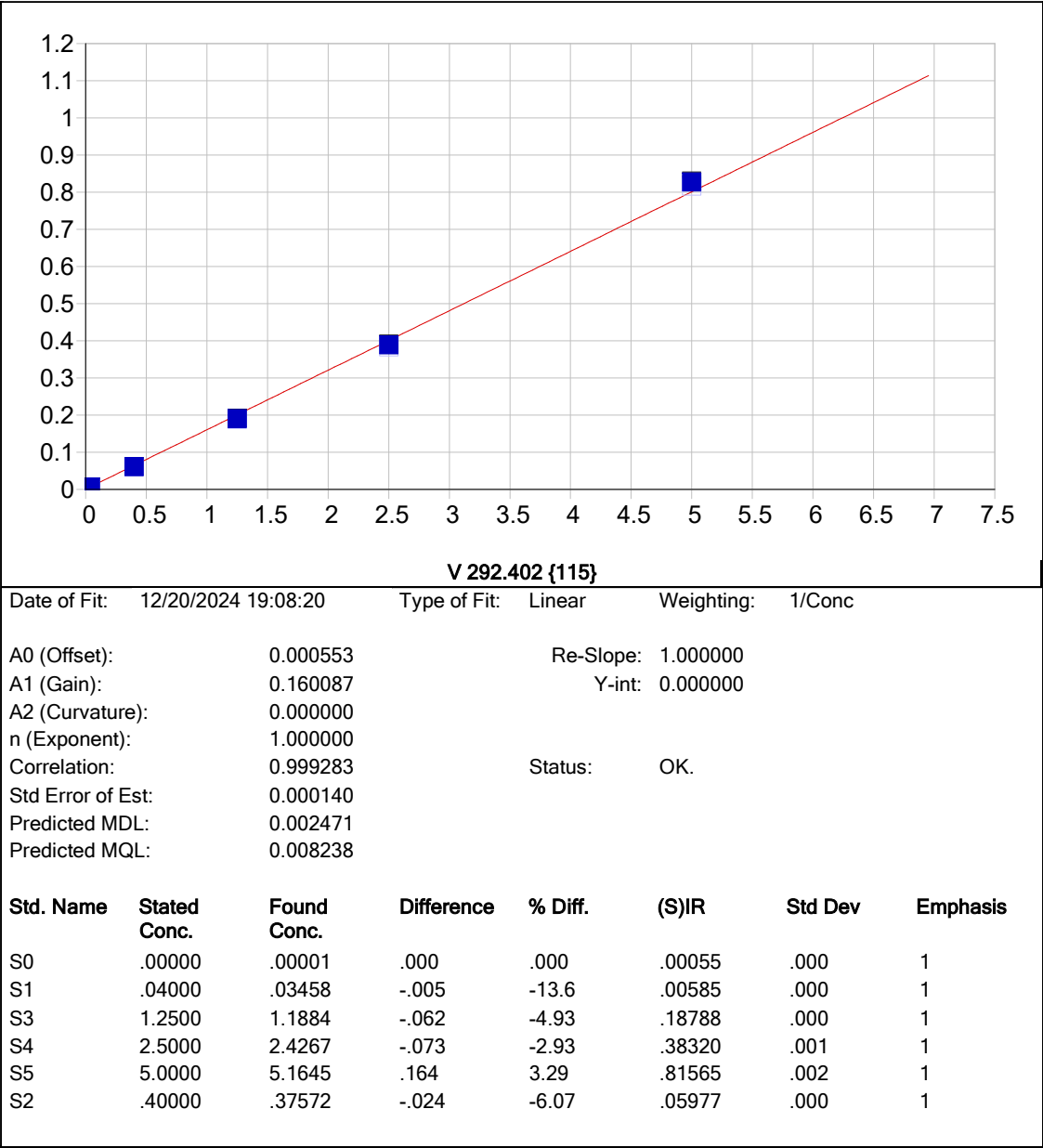


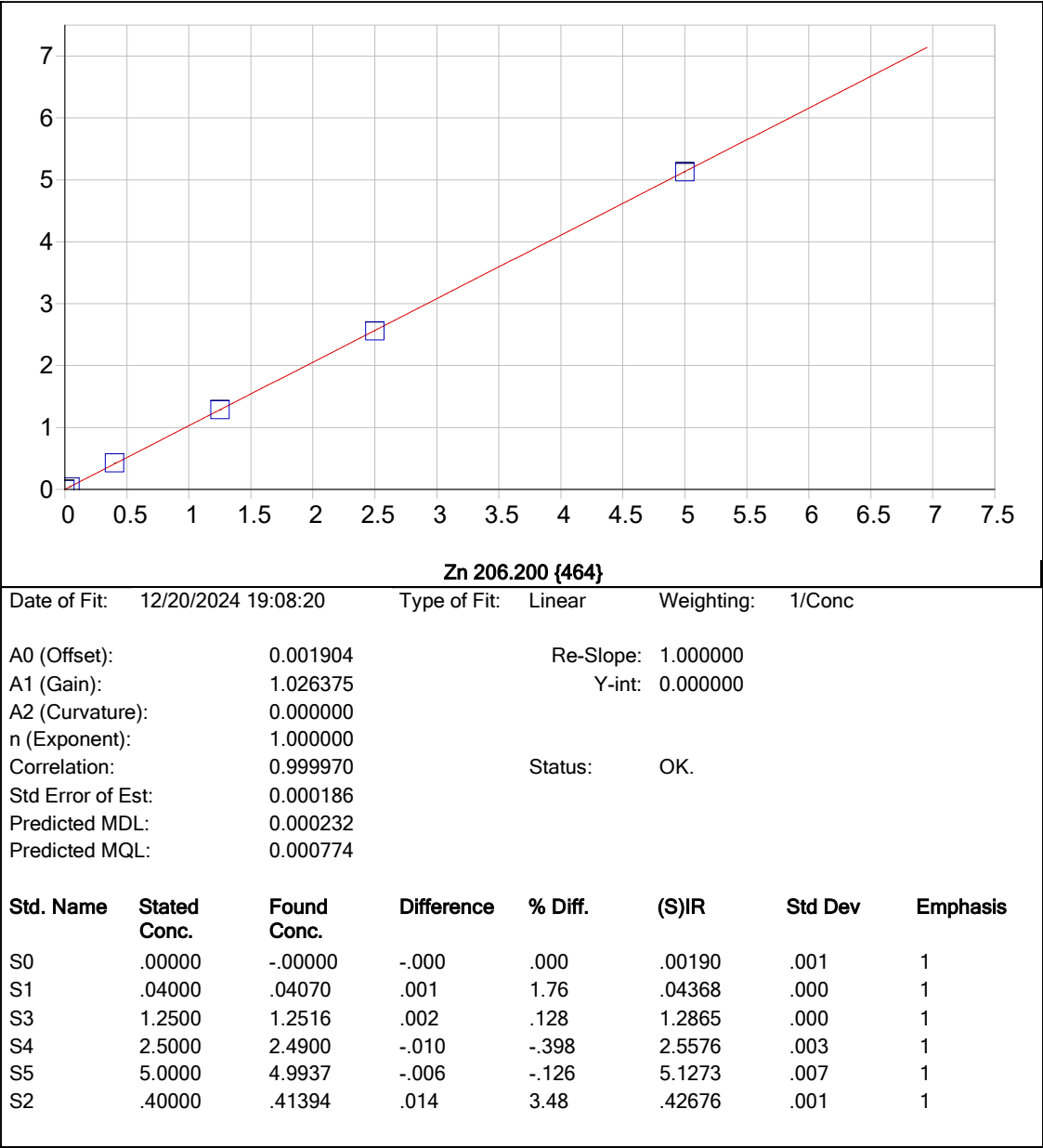


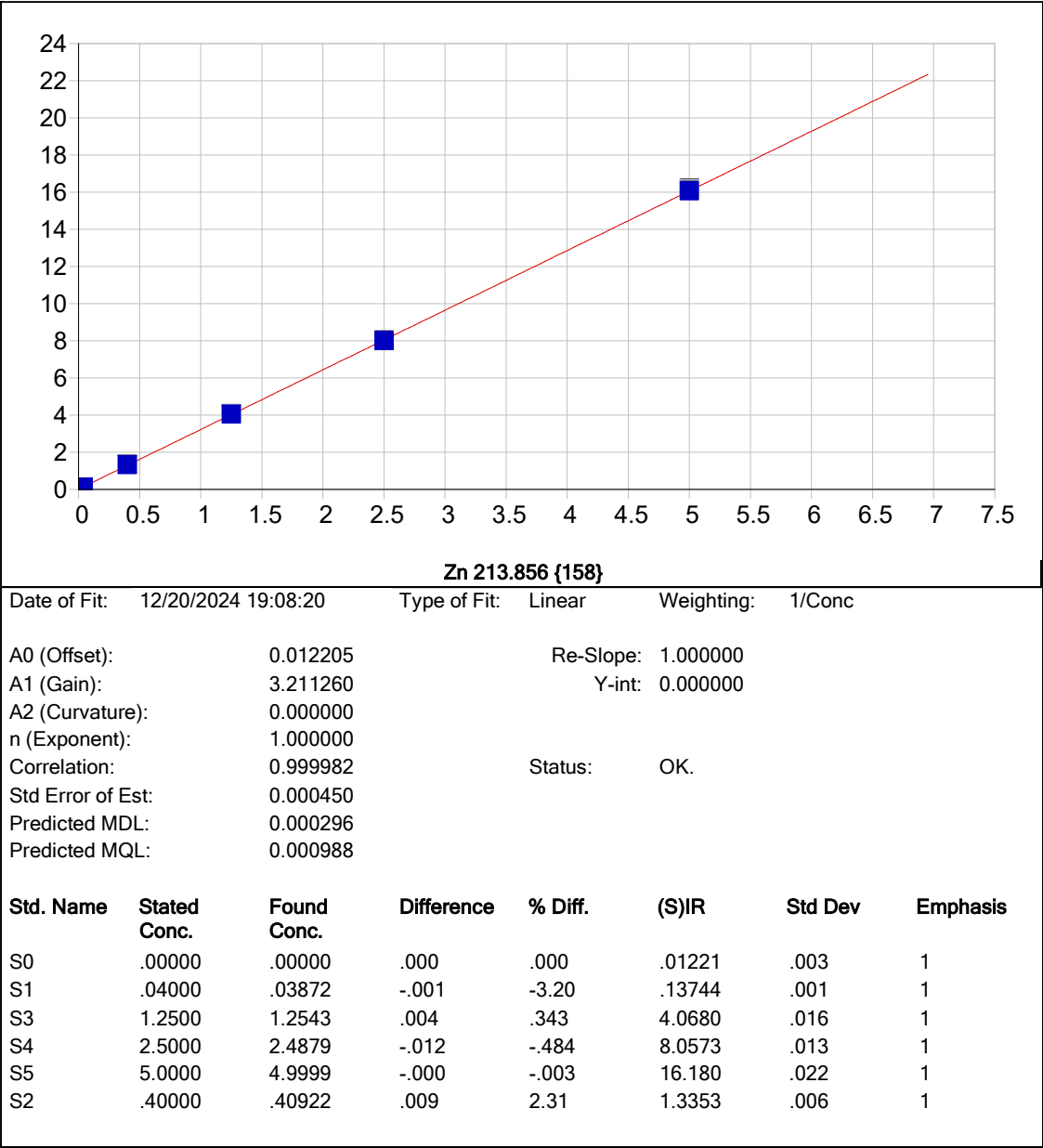


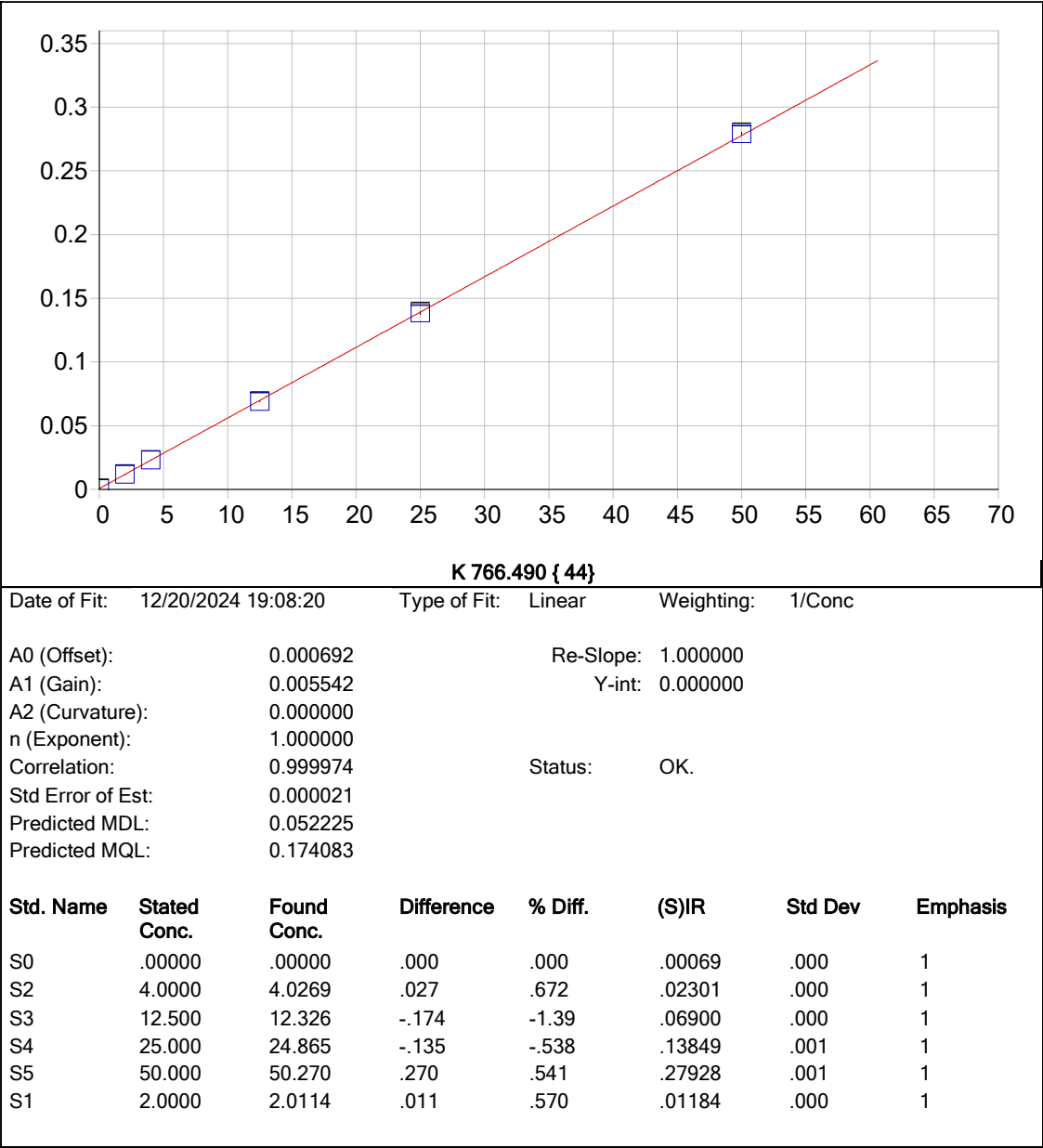


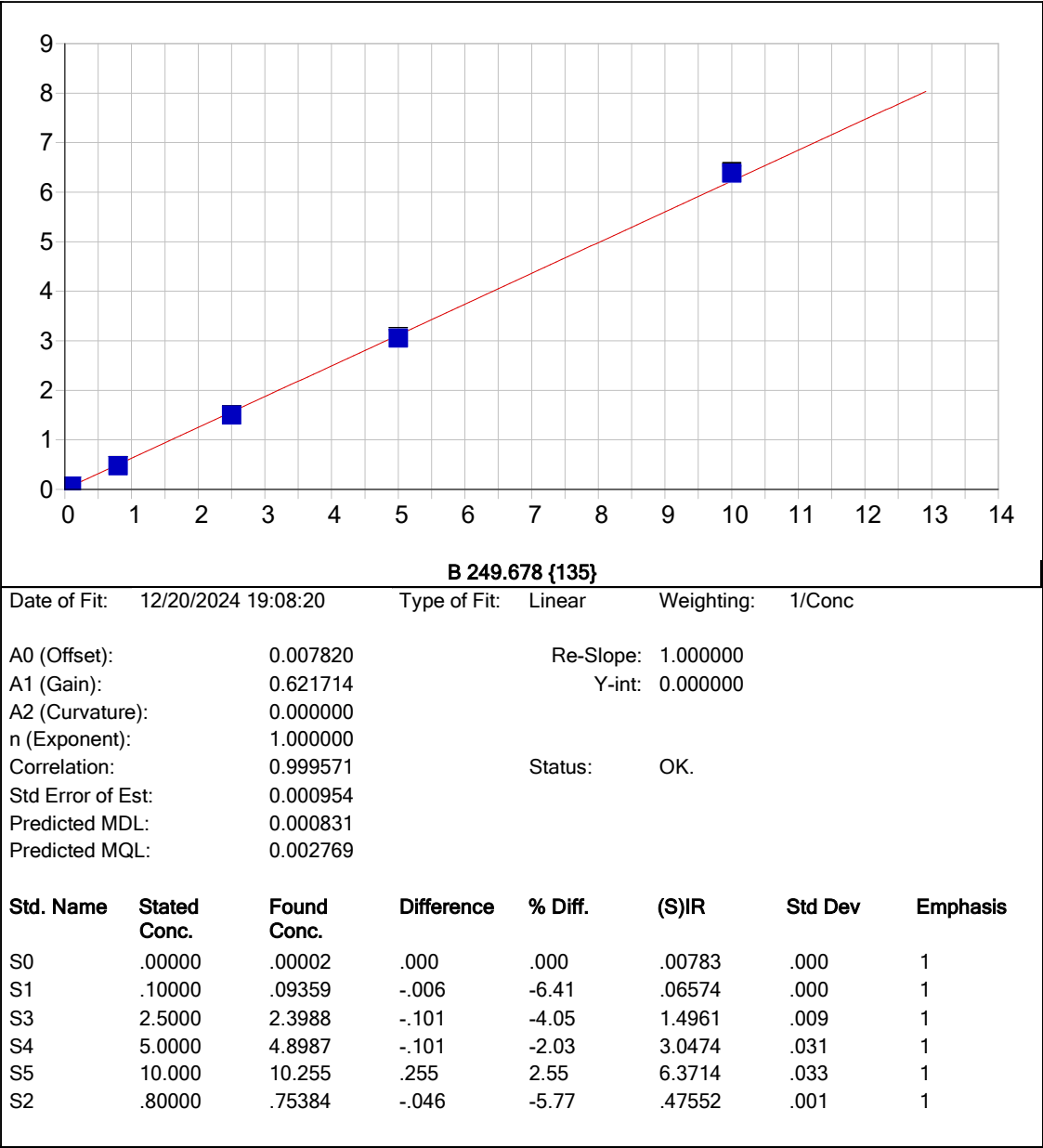


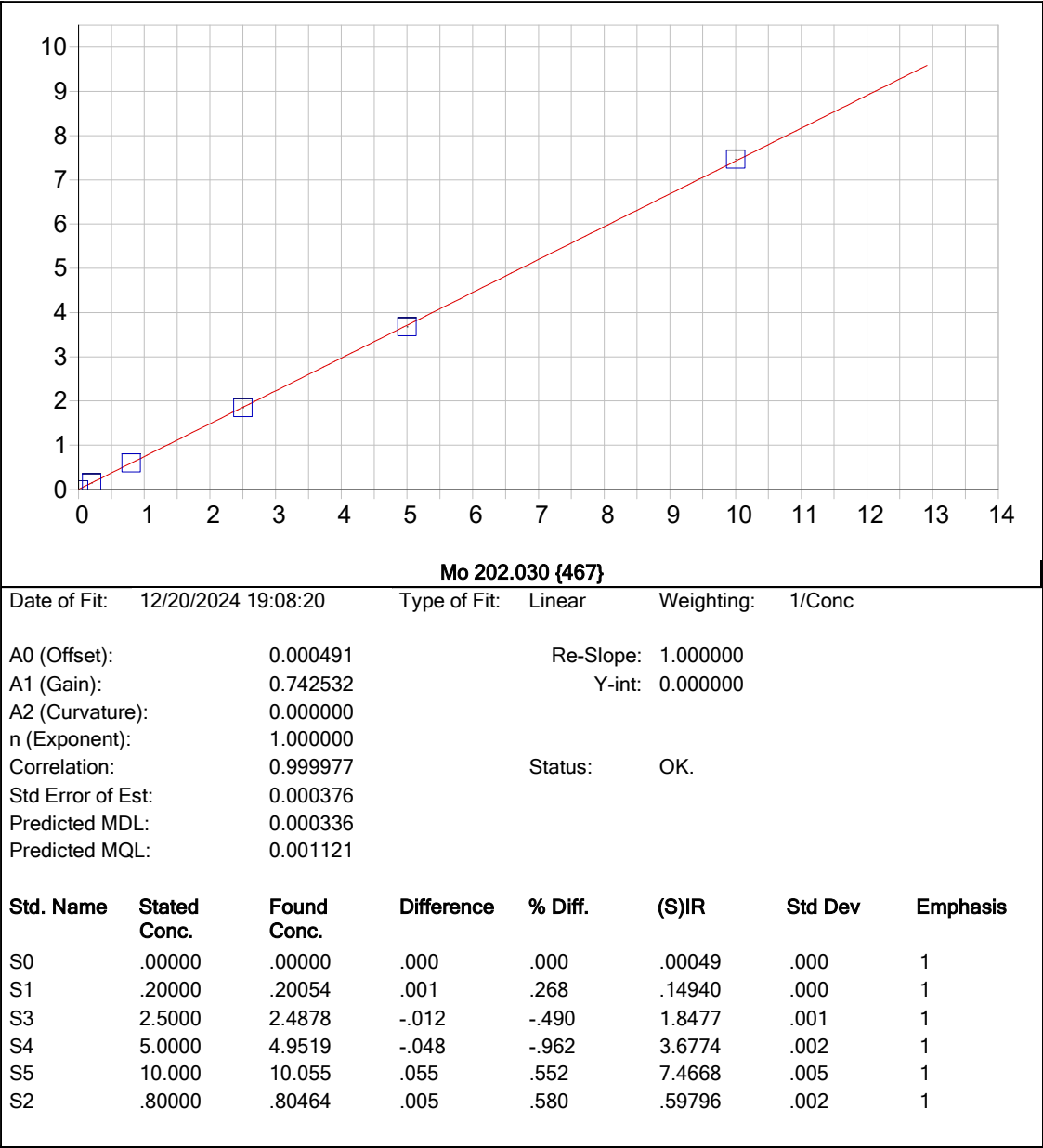


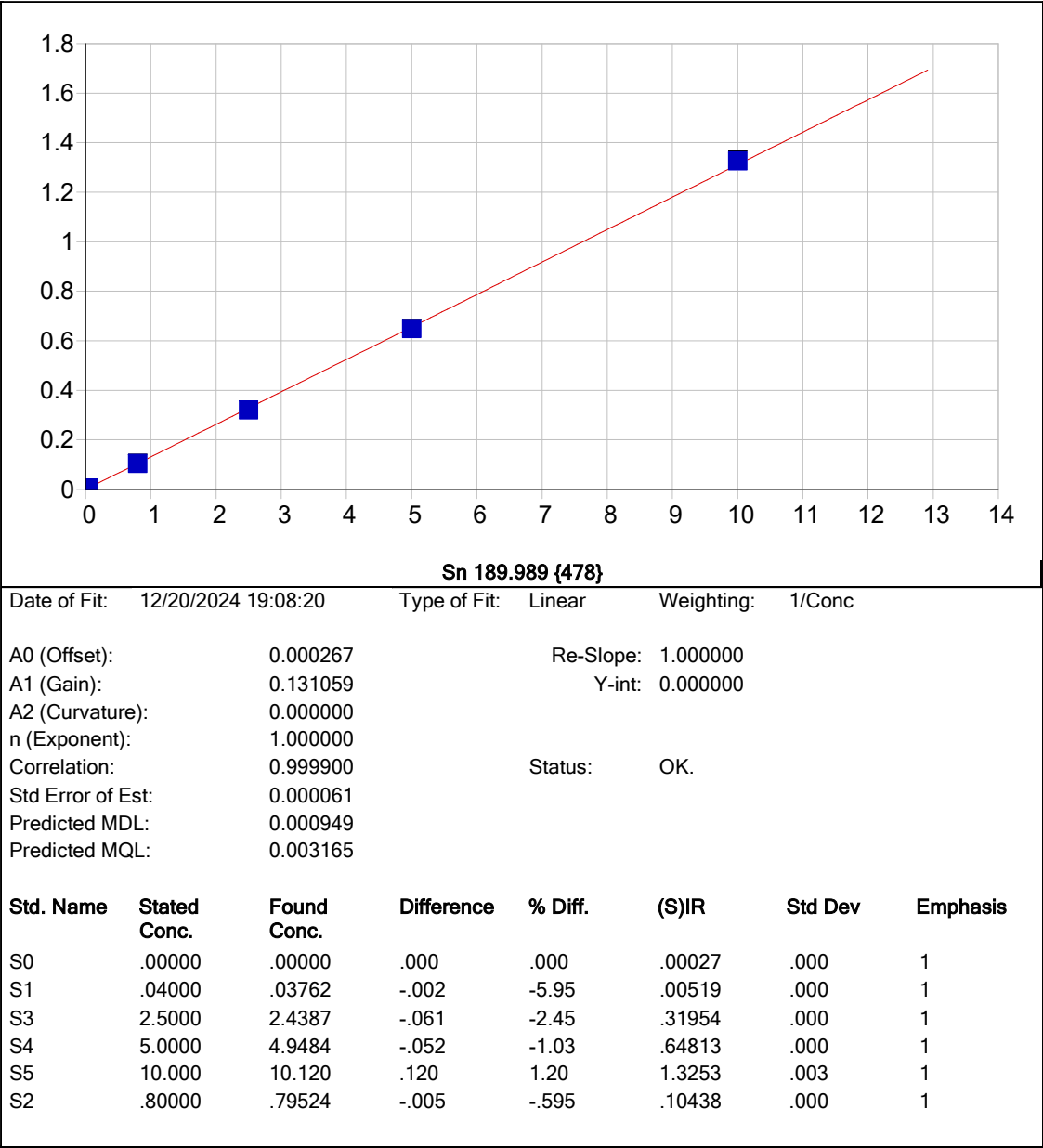


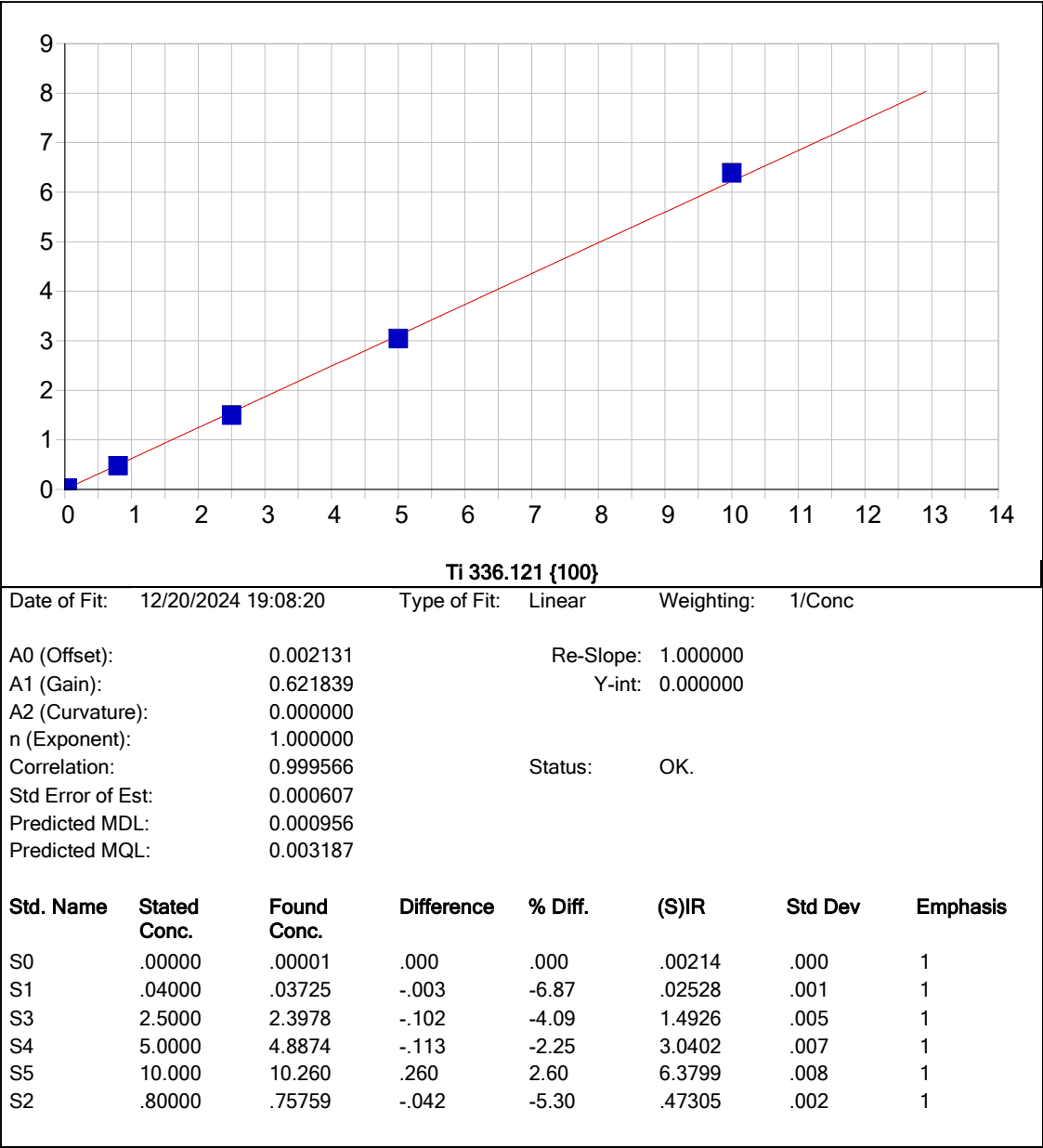


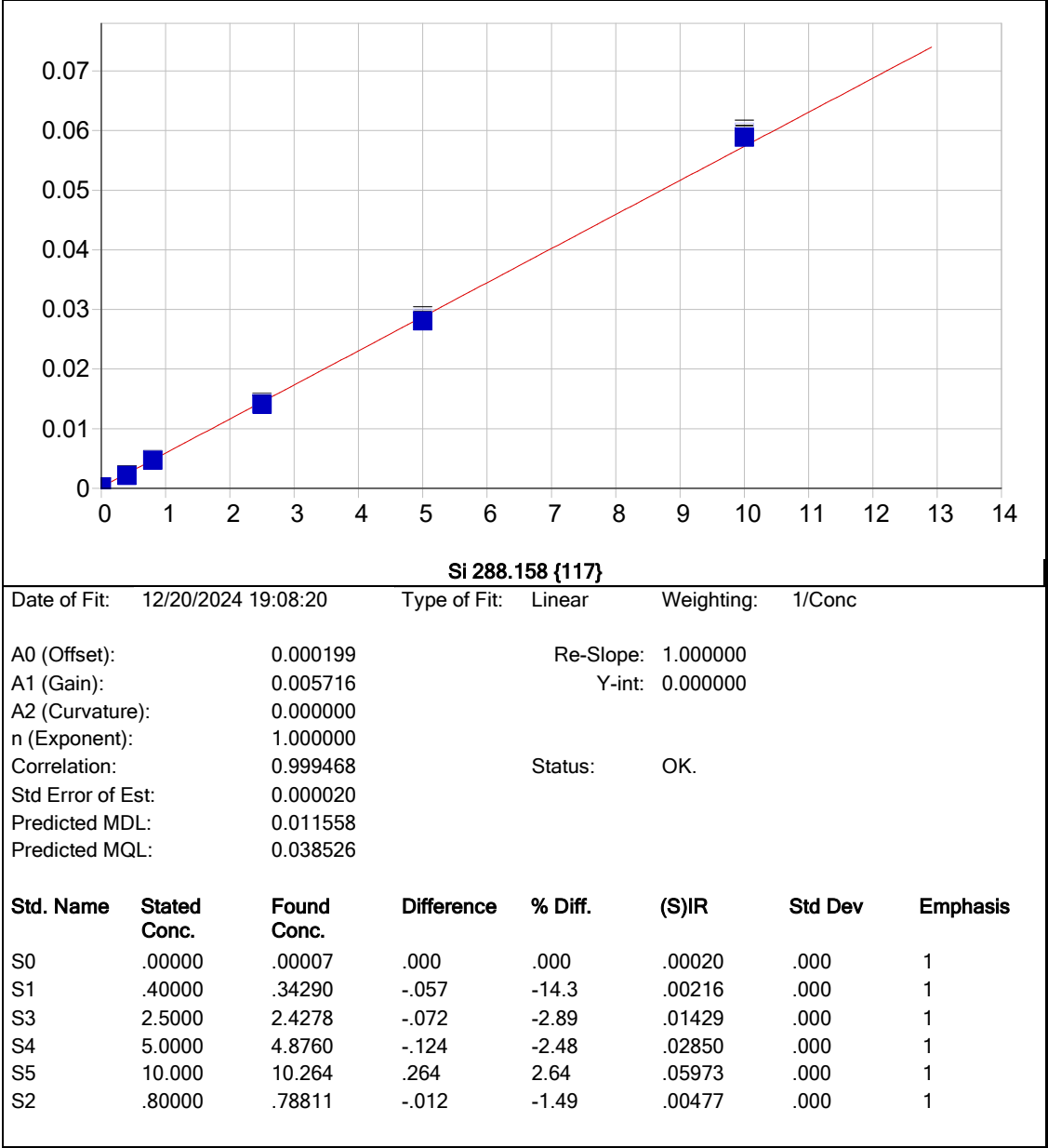


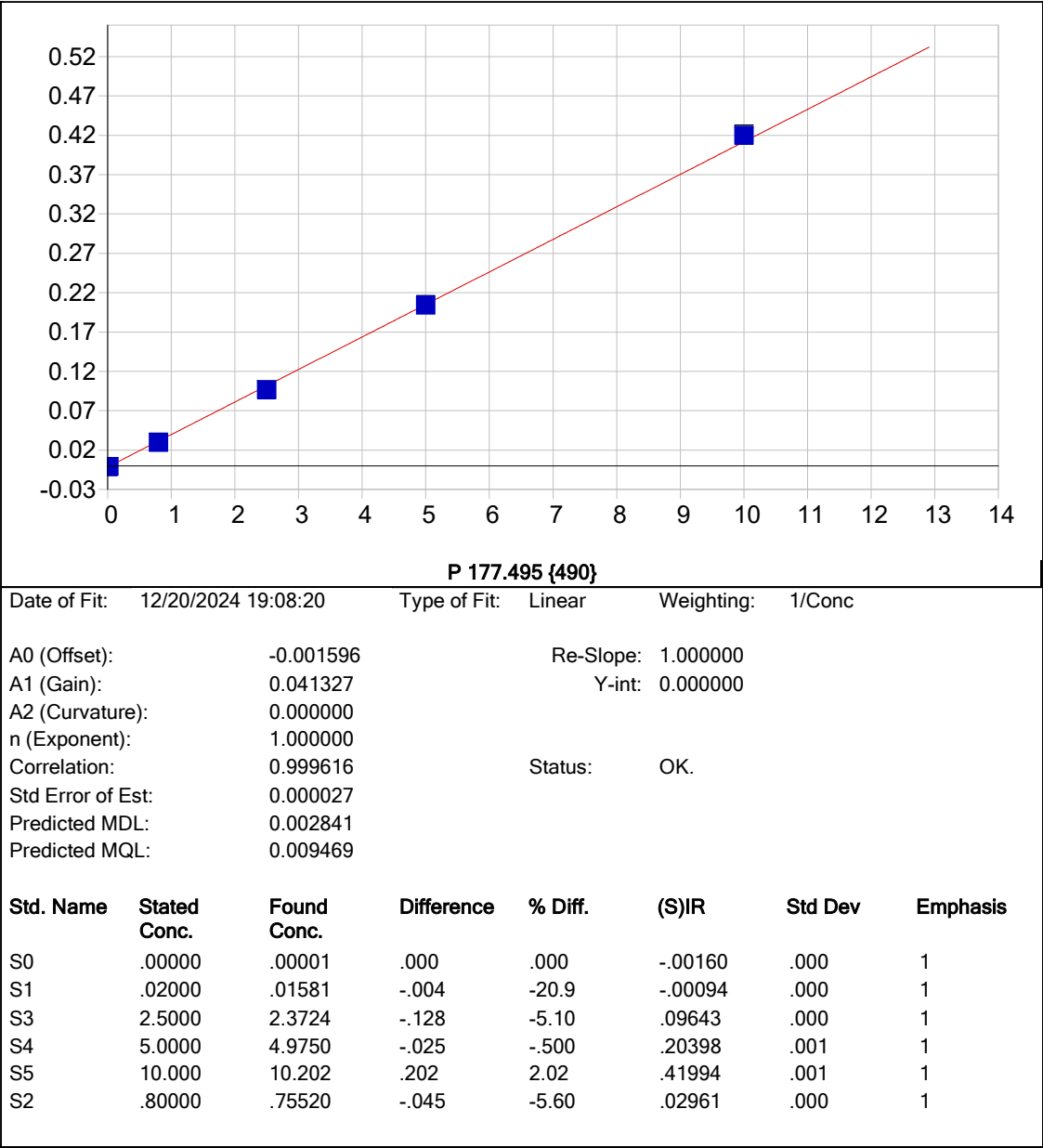


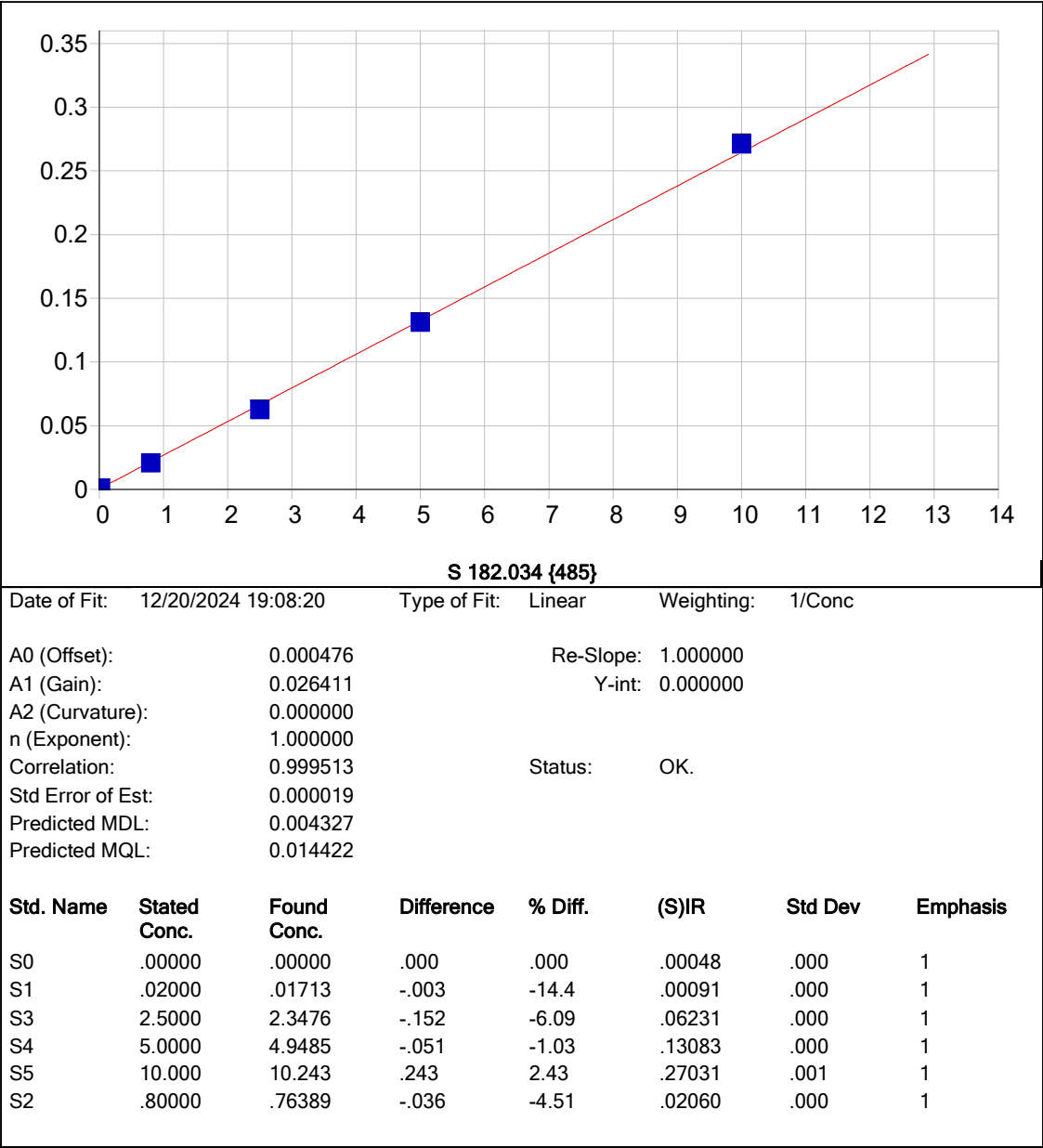


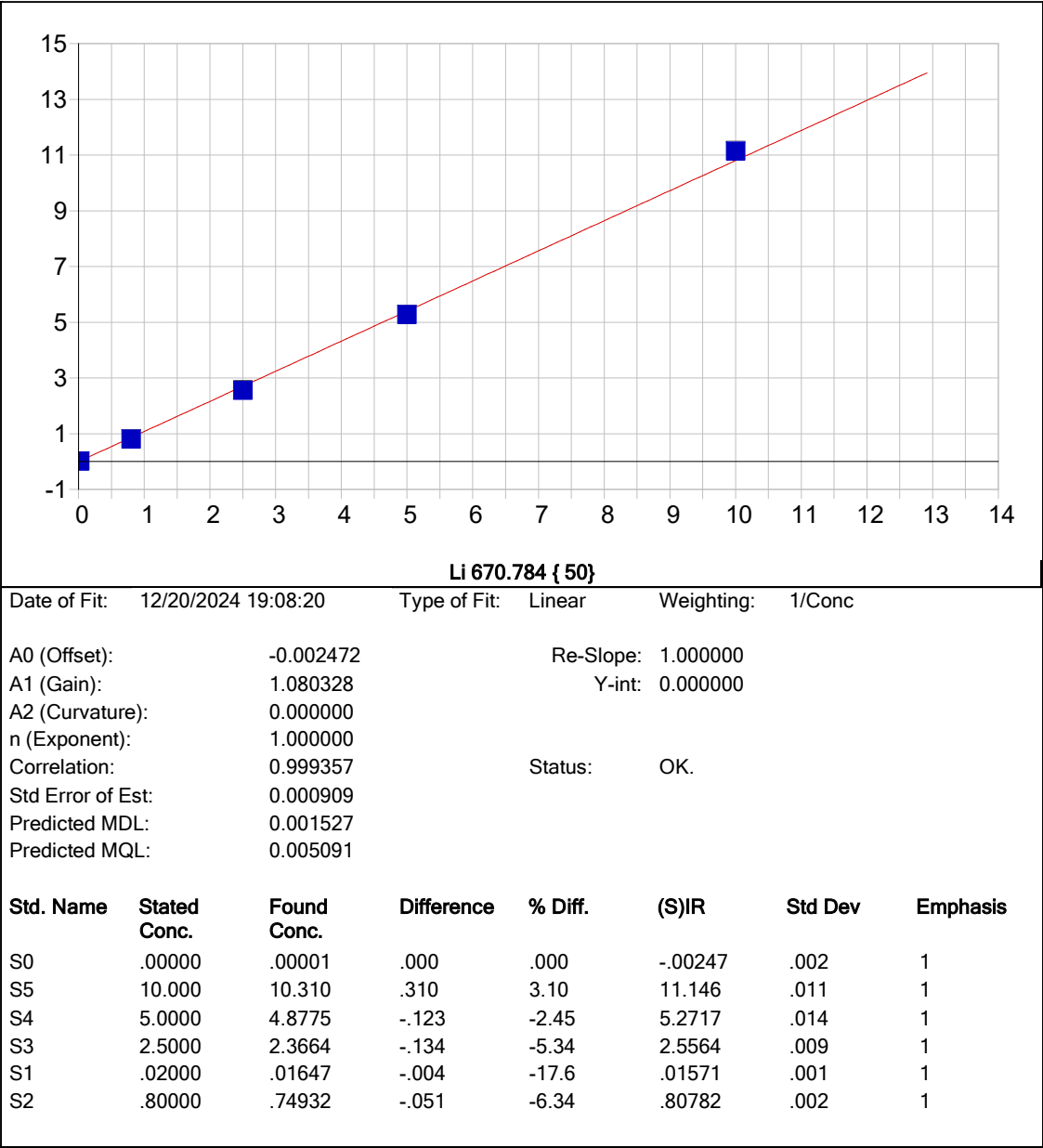


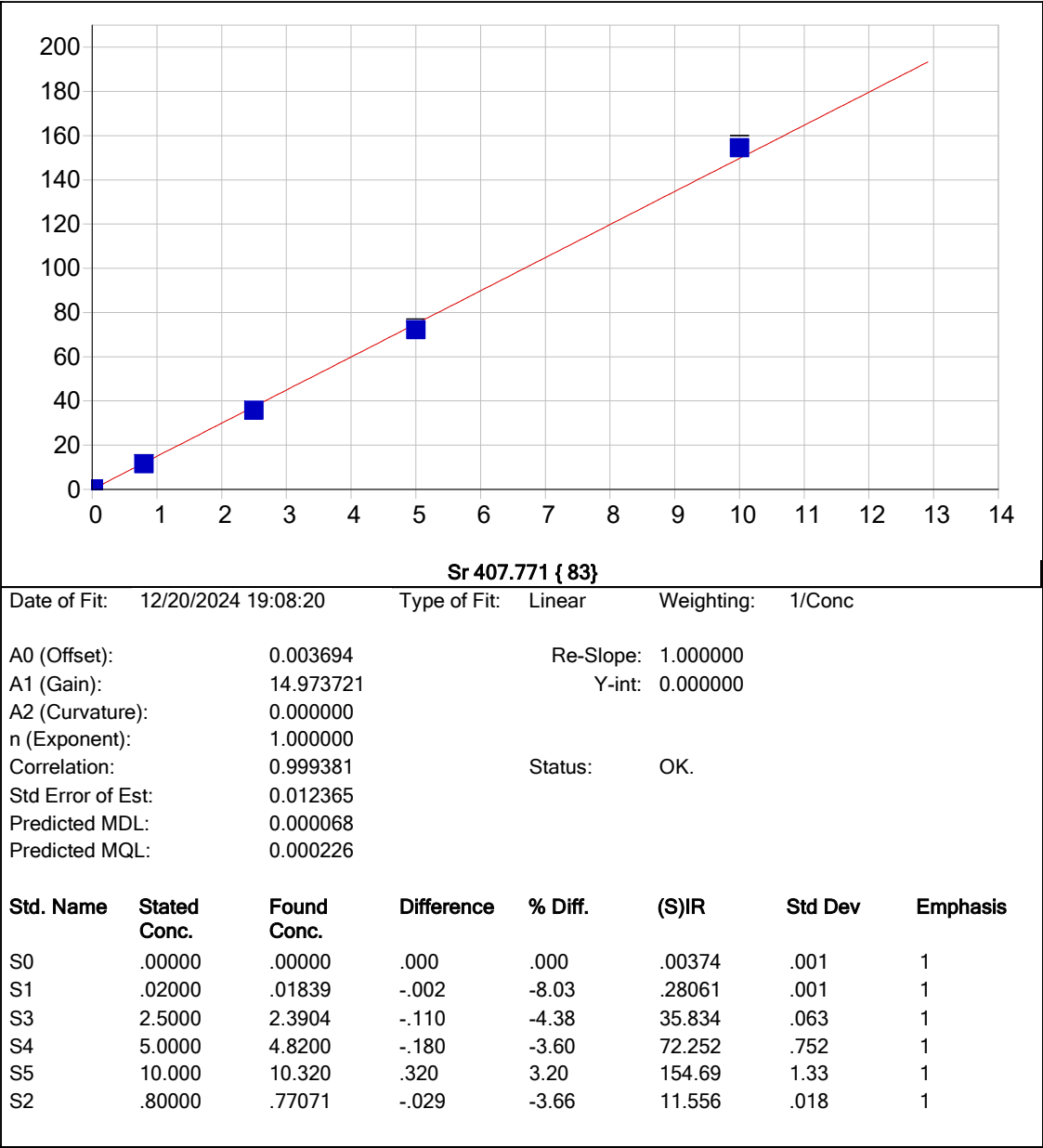






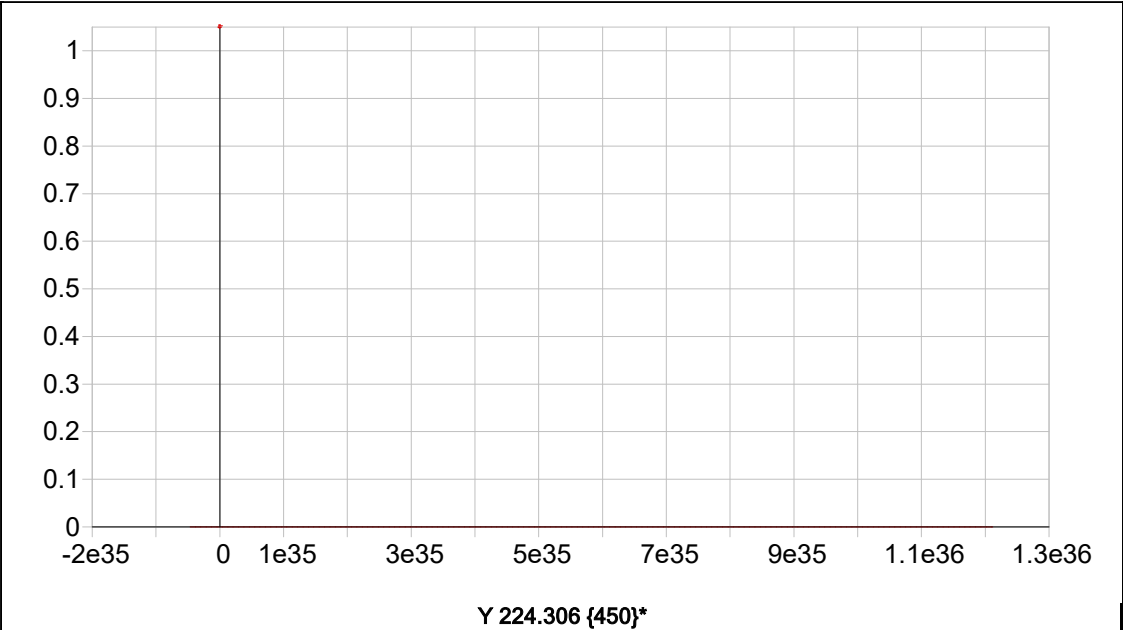






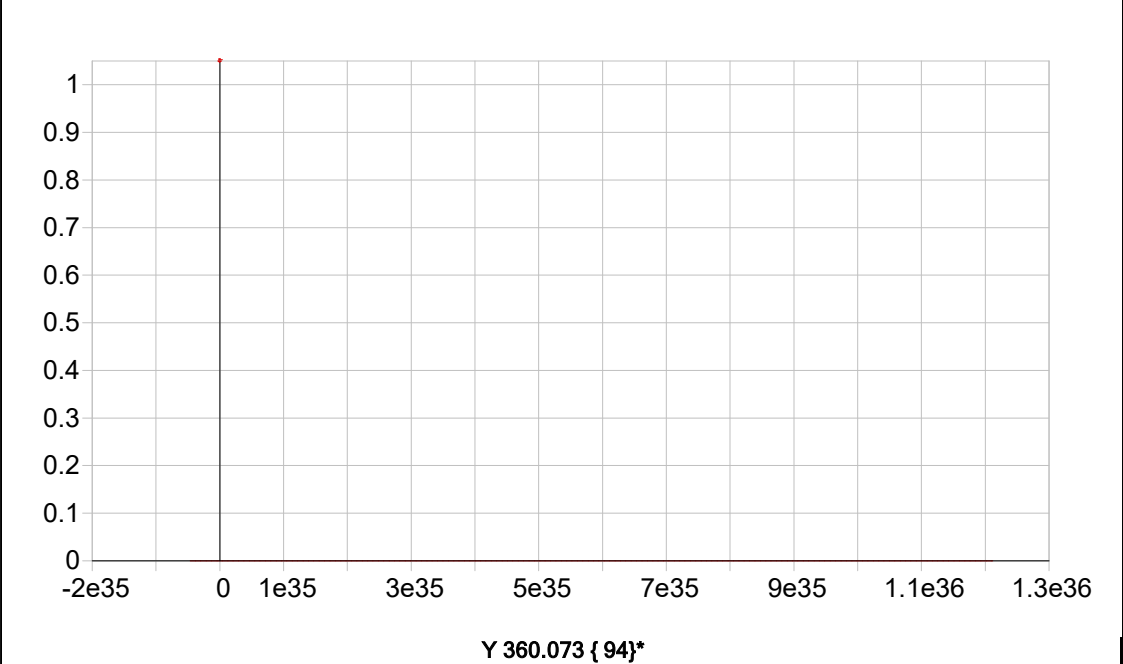
Date of Fit: 12/20/2024 19:08:20 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.003694 Re-Slope: 1.000000
A1 (Gain): 14.973721 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999381 Status: OK.
Std Error of Est: 0.012365
Predicted MDL: 0.000068
Predicted MQL: 0.000226

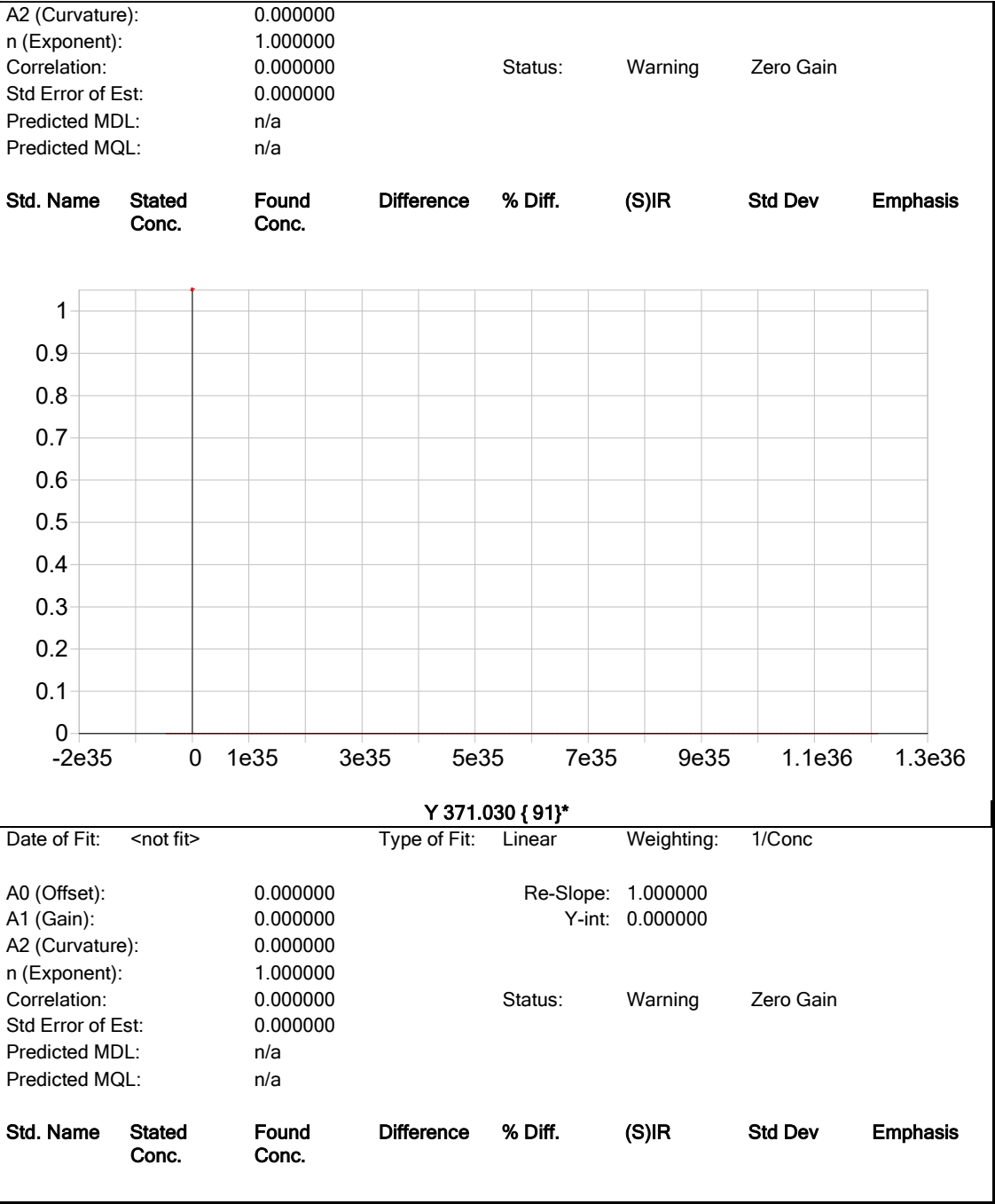


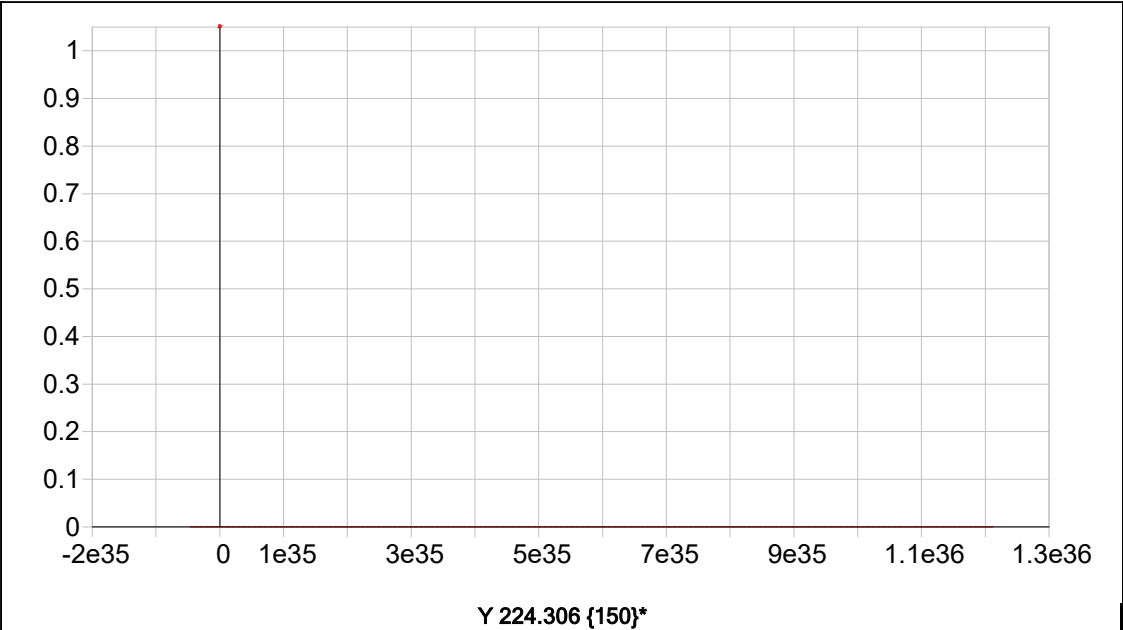
Date of Fit:	12/20/2024 19:08:20	Type of Fit:	Linear	Weighting:	1/Conc
A0 (Offset):	0.000000	Re-Slope:	1.000000		
A1 (Gain):	0.000000	Y-int:	0.000000		
A2 (Curvature):	0.000000				
n (Exponent):	1.000000				
Correlation:	0.000000	Status:	Warning	Zero Gain	
Std Error of Est:	0.000000				
Predicted MDL:	n/a				
Predicted MQL:	n/a				

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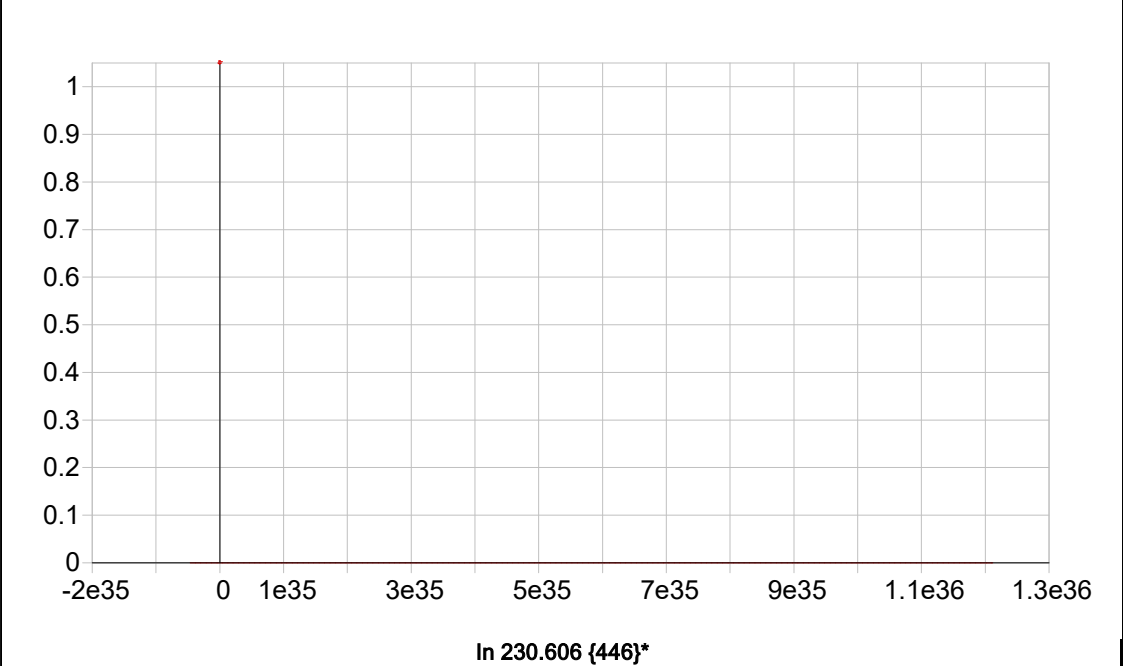


Date of Fit:	<not fit>	Type of Fit:	Linear	Weighting:	1/Conc
A0 (Offset):	0.000000	Re-Slope:	1.000000		
A1 (Gain):	0.000000	Y-int:	0.000000		





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



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

LB133852

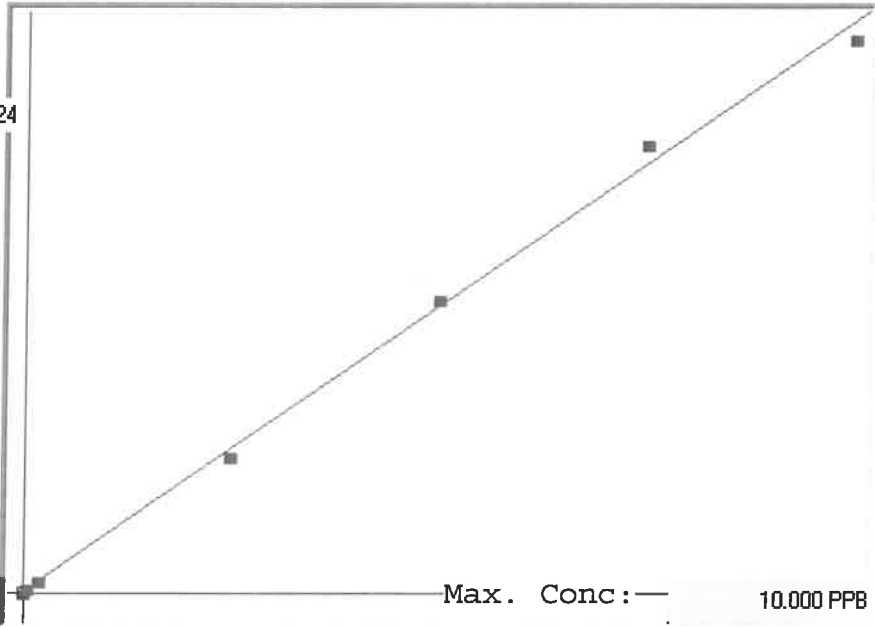
245.1

INSTRUMENT ID: CV1

Linear

μ Abs.:

35324



A= 0.0000e+000

B= 2.7480e-004

C= -3.0257e-002

Rho= 0.9986519

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	-0.020	-0.020	36	0.000	36				
0.05	0.050	0.051	0.001	297	0.0 %	297	0			
0.2	0.200	0.183	-0.017	777	0.0 %	777				
2.5	2.500	2.383	-0.117	8781	0.0 %	8781				
5.0	5.000	5.121	0.121	18746	0.0 %	18746				
7.5	7.500	7.855	0.355	28696	0.0 %	28696				
10.0	10.000	9.677	-0.323	35324	0.0 %	35324				

0/011
1
2
1
9
5
2
5
3

LB133852 INSTRUMENT ID : CV1

Method: 245.1

Operator: Admin

Date of Analysis: 10 Dec 2024 09:29:03

Sample ID	Extended ID	µ Abs	Conc	Std Conc	Method	Units	Date	Type	Type
0.0 - 1	30	38	-	0.0000	245.1	PPB	10 Dec 2024 09:37:35	S	Std
0.05 - 1	50.05	297	-	0.0500	245.1	PPB	10 Dec 2024 09:42:31	S	Std
0.2 - 1	50.2	777	-	0.2000	245.1	PPB	10 Dec 2024 09:44:48	S	Std
2.5 - 1	52.5	8781	-	2.5000	245.1	PPB	10 Dec 2024 09:47:04	S	Std
5.0 - 1	55	18746	-	5.0000	245.1	PPB	10 Dec 2024 09:49:20	S	Std
7.5 - 1	57.5	28696	-	7.5000	245.1	PPB	10 Dec 2024 09:51:37	S	Std
10.0 - 1	510	35324	-	10.0000	245.1	PPB	10 Dec 2024 09:59:28	S	Std
ICV14 - 1	ICV14	14778	4.0307	-245.1		PPB	10 Dec 2024 10:09:31	U	SMPL
ICB14 - 1	ICB14	-6	-0.0319	-245.1		PPB	10 Dec 2024 10:17:09	U	SMPL
CCV10 - 1	CCV10	19970	5.4574	-245.1		PPB	10 Dec 2024 10:29:43	U	SMPL
CCB10 - 1	CCB10	48	-0.0171	-245.1		PPB	10 Dec 2024 10:34:42	U	SMPL
CRA - 1	CRA	248	0.0379	-245.1		PPB	10 Dec 2024 10:39:32	U	SMPL
HighStd - 1	HighStd	31722	8.6868	-245.1		PPB	10 Dec 2024 10:49:15	U	SMPL
ChkStd - 1	ChkStd	23934	6.5467	-245.1		PPB	10 Dec 2024 10:51:31	U	SMPL
PB165519BL - 1	PBW	-208	-0.0874	-245.1		PPB	10 Dec 2024 10:53:49	U	SMPL
PB165519BS - 1	LCSW	14515	3.9584	-245.1		PPB	10 Dec 2024 11:02:20	U	SMPL
P4368-10 - 1	LOD-MDL-WATER-04-QT4-2024	233	0.0338	-245.1		PPB	10 Dec 2024 11:12:18	U	SMPL
P4368-11 - 1	LOQ-WATER-05-QT4-2024	925	0.2239	-245.1		PPB	10 Dec 2024 11:14:34	U	SMPL
P5051-07 - 1	14B-(1-4)-COMP	4142	1.1079	-245.1		PPB	10 Dec 2024 11:16:51	U	SMPL
P5068-07 - 1	14B-(1-4)-COMP	3264	0.8667	-245.1		PPB	10 Dec 2024 11:19:08	U	SMPL
P5192-02 - 1	EFF-WASTE WATER	98	-0.0033	-245.1		PPB	10 Dec 2024 11:21:26	U	SMPL
CCV11 - 1	CCV11	17194	4.6946	-245.1		PPB	10 Dec 2024 11:26:17	U	SMPL
CCB11 - 1	CCB11	6	-0.0286	-245.1		PPB	10 Dec 2024 11:31:06	U	SMPL
P5192-02DUP - 1	EFF-WASTE WATERDUP	73	-0.0102	-245.1		PPB	10 Dec 2024 11:33:20	U	SMPL
P5192-02MS - 1	EFF-WASTE WATERMS	13290	3.6218	-245.1		PPB	10 Dec 2024 11:35:35	U	SMPL
P5192-02MSD - 1	EFF-WASTE WATERMSD	14418	3.9318	-245.1		PPB	10 Dec 2024 11:37:51	U	SMPL
P5192-02LX5 - 1		-187	-0.0816	-245.1		PPB	10 Dec 2024 11:40:09	U	SMPL
P5192-02A - 1		13463	3.6693	-245.1		PPB	10 Dec 2024 11:42:27	U	SMPL
CCV12 - 1	CCV12	19587	5.3522	-245.1		PPB	10 Dec 2024 11:44:43	U	SMPL
CCB12 - 1	CCB12	2	-0.0297	-245.1		PPB	10 Dec 2024 11:49:38	U	SMPL

SOP ID : M200.7-Trace Elements-22

SDG No : N/A

Matrix : WATER

Pipette ID: ICP A

Balance ID : N/A

Filter paper ID : N/A

pH Strip ID : M6069

Hood ID : #3

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

Start Digest Date: 12/19/2024 Time : 09:30 Temp : 95 °C

End Digest Date: 12/19/2024 Time : 12:40 Temp : 95 °C

Digestion tube ID: M5595

Block thermometer ID: MET-DIG. #1

Dig Technician Signature: *SKS*

Supervisor Signature: *AB*

Temp : 1. 95°C 2. N/A

Standardized Name	MLS USED	STD REF. # FROM LOG
LFS-1	0.25	M6000
LFS-2	0.25	M6009
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	1.00	M6126
1:1 HCL	0.50	MP83105
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
N/A	N/A	N/A
N/A	N/A	N/A

Extraction Conformance/Non-Conformance Comments:

Hot Block # 1 Cell # 50 Temp: 95 C

Date / Time	Prepped Sample Relinquished By/Location	Received By/Location
12/19/24 13:40	<i>SKS. met digestion</i>	<i>AB - metal lab</i>
	Preparation Group	Analysis Group

Lab Sample ID	Client Sample ID	pH	Initial Vol (ml)	Final Vol (ml)	Color Before	Color After	Clarity Before	Clarity After	Comment	Prep Pos
P5192-02	EFF-WASTE WATER	<2	50	25	Colorless	Colorless	Clear	Clear	N/A	11
P5327-01	12175-12176-12177-12178	<2	50	25	Colorless	Colorless	Clear	Clear	N/A	12
P5327-01MS	12175-12176-12177-12178 MS	<2	50	25	Colorless	Colorless	Clear	Clear	M6000,M6009	14
P5327-01MSD	12175-12176-12177-12178 MSD	<2	50	25	Colorless	Colorless	Clear	Clear	M6000,M6009	15
P5327-01DUP	12175-12176-12177-12178 DUP	<2	50	25	Colorless	Colorless	Clear	Clear	N/A	13
PB165738BL	PBW738	<2	50	25	Colorless	Colorless	Clear	Clear	N/A	16
PB165738BS	LCS738	<2	50	25	Colorless	Colorless	Clear	Clear	M6000,M6009	17

WORKLIST(Hardcopy Internal Chain)

Worklist Name : PB165738

Worklist ID : 186462

Department : Digestion

Date : 12-19-2024 08:25:34

Sample	Customer Sample	Matrix	Test	Preservative	Customer	Raw Sample Storage Location	Collect Date	Method
P5192-02	EFF-WASTE WATER	Water	Metals ICP-Group	1:1 HNO3 to pH < 2	ARDM01	M11	12/06/2024	200.7
P5327-01	12175-12176-12177-12178	Water	Metals Group3	1:1 HNO3 to pH < 2	LEOI01	L41	12/18/2024	200.7

Date/Time

Raw Sample Received by:

Raw Sample Relinquished by:

JD CSM

Date/Time

Raw Sample Received by:

Raw Sample Relinquished by:

JD CSM

Instrument ID: CV1

Daily Analysis Runlog For Sequence/QC Batch ID # LB133852

Review By	jaswal	Review On	12/10/2024 8:51:31 PM
Supervise By	mohan	Supervise On	12/10/2024 8:52:42 PM

STD. NAME	STD REF.#
ICAL Standard	MP83534,MP83535,MP83536,MP83537,MP83538,MP83538,MP83540
ICV Standard	MP83541
CCV Standard	MP83543
ICSA Standard	
CRI Standard	MP83545
LCS Standard	
Chk Standard	MP83542,MP83544,MP83546,MP83548

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	S0	S0	CAL1	12/10/24 09:37		Mohan	OK
2	S0.05	S0.05	CAL2	12/10/24 09:42		Mohan	OK
3	S0.2	S0.2	CAL3	12/10/24 09:44		Mohan	OK
4	S2.5	S2.5	CAL4	12/10/24 09:47		Mohan	OK
5	S5	S5	CAL5	12/10/24 09:49		Mohan	OK
6	S7.5	S7.5	CAL6	12/10/24 09:51		Mohan	OK
7	S10	S10	CAL7	12/10/24 09:59		Mohan	OK
8	ICV14	ICV14	ICV	12/10/24 10:09		Mohan	OK
9	ICB14	ICB14	ICB	12/10/24 10:17		Mohan	OK
10	CCV10	CCV10	CCV	12/10/24 10:29		Mohan	OK
11	CCB10	CCB10	CCB	12/10/24 10:34		Mohan	OK
12	CRA	CRA	CRDL	12/10/24 10:39		Mohan	OK
13	HighStd	HighStd	HIGH STD	12/10/24 10:49		Mohan	OK
14	ChkStd	ChkStd	SAM	12/10/24 10:51		Mohan	OK
15	PB165519BL	PB165519BL	MB	12/10/24 10:53		Mohan	OK
16	PB165519BS	PB165519BS	LCS	12/10/24 11:02		Mohan	OK
17	P4368-10	LOD-MDL-WATER-04	SAM	12/10/24 11:12		Mohan	OK
18	P4368-11	LOQ-WATER-05-QT4	LOQ	12/10/24 11:14	true value - 0.2	Mohan	OK

Instrument ID: CV1

Daily Analysis Runlog For Sequence/QC Batch ID # LB133852

Review By	jaswal	Review On	12/10/2024 8:51:31 PM
Supervise By	mohan	Supervise On	12/10/2024 8:52:42 PM

STD. NAME	STD REF.#
ICAL Standard	MP83534,MP83535,MP83536,MP83537,MP83538,MP83538,MP83540
ICV Standard	MP83541
CCV Standard	MP83543
ICSA Standard	
CRI Standard	MP83545
LCS Standard	
Chk Standard	MP83542,MP83544,MP83546,MP83548

19	P5051-07	14B-(1-4)-COMP	SAM	12/10/24 11:16		Mohan	OK
20	P5068-07	14B-(1-4)-COMP	SAM	12/10/24 11:19		Mohan	OK
21	P5192-02	EFF-WASTE WATER	SAM	12/10/24 11:21		Mohan	OK
22	CCV11	CCV11	CCV	12/10/24 11:26		Mohan	OK
23	CCB11	CCB11	CCB	12/10/24 11:31		Mohan	OK
24	P5192-02DUP	EFF-WASTE WATER	DUP	12/10/24 11:33		Mohan	OK
25	P5192-02MS	EFF-WASTE WATER	MS	12/10/24 11:35		Mohan	OK
26	P5192-02MSD	EFF-WASTE WATER	MSD	12/10/24 11:37		Mohan	OK
27	P5192-02L	EFF-WASTE WATER	SD	12/10/24 11:40		Mohan	OK
28	P5192-02A	EFF-WASTE WATER	PS	12/10/24 11:42		Mohan	OK
29	CCV12	CCV12	CCV	12/10/24 11:44		Mohan	OK
30	CCB12	CCB12	CCB	12/10/24 11:49		Mohan	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134054

Review By	Review On
Supervise By	Supervise On

STD. NAME	STD REF.#
ICAL Standard ICV Standard CCV Standard ICSA Standard CRI Standard LCS Standard Chk Standard	

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	S0	S0	CAL1	12/20/24 15:41		Kareem	OK
2	S1	S1	CAL2	12/20/24 15:46		Kareem	OK
3	S2	S2	CAL3	12/20/24 15:50		Kareem	OK
4	S3	S3	CAL4	12/20/24 15:54		Kareem	OK
5	S4	S4	CAL5	12/20/24 15:58		Kareem	OK
6	S5	S5	CAL6	12/20/24 16:03		Kareem	OK
7	ICV01	ICV01	ICV	12/20/24 16:07	ICV fail for Ba,Mg,V (200.7)	Kareem	OK
8	LLICV01	LLICV01	LLICV	12/20/24 16:11		Kareem	OK
9	ICB01	ICB01	ICB	12/20/24 16:21		Kareem	OK
10	CRI01	CRI01	CRDL	12/20/24 16:26		Kareem	OK
11	ICSA01	ICSA01	ICSA	12/20/24 16:30		Kareem	OK
12	ICSAB01	ICSAB01	ICSAB	12/20/24 16:34		Kareem	OK
13	ICSADL	ICSADL	ICSA	12/20/24 16:38		Kareem	OK
14	ICSABDL	ICSABDL	ICSAB	12/20/24 16:43		Kareem	OK
15	CCV01	CCV01	CCV	12/20/24 16:47		Kareem	OK
16	CCB01	CCB01	CCB	12/20/24 16:51		Kareem	OK
17	P5312-01	SOIL-VNJ-222	SAM	12/20/24 16:55		Kareem	OK
18	P5343-01	VNJ210	SAM	12/20/24 17:00		Kareem	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134054

Review By	Review On
Supervise By	Supervise On

STD. NAME	STD REF.#
ICAL Standard ICV Standard CCV Standard ICSA Standard CRI Standard LCS Standard Chk Standard	

19	P5316-01	TT-304-IDWSO-2024	SAM	12/20/24 17:04		Kareem	OK
20	P5343-03	VNJ281	SAM	12/20/24 17:08		Kareem	OK
21	P5312-03	CONCRETE-VNJ-222	SAM	12/20/24 17:12		Kareem	OK
22	P5279-02	ROCKAWAY-PARK	SAM	12/20/24 17:16		Kareem	OK
23	P5192-02	EFF-WASTE WATER	SAM	12/20/24 17:21		Kareem	OK
24	P5327-01	12175-12176-12177-1	SAM	12/20/24 17:25		Kareem	OK
25	CCV02	CCV02	CCV	12/20/24 17:29		Kareem	OK
26	CCB02	CCB02	CCB	12/20/24 17:34		Kareem	OK
27	PB165738BL	PB165738BL	MB	12/20/24 17:38		Kareem	OK
28	PB165738BS	PB165738BS	LCS	12/20/24 17:42		Kareem	OK
29	PB165754BL	PB165754BL	MB	12/20/24 17:46		Kareem	OK
30	PB165754BS	PB165754BS	LCS	12/20/24 17:51		Kareem	OK
31	PB165720BL	PB165720BL	MB	12/20/24 17:55		Kareem	OK
32	PB165720BS	PB165720BS	LCS	12/20/24 17:59		Kareem	OK
33	PB165679TB	PB165679TB	MB	12/20/24 18:03		Kareem	OK
34	PB165680TB	PB165680TB	MB	12/20/24 18:08		Kareem	OK
35	CCV03	CCV03	CCV	12/20/24 18:12		Kareem	OK
36	CCB03	CCB03	CCB	12/20/24 18:16		Kareem	OK
37	P5341-01	STORMWATER-AQ-C	SAM	12/20/24 18:21		Kareem	OK
38	P5341-03RE	TOTE-425RE	SAM	12/20/24 18:25	NOT USE	Kareem	Not Ok

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134054

Review By	Review On
Supervise By	Supervise On

STD. NAME	STD REF.#
ICAL Standard ICV Standard CCV Standard ICSA Standard CRI Standard LCS Standard Chk Standard	

39	P5343-06	PUMP-WATER-271	SAM	12/20/24 18:29		Kareem	OK
40	P5291-13RE	WC-20241213RE	SAM	12/20/24 18:33	NOT USE	Kareem	Not Ok
41	P5299-01	SB-01	SAM	12/20/24 18:38		Kareem	OK
42	P5327-01DUP	12175-12176-12177-1	DUP	12/20/24 18:42		Kareem	OK
43	P5327-01L	12175-12176-12177-1	SD	12/20/24 18:46		Kareem	OK
44	P5327-01MS	12175-12176-12177-1	MS	12/20/24 18:50		Kareem	OK
45	P5327-01MSD	12175-12176-12177-1	MSD	12/20/24 18:54		Kareem	OK
46	P5327-01A	12175-12176-12177-1	PS	12/20/24 18:58		Kareem	OK
47	CCV04	CCV04	CCV	12/20/24 19:02		Kareem	OK
48	CCB04	CCB04	CCB	12/20/24 19:11		Kareem	OK
49	P5343-06L	PUMP-WATER-271L	SD	12/20/24 19:16		Kareem	OK
50	P5343-06DUP	PUMP-WATER-271DUP	DUP	12/20/24 19:20		Kareem	OK
51	P5343-06MS	PUMP-WATER-271MS	MS	12/20/24 19:24		Kareem	OK
52	P5343-06MSD	PUMP-WATER-271MSD	MSD	12/20/24 19:28		Kareem	OK
53	P5343-06A	PUMP-WATER-271A	PS	12/20/24 19:32		Kareem	OK
54	P5291-13DUP	WC-20241213DUP	DUP	12/20/24 19:37		Kareem	OK
55	P5291-13L	WC-20241213L	SD	12/20/24 19:41		Kareem	OK
56	P5291-13MS	WC-20241213MS	MS	12/20/24 19:45		Kareem	OK
57	P5291-13MSD	WC-20241213MSD	MSD	12/20/24 19:49		Kareem	OK
58	P5291-13A	WC-20241213A	PS	12/20/24 19:53		Kareem	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134054

Review By	Review On
Supervise By	Supervise On

STD. NAME	STD REF.#
ICAL Standard ICV Standard CCV Standard ICSA Standard CRI Standard LCS Standard Chk Standard	

59	CCV05	CCV05	CCV	12/20/24 19:57		Kareem	OK
60	CCB05	CCB05	CCB	12/20/24 20:01		Kareem	OK
61	P5299-02	SB-02	SAM	12/20/24 20:06		Kareem	OK
62	P5299-03	SB-01	SAM	12/20/24 20:10		Kareem	OK
63	P5299-04	SB-02	SAM	12/20/24 20:14		Kareem	OK
64	P5299-04DUP	SB-02DUP	DUP	12/20/24 20:18		Kareem	OK
65	P5299-04L	SB-02L	SD	12/20/24 20:22		Kareem	OK
66	P5299-04MS	SB-02MS	MS	12/20/24 20:26		Kareem	OK
67	P5299-04MSD	SB-02MSD	MSD	12/20/24 20:30		Kareem	OK
68	P5299-04A	SB-02A	PS	12/20/24 20:34		Kareem	OK
69	PB165722BL	PB165722BL	MB	12/20/24 20:38		Kareem	OK
70	PB165722BS	PB165722BS	LCS	12/20/24 20:43		Kareem	OK
71	CCV06	CCV06	CCV	12/20/24 20:47		Kareem	OK
72	CCB06	CCB06	CCB	12/20/24 20:51		Kareem	OK
73	P5330-01	TP-5	SAM	12/20/24 20:55		Kareem	OK
74	P5342-01	CHRT26634	SAM	12/20/24 20:59		Kareem	OK
75	P5342-03	HT2651	SAM	12/20/24 21:04		Kareem	OK
76	P5342-05	RB21198	SAM	12/20/24 21:08		Kareem	OK
77	P5343-03DUP	VNJ281DUP	DUP	12/20/24 21:12		Kareem	OK
78	P5343-03L	VNJ281L	SD	12/20/24 21:16		Kareem	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134054

Review By	Review On
Supervise By	Supervise On

STD. NAME	STD REF.#
ICAL Standard ICV Standard CCV Standard ICSA Standard CRI Standard LCS Standard Chk Standard	

79	P5343-03MSD	VNJ281MSD	MSD	12/20/24 21:24		Kareem	OK
80	P5343-03A	VNJ281A	PS	12/20/24 21:28		Kareem	OK
81	PB165753BL	PB165753BL	MB	12/20/24 21:32		Kareem	OK
82	CCV07	CCV07	CCV	12/20/24 21:37		Kareem	OK
83	CCB07	CCB07	CCB	12/20/24 22:04		Kareem	OK
84	PB165753BS	PB165753BS	LCS	12/20/24 22:08		Kareem	OK
85	P5337-01	ETGI-357	SAM	12/20/24 22:12		Kareem	OK
86	P5339-01	TR-06-12182024	SAM	12/20/24 22:17		Kareem	OK
87	P5355-01	RBR251688	SAM	12/20/24 22:21	MS/MSD fail for more than parameters	Kareem	Not Ok
88	P5355-01DUP	RBR251688DUP	DUP	12/20/24 22:25	MS/MSD fail for more than parameters	Kareem	Not Ok
89	P5355-01L	RBR251688L	SD	12/20/24 22:29	MS/MSD fail for more than parameters	Kareem	Not Ok
90	P5355-01MS	RBR251688MS	MS	12/20/24 22:33	MS/MSD fail for more than parameters	Kareem	Not Ok
91	P5355-01MSD	RBR251688MSD	MSD	12/20/24 22:38	MS/MSD fail for more than parameters	Kareem	Not Ok
92	P5355-01A	RBR251688A	PS	12/20/24 22:42	MS/MSD fail for more than parameters	Kareem	Not Ok
93	PB165786BL	PB165786BL	MB	12/20/24 22:46		Kareem	OK
94	CCV08	CCV08	CCV	12/20/24 23:01		Kareem	OK
95	CCB08	CCB08	CCB	12/20/24 23:12		Kareem	OK
96	PB165786BS	PB165786BS	LCS	12/20/24 23:17		Kareem	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB134054

Review By	Review On
Supervise By	Supervise On
STD. NAME	STD REF.#
ICAL Standard ICV Standard CCV Standard ICSA Standard CRI Standard LCS Standard Chk Standard	

97	P5341-03	TOTE-425	SAM	12/20/24 23:21		Kareem	OK
98	P5291-13	WC-20241213	SAM	12/20/24 23:25		Kareem	OK
99	LR1	LR1	HIGH STD	12/20/24 23:29		Kareem	OK
100	LR2	LR2	HIGH STD	12/20/24 23:41		Kareem	OK
101	P5343-03MS	VNJ281MS	MS	12/20/24 23:46		Kareem	OK
102	CCV09	CCV09	CCV	12/20/24 23:55		Kareem	OK
103	CCB09	CCB09	CCB	12/21/24 00:05		Kareem	OK

Prep Standard - Chemical Standard Summary

Order ID : P5192

Test : Mercury, Metals ICP-Group

Prepbatch ID : PB165519, PB165738,

Sequence ID/Qc Batch ID: LB133852, LB134054, LB134054,

Standard ID :

MP83105, MP835337, MP83534, MP83535, MP83536, MP83538, MP83540, MP83541, MP83542, MP83543, MP83544, MP83545, MP83546, MP83548,

Chemical ID :

M5062, M5882, M5953, M6000, M6009, M6111, M6121, M6126, W3112,

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
170	1:1HCL	MP83105	11/07/2024	12/27/2024	Janvi Patel	None	None	Sarabjit Jaswal
								11/07/2024

FROM 1000.00000ml of M6111 + 1000.00000ml of W3112 = Final Quantity: 2000.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1340	Hg 0.00 PPB STD	MP83534	12/10/2024	12/11/2024	Mohan Bera	None	METALS_PIPETTE_5 (HG A)	Sarabjit Jaswal
								12/10/2024

FROM 2.50000ml of M6126 + 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>
2750	Hg 0.05ppb	MP83535	12/10/2024	12/11/2024	Mohan Bera	None	METALS_PIPETTE_5 (HG)	Sarabjit Jaswal
FROM 2.50000ml of M6126 + 247.45000ml of W3112 + 0.05000ml of MP83533 = 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	MP83536	12/10/2024	12/11/2024	Mohan Bera	None	METALS_PIPETTE_5 (HG)	Sarabjit Jaswal
FROM 2.50000ml of M6126 + 247.30000ml of W3112 + 0.20000ml of MP83533 = 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	MP83538	12/10/2024	12/11/2024	Mohan Bera	None	METALS_PIPETTE_5 (HG)	Sarabjit Jaswal
FROM 2.50000ml of M6126 + 242.50000ml of W3112 + 5.00000ml of MP83533 = 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	MP83540	12/10/2024	12/11/2024	Mohan Bera	None	METALS_PIPETTE_5 (HG A)	Sarabjit Jaswal 12/10/2024
<u>FROM</u>	2.50000ml of M6126 + 237.50000ml of W3112 + 10.00000ml of MP83533 = 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	MP83541	12/10/2024	12/11/2024	Mohan Bera	None	METALS_PIPETTE_5 (HG	Sarabjit Jaswal
A) FROM 2.50000ml of M5953 + 2.50000ml of M6126 + 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)	MP83542	12/10/2024	12/11/2024	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Sarabjit Jaswal 12/10/2024
FROM 2.50000ml of M6126 + 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)	MP83543	12/10/2024	12/11/2024	Mohan Bera	None	METALS_PIPETTE_5 (HG A)	Sarabjit Jaswal 12/10/2024
FROM 485.00000ml of W3112 + 5.00000ml of M6126 + 10.00000ml of MP83533 = 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)	MP83544	12/10/2024	12/11/2024	Mohan Bera	None	METALS_PIPETTE_5 (HG A)	Sarabjit Jaswal 12/10/2024
FROM 495.00000ml of W3112 + 5.00000ml of M6126 = 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)	MP83545	12/10/2024	12/11/2024	Mohan Bera	None	METALS_PIPETTE_5 (HG A)	Sarabjit Jaswal 12/10/2024
<u>FROM</u>	2.50000ml of M6126 + 247.30000ml of W3112 + 0.20000ml of MP83533 = 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>
1350	CHK STD (Hg 7.0 PPB SOLUTION)	MP83546	12/10/2024	12/11/2024	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Sarabjit Jaswal 12/10/2024
<u>FROM</u>	2.50000ml of M6126 + 240.50000ml of W3112 + 7.00000ml of MP83533 = 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>PipettelID</u>	<u>Supervised By</u>
68	STANNOUS CHLORIDE SOLUTION	MP83548	12/10/2024	12/11/2024	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal 12/10/2024
<u>FROM</u> 450.00000ml of W3112 + 50.00000gram of M5882 + 50.00000ml of M6121 = 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 #
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 #
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 #
EPA	ICV-5 / ICV (HG) STOCK SOLN	ICV5-0415	01/01/2025	07/01/2024 / mohan	03/30/2023 / mohan	M5953

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	WW-LFS-1 / Laboratory Fortified Stock Solution 1, 125 ml	T2-MEB723367	08/30/2026	08/13/2024 / Jaswal	05/14/2024 / Jaswal	M6000

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	U2-MEB731108	03/17/2028	08/13/2024 / Jaswal	05/14/2024 / Jaswal	M6009

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9530-33 / Hydrochloric Acid, Instra-Analyzed (cs/6x2.5L)	22F0762009	05/09/2027	11/04/2024 / Eman	09/29/2024 / Janvi	M6111

CHEMICAL RECEIPT LOG BOOK

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

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

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



Refine your results. Redefine your industry.

RD:05/14/2024

Certificate of Analysis

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F: 540-585-3012

info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code:	Multi Analyte Custom Grade Solution
Catalog Number:	WW-LFS-1
Lot Number:	T2-MEB723367
Matrix:	5% (v/v) HNO ₃

Value / Analyte(s):	1 000 µg/mL ea:	
	Potassium,	
	600 µg/mL ea:	
	Phosphorus,	
	300 µg/mL ea:	
	Sodium,	Iron,
	200 µg/mL ea:	
	Magnesium,	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	200.0 ± 0.7 µg/mL	Arsenic, As	80.0 ± 0.7 µg/mL
Barium, Ba	20.00 ± 0.09 µg/mL	Beryllium, Be	20.00 ± 0.13 µg/mL
Boron, B	30.00 ± 0.18 µg/mL	Cadmium, Cd	20.00 ± 0.09 µg/mL
Calcium, Ca	100.0 ± 0.4 µg/mL	Cerium, Ce	200.0 ± 0.8 µg/mL
Chromium, Cr	40.00 ± 0.30 µg/mL	Cobalt, Co	20.00 ± 0.10 µg/mL
Copper, Cu	30.00 ± 0.13 µg/mL	Iron, Fe	300.0 ± 1.3 µg/mL
Lead, Pb	100.0 ± 0.4 µg/mL	Lithium, Li	20.00 ± 0.08 µg/mL
Magnesium, Mg	200.0 ± 0.8 µg/mL	Manganese, Mn	20.00 ± 0.08 µg/mL
Mercury, Hg	70.0 ± 0.3 µg/mL	Nickel, Ni	50.00 ± 0.22 µg/mL
Phosphorus, P	600.0 ± 2.7 µg/mL	Potassium, K	1 000 ± 4 µg/mL
Selenium, Se	200.0 ± 1.3 µg/mL	Silver, Ag	7.50 ± 0.03 µg/mL
Sodium, Na	300.0 ± 1.4 µg/mL	Strontium, Sr	20.01 ± 0.08 µg/mL
Thallium, Tl	200.0 ± 1.4 µg/mL	Vanadium, V	30.00 ± 0.13 µg/mL
Zinc, Zn	20.00 ± 0.09 µg/mL		

Density: 1.034 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ag	ICP Assay	3151	160729
Ag	Volhard	999c	999c
Ag	Calculated		See Sec. 4.2
Al	ICP Assay	3101a	140903
Al	EDTA	928	928
As	ICP Assay	3103a	100818
B	ICP Assay	3107	190605
Ba	ICP Assay	3104a	140909
Ba	Gravimetric		See Sec. 4.2
Be	ICP Assay	3105a	090514
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
Cd	ICP Assay	3108	130116
Cd	EDTA	928	928
Ce	ICP Assay	3110	090504
Ce	EDTA	928	928
Co	ICP Assay	3113	190630
Co	EDTA	928	928
Cr	ICP Assay	3112a	170630
Cu	ICP Assay	3114	121207
Cu	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
Hg	ICP Assay	3133	160921
Hg	EDTA	928	928
K	ICP Assay	3141a	140813
K	Gravimetric		See Sec. 4.2
Li	ICP Assay	3129a	100714
Li	Gravimetric		See Sec. 4.2
Mg	ICP Assay	3131a	140110
Mg	EDTA	928	928
Mn	ICP Assay	3132	050429
Mn	EDTA	928	928
Na	ICP Assay	Traceable to 3152A	S2-NA700842
Na	Gravimetric		See Sec. 4.2
Ni	ICP Assay	3136	120619
Ni	EDTA	928	928
P	ICP Assay	3139a	060717
P	Acidimetric	84L	84L
Pb	ICP Assay	3128	101026
Pb	EDTA	928	928
Se	ICP Assay	3149	100901
Sr	EDTA	928	928
Sr	ICP Assay	Traceable to 3153a	K2-SR650985
Tl	ICP Assay	3158	151215
V	IC Assay	3165	160906
V	EDTA	928	928
Zn	ICP Assay	3168a	120629
Zn	EDTA	928	928

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

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

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

Low Silver Note: This solution contains "LOW" levels of Silver. Please store this entire bottle inside a sealed glass jar.

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

August 30, 2022

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

11.2 Lot Expiration Date

- August 30, 2026

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





Refine your results. Redefine your industry.

RD:05/14/2024

Certificate of Analysis

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1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: WW-LFS-2
Lot Number: U2-MEB731108
Matrix: 5% (v/v) HNO₃
tr. HF
Value / Analyte(s):
200 µg/mL ea:
Silica,
80 µg/mL ea:
Antimony,
70 µg/mL ea:
Tin,
40 µg/mL ea:
Molybdenum,
20 µg/mL ea:
Titanium

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Antimony, Sb	80.1 ± 0.6 µg/mL	Molybdenum, Mo	40.03 ± 0.18 µg/mL
Silica, SiO ₂	200.2 ± 1.3 µg/mL	Tin, Sn	70.0 ± 0.4 µg/mL
Titanium, Ti	20.01 ± 0.13 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
Mo	Calculated		See Sec. 4.2
Sb	ICP Assay	3102a	140911
SiO ₂	ICP Assay	3150	130912
Sn	ICP Assay	3161a	140917
Ti	ICP Assay	3162a	130925
Ti	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, $X_{\text{CRM/RM}}$, 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:

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{TS} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

N/A

6.0 INTENDED USE

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

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 17, 2023

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

11.2 Lot Expiration Date

- **March 17, 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



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1.0 ACCREDITATION / REGISTRATION

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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.

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

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

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





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

Instructions for QATS Reference Material: *Inorganic ICV Solutions*

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

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

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

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



M5528-32
M5953
3/30/23

(A) **SAMPLE DESCRIPTION**

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

(B) **BREAKAGE OR MISSING ITEMS**

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

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

(C) **ANALYSIS OF SAMPLES**

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

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





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

Instructions for QATS Reference Material: Inorganic ICV Solutions

ICV1-1014

For ICP-MS analysis, use a 50-fold dilution by pipetting 2 mL of the ICV1 concentrate into a 100 mL volumetric flask and dilute to volume with 1% (v/v) nitric acid.

ICV5-0415

For the cold vapor analysis of mercury by AA, use a 100-fold dilution by pipetting 1 mL of the ICV5 concentrate into a 100 mL volumetric flask and dilute to volume with 2% (v/v) nitric acid. The ICV5 concentrate is prepared in 0.05% (w/v) $K_2Cr_2O_7$ and 5% (v/v) nitric acid.

ICV6-0400

For the analysis of cyanide, use a 100-fold dilution by pipetting 1 mL of the ICV6 concentrate into a 100 mL volumetric flask and dilute to volume with Type II water. Distill this solution along with the samples before analysis. The cyanide concentrate is prepared from $K_3Fe(CN)_6$, Type II water, and 0.1 % sodium hydroxide, and will decompose rapidly if exposed to light.

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

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

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

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

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

Receive date
9/29/24
Met diag.

 avantor™



Material No.: 9530-33
Batch No.: 22F0762009
Manufactured Date: 2022-05-10
Retest Date: 2027-05-09
Revision No.: 0

M6109
M6110
M6111

Certificate of Analysis

Test	Specification	Result
ACS – Assay (as HCl) (by acid–base titrn)	36.5 – 38.0 %	37.6 %
ACS – Color (APHA)	≤ 10	5
ACS – Residue after Ignition	≤ 3 ppm	< 1 ppm
ACS – Specific Gravity at 60°/60°F	1.185 – 1.192	1.190
ACS – Bromide (Br)	≤ 0.005 %	< 0.005 %
ACS – Extractable Organic Substances	≤ 5 ppm	< 1 ppm
ACS – Free Chlorine (as Cl ₂)	≤ 0.5 ppm	< 0.5 ppm
Phosphate (PO ₄)	≤ 0.05 ppm	< 0.03 ppm
Sulfate (SO ₄)	≤ 0.5 ppm	< 0.3 ppm
Sulfite (SO ₃)	≤ 0.8 ppm	0.3 ppm
Ammonium (NH ₄)	≤ 3 ppm	< 1 ppm
Trace Impurities – Arsenic (As)	≤ 0.010 ppm	< 0.003 ppm
Trace Impurities – Aluminum (Al)	≤ 10.0 ppb	0.8 ppb
Arsenic and Antimony (as As)	≤ 5.0 ppb	< 3.0 ppb
Trace Impurities – Barium (Ba)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Beryllium (Be)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Bismuth (Bi)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Boron (B)	≤ 20.0 ppb	< 5.0 ppb
Trace Impurities – Cadmium (Cd)	≤ 1.0 ppb	< 0.3 ppb
Trace Impurities – Calcium (Ca)	≤ 50.0 ppb	14.9 ppb
Trace Impurities – Chromium (Cr)	≤ 1.0 ppb	< 0.4 ppb
Trace Impurities – Cobalt (Co)	≤ 1.0 ppb	< 0.3 ppb
Trace Impurities – Copper (Cu)	≤ 1.0 ppb	< 0.1 ppb
Trace Impurities – Gallium (Ga)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Germanium (Ge)	≤ 3.0 ppb	< 2.0 ppb
Trace Impurities – Gold (Au)	≤ 4.0 ppb	0.2 ppb
Heavy Metals (as Pb)	≤ 100 ppb	< 50 ppb
Trace Impurities – Iron (Fe)	≤ 15 ppb	6 ppb

>>> Continued on page 2 >>>

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



Material No.: 9530-33
Batch No.: 22F0762009

Test	Specification	Result
Trace Impurities – Lead (Pb)	≤ 1.0 ppb	< 0.5 ppb
Trace Impurities – Lithium (Li)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Magnesium (Mg)	≤ 10.0 ppb	0.8 ppb
Trace Impurities – Manganese (Mn)	≤ 1.0 ppb	< 0.4 ppb
Trace Impurities – Mercury (Hg)	≤ 0.5 ppb	0.1 ppb
Trace Impurities – Molybdenum (Mo)	≤ 10.0 ppb	< 3.0 ppb
Trace Impurities – Nickel (Ni)	≤ 4.0 ppb	< 0.3 ppb
Trace Impurities – Niobium (Nb)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Potassium (K)	≤ 9.0 ppb	< 2.0 ppb
Trace Impurities – Selenium (Se), For Information Only		< 1.0 ppb
Trace Impurities – Silicon (Si)	≤ 100.0 ppb	1.0 ppb
Trace Impurities – Silver (Ag)	≤ 1.0 ppb	< 0.3 ppb
Trace Impurities – Sodium (Na)	≤ 100.0 ppb	0.7 ppb
Trace Impurities – Strontium (Sr)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Tantalum (Ta)	≤ 1.0 ppb	< 0.9 ppb
Trace Impurities – Thallium (Tl)	≤ 5.0 ppb	< 2.0 ppb
Trace Impurities – Tin (Sn)	≤ 5.0 ppb	< 0.8 ppb
Trace Impurities – Titanium (Ti)	≤ 1.0 ppb	0.2 ppb
Trace Impurities – Vanadium (V)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Zinc (Zn)	≤ 5.0 ppb	0.8 ppb
Trace Impurities – Zirconium (Zr)	≤ 1.0 ppb	< 0.1 ppb

>>> Continued on page 3 >>>

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

 **avantor™**

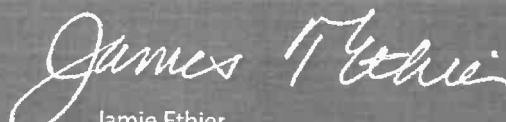


Material No.: 9530-33
Batch No.: 22F0762009

Test	Specification	Result
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For Laboratory, Research, or Manufacturing Use
Product Information (not specifications):
Appearance (clear, fuming liquid)
Meets ACS Specifications
Storage Condition: Store below 25 °C.

Country of Origin: USA
Packaging Site: Phillipsburg Mfg Ctr & DC


Jamie Ethier
Vice President Global Quality

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

avantor™



R → 16/13/24
Met dig

M 6121

Material No.: 9530-33
Batch No.: 0000275677
Manufactured Date: 2020/12/16
Retest Date: 2025/12/15
Revision No: 1

Certificate of Analysis

Test	Specification	Result
ACS – Assay (as HCl) (by acid-base titrn)	36.5 – 38.0 %	37.6
ACS – Color (APHA)	≤ 10	5
ACS – Residue after Ignition	≤ 3 ppm	1
ACS – Specific Gravity at 60°/60°F	1.185 – 1.192	1.190
ACS – Bromide (Br)	≤ 0.005 %	< 0.005
ACS – Extractable Organic Substances	≤ 5 ppm	1
ACS – Free Chlorine (as Cl ₂)	≤ 0.5 ppm	< 0.5
Phosphate (PO ₄)	≤ 0.05 ppm	< 0.03
Sulfate (SO ₄)	≤ 0.5 ppm	< 0.3
Sulfite (SO ₃)	≤ 0.8 ppm	0.3
Ammonium (NH ₄)	≤ 3 ppm	< 1
Trace Impurities – Arsenic (As)	≤ 0.010 ppm	< 0.003
Trace Impurities – Aluminum (Al)	≤ 10.0 ppb	< 0.2
Arsenic and Antimony (as As)	≤ 5 ppb	< 3
Trace Impurities – Barium (Ba)	≤ 1.0 ppb	< 0.2
Trace Impurities – Beryllium (Be)	≤ 1.0 ppb	< 0.2
Trace Impurities – Bismuth (Bi)	≤ 10.0 ppb	< 1.0
Trace Impurities – Boron (B)	≤ 20.0 ppb	< 5.0
Trace Impurities – Cadmium (Cd)	≤ 1.0 ppb	< 0.3
Trace Impurities – Calcium (Ca)	≤ 50.0 ppb	29.7
Trace Impurities – Chromium (Cr)	≤ 1.0 ppb	< 0.4
Trace Impurities – Cobalt (Co)	≤ 1.0 ppb	< 0.3
Trace Impurities – Copper (Cu)	≤ 1.0 ppb	< 0.1
Trace Impurities – Gallium (Ga)	≤ 1.0 ppb	< 0.2

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700

Avantor Performance Materials, LLC

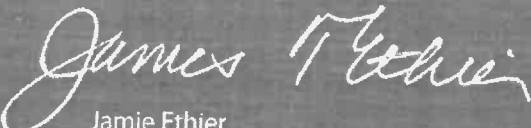
100 Matsonford Rd, Suite 200, Radnor, PA 19087. U.S.A. Phone: 610.386.1700

Material No.: 9530-33
Batch No.: 0000275677

Test	Specification	Result
Trace Impurities – Germanium (Ge)	<= 3.0 ppb	< 2.0
Trace Impurities – Gold (Au)	<= 4.0 ppb	< 0.2
Heavy Metals (as Pb)	<= 100 ppb	< 50
Trace Impurities – Iron (Fe)	<= 15.0 ppb	< 1
Trace Impurities – Lead (Pb)	<= 1.0 ppb	< 0.5
Trace Impurities – Lithium (Li)	<= 1.0 ppb	0.2
Trace Impurities – Magnesium (Mg)	<= 10.0 ppb	0.4
Trace Impurities – Manganese (Mn)	<= 1.0 ppb	< 0.4
Trace Impurities – Mercury (Hg)	<= 0.5 ppb	0.1
Trace Impurities – Molybdenum (Mo)	<= 10.0 ppb	< 5.0
Trace Impurities – Nickel (Ni)	<= 4.0 ppb	< 0.3
Trace Impurities – Niobium (Nb)	<= 1.0 ppb	< 0.2
Trace Impurities – Potassium (K)	<= 9.0 ppb	< 2.0
Trace Impurities – Selenium (Se), For Information Only	ppb	1.0
Trace Impurities – Silicon (Si)	<= 100.0 ppb	< 10.0
Trace Impurities – Silver (Ag)	<= 1.0 ppb	< 0.3
Trace Impurities – Sodium (Na)	<= 100.0 ppb	< 5.0
Trace Impurities – Strontium (Sr)	<= 1.0 ppb	< 0.2
Trace Impurities – Tantalum (Ta)	<= 1.0 ppb	< 0.9
Trace Impurities – Thallium (Tl)	<= 5.0 ppb	< 2.0
Trace Impurities – Tin (Sn)	<= 5.0 ppb	< 0.8
Trace Impurities – Titanium (Ti)	<= 1.0 ppb	0.2
Trace Impurities – Vanadium (V)	<= 1.0 ppb	< 0.2
Trace Impurities – Zinc (Zn)	<= 5.0 ppb	0.3
Trace Impurities – Zirconium (Zr)	<= 1.0 ppb	< 0.1

For Laboratory, Research or Manufacturing Use
Product Information (not specifications):
Appearance (clear, fuming liquid)
Meets ACS Specifications

Country of Origin: US
Packaging Site: Phillipsburg Mfg Ctr & DC


Jamie Ethier
Vice President Global Quality

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700

Avantor Performance Materials, LLC
100 Matsonford Rd, Suite 200, Radnor, PA 19087. U.S.A. Phone: 610.386.1700

Nitric Acid 69%
CMOS



R → 11/12/24

M6126

Material No.: 9606-03
Batch No.: 24D1062002
Manufactured Date: 2024-03-26
Retest Date: 2029-03-25
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
Assay (HNO ₃)	69.0 – 70.0 %	69.7 %
Appearance	Passes Test	Passes Test
Color (APHA)	≤ 10	5
Residue after Ignition	≤ 2 ppm	1 ppm
Chloride (Cl)	≤ 0.08 ppm	< 0.03 ppm
Phosphate (PO ₄)	≤ 0.10 ppm	< 0.03 ppm
Sulfate (SO ₄)	≤ 0.2 ppm	< 0.2 ppm
Trace Impurities – Aluminum (Al)	≤ 40.0 ppb	< 1.0 ppb
Arsenic and Antimony (as As)	≤ 5.0 ppb	< 2.0 ppb
Trace Impurities – Barium (Ba)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Beryllium (Be)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Bismuth (Bi)	≤ 20.0 ppb	< 10.0 ppb
Trace Impurities – Boron (B)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities – Cadmium (Cd)	≤ 50 ppb	< 1 ppb
Trace Impurities – Calcium (Ca)	≤ 50.0 ppb	2.3 ppb
Trace Impurities – Chromium (Cr)	≤ 30.0 ppb	< 1.0 ppb
Trace Impurities – Cobalt (Co)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Copper (Cu)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Gallium (Ga)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Germanium (Ge)	≤ 20 ppb	< 10 ppb
Trace Impurities – Gold (Au)	≤ 20 ppb	< 5 ppb
Heavy Metals (as Pb)	≤ 100 ppb	100 ppb
Trace Impurities – Iron (Fe)	≤ 40.0 ppb	< 1.0 ppb
Trace Impurities – Lead (Pb)	≤ 20.0 ppb	< 10.0 ppb
Trace Impurities – Lithium (Li)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Magnesium (Mg)	≤ 20 ppb	< 1 ppb
Trace Impurities – Manganese (Mn)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Nickel (Ni)	≤ 20.0 ppb	< 5.0 ppb

>>> Continued on page 2 >>>

Nitric Acid 69%
CMOS

 **avantor**TM



Material No.: 9606-03
Batch No.: 24D1062002

Test	Specification	Result
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For Microelectronic Use

Country of Origin: USA
Packaging Site: Phillipsburg Mfg Ctr & DC



Jamie Croak
Director Quality Operations, Bioscience Production



SHIPPING DOCUMENTS

CLIENT INFORMATION

REPORT TO BE SENT TO:

COMPANY: HARDMORE INC
ADDRESS: 29 RIVERSIDE AVE BLDG 14
CITY Newark STATE: NJ ZIP: 07104
ATTENTION: Michael Sharphouse
PHONE: 973 481 2406 FAX: 973 481-2637

CLIENT PROJECT INFORMATION

PROJECT NAME:
PROJECT NO.: LOCATION:
PROJECT MANAGER:
e-mail:
PHONE: FAX:

CLIENT BILLING INFORMATION

BILL TO: PO#:
ADDRESS:
CITY STATE: ZIP:
ATTENTION: PHONE:

ANALYSIS

DATA TURNAROUND INFORMATION

FAX (RUSH) _____ DAYS*
HARDCOPY (DATA PACKAGE): _____ DAYS*
EDD: _____ DAYS*
*TO BE APPROVED BY CHEMTECH
STANDARD HARDCOPY TURNAROUND TIME IS 10 BUSINESS

DATA DELIVERABLE INFORMATION

☐ Level 1 (Results Only) ☐ Level 4 (QC + Full Raw Data)
☐ Level 2 (Results + QC) ☐ NJ Reduced ☐ US EPA CLP
☐ Level 3 (Results + QC) ☐ NYS ASP A ☐ NYS ASP B
+ Raw Data ☐ Other _____
☐ EDD FORMAT

1. VOA
2. CN
3. SVOA
4. BOD/TSS
5. METALS
6.
7.
8.
9.

PRESERVATIVES

COMMENTS

← Specify Preservatives
A-HCl D-NaOH
B-HNO3 E-ICE
C-H2SO4 F-OTHER

ALLIANCE SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		# OF BOTTLES										
			COMP	GRAB	DATE	TIME		1	2	3	4	5	6	7	8	9	
1.	EFF WASTE WATER	WW		X	12/6/27	7:15		X	X								
2.	EFF WASTE WATER	WW	X		12/6/27	6:45				X	X	X					
3.																	
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER: 1. <u>[Signature]</u>	DATE/TIME: <u>12/6/27 1425</u>	RECEIVED BY: 1. <u>Michael Sharphouse</u>	Conditions of bottles or coolers at receipt: ☐ COMPLIANT ☐ NON COMPLIANT ☐ COOLER TEMP <u>2-30.5</u> °C
RELINQUISHED BY SAMPLER: 2.	DATE/TIME: <u>12-6-27 1425</u>	RECEIVED BY: 2. <u>[Signature]</u>	Comments: <u>Zinc Lead Metals</u>
RELINQUISHED BY SAMPLER: 3.	DATE/TIME:	RECEIVED BY: 3.	Comments: <u>Fluoride</u>

Page ____ of ____ CLIENT: ☐ Hand Delivered ☐ Other Shipment Complete ☐ YES ☐ NO



284 Sheffield Street, Mountainside NJ 07092 (908)-789-8900 Fax : 908 789 8922

Laboratory Certification

Certified By	License No.
CAS EPA CLP Contract	68HERH20D0011
Connecticut	PH-0830
DOD ELAP (ANAB)	L2219
Maine	2024021
Maryland	296
New Hampshire	255424 Rev 1
New Jersey	20012
New York	11376
Pennsylvania	68-00548
Soil Permit	525-24-234-08441
Texas	T104704488

LOGIN REPORT/SAMPLE TRANSFER

Order ID : P5192 ARDM01

Order Date : 12/6/2024 2:34:00 PM

Project Mgr :

Client Name : Ardmore Chemical

Project Name : PVSC Monthly 2024

Report Type : Level 1

Client Contact : Michael Sharpouse

Receive DateTime : 12/6/2024 2:25:00 PM

EDD Type : NONE

Invoice Name : Ardmore Chemical

Purchase Order :

Hard Copy Date :

Invoice Contact : Michael Sharpouse

Date Signoff :

LAB ID	CLIENT ID	MATRIX	SAMPLE DATE	SAMPLE TIME	TEST	TEST GROUP	METHOD	FAX DATE	DUE DATES
P5192-01	EFF-WASTE WATER	Water	12/06/2024	07:55	VOC-PP		624.1		10 Bus. Days

Relinquished By : 

Date / Time : 12-6-24 15:35

Received By : 

Date / Time : 12-6-24 15:35

Storage Area : VOA Refridgerator Room