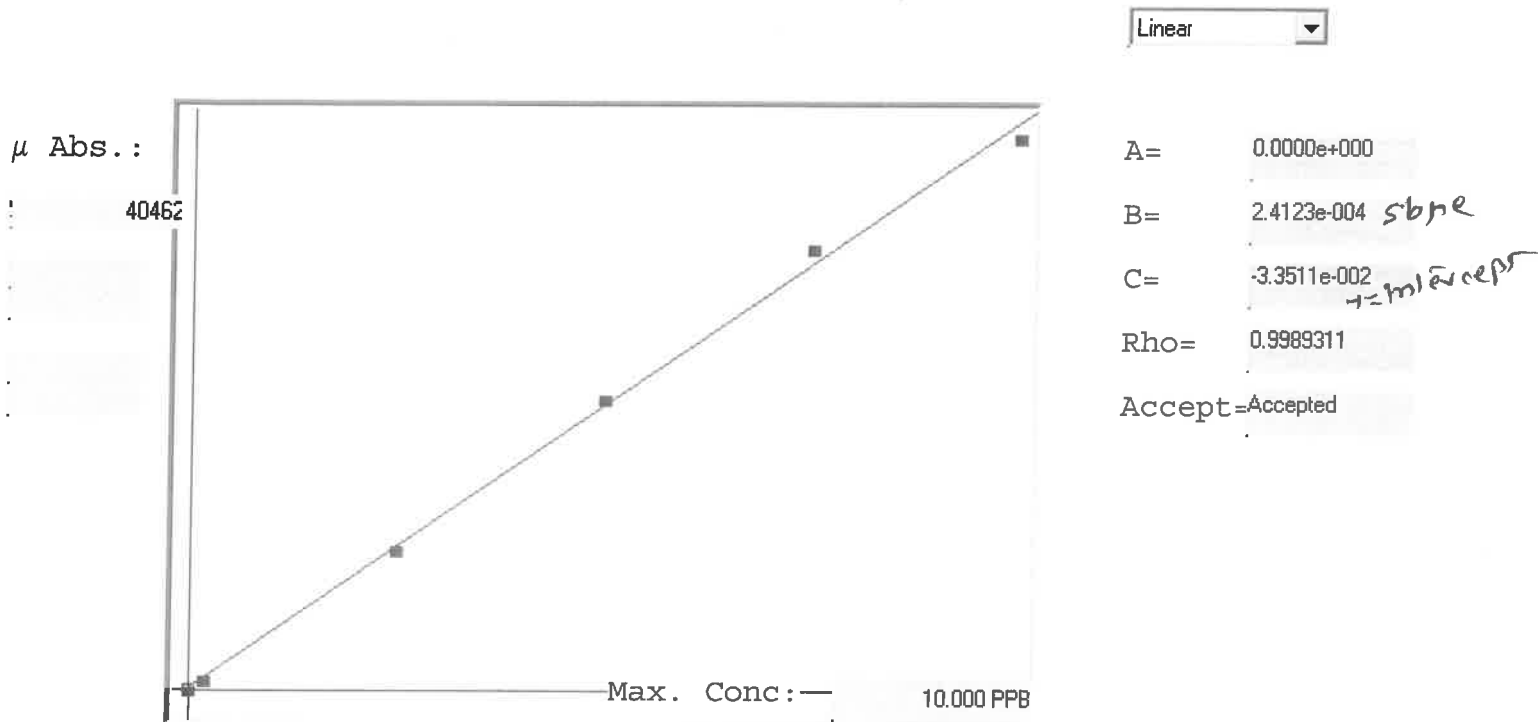


LB134747

SFAM01.1

INSTRUMENT ID: CV1



Std ID	Conc.	Calc.	Dev.	Mean	SD or %RSD	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	<i>o/d</i>
0.00	0.000	-0.034	-0.034	0	0.000	0					=
0.05	0.050										~17
0.20	0.200	0.167	-0.033	831	0.0 %	831					~2
2.50	2.500	2.445	-0.055	10274	0.0 %	10274					2
5.00	5.000	5.104	0.104	21298	0.0 %	21298					4
7.50	7.500	7.790	0.290	32431	0.0 %	32431					~3
10.0	10.000	9.727	-0.273	40462	0.0 %	40462					

LB134747

INSTRUMENT ID : CV1

Sample ID	Extended ID	μ Abs.	Conc.	Std Conc	Method	Units	Date	Type
	0 S0	0	-		0 SFAM01.1	PPB	2/19/2025 14:26	Std
	0.2 S01	831	-		0.2 SFAM01.1	PPB	2/19/2025 14:28	Std
	2.5 S02	10274	-		2.5 SFAM01.1	PPB	2/19/2025 14:31	Std
	5 S03	21298	-		5 SFAM01.1	PPB	2/19/2025 14:33	Std
	7.5 S04	32431	-		7.5 SFAM01.1	PPB	2/19/2025 14:35	Std
	10 S05	40462	-		10 SFAM01.1	PPB	2/19/2025 14:38	Std
ICV010	ICV010	15781	3.7734 -		SFAM01.1	PPB	2/19/2025 14:43	SMPL
ICB010	ICB010	-7	-0.0352 -		SFAM01.1	PPB	2/19/2025 14:48	SMPL
CCV087	CCV087	21702	5.2018 -		SFAM01.1	PPB	2/19/2025 14:50	SMPL
CCB087	CCB087	-298	-0.1054 -		SFAM01.1	PPB	2/19/2025 14:52	SMPL
PB166782BL	PBW782	282	0.0345 -		SFAM01.1	PPB	2/19/2025 14:55	SMPL
Q1231-01	ME2993	314	0.0422 -		SFAM01.1	PPB	2/19/2025 14:57	SMPL
Q1231-02	ME2993D	280	0.034 -		SFAM01.1	PPB	2/19/2025 14:59	SMPL
Q1231-03	ME2993S	5535	1.3017 -		SFAM01.1	PPB	2/19/2025 15:02	SMPL
Q1231-04	ME29C1	496	0.0861 -		SFAM01.1	PPB	2/19/2025 15:04	SMPL
Q1231-05	ME29C2	247	0.0261 -		SFAM01.1	PPB	2/19/2025 15:06	SMPL
Q1231-06	ME29C3	167	0.0068 -		SFAM01.1	PPB	2/19/2025 15:08	SMPL
Q1231-07	ME29C4	186	0.0114 -		SFAM01.1	PPB	2/19/2025 15:11	SMPL
Q1255-01	MDCZM3	219	0.0193 -		SFAM01.1	PPB	2/19/2025 15:13	SMPL
Q1255-02	MDCZP0	297	0.0381 -		SFAM01.1	PPB	2/19/2025 15:15	SMPL
Q1255-03	MDCZP1	330	0.0461 -		SFAM01.1	PPB	2/19/2025 15:17	SMPL
Q1255-04	MDCZP5	2458	0.5594 -		SFAM01.1	PPB	2/19/2025 15:20	SMPL
Q1255-05	MDCZM4	-78	-0.0523 -		SFAM01.1	PPB	2/19/2025 15:22	SMPL
Q1255-06	MDCZN3	283	0.0348 -		SFAM01.1	PPB	2/19/2025 15:24	SMPL
Q1255-07	MDCZP2	259	0.029 -		SFAM01.1	PPB	2/19/2025 15:27	SMPL
Q1255-08	MDCZN8	-23	-0.0391 -		SFAM01.1	PPB	2/19/2025 15:29	SMPL
Q1255-09	MDCZN8D	-8	-0.0354 -		SFAM01.1	PPB	2/19/2025 15:31	SMPL
Q1255-10	MDCZN8S	5182	1.2166 -		SFAM01.1	PPB	2/19/2025 15:33	SMPL
Q1255-11	MDCZL6	173	0.0082 -		SFAM01.1	PPB	2/19/2025 15:36	SMPL
Q1255-12	MDCZL9	-36	-0.0422 -		SFAM01.1	PPB	2/19/2025 15:38	SMPL
CCV088	CCV088	21376	5.1231 -		SFAM01.1	PPB	2/19/2025 15:41	SMPL
CCB088	CCB088	-240	-0.0914 -		SFAM01.1	PPB	2/19/2025 15:43	SMPL
Q1255-13	MDCZN9	333	0.0468 -		SFAM01.1	PPB	2/19/2025 15:46	SMPL
Q1255-14	MDCZN2	354	0.0519 -		SFAM01.1	PPB	2/19/2025 15:48	SMPL
Q1255-15	MDCZN7	281	0.0343 -		SFAM01.1	PPB	2/19/2025 15:50	SMPL
Q1255-16	MDCZP4	278	0.0336 -		SFAM01.1	PPB	2/19/2025 15:52	SMPL
PB166783BL	PBW783	180	0.0099 -		SFAM01.1	PPB	2/19/2025 15:55	SMPL
Q1245-05	A6327	400	0.063 -		SFAM01.1	PPB	2/19/2025 16:01	SMPL
Q1245-06	A6328	201	0.015 -		SFAM01.1	PPB	2/19/2025 16:04	SMPL
Q1245-07	A6329	207	0.0164 -		SFAM01.1	PPB	2/19/2025 16:06	SMPL
Q1245-08	A6330	223	0.0203 -		SFAM01.1	PPB	2/19/2025 16:08	SMPL
Q1245-09	A6335	256	0.0282 -		SFAM01.1	PPB	2/19/2025 16:10	SMPL
Q1245-10	A6335D	193	0.013 -		SFAM01.1	PPB	2/19/2025 16:13	SMPL
Q1245-11	A6335S	5350	1.2571 -		SFAM01.1	PPB	2/19/2025 16:15	SMPL
Q1245-12	A6336	242	0.0249 -		SFAM01.1	PPB	2/19/2025 16:17	SMPL

LB134747
INSTRUMENT ID : CV1

Q1245-13	A6337	228	0.0215 -	SFAM01.1	PPB	2/19/2025 16:19	SMPL
Q1245-14	A6338	301	0.0391 -	SFAM01.1	PPB	2/19/2025 16:22	SMPL
Q1245-15	A6339	251	0.027 -	SFAM01.1	PPB	2/19/2025 16:24	SMPL
Q1245-16	A6340	268	0.0311 -	SFAM01.1	PPB	2/19/2025 16:26	SMPL
Q1245-17	A6341	204	0.0157 -	SFAM01.1	PPB	2/19/2025 16:29	SMPL
CCV089	CCV089	22472	5.3875 -	SFAM01.1	PPB	2/19/2025 16:31	SMPL
CCB089	CCB089	-284	-0.102 -	SFAM01.1	PPB	2/19/2025 16:33	SMPL
Q1339-01	ME29C5	171	0.0077 -	SFAM01.1	PPB	2/19/2025 16:35	SMPL
Q1339-02	ME29C7	218	0.0191 -	SFAM01.1	PPB	2/19/2025 16:38	SMPL
Q1339-03	ME29C6	241	0.0246 -	SFAM01.1	PPB	2/19/2025 16:40	SMPL
Q1339-04	ME29C9	290	0.0364 -	SFAM01.1	PPB	2/19/2025 16:42	SMPL
Q1339-05	ME29D1	227	0.0212 -	SFAM01.1	PPB	2/19/2025 16:44	SMPL
Q1339-06	ME29D2	213	0.0179 -	SFAM01.1	PPB	2/19/2025 16:47	SMPL
Q1339-07	ME29D4	283	0.0348 -	SFAM01.1	PPB	2/19/2025 16:49	SMPL
Q1339-08	ME29D2D	253	0.0275 -	SFAM01.1	PPB	2/19/2025 16:51	SMPL
Q1339-09	ME29D2S	5342	1.2552 -	SFAM01.1	PPB	2/19/2025 16:54	SMPL
Q1245-03	A6315	36037	8.6599 -	SFAM01.1	PPB	2/19/2025 16:58	SMPL
Q1245-04	A6316	28475	6.8357 -	SFAM01.1	PPB	2/19/2025 17:05	SMPL
CCV090	CCV090	21387	5.1258 -	SFAM01.1	PPB	2/19/2025 17:14	SMPL
CCB090	CCB090	-70	-0.0504 -	SFAM01.1	PPB	2/19/2025 17:19	SMPL

Prep Standard - Chemical Standard Summary

Order ID : Q1231

Test : Mercury

Prepbatch ID : PB166782,

Sequence ID/Qc Batch ID: LB134747,

Standard ID :

MP84563,MP84564,MP84565,MP84566,MP84567,MP84568,MP84569,MP84570,MP84571,MP84572,MP84573,MP84574,MP84575,MP84576,MP84577,MP84581,

Chemical ID :

M4371,M4465,M4916,M5062,M5532,M5789,M5882,M5884,M6041,M6126,M6151,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>
3965	2:1 H2SO4 : HNO3	MP84563	02/18/2025	06/03/2025	Mohan Bera	None	None	Janvi Patel
								02/19/2025

FROM 1600.00000ml of M6041 + 800.00000ml of M6126 = Final Quantity: 3200.000 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>
65	POTASSIUM PERMANGANATE SOLUTION 5 %	MP84564	02/18/2025	08/18/2025	Mohan Bera	None	None	Janvi Patel
								02/19/2025

FROM 100.00000gram of M4916 + 2000.00000ml of W3112 = Final Quantity: 2000.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
66	POTASSIUM PERSULFATE SOLUTION 5 %	MP84565	02/18/2025	08/06/2025	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Janvi Patel
02/19/2025								

FROM 100.00000ml of M4465 + 2000.00000ml of W3112 = Final Quantity: 2000.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
67	SODIUM CHLORIDE - HYDROXYL- CHLORIDE SOLUTION	MP84566	02/18/2025	06/25/2025	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Janvi Patel
02/19/2025								

FROM 2000.00000ml of W3112 + 240.00000gram of M4371 + 240.00000gram of M5884 = Final Quantity: 2000.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
871	MERCURY INTERMEDIATE B 250PPB WORKING STD.	MP84567	02/19/2025	02/20/2025	Mohan Bera	None	METALS_PIP ETTE_3 (A)	Iwona Zarych 02/19/2025

FROM 1.00000ml of M6126 + 2.50000ml of M5062 + 96.50000ml of W3112 = Final Quantity: 100.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1340	Hg 0.00 PPB STD	MP84568	02/19/2025	02/20/2025	Mohan Bera	None	METALS_PIP ETTE_3 (A)	Iwona Zarych 02/19/2025

FROM 2.50000ml of M6126 + 247.50000ml of W3112 = Final Quantity: 250.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1341	Hg 0.2 PPB STD	MP84569	02/19/2025	02/20/2025	Mohan Bera	None	METALS_PIPETTE_3 (A)	Iwona Zarych 02/19/2025

FROM 2.50000ml of M6126 + 247.30000ml of W3112 + 0.20000ml of MP84567 = Final Quantity: 250.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1342	Hg 2.5 PPB STD	MP84570	02/19/2025	02/20/2025	Mohan Bera	None	METALS_PIPETTE_3 (A)	Iwona Zarych 02/19/2025

FROM 2.50000ml of M6126 + 245.00000ml of W3112 + 2.50000ml of MP84567 = Final Quantity: 250.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1343	Hg 5.0 PPB STD	MP84571	02/19/2025	02/20/2025	Mohan Bera	None	METALS_PIPETTE_3 (A)	Iwona Zarych 02/19/2025

FROM 2.50000ml of M6126 + 242.50000ml of W3112 + 5.00000ml of MP84567 = Final Quantity: 250.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1344	Hg 7.5 PPB STD	MP84572	02/19/2025	02/20/2025	Mohan Bera	None	METALS_PIPETTE_3 (A)	Iwona Zarych 02/19/2025

FROM 2.50000ml of M6126 + 240.00000ml of W3112 + 7.50000ml of MP84567 = Final Quantity: 250.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1345	Hg 10.0 PPB STD	MP84573	02/19/2025	02/20/2025	Mohan Bera	None	METALS_PIPETTE_3 (A)	Iwona Zarych 02/19/2025

FROM 2.50000ml of M6126 + 237.50000ml of W3112 + 10.00000ml of MP84567 = 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	MP84574	02/19/2025	02/20/2025	Mohan Bera	None	METALS_PIPETTE_3 (A)	Iwona Zarych 02/19/2025

FROM 2.50000ml of M5532 + 2.50000ml of M6126 + 245.00000ml of W3112 = Final Quantity: 250.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1351	ICB (Hg 0.00 PPB SOLUTION)	MP84575	02/19/2025	02/20/2025	Mohan Bera	None	METALS_PIPETTE_3 (A)	Iwona Zarych 02/19/2025

FROM 2.50000ml of M5789 + 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)	MP84576	02/19/2025	02/20/2025	Mohan Bera	None	METALS_PIPETTE_3 (A)	Iwona Zarych 02/19/2025

FROM 485.00000ml of W3112 + 5.00000ml of M6126 + 10.00000ml of MP84567 = Final Quantity: 500.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1352	CCB (Hg 0.00 PPB SOLUTION)	MP84577	02/19/2025	02/20/2025	Mohan Bera	None	METALS_PIPETTE_3 (A)	Iwona Zarych 02/19/2025

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>
68	STANNOUS CHLORIDE SOLUTION	MP84581	02/19/2025	02/20/2025	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Iwona Zarych 02/19/2025

FROM 450.00000ml of W3112 + 50.00000gram of M5882 + 50.00000ml of M6151 = Final Quantity: 500.000 ml

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-2196-01 / Hydroxylamine Hydrochloride, Crystal (cs/4x500g)	0000215387	06/25/2025	07/01/2019 / RICHARD	06/07/2019 / RICHARD	M4371

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-3238-05 / Potassium Persulfate (2.5kg)	0000234156	08/06/2025	07/23/2019 / mohan	07/25/2019 / manojkumar	M4465

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

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
EPA	ICV-5 / ICV (HG) STOCK SOLN	ICV5-0415	02/28/2025	01/02/2025 / mohan	03/30/2023 / mohan	M5532

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9598-34 / Nitric Acid, Instra-Analyzed (cs/4x2.5L)	23G1262003	07/30/2025	02/08/2024 / Al-Terek	06/26/2023 / Al-Terek	M5789

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-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 #
Seidler Chemical	BA-3624-05 / Sodium Chloride, Crystal (cs/4x2.5kg)	0000281938	07/06/2026	04/30/2024 / mohan	04/25/2024 / mohan	M5884

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9673-33 / Sulfuric Acid, Instra-Analyzed (cs/6c2.5L)	23D2462010	03/20/2028	08/16/2024 / mohan	08/16/2024 / mohan	M6041

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	BA-9530-33 / Hydrochloric Acid, Instra-Analyzed (cs/6x2.5L)	22G2862015	08/18/2025	02/18/2025 / Sagar	01/15/2025 / Sagar	M6151

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
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.

M4371

Hydroxylamine Hydrochloride, Crystal
BAKER ANALYZED® A.C.S. Reagent
Suitable for Mercury Determination
(hydroxylammonium chloride)

Rec - 06.07.19



avantortm

Material No.: 2196-01
Batch No.: 0000215387
Manufactured Date: 2018/06/27
Retest Date: 2025/06/25
Revision No: 1

Certificate of Analysis

Meets ACS Reagent Chemical Requirements,

Test	Specification	Result
Assay (NH ₂ OH · HCl) (by KMnO ₄ titrn)	>= 96.0 %	99.1
Clarity of Alcohol Solution	Passes Test	PT
Residue after Ignition	<= 0.050 %	0.017
Titrate Free Acid (meq/g)	<= 0.25	0.19
Ammonium (NH ₄)	Passes Test	PT
Sulfur Compounds (as SO ₄)	<= 0.005 %	< 0.003
Trace Impurities - ACS - Heavy Metals (as Pb)	<= 5 ppm	4
Trace Impurities - Iron (Fe)	<= 5 ppm	< 3
Trace Impurities - Mercury (Hg)	<= 0.050 ppm	< 0.005

For Laboratory, Research or Manufacturing Use

Country of Origin: CN
Packaging Site: Paris Mfg Ctr & DC

ISO

Phillipsburg, NJ 9001:2015, FSSC22000
Paris, KY 9001:2008
Mexico City, Mexico 9001:2008
Gliwice, Poland 9001:2015, 13485:2012
Selangor, Malaysia 9001:2008
Dehradun, India, 9001:2008, 14001:2004, 13485:2003
Mumbai, India, 9001:2015, 17025:2005
Panoli, India 9001:2015

James Ethier

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

M4913-16

MS

Certificate of Analysis

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

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

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

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

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

Julian Burton

Julian Burton - Quality Control Manager – Fair Lawn

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

*Based on suggested storage condition.

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

MS062
MS063
MB

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

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

3.0 CERTIFIED VALUES AND UNCERTAINTIES

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

Assay Information:

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

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

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

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

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

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 22, 2021

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

11.2 Lot Expiration Date

- **September 22, 2026**

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:

Uyen Truong
Supervisor, Product Documentation



Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





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

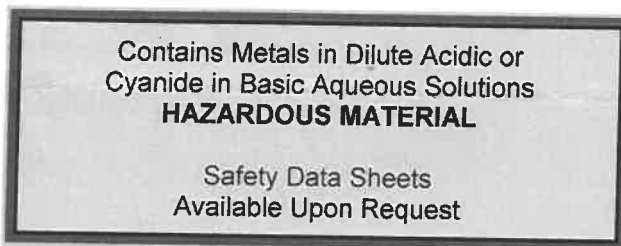
Instructions for QATS Reference Material: *Inorganic ICV Solutions*

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.



(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 $\mu\text{g/L}$ (ppb) for the resulting solution(s) after the dilution of the concentrate(s) according to the following instructions. Use Class 'A' glassware to prepare the solution(s).

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





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

Instructions for QATS Reference Material: *Inorganic ICV Solutions*

ICV1-1014

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

ICV5-0415

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

ICV6-0400

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

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

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

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

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

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



MS824
MB

Material No.: 3624-01

Batch No.: 0000281938

Manufactured Date: 2021-06-07

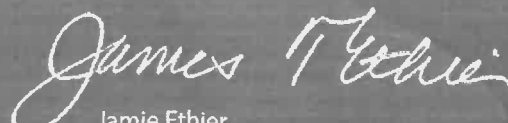
Retest Date: 2026-06-07

Revision No.: 1

Certificate of Analysis

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

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


Jamie Ethier
Vice President Global Quality

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

Avantor Performance Materials, LLC

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

Sulfuric Acid
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis
Low Selenium

avantor™



Material No.: 9673-33
Batch No.: 23D2462010
Manufactured Date: 2023-03-22
Retest Date: 2028-03-20
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
ACS – Assay (H ₂ SO ₄)	95.0 – 98.0 %	96.1 %
Appearance	Passes Test	Passes Test
ACS – Color (APHA)	≤ 10	5
ACS – Residue after Ignition	≤ 3 ppm	< 1 ppm
ACS – Substances Reducing Permanganate (as SO ₂)	≤ 2 ppm	< 2 ppm
Ammonium (NH ₄)	≤ 1 ppm	1 ppm
Chloride (Cl)	≤ 0.1 ppm	< 0.1 ppm
Nitrate (NO ₃)	≤ 0.2 ppm	< 0.1 ppm
Phosphate (PO ₄)	≤ 0.5 ppm	< 0.1 ppm
Trace Impurities – Aluminum (Al)	≤ 30.0 ppb	< 5.0 ppb
Arsenic and Antimony (as As)	≤ 4.0 ppb	< 2.0 ppb
Trace Impurities – Boron (B)	≤ 10.0 ppb	8.5 ppb
Trace Impurities – Cadmium (Cd)	≤ 2.0 ppb	< 0.3 ppb
Trace Impurities – Chromium (Cr)	≤ 6.0 ppb	< 0.4 ppb
Trace Impurities – Cobalt (Co)	≤ 0.5 ppb	< 0.3 ppb
Trace Impurities – Copper (Cu)	≤ 1.0 ppb	< 0.1 ppb
Trace Impurities – Gold (Au)	≤ 10.0 ppb	0.5 ppb
Heavy Metals (as Pb)	≤ 500.0 ppb	< 100.0 ppb
Trace Impurities – Iron (Fe)	≤ 50.0 ppb	1.3 ppb
Trace Impurities – Lead (Pb)	≤ 0.5 ppb	< 0.5 ppb
Trace Impurities – Magnesium (Mg)	≤ 7.0 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 – Nickel (Ni)	≤ 2.0 ppb	0.3 ppb
Trace Impurities – Potassium (K)	≤ 500.0 ppb	< 2.0 ppb
Trace Impurities – Selenium (Se)	≤ 50.0 ppb	< 0.1 ppb
Trace Impurities – Silicon (Si)	≤ 100.0 ppb	31.5 ppb
Trace Impurities – Silver (Ag)	≤ 1.0 ppb	< 0.3 ppb

>>> Continued on page 2 >>>

Sulfuric Acid
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis
Low Selenium

 **avantor™**

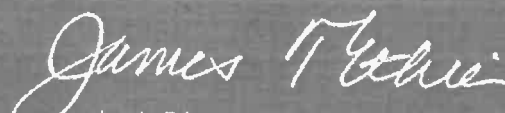


Material No.: 9673-33
Batch No.: 23D2462010

Test	Specification	Result
Trace Impurities – Sodium (Na)	≤ 500.0 ppb	5.4 ppb
Trace Impurities – Strontium (Sr)	≤ 5.0 ppb	< 0.2 ppb
Trace Impurities – Tin (Sn)	≤ 5.0 ppb	< 0.8 ppb
Trace Impurities – Zinc (Zn)	≤ 5.0 ppb	0.4 ppb

For Laboratory, Research, or Manufacturing Use

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


Jamie Ethier
Vice President Global Quality

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

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

 **avantor™**



M6151

R → 11/15/25

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

Certificate of Analysis

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

>>> Continued on page 2 >>>

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

 **avantorsm**



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

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

>>> Continued on page 3 >>>

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



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

Test	Specification	Result
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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

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

SOP ID : M7470A-Mercury-19, MSFAM01.1-Mercury in Water-2

SDG No : ME2993/MDCZM3

Start Digest Date: 02/19/2025 Time : 11:25 Temp : 94 °C

Matrix : WATER

End Digest Date: 02/19/2025 Time : 13:25 Temp : 95 °C

Pipette ID: HG A

Digestion tube ID: M6054

Balance ID : N/A

Block thermometer ID: HG-DIG#1

Filter paper ID : NA

Dig Technician Signature: *MB*

pH Strip ID : M6069

Supervisor Signature: *12*

Hood ID : #1

Temp : 1. 94°C 2. N/A

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

Standardized Name	MLS USED	STD REF. # FROM LOG
ICV	100mL	MP84574
CCV	100mL	MP84576
Matrix Spike	0.40mL	MP84567
N/A	N/A	N/A
N/A	N/A	N/A

Chemical Used	ML/SAMPLE USED	Lot Number
HNO3/H2SO4(1:2)	7.5mL	MP84563
KMnO4 (5%)	15.0mL	MP84564
K2S2O8 (5%)	8.0mL	MP84565
Hydroxylamine HCL (12%)	6.0mL	MP84566
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

LAB SAMPLE ID	CLIENT SAMPLE ID	Wt(g)/Vol(ml)	Comment
0.0 ppb	S0	100mL	MP84568
0.05 ppb	S0.05	N/A	N/A
0.2 ppb	S0.2	100mL	MP84569
2.5 ppb	S2.5	100mL	MP84570
5.0 ppb	S5.0	100mL	MP84571
7.5 ppb	S7.5	100mL	MP84572
10.0 ppb	S10.0	100mL	MP84573
ICV	ICV	100mL	MP84574
ICB	ICB	100mL	MP84575
CCV	CCV	100mL	MP84576
CCB	CCB	100mL	MP84577
CRI	CRI	N/A	N/A
CHK STD	CHK STD	N/A	N/A

Extraction Conformance/Non-Conformance Comments:

N/A		
Date / Time	Prepped Sample Relinquished By/Location	Received By/Location
2/19/25 @ 13:25	<i>MB, M7470A Lab</i>	<i>MB, M7470A Lab</i>
	Preparation Group	Analysis Group

Lab Sample ID	Client Sample ID	Initial Vol (ml)	Final Vol (ml)	pH	Comment	Prep Pos
PB166782BL	PBW782	100	100	<2	N/A	1-1
Q1231-01	ME2993	100	100	<2	N/A	2
Q1231-02	ME2993D	100	100	<2	N/A	3
Q1231-03	ME2993S	100	100	<2	MP84567	4
Q1231-04	ME29C1	100	100	<2	N/A	5
Q1231-05	ME29C2	100	100	<2	N/A	6
Q1231-06	ME29C3	100	100	<2	N/A	7
Q1231-07	ME29C4	100	100	<2	N/A	8
Q1255-01	MDCZM3	100	100	<2	N/A	9
Q1255-02	MDCZP0	100	100	<2	N/A	10
Q1255-03	MDCZP1	100	100	<2	N/A	11
Q1255-04	MDCZP5	100	100	<2	N/A	12
Q1255-05	MDCZM4	100	100	<2	N/A	13
Q1255-06	MDCZN3	100	100	<2	N/A	14
Q1255-07	MDCZP2	100	100	<2	N/A	15
Q1255-08	MDCZN8	100	100	<2	N/A	16
Q1255-09	MDCZN8D	100	100	<2	N/A	17
Q1255-10	MDCZN8S	100	100	<2	MP84567	18
Q1255-11	MDCZL6	100	100	<2	N/A	19
Q1255-12	MDCZL9	100	100	<2	N/A	20
Q1255-13	MDCZN9	100	100	<2	N/A	21
Q1255-14	MDCZN2	100	100	<2	N/A	22
Q1255-15	MDCZN7	100	100	<2	N/A	23
Q1255-16	MDCZP4	100	100	<2	N/A	24

Instrument ID: CV1

Daily Analysis Runlog For Sequence/QC Batch ID # LB134747

Review By	Mohan Bera	Review On	2/20/2025 8:58:10 AM
Supervise By	Jignesh Parikh	Supervise On	2/20/2025 9:08:45 AM
STD. NAME	STD REF.#		
ICAL Standard	MP84568,MP84569,MP84570,MP84571,MP84572,MP84573		
ICV Standard	MP84574		
CCV Standard	MP84576		
ICSA Standard			
CRI Standard			
LCS Standard			
Chk Standard	MP84575,MP84577,MP84581		

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	S0	S0	CAL1	02/19/25 14:26		Mohan	OK
2	S0.2	S01	CAL2	02/19/25 14:28		Mohan	OK
3	S2.5	S02	CAL3	02/19/25 14:31		Mohan	OK
4	S5	S03	CAL4	02/19/25 14:33		Mohan	OK
5	S7.5	S04	CAL5	02/19/25 14:35		Mohan	OK
6	S10	S05	CAL6	02/19/25 14:38		Mohan	OK
7	ICV010	ICV010	ICV	02/19/25 14:43		Mohan	OK
8	ICB010	ICB010	ICB	02/19/25 14:48		Mohan	OK
9	CCV087	CCV087	CCV	02/19/25 14:50		Mohan	OK
10	CCB087	CCB087	CCB	02/19/25 14:52		Mohan	OK
11	PB166782BL	PBW782	MB	02/19/25 14:55		Mohan	OK
12	Q1231-01	ME2993	SAM	02/19/25 14:57		Mohan	OK
13	Q1231-02	ME2993D	DUP	02/19/25 14:59		Mohan	OK
14	Q1231-03	ME2993S	MS	02/19/25 15:02		Mohan	OK
15	Q1231-04	ME29C1	SAM	02/19/25 15:04		Mohan	OK
16	Q1231-05	ME29C2	SAM	02/19/25 15:06		Mohan	OK
17	Q1231-06	ME29C3	SAM	02/19/25 15:08		Mohan	OK
18	Q1231-07	ME29C4	SAM	02/19/25 15:11		Mohan	OK

Instrument ID: CV1

Daily Analysis Runlog For Sequence/QC Batch ID # LB134747

Review By	Mohan Bera	Review On	2/20/2025 8:58:10 AM
Supervise By	Jignesh Parikh	Supervise On	2/20/2025 9:08:45 AM
STD. NAME	STD REF.#		
ICAL Standard	MP84568,MP84569,MP84570,MP84571,MP84572,MP84573		
ICV Standard	MP84574		
CCV Standard	MP84576		
ICSA Standard			
CRI Standard			
LCS Standard			
Chk Standard	MP84575,MP84577,MP84581		

19	Q1255-01	MDCZM3	SAM	02/19/25 15:13		Mohan	OK
20	Q1255-02	MDCZP0	SAM	02/19/25 15:15		Mohan	OK
21	Q1255-03	MDCZP1	SAM	02/19/25 15:17		Mohan	OK
22	Q1255-04	MDCZP5	SAM	02/19/25 15:20		Mohan	OK
23	Q1255-05	MDCZM4	SAM	02/19/25 15:22		Mohan	OK
24	Q1255-06	MDCZN3	SAM	02/19/25 15:24		Mohan	OK
25	Q1255-07	MDCZP2	SAM	02/19/25 15:27		Mohan	OK
26	Q1255-08	MDCZN8	SAM	02/19/25 15:29		Mohan	OK
27	Q1255-09	MDCZN8D	DUP	02/19/25 15:31		Mohan	OK
28	Q1255-10	MDCZN8S	MS	02/19/25 15:33		Mohan	OK
29	Q1255-11	MDCZL6	SAM	02/19/25 15:36		Mohan	OK
30	Q1255-12	MDCZL9	SAM	02/19/25 15:38		Mohan	OK
31	CCV088	CCV088	CCV	02/19/25 15:41		Mohan	OK
32	CCB088	CCB088	CCB	02/19/25 15:43		Mohan	OK
33	Q1255-13	MDCZN9	SAM	02/19/25 15:46		Mohan	OK
34	Q1255-14	MDCZN2	SAM	02/19/25 15:48		Mohan	OK
35	Q1255-15	MDCZN7	SAM	02/19/25 15:50		Mohan	OK
36	Q1255-16	MDCZP4	SAM	02/19/25 15:52		Mohan	OK
37	PB166783BL	PBW783	MB	02/19/25 15:55		Mohan	OK
38	Q1245-05	A6327	SAM	02/19/25 16:01		Mohan	OK

Instrument ID: CV1

Daily Analysis Runlog For Sequence/QC Batch ID # LB134747

Review By	Mohan Bera	Review On	2/20/2025 8:58:10 AM
Supervise By	Jignesh Parikh	Supervise On	2/20/2025 9:08:45 AM
STD. NAME	STD REF.#		
ICAL Standard	MP84568,MP84569,MP84570,MP84571,MP84572,MP84573		
ICV Standard	MP84574		
CCV Standard	MP84576		
ICSA Standard			
CRI Standard			
LCS Standard			
Chk Standard	MP84575,MP84577,MP84581		

39	Q1245-06	A6328	SAM	02/19/25 16:04		Mohan	OK
40	Q1245-07	A6329	SAM	02/19/25 16:06		Mohan	OK
41	Q1245-08	A6330	SAM	02/19/25 16:08		Mohan	OK
42	Q1245-09	A6335	SAM	02/19/25 16:10		Mohan	OK
43	Q1245-10	A6335D	DUP	02/19/25 16:13		Mohan	OK
44	Q1245-11	A6335S	MS	02/19/25 16:15		Mohan	OK
45	Q1245-12	A6336	SAM	02/19/25 16:17		Mohan	OK
46	Q1245-13	A6337	SAM	02/19/25 16:19		Mohan	OK
47	Q1245-14	A6338	SAM	02/19/25 16:22		Mohan	OK
48	Q1245-15	A6339	SAM	02/19/25 16:24		Mohan	OK
49	Q1245-16	A6340	SAM	02/19/25 16:26		Mohan	OK
50	Q1245-17	A6341	SAM	02/19/25 16:29		Mohan	OK
51	CCV089	CCV089	CCV	02/19/25 16:31		Mohan	OK
52	CCB089	CCB089	CCB	02/19/25 16:33		Mohan	OK
53	Q1339-01	ME29C5	SAM	02/19/25 16:35		Mohan	OK
54	Q1339-02	ME29C7	SAM	02/19/25 16:38		Mohan	OK
55	Q1339-03	ME29C6	SAM	02/19/25 16:40		Mohan	OK
56	Q1339-04	ME29C9	SAM	02/19/25 16:42		Mohan	OK
57	Q1339-05	ME29D1	SAM	02/19/25 16:44		Mohan	OK
58	Q1339-06	ME29D2	SAM	02/19/25 16:47		Mohan	OK

Instrument ID: CV1

Daily Analysis Runlog For Sequence/QC Batch ID # LB134747

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Supervise By	Jignesh Parikh	Supervise On	2/20/2025 9:08:45 AM
STD. NAME	STD REF.#		
ICAL Standard	MP84568,MP84569,MP84570,MP84571,MP84572,MP84573		
ICV Standard	MP84574		
CCV Standard	MP84576		
ICSA Standard			
CRI Standard			
LCS Standard			
Chk Standard	MP84575,MP84577,MP84581		

59	Q1339-07	ME29D4	SAM	02/19/25 16:49		Mohan	OK
60	Q1339-08	ME29D2D	DUP	02/19/25 16:51		Mohan	OK
61	Q1339-09	ME29D2S	MS	02/19/25 16:54		Mohan	OK
62	Q1245-03	A6315	SAM	02/19/25 16:58		Mohan	OK
63	Q1245-04	A6316	SAM	02/19/25 17:05		Mohan	OK
64	CCV090	CCV090	CCV	02/19/25 17:14		Mohan	OK
65	CCB090	CCB090	CCB	02/19/25 17:19		Mohan	OK