EPA SAMPLE NO.

MC0VH4

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: 51810 MA No. : SDG No.: MC0VH4

Matrix: SOIL Lab Sample ID: P4656-01

% Solids: 94.6 Date Received: 10/31/2024

Analytical Method: Hg

Concentration Units (µg/L, mg/L, mg/kg dry weight, µg, or µg/cm²): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.16		11/21/2024	1210

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

Comments:

EPA SAMPLE NO.

MC0VJ0

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: 51810 MA No. : SDG No.: MC0VH4

Matrix: SOIL Lab Sample ID: P4656-02

% Solids: 83.4 Date Received: 10/31/2024

Analytical Method: Hg

Concentration Units (µg/L, mg/L, mg/kg dry weight, µg, or µg/cm²): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.33		11/21/2024	1212

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

Comments:

EPA SAMPLE NO.

MC0VM0

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: 51810 MA No. : SDG No.: MC0VH4

Matrix: SOIL Lab Sample ID: P4656-03

% Solids: 79.6 Date Received: 11/02/2024

Analytical Method: Hg

Concentration Units (µg/L, mg/L, mg/kg dry weight, µg, or µg/cm²): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.16		11/21/2024	1214

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

Comments:

EPA SAMPLE NO.

MC0VM6

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: 51810 MA No. : SDG No.: MC0VH4

Matrix: SOIL Lab Sample ID: P4656-06

% Solids: 85.3 Date Received: 11/02/2024

Analytical Method: Hg

Concentration Units (µg/L, mg/L, mg/kg dry weight, µg, or µg/cm²): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.051	J	11/21/2024	1221

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

Comments:

EPA SAMPLE NO.

MC0VM7

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: 51810 MA No. : SDG No.: MC0VH4

Matrix: SOIL Lab Sample ID: P4656-07

% Solids: 87.1 Date Received: 11/02/2024

Analytical Method: Hg

Concentration Units (µg/L, mg/L, mg/kg dry weight, µg, or µg/cm²): mg/kg

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.45		11/21/2024	1224

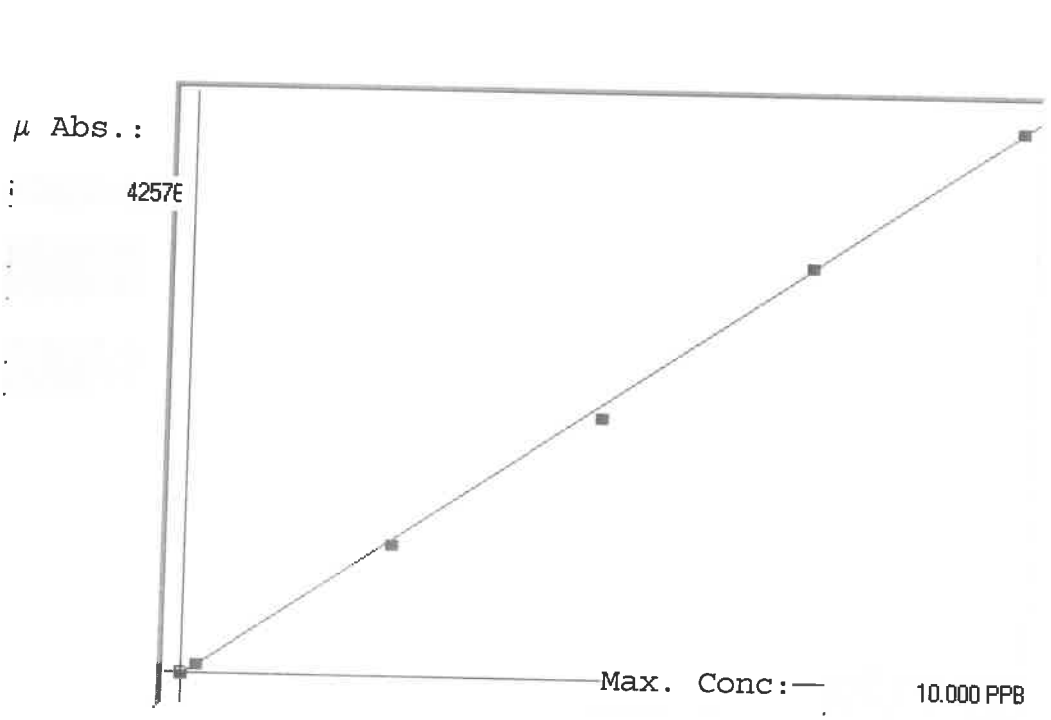
NOTE: Hardness (total) is reported in mg/L

Comments:

LB133546

SFAM01.1

INSTRUMENT ID: CV1



A= 0.0000e+000

B= 2.3491e-004 slope

C= 4.8346e-002 y-intercept

Rho= 0.9996963

Accept=Accepted

Std ID	Conc.	Calc.	Dev.	Mean	SD or %RSD	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	%dif
0.00	0.000	0.060	0.060	51	0.000	51					
0.05	0.050					442	0				=
0.20	0.200	0.252	0.052	868	0.0 %	868					26
2.50	2.500	2.462	-0.038	10275	0.0 %	10275					-2
5.00	5.000	4.812	-0.188	20279	0.0 %	20279					-4
7.50	7.500	7.563	0.063	31991	0.0 %	31991					1
10.0	10.000	10.050	0.050	42576	0.0 %	42576					1

LB133546

INSTRUMEN ID : CV1

Sample ID	Extended ID	µ Abs.	Conc.		Stnd Conc	Method	Units	Date	Type
0	S0	51	-		0	SFAM01.1	PPB	11/21/2024 10:34	Std
0.2	S01	868	-		0.2	SFAM01.1	PPB	11/21/2024 10:36	Std
2.5	S02	10275	-		2.5	SFAM01.1	PPB	11/21/2024 10:39	Std
5	S03	20279	-		5	SFAM01.1	PPB	11/21/2024 10:41	Std
7.5	S04	31991	-		7.5	SFAM01.1	PPB	11/21/2024 10:46	Std
10	S05	42576	-		10	SFAM01.1	PPB	11/21/2024 10:48	Std
ICV094	ICV094	15939	3.7926	-		SFAM01.1	PPB	11/21/2024 10:59	SMPL
ICB094	ICB094	-25	0.0425	-		SFAM01.1	PPB	11/21/2024 11:01	SMPL
CCV021	CCV021	19566	4.6446	-		SFAM01.1	PPB	11/21/2024 11:03	SMPL
CCB021	CCB021	-61	0.034	-		SFAM01.1	PPB	11/21/2024 11:05	SMPL
PB165162BL	PBS162	30	0.0554	-		SFAM01.1	PPB	11/21/2024 11:08	SMPL
P4654-01	MC0VG5	4338	1.0674	-		SFAM01.1	PPB	11/21/2024 11:10	SMPL
P4654-02	MC0VH9	3733	0.9253	-		SFAM01.1	PPB	11/21/2024 11:12	SMPL
P4654-03	MC0VJ3	1925	0.5005	-		SFAM01.1	PPB	11/21/2024 11:15	SMPL
P4654-04	MC0VJ4	2863	0.7209	-		SFAM01.1	PPB	11/21/2024 11:17	SMPL
P4654-05	MC0VJ5	3611	0.8966	-		SFAM01.1	PPB	11/21/2024 11:19	SMPL
P4654-06	MC0VJ6	11252	2.6916	-		SFAM01.1	PPB	11/21/2024 11:21	SMPL
P4654-07	MC0VJ7	2065	0.5334	-		SFAM01.1	PPB	11/21/2024 11:24	SMPL
P4654-08	MC0VJ8	4013	0.991	-		SFAM01.1	PPB	11/21/2024 11:26	SMPL
P4654-09	MC0VJ9	3070	0.7695	-		SFAM01.1	PPB	11/21/2024 11:28	SMPL
P4654-10	MC0VK0	3224	0.8057	-		SFAM01.1	PPB	11/21/2024 11:30	SMPL
P4654-11	MC0VK0D	3420	0.8517	-		SFAM01.1	PPB	11/21/2024 11:33	SMPL
P4654-12	MC0VK0S	11548	2.7611	-		SFAM01.1	PPB	11/21/2024 11:37	SMPL
P4654-13	MC0VK1	5413	1.3199	-		SFAM01.1	PPB	11/21/2024 11:40	SMPL
P4654-14	MC0VK2	2898	0.7291	-		SFAM01.1	PPB	11/21/2024 11:42	SMPL
P4654-15	MC0VK3	4917	1.2034	-		SFAM01.1	PPB	11/21/2024 11:44	SMPL
P4654-16	MC0VK4	5803	1.4115	-		SFAM01.1	PPB	11/21/2024 11:47	SMPL
P4654-17	MC0VK5	3293	0.8219	-		SFAM01.1	PPB	11/21/2024 11:49	SMPL
P4654-18	MC0VK6	2406	0.6135	-		SFAM01.1	PPB	11/21/2024 11:51	SMPL
P4654-19	MC0VK7	2428	0.6187	-		SFAM01.1	PPB	11/21/2024 11:53	SMPL
CCV022	CCV022	19931	4.7303	-		SFAM01.1	PPB	11/21/2024 11:56	SMPL
CCB022	CCB022	-116	0.0211	-		SFAM01.1	PPB	11/21/2024 11:58	SMPL
P4654-20	MC0VK8	10174	2.4383	-		SFAM01.1	PPB	11/21/2024 12:00	SMPL
P4654-21	MC0VK9	3324	0.8292	-		SFAM01.1	PPB	11/21/2024 12:03	SMPL
PB165163BL	PBS163	-88	0.0277	-		SFAM01.1	PPB	11/21/2024 12:08	SMPL
P4656-01	MC0VH4	3183	0.7961	-		SFAM01.1	PPB	11/21/2024 12:10	SMPL
P4656-02	MC0VJ0	6618	1.603	-		SFAM01.1	PPB	11/21/2024 12:12	SMPL
P4656-03	MC0VM0	2792	0.7042	-		SFAM01.1	PPB	11/21/2024 12:14	SMPL
P4656-04	MC0VM0D	2676	0.677	-		SFAM01.1	PPB	11/21/2024 12:17	SMPL
P4656-05	MC0VM0S	12639	3.0174	-		SFAM01.1	PPB	11/21/2024 12:19	SMPL
P4656-06	MC0VM6	834	0.2443	-		SFAM01.1	PPB	11/21/2024 12:21	SMPL
P4656-07	MC0VM7	8696	2.0911	-		SFAM01.1	PPB	11/21/2024 12:24	SMPL
P4688-01	MC0VL1	2395	0.611	-		SFAM01.1	PPB	11/21/2024 12:26	SMPL
P4688-02	MC0VL2	1668	0.4402	-		SFAM01.1	PPB	11/21/2024 12:28	SMPL
P4688-03	MC0VL3	2387	0.6091	-		SFAM01.1	PPB	11/21/2024 12:30	SMPL
P4688-04	MC0VL4	2097	0.541	-		SFAM01.1	PPB	11/21/2024 12:33	SMPL

LB133546

INSTRUMEN ID : CV1

P4688-05	MC0VL5	6336	1.5367 -	SFAM01.1	PPB	11/21/2024 12:35	SMPL
P4688-06	MC0VL6	2828	0.7127 -	SFAM01.1	PPB	11/21/2024 12:37	SMPL
P4688-07	MC0VL7	11994	2.8659 -	SFAM01.1	PPB	11/21/2024 12:39	SMPL
P4688-08	MC0VL8	3823	0.9464 -	SFAM01.1	PPB	11/21/2024 12:42	SMPL
P4688-09	MC0VL9	3085	0.773 -	SFAM01.1	PPB	11/21/2024 12:44	SMPL
P4688-10	MC0VM0	3053	0.7655 -	SFAM01.1	PPB	11/21/2024 12:46	SMPL
CCV023	CCV023	19565	4.6444 -	SFAM01.1	PPB	11/21/2024 12:49	SMPL
CCB023	CCB023	-241	-0.0083 -	SFAM01.1	PPB	11/21/2024 12:51	SMPL
P4688-11	MC0VM0D	2797	0.7054 -	SFAM01.1	PPB	11/21/2024 12:56	SMPL
P4688-12	MC0VM0S	11525	2.7557 -	SFAM01.1	PPB	11/21/2024 13:03	SMPL
P4688-13	MC0VM1	1668	0.4402 -	SFAM01.1	PPB	11/21/2024 13:06	SMPL
P4688-14	MC0VM2	3619	0.8985 -	SFAM01.1	PPB	11/21/2024 13:08	SMPL
P4688-15	MC0VM3	31692	7.4931 -	SFAM01.1	PPB	11/21/2024 13:10	SMPL
P4688-16	MC0VM4	4917	1.2034 -	SFAM01.1	PPB	11/21/2024 13:12	SMPL
P4688-17	MC0VM5	1720	0.4524 -	SFAM01.1	PPB	11/21/2024 13:15	SMPL
CCV024	CCV024	19282	4.5779 -	SFAM01.1	PPB	11/21/2024 13:17	SMPL
CCB024	CCB024	-134	0.0169 -	SFAM01.1	PPB	11/21/2024 13:19	SMPL

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Prep Standard - Chemical Standard Summary

Order ID : P4656

Test : Mercury

Prepbatch ID : PB165163,

Sequence ID/Qc Batch ID: LB133546,

Standard ID :
MP83208,MP83210,MP83312,MP83313,MP83315,MP83316,MP83317,MP83318,MP83319,MP83320,MP83321,MP83322,MP83323,MP83326,MP83343,

Chemical ID :
M4371,M4916,M5062,M5882,M5884,M5953,M6120,M6121,W3112,

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Metals STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
65	POTASSIUM PERMANGANATE SOLUTION 5 %	MP83208	11/11/2024	05/11/2025	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal 11/11/2024

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

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
67	SODIUM CHLORIDE - HYDROXYL- CHLORIDE SOLUTION	MP83210	11/11/2024	05/11/2025	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal 11/11/2024

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

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Metals STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
871	MERCURY INTERMEDIATE B 250PPB WORKING STD.	MP83312	11/20/2024	11/21/2024	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Sarabjit Jaswal 11/20/2024

FROM 1.00000ml of M6120 + 2.50000ml of M5062 + 96.50000ml of W3112 = Final Quantity: 100.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1340	Hg 0.00 PPB STD	MP83313	11/20/2024	11/21/2024	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Sarabjit Jaswal 11/20/2024

FROM 2.50000ml of M6120 + 247.50000ml of W3112 = Final Quantity: 250.000 ml

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Metals STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1341	Hg 0.2 PPB STD	MP83315	11/20/2024	11/21/2024	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Sarabjit Jaswal 11/20/2024

FROM 2.50000ml of M6120 + 247.30000ml of W3112 + 0.20000ml of MP83312 = Final Quantity: 250.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1342	Hg 2.5 PPB STD	MP83316	11/20/2024	11/21/2024	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Sarabjit Jaswal 11/20/2024

FROM 2.50000ml of M6120 + 245.00000ml of W3112 + 2.50000ml of MP83312 = Final Quantity: 250.000 ml

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Metals STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1343	Hg 5.0 PPB STD	MP83317	11/20/2024	11/21/2024	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Sarabjit Jaswal 11/20/2024

FROM 2.50000ml of M6120 + 242.50000ml of W3112 + 5.00000ml of MP83312 = Final Quantity: 250.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1344	Hg 7.5 PPB STD	MP83318	11/20/2024	11/21/2024	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Sarabjit Jaswal 11/20/2024

FROM 2.50000ml of M6120 + 240.00000ml of W3112 + 7.50000ml of MP83312 = Final Quantity: 250.000 ml

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Metals STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1345	Hg 10.0 PPB STD	MP83319	11/20/2024	11/21/2024	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Sarabjit Jaswal 11/20/2024

FROM 2.50000ml of M6120 + 237.50000ml of W3112 + 10.00000ml of MP83312 = Final Quantity: 250.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1346	Hg ICV SOLUTION	MP83320	11/20/2024	11/21/2024	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Sarabjit Jaswal 11/20/2024

FROM 2.50000ml of M5953 + 2.50000ml of M6120 + 245.00000ml of W3112 = Final Quantity: 250.000 ml

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Metals STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1351	ICB (Hg 0.00 PPB SOLUTION)	MP83321	11/20/2024	11/21/2024	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Sarabjit Jaswal 11/20/2024

FROM 2.50000ml of M6120 + 247.50000ml of W3112 = Final Quantity: 250.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1358	CCV (Hg 5.0 PPB SOLUTION)	MP83322	11/20/2024	11/21/2024	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Sarabjit Jaswal 11/20/2024

FROM 485.00000ml of W3112 + 5.00000ml of M6120 + 10.00000ml of MP83312 = Final Quantity: 500.000 ml

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Metals STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1352	CCB (Hg 0.00 PPB SOLUTION)	MP83323	11/20/2024	11/21/2024	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Sarabjit Jaswal 11/20/2024

FROM 495.00000ml of W3112 + 5.00000ml of M6120 = Final Quantity: 500.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
887	AQUA REGIA FOR HG ON 7471A	MP83326	11/20/2024	11/21/2024	Mohan Bera	None	None	Sarabjit Jaswal 11/20/2024

FROM 150.00000ml of M6121 + 50.00000ml of M6120 = Final Quantity: 200.000 ml

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Metals STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
68	STANNOUS CHLORIDE SOLUTION	MP83343	11/21/2024	11/22/2024	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal 11/21/2024

FROM 450.00000ml of W3112 + 50.00000gram of M5882 + 50.00000ml of M6121 = Final Quantity: 500.000 ml

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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-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 #
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 #
EPA	ICV-5 / ICV (HG) STOCK SOLN	ICV5-0415	01/01/2025	07/01/2024 / mohan	03/30/2023 / mohan	M5953

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CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9598-34 / Nitric Acid, Instra-Analyzed (cs/4x2.5L)	23I0662003	05/13/2025	11/13/2024 / Eman	10/13/2024 / Eman	M6120

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	DIW / DI Water	Daily Lab-Certified	07/03/2029	07/03/2024 / Iwona	07/03/2024 / Iwona	W3112

Certificate of Analysis

ThermoFisher SCIENTIFIC

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

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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

J.T.Baker® | avantor™

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 ($NH_2OH \cdot HCl$) (by $KMnO_4$ titrn)	>= 96.0 %	99.1
Clarity of Alcohol Solution	Passes Test	PT
Residue after Ignition	<= 0.050 %	0.017
Titrable 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

ThermoFisher SCIENTIFIC

M4913-16

MB

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.

INORGANIC VENTURES
Refine your results. Redefine your industry.

Certificate of Analysis

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

M5062
M5063
M3

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).

ACCREDITED Testing Laboratory Certificate 883.01 ACCREDITED Reference Material Producer Certificate 883.02

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:

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

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.

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

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ 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 Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

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 HNO_3. 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% HNO_3 / LDPE container, stable in 10% HNO_3 packaged in borosilicate glass. 1-100 ppm levels stable in 7% HNO_3 packaged in borosilicate glass. 1000-10,000 ppm solutions are chemically stable for years in 5-10% HNO_3 / LDPE container.

Hg Containing Samples (Preparation and Solution) - Metal (soluble in HNO_3); Oxide (Soluble in HNO_3); 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

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

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

MT884
MB

avantor™ | J.T.Baker®

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)	≥ 99.0 %	100.0 %
pH of 5% Solution at 25°C	5.0 - 9.0	6.3
Insoluble Matter	≤ 0.005 %	0.003 %
Iodide (I)	≤ 0.002 %	< 0.002 %
Bromide (Br)	≤ 0.01 %	< 0.01 %
Chlorate and Nitrate (as NO_3)	≤ 0.003 %	< 0.001 %
ACS - Phosphate (PO_4)	≤ 5 ppm	< 5 ppm
Sulfate (SO_4)	≤ 0.004 %	< 0.004 %
Barium (Ba)	Passes Test	Passes Test
ACS - Heavy Metals (as Pb)	≤ 5 ppm	< 5 ppm
Iron (Fe)	≤ 2 ppm	< 1 ppm
Calcium (Ca)	≤ 0.002 %	< 0.001 %
Magnesium (Mg)	≤ 0.001 %	< 0.001 %
Potassium (K)	≤ 0.005 %	0.001 %

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

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

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.

MTS28-37 MB
MTS53 MB 3/30/23

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

Safety Data Sheets Available Upon Request

(A) *SAMPLE DESCRIPTION*

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

(B) *BREAKAGE OR MISSING ITEMS*

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

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

(C) *ANALYSIS OF SAMPLES*

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

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

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

Nitric Acid 69%
CMOS

avantor™ | J.T.Baker®

R ->10/13/24
Metal g

M 6120

Material No.: 9606-03
Batch No.: 2310662003
Manufactured Date: 2023-08-21
Retest Date: 2028-08-19
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
Assay (HNO_3)	69.0 - 70.0 %	69.5 %
Appearance	Passes Test	Passes Test
Color (APHA)	≤ 10	10
Residue after Ignition	≤ 2 ppm	< 2 ppm
Chloride (Cl)	≤ 0.08 ppm	< 0.08 ppm
Phosphate (PO_4)	≤ 0.10 ppm	< 0.10 ppm
Sulfate (SO_4)	≤ 0.2 ppm	0.2 ppm
Trace Impurities - Aluminum (Al)	≤ 40.0 ppb	< 40.0 ppb
Arsenic and Antimony (as As)	≤ 5.0 ppb	< 5.0 ppb
Trace Impurities - Barium (Ba)	≤ 10.0 ppb	< 10.0 ppb
Trace Impurities - Beryllium (Be)	≤ 10.0 ppb	< 10.0 ppb
Trace Impurities - Bismuth (Bi)	≤ 20.0 ppb	< 20.0 ppb
Trace Impurities - Boron (B)	≤ 10.0 ppb	< 10.0 ppb
Trace Impurities - Cadmium (Cd)	≤ 50 ppb	< 50 ppb
Trace Impurities - Calcium (Ca)	≤ 50.0 ppb	< 50.0 ppb
Trace Impurities - Chromium (Cr)	≤ 30.0 ppb	30.0 ppb
Trace Impurities - Cobalt (Co)	≤ 10.0 ppb	< 10.0 ppb
Trace Impurities - Copper (Cu)	≤ 10.0 ppb	< 10.0 ppb
Trace Impurities - Gallium (Ga)	≤ 10.0 ppb	< 10.0 ppb
Trace Impurities - Germanium (Ge)	≤ 20 ppb	< 20 ppb
Trace Impurities - Gold (Au)	≤ 20 ppb	< 20 ppb
Heavy Metals (as Pb)	≤ 100 ppb	< 100 ppb
Trace Impurities - Iron (Fe)	≤ 40.0 ppb	< 40.0 ppb
Trace Impurities - Lead (Pb)	≤ 20.0 ppb	< 20.0 ppb
Trace Impurities - Lithium (Li)	≤ 10.0 ppb	< 10.0 ppb
Trace Impurities - Magnesium (Mg)	≤ 20 ppb	< 20 ppb
Trace Impurities - Manganese (Mn)	≤ 10.0 ppb	< 10.0 ppb
Trace Impurities - Nickel (Ni)	≤ 20.0 ppb	< 20.0 ppb

>>> Continued on page 2 >>>

Nitric Acid 69%
CMOS

avantor™ | J.T.Baker®

Material No.: 9606-03
Batch No.: 2310662003

Test	Specification	Result
Trace Impurities – Niobium (Nb)	≤ 50.0 ppb	< 50.0 ppb
Trace Impurities – Potassium (K)	≤ 50 ppb	< 50 ppb
Trace Impurities – Silicon (Si)	≤ 50 ppb	< 50 ppb
Trace Impurities – Silver (Ag)	≤ 20.0 ppb	< 20.0 ppb
Trace Impurities – Sodium (Na)	≤ 150.0 ppb	< 150.0 ppb
Trace Impurities – Strontium (Sr)	≤ 30.0 ppb	< 30.0 ppb
Trace Impurities – Tantalum (Ta)	≤ 10.0 ppb	< 10.0 ppb
Trace Impurities – Thallium (Tl)	≤ 10.0 ppb	< 10.0 ppb
Trace Impurities – Tin (Sn)	≤ 20.0 ppb	< 20.0 ppb
Trace Impurities – Titanium (Ti)	≤ 10.0 ppb	< 10.0 ppb
Trace Impurities – Vanadium (V)	≤ 10.0 ppb	< 10.0 ppb
Trace Impurities – Zinc (Zn)	≤ 20.0 ppb	< 20.0 ppb
Trace Impurities – Zirconium (Zr)	≤ 10.0 ppb	< 10.0 ppb
Particle Count – 0.5 µm and greater	≤ 60 par/ml	60 par/ml
Particle Count – 1.0 µm and greater	≤ 10 par/ml	10 par/ml

>>> Continued on page 3 >>>

Nitric Acid 69%
CMOS

avantor™ | J.T.Baker®

Material No.: 9606-03
Batch No.: 2310662003

Test	Specification	Result

For Microelectronic Use

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

Ken Koehnlein
Sr. Manager, Quality Assurance

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

avantor™ | J.T.Baker®

R → 10/13/24
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

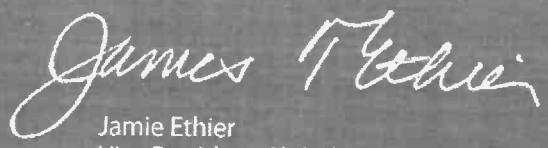
For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700
Avantor Performance Materials, LLC
100 Matsonford Rd, Suite 200, Radnor, PA 19087. U.S.A. Phone: 610.386.1700

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

Alliance TECHNICAL GROUP

Soil/Sludge Mercury Preparation Sheet

PB165163

SOP ID : M7471B-Mercury-18, MSFAM01.1-Mercury in Soil-2

SDG No : MC0VL1/MC0VH4

Matrix : SOIL

Pippete ID: HG A

Balance ID : M SC-3

Filter paper ID : NA

pH Strip ID : NA

Hood ID : #1

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

Start Digest Date: 11/20/2024 **Time :** 18:45 **Temp :** 95 °C

End Digest Date: 11/20/2024 **Time :** 19:15 **Temp :** 96 °C

Digestion tube ID: M6054

Block thermometer ID: HG-DIG#2

Dig Technician Signature: MB

Supervisor Signature: [signature]

Temp : 1. 95°C 2. N/A

Standared Name	MLS USED	STD REF. # FROM LOG
ICV	100mL	MP83320
CCV	100mL	MP83322
Matrix Spike	1.0mL	MP83312
N/A	N/A	N/A
N/A	N/A	N/A

Chemical Used	ML/SAMPLE USED	Lot Number
AQUA REGIA	5.0mL	MP83326
KMnO4 (5%)	15.0mL	MP83208
Hydroxylamine HCL (12%)	6.0mL	MP83210
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

LAB SAMPLE ID	CLIENT SAMPLE ID	Wt(g)/Vol(ml)	Comment
0.0 ppb	S0	100mL	MP83313
0.05 ppb	S0.05	N/A	N/A
0.2 ppb	S0.2	100mL	MP83315
2.5 ppb	S2.5	100mL	MP83316
5.0 ppb	S5.0	100mL	MP83317
7.5 ppb	S7.5	100mL	MP83318
10.0 ppb	S10.0	100mL	MP83319
ICV	ICV	100mL	MP83320
ICB	ICB	100mL	MP83321
CCV	CCV	100mL	MP83322
CCB	CCB	100mL	MP83323
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
11/20/24 @ 19:30	MB – Dig. Lab	AB - metal lab
	Preparation Group	Analysis Group

Alliance TECHNICAL GROUP

Soil/Sludge Mercury Preparation Sheet

PB165163

Lab Sample ID	Client Sample ID	Initial Weight (g)	Final Vol (ml)	pH	Comment	Prep Pos
P4656-01	MC0VH4	0.52	100	NA	N/A	2-1
P4656-02	MC0VJ0	0.59	100	NA	N/A	2
P4656-03	MC0VM0	0.56	100	NA	N/A	3
P4656-04	MC0VM0D	0.53	100	NA	N/A	4
P4656-05	MC0VM0S	0.57	100	NA	MP83312	5
P4656-06	MC0VM6	0.56	100	NA	N/A	6
P4656-07	MC0VM7	0.53	100	NA	N/A	7
P4688-01	MC0VL1	0.51	100	NA	N/A	8
P4688-02	MC0VL2	0.50	100	NA	N/A	9
P4688-03	MC0VL3	0.50	100	NA	N/A	10
P4688-04	MC0VL4	0.57	100	NA	N/A	11
P4688-05	MC0VL5	0.59	100	NA	N/A	12
P4688-06	MC0VL6	0.56	100	NA	N/A	13
P4688-07	MC0VL7	0.59	100	NA	N/A	14
P4688-08	MC0VL8	0.50	100	NA	N/A	15
P4688-09	MC0VL9	0.50	100	NA	N/A	16
P4688-10	MC0VM0	0.55	100	NA	N/A	17
P4688-11	MC0VM0D	0.58	100	NA	N/A	18
P4688-12	MC0VM0S	0.56	100	NA	MP83312	19
P4688-13	MC0VM1	0.53	100	NA	N/A	20
P4688-14	MC0VM2	0.60	100	NA	N/A	21
P4688-15	MC0VM3	0.59	100	NA	N/A	22
P4688-16	MC0VM4	0.53	100	NA	N/A	23
P4688-17	MC0VM5	0.52	100	NA	N/A	24
PB165163BL	PBS163	0.50	100	NA	N/A	25

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

Instrument ID: CV1

Daily Analysis Runlog For Sequence/QCBatch ID # LB133546

Review By	Sarabjit Jaswal	Review On	11/21/2024 10:21:17 PM
Supervise By	Mohan Bera	Supervise On	11/21/2024 10:27:33 PM

STD. NAME	STD REF.#
ICAL Standard	MP83313,MP83315,MP83316,MP83317,MP83318,MP83319
ICV Standard	MP83320
CCV Standard	MP83322
ICSA Standard	
CRI Standard	
LCS Standard	
Chk Standard	MP83321,MP83323,MP83343

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	S0	S0	CAL1	11/21/24 10:34		Mohan	OK
2	S0.2	S01	CAL2	11/21/24 10:36		Mohan	OK
3	S2.5	S02	CAL3	11/21/24 10:39		Mohan	OK
4	S5	S03	CAL4	11/21/24 10:41		Mohan	OK
5	S7.5	S04	CAL5	11/21/24 10:46		Mohan	OK
6	S10	S05	CAL6	11/21/24 10:48		Mohan	OK
7	ICV094	ICV094	ICV	11/21/24 10:59		Mohan	OK
8	ICB094	ICB094	ICB	11/21/24 11:01		Mohan	OK
9	CCV021	CCV021	CCV	11/21/24 11:03		Mohan	OK
10	CCB021	CCB021	CCB	11/21/24 11:05		Mohan	OK
11	PB165162BL	PBS162	MB	11/21/24 11:08		Mohan	OK
12	P4654-01	MC0VG5	SAM	11/21/24 11:10		Mohan	OK
13	P4654-02	MC0VH9	SAM	11/21/24 11:12		Mohan	OK
14	P4654-03	MC0VJ3	SAM	11/21/24 11:15		Mohan	OK
15	P4654-04	MC0VJ4	SAM	11/21/24 11:17		Mohan	OK
16	P4654-05	MC0VJ5	SAM	11/21/24 11:19		Mohan	OK
17	P4654-06	MC0VJ6	SAM	11/21/24 11:21		Mohan	OK
18	P4654-07	MC0VJ7	SAM	11/21/24 11:24		Mohan	OK

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ICV Standard	MP83320
CCV Standard	MP83322
ICSA Standard	
CRI Standard	
LCS Standard	
Chk Standard	MP83321,MP83323,MP83343

19	P4654-08	MC0VJ8	SAM	11/21/24 11:26		Mohan	OK
20	P4654-09	MC0VJ9	SAM	11/21/24 11:28		Mohan	OK
21	P4654-10	MC0VK0	SAM	11/21/24 11:30		Mohan	OK
22	P4654-11	MC0VK0D	DUP	11/21/24 11:33		Mohan	OK
23	P4654-12	MC0VK0S	MS	11/21/24 11:37		Mohan	OK
24	P4654-13	MC0VK1	SAM	11/21/24 11:40		Mohan	OK
25	P4654-14	MC0VK2	SAM	11/21/24 11:42		Mohan	OK
26	P4654-15	MC0VK3	SAM	11/21/24 11:44		Mohan	OK
27	P4654-16	MC0VK4	SAM	11/21/24 11:47		Mohan	OK
28	P4654-17	MC0VK5	SAM	11/21/24 11:49		Mohan	OK
29	P4654-18	MC0VK6	SAM	11/21/24 11:51		Mohan	OK
30	P4654-19	MC0VK7	SAM	11/21/24 11:53		Mohan	OK
31	CCV022	CCV022	CCV	11/21/24 11:56		Mohan	OK
32	CCB022	CCB022	CCB	11/21/24 11:58		Mohan	OK
33	P4654-20	MC0VK8	SAM	11/21/24 12:00		Mohan	OK
34	P4654-21	MC0VK9	SAM	11/21/24 12:03		Mohan	OK
35	PB165163BL	PBS163	MB	11/21/24 12:08		Mohan	OK
36	P4656-01	MC0VH4	SAM	11/21/24 12:10		Mohan	OK
37	P4656-02	MC0VJ0	SAM	11/21/24 12:12		Mohan	OK
38	P4656-03	MC0VM0	SAM	11/21/24 12:14		Mohan	OK

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CCV Standard	MP83322
ICSA Standard	
CRI Standard	
LCS Standard	
Chk Standard	MP83321,MP83323,MP83343

39	P4656-04	MC0VM0D	DUP	11/21/24 12:17		Mohan	OK
40	P4656-05	MC0VM0S	MS	11/21/24 12:19		Mohan	OK
41	P4656-06	MC0VM6	SAM	11/21/24 12:21		Mohan	OK
42	P4656-07	MC0VM7	SAM	11/21/24 12:24		Mohan	OK
43	P4688-01	MC0VL1	SAM	11/21/24 12:26		Mohan	OK
44	P4688-02	MC0VL2	SAM	11/21/24 12:28		Mohan	OK
45	P4688-03	MC0VL3	SAM	11/21/24 12:30		Mohan	OK
46	P4688-04	MC0VL4	SAM	11/21/24 12:33		Mohan	OK
47	P4688-05	MC0VL5	SAM	11/21/24 12:35		Mohan	OK
48	P4688-06	MC0VL6	SAM	11/21/24 12:37		Mohan	OK
49	P4688-07	MC0VL7	SAM	11/21/24 12:39		Mohan	OK
50	P4688-08	MC0VL8	SAM	11/21/24 12:42		Mohan	OK
51	P4688-09	MC0VL9	SAM	11/21/24 12:44		Mohan	OK
52	P4688-10	MC0VM0	SAM	11/21/24 12:46		Mohan	OK
53	CCV023	CCV023	CCV	11/21/24 12:49		Mohan	OK
54	CCB023	CCB023	CCB	11/21/24 12:51		Mohan	OK
55	P4688-11	MC0VM0D	DUP	11/21/24 12:56		Mohan	OK
56	P4688-12	MC0VM0S	MS	11/21/24 13:03		Mohan	OK
57	P4688-13	MC0VM1	SAM	11/21/24 13:06		Mohan	OK
58	P4688-14	MC0VM2	SAM	11/21/24 13:08		Mohan	OK

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ICV Standard	MP83320
CCV Standard	MP83322
ICSA Standard	
CRI Standard	
LCS Standard	
Chk Standard	MP83321,MP83323,MP83343

59	P4688-15	MC0VM3	SAM	11/21/24 13:10		Mohan	OK
60	P4688-16	MC0VM4	SAM	11/21/24 13:12		Mohan	OK
61	P4688-17	MC0VM5	SAM	11/21/24 13:15		Mohan	OK
62	CCV024	CCV024	CCV	11/21/24 13:17		Mohan	OK
63	CCB024	CCB024	CCB	11/21/24 13:19		Mohan	OK