EPA SAMPLE NO.

DUP(20240926)

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: ARC Sayreville MA No. : SDG No.: P4227

Matrix: Water Lab Sample ID: P4227-07

% Solids: Date Received: 09/27/2024

Analytical Method: Hg

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

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.024	J	10/09/2024	1621

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

Comments:

EPA SAMPLE NO.

EB(20240927)

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: ARC Sayreville MA No. : SDG No.: P4227

Matrix: Water Lab Sample ID: P4227-22

% Solids: Date Received: 09/27/2024

Analytical Method: Hg

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

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.20	U	10/09/2024	1704

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

Comments:

EPA SAMPLE NO.

FB(20240925)

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: ARC Sayreville MA No. : SDG No.: P4227

Matrix: Water Lab Sample ID: P4227-19

% Solids: Date Received: 09/27/2024

Analytical Method: Hg

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

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.11	J	10/09/2024	1653

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

Comments:

EPA SAMPLE NO.

FB(20240926)

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: ARC Sayreville MA No. : SDG No.: P4227

Matrix: Water Lab Sample ID: P4227-20

% Solids: Date Received: 09/27/2024

Analytical Method: Hg

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

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.20	U	10/09/2024	1700

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

Comments:

EPA SAMPLE NO.

FB(20240927)

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: ARC Sayreville MA No. : SDG No.: P4227

Matrix: Water Lab Sample ID: P4227-21

% Solids: Date Received: 09/27/2024

Analytical Method: Hg

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

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.20	U	10/09/2024	1702

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

Comments:

EPA SAMPLE NO.

MW-1(MCUA)(20240

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: ARC Sayreville MA No. : SDG No.: P4227

Matrix: Water Lab Sample ID: P4227-10

% Solids: Date Received: 09/27/2024

Analytical Method: Hg

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

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.20	U	10/09/2024	1628

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

Comments:

EPA SAMPLE NO.

MW-2(MCUA)(20240

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: ARC Sayreville MA No. : SDG No.: P4227

Matrix: Water Lab Sample ID: P4227-08

% Solids: Date Received: 09/27/2024

Analytical Method: Hg

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

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.20	U	10/09/2024	1623

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

Comments:

EPA SAMPLE NO.

PMW-1(20240925)

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: ARC Sayreville MA No. : SDG No.: P4227

Matrix: Water Lab Sample ID: P4227-01

% Solids: Date Received: 09/27/2024

Analytical Method: Hg

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

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	1.3		10/09/2024	1607

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

Comments:

EPA SAMPLE NO.

PMW-10(20240927)

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: ARC Sayreville MA No. : SDG No.: P4227

Matrix: Water Lab Sample ID: P4227-18

% Solids: Date Received: 09/27/2024

Analytical Method: Hg

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

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.18	J	10/09/2024	1651

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

Comments:

EPA SAMPLE NO.

PMW-2(20240925)

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: ARC Sayreville MA No. : SDG No.: P4227

Matrix: Water Lab Sample ID: P4227-02

% Solids: Date Received: 09/27/2024

Analytical Method: Hg

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

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.24		10/09/2024	1610

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

Comments:

EPA SAMPLE NO.

PMW-3(20240927)

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: ARC Sayreville MA No. : SDG No.: P4227

Matrix: Water Lab Sample ID: P4227-11

% Solids: Date Received: 09/27/2024

Analytical Method: Hg

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

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.040	J	10/09/2024	1630

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

Comments:

EPA SAMPLE NO.

PMW-4(20240927)

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: ARC Sayreville MA No. : SDG No.: P4227

Matrix: Water Lab Sample ID: P4227-12

% Solids: Date Received: 09/27/2024

Analytical Method: Hg

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

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.20	U	10/09/2024	1632

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

Comments:

EPA SAMPLE NO.

PMW-5(20240926)

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: ARC Sayreville MA No. : SDG No.: P4227

Matrix: Water Lab Sample ID: P4227-09

% Solids: Date Received: 09/27/2024

Analytical Method: Hg

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

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.041	J	10/09/2024	1626

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

Comments:

EPA SAMPLE NO.

PMW-6(20240927)

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: ARC Sayreville MA No. : SDG No.: P4227

Matrix: Water Lab Sample ID: P4227-13

% Solids: Date Received: 09/27/2024

Analytical Method: Hg

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

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.029	J	10/09/2024	1635

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

Comments:

EPA SAMPLE NO.

PMW-7D(20240927)

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: ARC Sayreville MA No. : SDG No.: P4227

Matrix: Water Lab Sample ID: P4227-15

% Solids: Date Received: 09/27/2024

Analytical Method: Hg

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

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.20	U	10/09/2024	1639

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

Comments:

EPA SAMPLE NO.

PMW-7S(20240927)

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: ARC Sayreville MA No. : SDG No.: P4227

Matrix: Water Lab Sample ID: P4227-14

% Solids: Date Received: 09/27/2024

Analytical Method: Hg

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

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.20	U	10/09/2024	1637

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

Comments:

EPA SAMPLE NO.

PMW-8D(20240926)

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: ARC Sayreville MA No. : SDG No.: P4227

Matrix: Water Lab Sample ID: P4227-06

% Solids: Date Received: 09/27/2024

Analytical Method: Hg

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

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.20	U	10/09/2024	1619

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

Comments:

EPA SAMPLE NO.

PMW-8S(20240926)

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: ARC Sayreville MA No. : SDG No.: P4227

Matrix: Water Lab Sample ID: P4227-05

% Solids: Date Received: 09/27/2024

Analytical Method: Hg

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

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.20	U	10/09/2024	1616

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

Comments:

EPA SAMPLE NO.

PMW-9D(20240926)

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: ARC Sayreville MA No. : SDG No.: P4227

Matrix: Water Lab Sample ID: P4227-04

% Solids: Date Received: 09/27/2024

Analytical Method: Hg

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

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.035	J	10/09/2024	1614

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

Comments:

EPA SAMPLE NO.

PMW-9S(20240926)

FORM 1 - IN

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: ACE Case No.: ARC Sayreville MA No. : SDG No.: P4227

Matrix: Water Lab Sample ID: P4227-03

% Solids: Date Received: 09/27/2024

Analytical Method: Hg

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

CAS No.	Analyte	Concentration	Q	Date Analyzed	Time Analyzed
7439-97-6	Mercury	0.034	J	10/09/2024	1612

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

Comments:

FORM 2 - IN

INITIAL AND CONTINUING CALIBRATION VERIFICATION

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

Lab Code: ACE Case No.: ARC Sayrevill MA No. : SDG No.: P4227

Initial Calibration Verification Source : MP82739

Continuing Calibration Verification Source : MP82741

Run Batch: LB132850 Analytical Method: CVAA

Concentration Units: µg/L

	Initial Calibration Verification				Continuing Calibration Verification						
	ID: ICV031				ID: CCV095				ID: CCV096		
Analyte	True	Found	%R	%RSD	True	Found	%R	%RSD	Found	%R	%RSD
Mercury	4.0	3.7	92		5.0	5.0	101		5.1	102	

FORM 2 - IN

INITIAL AND CONTINUING CALIBRATION VERIFICATION

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

Lab Code: ACE Case No.: ARC Sayrevill MA No. : SDG No.: P4227

Initial Calibration Verification Source : MP82739

Continuing Calibration Verification Source : MP82741

Run Batch: LB132850 Analytical Method: CVAA

Concentration Units: µg/L

	Initial Calibration Verification				Continuing Calibration Verification						
	ID:				ID: CCV097				ID:		
Analyte	True	Found	%R	%RSD	True	Found	%R	%RSD	Found	%R	%RSD
Mercury					5.0	5.0	101				

FORM 3 - IN
BLANKS

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

Lab Code: ACE Case No.: ARC Sayrevil MA No. : S DG No.: P4227

Preparation Blank Matrix : Water

Preparation Blank Concentration Units (µg/L, mg/L, mg/kg dry weight, or µg): ug/L

Analytical Method: CVAA Preparation Batch: PB164008

Run Batch: LB132850 Preparation Method: 7470A

Analyte	Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank/Leachate Extraction Blank	
	ID: ICB031	Q	ID: CCB095	Q	ID: CCB096	Q	ID: CCB097	Q	ID: PBW008	Q
Mercury	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U

EPA SAMPLE NO.

PMW-7D(20240927)S

FORM 5A - IN

MATRIX SPIKE SAMPLE RECOVERY

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

Lab Code: ACE Case No.: ARC Sayrevil MA No. : SDG No.: P4227

Matrix : Water Analytical Method: CVAA

% Solids:

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	Q	Sample Result (SR)	Q	Spike Added (SA)	%R	Q
Mercury	75 - 125	0.79		0.2	U	1.0	79	

EPA SAMPLE NO.

PMW-7D(20240927)D

FORM 6 - IN
DUPLICATES

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

Lab Code: ACE Case No.: ARC Sayrevill MA No. : SDG No.: P4227

Matrix : Water Analytical Method: CVAA

% Solids:

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

Analyte	Control Limit	Sample (S)	Q	Duplicate (D)	Q	RPD	Q
Mercury		0.2	U	0.2	U		

FORM 9-IN

METHOD DETECTION LIMIT

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

Lab Code: ACE Case No.: ARC Sayreville PostEx 2024 SDG No.: P4227

Analytical Method: CVAA MA No.: Instrument ID: CV1

Preparation Method: 7470A

Concentration Units (µg/L, µg or mg/kg): ug/L

Analyte	Wavelength/Mass	MDL	Date Analyzed
Mercury	253.70	0.024	02/16/2024

FORM 12-IN

ANALYSIS LOG

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

Lab Code: ACE Case No.: ARC Sayreville PostEx 2024 SDG No.: P4227

Instrument ID: CV1 Analytical Method: CVAA

Start Date: 10/09/2024 End Date: 10/09/2024

Run Batch: LB132850

EPA Sample No.	D/F	Time	Analytes																									
			AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN		
S0	1.0	1539															X											
S01	1.0	1541															X											
S02	1.0	1544															X											
S03	1.0	1546															X											
S04	1.0	1548															X											
S05	1.0	1553															X											
ICV031	1.0	1556															X											
ICB031	1.0	1558															X											
CCV095	1.0	1601															X											
CCB095	1.0	1603															X											
PBW008	1.0	1605															X											
PMW-1(2024	1.0	1607															X											
PMW-2(2024	1.0	1610															X											
PMW-9S(202	1.0	1612															X											
PMW-9D(202	1.0	1614															X											
PMW-8S(202	1.0	1616															X											
PMW-8D(202	1.0	1619															X											
DUP(202409	1.0	1621															X											
MW-2(MCUA)	1.0	1623															X											
PMW-5(2024	1.0	1626															X											
MW-1(MCUA)	1.0	1628															X											
PMW-3(2024	1.0	1630															X											
PMW-4(2024	1.0	1632															X											
PMW-6(2024	1.0	1635															X											
PMW-7S(202	1.0	1637															X											
PMW-7D(202	1.0	1639															X											
PMW-7D(202	1.0	1644															X											
PMW-7D(202	1.0	1648															X											
PMW-10(202	1.0	1651															X											
FB(2024092	1.0	1653															X											
CCV096	1.0	1655															X											
CCB096	1.0	1657															X											
FB(20240920	1.0	1700															X											
FB(20240920	1.0	1702															X											
EB(20240920	1.0	1704															X											
CCV097	1.0	1707															X											
CCB097	1.0	1709															X											

FORM 15-IN

INITIAL CALIBRATION

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

Lab Code: ACE Case No.: ARC Sayreville PostEx 2024 SDG No.: P4227

Instrument ID: CV1 Start Date: 10/09/2024

Analytical Method: CVAA Run Batch: LB132850

Concentration Units: ug/L

Analyte	True	Found	%D	True	Found	%D	True	Found	%D
Mercury	0	0.0	0	0.2	0.24	20	2.5	2.5	0

FORM 15-IN

INITIAL CALIBRATION

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

Lab Code: ACE Case No.: ARC Sayrevi MA No.: SDG No.: P4227

Instrument ID: CV1 Start Date: 10/09/2024

Analytical Method: CVAA Run Batch: LB132850

Concentration Units: ug/L

Analyte	True	Found	%D	True	Found	%D	True	Found	%D
Mercury	5	5.1	2	7.5	7.2	-4	10	10	2

FORM 16-IN

INITIAL CALIBRATION SUMMARY

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

Lab Code: ACE Case No.: ARC Sayreville PostEx 2024 SDG No.: P4227

Instrument ID: CV1 Start Date : 10/09/2024

Analytical Method: CVAA Run Batch : LB132850

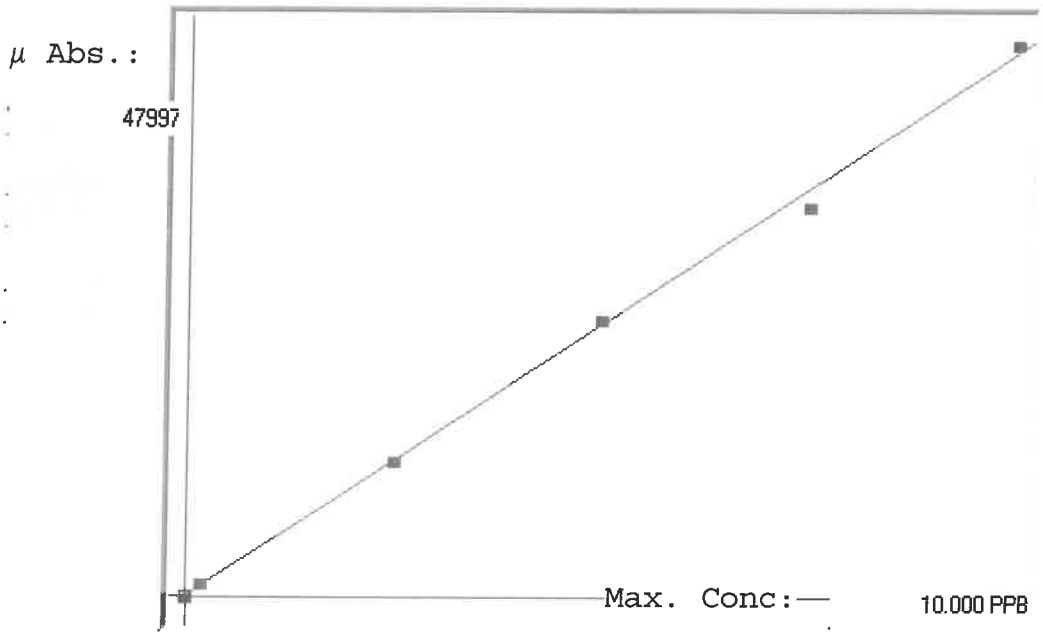
Analyte	Corr. Coeff.	Slope	Intercept	Calib. Type	Weighting
Mercury	0.999228	0.000212	-0.008981	Lin. Reg	NONE

Reviewed By:jaswal
On:10/10/2024
10:46:38 PM
Inst Id :CV1

LB132850

SFAM01.1 INSTRUMENT ID: CV1

Linear



A= 0.0000e+000

B= 2.1188e-004 slope

C= -8.9807e-003 y=mx+intercept

Rho= 0.9992276

Accept=Accepted

Std ID	Conc.	Calc.	Dev.	Mean	SD or %RSD	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	%D
0.00	0.000	-0.002	-0.002	34	0.000	34					5
0.05	0.050					442	0				20
0.20	0.200	0.240	0.040	1174	0.0 %	1174					0
2.50	2.500	2.501	0.001	11846	0.0 %	11846					2
5.00	5.000	5.098	0.098	24105	0.0 %	24105					-4
7.50	7.500	7.202	-0.298	34031	0.0 %	34031					2
10.0	10.000	10.161	0.161	47997	0.0 %	47997					

Reviewed By:jaswal
On:10/10/2024
10:46:38 PM
Inst Id :CV1

LB132850

INSTRUMENT ID : CV1

Sample ID	Extended ID	µ Abs.	Conc.	Stnd Con	Method	Units	Date	Type
0	S0	34	-	0	SFAM01.1	PPB	10/9/2024 15:39	Std
0.2	S01	1174	-	0.2	SFAM01.1	PPB	10/9/2024 15:41	Std
2.5	S02	11846	-	2.5	SFAM01.1	PPB	10/9/2024 15:44	Std
5	S03	24105	-	5	SFAM01.1	PPB	10/9/2024 15:46	Std
7.5	S04	34031	-	7.5	SFAM01.1	PPB	10/9/2024 15:48	Std
10	S05	47997	-	10	SFAM01.1	PPB	10/9/2024 15:53	Std
ICV031	ICV031	17485	3.6958	-	SFAM01.1	PPB	10/9/2024 15:56	SMPL
ICB031	ICB031	-134	-0.0374	-	SFAM01.1	PPB	10/9/2024 15:58	SMPL
CCV095	CCV095	23818	5.0377	-	SFAM01.1	PPB	10/9/2024 16:01	SMPL
CCB095	CCB095	-179	-0.0469	-	SFAM01.1	PPB	10/9/2024 16:03	SMPL
PB164008BL	PBW008	129	0.0184	-	SFAM01.1	PPB	10/9/2024 16:05	SMPL
P4227-01	PMW-1(20240925)	6271	1.3197	-	SFAM01.1	PPB	10/9/2024 16:07	SMPL
P4227-02	PMW-2(20240925)	1193	0.2438	-	SFAM01.1	PPB	10/9/2024 16:10	SMPL
P4227-03	PMW-9S(20240926)	201	0.0336	-	SFAM01.1	PPB	10/9/2024 16:12	SMPL
P4227-04	PMW-9D(20240926)	207	0.0349	-	SFAM01.1	PPB	10/9/2024 16:14	SMPL
P4227-05	PMW-8S(20240926)	136	0.0198	-	SFAM01.1	PPB	10/9/2024 16:16	SMPL
P4227-06	PMW-8D(20240926)	142	0.0211	-	SFAM01.1	PPB	10/9/2024 16:19	SMPL
P4227-07	DUP(20240926)	157	0.0243	-	SFAM01.1	PPB	10/9/2024 16:21	SMPL
P4227-08	MW-2(MCUA)(20240926)	-13	-0.0117	-	SFAM01.1	PPB	10/9/2024 16:23	SMPL
P4227-09	PMW-5(20240926)	235	0.0408	-	SFAM01.1	PPB	10/9/2024 16:26	SMPL
P4227-10	MW-1(MCUA)(20240926)	20	-0.0047	-	SFAM01.1	PPB	10/9/2024 16:28	SMPL
P4227-11	PMW-3(20240927)	231	0.04	-	SFAM01.1	PPB	10/9/2024 16:30	SMPL
P4227-12	PMW-4(20240927)	147	0.0222	-	SFAM01.1	PPB	10/9/2024 16:32	SMPL
P4227-13	PMW-6(20240927)	178	0.0287	-	SFAM01.1	PPB	10/9/2024 16:35	SMPL
P4227-14	PMW-7S(20240927)	-4	-0.0098	-	SFAM01.1	PPB	10/9/2024 16:37	SMPL
P4227-15	PMW-7D(20240927)	22	-0.0043	-	SFAM01.1	PPB	10/9/2024 16:39	SMPL
P4227-16	P4227-15D	60	0.0037	-	SFAM01.1	PPB	10/9/2024 16:44	SMPL
P4227-17	P4227-15S	3772	0.7902	-	SFAM01.1	PPB	10/9/2024 16:48	SMPL
P4227-18	PMW-10(20240927)	869	0.1751	-	SFAM01.1	PPB	10/9/2024 16:51	SMPL
P4227-19	FB(20240925)	555	0.1086	-	SFAM01.1	PPB	10/9/2024 16:53	SMPL
CCV096	CCV096	24037	5.0841	-	SFAM01.1	PPB	10/9/2024 16:55	SMPL
CCB096	CCB096	-156	-0.042	-	SFAM01.1	PPB	10/9/2024 16:57	SMPL
P4227-20	FB(20240926)	30	-0.0026	-	SFAM01.1	PPB	10/9/2024 17:00	SMPL
P4227-21	FB(20240927)	44	0.0003	-	SFAM01.1	PPB	10/9/2024 17:02	SMPL
P4227-22	EB(20240927)	92	0.0105	-	SFAM01.1	PPB	10/9/2024 17:04	SMPL
CCV097	CCV097	23770	5.0275	-	SFAM01.1	PPB	10/9/2024 17:07	SMPL
CCB097	CCB097	-99	-0.03	-	SFAM01.1	PPB	10/9/2024 17:09	SMPL

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Water Mercury Preparation Sheet

PB164008

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

SDG No : NA

Matrix : WATER

Pippete ID: HG A

Balance ID : N/A

Filter paper ID : NA

pH Strip ID : M4909

Hood ID : #1

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

Start Digest Date: 10/09/2024 **Time :** 10:35 **Temp :** 94 °C

End Digest Date: 10/09/2024 **Time :** 12:35 **Temp :** 95 °C

Digestion tube ID: M6054

Block thermometer ID: HG-DIG#1

Dig Technician Signature: MB

Supervisor Signature: 12

Temp : 1. 94°C 2. N/A

Standared Name	MLS USED	STD REF. # FROM LOG
ICV	100mL	MP82739
CCV	100mL	MP82741
Matrix Spike	0.40mL	MP82732
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	MP82651
KMnO4	15.0mL	MP82652
K2S2O8	8.0mL	MP82653
Hydroxylamine HCL	6.0mL	MP82654
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	MP82733
0.05 ppb	S0.05	N/A	N/A
0.2 ppb	S0.2	100mL	MP82734
2.5 ppb	S2.5	100mL	MP82735
5.0 ppb	S5.0	100mL	MP82736
7.5 ppb	S7.5	100mL	MP82737
10.0 ppb	S10.0	100mL	MP82738
ICV	ICV	100mL	MP82739
ICB	ICB	100mL	MP82740
CCV	CCV	100mL	MP82741
CCB	CCB	100mL	MP82742
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
10/9/24 @ 13:05	MB - Dig Lab	MB - Refrig Lab
	Preparation Group	Analysis Group

Alliance TECHNICAL GROUP

Water Mercury Preparation Sheet

PB164008

Lab Sample ID	Client Sample ID	Initial Vol (ml)	Final Vol (ml)	pH	Comment	Prep Pos
P4227-01	PMW-1(20240925)	100	100	<2	N/A	1-1
P4227-02	PMW-2(20240925)	100	100	<2	N/A	2
P4227-03	PMW-9S(20240926)	100	100	<2	N/A	3
P4227-04	PMW-9D(20240926)	100	100	<2	N/A	4
P4227-05	PMW-8S(20240926)	100	100	<2	N/A	5
P4227-06	PMW-8D(20240926)	100	100	<2	N/A	6
P4227-07	DUP(20240926)	100	100	<2	N/A	7
P4227-08	MW-2(MCUA)(20240926)	100	100	<2	N/A	8
P4227-09	PMW-5(20240926)	100	100	<2	N/A	9
P4227-10	MW-1(MCUA)(20240926)	100	100	<2	N/A	10
P4227-11	PMW-3(20240927)	100	100	<2	N/A	11
P4227-12	PMW-4(20240927)	100	100	<2	N/A	12
P4227-13	PMW-6(20240927)	100	100	<2	N/A	13
P4227-14	PMW-7S(20240927)	100	100	<2	N/A	14
P4227-15	PMW-7D(20240927)	100	100	<2	N/A	15
P4227-16	P4227-15MS D	100	100	<2	N/A	16
P4227-17	P4227-15MSD S	100	100	<2	MP82732	17
P4227-18	PMW-10(20240927)	100	100	<2	N/A	18
P4227-19	FB(20240925)	100	100	<2	N/A	19
P4227-20	FB(20240926)	100	100	<2	N/A	20
P4227-21	FB(20240927)	100	100	<2	N/A	21
P4227-22	EB(20240927)	100	100	<2	N/A	22
PB164008BL	PBW008	100	100	<2	N/A	23

MB 10/10/24

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Prep Standard - Chemical Standard Summary

Order ID : P4227

Test : Mercury

Prepbatch ID : PB164008,

Sequence ID/Qc Batch ID: LB132850,

Standard ID :
MP82651,MP82652,MP82653,MP82654,MP82732,MP82733,MP82734,MP82735,MP82736,MP82737,MP82738,MP82739,MP82740,MP82741,MP82742,

Chemical ID :
M4371,M4465,M4916,M5062,M5501,M5673,M5953,M6080,M6083,W3112,

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Fax : 908 789 8922

Metals STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
3965	2:1 H2SO4 : HNO3	MP82651	09/30/2024	03/25/2025	Mohan Bera	None	None	Sarabjit Jaswal 10/04/2024

FROM 1600.00000ml of M5673 + 800.00000ml of M6080 = Final Quantity: 3200.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
65	POTASSIUM PERMANGANATE SOLUTION 5 %	MP82652	09/30/2024	04/03/2025	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal 10/04/2024

FROM 100.00000gram of M4916 + 2000.00000ml of W3112 = 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
66	POTASSIUM PERSULFATE SOLUTION 5 %	MP82653	09/30/2024	04/03/2025	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal 10/04/2024

FROM 100.00000ml of M4465 + 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	MP82654	09/30/2024	04/03/2025	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal 10/04/2024

FROM 2000.00000ml of W3112 + 240.00000gram of M4371 + 240.00000gram of M5501 = Final Quantity: 2000.000 ml

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Fax : 908 789 8922

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.	MP82732	10/09/2024	10/10/2024	Mohan Bera	None	METALS_PIPETTE_3 (A)	Sarabjit Jaswal 10/10/2024

FROM 1.00000ml of M6083 + 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	MP82733	10/09/2024	10/10/2024	Mohan Bera	None	METALS_PIPETTE_3 (A)	Sarabjit Jaswal 10/10/2024

FROM 2.50000ml of M6083 + 247.50000ml of W3112 = Final Quantity: 250.000 ml

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Fax : 908 789 8922

Metals STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1341	Hg 0.2 PPB STD	MP82734	10/09/2024	10/10/2024	Mohan Bera	None	METALS_PIPETTE_3 (A)	Sarabjit Jaswal 10/10/2024

FROM 2.50000ml of M6083 + 247.30000ml of W3112 + 0.20000ml of MP82732 = 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	MP82735	10/09/2024	10/10/2024	Mohan Bera	None	METALS_PIPETTE_3 (A)	Sarabjit Jaswal 10/10/2024

FROM 2.50000ml of M6083 + 245.00000ml of W3112 + 2.50000ml of MP82732 = 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	MP82736	10/09/2024	10/10/2024	Mohan Bera	None	METALS_PIPETTE_3 (A)	Sarabjit Jaswal 10/10/2024

FROM 2.50000ml of M6083 + 242.50000ml of W3112 + 5.00000ml of MP82732 = 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	MP82737	10/09/2024	10/10/2024	Mohan Bera	None	METALS_PIPETTE_3 (A)	Sarabjit Jaswal 10/10/2024

FROM 2.50000ml of M6083 + 240.00000ml of W3112 + 7.50000ml of MP82732 = 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	MP82738	10/09/2024	10/10/2024	Mohan Bera	None	METALS_PIPETTE_3 (A)	Sarabjit Jaswal 10/10/2024

FROM 2.50000ml of M6083 + 237.50000ml of W3112 + 10.00000ml of MP82732 = Final Quantity: 250.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1346	Hg ICV SOLUTION	MP82739	10/09/2024	10/10/2024	Mohan Bera	None	METALS_PIPETTE_3 (A)	Sarabjit Jaswal 10/10/2024

FROM 2.50000ml of M5953 + 2.50000ml of M6083 + 245.00000ml of W3112 = Final Quantity: 250.000 ml

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Fax : 908 789 8922

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)	MP82740	10/09/2024	10/10/2024	Mohan Bera	None	METALS_PIPETTE_3 (A)	Sarabjit Jaswal 10/10/2024

FROM 2.50000ml of M6083 + 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)	MP82741	10/09/2024	10/10/2024	Mohan Bera	None	METALS_PIPETTE_3 (A)	Sarabjit Jaswal 10/10/2024

FROM 485.00000ml of W3112 + 5.00000ml of M6083 + 10.00000ml of MP82732 = 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)	MP82742	10/09/2024	10/10/2024	Mohan Bera	None	METALS_PIPETTE_3 (A)	Sarabjit Jaswal 10/10/2024

FROM 495.00000ml of W3112 + 5.00000ml of M6083 = 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-3238-05 / Potassium Persulfate (2.5kg)	0000234156	08/06/2025	07/23/2019 / jaswal	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 #
Seidler Chemical	BA-3624-05 / Sodium Chloride, Crystal (cs/4x2.5kg)	0000281938	07/06/2026	07/24/2023 / mohan	04/14/2023 / mohan	M5501

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9673-33 / Sulfuric Acid, Instra-Analyzed (cs/6c2.5L)	23D2462010	03/20/2028	09/21/2023 / mohan	09/05/2023 / mohan	M5673

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CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
EPA	ICV-5 / ICV (HG) STOCK SOLN	ICV5-0415	01/01/2025	07/01/2024 / mohan	03/30/2023 / mohan	M5953

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9598-34 / Nitric Acid, Instra-Analyzed (cs/4x2.5L)	24D1062002	03/25/2025	10/02/2024 / Janvi	09/02/2024 / Janvi	M6080

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	03/25/2029	10/06/2024 / Janvi	09/02/2024 / Janvi	M6083

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

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

Certificate of Analysis
ThermoFisher SCIENTIFIC

M4913-1b

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.

Certificate of Analysis

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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 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

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

M5493 - M5708
Rec'd on 9/14/23
MG

avantor™ | J.T.Baker®

Material No.: 3624-01
Batch No.: 0000281938
Manufactured Date: 2021-06-07
Retest Date: 2026-06-07
Revision No.: 2

Certificate of Analysis

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

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

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 Matsonford 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

A15673-78
A-3

avantor™ | J.T.Baker®

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_2SO_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 SO2)	≤ 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™ | J.T.Baker®

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

James Ethier

Jamie Ethier
Vice President Global Quality

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

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

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

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

M5528-32
MB
M5953
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.

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®

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

R: 9/2/24.

Certificate of Analysis

M6080, M6081, M6082, M6083, M6084

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™ | J.T.Baker®

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

Test	Specification	Result
Trace Impurities - Niobium (Nb)	≤ 50.0 ppb	< 1.0 ppb
Trace Impurities - Potassium (K)	≤ 50 ppb	16 ppb
Trace Impurities - Silicon (Si)	≤ 50 ppb	< 10 ppb
Trace Impurities - Silver (Ag)	≤ 20.0 ppb	< 1.0 ppb
Trace Impurities - Sodium (Na)	≤ 150.0 ppb	< 5.0 ppb
Trace Impurities - Strontium (Sr)	≤ 30.0 ppb	< 1.0 ppb
Trace Impurities - Tantalum (Ta)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities - Thallium (Tl)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities - Tin (Sn)	≤ 20.0 ppb	< 10.0 ppb
Trace Impurities - Titanium (Ti)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities - Vanadium (V)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities - Zinc (Zn)	≤ 20.0 ppb	< 1.0 ppb
Trace Impurities - Zirconium (Zr)	≤ 10.0 ppb	< 1.0 ppb
Particle Count - 0.5 µm and greater	≤ 60 par/ml	10 par/ml
Particle Count - 1.0 µm and greater	≤ 10 par/ml	3 par/ml

>>> Continued on page 3 >>>

Nitric Acid 69%
CMOS

avantor™ | J.T.Baker®

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

Test	Specification	Result

For Microelectronic Use

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

Jamie Croak
Director Quality Operations, Bioscience Production

Nitric Acid 69%
CMOS

avantor™ | J.T.Baker®

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

R: 9/2/24.

Certificate of Analysis

M6080, M6081, M6082, M6083, M6084

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™ | J.T.Baker®

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

Test	Specification	Result
Trace Impurities - Niobium (Nb)	≤ 50.0 ppb	< 1.0 ppb
Trace Impurities - Potassium (K)	≤ 50 ppb	16 ppb
Trace Impurities - Silicon (Si)	≤ 50 ppb	< 10 ppb
Trace Impurities - Silver (Ag)	≤ 20.0 ppb	< 1.0 ppb
Trace Impurities - Sodium (Na)	≤ 150.0 ppb	< 5.0 ppb
Trace Impurities - Strontium (Sr)	≤ 30.0 ppb	< 1.0 ppb
Trace Impurities - Tantalum (Ta)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities - Thallium (Tl)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities - Tin (Sn)	≤ 20.0 ppb	< 10.0 ppb
Trace Impurities - Titanium (Ti)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities - Vanadium (V)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities - Zinc (Zn)	≤ 20.0 ppb	< 1.0 ppb
Trace Impurities - Zirconium (Zr)	≤ 10.0 ppb	< 1.0 ppb
Particle Count - 0.5 µm and greater	≤ 60 par/ml	10 par/ml
Particle Count - 1.0 µm and greater	≤ 10 par/ml	3 par/ml

>>> Continued on page 3 >>>

Nitric Acid 69%
CMOS

avantor™ | J.T.Baker®

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

Test	Specification	Result

For Microelectronic Use

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

Jamie Croak
Director Quality Operations, Bioscience Production

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 # LB132850

Review By	mohan	Review On	10/10/2024 10:45:13 PM
Supervise By	jaswal	Supervise On	10/10/2024 10:46:38 PM

STD. NAME	STD REF.#
ICAL Standard	MP82733,MP82734,MP82735,MP82736,MP82737,MP82738
ICV Standard	MP82739
CCV Standard	MP82741
ICSA Standard	
CRI Standard	
LCS Standard	
Chk Standard	MP82740,MP82742

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	S0	S0	CAL1	10/09/24 15:39		Mohan	OK
2	S0.2	S01	CAL2	10/09/24 15:41		Mohan	OK
3	S2.5	S02	CAL3	10/09/24 15:44		Mohan	OK
4	S5	S03	CAL4	10/09/24 15:46		Mohan	OK
5	S7.5	S04	CAL5	10/09/24 15:48		Mohan	OK
6	S10	S05	CAL6	10/09/24 15:53		Mohan	OK
7	ICV031	ICV031	ICV	10/09/24 15:56		Mohan	OK
8	ICB031	ICB031	ICB	10/09/24 15:58		Mohan	OK
9	CCV095	CCV095	CCV	10/09/24 16:01		Mohan	OK
10	CCB095	CCB095	CCB	10/09/24 16:03		Mohan	OK
11	PB164008BL	PBW008	MB	10/09/24 16:05		Mohan	OK
12	P4227-01	PMW-1(20240925)	SAM	10/09/24 16:07		Mohan	OK
13	P4227-02	PMW-2(20240925)	SAM	10/09/24 16:10		Mohan	OK
14	P4227-03	PMW-9S(20240926)	SAM	10/09/24 16:12		Mohan	OK
15	P4227-04	PMW-9D(20240926)	SAM	10/09/24 16:14		Mohan	OK
16	P4227-05	PMW-8S(20240926)	SAM	10/09/24 16:16		Mohan	OK
17	P4227-06	PMW-8D(20240926)	SAM	10/09/24 16:19		Mohan	OK
18	P4227-07	DUP(20240926)	SAM	10/09/24 16:21		Mohan	OK

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Fax : 908 789 8922

Instrument ID: CV1

Daily Analysis Runlog For Sequence/QCBatch ID # LB132850

Review By	mohan	Review On	10/10/2024 10:45:13 PM
Supervise By	jaswal	Supervise On	10/10/2024 10:46:38 PM

STD. NAME	STD REF.#
ICAL Standard	MP82733,MP82734,MP82735,MP82736,MP82737,MP82738
ICV Standard	MP82739
CCV Standard	MP82741
ICSA Standard	
CRI Standard	
LCS Standard	
Chk Standard	MP82740,MP82742

19	P4227-08	MW-2(MCUA)(202409	SAM	10/09/24 16:23		Mohan	OK
20	P4227-09	PMW-5(20240926)	SAM	10/09/24 16:26		Mohan	OK
21	P4227-10	MW-1(MCUA)(202409	SAM	10/09/24 16:28		Mohan	OK
22	P4227-11	PMW-3(20240927)	SAM	10/09/24 16:30		Mohan	OK
23	P4227-12	PMW-4(20240927)	SAM	10/09/24 16:32		Mohan	OK
24	P4227-13	PMW-6(20240927)	SAM	10/09/24 16:35		Mohan	OK
25	P4227-14	PMW-7S(20240927)	SAM	10/09/24 16:37		Mohan	OK
26	P4227-15	PMW-7D(20240927)	SAM	10/09/24 16:39		Mohan	OK
27	P4227-16	PMW-7D(20240927)D	DUP	10/09/24 16:44		Mohan	OK
28	P4227-17	PMW-7D(20240927)S	MS	10/09/24 16:48		Mohan	OK
29	P4227-18	PMW-10(20240927)	SAM	10/09/24 16:51		Mohan	OK
30	P4227-19	FB(20240925)	SAM	10/09/24 16:53		Mohan	OK
31	CCV096	CCV096	CCV	10/09/24 16:55		Mohan	OK
32	CCB096	CCB096	CCB	10/09/24 16:57		Mohan	OK
33	P4227-20	FB(20240926)	SAM	10/09/24 17:00		Mohan	OK
34	P4227-21	FB(20240927)	SAM	10/09/24 17:02		Mohan	OK
35	P4227-22	EB(20240927)	SAM	10/09/24 17:04		Mohan	OK
36	CCV097	CCV097	CCV	10/09/24 17:07		Mohan	OK
37	CCB097	CCB097	CCB	10/09/24 17:09		Mohan	OK