

PREP BATCH REPORT

Prep Code: **PRP-3010**
 Prep Batch **162274** Prep Temp: **94.1 °C**

Technician: **Amanda E. McDaniels**
 Batch Units: **ML**

Prep Start Date: **12/16/2021 3:59:10 P**
 Prep End Date: **12/17/2021 10:20:00 A**

Sample ID	Matrix	pH	Initial Samp Amt	Sol Added	Sol Recovered	Final Vol (mL)	Factor	Balance	Prep Start Date	Prep End Date
MB-162274	Temp cell D4		50	0	0	50	1		12/16/2021	12/17/2021
LCS4-162274			50	0	0	50	1		12/16/2021	12/17/2021
B21121402-001C	Ground Water		50	0	0	50	1		12/16/2021	12/17/2021
B21121402-001CMS4			50	0	0	50	1		12/16/2021	12/17/2021
B21121402-001CMSD4			50	0	0	50	1		12/16/2021	12/17/2021
B21121402-002C	Ground Water		50	0	0	50	1		12/16/2021	12/17/2021
B21121402-003C	Ground Water		50	0	0	50	1		12/16/2021	12/17/2021

Number	Reagent Name	Exp Date	
14344	Hydrochloric Acid, 36.5-38.0% 0000285454	5/10/2026	1 mL
14377	50mL DigiTubes J521901-2029	10/12/2022	
14601	Nitric Acid Instra Analyzed,0000280251	3/17/2026	6 mL

Spk ID	Spike Name	SampType	AmtAdd	Exp Date
ME211124 EL-M	EL-MSICV-2	LCS4/MS4	0.05 ml	11/24/2022
ME211202 EL200	EL-200.2MS	LCS4/MS4	0.05 mL	12/2/2022
ME211213 AUDI	AUDIGSPK	LCS4/MS4	0.05 ml	9/3/2022

Energy Laboratories Inc

ANALYTICAL RUN Summary

19-Jan-22

Run ID ICPMS207-B_211220A

Run Start Date: 12/20/2021 10:52:31
 Analyst: Cindy Rohrer
 Ical: 0
 Column ID:
 Comments:

Instrument ID	Description
04F07114	Metals 5-50 uL Adjustable Pipette
340760037	Metals 100-1000 uL Adjustable Pipette
340760040	Metals 100-1000 uL Adjustable Pipette
440780018	Metals 1-5 mL Adjustable Pipette
440780025	Metals 1-5 mL Adjustable Pipette
841980007	1000-5000uL Pipette
841980009	1000-5000uL Pipette

Std ID	Std Name	Std Amount	Std Units	Samp Amount	Samp Units	SampType	Expiration Date
ME210901 0.025 PPB STAND	0.025 ppb Standard					CAL1	1/4/2022
ME210901 0.05 PPB STAND	0.05 ppb Standard					CAL2	1/4/2022
ME210901 0.1 PPB STANDAR	0.1 ppb Standard					CAL3	1/4/2022
ME210901 0.5 PPB STANDAR	0.5 ppb Standard					CAL4	1/4/2022
ME210901 1 PPB STANDARD	1 PPB STANDARD					CAL5	1/4/2022
ME210901 10 PPB STANDAR	10 ppb Standard					CAL6	1/4/2022
ME210901 100 PPB STANDAR	100 ppb Standard					CAL8	1/4/2022
ME210901 1000 PPB STAND	1000 PPB Standard					CAL10	1/4/2022
ME210901 CCV STANDARD	CCV for ICPMS standards					CAL7, CCV	1/5/2022
ME210901 ICSA	ICSA					ICSA	9/1/2022
ME210901 ICSAB	ICSAB					ICSAB	9/1/2022
ME211006 SS1	SS1 ICPMS Spiking Solution					LFB	1/5/2022
ME211117A INTERNAL STAN	Internal Standards 2 mg/L						1/4/2022
ME211206 ICV STANDARD	ICV for ICPMS Standards					ICV	4/30/2022
ME211207 2008TS	200.8 Tune Solution						12/7/2022

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983984	Rinse	ICPMS-6020-W- SAMP			12/20/2021 10:5	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983985	Cal Blk	ICPMS-6020-W- SAMP			12/20/2021 10:5	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983985	Cal Blk	ICPMS-6020-W-	SAMP		12/20/2021 10:5	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0	0		0	0	0	0.00086	0.001	1	0%	0	0	0%	
Arsenic	A	mg/L	0	0		0	0	0	0.00019	0.001	1	0%	0	0	0%	
Barium	A	mg/L	0	0		0	0	0	0.000042	0.001	1	0%	0	0	0%	
Beryllium	A	mg/L	0	0		0	0	0	0.00012	0.001	1	0%	0	0	0%	
Cadmium	A	mg/L	0	0		0	0	0	0.000025	0.001	1	0%	0	0	0%	
Cerium	A	mg/L	0	0		0	0	0	0.000012	0.001	0.1	0%	0	0	0%	
Chromium	A	mg/L	0	0		0	0	0	0.00018	0.001	1	0%	0	0	0%	
Cobalt	A	mg/L	0	0		0	0	0	0.000042	0.001	1	0%	0	0	0%	
Copper	A	mg/L	0	0		0	0	0	0.00027	0.001	1	0%	0	0	0%	
Lanthanum	A	mg/L	0	0		0	0	0	0.000011	0.001	0.1	0%	0	0	0%	
Lead	A	mg/L	0	0		0	0	0	0.000056	0.001	1	0%	0	0	0%	
Manganese	A	mg/L	0	0		0	0	0	0.000095	0.001	1	0%	0	0	0%	
Mercury	A	mg/L	0	0		0	0	0	0.00016	0.001	0.002	0%	0	0	0%	
Molybdenum	A	mg/L	0	0		0	0	0	0.00005	0.001	0.1	0%	0	0	0%	
Nickel	A	mg/L	0	0		0	0	0	0.00063	0.001	1	0%	0	0	0%	
Selenium	A	mg/L	0	0		0	0	0	0.00033	0.001	1	0%	0	0	0%	
Silicon	A	mg/L	0	0		0	0	0	0.01223	0.1	0.4	0%	0	0	0%	
Silver	A	mg/L	0	0		0	0	0	0.00002	0.001	0.04	0%	0	0	0%	
Strontium	A	mg/L	0	0		0	0	0	0.00014	0.001	1	0%	0	0	0%	
Thallium	A	mg/L	0	0		0	0	0	0.000041	0.001	1	0%	0	0	0%	
Thorium	A	mg/L	0	0		0	0	0	0.00061	0.001	1	0%	0	0	0%	
Titanium	A	mg/L	0	0		0	0	0	0.000094	0.001	1	0%	0	0	0%	
Uranium	A	mg/L	0	0		0	0	0	0.000052	0.0003	1	0%	0	0	0%	
Boron	B	mg/L	0	0		0	0	0	0.00561	0.00561	1	0%	0	0	0%	L
Calcium	B	mg/L	0	0		0	0	0	0.02092	0.02092	50	0%	0	0	0%	L
Iron	B	mg/L	0	0		0	0	0	0.00119	0.00119	5	0%	0	0	0%	
Iron, Ferrous	B	mg/L	0	0		0	0	0	0.00119	0.00119	5	0%	0	0	0%	
Magnesium	B	mg/L	0	0		0	0	0	0.00564	0.00564	50	0%	0	0	0%	L
Sodium	B	mg/L	0	0		0	0	0	0.02171	0.02171	50	0%	0	0	0%	L
Tin	B	mg/L	0	0		0	0	0	0.00132	0.00132	0.1	0%	0	0	0%	
Vanadium	B	mg/L	0	0		0	0	0	0.0013	0.0013	1	0%	0	0	0%	
Zinc	B	mg/L	0	0		0	0	0	0.00273	0.00273	1	0%	0	0	0%	L

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983986	0.025 ppb STD	ICPMS-6020B-C	Ca11		12/20/2021 11:0	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00004622	0.00004622		0	0	0		0.01		0%			0%	
Antimony	A	mg/L	0.00002769	0.00002769		0	0	0		0.001		0%			0%	
Arsenic	A	mg/L	-0.00004055	-0.00004055		0.000025	0	0		0.001		-162%	80	120	0%	S
Barium	A	mg/L	0.00003454	0.00003454		0.000025	0	0		0.0003		138%	80	120	0%	S
Beryllium	A	mg/L	0.00001686	0.00001686		0.000025	0	0		0.001		67%	80	120	0%	S
Boron	A	mg/L	-0.0000192	-0.0000192		0	0	0		0.1		0%			0%	
Cadmium	A	mg/L	0.00002696	0.00002696		0.000025	0	0		0.001		108%	80	120	0%	
Calcium	A	mg/L	0.01485	0.01485		0	0	0		1		0%			0%	
Cerium	A	mg/L	0.00002852	0.00002852		0.000025	0	0		0.001		114%	80	120	0%	
Chromium	A	mg/L	0.00003822	0.00003822		0.000025	0	0		0.001		153%	80	120	0%	S
Cobalt	A	mg/L	0.00002738	0.00002738		0.000025	0	0		0.001		110%	80	120	0%	
Copper	A	mg/L	0.00003152	0.00003152		0	0	0		0.005		0%			0%	
Iron	A	mg/L	0.0008676	0.0008676		0	0	0		0.01		0%			0%	
Lanthanum	A	mg/L	0.00002966	0.00002966		0.000025	0	0		0.001		119%	80	120	0%	
Lead	A	mg/L	0.00002574	0.00002574		0.000025	0	0		0.001		103%	80	120	0%	
Lithium	A	mg/L	0.0002993	0.0002993		0.0003125	0	0		1		96%	80	120	0%	
Magnesium	A	mg/L	0.007539	0.007539		0	0	0		1		0%			0%	
Manganese	A	mg/L	0.00002864	0.00002864		0	0	0		0.001		0%			0%	
Mercury	A	mg/L	-9.295E-07	-9.295E-07		0	0	0		0.001		0%			0%	
Molybdenum	A	mg/L	0.00002328	0.00002328		0	0	0		0.001		0%			0%	
Nickel	A	mg/L	0.00002706	0.00002706		0	0	0		0.005		0%			0%	
Potassium	A	mg/L	0.01316	0.01316		0.00625	0	0		1		211%	80	120	0%	S
Selenium	A	mg/L	0.00001038	0.00001038		0.000025	0	0		0.005		42%	80	120	0%	S
Silicon	A	mg/L	-0.0003726	-0.0003726		0	0	0		0.1		0%			0%	
Silver	A	mg/L	0.00001108	0.00001108		0	0	0		0.001		0%			0%	
Sodium	A	mg/L	0.008578	0.008578		0.00625	0	0		1		137%	80	120	0%	S
Strontium	A	mg/L	0.00003438	0.00003438		0	0	0		0.001		0%	80	120	0%	
Thallium	A	mg/L	0.00002791	0.00002791		0	0	0		0.001		0%			0%	
Thorium	A	mg/L	0.00001726	0.00001726		0	0	0		0.05		0%			0%	
Tin	A	mg/L	0.0002055	0.0002055		0	0	0		0.001		0%			0%	
Titanium	A	mg/L	0.00005244	0.00005244		0	0	0		0.001		0%			0%	
Uranium	A	mg/L	0.00002647	0.00002647		0.000025	0	0		0.001		106%	80	120	0%	
Vanadium	A	mg/L	-0.0003677	-0.0003677		0	0	0		0.005		0%			0%	
Zinc	A	mg/L	0.0005913	0.0005913		0	0	0		0.01		0%			0%	
Iron, Ferrous	C	mg/L	0.0008676	0.0008676		0.000025	0	0		0.01	5	3470%	80	120	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983986	0.025 ppb STD	ICPMS-6020B-C	Cal1		12/20/2021 11:0	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon as SiO2	C	mg/L	-0.00079736	-0.00079736		0.0000535	0	0		0.214	0.9	-1490%	80	120	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983987	0.05 ppb STD	ICPMS-6020B-C	Cal2		12/20/2021 11:1	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.0002303	-0.0002303		0	0	0		0.01		0%			0%	
Antimony	A	mg/L	0.00004989	0.00004989		0.00005	0	0		0.001		100%	80	120	0%	
Arsenic	A	mg/L	0.00002052	0.00002052		0.00005	0	0		0.001		41%	80	120	0%	S
Barium	A	mg/L	0.00003731	0.00003731		0.00005	0	0		0.0003		75%	80	120	0%	S
Beryllium	A	mg/L	0.0001011	0.0001011		0.00005	0	0		0.001		202%	80	120	0%	S
Boron	A	mg/L	-0.00002514	-0.00002514		0	0	0		0.1		0%			0%	
Cadmium	A	mg/L	0.0000561	0.0000561		0.00005	0	0		0.001		112%	80	120	0%	
Calcium	A	mg/L	0.01802	0.01802		0.0125	0	0		1		144%	80	120	0%	S
Cerium	A	mg/L	0.00005603	0.00005603		0.00005	0	0		0.001		112%	80	120	0%	
Chromium	A	mg/L	0.00008709	0.00008709		0.00005	0	0		0.001		174%	80	120	0%	S
Cobalt	A	mg/L	0.00006819	0.00006819		0	0	0		0.001		0%			0%	
Copper	A	mg/L	0.00005263	0.00005263		0.00005	0	0		0.005		105%	80	120	0%	
Iron	A	mg/L	0.00157	0.00157		0.00125	0	0		0.01		126%	80	120	0%	S
Lanthanum	A	mg/L	0.00005396	0.00005396		0.00005	0	0		0.001		108%	80	120	0%	
Lead	A	mg/L	0.00005315	0.00005315		0.00005	0	0		0.001		106%	80	120	0%	
Lithium	A	mg/L	0.0005843	0.0005843		0.000625	0	0		1		93%	80	120	0%	
Magnesium	A	mg/L	0.01617	0.01617		0.0125	0	0		1		129%	80	120	0%	S
Manganese	A	mg/L	0.00004676	0.00004676		0.00005	0	0		0.001		94%	80	120	0%	
Mercury	A	mg/L	-9.555E-08	-9.555E-08		0	0	0		0.001		0%			0%	
Molybdenum	A	mg/L	0.00005453	0.00005453		0.00005	0	0		0.001		109%	80	120	0%	
Nickel	A	mg/L	0.00005739	0.00005739		0	0	0		0.005		0%			0%	
Potassium	A	mg/L	0.01925	0.01925		0.0125	0	0		1		154%	80	120	0%	S
Selenium	A	mg/L	0.00004504	0.00004504		0.00005	0	0		0.005		90%	80	120	0%	
Silicon	A	mg/L	-0.0002623	-0.0002623		0	0	0		0.1		0%			0%	
Silver	A	mg/L	0.00002087	0.00002087		0.00002	0	0		0.001		104%	80	120	0%	
Sodium	A	mg/L	0.01408	0.01408		0.0125	0	0		1		113%	80	120	0%	
Strontium	A	mg/L	0.00006632	0.00006632		0.00005	0	0		0.001		133%	80	120	0%	S
Thallium	A	mg/L	0.00005425	0.00005425		0	0	0		0.001		0%			0%	
Thorium	A	mg/L	0.00003762	0.00003762		0	0	0		0.05		0%			0%	

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14983987	0.05 ppb STD	ICPMS-6020B-C	Cal2		12/20/2021 11:1	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tin	A	mg/L	0.00007953	0.00007953		0	0	0		0.001		0%			0%	
Titanium	A	mg/L	0.0000668	0.0000668		0	0	0		0.001		0%			0%	
Uranium	A	mg/L	0.00005521	0.00005521		0.00005	0	0		0.001		110%	80	120	0%	
Vanadium	A	mg/L	-0.00007464	-0.00007464		0	0	0		0.005		0%			0%	
Zinc	A	mg/L	0.00009518	0.00009518		0	0	0		0.01		0%			0%	
Iron, Ferrous	C	mg/L	0.00157	0.00157		0.00005	0	0		0.01	5	3140%	80	120	0%	S
Silicon as SiO2	C	mg/L	-0.00056132	-0.00056132		0.00428	0	0		0.214	0.9	-13%	80	120	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983988	0.10 ppb STD	ICPMS-6020B-C	Cal3		12/20/2021 11:1	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.0003275	-0.0003275		0.0001	0	0		0.01		-328%	80	120	0%	S
Antimony	A	mg/L	0.0001133	0.0001133		0.0001	0	0		0.001		113%	80	120	0%	
Arsenic	A	mg/L	0.00009178	0.00009178		0.0001	0	0		0.001		92%	80	120	0%	
Barium	A	mg/L	0.0001228	0.0001228		0.0001	0	0		0.0003		123%	80	120	0%	S
Beryllium	A	mg/L	0.0001132	0.0001132		0.0001	0	0		0.001		113%	80	120	0%	
Boron	A	mg/L	0.000006375	0.000006375		0	0	0		0.1		0%			0%	
Cadmium	A	mg/L	0.0001203	0.0001203		0.0001	0	0		0.001		120%	80	120	0%	
Calcium	A	mg/L	0.03661	0.03661		0.025	0	0		1		146%	80	120	0%	S
Cerium	A	mg/L	0.0001176	0.0001176		0.0001	0	0		0.001		118%	80	120	0%	
Chromium	A	mg/L	0.0001493	0.0001493		0.0001	0	0		0.001		149%	80	120	0%	S
Cobalt	A	mg/L	0.0001432	0.0001432		0.0001	0	0		0.001		143%	80	120	0%	S
Copper	A	mg/L	0.0001185	0.0001185		0.0001	0	0		0.005		119%	80	120	0%	
Iron	A	mg/L	0.003314	0.003314		0.0025	0	0		0.01		133%	80	120	0%	S
Lanthanum	A	mg/L	0.0001227	0.0001227		0.0001	0	0		0.001		123%	80	120	0%	S
Lead	A	mg/L	0.0001161	0.0001161		0.0001	0	0		0.001		116%	80	120	0%	
Lithium	A	mg/L	0.001395	0.001395		0.00125	0	0		1		112%	80	120	0%	
Magnesium	A	mg/L	0.03358	0.03358		0.025	0	0		1		134%	80	120	0%	S
Manganese	A	mg/L	0.0001248	0.0001248		0.0001	0	0		0.001		125%	80	120	0%	S
Mercury	A	mg/L	0.000002437	0.000002437		0.000002	0	0		0.001		122%	80	120	0%	S
Molybdenum	A	mg/L	0.0001226	0.0001226		0.0001	0	0		0.001		123%	80	120	0%	S
Nickel	A	mg/L	0.0001268	0.0001268		0.0001	0	0		0.005		127%	80	120	0%	S
Potassium	A	mg/L	0.04051	0.04051		0.025	0	0		1		162%	80	120	0%	S
Selenium	A	mg/L	0.000121	0.000121		0.0001	0	0		0.005		121%	80	120	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983988	0.10 ppb STD	ICPMS-6020B-C	Cal3		12/20/2021 11:1	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon	A	mg/L	-0.0006408	-0.0006408		0.0004	0	0		0.1		-160%	80	120	0%	S
Silver	A	mg/L	0.00004862	0.00004862		0.00004	0	0		0.001		122%	80	120	0%	S
Sodium	A	mg/L	0.03014	0.03014		0.025	0	0		1		121%	80	120	0%	S
Strontium	A	mg/L	0.0001301	0.0001301		0.0001	0	0		0.001		130%	80	120	0%	S
Thallium	A	mg/L	0.0001175	0.0001175		0.0001	0	0		0.001		118%	80	120	0%	S
Thorium	A	mg/L	0.00008306	0.00008306		0.0001	0	0		0.05		83%	80	120	0%	S
Tin	A	mg/L	0.0001448	0.0001448		0.0001	0	0		0.001		145%	80	120	0%	S
Titanium	A	mg/L	0.000156	0.000156		0.0001	0	0		0.001		156%	80	120	0%	S
Uranium	A	mg/L	0.0001174	0.0001174		0.0001	0	0		0.001		117%	80	120	0%	S
Vanadium	A	mg/L	0.0001321	0.0001321		0.0001	0	0		0.005		132%	80	120	0%	S
Zinc	A	mg/L	0.0001359	0.0001359		0.0001	0	0		0.01		136%	80	120	0%	S
Iron, Ferrous	C	mg/L	0.003314	0.003314		0.0001	0	0		0.01	5	3314%	80	120	0%	S
Silicon as SiO2	C	mg/L	-0.00137131	-0.00137131		0.00856	0	0		0.214	0.9	-16%	80	120	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983989	0.5 ppb STD	ICPMS-6020B-C	Cal4		12/20/2021 11:2	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.0000373	0.0000373		0.0005	0	0		0.01		7%	80	120	0%	S
Antimony	A	mg/L	0.0004933	0.0004933		0.0005	0	0		0.001		99%	80	120	0%	S
Arsenic	A	mg/L	0.0005262	0.0005262		0.0005	0	0		0.001		105%	80	120	0%	S
Barium	A	mg/L	0.0005318	0.0005318		0.0005	0	0		0.0003		106%	80	120	0%	S
Beryllium	A	mg/L	0.0005561	0.0005561		0.0005	0	0		0.001		111%	80	120	0%	S
Boron	A	mg/L	0.0004724	0.0004724		0.0005	0	0		0.1		94%	80	120	0%	S
Cadmium	A	mg/L	0.0005169	0.0005169		0.0005	0	0		0.001		103%	80	120	0%	S
Calcium	A	mg/L	0.1613	0.1613		0.125	0	0		1		129%	80	120	0%	S
Cerium	A	mg/L	0.0005285	0.0005285		0.0005	0	0		0.001		106%	80	120	0%	S
Chromium	A	mg/L	0.0006111	0.0006111		0.0005	0	0		0.001		122%	80	120	0%	S
Cobalt	A	mg/L	0.0005825	0.0005825		0.0005	0	0		0.001		117%	80	120	0%	S
Copper	A	mg/L	0.0005816	0.0005816		0.0005	0	0		0.005		116%	80	120	0%	S
Iron	A	mg/L	0.01489	0.01489		0.0125	0	0		0.01		119%	80	120	0%	S
Lanthanum	A	mg/L	0.0005332	0.0005332		0.0005	0	0		0.001		107%	80	120	0%	S
Lead	A	mg/L	0.000516	0.000516		0.0005	0	0		0.001		103%	80	120	0%	S
Lithium	A	mg/L	0.006882	0.006882		0.00625	0	0		1		110%	80	120	0%	S
Magnesium	A	mg/L	0.1516	0.1516		0.125	0	0		1		121%	80	120	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983989	0.5 ppb STD	ICPMS-6020B-C	CaI4		12/20/2021 11:2	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Manganese	A	mg/L	0.0005736	0.0005736		0.0005	0	0		0.001		115%	80	120	0%	
Mercury	A	mg/L	0.0000101	0.0000101		0.00001	0	0		0.001		101%	80	120	0%	
Molybdenum	A	mg/L	0.0004953	0.0004953		0.0005	0	0		0.001		99%	80	120	0%	
Nickel	A	mg/L	0.00056	0.00056		0.0005	0	0		0.005		112%	80	120	0%	
Potassium	A	mg/L	0.1492	0.1492		0.125	0	0		1		119%	80	120	0%	
Selenium	A	mg/L	0.00055	0.00055		0.0005	0	0		0.005		110%	80	120	0%	
Silicon	A	mg/L	0.0007146	0.0007146		0.002	0	0		0.1		36%	80	120	0%	S
Silver	A	mg/L	0.0002067	0.0002067		0.0002	0	0		0.001		103%	80	120	0%	
Sodium	A	mg/L	0.1396	0.1396		0.125	0	0		1		112%	80	120	0%	
Strontium	A	mg/L	0.000579	0.000579		0.0005	0	0		0.001		116%	80	120	0%	
Thallium	A	mg/L	0.0005381	0.0005381		0.0005	0	0		0.001		108%	80	120	0%	
Thorium	A	mg/L	0.0004242	0.0004242		0.0005	0	0		0.05		85%	80	120	0%	
Tin	A	mg/L	0.0005094	0.0005094		0.0005	0	0		0.001		102%	80	120	0%	
Titanium	A	mg/L	0.0005653	0.0005653		0.0005	0	0		0.001		113%	80	120	0%	
Uranium	A	mg/L	0.0005124	0.0005124		0.0005	0	0		0.001		102%	80	120	0%	
Vanadium	A	mg/L	0.0004864	0.0004864		0.0005	0	0		0.005		97%	80	120	0%	
Zinc	A	mg/L	0.0005727	0.0005727		0.0005	0	0		0.01		115%	80	120	0%	
Iron, Ferrous	C	mg/L	0.01489	0.01489		0.0005	0	0		0.01	5	2978%	80	120	0%	S
Silicon as SiO2	C	mg/L	0.001529244	0.001529244		0.0428	0	0		0.214	0.9	4%	80	120	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983990	1 ppb STD	ICPMS-6020B-C	CaI5		12/20/2021 11:3	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.0005378	0.0005378		0.001	0	0		0.01		54%	80	120	0%	S
Antimony	A	mg/L	0.001081	0.001081		0.001	0	0		0.001		108%	80	120	0%	
Arsenic	A	mg/L	0.00118	0.00118		0.001	0	0		0.001		118%	80	120	0%	
Barium	A	mg/L	0.001187	0.001187		0.001	0	0		0.0003		119%	80	120	0%	
Beryllium	A	mg/L	0.001136	0.001136		0.001	0	0		0.001		114%	80	120	0%	
Boron	A	mg/L	0.0009953	0.0009953		0.001	0	0		0.1		100%	80	120	0%	
Cadmium	A	mg/L	0.001123	0.001123		0.001	0	0		0.001		112%	80	120	0%	
Calcium	A	mg/L	0.3318	0.3318		0.25	0	0		1		133%	80	120	0%	S
Cerium	A	mg/L	0.001134	0.001134		0.001	0	0		0.001		113%	80	120	0%	
Chromium	A	mg/L	0.001242	0.001242		0.001	0	0		0.001		124%	80	120	0%	S
Cobalt	A	mg/L	0.001262	0.001262		0.001	0	0		0.001		126%	80	120	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983990	1 ppb STD	ICPMS-6020B-C	Cal5		12/20/2021 11:3	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Copper	A	mg/L	0.0013	0.0013		0.001	0	0		0.005		130%	80	120	0%	S
Iron	A	mg/L	0.03203	0.03203		0.025	0	0		0.01		128%	80	120	0%	S
Lanthanum	A	mg/L	0.001156	0.001156		0.001	0	0		0.001		116%	80	120	0%	
Lead	A	mg/L	0.001144	0.001144		0.001	0	0		0.001		114%	80	120	0%	
Lithium	A	mg/L	0.01486	0.01486		0.0125	0	0		1		119%	80	120	0%	
Magnesium	A	mg/L	0.3223	0.3223		0.25	0	0		1		129%	80	120	0%	S
Manganese	A	mg/L	0.001267	0.001267		0.001	0	0		0.001		127%	80	120	0%	S
Mercury	A	mg/L	0.00002293	0.00002293		0.00002	0	0		0.001		115%	80	120	0%	
Molybdenum	A	mg/L	0.001078	0.001078		0.001	0	0		0.001		108%	80	120	0%	
Nickel	A	mg/L	0.001241	0.001241		0.001	0	0		0.005		124%	80	120	0%	S
Potassium	A	mg/L	0.3219	0.3219		0.25	0	0		1		129%	80	120	0%	S
Selenium	A	mg/L	0.001174	0.001174		0.001	0	0		0.005		117%	80	120	0%	
Silicon	A	mg/L	0.003197	0.003197		0.004	0	0		0.1		80%	80	120	0%	
Silver	A	mg/L	0.0004403	0.0004403		0.0004	0	0		0.001		110%	80	120	0%	
Sodium	A	mg/L	0.3033	0.3033		0.25	0	0		1		121%	80	120	0%	S
Strontium	A	mg/L	0.001246	0.001246		0.001	0	0		0.001		125%	80	120	0%	S
Thallium	A	mg/L	0.001203	0.001203		0.001	0	0		0.001		120%	80	120	0%	
Thorium	A	mg/L	0.001028	0.001028		0.001	0	0		0.05		103%	80	120	0%	
Tin	A	mg/L	0.001103	0.001103		0.001	0	0		0.001		110%	80	120	0%	
Titanium	A	mg/L	0.001173	0.001173		0.001	0	0		0.001		117%	80	120	0%	
Uranium	A	mg/L	0.001136	0.001136		0.001	0	0		0.001		114%	80	120	0%	
Vanadium	A	mg/L	0.001054	0.001054		0.001	0	0		0.005		105%	80	120	0%	
Zinc	A	mg/L	0.00116	0.00116		0.001	0	0		0.01		116%	80	120	0%	
Iron, Ferrous	C	mg/L	0.03203	0.03203		0.001	0	0		0.01	5	3203%	80	120	0%	S
Silicon as SiO2	C	mg/L	0.00684158	0.00684158		0.0856	0	0		0.214	0.9	8%	80	120	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983991	10 ppb STD	ICPMS-6020B-C	Cal6		12/20/2021 11:3	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.01091	0.01091		0.01	0	0		0.01		109%	90	110	0%	
Antimony	A	mg/L	0.01043	0.01043		0.01	0	0		0.001		104%	90	110	0%	
Arsenic	A	mg/L	0.01141	0.01141		0.01	0	0		0.001		114%	90	110	0%	S
Barium	A	mg/L	0.01104	0.01104		0.01	0	0		0.0003		110%	90	110	0%	
Beryllium	A	mg/L	0.01152	0.01152		0.01	0	0		0.001		115%	90	110	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983991	10 ppb STD	ICPMS-6020B-C	Cal6		12/20/2021 11:3	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	A	mg/L	0.01121	0.01121		0.01	0	0		0.1		112%	90	110	0%	S
Cadmium	A	mg/L	0.01085	0.01085		0.01	0	0		0.001		108%	90	110	0%	
Calcium	A	mg/L	3.08	3.08		2.5	0	0		1		123%	90	110	0%	S
Cerium	A	mg/L	0.01065	0.01065		0.01	0	0		0.001		106%	90	110	0%	
Chromium	A	mg/L	0.01168	0.01168		0.01	0	0		0.001		117%	90	110	0%	S
Cobalt	A	mg/L	0.01191	0.01191		0.01	0	0		0.001		119%	90	110	0%	S
Copper	A	mg/L	0.01221	0.01221		0.01	0	0		0.005		122%	90	110	0%	S
Iron	A	mg/L	0.2945	0.2945		0.25	0	0		0.01		118%	90	110	0%	S
Lanthanum	A	mg/L	0.01047	0.01047		0.01	0	0		0.001		105%	90	110	0%	
Lead	A	mg/L	0.01079	0.01079		0.01	0	0		0.001		108%	90	110	0%	
Lithium	A	mg/L	0.145	0.145		0.125	0	0		1		116%	90	110	0%	S
Magnesium	A	mg/L	2.935	2.935		2.5	0	0		1		117%	90	110	0%	S
Manganese	A	mg/L	0.01167	0.01167		0.01	0	0		0.001		117%	90	110	0%	S
Mercury	A	mg/L	0.0002096	0.0002096		0.0002	0	0		0.001		105%	90	110	0%	
Molybdenum	A	mg/L	0.0106	0.0106		0.01	0	0		0.001		106%	90	110	0%	
Nickel	A	mg/L	0.01193	0.01193		0.01	0	0		0.005		119%	90	110	0%	S
Potassium	A	mg/L	2.945	2.945		2.5	0	0		1		118%	90	110	0%	S
Selenium	A	mg/L	0.01129	0.01129		0.01	0	0		0.005		113%	90	110	0%	S
Silicon	A	mg/L	0.04187	0.04187		0.04	0	0		0.1		105%	90	110	0%	
Silver	A	mg/L	0.004294	0.004294		0.004	0	0		0.001		107%	90	110	0%	
Sodium	A	mg/L	2.906	2.906		2.5	0	0		1		116%	90	110	0%	S
Strontium	A	mg/L	0.01139	0.01139		0.01	0	0		0.001		114%	90	110	0%	S
Thallium	A	mg/L	0.01105	0.01105		0.01	0	0		0.001		110%	90	110	0%	
Thorium	A	mg/L	0.01018	0.01018		0.01	0	0		0.05		102%	90	110	0%	
Tin	A	mg/L	0.01007	0.01007		0.01	0	0		0.001		101%	90	110	0%	
Titanium	A	mg/L	0.01079	0.01079		0.01	0	0		0.001		108%	90	110	0%	
Uranium	A	mg/L	0.01104	0.01104		0.01	0	0		0.001		110%	90	110	0%	
Vanadium	A	mg/L	0.01012	0.01012		0.01	0	0		0.005		101%	90	110	0%	
Zinc	A	mg/L	0.01175	0.01175		0.01	0	0		0.01		118%	90	110	0%	S
Iron, Ferrous	C	mg/L	0.2945	0.2945		0.01	0	0		0.01	5	2945%	90	110	0%	S
Silicon as SiO2	C	mg/L	0.0896018	0.0896018		0.856	0	0		0.214	0.9	10%	90	110	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983992	50 ppb STD	ICPMS-6020B-C Cal7			12/20/2021 11:4	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.04946	0.04946		0.05	0	0		0.01		99%	90	110	0%	
Antimony	A	mg/L	0.04917	0.04917		0.05	0	0		0.001		98%	90	110	0%	
Arsenic	A	mg/L	0.05081	0.05081		0.05	0	0		0.001		102%	90	110	0%	
Barium	A	mg/L	0.05036	0.05036		0.05	0	0		0.0003		101%	90	110	0%	
Beryllium	A	mg/L	0.04892	0.04892		0.05	0	0		0.001		98%	90	110	0%	
Boron	A	mg/L	0.04906	0.04906		0.05	0	0		0.1		98%	90	110	0%	
Cadmium	A	mg/L	0.04814	0.04814		0.05	0	0		0.001		96%	90	110	0%	
Calcium	A	mg/L	13.5	13.5		12.5	0	0		1		108%	90	110	0%	
Cerium	A	mg/L	0.04937	0.04937		0.05	0	0		0.001		99%	90	110	0%	
Chromium	A	mg/L	0.05094	0.05094		0.05	0	0		0.001		102%	90	110	0%	
Cobalt	A	mg/L	0.05121	0.05121		0.05	0	0		0.001		102%	90	110	0%	
Copper	A	mg/L	0.05242	0.05242		0.05	0	0		0.005		105%	90	110	0%	
Iron	A	mg/L	1.281	1.281		1.25	0	0		0.01		102%	90	110	0%	
Lanthanum	A	mg/L	0.04929	0.04929		0.05	0	0		0.001		99%	90	110	0%	
Lead	A	mg/L	0.04924	0.04924		0.05	0	0		0.001		98%	90	110	0%	
Lithium	A	mg/L	0.6126	0.6126		0.625	0	0		1		98%	90	110	0%	
Magnesium	A	mg/L	12.65	12.65		12.5	0	0		1		101%	90	110	0%	
Manganese	A	mg/L	0.05115	0.05115		0.05	0	0		0.001		102%	90	110	0%	
Mercury	A	mg/L	0.001003	0.001003		0.001	0	0		0.001		100%	90	110	0%	
Molybdenum	A	mg/L	0.04843	0.04843		0.05	0	0		0.001		97%	90	110	0%	
Nickel	A	mg/L	0.05168	0.05168		0.05	0	0		0.005		103%	90	110	0%	
Potassium	A	mg/L	12.69	12.69		12.5	0	0		1		102%	90	110	0%	
Selenium	A	mg/L	0.04975	0.04975		0.05	0	0		0.005		99%	90	110	0%	
Silicon	A	mg/L	0.2043	0.2043		0.2	0	0		0.1		102%	90	110	0%	
Silver	A	mg/L	0.01909	0.01909		0.02	0	0		0.001		95%	90	110	0%	
Sodium	A	mg/L	12.53	12.53		12.5	0	0		1		100%	90	110	0%	
Strontium	A	mg/L	0.05093	0.05093		0.05	0	0		0.001		102%	90	110	0%	
Thallium	A	mg/L	0.05109	0.05109		0.05	0	0		0.001		102%	90	110	0%	
Thorium	A	mg/L	0.04856	0.04856		0.05	0	0		0.05		97%	90	110	0%	
Tin	A	mg/L	0.05488	0.05488		0.05	0	0		0.001		110%	90	110	0%	
Titanium	A	mg/L	0.04977	0.04977		0.05	0	0		0.001		100%	90	110	0%	
Uranium	A	mg/L	0.05045	0.05045		0.05	0	0		0.001		101%	90	110	0%	
Vanadium	A	mg/L	0.04644	0.04644		0.05	0	0		0.005		93%	90	110	0%	
Zinc	A	mg/L	0.05199	0.05199		0.05	0	0		0.01		104%	90	110	0%	
Iron, Ferrous	C	mg/L	1.281	1.281		0.05	0	0		0.01	5	2562%	90	110	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983992	50 ppb STD	ICPMS-6020B-C Cal7			12/20/2021 11:4	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon as SiO2	C	mg/L	0.437202	0.437202		4.28	0	0		0.214	0.9	10%	90	110	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983993	100 ppb STD	ICPMS-6020B-C Cal8			12/20/2021 11:5	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.1054	0.1054		0.1	0	0		0.01		105%	90	110	0%	
Antimony	A	mg/L	0.1004	0.1004		0.1	0	0		0.001		100%	90	110	0%	
Arsenic	A	mg/L	0.1038	0.1038		0.1	0	0		0.001		104%	90	110	0%	
Barium	A	mg/L	0.1061	0.1061		0.1	0	0		0.0003		106%	90	110	0%	
Beryllium	A	mg/L	0.1078	0.1078		0.1	0	0		0.001		108%	90	110	0%	
Boron	A	mg/L	0.1062	0.1062		0.1	0	0		0.1		106%	90	110	0%	
Cadmium	A	mg/L	0.104	0.104		0.1	0	0		0.001		104%	90	110	0%	
Calcium	A	mg/L	26.09	26.09		25	0	0		1		104%	90	110	0%	
Cerium	A	mg/L	0.1002	0.1002		0.1	0	0		0.001		100%	90	110	0%	
Chromium	A	mg/L	0.1034	0.1034		0.1	0	0		0.001		103%	90	110	0%	
Cobalt	A	mg/L	0.101	0.101		0.1	0	0		0.001		101%	90	110	0%	
Copper	A	mg/L	0.1054	0.1054		0.1	0	0		0.005		105%	90	110	0%	
Iron	A	mg/L	2.596	2.596		2.5	0	0		0.01		104%	90	110	0%	
Lanthanum	A	mg/L	0.1003	0.1003		0.1	0	0		0.001		100%	90	110	0%	
Lead	A	mg/L	0.1032	0.1032		0.1	0	0		0.001		103%	90	110	0%	
Lithium	A	mg/L	1.281	1.281		1.25	0	0		1		102%	90	110	0%	
Magnesium	A	mg/L	25.23	25.23		25	0	0		1		101%	90	110	0%	
Manganese	A	mg/L	0.1032	0.1032		0.1	0	0		0.001		103%	90	110	0%	
Mercury	A	mg/L	0.001998	0.001998		0.002	0	0		0.001		100%	90	110	0%	
Molybdenum	A	mg/L	0.1007	0.1007		0.1	0	0		0.001		101%	90	110	0%	
Nickel	A	mg/L	0.1042	0.1042		0.1	0	0		0.005		104%	90	110	0%	
Potassium	A	mg/L	25.25	25.25		25	0	0		1		101%	90	110	0%	
Selenium	A	mg/L	0.1031	0.1031		0.1	0	0		0.005		103%	90	110	0%	
Silicon	A	mg/L	0.3977	0.3977		0.4	0	0		0.1		99%	90	110	0%	
Silver	A	mg/L	0.04043	0.04043		0.04	0	0		0.001		101%	90	110	0%	
Sodium	A	mg/L	24.81	24.81		25	0	0		1		99%	90	110	0%	
Strontium	A	mg/L	0.1041	0.1041		0.1	0	0		0.001		104%	90	110	0%	
Thallium	A	mg/L	0.1054	0.1054		0.1	0	0		0.001		105%	90	110	0%	
Thorium	A	mg/L	0.1029	0.1029		0.1	0	0		0.05		103%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983993	100 ppb STD	ICPMS-6020B-C Cal8			12/20/2021 11:5	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tin	A	mg/L	0.09755	0.09755		0.1	0	0		0.001		98%	90	110	0%	
Titanium	A	mg/L	0.1	0.1		0.1	0	0		0.001		100%	90	110	0%	
Uranium	A	mg/L	0.1049	0.1049		0.1	0	0		0.001		105%	90	110	0%	
Vanadium	A	mg/L	0.09994	0.09994		0.1	0	0		0.005		100%	90	110	0%	
Zinc	A	mg/L	0.1037	0.1037		0.1	0	0		0.01		104%	90	110	0%	
Iron, Ferrous	C	mg/L	2.596	2.596		0.1	0	0		0.01	5	2596%	90	110	0%	S
Silicon as SiO2	C	mg/L	0.851078	0.851078		8.56	0	0		0.214	0.9	10%	90	110	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983994	1000 ppb STD	ICPMS-6020B-C Cal10			12/20/2021 11:5	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.9995	0.9995		1	0	0		0.01		100%	90	110	0%	
Antimony	A	mg/L	0.00006843	0.00006843		0	0	0		0.001		0%			0%	
Arsenic	A	mg/L	0.9996	0.9996		1	0	0		0.001		100%	90	110	0%	
Barium	A	mg/L	0.9994	0.9994		1	0	0		0.0003		100%	90	110	0%	
Beryllium	A	mg/L	0.9993	0.9993		1	0	0		0.001		100%	90	110	0%	
Boron	A	mg/L	0.9994	0.9994		1	0	0		0.1		100%	90	110	0%	
Cadmium	A	mg/L	0.9997	0.9997		1	0	0		0.001		100%	90	110	0%	
Calcium	A	mg/L	49.18	49.18		50	0	0		1		98%	90	110	0%	
Cerium	A	mg/L	0.0000197	0.0000197		0	0	0		0.001		0%			0%	
Chromium	A	mg/L	0.9996	0.9996		1	0	0		0.001		100%	90	110	0%	
Cobalt	A	mg/L	0.9998	0.9998		1	0	0		0.001		100%	90	110	0%	
Copper	A	mg/L	0.9993	0.9993		1	0	0		0.005		100%	90	110	0%	
Iron	A	mg/L	6.004	6.004		6	0	0		0.01		100%	90	110	0%	
Lanthanum	A	mg/L	0.00009807	0.00009807		0	0	0		0.001		0%			0%	
Lead	A	mg/L	0.9997	0.9997		1	0	0		0.001		100%	90	110	0%	
Lithium	A	mg/L	2.486	2.486		2.5	0	0		1		99%	90	110	0%	
Magnesium	A	mg/L	49.82	49.82		50	0	0		1		100%	90	110	0%	
Manganese	A	mg/L	0.9996	0.9996		1	0	0		0.001		100%	90		0%	
Mercury	A	mg/L	0.0000409	0.0000409		0	0	0		0.001		0%			0%	
Molybdenum	A	mg/L	0.00004896	0.00004896		0	0	0		0.001		0%			0%	
Nickel	A	mg/L	0.9995	0.9995		1	0	0		0.005		100%	90	110	0%	
Potassium	A	mg/L	49.81	49.81		50	0	0		1		100%	90	110	0%	
Selenium	A	mg/L	0.9997	0.9997		1	0	0		0.005		100%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983994	1000 ppb STD	ICPMS-6020B-C	Cal10		12/20/2021 11:5	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon	A	mg/L	-0.0004194	-0.0004194		0	0	0		0.1		0%				0%
Silver	A	mg/L	0.2607	0.2607		0	0	0		0.001		0%				0%
Sodium	A	mg/L	50.07	50.07		50	0	0		1		100%	90	110		0%
Strontium	A	mg/L	0.9995	0.9995		1	0	0		0.001		100%	90	110		0%
Thallium	A	mg/L	0.9994	0.9994		1	0	0		0.001		100%	90	110		0%
Thorium	A	mg/L	0.9998	0.9998		1	0	0		0.05		100%	90	110		0%
Tin	A	mg/L	0.00006231	0.00006231		0	0	0		0.001		0%				0%
Titanium	A	mg/L	0.007742	0.007742		1	0	0		0.001		1%	90	110		0% S
Uranium	A	mg/L	0.9995	0.9995		1	0	0		0.001		100%	90	110		0%
Vanadium	A	mg/L	1	1		1	0	0		0.005		100%	90	110		0%
Zinc	A	mg/L	0.9995	0.9995		1	0	0		0.01		100%	90	110		0%
Iron, Ferrous	C	mg/L	6.004	6.004		0	0	0		0.01	5	0%				0%
Silicon as SiO2	C	mg/L	-0.00089752	-0.00089752		0	0	0		0.214	0.9	0%				0%

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983995	100 ppb Br STD	ICPMS-6020-W-	SAMP		12/20/2021 12:0	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.0008109	0		0	0	0	0.00086	0.001	1	0%	0	0		0%
Arsenic	A	mg/L	-0.000197	0		0	0	0	0.00019	0.001	1	0%	0	0		0%
Barium	A	mg/L	-5.791E-06	0		0	0	0	0.000042	0.001	1	0%	0	0		0%
Beryllium	A	mg/L	-0.00001193	0		0	0	0	0.00012	0.001	1	0%	0	0		0%
Cadmium	A	mg/L	0.00001785	0		0	0	0	0.000025	0.001	1	0%	0	0		0%
Cerium	A	mg/L	9.147E-07	0		0	0	0	0.000012	0.001	0.1	0%	0	0		0%
Chromium	A	mg/L	0.00002136	0		0	0	0	0.00018	0.001	1	0%	0	0		0%
Cobalt	A	mg/L	0.00001112	0		0	0	0	0.000042	0.001	1	0%	0	0		0%
Copper	A	mg/L	0.00002728	0		0	0	0	0.00027	0.001	1	0%	0	0		0%
Lanthanum	A	mg/L	6.891E-07	0		0	0	0	0.000011	0.001	0.1	0%	0	0		0%
Lead	A	mg/L	0.00002177	0		0	0	0	0.000056	0.001	1	0%	0	0		0%
Manganese	A	mg/L	-0.00000161	0		0	0	0	0.000095	0.001	1	0%	0	0		0%
Mercury	A	mg/L	-3.847E-07	0		0	0	0	0.00016	0.001	0.002	0%	0	0		0%
Molybdenum	A	mg/L	0.00001216	0		0	0	0	0.00005	0.001	0.1	0%	0	0		0%
Nickel	A	mg/L	-0.00001358	0		0	0	0	0.00063	0.001	1	0%	0	0		0%
Selenium	A	mg/L	0.00004547	0		0	0	0	0.00033	0.001	1	0%	0	0		0%
Silicon	A	mg/L	-0.002278	0		0	0	0	0.01223	0.1	0.4	0%	0	0		0%

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983995	100 ppb Br STD	ICPMS-6020-W-	SAMP		12/20/2021 12:0	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silver	A	mg/L	0.00007415	0.00007415		0	0	0	0.00002	0.001	0.04	0%	0	0	0%	J
Strontium	A	mg/L	0.000007646	0		0	0	0	0.00014	0.001	1	0%	0	0	0%	
Thallium	A	mg/L	0.0002404	0.0002404		0	0	0	0.000041	0.001	1	0%	0	0	0%	J
Thorium	A	mg/L	0.00005206	0		0	0	0	0.00061	0.001	1	0%	0	0	0%	
Titanium	A	mg/L	0.00005017	0		0	0	0	0.000094	0.001	1	0%	0	0	0%	
Uranium	A	mg/L	0.000009449	0		0	0	0	0.000052	0.0003	1	0%	0	0	0%	
Boron	B	mg/L	0.004336	0		0	0	0	0.00561	0.00561	1	0%	0	0	0%	L
Calcium	B	mg/L	0.00267	0		0	0	0	0.02092	0.02092	50	0%	0	0	0%	L
Iron	B	mg/L	0.0001252	0		0	0	0	0.00119	0.00119	5	0%	0	0	0%	
Iron, Ferrous	B	mg/L	0.0001252	0		0	0	0	0.00119	0.00119	5	0%	0	0	0%	
Magnesium	B	mg/L	0.0002376	0		0	0	0	0.00564	0.00564	50	0%	0	0	0%	L
Sodium	B	mg/L	0.004012	0		0	0	0	0.02171	0.02171	50	0%	0	0	0%	L
Tin	B	mg/L	0.0001783	0		0	0	0	0.00132	0.00132	0.1	0%	0	0	0%	
Vanadium	B	mg/L	-0.00239	0		0	0	0	0.0013	0.0013	1	0%	0	0	0%	
Zinc	B	mg/L	0.0001942	0		0	0	0	0.00273	0.00273	1	0%	0	0	0%	L

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983996	Rinse	ICPMS-6020-W-	SAMP		12/20/2021 12:0	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.0004051	0		0	0	0	0.00086	0.001	1	0%	0	0	0%	
Arsenic	A	mg/L	-0.0002624	0		0	0	0	0.00019	0.001	1	0%	0	0	0%	
Barium	A	mg/L	-9.035E-06	0		0	0	0	0.000042	0.001	1	0%	0	0	0%	
Beryllium	A	mg/L	-0.00002737	0		0	0	0	0.00012	0.001	1	0%	0	0	0%	
Cadmium	A	mg/L	0.000008751	0		0	0	0	0.000025	0.001	1	0%	0	0	0%	
Cerium	A	mg/L	-2.458E-07	0		0	0	0	0.000012	0.001	0.1	0%	0	0	0%	
Chromium	A	mg/L	0.00001014	0		0	0	0	0.00018	0.001	1	0%	0	0	0%	
Cobalt	A	mg/L	0.000001797	0		0	0	0	0.000042	0.001	1	0%	0	0	0%	
Copper	A	mg/L	0.000002197	0		0	0	0	0.00027	0.001	1	0%	0	0	0%	
Lanthanum	A	mg/L	-3.261E-07	0		0	0	0	0.000011	0.001	0.1	0%	0	0	0%	
Lead	A	mg/L	0.000005757	0		0	0	0	0.000056	0.001	1	0%	0	0	0%	
Manganese	A	mg/L	-0.00001547	0		0	0	0	0.000095	0.001	1	0%	0	0	0%	
Mercury	A	mg/L	-9.391E-07	0		0	0	0	0.00016	0.001	0.002	0%	0	0	0%	
Molybdenum	A	mg/L	-1.159E-06	0		0	0	0	0.00005	0.001	0.1	0%	0	0	0%	
Nickel	A	mg/L	-0.00001615	0		0	0	0	0.00063	0.001	1	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983996	Rinse	ICPMS-6020-W-	SAMP		12/20/2021 12:0	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Selenium	A	mg/L	-0.00001703	0		0	0	0	0.00033	0.001	1	0%	0	0	0%	
Silicon	A	mg/L	-0.002453	0		0	0	0	0.01223	0.1	0.4	0%	0	0	0%	
Silver	A	mg/L	0.000006153	0		0	0	0	0.00002	0.001	0.04	0%	0	0	0%	
Strontium	A	mg/L	-2.022E-06	0		0	0	0	0.00014	0.001	1	0%	0	0	0%	
Thallium	A	mg/L	0.00006109	0.00006109		0	0	0	0.000041	0.001	1	0%	0	0	0%	J
Thorium	A	mg/L	0.00001489	0		0	0	0	0.00061	0.001	1	0%	0	0	0%	
Titanium	A	mg/L	-0.00002391	0		0	0	0	0.000094	0.001	1	0%	0	0	0%	
Uranium	A	mg/L	0.000002363	0		0	0	0	0.000052	0.0003	1	0%	0	0	0%	
Boron	B	mg/L	0.002817	0		0	0	0	0.00561	0.00561	1	0%	0	0	0%	L
Calcium	B	mg/L	0.0005096	0		0	0	0	0.02092	0.02092	50	0%	0	0	0%	L
Iron	B	mg/L	-0.00001837	0		0	0	0	0.00119	0.00119	5	0%	0	0	0%	
Iron, Ferrous	B	mg/L	-0.00001837	0		0	0	0	0.00119	0.00119	5	0%	0	0	0%	
Magnesium	B	mg/L	0.0006239	0		0	0	0	0.00564	0.00564	50	0%	0	0	0%	L
Sodium	B	mg/L	-0.0002633	0		0	0	0	0.02171	0.02171	50	0%	0	0	0%	L
Tin	B	mg/L	-0.00002331	0		0	0	0	0.00132	0.00132	0.1	0%	0	0	0%	
Vanadium	B	mg/L	-0.002333	0		0	0	0	0.0013	0.0013	1	0%	0	0	0%	
Zinc	B	mg/L	-0.000114	0		0	0	0	0.00273	0.00273	1	0%	0	0	0%	L

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983997	QCS	ICPMS-6020-W-	ICV		12/20/2021 12:1	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.2545	0.2545		0.25	0	0	0.00086	0.001	1	102%	90	110	0%	
Antimony	A	mg/L	0.04353	0.04353		0.05	0	0	0.00042	0.001	0.1	87%	90	110	0%	S
Arsenic	A	mg/L	0.05184	0.05184		0.05	0	0	0.00019	0.001	1	104%	90	110	0%	
Barium	A	mg/L	0.04862	0.04862		0.05	0	0	0.000042	0.001	1	97%	90	110	0%	
Beryllium	A	mg/L	0.02439	0.02439		0.025	0	0	0.00012	0.001	1	98%	90	110	0%	
Boron	A	mg/L	0.05229	0.05229		0.05	0	0	0.00561	0.00561	1	105%	90	110	0%	
Cadmium	A	mg/L	0.02414	0.02414		0.025	0	0	0.000025	0.001	1	97%	90	110	0%	
Calcium	A	mg/L	2.747	2.747		2.5	0	0	0.02092	0.02092	50	110%	90	110	0%	
Cerium	A	mg/L	0.05087	0.05087		0.05	0	0	0.000012	0.001	0.1	102%	90	110	0%	
Chromium	A	mg/L	0.05277	0.05277		0.05	0	0	0.00018	0.001	1	106%	90	110	0%	
Cobalt	A	mg/L	0.05249	0.05249		0.05	0	0	0.000042	0.001	1	105%	90	110	0%	
Copper	A	mg/L	0.05501	0.05501		0.05	0	0	0.00027	0.001	1	110%	90	110	0%	
Iron	A	mg/L	0.2598	0.2598		0.25	0	0	0.00119	0.00119	5	104%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983997	QCS	ICPMS-6020-W- ICV			12/20/2021 12:1	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lanthanum	A	mg/L	0.04956	0.04956		0.05	0	0	0.000011	0.001	0.1	99%	90	110	0%	
Lead	A	mg/L	0.04833	0.04833		0.05	0	0	0.000056	0.001	1	97%	90	110	0%	
Magnesium	A	mg/L	2.695	2.695		2.5	0	0	0.00564	0.00564	50	108%	90	110	0%	
Manganese	A	mg/L	0.2658	0.2658		0.25	0	0	0.000095	0.001	1	106%	90	110	0%	
Mercury	A	mg/L	0.001001	0.001001		0.001	0	0	0.00016	0.001	0.002	100%	90	110	0%	
Molybdenum	A	mg/L	0.0475	0.0475		0.05	0	0	0.00005	0.001	0.1	95%	90	110	0%	
Nickel	A	mg/L	0.05367	0.05367		0.05	0	0	0.00063	0.001	1	107%	90	110	0%	
Potassium	A	mg/L	2.767	2.767		2.5	0	0	0.08139	0.08139	50	111%	90	110	0%	S
Selenium	A	mg/L	0.05116	0.05116		0.05	0	0	0.00033	0.001	1	102%	90	110	0%	
Silicon	A	mg/L	0.5166	0.5166		0.5	0	0	0.01223	0.1	0.4	103%	90	110	0%	
Silver	A	mg/L	0.02361	0.02361		0.025	0	0	0.00002	0.001	0.04	94%	90	110	0%	
Sodium	A	mg/L	2.65	2.65		2.5	0	0	0.02171	0.02171	50	106%	90	110	0%	
Strontium	A	mg/L	0.0522	0.0522		0.05	0	0	0.00014	0.001	1	104%	90	110	0%	
Thallium	A	mg/L	0.04787	0.04787		0.05	0	0	0.000041	0.001	1	96%	90	110	0%	
Thorium	A	mg/L	0.04795	0.04795		0.05	0	0	0.00061	0.001	1	96%	90	110	0%	
Tin	A	mg/L	0.04633	0.04633		0.05	0	0	0.00132	0.00132	0.1	93%	90	110	0%	
Titanium	A	mg/L	0.04824	0.04824		0.05	0	0	0.000094	0.001	1	96%	90	110	0%	
Uranium	A	mg/L	0.05139	0.05139		0.05	0	0	0.000052	0.0003	1	103%	90	110	0%	
Vanadium	A	mg/L	0.04978	0.04978		0.05	0	0	0.0013	0.0013	1	100%	90	110	0%	
Zinc	A	mg/L	0.05388	0.05388		0.05	0	0	0.00273	0.00273	1	108%	90	110	0%	
Iron, Ferrous	C	mg/L	0.2598	0.2598		0	0	0	0.00119	0.00119	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983998	CCV	ICPMS-6020-W- CCV			12/20/2021 12:2	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.04842	0.04842		0.05	0	0	0.00086	0.001	1	97%	90	110	0%	
Antimony	A	mg/L	0.04949	0.04949		0.05	0	0	0.00042	0.001	0.1	99%	90	110	0%	
Arsenic	A	mg/L	0.0507	0.0507		0.05	0	0	0.00019	0.001	1	101%	90	110	0%	
Barium	A	mg/L	0.05002	0.05002		0.05	0	0	0.000042	0.001	1	100%	90	110	0%	
Beryllium	A	mg/L	0.04833	0.04833		0.05	0	0	0.00012	0.001	1	97%	90	110	0%	
Boron	A	mg/L	0.05078	0.05078		0.05	0	0	0.00561	0.00561	1	102%	90	110	0%	
Cadmium	A	mg/L	0.04874	0.04874		0.05	0	0	0.000025	0.001	1	97%	90	110	0%	
Calcium	A	mg/L	12.86	12.86		12.5	0	0	0.02092	0.02092	50	103%	90	110	0%	
Cerium	A	mg/L	0.05076	0.05076		0.05	0	0	0.000012	0.001	0.1	102%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983998	CCV	ICPMS-6020-W-	CCV		12/20/2021 12:2	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Chromium	A	mg/L	0.05087	0.05087		0.05	0	0	0.00018	0.001	1	102%	90	110	0%	
Cobalt	A	mg/L	0.0504	0.0504		0.05	0	0	0.000042	0.001	1	101%	90	110	0%	
Copper	A	mg/L	0.05261	0.05261		0.05	0	0	0.00027	0.001	1	105%	90	110	0%	
Iron	A	mg/L	1.306	1.306		1.3	0	0	0.00119	0.00119	5	100%	90	110	0%	
Lanthanum	A	mg/L	0.05077	0.05077		0.05	0	0	0.000011	0.001	0.1	102%	90	110	0%	
Lead	A	mg/L	0.05014	0.05014		0.05	0	0	0.000056	0.001	1	100%	90	110	0%	
Magnesium	A	mg/L	12.84	12.84		12.5	0	0	0.00564	0.00564	50	103%	90	110	0%	
Manganese	A	mg/L	0.05132	0.05132		0.05	0	0	0.000095	0.001	1	103%	90	110	0%	
Mercury	A	mg/L	0.001023	0.001023		0.001	0	0	0.00016	0.001	0.002	102%	90	110	0%	
Molybdenum	A	mg/L	0.04884	0.04884		0.05	0	0	0.00005	0.001	0.1	98%	90	110	0%	
Nickel	A	mg/L	0.05179	0.05179		0.05	0	0	0.00063	0.001	1	104%	90	110	0%	
Potassium	A	mg/L	12.94	12.94		12.5	0	0	0.08139	0.08139	50	104%	90	110	0%	
Selenium	A	mg/L	0.05021	0.05021		0.05	0	0	0.00033	0.001	1	100%	90	110	0%	
Silicon	A	mg/L	0.2015	0.2015		0.2	0	0	0.01223	0.1	0.4	101%	90	110	0%	
Silver	A	mg/L	0.01926	0.01926		0.02	0	0	0.00002	0.001	0.04	96%	90	110	0%	
Sodium	A	mg/L	12.68	12.68		12.5	0	0	0.02171	0.02171	50	101%	90	110	0%	
Strontium	A	mg/L	0.04999	0.04999		0.05	0	0	0.00014	0.001	1	100%	90	110	0%	
Thallium	A	mg/L	0.0503	0.0503		0.05	0	0	0.000041	0.001	1	101%	90	110	0%	
Thorium	A	mg/L	0.04889	0.04889		0.05	0	0	0.00061	0.001	1	98%	90	110	0%	
Tin	A	mg/L	0.05423	0.05423		0.05	0	0	0.00132	0.00132	0.1	108%	90	110	0%	
Titanium	A	mg/L	0.04794	0.04794		0.05	0	0	0.000094	0.001	1	96%	90	110	0%	
Uranium	A	mg/L	0.05117	0.05117		0.05	0	0	0.000052	0.0003	1	102%	90	110	0%	
Vanadium	A	mg/L	0.04754	0.04754		0.05	0	0	0.0013	0.0013	1	95%	90	110	0%	
Zinc	A	mg/L	0.05288	0.05288		0.05	0	0	0.00273	0.00273	1	106%	90	110	0%	
Iron, Ferrous	C	mg/L	1.306	1.306		0	0	0	0.00119	0.00119	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983999	CCB	ICPMS-6020-W-	CCB		12/20/2021 12:2	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.0009617	-0.0009617		0	0	0	0.00086	0.001	1	0%			0%	
Antimony	A	mg/L	0.00001295	0.00001295		0	0	0	0.00042	0.001	0.1	0%			0%	
Arsenic	A	mg/L	-0.0001639	-0.0001639		0	0	0	0.00019	0.001	1	0%			0%	
Barium	A	mg/L	-3.242E-06	-3.242E-06		0	0	0	0.000042	0.001	1	0%			0%	
Beryllium	A	mg/L	-0.0000288	-0.0000288		0	0	0	0.00012	0.001	1	0%			0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14983999	CCB	ICPMS-6020-W-	CCB		12/20/2021 12:2	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	A	mg/L	0.002146	0.002146		0	0	0	0.00561	0.00561	1	0%			0%	
Cadmium	A	mg/L	0.000003241	0.000003241		0	0	0	0.000025	0.001	1	0%			0%	
Calcium	A	mg/L	0.0001305	0.0001305		0	0	0	0.02092	0.02092	50	0%			0%	
Cerium	A	mg/L	-3.087E-07	-3.087E-07		0	0	0	0.000012	0.001	0.1	0%	0	0	0%	
Chromium	A	mg/L	0.00004099	0.00004099		0	0	0	0.00018	0.001	1	0%			0%	
Cobalt	A	mg/L	0.000001809	0.000001809		0	0	0	0.000042	0.001	1	0%			0%	
Copper	A	mg/L	-0.00001325	-0.00001325		0	0	0	0.00027	0.001	1	0%			0%	
Iron	A	mg/L	0.000006127	0.000006127		0	0	0	0.00119	0.00119	5	0%			0%	
Lanthanum	A	mg/L	-4.372E-07	-4.372E-07		0	0	0	0.000011	0.001	0.1	0%	0	0	0%	
Lead	A	mg/L	0.000004695	0.000004695		0	0	0	0.000056	0.001	1	0%			0%	
Magnesium	A	mg/L	-0.00003978	-0.00003978		0	0	0	0.00564	0.00564	50	0%			0%	
Manganese	A	mg/L	-0.00001924	-0.00001924		0	0	0	0.000095	0.001	1	0%			0%	
Mercury	A	mg/L	0.000001695	0.000001695		0	0	0	0.00016	0.001	0.002	0%			0%	
Molybdenum	A	mg/L	0.000009507	0.000009507		0	0	0	0.00005	0.001	0.1	0%			0%	
Nickel	A	mg/L	-0.00003454	-0.00003454		0	0	0	0.00063	0.001	1	0%			0%	
Potassium	A	mg/L	0.03658	0.03658		0	0	0	0.08139	0.08139	50	0%			0%	
Selenium	A	mg/L	-0.0000198	-0.0000198		0	0	0	0.00033	0.001	1	0%			0%	
Silicon	A	mg/L	-0.002484	-0.002484		0	0	0	0.01223	0.1	0.4	0%	0	0	0%	
Silver	A	mg/L	8.487E-07	8.487E-07		0	0	0	0.00002	0.001	0.04	0%			0%	
Sodium	A	mg/L	-0.0001364	-0.0001364		0	0	0	0.02171	0.02171	50	0%			0%	
Strontium	A	mg/L	6.644E-07	6.644E-07		0	0	0	0.00014	0.001	1	0%	0	0	0%	
Thallium	A	mg/L	0.000075	0.000075		0	0	0	0.000041	0.001	1	0%	0	0	0%	
Thorium	A	mg/L	0.00002292	0.00002292		0	0	0	0.00061	0.001	1	0%	0	0	0%	
Tin	A	mg/L	-7.224E-06	-7.224E-06		0	0	0	0.00132	0.00132	0.1	0%	0	0	0%	
Titanium	A	mg/L	-0.0000107	-0.0000107		0	0	0	0.000094	0.001	1	0%	0	0	0%	
Uranium	A	mg/L	0.000001353	0.000001353		0	0	0	0.000052	0.0003	1	0%	0	0	0%	
Vanadium	A	mg/L	-0.001222	-0.001222		0	0	0	0.0013	0.0013	1	0%	0	0	0%	
Zinc	A	mg/L	-0.00007912	-0.00007912		0	0	0	0.00273	0.00273	1	0%	0	0	0%	
Iron, Ferrous	C	mg/L	0.000006127	0.000006127		0	0	0	0.00119	0.00119	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984000	LRB	ICPMS-6020-W-	MBLK		12/20/2021 12:3	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984000	LRB	ICPMS-6020-W- MBLK			12/20/2021 12:3	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.0008104	0		0	0	0	0.00086	0.001	1	0%	0	0	0%	
Antimony	A	mg/L	0.000005012	0		0	0	0	0.00042	0.001	0.1	0%	0	0	0%	
Arsenic	A	mg/L	-0.0001419	0		0	0	0	0.00019	0.001	1	0%	0	0	0%	
Barium	A	mg/L	-0.00001297	0		0	0	0	0.000042	0.001	1	0%	0	0	0%	
Beryllium	A	mg/L	-0.0000344	0		0	0	0	0.00012	0.001	1	0%	0	0	0%	
Boron	A	mg/L	0.001732	0		0	0	0	0.00561	0.00561	1	0%	0	0	0%	
Cadmium	A	mg/L	0.000002397	0		0	0	0	0.000025	0.001	1	0%	0	0	0%	
Calcium	A	mg/L	0.02109	0.02109		0	0	0	0.02092	0.02092	50	0%	0	0	0%	
Cerium	A	mg/L	8.109E-09	0		0	0	0	0.000012	0.001	0.1	0%	0	0	0%	
Chromium	A	mg/L	0.00002258	0		0	0	0	0.00018	0.001	1	0%	0	0	0%	
Cobalt	A	mg/L	0.000003509	0		0	0	0	0.000042	0.001	1	0%	0	0	0%	
Copper	A	mg/L	-0.00001634	0		0	0	0	0.00027	0.001	1	0%	0	0	0%	
Iron	A	mg/L	0.00004925	0		0	0	0	0.00119	0.00119	5	0%	0	0	0%	
Lanthanum	A	mg/L	1.595E-07	0		0	0	0	0.000011	0.001	0.1	0%	0	0	0%	
Lead	A	mg/L	0.000001805	0		0	0	0	0.000056	0.0005	1	0%	0	0	0%	
Magnesium	A	mg/L	0.0008113	0		0	0	0	0.00564	0.00564	50	0%	0	0	0%	
Manganese	A	mg/L	-9.965E-06	0		0	0	0	0.000095	0.001	1	0%	0	0	0%	
Mercury	A	mg/L	0.000003511	0		0	0	0	0.00016	0.001	0.002	0%	0	0	0%	
Molybdenum	A	mg/L	0.000004267	0		0	0	0	0.00005	0.001	0.1	0%	0	0	0%	
Nickel	A	mg/L	-0.00003016	0		0	0	0	0.00063	0.001	1	0%	0	0	0%	
Potassium	A	mg/L	0.03789	0		0	0	0	0.08139	0.08139	50	0%	0	0	0%	
Selenium	A	mg/L	-0.00003446	0		0	0	0	0.00033	0.001	1	0%	0	0	0%	
Silicon	A	mg/L	-0.002008	0		0	0	0	0.01223	0.1	0.4	0%	0	0	0%	
Silver	A	mg/L	-2.382E-08	0		0	0	0	0.00002	0.001	0.04	0%	0	0	0%	
Sodium	A	mg/L	0.007095	0		0	0	0	0.02171	0.02171	50	0%	0	0	0%	
Strontium	A	mg/L	0.00001603	0		0	0	0	0.00014	0.001	1	0%	0	0	0%	
Thallium	A	mg/L	0.00002511	0		0	0	0	0.000041	0.001	1	0%	0	0	0%	
Thorium	A	mg/L	0.000007673	0		0	0	0	0.00061	0.001	1	0%	0	0	0%	
Tin	A	mg/L	-0.00003513	0		0	0	0	0.00132	0.00132	0.1	0%	0	0	0%	
Titanium	A	mg/L	-0.00004629	0		0	0	0	0.000094	0.001	1	0%	0	0	0%	
Uranium	A	mg/L	9.757E-07	0		0	0	0	0.000052	0.0003	1	0%	0	0	0%	
Vanadium	A	mg/L	-0.00133	0		0	0	0	0.0013	0.0013	1	0%	0	0	0%	
Zinc	A	mg/L	0.0001727	0		0	0	0	0.00273	0.00273	1	0%	0	0	0%	
Iron, Ferrous	C	mg/L	0.00004925	0		0	0	0	0.00119	0.00119	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984001	LFB	ICPMS-6020-W-	LFB		12/20/2021 12:4	1.03	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.04881	0.0502743		0.05	0	0	0.0008858	0.001	1	101%	85	115	0%	
Antimony	A	mg/L	0.04643	0.0478229		0.05	0	0	0.0004326	0.001	0.1	96%	85	115	0%	
Arsenic	A	mg/L	0.05047	0.0519841		0.05	0	0	0.0001957	0.001	1	104%	85	115	0%	
Barium	A	mg/L	0.05023	0.0517369		0.05	0	0	4.326E-05	0.001	1	103%	85	115	0%	
Beryllium	A	mg/L	0.04816	0.0496048		0.05	0	0	0.0001236	0.001	1	99%	85	115	0%	
Boron	A	mg/L	0.05066	0.0521798		0.05	0	0	0.0057783	0.0057783	1	104%	85	115	0%	
Cadmium	A	mg/L	0.04828	0.0497284		0.05	0	0	2.575E-05	0.001	1	99%	85	115	0%	
Calcium	A	mg/L	45.7	47.071		50	0	0	0.0215476	0.0215476	50	94%	85	115	0%	
Cerium	A	mg/L	0.0492	0.050676		0.05	0	0	1.236E-05	0.001	0.1	101%	85	115	0%	
Chromium	A	mg/L	0.05084	0.0523652		0.05	0	0	0.0001854	0.001	1	105%	85	115	0%	
Cobalt	A	mg/L	0.04852	0.0499756		0.05	0	0	4.326E-05	0.001	1	100%	85	115	0%	
Copper	A	mg/L	0.05134	0.0528802		0.05	0	0	0.0002781	0.001	1	106%	85	115	0%	
Iron	A	mg/L	4.852	4.99756		5.05	0	0	0.0012257	0.0012257	5	99%	85	115	0%	
Lanthanum	A	mg/L	0.04952	0.0510056		0.05	0	0	1.133E-05	0.001	0.1	102%	85	115	0%	
Lead	A	mg/L	0.04812	0.0495636		0.05	0	0	5.768E-05	0.001	1	99%	88	115	0%	
Magnesium	A	mg/L	50.83	52.3549		50	0	0	0.0058092	0.0058092	50	105%	85	115	0%	
Manganese	A	mg/L	0.05028	0.0517884		0.05	0	0	9.785E-05	0.001	1	104%	85	115	0%	
Mercury	A	mg/L	0.0009874	0.001017022		0.001	0	0	0.0001648	0.001	0.002	102%	85	115	0%	
Molybdenum	A	mg/L	0.0486	0.050058		0.05	0	0	0.0000515	0.001	0.1	100%	85	115	0%	
Nickel	A	mg/L	0.05098	0.0525094		0.05	0	0	0.0006489	0.001	1	105%	85	115	0%	
Potassium	A	mg/L	50.86	52.3858		50	0	0	0.0838317	0.0838317	50	105%	85	115	0%	
Selenium	A	mg/L	0.04766	0.0490898		0.05	0	0	0.0003399	0.001	1	98%	85	115	0%	
Silicon	A	mg/L	0.1778	0.183134		0.2	0	0	0.0125969	0.1	0.4	92%	85	115	0%	
Silver	A	mg/L	0.01861	0.0191683		0.02	0	0	0.0000206	0.001	0.04	96%	85	115	0%	
Sodium	A	mg/L	49.92	51.4176		50	0	0	0.0223613	0.0223613	50	103%	85	115	0%	
Strontium	A	mg/L	0.04963	0.0511189		0.05	0	0	0.0001442	0.001	1	102%	85	115	0%	
Thallium	A	mg/L	0.0488	0.050264		0.05	0	0	4.223E-05	0.001	1	101%	85	115	0%	
Thorium	A	mg/L	0.04835	0.0498005		0.05	0	0	0.0006283	0.001	1	100%	85	115	0%	
Tin	A	mg/L	0.04691	0.0483173		0.05	0	0	0.0013596	0.0013596	0.1	97%	85	115	0%	
Titanium	A	mg/L	0.05167	0.0532201		0.05	0	0	9.682E-05	0.001	1	106%	85	115	0%	
Uranium	A	mg/L	0.05053	0.0520459		0.05	0	0	5.356E-05	0.0003	1	104%	85	115	0%	
Vanadium	A	mg/L	0.05013	0.0516339		0.05	0	0	0.001339	0.001339	1	103%	85	115	0%	
Zinc	A	mg/L	0.05193	0.0534879		0.05	0	0	0.0028119	0.0028119	1	107%	85	115	0%	
Iron, Ferrous	C	mg/L	4.852	4.99756		0	0	0	0.0012257	0.0012257	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984002	ICSA	ICPMS-6020-W-ICSA			12/20/2021 12:4	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	38.93	38.93		40	0	0	0.00086	0.001	1	97%	80	120	0%	
Antimony	A	mg/L	0.0002975	0.0002975		0	0	0	0.00042	0.001	0.1	0%			0%	
Arsenic	A	mg/L	-0.0005312	-0.0005312		0	0	0	0.00019	0.001	1	0%			0%	
Barium	A	mg/L	0.00004012	0.00004012		0	0	0	0.000042	0.001	1	0%			0%	
Beryllium	A	mg/L	-0.00004144	-0.00004144		0	0	0	0.00012	0.001	1	0%			0%	
Boron	A	mg/L	0.001547	0.001547		0	0	0	0.00561	0.00561	1	0%			0%	
Cadmium	A	mg/L	0.00004912	0.00004912		0	0	0	0.000025	0.001	1	0%			0%	
Calcium	A	mg/L	109.8	109.8		120	0	0	0.02092	0.02092	50	91%	80	120	0%	
Cerium	A	mg/L	0.000002535	0.000002535		0	0	0	0.000012	0.001	0.1	0%			0%	
Chromium	A	mg/L	0.0008431	0.0008431		0	0	0	0.00018	0.001	1	0%			0%	
Cobalt	A	mg/L	0.0003355	0.0003355		0	0	0	0.000042	0.001	1	0%			0%	
Copper	A	mg/L	0.0000568	0.0000568		0	0	0	0.00027	0.001	1	0%			0%	
Iron	A	mg/L	103.3	103.3		100	0	0	0.00119	0.00119	5	103%	80	120	0%	
Lanthanum	A	mg/L	0.000009841	0.000009841		0	0	0	0.000011	0.001	0.1	0%			0%	
Lead	A	mg/L	0.00001841	0.00001841		0	0	0	0.000056	0.001	1	0%			0%	
Magnesium	A	mg/L	41.46	41.46		50	0	0	0.00564	0.00564	50	83%			0%	
Manganese	A	mg/L	0.0001962	0.0001962		0	0	0	0.000095	0.001	1	0%			0%	
Mercury	A	mg/L	5.054E-07	5.054E-07		0	0	0	0.00016	0.001	0.002	0%			0%	
Molybdenum	A	mg/L	0.8258	0.8258		0.8	0	0	0.00005	0.001	0.1	103%	80	120	0%	
Nickel	A	mg/L	0.0001297	0.0001297		0	0	0	0.00063	0.001	1	0%			0%	
Potassium	A	mg/L	41.58	41.58		50	0	0	0.08139	0.08139	50	83%			0%	
Selenium	A	mg/L	0.00003016	0.00003016		0	0	0	0.00033	0.001	1	0%			0%	
Silicon	A	mg/L	-0.001301	-0.001301		0	0	0	0.01223	0.1	0.4	0%			0%	
Silver	A	mg/L	0.000006712	0.000006712		0	0	0	0.00002	0.001	0.04	0%			0%	
Sodium	A	mg/L	103.3	103.3		100	0	0	0.02171	0.02171	50	103%			0%	
Strontium	A	mg/L	0.001265	0.001265		0	0	0	0.00014	0.001	1	0%			0%	
Thallium	A	mg/L	0.00004007	0.00004007		0	0	0	0.000041	0.001	1	0%			0%	
Thorium	A	mg/L	0.00003121	0.00003121		0	0	0	0.00061	0.001	1	0%			0%	
Tin	A	mg/L	0.0001342	0.0001342		0	0	0	0.00132	0.00132	0.1	0%			0%	
Titanium	A	mg/L	0.7793	0.7793		0.8	0	0	0.000094	0.001	1	97%			0%	
Uranium	A	mg/L	0.000002269	0.000002269		0	0	0	0.000052	0.0003	1	0%			0%	
Vanadium	A	mg/L	-0.007055	-0.007055		0	0	0	0.0013	0.0013	1	0%			0%	
Zinc	A	mg/L	0.0004639	0.0004639		0	0	0	0.00273	0.00273	1	0%			0%	
Iron, Ferrous	C	mg/L	103.3	103.3		0	0	0	0.00119	0.00119	5	0%			0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984003	ICSAB	ICPMS-6020-W-	ICSAB		12/20/2021 12:5	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	35.79	35.79		40	0	0	0.00086	0.001	1	89%	80	120	0%	
Antimony	A	mg/L	0.0001125	0.0001125		0	0	0	0.00042	0.001	0.1	0%			0%	
Arsenic	A	mg/L	0.009542	0.009542		0.01	0	0	0.00019	0.001	1	95%	80	120	0%	
Barium	A	mg/L	0.00004143	0.00004143		0	0	0	0.000042	0.001	1	0%			0%	
Beryllium	A	mg/L	-0.00004114	-0.00004114		0	0	0	0.00012	0.001	1	0%			0%	
Boron	A	mg/L	0.001002	0.001002		0	0	0	0.00561	0.00561	1	0%			0%	
Cadmium	A	mg/L	0.009421	0.009421		0.01	0	0	0.000025	0.001	1	94%	80	120	0%	
Calcium	A	mg/L	112.6	112.6		120	0	0	0.02092	0.02092	50	94%	80	120	0%	
Cerium	A	mg/L	0.000002988	0.000002988		0	0	0	0.000012	0.001	0.1	0%			0%	
Chromium	A	mg/L	0.02163	0.02163		0.02	0	0	0.00018	0.001	1	108%	80	120	0%	
Cobalt	A	mg/L	0.02051	0.02051		0.02	0	0	0.000042	0.001	1	103%	80	120	0%	
Copper	A	mg/L	0.02108	0.02108		0.02	0	0	0.00027	0.001	1	105%	80	120	0%	
Iron	A	mg/L	100.2	100.2		100	0	0	0.00119	0.00119	5	100%	80	120	0%	
Lanthanum	A	mg/L	0.000009278	0.000009278		0	0	0	0.000011	0.001	0.1	0%			0%	
Lead	A	mg/L	0.00001557	0.00001557		0	0	0	0.000056	0.001	1	0%			0%	
Magnesium	A	mg/L	42.27	42.27		40	0	0	0.00564	0.00564	50	106%	80	120	0%	
Manganese	A	mg/L	0.02059	0.02059		0.02	0	0	0.000095	0.001	1	103%	80	120	0%	
Mercury	A	mg/L	0.000001678	0.000001678		0	0	0	0.00016	0.001	0.002	0%			0%	
Molybdenum	A	mg/L	0.7789	0.7789		0.8	0	0	0.00005	0.001	0.1	97%	80	120	0%	
Nickel	A	mg/L	0.02103	0.02103		0.02	0	0	0.00063	0.001	1	105%	80	120	0%	
Potassium	A	mg/L	40.86	40.86		40	0	0	0.08139	0.08139	50	102%	80	120	0%	
Selenium	A	mg/L	0.01031	0.01031		0.01	0	0	0.00033	0.001	1	103%	80	120	0%	
Silicon	A	mg/L	0.02621	0.02621		0	0	0	0.01223	0.1	0.4	0%			0%	
Silver	A	mg/L	0.004557	0.004557		0.005	0	0	0.00002	0.001	0.04	91%	80	120	0%	
Sodium	A	mg/L	102.8	102.8		100	0	0	0.02171	0.02171	50	103%	80	120	0%	
Strontium	A	mg/L	0.001233	0.001233		0	0	0	0.00014	0.001	1	0%			0%	
Thallium	A	mg/L	0.00001389	0.00001389		0	0	0	0.000041	0.001	1	0%			0%	
Thorium	A	mg/L	0.00001659	0.00001659		0	0	0	0.00061	0.001	1	0%			0%	
Tin	A	mg/L	0.00001525	0.00001525		0	0	0	0.00132	0.00132	0.1	0%			0%	
Titanium	A	mg/L	0.779	0.779		0.8	0	0	0.000094	0.001	1	97%	80	120	0%	
Uranium	A	mg/L	0.000001643	0.000001643		0	0	0	0.000052	0.0003	1	0%			0%	
Vanadium	A	mg/L	0.01297	0.01297		0.02	0	0	0.0013	0.0013	1	65%	80	120	0%	S
Zinc	A	mg/L	0.0103	0.0103		0.01	0	0	0.00273	0.00273	1	103%	80	120	0%	
Iron, Ferrous	C	mg/L	100.2	100.2		0	0	0	0.00119	0.00119	5	0%			0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984004	Rinse	ICPMS-6020-W-	SAMP		12/20/2021 12:5	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Arsenic	A	mg/L	-0.0007485	0		0	0	0	0.00019	0.001	1	0%	0	0	0%	
Barium	A	mg/L	-0.00001499	0		0	0	0	0.000042	0.001	1	0%	0	0	0%	
Cadmium	A	mg/L	6.098E-07	0		0	0	0	0.000025	0.001	1	0%	0	0	0%	
Cerium	A	mg/L	6.446E-08	0		0	0	0	0.000012	0.001	0.1	0%	0	0	0%	
Chromium	A	mg/L	-0.00002867	0		0	0	0	0.00018	0.001	1	0%	0	0	0%	
Cobalt	A	mg/L	-1.363E-06	0		0	0	0	0.000042	0.001	1	0%	0	0	0%	
Copper	A	mg/L	-0.00002176	0		0	0	0	0.00027	0.001	1	0%	0	0	0%	
Lanthanum	A	mg/L	-3.459E-07	0		0	0	0	0.000011	0.001	0.1	0%	0	0	0%	
Lead	A	mg/L	-1.199E-06	0		0	0	0	0.000056	0.001	1	0%	0	0	0%	
Manganese	A	mg/L	-0.00002977	0		0	0	0	0.000095	0.001	1	0%	0	0	0%	
Mercury	A	mg/L	-1.047E-06	0		0	0	0	0.00016	0.001	0.002	0%	0	0	0%	
Molybdenum	A	mg/L	0.0000656	0.0000656		0	0	0	0.00005	0.001	0.1	0%	0	0	0%	J
Nickel	A	mg/L	-0.0000207	0		0	0	0	0.00063	0.001	1	0%	0	0	0%	
Selenium	A	mg/L	-0.00008401	0		0	0	0	0.00033	0.001	1	0%	0	0	0%	
Silicon	A	mg/L	-0.002949	0		0	0	0	0.01223	0.1	0.4	0%	0	0	0%	
Silver	A	mg/L	2.168E-07	0		0	0	0	0.00002	0.001	0.04	0%	0	0	0%	
Strontium	A	mg/L	0.000002682	0		0	0	0	0.00014	0.001	1	0%	0	0	0%	
Thallium	A	mg/L	0.00000508	0		0	0	0	0.000041	0.001	1	0%	0	0	0%	
Thorium	A	mg/L	0.000001472	0		0	0	0	0.00061	0.001	1	0%	0	0	0%	
Titanium	A	mg/L	-0.00003192	0		0	0	0	0.000094	0.001	1	0%	0	0	0%	
Uranium	A	mg/L	3.385E-07	0		0	0	0	0.000052	0.0003	1	0%	0	0	0%	
Calcium	B	mg/L	0.001341	0		0	0	0	0.02092	0.02092	50	0%	0	0	0%	L
Iron	B	mg/L	0.0007805	0		0	0	0	0.00119	0.00119	5	0%	0	0	0%	
Iron, Ferrous	B	mg/L	0.0007805	0		0	0	0	0.00119	0.00119	5	0%	0	0	0%	
Magnesium	B	mg/L	0.00104	0		0	0	0	0.00564	0.00564	50	0%	0	0	0%	L
Sodium	B	mg/L	0.0196	0		0	0	0	0.02171	0.02171	50	0%	0	0	0%	L
Tin	B	mg/L	-9.504E-06	0		0	0	0	0.00132	0.00132	0.1	0%	0	0	0%	
Zinc	B	mg/L	-0.0001086	0		0	0	0	0.00273	0.00273	1	0%	0	0	0%	L

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984005	CCV	ICPMS-6020-W-	CCV		12/20/2021 1:05:	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984005	CCV	ICPMS-6020-W-	CCV		12/20/2021 1:05:	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.04457	0.04457		0.05	0	0	0.00086	0.001	1	89%	90	110	0%	S
Antimony	A	mg/L	0.04993	0.04993		0.05	0	0	0.00042	0.001	0.1	100%	90	110	0%	
Arsenic	A	mg/L	0.05029	0.05029		0.05	0	0	0.00019	0.001	1	101%	90	110	0%	
Barium	A	mg/L	0.05084	0.05084		0.05	0	0	0.000042	0.001	1	102%	90	110	0%	
Beryllium	A	mg/L	0.04214	0.04214		0.05	0	0	0.00012	0.001	1	84%	90	110	0%	S
Boron	A	mg/L	0.04468	0.04468		0.05	0	0	0.00561	0.00561	1	89%	90	110	0%	S
Cadmium	A	mg/L	0.04898	0.04898		0.05	0	0	0.000025	0.001	1	98%	90	110	0%	
Calcium	A	mg/L	13.37	13.37		12.5	0	0	0.02092	0.02092	50	107%	90	110	0%	
Cerium	A	mg/L	0.05027	0.05027		0.05	0	0	0.000012	0.001	0.1	101%	90	110	0%	
Chromium	A	mg/L	0.05214	0.05214		0.05	0	0	0.00018	0.001	1	104%	90	110	0%	
Cobalt	A	mg/L	0.04983	0.04983		0.05	0	0	0.000042	0.001	1	100%	90	110	0%	
Copper	A	mg/L	0.05385	0.05385		0.05	0	0	0.00027	0.001	1	108%	90	110	0%	
Iron	A	mg/L	1.306	1.306		1.3	0	0	0.00119	0.00119	5	100%	90	110	0%	
Lanthanum	A	mg/L	0.05084	0.05084		0.05	0	0	0.000011	0.001	0.1	102%	90	110	0%	
Lead	A	mg/L	0.04876	0.04876		0.05	0	0	0.000056	0.001	1	98%	90	110	0%	
Magnesium	A	mg/L	13.05	13.05		12.5	0	0	0.00564	0.00564	50	104%	90	110	0%	
Manganese	A	mg/L	0.05116	0.05116		0.05	0	0	0.000095	0.001	1	102%	90	110	0%	
Mercury	A	mg/L	0.001019	0.001019		0.001	0	0	0.00016	0.001	0.002	102%	90	110	0%	
Molybdenum	A	mg/L	0.04875	0.04875		0.05	0	0	0.00005	0.001	0.1	97%	90	110	0%	
Nickel	A	mg/L	0.05282	0.05282		0.05	0	0	0.00063	0.001	1	106%	90	110	0%	
Potassium	A	mg/L	12.96	12.96		12.5	0	0	0.08139	0.08139	50	104%	90	110	0%	
Selenium	A	mg/L	0.05066	0.05066		0.05	0	0	0.00033	0.001	1	101%	90	110	0%	
Silicon	A	mg/L	0.2027	0.2027		0.2	0	0	0.01223	0.1	0.4	101%	90	110	0%	
Silver	A	mg/L	0.01884	0.01884		0.02	0	0	0.00002	0.001	0.04	94%	90	110	0%	
Sodium	A	mg/L	13.02	13.02		12.5	0	0	0.02171	0.02171	50	104%	90	110	0%	
Strontium	A	mg/L	0.04977	0.04977		0.05	0	0	0.00014	0.001	1	100%	90	110	0%	
Thallium	A	mg/L	0.04821	0.04821		0.05	0	0	0.000041	0.001	1	96%	90	110	0%	
Thorium	A	mg/L	0.04848	0.04848		0.05	0	0	0.00061	0.001	1	97%	90	110	0%	
Tin	A	mg/L	0.05426	0.05426		0.05	0	0	0.00132	0.00132	0.1	109%	90	110	0%	
Titanium	A	mg/L	0.04751	0.04751		0.05	0	0	0.000094	0.001	1	95%	90	110	0%	
Uranium	A	mg/L	0.04931	0.04931		0.05	0	0	0.000052	0.0003	1	99%	90	110	0%	
Vanadium	A	mg/L	0.0441	0.0441		0.05	0	0	0.0013	0.0013	1	88%	90	110	0%	S
Zinc	A	mg/L	0.05297	0.05297		0.05	0	0	0.00273	0.00273	1	106%	90	110	0%	
Iron, Ferrous	C	mg/L	1.306	1.306		0	0	0	0.00119	0.00119	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984006	CCB	ICPMS-6020-W-	CCB		12/20/2021 1:11:	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.0009144	-0.0009144		0	0	0	0.00086	0.001	1	0%			0%	
Antimony	A	mg/L	0.00001468	0.00001468		0	0	0	0.00042	0.001	0.1	0%			0%	
Arsenic	A	mg/L	-0.0006794	-0.0006794		0	0	0	0.00019	0.001	1	0%			0%	
Barium	A	mg/L	-0.00001514	-0.00001514		0	0	0	0.000042	0.001	1	0%			0%	
Beryllium	A	mg/L	-0.00003916	-0.00003916		0	0	0	0.00012	0.001	1	0%			0%	
Boron	A	mg/L	0.0006474	0.0006474		0	0	0	0.00561	0.00561	1	0%			0%	
Cadmium	A	mg/L	0.000004313	0.000004313		0	0	0	0.000025	0.001	1	0%			0%	
Calcium	A	mg/L	0.0002128	0.0002128		0	0	0	0.02092	0.02092	50	0%			0%	
Cerium	A	mg/L	-9.644E-08	-9.644E-08		0	0	0	0.000012	0.001	0.1	0%	0	0	0%	
Chromium	A	mg/L	0.00003786	0.00003786		0	0	0	0.00018	0.001	1	0%			0%	
Cobalt	A	mg/L	-1.869E-06	-1.869E-06		0	0	0	0.000042	0.001	1	0%			0%	
Copper	A	mg/L	-0.0000164	-0.0000164		0	0	0	0.00027	0.001	1	0%			0%	
Iron	A	mg/L	0.0001402	0.0001402		0	0	0	0.00119	0.00119	5	0%			0%	
Lanthanum	A	mg/L	-1.55E-07	-1.55E-07		0	0	0	0.000011	0.001	0.1	0%	0	0	0%	
Lead	A	mg/L	-0.00000071	-0.00000071		0	0	0	0.000056	0.001	1	0%			0%	
Magnesium	A	mg/L	0.0001446	0.0001446		0	0	0	0.00564	0.00564	50	0%			0%	
Manganese	A	mg/L	-0.00002188	-0.00002188		0	0	0	0.000095	0.001	1	0%			0%	
Mercury	A	mg/L	-4.641E-07	-4.641E-07		0	0	0	0.00016	0.001	0.002	0%			0%	
Molybdenum	A	mg/L	0.00001864	0.00001864		0	0	0	0.00005	0.001	0.1	0%			0%	
Nickel	A	mg/L	-0.00004292	-0.00004292		0	0	0	0.00063	0.001	1	0%			0%	
Potassium	A	mg/L	0.01609	0.01609		0	0	0	0.08139	0.08139	50	0%			0%	
Selenium	A	mg/L	-0.00006231	-0.00006231		0	0	0	0.00033	0.001	1	0%			0%	
Silicon	A	mg/L	-0.002861	-0.002861		0	0	0	0.01223	0.1	0.4	0%	0	0	0%	
Silver	A	mg/L	-7.766E-09	-7.766E-09		0	0	0	0.00002	0.001	0.04	0%			0%	
Sodium	A	mg/L	0.0133	0.0133		0	0	0	0.02171	0.02171	50	0%			0%	
Strontium	A	mg/L	0.000002317	0.000002317		0	0	0	0.00014	0.001	1	0%	0	0	0%	
Thallium	A	mg/L	0.00006943	0.00006943		0	0	0	0.000041	0.001	1	0%	0	0	0%	
Thorium	A	mg/L	0.00001451	0.00001451		0	0	0	0.00061	0.001	1	0%	0	0	0%	
Tin	A	mg/L	-0.0000163	-0.0000163		0	0	0	0.00132	0.00132	0.1	0%	0	0	0%	
Titanium	A	mg/L	-0.00007746	-0.00007746		0	0	0	0.000094	0.001	1	0%	0	0	0%	
Uranium	A	mg/L	5.921E-07	5.921E-07		0	0	0	0.000052	0.0003	1	0%	0	0	0%	
Vanadium	A	mg/L	-0.005947	-0.005947		0	0	0	0.0013	0.0013	1	0%	0	0	0%	
Zinc	A	mg/L	-0.00009738	-0.00009738		0	0	0	0.00273	0.00273	1	0%	0	0	0%	
Iron, Ferrous	C	mg/L	0.0001402	0.0001402		0	0	0	0.00119	0.00119	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984007	MB-162274	ICPMS-6020-W- MBLK			12/20/2021 1:17:	1	162274	12/16/2021	0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.0007416	0		0	0	0	0.0038747	0.0031975	1	0%	0	0	0%	
Antimony	A	mg/L	0.00003203	0		0	0	0	0.0002799	0.001	0.1	0%	0	0	0%	
Arsenic	A	mg/L	-0.0003724	0		0	0	0	0.0003412	0.001	1	0%	0	0	0%	
Barium	A	mg/L	-4.951E-06	0		0	0	0	0.0002682	0.001	1	0%	0	0	0%	
Beryllium	A	mg/L	-0.0000373	0		0	0	0	0.0001071	0.01	1	0%	0	0	0%	
Boron	A	mg/L	0.001186	0		0	0	0	0.0203802	0.01467	1	0%	0	0	0%	
Cadmium	A	mg/L	3.711E-09	0		0	0	0	1.821E-05	0.005	1	0%	0	0	0%	
Calcium	A	mg/L	0.03002	0		0	0	0	0.0372936	0.1103481	50	0%	0	0	0%	
Cerium	A	mg/L	0.000001238	0		0	0	0	2.738E-05	0.001	0.1	0%	0	0	0%	
Chromium	A	mg/L	0.0003683	0		0	0	0	0.0015375	0.0015375	1	0%	0	0	0%	
Cobalt	A	mg/L	0.00003164	0		0	0	0	9.541E-05	0.001	1	0%	0	0	0%	
Copper	A	mg/L	0.000178	0		0	0	0	0.0008747	0.00198	1	0%	0	0	0%	
Iron	A	mg/L	0.0008854	0		0	0	0	0.007424	0.00513	5	0%	0	0	0%	
Lanthanum	A	mg/L	1.115E-07	0		0	0	0	0.000055	0.001	0.1	0%	0	0	0%	
Lead	A	mg/L	0.00003061	0		0	0	0	7.716E-05	0.0005	1	0%	0	0	0%	
Magnesium	A	mg/L	0.001794	0		0	0	0	0.0104254	0.0081522	50	0%	0	0	0%	
Manganese	A	mg/L	0.00007364	0		0	0	0	0.0005399	0.001	1	0%	0	0	0%	
Molybdenum	A	mg/L	0.00006179	0		0	0	0	0.0001763	0.001	0.1	0%	0	0	0%	
Nickel	A	mg/L	-8.693E-06	0		0	0	0	0.0002288	0.0024200	1	0%	0	0	0%	
Potassium	A	mg/L	-0.0085	0		0	0	0	0.0765619	0.0261205	50	0%	0	0	0%	
Selenium	A	mg/L	-0.00001413	0		0	0	0	0.0001357	0.001	1	0%	0	0	0%	
Silicon	A	mg/L	0.009748	0		0	0	0	0.0422089	0.0053212	0.4	0%	0	0	0%	
Silver	A	mg/L	5.112E-07	0		0	0	0	4.281E-05	0.001	0.04	0%	0	0	0%	
Sodium	A	mg/L	0.02529	0		0	0	0	0.1019461	0.7330269	50	0%	0	0	0%	
Strontium	A	mg/L	0.00002228	0		0	0	0	0.0002433	0.001	1	0%	0	0	0%	
Thallium	A	mg/L	0.00006196	0		0	0	0	0.0001114	0.001	1	0%	0	0	0%	
Thorium	A	mg/L	0.00009437	0		0	0	0	0.0003796	0.00415	1	0%	0	0	0%	
Tin	A	mg/L	0.0001119	0		0	0	0	0.0018932	0.0011175	0.1	0%	0	0	0%	
Titanium	A	mg/L	0.0002756	0		0	0	0	0.0005733	0.001	1	0%	0	0	0%	
Uranium	A	mg/L	0.000000494	0		0	0	0	1.699E-05	0.0003	1	0%	0	0	0%	
Vanadium	A	mg/L	-0.004651	0		0	0	0	0.0039127	0.0021085	1	0%	0	0	0%	
Zinc	A	mg/L	0.0007321	0		0	0	0	0.0011617	0.0065544	1	0%	0	0	0%	
Silica	C	mg/L	0.020852922	0		0	0	0	0.0902933	0.0113831	5	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.020852922	0		0	0	0	0.0902933	0.0113831	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984008	LCS4-162274	ICPMS-6020-W- LCS4			12/20/2021 1:23:	1	162274	12/16/2021	0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.4684	0.4684		0.5	0	0	0.0038747	0.0031975	1	94%	80	120	0%	
Antimony	A	mg/L	0.1066	0.1066		0.1	0	0	0.0002799	0.001	0.1	107%	80	120	0%	
Arsenic	A	mg/L	0.1018	0.1018		0.1	0	0	0.0003412	0.001	1	102%	80	120	0%	
Barium	A	mg/L	0.1016	0.1016		0.1	0	0	0.0002682	0.001	1	102%	80	120	0%	
Beryllium	A	mg/L	0.04382	0.04382		0.05	0	0	0.0001071	0.01	1	88%	80	120	0%	
Boron	A	mg/L	0.0932	0.0932		0.1	0	0	0.0203802	0.01467	1	93%	80	120	0%	
Cadmium	A	mg/L	0.05155	0.05155		0.05	0	0	1.821E-05	0.005	1	103%	80	120	0%	
Calcium	A	mg/L	5.195	5.195		5	0	0	0.0372936	0.1103481	50	104%	80	120	0%	
Cerium	A	mg/L	0.1099	0.1099		0.1	0	0	2.738E-05	0.001	0.1	110%	80	120	0%	
Chromium	A	mg/L	0.1077	0.1077		0.1	0	0	0.0015375	0.0015375	1	108%	80	120	0%	
Cobalt	A	mg/L	0.09845	0.09845		0.1	0	0	9.541E-05	0.001	1	98%	80	120	0%	
Copper	A	mg/L	0.1125	0.1125		0.1	0	0	0.0008747	0.00198	1	113%	80	120	0%	
Iron	A	mg/L	0.5168	0.5168		0.5	0	0	0.007424	0.00513	5	103%	80	120	0%	
Lanthanum	A	mg/L	0.1082	0.1082		0.1	0	0	0.000055	0.001	0.1	108%	80	120	0%	
Lead	A	mg/L	0.1026	0.1026		0.1	0	0	7.716E-05	0.001	1	103%	88	115	0%	
Magnesium	A	mg/L	5.653	5.653		5	0	0	0.0104254	0.0081522	50	113%	80	120	0%	
Manganese	A	mg/L	0.5298	0.5298		0.5	0	0	0.0005399	0.001	1	106%	80	120	0%	
Molybdenum	A	mg/L	0.09929	0.09929		0.1	0	0	0.0001763	0.001	0.1	99%	80	120	0%	
Nickel	A	mg/L	0.1104	0.1104		0.1	0	0	0.0002288	0.0024200	1	110%	80	120	0%	
Potassium	A	mg/L	5.167	5.167		5	0	0	0.0765619	0.0261205	50	103%	80	120	0%	
Selenium	A	mg/L	0.1012	0.1012		0.1	0	0	0.0001357	0.001	1	101%	80	120	0%	
Silicon	A	mg/L	0.9827	0.9827		1	0	0	0.0422089	0.0053212	0.4	98%	80	120	0%	
Silver	A	mg/L	0.009675	0.009675		0.01	0	0	4.281E-05	0.001	0.04	97%	80	120	0%	
Sodium	A	mg/L	5.569	5.569		5	0	0	0.1019461	0.7330269	50	111%	80	120	0%	
Strontium	A	mg/L	0.1007	0.1007		0.1	0	0	0.0002433	0.001	1	101%	80	120	0%	
Thallium	A	mg/L	0.1044	0.1044		0.1	0	0	0.0001114	0.001	1	104%	80	120	0%	
Thorium	A	mg/L	0.09977	0.09977		0.1	0	0	0.0003796	0.00415	1	100%	80	120	0%	
Tin	A	mg/L	0.098	0.098		0.1	0	0	0.0018932	0.0011175	0.1	98%	80	120	0%	
Titanium	A	mg/L	0.08751	0.08751		0.1	0	0	0.0005733	0.001	1	88%	80	120	0%	
Uranium	A	mg/L	0.1071	0.1071		0.1	0	0	1.699E-05	0.0003	1	107%	80	120	0%	
Vanadium	A	mg/L	0.1005	0.1005		0.1	0	0	0.0039127	0.0021085	1	100%	80	120	0%	
Zinc	A	mg/L	0.1047	0.1047		0.1	0	0	0.0011617	0.0065544	1	105%	80	120	0%	
Silica	C	mg/L	2.10219184	2.10219184		0	0	0	0.0902933	0.0113831	5	0%	0	0	0%	
Silicon as SiO2	C	mg/L	2.10219184	2.10219184		2.14	0	0	0.0902933	0.0113831	5	98%	80	120	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984009	Rinse	ICPMS-6020-W-	SAMP		12/20/2021 1:29:	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Arsenic	A	mg/L	-0.0007611	0		0	0	0	0.00019	0.001	1	0%	0	0	0%	
Barium	A	mg/L	-7.768E-06	0		0	0	0	0.000042	0.001	1	0%	0	0	0%	
Cadmium	A	mg/L	0.000004225	0		0	0	0	0.000025	0.001	1	0%	0	0	0%	
Cerium	A	mg/L	-2.085E-08	0		0	0	0	0.000012	0.001	0.1	0%	0	0	0%	
Chromium	A	mg/L	0.00002867	0		0	0	0	0.00018	0.001	1	0%	0	0	0%	
Cobalt	A	mg/L	-8.621E-07	0		0	0	0	0.000042	0.001	1	0%	0	0	0%	
Copper	A	mg/L	-0.00002932	0		0	0	0	0.00027	0.001	1	0%	0	0	0%	
Lanthanum	A	mg/L	-7.597E-08	0		0	0	0	0.000011	0.001	0.1	0%	0	0	0%	
Lead	A	mg/L	0.000004595	0		0	0	0	0.000056	0.001	1	0%	0	0	0%	
Manganese	A	mg/L	-6.859E-06	0		0	0	0	0.000095	0.001	1	0%	0	0	0%	
Mercury	A	mg/L	-7.824E-10	0		0	0	0	0.00016	0.001	0.002	0%	0	0	0%	
Molybdenum	A	mg/L	0.000005977	0		0	0	0	0.00005	0.001	0.1	0%	0	0	0%	
Nickel	A	mg/L	-0.0000108	0		0	0	0	0.00063	0.001	1	0%	0	0	0%	
Selenium	A	mg/L	-0.00006763	0		0	0	0	0.00033	0.001	1	0%	0	0	0%	
Silicon	A	mg/L	-0.002869	0		0	0	0	0.01223	0.1	0.4	0%	0	0	0%	
Silver	A	mg/L	3.099E-07	0		0	0	0	0.00002	0.001	0.04	0%	0	0	0%	
Strontium	A	mg/L	0.000002958	0		0	0	0	0.00014	0.001	1	0%	0	0	0%	
Thallium	A	mg/L	0.000107	0.000107		0	0	0	0.000041	0.001	1	0%	0	0	0%	J
Thorium	A	mg/L	0.00001284	0		0	0	0	0.00061	0.001	1	0%	0	0	0%	
Uranium	A	mg/L	0.000000886	0		0	0	0	0.000052	0.0003	1	0%	0	0	0%	
Calcium	B	mg/L	0.0003093	0		0	0	0	0.02092	0.02092	50	0%	0	0	0%	L
Iron	B	mg/L	0.00005437	0		0	0	0	0.00119	0.00119	5	0%	0	0	0%	
Iron, Ferrous	B	mg/L	0.00005437	0		0	0	0	0.00119	0.00119	5	0%	0	0	0%	
Magnesium	B	mg/L	0.0008773	0		0	0	0	0.00564	0.00564	50	0%	0	0	0%	L
Tin	B	mg/L	-9.295E-06	0		0	0	0	0.00132	0.00132	0.1	0%	0	0	0%	
Zinc	B	mg/L	0.0002479	0		0	0	0	0.00273	0.00273	1	0%	0	0	0%	L

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984010	B21121402-002	ICPMS-6020-W-	SAMP		12/20/2021 1:35:	1	162274	12/16/2021	0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.07511	0.07511		0	0	0	0.0002682	0.001	1	0%	0	0	0%	
Cadmium	A	mg/L	0.00000572	0		0	0	0	1.821E-05	0.005	1	0%	0	0	0%	U
Cerium	A	mg/L	0.000002243	0		0	0	0	2.738E-05	0.001	0.1	0%	0	0	0%	U
Cobalt	A	mg/L	0.001159	0.001159		0	0	0	9.541E-05	0.001	1	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984010	B21121402-002	ICPMS-6020-W-	SAMP		12/20/2021 1:35:	1	162274	12/16/2021	0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lanthanum	A	mg/L	0.000001449	0		0	0	0	0.000055	0.001	0.1	0%	0	0	0%	U
Lead	A	mg/L	0.0000384	0		0	0	0	7.716E-05	0.001	1	0%	0	0	0%	U
Manganese	A	mg/L	0.002661	0.002661		0	0	0	0.0005399	0.001	1	0%	0	0	0%	
Molybdenum	A	mg/L	0.001285	0.001285		0	0	0	0.0001763	0.001	0.1	0%	0	0	0%	
Selenium	A	mg/L	0.004567	0.004567		0	0	0	0.0001357	0.001	1	0%	0	0	0%	
Silver	A	mg/L	0.000004858	0		0	0	0	4.281E-05	0.001	0.04	0%	0	0	0%	U
Thallium	A	mg/L	0.00005675	0		0	0	0	0.0001114	0.001	1	0%	0	0	0%	U
Uranium	A	mg/L	0.00007326	0.00007326		0	0	0	1.699E-05	0.0003	1	0%	0	0	0%	J
Chromium	B	mg/L	0.01536	0.01536		0	0	0	0.0015375	0.0015375	1	0%	0	0	0%	D
Copper	B	mg/L	0.000753	0		0	0	0	0.0008747	0.00198	1	0%	0	0	0%	LU
Iron	B	mg/L	0.1124	0.1124		0	0	0	0.007424	0.00513	5	0%	0	0	0%	D
Nickel	B	mg/L	0.07007	0.07007		0	0	0	0.0002288	0.0024200	1	0%	0	0	0%	D
Thorium	B	mg/L	0.00007968	0		0	0	0	0.0003796	0.00415	1	0%	0	0	0%	LU
Tin	B	mg/L	0.0001113	0		0	0	0	0.0018932	0.0011175	0.1	0%	0	0	0%	U
Zinc	B	mg/L	0.001237	0.001237		0	0	0	0.0011617	0.0065544	1	0%	0	0	0%	JL

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984011	B21121402-003	ICPMS-6020-W-	SAMP		12/20/2021 1:42:	1	162274	12/16/2021	0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Arsenic	A	mg/L	0.0001528	0		0	0	0	0.0003412	0.001	1	0%	0	0	0%	U
Barium	A	mg/L	0.002293	0.002293		0	0	0	0.0002682	0.001	1	0%	0	0	0%	
Cadmium	A	mg/L	0.000002208	0		0	0	0	1.821E-05	0.005	1	0%	0	0	0%	U
Cerium	A	mg/L	0.00001484	0		0	0	0	2.738E-05	0.001	0.1	0%	0	0	0%	U
Cobalt	A	mg/L	0.000133	0.000133		0	0	0	9.541E-05	0.001	1	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000006811	0		0	0	0	0.000055	0.001	0.1	0%	0	0	0%	U
Lead	A	mg/L	0.0001213	0.0001213		0	0	0	7.716E-05	0.001	1	0%	0	0	0%	J
Manganese	A	mg/L	0.008737	0.008737		0	0	0	0.0005399	0.001	1	0%	0	0	0%	
Molybdenum	A	mg/L	0.0008029	0.0008029		0	0	0	0.0001763	0.001	0.1	0%	0	0	0%	J
Selenium	A	mg/L	0.0001768	0.0001768		0	0	0	0.0001357	0.001	1	0%	0	0	0%	J
Silver	A	mg/L	0.000004875	0		0	0	0	4.281E-05	0.001	0.04	0%	0	0	0%	U
Strontium	A	mg/L	0.05814	0.05814		0	0	0	0.0002433	0.001	1	0%	0	0	0%	
Thallium	A	mg/L	0.00003228	0		0	0	0	0.0001114	0.001	1	0%	0	0	0%	U
Uranium	A	mg/L	0.000006617	0		0	0	0	1.699E-05	0.0003	1	0%	0	0	0%	U
Calcium	B	mg/L	7.918	7.918		0	0	0	0.0372936	0.1103481	50	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984011	B21121402-003	ICPMS-6020-W-	SAMP		12/20/2021 1:42:	1	162274	12/16/2021	0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Chromium	B	mg/L	0.004334	0.004334		0	0	0	0.0015375	0.0015375	1	0%	0	0	0%	DU
Copper	B	mg/L	0.0005905	0		0	0	0	0.0008747	0.00198	1	0%	0	0	0%	LU
Iron	B	mg/L	0.2318	0.2318		0	0	0	0.007424	0.00513	5	0%	0	0	0%	D
Magnesium	B	mg/L	9.535	9.535		0	0	0	0.0104254	0.0081522	50	0%	0	0	0%	D
Nickel	B	mg/L	0.0004997	0.0004997		0	0	0	0.0002288	0.0024200	1	0%	0	0	0%	JL
Sodium	B	mg/L	39.61	39.61		0	0	0	0.1019461	0.7330269	50	0%	0	0	0%	D
Thorium	B	mg/L	0.00004367	0		0	0	0	0.0003796	0.00415	1	0%	0	0	0%	LU
Tin	B	mg/L	0.0002033	0		0	0	0	0.0018932	0.0011175	0.1	0%	0	0	0%	U
Zinc	B	mg/L	0.0183	0.0183		0	0	0	0.0011617	0.0065544	1	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984012	B21121402-001	ICPMS-6020-W-	SAMP		12/20/2021 1:48:	1	162274	12/16/2021	0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.012	0.012		0	0	0	0.0002682	0.001	1	0%	0	0	0%	
Cadmium	A	mg/L	0.000005552	0		0	0	0	1.821E-05	0.005	1	0%	0	0	0%	U
Cerium	A	mg/L	0.00004037	0.00004037		0	0	0	2.738E-05	0.001	0.1	0%	0	0	0%	J
Cobalt	A	mg/L	0.0001618	0.0001618		0	0	0	9.541E-05	0.001	1	0%	0	0	0%	J
Lanthanum	A	mg/L	0.00001796	0		0	0	0	0.000055	0.001	0.1	0%	0	0	0%	U
Lead	A	mg/L	0.0005012	0.0005012		0	0	0	7.716E-05	0.001	1	0%	0	0	0%	J
Manganese	A	mg/L	0.002235	0.002235		0	0	0	0.0005399	0.001	1	0%	0	0	0%	
Molybdenum	A	mg/L	0.002896	0.002896		0	0	0	0.0001763	0.001	0.1	0%	0	0	0%	
Selenium	A	mg/L	0.0002553	0.0002553		0	0	0	0.0001357	0.001	1	0%	0	0	0%	J
Silver	A	mg/L	0.0002833	0.0002833		0	0	0	4.281E-05	0.001	0.04	0%	0	0	0%	J
Strontium	A	mg/L	0.2502	0.2502		0	0	0	0.0002433	0.001	1	0%	0	0	0%	
Thallium	A	mg/L	0.0000235	0		0	0	0	0.0001114	0.001	1	0%	0	0	0%	U
Uranium	A	mg/L	0.00002074	0.00002074		0	0	0	1.699E-05	0.0003	1	0%	0	0	0%	J
Calcium	B	mg/L	25.98	25.98		0	0	0	0.0372936	0.1103481	50	0%	0	0	0%	D
Chromium	B	mg/L	0.02081	0.02081		0	0	0	0.0015375	0.0015375	1	0%	0	0	0%	D
Copper	B	mg/L	0.002575	0.002575		0	0	0	0.0008747	0.00198	1	0%	0	0	0%	D
Iron	B	mg/L	0.2062	0.2062		0	0	0	0.007424	0.00513	5	0%	0	0	0%	D
Magnesium	B	mg/L	48.28	48.28		0	0	0	0.0104254	0.0081522	50	0%	0	0	0%	D
Nickel	B	mg/L	0.002788	0.002788		0	0	0	0.0002288	0.0024200	1	0%	0	0	0%	D
Thorium	B	mg/L	0.00003153	0		0	0	0	0.0003796	0.00415	1	0%	0	0	0%	LU
Tin	B	mg/L	0.001676	0		0	0	0	0.0018932	0.0011175	0.1	0%	0	0	0%	U

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984012	B21121402-001	ICPMS-6020-W- SAMP			12/20/2021 1:48:	1	162274	12/16/2021	0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Zinc	B	mg/L	0.1507	0.1507		0	0	0	0.0011617	0.0065544	1	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984013	B21121402-001	ICPMS-6020-W- SD			12/20/2021 1:54:	5	162274	12/16/2021	0	1E+07						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.007888	0.03944		0	0	0.03563	0.0193736	0.0159875	1	0%	0	0		N
Antimony	A	mg/L	0.0001605	0		0	0	0.0008596	0.0013997	0.0049	0.1	0%	0	0		
Arsenic	A	mg/L	-0.000268	0		0	0	0.0003538	0.0017061	0.0013383	1	0%	0	0		
Barium	A	mg/L	0.002245	0.011225		0	0	0.012	0.0013411	0.0012039	1	0%	0	0		N
Beryllium	A	mg/L	-0.00004838	0		0	0	0	0.0005353	0.01	1	0%	0	0		
Boron	A	mg/L	0.01105	0		0	0	0.05605	0.1019008	0.07335	1	0%	0	0		
Cadmium	A	mg/L	0.000003205	0		0	0	0	9.105E-05	0.005	1	0%	0	0		
Calcium	A	mg/L	5.55	27.75		0	0	25.98	0.1864681	0.5517403	50	0%	0	0	7%	
Cerium	A	mg/L	0.00001913	0		0	0	4.037E-05	0.0001369	0.001	0.1	0%	0	0		
Chromium	A	mg/L	0.004093	0.020465		0	0	0.02081	0.0076875	0.0076875	1	0%	0	0		N
Cobalt	A	mg/L	0.00003262	0		0	0	0.0001618	0.0004771	0.001	1	0%	0	0		
Copper	A	mg/L	0.0005349	0		0	0	0.002575	0.0043735	0.0099	1	0%	0	0		
Iron	A	mg/L	0.04	0.2		0	0	0.2062	0.0371198	0.02565	5	0%	0	0		N
Lanthanum	A	mg/L	0.000006693	0		0	0	0	0.000275	0.001	0.1	0%	0	0		
Lead	A	mg/L	0.000107	0.000535		0	0	0.0005012	0.0003858	0.001	1	0%	0	0		N
Magnesium	A	mg/L	9.446	47.23		0	0	48.28	0.0521269	0.0407608	50	0%	0	0	2%	
Manganese	A	mg/L	0.0004854	0		0	0	0.002235	0.0026994	0.0010695	1	0%	0	0		
Molybdenum	A	mg/L	0.0005188	0.002594		0	0	0.002896	0.0008814	0.001	0.1	0%	0	0		N
Nickel	A	mg/L	0.0005374	0.002687		0	0	0.002788	0.0011441	0.0121000	1	0%	0	0		N
Potassium	A	mg/L	0.4196	2.098		0	0	2.223	0.3828097	0.1306027	50	0%	0	0		N
Selenium	A	mg/L	-6.573E-07	0		0	0	0.0002553	0.0006787	0.0029274	1	0%	0	0		
Silicon	A	mg/L	4.787	23.935		0	0	24.26	0.2110446	0.026606	0.4	0%	0	0	1%	
Silver	A	mg/L	0.00005272	0.0002636		0	0	0.0002833	0.0002141	0.001	0.04	0%	0	0		N
Sodium	A	mg/L	33.28	166.4		0	0	169.4	0.5097304	3.6651346	50	0%	0	0	2%	
Strontium	A	mg/L	0.04794	0.2397		0	0	0.2502	0.0012164	0.001	1	0%	0	0	4%	
Thallium	A	mg/L	0.00001037	0		0	0	0	0.0005569	0.001	1	0%	0	0		
Thorium	A	mg/L	0.00000128	0		0	0	0	0.0018981	0.02075	1	0%	0	0		
Tin	A	mg/L	0.0003002	0		0	0	0	0.0094659	0.0055874	0.1	0%	0	0		
Titanium	A	mg/L	0.0007986	0.003993		0	0	0.004054	0.0028666	0.001	1	0%	0	0		N

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984013	B21121402-001	ICPMS-6020-W- SD			12/20/2021 1:54:	5	162274	12/16/2021	0	1E+07						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Uranium	A	mg/L	0.00004689	0		0	0	2.074E-05	8.495E-05	0.0004224	1	0%	0	0		
Vanadium	A	mg/L	0.002227	0		0	0	0.02182	0.0195637	0.0105423	1	0%	0	0		
Zinc	A	mg/L	0.03018	0.1509		0	0	0.1507	0.0058087	0.0327721	1	0%	0	0	0%	
Silica	C	mg/L	10.2403504	51.201752		0	0	0	0.4514666	0.0569155	5	0%	0	0		N
Silicon as SiO2	C	mg/L	10.2403504	51.201752		0	0	0	0.4514666	0.0569155	5	0%	0	0		N

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984014	B21121402-001	ICPMS-6020-W- PDS1			12/20/2021 2:00:	1.03	162274	12/16/2021	1E+07	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.07715	0.0794645		0.0515	0.03563	0	0.003991	0.0032934	1	85%	75	125	0%	
Antimony	A	mg/L	0.04857	0.0500271		0.0515	0.0008596	0	0.0002883	0.0010094	0.1	95%	75	125	0%	
Arsenic	A	mg/L	0.04992	0.0514176		0.0515	0.0003538	0	0.0003514	0.001	1	99%	75	125	0%	
Barium	A	mg/L	0.06289	0.0647767		0.0515	0.012	0	0.0002763	0.001	1	102%	75	125	0%	
Beryllium	A	mg/L	0.03891	0.0400773		0.0515	0	0	0.0001103	0.01	1	78%	75	125	0%	
Boron	A	mg/L	0.09601	0.0988903		0.0515	0.05605	0	0.0209916	0.0151101	1	83%	75	125	0%	
Cadmium	A	mg/L	0.04975	0.0512425		0.0515	0	0	1.876E-05	0.005	1	99%	75	125	0%	
Calcium	A	mg/L	63.76	65.6728		51.5	25.98	0	0.0384124	0.1136585	50	77%	75	125	0%	
Cerium	A	mg/L	0.0503	0.051809		0.0515	4.037E-05	0	2.820E-05	0.001	0.1	101%	75	125	0%	
Chromium	A	mg/L	0.07012	0.0722236		0.0515	0.02081	0	0.0015836	0.0015836	1	100%	75	125	0%	
Cobalt	A	mg/L	0.04438	0.0457114		0.0515	0.0001618	0	9.827E-05	0.001	1	88%	75	125	0%	
Copper	A	mg/L	0.05366	0.0552698		0.0515	0.002575	0	0.0009009	0.0020394	1	102%	75	125	0%	
Iron	A	mg/L	4.972	5.12116		5.15	0.2062	0	0.0076467	0.0052839	5	95%	75	125	0%	
Lanthanum	A	mg/L	0.04973	0.0512219		0.0515	0	0	5.665E-05	0.001	0.1	99%	75	125	0%	
Lead	A	mg/L	0.04787	0.0493061		0.0515	0.0005012	0	7.947E-05	0.001	1	95%	80	120	0%	
Magnesium	A	mg/L	96.2	99.086		51.5	48.28	0	0.0107381	0.0083967	50	99%	75	125	0%	
Manganese	A	mg/L	0.05071	0.0522313		0.0515	0.002235	0	0.0005561	0.001	1	97%	75	125	0%	
Molybdenum	A	mg/L	0.0493	0.050779		0.0515	0.002896	0	0.0001816	0.001	0.1	93%	75	125	0%	
Nickel	A	mg/L	0.05241	0.0539823		0.0515	0.002788	0	0.0002357	0.0024926	1	99%	75	125	0%	
Potassium	A	mg/L	50.52	52.0356		51.5	2.223	0	0.0788588	0.0269042	50	97%	75	125	0%	
Selenium	A	mg/L	0.04818	0.0496254		0.0515	0.0002553	0	0.0001398	0.001	1	96%	75	125	0%	
Silicon	A	mg/L	23.42	24.1226		0.206	24.26	0	0.0434752	0.0054808	0.4		0	0	0%	A
Silver	A	mg/L	0.01825	0.0187975		0.0206	0.0002833	0	4.409E-05	0.001	0.04	90%	75	125	0%	
Sodium	A	mg/L	205.8	211.974		51.5	169.4	0	0.1050045	0.7550177	50	83%	75	125	0%	
Strontium	A	mg/L	0.2931	0.301893		0.0515	0.2502	0	0.0002506	0.001	1		75	125	0%	A

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984014	B21121402-001	ICPMS-6020-W-	PDS1		12/20/2021 2:00:	1.03	162274	12/16/2021	1E+07	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thallium	A	mg/L	0.04907	0.0505421		0.0515	0	0	0.0001147	0.001	1	98%	75	125	0%	
Thorium	A	mg/L	0.04838	0.0498314		0.0515	0	0	0.000391	0.0042745	1	97%	75	125	0%	
Tin	A	mg/L	0.04802	0.0494606		0.0515	0	0	0.00195	0.001151	0.1	96%	75	125	0%	
Titanium	A	mg/L	0.04751	0.0489353		0.0515	0.004054	0	0.0005905	0.001	1	87%	75	125	0%	
Uranium	A	mg/L	0.04977	0.0512631		0.0515	2.074E-05	0	1.75E-05	0.0003	1	99%	75	125	0%	
Vanadium	A	mg/L	0.07544	0.0777032		0.0515	0.02182	0	0.0040301	0.0021717	1	109%	75	125	0%	
Zinc	A	mg/L	0.193	0.19879		0.0515	0.1507	0	0.0011966	0.0067511	1	93%	75	125	0%	
Silica	C	mg/L	50.100064	51.60306592		0	0	0	0.0930021	0.0117246	5	0%	0	0	0%	
Silicon as SiO2	C	mg/L	50.100064	51.60306592		0.0515	0	0	0.0930021	0.0117246	5	100200%	75	125	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984015	B21121402-001	ICPMS-6020-W-	MS4		12/20/2021 2:06:	1	162274	12/16/2021	1E+07	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.4771	0.4771		0.5	0.03563	0	0.0038747	0.0031975	1	88%	75	125	0%	
Antimony	A	mg/L	0.1063	0.1063		0.1	0.0008596	0	0.0002799	0.001	0.1	105%	75	125	0%	
Arsenic	A	mg/L	0.1027	0.1027		0.1	0.0003538	0	0.0003412	0.001	1	102%	75	125	0%	
Barium	A	mg/L	0.1111	0.1111		0.1	0.012	0	0.0002682	0.001	1	99%	75	125	0%	
Beryllium	A	mg/L	0.04093	0.04093		0.05	0	0	0.0001071	0.01	1	82%	75	125	0%	
Boron	A	mg/L	0.14	0.14		0.1	0.05605	0	0.0203802	0.01467	1	84%	75	125	0%	
Cadmium	A	mg/L	0.05163	0.05163		0.05	0	0	1.821E-05	0.005	1	103%	75	125	0%	
Calcium	A	mg/L	30.07	30.07		5	25.98	0	0.0372936	0.1103481	50		75	125	0%	A
Cerium	A	mg/L	0.1098	0.1098		0.1	4.037E-05	0	2.738E-05	0.001	0.1	110%	75	125	0%	
Chromium	A	mg/L	0.1239	0.1239		0.1	0.02081	0	0.0015375	0.0015375	1	103%	75	125	0%	
Cobalt	A	mg/L	0.09409	0.09409		0.1	0.0001618	0	9.541E-05	0.001	1	94%	75	125	0%	
Copper	A	mg/L	0.1108	0.1108		0.1	0.002575	0	0.0008747	0.00198	1	108%	75	125	0%	
Iron	A	mg/L	0.6903	0.6903		0.5	0.2062	0	0.007424	0.00513	5	97%	75	125	0%	
Lanthanum	A	mg/L	0.11	0.11		0.1	0	0	0.000055	0.001	0.1	110%	75	125	0%	
Lead	A	mg/L	0.09933	0.09933		0.1	0.0005012	0	7.716E-05	0.001	1	99%	88	115	0%	
Magnesium	A	mg/L	52.68	52.68		5	48.28	0	0.0104254	0.0081522	50		75	125	0%	A
Manganese	A	mg/L	0.5138	0.5138		0.5	0.002235	0	0.0005399	0.001	1	102%	75	125	0%	
Molybdenum	A	mg/L	0.1004	0.1004		0.1	0.002896	0	0.0001763	0.001	0.1	98%	75	125	0%	
Nickel	A	mg/L	0.1076	0.1076		0.1	0.002788	0	0.0002288	0.0024200	1	105%	75	125	0%	
Potassium	A	mg/L	7.257	7.257		5	2.223	0	0.0765619	0.0261205	50	101%	75	125	0%	
Selenium	A	mg/L	0.1004	0.1004		0.1	0.0002553	0	0.0001357	0.001	1	100%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984015	B21121402-001	ICPMS-6020-W- MS4			12/20/2021 2:06:	1	162274	12/16/2021	1E+07	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon	A	mg/L	31.35	31.35		1	24.26	0	0.0422089	0.0053212	0.4		75	125	0%	A
Silver	A	mg/L	0.009547	0.009547		0.01	0.0002833	0	4.281E-05	0.001	0.04	93%	75	125	0%	
Sodium	A	mg/L	169.1	169.1		5	169.4	0	0.1019461	0.7330269	50		75	125	0%	A
Strontium	A	mg/L	0.3669	0.3669		0.1	0.2502	0	0.0002433	0.001	1	117%	75	125	0%	
Thallium	A	mg/L	0.1057	0.1057		0.1	0	0	0.0001114	0.001	1	106%	75	125	0%	
Thorium	A	mg/L	0.1047	0.1047		0.1	0	0	0.0003796	0.00415	1	105%	75	125	0%	
Tin	A	mg/L	0.09994	0.09994		0.1	0	0	0.0018932	0.0011175	0.1	100%	75	125	0%	
Titanium	A	mg/L	0.09144	0.09144		0.1	0.004054	0	0.0005733	0.001	1	87%	75	125	0%	
Uranium	A	mg/L	0.1052	0.1052		0.1	2.074E-05	0	1.699E-05	0.0003	1	105%	75	125	0%	
Vanadium	A	mg/L	0.1285	0.1285		0.1	0.02182	0	0.0039127	0.0021085	1	107%	75	125	0%	
Zinc	A	mg/L	0.2595	0.2595		0.1	0.1507	0	0.0011617	0.0065544	1	109%	75	125	0%	
Silica	C	mg/L	67.06392	67.06392		0	0	0	0.0902933	0.0113831	5	0%	0	0	0%	
Silicon as SiO2	C	mg/L	67.06392	67.06392		2.14	0	0	0.0902933	0.0113831	5	3134%	75	125	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984016	B21121402-001	ICPMS-6020-W- MSD4			12/20/2021 2:12:	1	162274	12/16/2021	1E+07	1E+07						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.5107	0.5107		0.5	0.03563	0.4771	0.0038747	0.0031975	1	95%	75	125	7%	
Antimony	A	mg/L	0.1123	0.1123		0.1	0.0008596	0.1063	0.0002799	0.001	0.1	111%	75	125	5%	
Arsenic	A	mg/L	0.1043	0.1043		0.1	0.0003538	0.1027	0.0003412	0.001	1	104%	75	125	2%	
Barium	A	mg/L	0.1188	0.1188		0.1	0.012	0.1111	0.0002682	0.001	1	107%	75	125	7%	
Beryllium	A	mg/L	0.04257	0.04257		0.05	0	0.04093	0.0001071	0.01	1	85%	75	125	4%	
Boron	A	mg/L	0.1484	0.1484		0.1	0.05605	0.14	0.0203802	0.01467	1	92%	75	125	6%	
Cadmium	A	mg/L	0.05221	0.05221		0.05	0	0.05163	1.821E-05	0.005	1	104%	75	125	1%	
Calcium	A	mg/L	30	30		5	25.98	30.07	0.0372936	0.1103481	50		75	125	0%	A
Cerium	A	mg/L	0.1129	0.1129		0.1	4.037E-05	0.1098	2.738E-05	0.001	0.1	113%	75	125	3%	
Chromium	A	mg/L	0.1258	0.1258		0.1	0.02081	0.1239	0.0015375	0.0015375	1	105%	75	125	2%	
Cobalt	A	mg/L	0.09472	0.09472		0.1	0.0001618	0.09409	9.541E-05	0.001	1	95%	75	125	1%	
Copper	A	mg/L	0.112	0.112		0.1	0.002575	0.1108	0.0008747	0.00198	1	109%	75	125	1%	
Iron	A	mg/L	0.6787	0.6787		0.5	0.2062	0.6903	0.007424	0.00513	5	95%	75	125	2%	
Lanthanum	A	mg/L	0.1118	0.1118		0.1	0	0.11	0.000055	0.001	0.1	112%	75	125	2%	
Lead	A	mg/L	0.104	0.104		0.1	0.0005012	0.09933	7.716E-05	0.001	1	103%	88	115	5%	
Magnesium	A	mg/L	52.98	52.98		5	48.28	52.68	0.0104254	0.0081522	50		75	125	1%	A
Manganese	A	mg/L	0.5273	0.5273		0.5	0.002235	0.5138	0.0005399	0.001	1	105%	75	125	3%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984016	B21121402-001	ICPMS-6020-W-MSD4			12/20/2021 2:12:	1	162274	12/16/2021	1E+07	1E+07						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Molybdenum	A	mg/L	0.1064	0.1064		0.1	0.002896	0.1004	0.0001763	0.001	0.1	104%	75	125	6%	
Nickel	A	mg/L	0.1101	0.1101		0.1	0.002788	0.1076	0.0002288	0.0024200	1	107%	75	125	2%	
Potassium	A	mg/L	7.448	7.448		5	2.223	7.257	0.0765619	0.0261205	50	105%	75	125	3%	
Selenium	A	mg/L	0.1015	0.1015		0.1	0.0002553	0.1004	0.0001357	0.001	1	101%	75	125	1%	
Silicon	A	mg/L	32.12	32.12		1	24.26	31.35	0.0422089	0.0053212	0.4		75	125	2%	A
Silver	A	mg/L	0.01008	0.01008		0.01	0.0002833	0.009547	4.281E-05	0.001	0.04	98%	75	125	5%	
Sodium	A	mg/L	173.7	173.7		5	169.4	169.1	0.1019461	0.7330269	50		75	125	3%	A
Strontium	A	mg/L	0.3697	0.3697		0.1	0.2502	0.3669	0.0002433	0.001	1	119%	75	125	1%	
Thallium	A	mg/L	0.1044	0.1044		0.1	0	0.1057	0.0001114	0.001	1	104%	75	125	1%	
Thorium	A	mg/L	0.1019	0.1019		0.1	0	0.1047	0.0003796	0.00415	1	102%	75	125	3%	
Tin	A	mg/L	0.1057	0.1057		0.1	0	0.09994	0.0018932	0.0011175	0.1	106%	75	125	6%	
Titanium	A	mg/L	0.0943	0.0943		0.1	0.004054	0.09144	0.0005733	0.001	1	90%	75	125	3%	
Uranium	A	mg/L	0.1112	0.1112		0.1	2.074E-05	0.1052	1.699E-05	0.0003	1	111%	75	125	6%	
Vanadium	A	mg/L	0.13	0.13		0.1	0.02182	0.1285	0.0039127	0.0021085	1	108%	75	125	1%	
Zinc	A	mg/L	0.2571	0.2571		0.1	0.1507	0.2595	0.0011617	0.0065544	1	106%	75	125	1%	
Silica	C	mg/L	68.711104	68.711104		0	0	67.06392	0.0902933	0.0113831	5	0%	0	0	2%	
Silicon as SiO2	C	mg/L	68.711104	68.711104		2.14	0	67.06392	0.0902933	0.0113831	5	3211%	75	125	2%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984017	CCV	ICPMS-6020-W-CCV			12/20/2021 2:18:	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.04408	0.04408		0.05	0	0	0.00086	0.001	1	88%	90	110	0%	S
Antimony	A	mg/L	0.0506	0.0506		0.05	0	0	0.00042	0.001	0.1	101%	90	110	0%	
Arsenic	A	mg/L	0.04973	0.04973		0.05	0	0	0.00019	0.001	1	99%	90	110	0%	
Barium	A	mg/L	0.05025	0.05025		0.05	0	0	0.000042	0.001	1	100%	90	110	0%	
Beryllium	A	mg/L	0.04109	0.04109		0.05	0	0	0.00012	0.001	1	82%	90	110	0%	S
Boron	A	mg/L	0.04414	0.04414		0.05	0	0	0.00561	0.00561	1	88%	90	110	0%	S
Cadmium	A	mg/L	0.04887	0.04887		0.05	0	0	0.000025	0.001	1	98%	90	110	0%	
Calcium	A	mg/L	12.52	12.52		12.5	0	0	0.02092	0.02092	50	100%	90	110	0%	
Cerium	A	mg/L	0.0497	0.0497		0.05	0	0	0.000012	0.001	0.1	99%	90	110	0%	
Chromium	A	mg/L	0.05087	0.05087		0.05	0	0	0.00018	0.001	1	102%	90	110	0%	
Cobalt	A	mg/L	0.04649	0.04649		0.05	0	0	0.000042	0.001	1	93%	90	110	0%	
Copper	A	mg/L	0.05352	0.05352		0.05	0	0	0.00027	0.001	1	107%	90	110	0%	
Iron	A	mg/L	1.326	1.326		1.3	0	0	0.00119	0.00119	5	102%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984017	CCV	ICPMS-6020-W- CCV			12/20/2021 2:18:	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lanthanum	A	mg/L	0.05013	0.05013		0.05	0	0	0.000011	0.001	0.1	100%	90	110	0%	
Lead	A	mg/L	0.04724	0.04724		0.05	0	0	0.000056	0.001	1	94%	90	110	0%	
Magnesium	A	mg/L	13.06	13.06		12.5	0	0	0.00564	0.00564	50	104%	90	110	0%	
Manganese	A	mg/L	0.05047	0.05047		0.05	0	0	0.000095	0.001	1	101%	90	110	0%	
Mercury	A	mg/L	0.001007	0.001007		0.001	0	0	0.00016	0.001	0.002	101%	90	110	0%	
Molybdenum	A	mg/L	0.04768	0.04768		0.05	0	0	0.00005	0.001	0.1	95%	90	110	0%	
Nickel	A	mg/L	0.05248	0.05248		0.05	0	0	0.00063	0.001	1	105%	90	110	0%	
Potassium	A	mg/L	12.52	12.52		12.5	0	0	0.08139	0.08139	50	100%	90	110	0%	
Selenium	A	mg/L	0.05021	0.05021		0.05	0	0	0.00033	0.001	1	100%	90	110	0%	
Silicon	A	mg/L	0.2037	0.2037		0.2	0	0	0.01223	0.1	0.4	102%	90	110	0%	
Silver	A	mg/L	0.01892	0.01892		0.02	0	0	0.00002	0.001	0.04	95%	90	110	0%	
Sodium	A	mg/L	13.15	13.15		12.5	0	0	0.02171	0.02171	50	105%	90	110	0%	
Strontium	A	mg/L	0.04862	0.04862		0.05	0	0	0.00014	0.001	1	97%	90	110	0%	
Thallium	A	mg/L	0.04757	0.04757		0.05	0	0	0.000041	0.001	1	95%	90	110	0%	
Thorium	A	mg/L	0.04791	0.04791		0.05	0	0	0.00061	0.001	1	96%	90	110	0%	
Tin	A	mg/L	0.05388	0.05388		0.05	0	0	0.00132	0.00132	0.1	108%	90	110	0%	
Titanium	A	mg/L	0.04351	0.04351		0.05	0	0	0.000094	0.001	1	87%	90	110	0%	S
Uranium	A	mg/L	0.04861	0.04861		0.05	0	0	0.000052	0.0003	1	97%	90	110	0%	
Vanadium	A	mg/L	0.04853	0.04853		0.05	0	0	0.0013	0.0013	1	97%	90	110	0%	
Zinc	A	mg/L	0.05218	0.05218		0.05	0	0	0.00273	0.00273	1	104%	90	110	0%	
Iron, Ferrous	C	mg/L	1.326	1.326		0	0	0	0.00119	0.00119	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984018	CCB	ICPMS-6020-W- CCB			12/20/2021 2:24:	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.0011	-0.0011		0	0	0	0.00086	0.001	1	0%			0%	
Antimony	A	mg/L	0.0000275	0.0000275		0	0	0	0.00042	0.001	0.1	0%			0%	
Arsenic	A	mg/L	-0.0003882	-0.0003882		0	0	0	0.00019	0.001	1	0%			0%	
Barium	A	mg/L	-0.0000145	-0.0000145		0	0	0	0.000042	0.001	1	0%			0%	
Beryllium	A	mg/L	-0.00004188	-0.00004188		0	0	0	0.00012	0.001	1	0%			0%	
Boron	A	mg/L	0.0008981	0.0008981		0	0	0	0.00561	0.00561	1	0%			0%	
Cadmium	A	mg/L	0.000003013	0.000003013		0	0	0	0.000025	0.001	1	0%			0%	
Calcium	A	mg/L	0.0004757	0.0004757		0	0	0	0.02092	0.02092	50	0%			0%	
Cerium	A	mg/L	-2.892E-08	-2.892E-08		0	0	0	0.000012	0.001	0.1	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14984018	CCB	ICPMS-6020-W-	CCB		12/20/2021 2:24:	1	R372070		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Chromium	A	mg/L	0.00007534	0.00007534		0	0	0	0.00018	0.001	1	0%			0%	
Cobalt	A	mg/L	-1.519E-06	-1.519E-06		0	0	0	0.000042	0.001	1	0%			0%	
Copper	A	mg/L	-0.00002211	-0.00002211		0	0	0	0.00027	0.001	1	0%			0%	
Iron	A	mg/L	0.00005935	0.00005935		0	0	0	0.00119	0.00119	5	0%			0%	
Lanthanum	A	mg/L	-2.736E-07	-2.736E-07		0	0	0	0.000011	0.001	0.1	0%	0	0	0%	
Lead	A	mg/L	0.000000509	0.000000509		0	0	0	0.000056	0.001	1	0%			0%	
Magnesium	A	mg/L	0.001617	0.001617		0	0	0	0.00564	0.00564	50	0%			0%	
Manganese	A	mg/L	0.00001027	0.00001027		0	0	0	0.000095	0.001	1	0%			0%	
Mercury	A	mg/L	3.322E-07	3.322E-07		0	0	0	0.00016	0.001	0.002	0%			0%	
Molybdenum	A	mg/L	0.00001128	0.00001128		0	0	0	0.00005	0.001	0.1	0%			0%	
Nickel	A	mg/L	-0.00002044	-0.00002044		0	0	0	0.00063	0.001	1	0%			0%	
Potassium	A	mg/L	-0.0082	-0.0082		0	0	0	0.08139	0.08139	50	0%			0%	
Selenium	A	mg/L	-0.00002793	-0.00002793		0	0	0	0.00033	0.001	1	0%			0%	
Silicon	A	mg/L	0.002005	0.002005		0	0	0	0.01223	0.1	0.4	0%	0	0	0%	
Silver	A	mg/L	-2.942E-07	-2.942E-07		0	0	0	0.00002	0.001	0.04	0%			0%	
Sodium	A	mg/L	0.04731	0.04731		0	0	0	0.02171	0.02171	50	0%			0%	
Strontium	A	mg/L	-1.061E-06	-1.061E-06		0	0	0	0.00014	0.001	1	0%	0	0	0%	
Thallium	A	mg/L	0.0001983	0.0001983		0	0	0	0.000041	0.001	1	0%	0	0	0%	
Thorium	A	mg/L	0.00002051	0.00002051		0	0	0	0.00061	0.001	1	0%	0	0	0%	
Tin	A	mg/L	-0.00001758	-0.00001758		0	0	0	0.00132	0.00132	0.1	0%	0	0	0%	
Titanium	A	mg/L	-0.00006763	-0.00006763		0	0	0	0.000094	0.001	1	0%	0	0	0%	
Uranium	A	mg/L	0.000001006	0.000001006		0	0	0	0.000052	0.0003	1	0%	0	0	0%	
Vanadium	A	mg/L	-0.001334	-0.001334		0	0	0	0.0013	0.0013	1	0%	0	0	0%	
Zinc	A	mg/L	-0.000148	-0.000148		0	0	0	0.00273	0.00273	1	0%	0	0	0%	
Iron, Ferrous	C	mg/L	0.00005935	0.00005935		0	0	0	0.00119	0.00119	5	0%	0	0	0%	

Batch Summary Report

Batch Folder: D:\Agilent\ICPMH\1\DATA\211220ADoD.b\
 Analysis File: 211220ADoD.batch.bin
 Tune Step: #1 No Gas
 #2 H2
 #3 He

	Rjct	Acq. Date-Time	Data File	Sample Name	Type	Level	Dilution
1		2021-12-20 10:52:31	001BLKV.d	Rinse	BlkVrfy		1.0000
2		2021-12-20 10:58:42	002CALB.d	Cal Blk	CalBlk	1	1.0000
3		2021-12-20 11:05:41	003CAL.S.d	0.025 ppb STD	CalStd	2	1.0000
4		2021-12-20 11:12:15	004CAL.S.d	0.05 ppb STD	CalStd	3	1.0000
5		2021-12-20 11:18:50	005CAL.S.d	0.10 ppb STD	CalStd	4	1.0000
6		2021-12-20 11:25:24	006CAL.S.d	0.5 ppb STD	CalStd	5	1.0000
7		2021-12-20 11:31:58	007CAL.S.d	1 ppb STD	CalStd	6	1.0000
8		2021-12-20 11:38:31	008CAL.S.d	10 ppb STD	CalStd	7	1.0000
9		2021-12-20 11:45:03	009CAL.S.d	50 ppb STD	CalStd	8	1.0000
10		2021-12-20 11:51:31	010CAL.S.d	100 ppb STD	CalStd	9	1.0000
11		2021-12-20 11:57:45	011CAL.S.d	1000 ppb STD	CalStd	10	1.0000
12		2021-12-20 12:03:29	012CAL.S.d	100 ppb Br STD	CalStd	11	1.0000
13		2021-12-20 12:09:48	013BLKV.d	Rinse	BlkVrfy		1.0000
14		2021-12-20 12:15:58	014_QC1.d	QCS	QC1		1.0000
15		2021-12-20 12:22:04	015_CCV.d	CCV	CCV		1.0000
16		2021-12-20 12:28:12	016_CCB.d	CCB	CCB		1.0000
17		2021-12-20 12:34:23	017MBLK.d	LRB	MBLK		1.0000
18		2021-12-20 12:40:34	018_LFB.d	LFB	LFB		1.0300
19		2021-12-20 12:46:43	019ICSA.d	ICSA	ICSA		1.0000
20		2021-12-20 12:52:52	020ICSAB.d	ICSAB	ICSAB		1.0000
21		2021-12-20 12:59:04	021BLKV.d	Rinse	BlkVrfy		1.0000
22		2021-12-20 13:05:14	022_CCV.d	CCV	CCV		1.0000
23		2021-12-20 13:11:22	023_CCB.d	CCB	CCB		1.0000
24		2021-12-20 13:17:33	024ARef.d	MB-162274	AllRef		1.0000
25		2021-12-20 13:23:43	025LCS4.d	LCS4-162274	LCS4		1.0000

Batch Summary Report

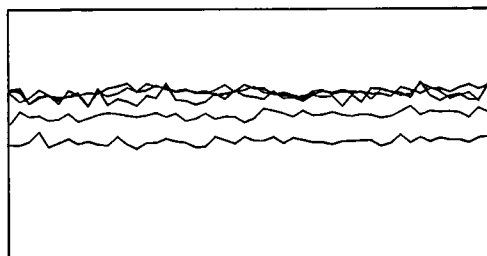
	Rjct	Acq. Date-Time	Data File	Sample Name	Type	Level	Dilution
26		2021-12-20 13:29:41	026BLKV.d	Rinse	BlkVrfy		1.0000
27		2021-12-20 13:35:51	027SMPL.d	B21121402-002C	Sample		1.0000
28		2021-12-20 13:42:00	028SMPL.d	B21121402-003C	Sample		1.0000
29		2021-12-20 13:48:07	029SMPL.d	B21121402-001C	Sample		1.0000
30		2021-12-20 13:54:16	030SMPL.d	B21121402-001CDIL	Sample		5.0000
31		2021-12-20 14:00:25	031ARef.d	B21121402-001CPDS1	AllRef		1.0300
32		2021-12-20 14:06:31	032MS4.d	B21121402-001CMS4	MS4		1.0000
33		2021-12-20 14:12:29	033MSD4.d	B21121402-001CMSD4	MSD4		1.0000
34		2021-12-20 14:18:27	034_CCV.d	CCV	CCV		1.0000
35		2021-12-20 14:24:36	035_CCB.d	CCB	CCB		1.0000

Tune Report

Operator Name elim
 Acq/Data Batch D:\Agilent\ICPMH\1\DATA\211220ADoD b
 Acq. Date-Time 2021-12-20 10 14 47
 Report Comment ICPMS207-B JPV
 Instrument Name G8403A JP17281923

[No Gas]

Sensitivity



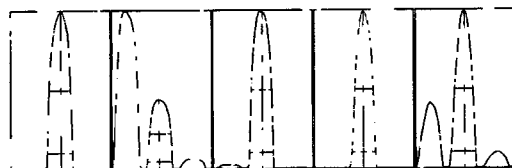
Mass	Range	Count	RSD%	Background
9	200000	131860	3.469	3.100
24	50000	33743	2.765	1.700
59	100000	67930	2.312	0.800
115	100000	58515	2.443	2.800
208	50000	24041	2.829	5.400

Sampling Period [sec] 0.514
 Integration Time [sec] 0.1

Oxide/Doubly Charged Ratio

Oxide 156 / 140 1.234 %
 Doubly Charged 70 / 140 0.863 %

Resolution/Axis



Mass	Peak Height	Axis	W-50%	W-10%
9	133367.21	9.05	0.64	0.771
24	34817.31	23.95	0.65	0.766
59	67141.08	59.00	0.62	0.728
115	58684.93	115.00	0.55	0.715
208	23801.49	208.00	0.55	0.740

Integration Time [sec] 0.1
 Acquisition Time [sec] 37.4
 Y Axis Linear

Tune Parameters

Plasma Parameters

Plasma Mode	---	Nebulizer Gas	0.80 L/min	Dilution Gas	0.12 L/min
RF Power	1600 W	Option Gas	---	Auxiliary Gas	0.90 L/min
RF Matching	1.00 V	Nebulizer Pump	0.10 rps	Plasma Gas	15.0 L/min
Sample Depth	8.0 mm	S/C Temp	2 °C		

Lens Parameters

Extract 1	0.0 V	Omega Lens	10.8 V	Deflect	15.2 V
Extract 2	-250.0 V	Cell Entrance	-30 V	Plate Bias	-35 V

Tune Report

Omega Bias -80 V Cell Exit -50 V

Cell Parameters

Use Gas No 3rd Gas Flow — Energy Discrimination 5.0 V
 He Flow 0.0 mL/min OctP Bias -8.0 V
 H2 Flow 0.0 mL/min OctP RF 200 V

QP Parameters

Mass Gain 126 Axis Gain 0.9990 QP Bias -3.0 V
 Mass Offset 126 Axis Offset 0.10

Hardware Settings

Torch

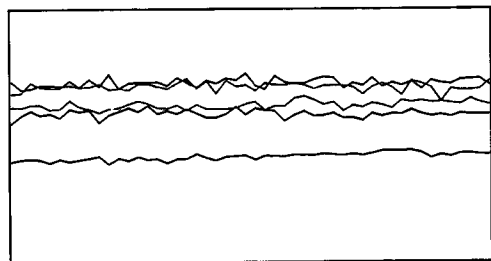
Torch H -0.9 mm Torch V 0.4 mm

EM

Discriminator 5.8 mV Analog HV 2241 V Pulse HV 1573 V

[H2]

Sensitivity



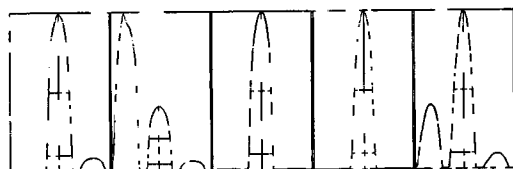
Mass	Range	Count	RSD%	Background
9	50000	35595	2.204	0.400
24	20000	13915	2.499	0.300
59	50000	29426	2.549	0.000
115	100000	62326	2.325	0.200
208	50000	20906	3.010	0.300

Sampling Period [sec] 0.514
 Integration Time [sec] 0.1

Oxide/Doubly Charged Ratio

Oxide —
 Doubly Charged 70 / 140 0.840 %

Resolution/Axis



Mass	Peak Height	Axis	W-50%	W-10%
9	36130.99	9.00	0.63	0.766
24	13881.76	23.95	0.65	0.735
59	28993.83	59.00	0.61	0.726
115	62160.85	115.05	0.55	0.704
208	22018.14	208.00	0.56	0.741

Integration Time [sec] 0.1
 Acquisition Time [sec] 37.4
 Y Axis Linear

Tune Parameters

Plasma Parameters

Tune Report

Plasma Mode	—	Nebulizer Gas	0.80 L/min	Dilution Gas	0.12 L/min
RF Power	1600 W	Option Gas	—	Auxiliary Gas	0.90 L/min
RF Matching	1.00 V	Nebulizer Pump	0.10 rps	Plasma Gas	15.0 L/min
Sample Depth	8.0 mm	S/C Temp	2 °C		

Lens Parameters

Extract 1	0.0 V	Omega Lens	10.0 V	Deflect	4.0 V
Extract 2	-240.0 V	Cell Entrance	-30 V	Plate Bias	-80 V
Omega Bias	-115 V	Cell Exit	-50 V		

Cell Parameters

Use Gas	Yes	3rd Gas Flow	—	Energy Discrimination	5.0 V
He Flow	0.0 mL/min	OctP Bias	-18.0 V		
H2 Flow	3.8 mL/min	OctP RF	180 V		

QP Parameters

Mass Gain	126	Axis Gain	0.9990	QP Bias	-13.0 V
Mass Offset	126	Axis Offset	0.10		

Hardware Settings

Torch

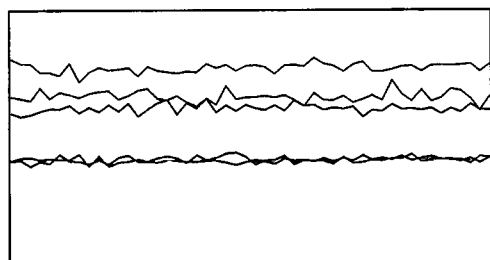
Torch H	-0.9 mm	Torch V	0.4 mm
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EM

Discriminator	5.8 mV	Analog HV	2241 V	Pulse HV	1573 V
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[He]

Sensitivity



Mass	Range	Count	RSD%	Background
9	5000	2038	3.090	2.600
24	2000	1322	3.294	1.200
59	50000	20223	2.428	0.600
115	20000	15513	2.330	0.600
208	20000	12267	2.731	1.600

Sampling Period [sec] 0.514

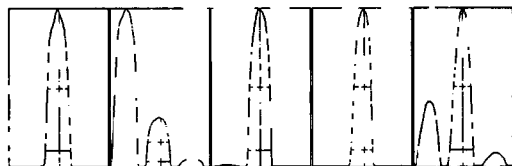
Integration Time [sec] 0.1

Oxide/Doubly Charged Ratio

Oxide	—
Doubly Charged	70 / 140 1.015 %

Resolution/Axis

Tune Report



Mass	Peak Height	Axis	W-50%	W-10%
9	2026.16	9.05	0.63	0.765
24	1274.33	24.05	0.64	0.732
59	20421.78	59.00	0.60	0.723
115	15755.77	115.10	0.53	0.666
208	12299.13	208.00	0.53	0.720

Integration Time [sec] 0.1
 Acquisition Time [sec] 37.4
 Y Axis Linear

Tune Parameters

Plasma Parameters

Plasma Mode	---	Nebulizer Gas	0.80 L/min	Dilution Gas	0.12 L/min
RF Power	1600 W	Option Gas	---	Auxiliary Gas	0.90 L/min
RF Matching	1.00 V	Nebulizer Pump	0.10 rps	Plasma Gas	15.0 L/min
Sample Depth	8.0 mm	S/C Temp	2 °C		

Lens Parameters

Extract 1	0.0 V	Omega Lens	11.2 V	Deflect	1.6 V
Extract 2	-240.0 V	Cell Entrance	-30 V	Plate Bias	-80 V
Omega Bias	-95 V	Cell Exit	-50 V		

Cell Parameters

Use Gas	Yes	3rd Gas Flow	---	Energy Discrimination	5.0 V
He Flow	4.0 mL/min	OctP Bias	-18.0 V		
H2 Flow	0.0 mL/min	OctP RF	200 V		

QP Parameters

Mass Gain	126	Axis Gain	0.9990	QP Bias	-13.0 V
Mass Offset	126	Axis Offset	0.10		

Hardware Settings

Torch

Torch H	-0.9 mm	Torch V	0.4 mm
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EM

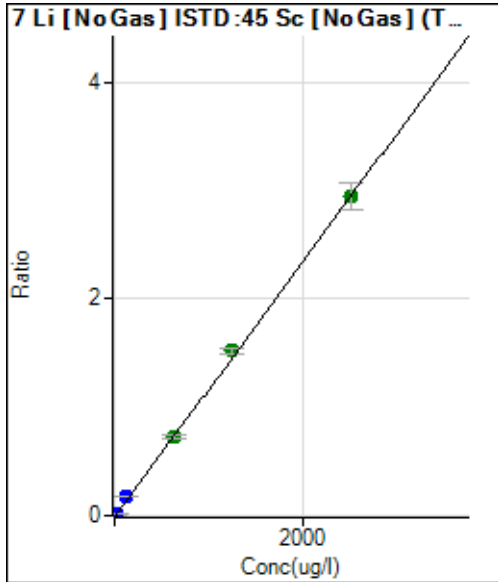
Discriminator	5.8 mV	Analog HV	2241 V	Pulse HV	1573 V
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Calibration for 028SMPL.d

Batch Folder: D:\Agilent\ICPMH\1\DATA\211220ADoD.b\
 Analysis File: 211220ADoD.batch.bin
 DA Date-Time: 2021-12-20 13:44:48
 Calibration Title:
 Calibration Method: External Calibration
 VIS Interpolation Fit:

Level	Standard Data File	Sample Name	Acq. Date-Time
1	002CALB.d	Cal Blk	2021-12-20 10:58:42
2	003CAL.S.d	0.025 ppb STD	2021-12-20 11:05:41
3	004CAL.S.d	0.05 ppb STD	2021-12-20 11:12:15
4	005CAL.S.d	0.10 ppb STD	2021-12-20 11:18:50
5	006CAL.S.d	0.5 ppb STD	2021-12-20 11:25:24
6	007CAL.S.d	1 ppb STD	2021-12-20 11:31:58
7	008CAL.S.d	10 ppb STD	2021-12-20 11:38:31
8	009CAL.S.d	50 ppb STD	2021-12-20 11:45:03
9	010CAL.S.d	100 ppb STD	2021-12-20 11:51:31
10	011CAL.S.d	1000 ppb STD	2021-12-20 11:57:45
11	012CAL.S.d	100 ppb Br STD	2021-12-20 12:03:29

Calibration for 028SMPL.d



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	4667.94	0.0009	P	1.8	
2	<input type="checkbox"/>	0.313	0.299	6418.61	0.0013	P	2.4	-4.2
3	<input type="checkbox"/>	0.625	0.584	8168.15	0.0016	P	3.7	-6.5
4	<input type="checkbox"/>	1.250	1.395	12902.00	0.0026	P	3.3	11.6
5	<input type="checkbox"/>	6.250	6.882	44598.48	0.0091	P	2.5	10.1
6	<input type="checkbox"/>	12.500	14.857	94157.94	0.0185	P	2.5	18.9
7	<input type="checkbox"/>	125.000	145.005	861650.07	0.1727	P	1.6	16.0
8	<input type="checkbox"/>	625.000	612.641	3739561.40	0.7268	A	4.0	-2.0
9	<input type="checkbox"/>	1250.000	1281.486	7651618.31	1.5192	A	4.4	2.5
10	<input type="checkbox"/>	2500.000	2486.333	14738523.74	2.9467	A	8.1	-0.5
11	<input type="checkbox"/>			9211.15	0.0018	P	1.4	

$$y = 0.0012 * x + 9.4502E-004$$

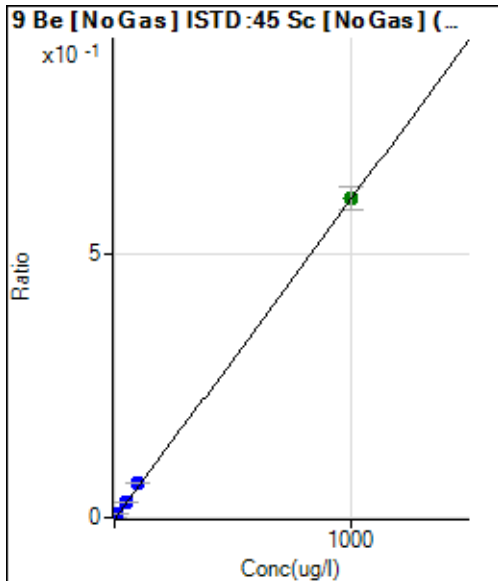
$$R = 0.9999$$

$$DL = 0.04248 \text{ ug/l}$$

$$BEC = 0.7976 \text{ ug/l}$$

Weight: 1/y

Min Conc: <None>



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	169.64	0.0000	P	1.1	
2	<input type="checkbox"/>	0.025	0.017	219.96	0.0000	P	9.8	-32.6
3	<input type="checkbox"/>	0.050	0.101	481.39	0.0001	P	60.2	102.1
4	<input type="checkbox"/>	0.100	0.113	511.24	0.0001	P	6.9	13.2
5	<input type="checkbox"/>	0.500	0.556	1821.08	0.0004	P	1.2	11.2
6	<input type="checkbox"/>	1.000	1.136	3670.38	0.0007	P	2.2	13.6
7	<input type="checkbox"/>	10.000	11.517	34987.43	0.0070	P	3.4	15.2
8	<input type="checkbox"/>	50.000	48.917	152774.30	0.0297	P	4.8	-2.2
9	<input type="checkbox"/>	100.000	107.763	329439.66	0.0654	P	1.9	7.8
10	<input type="checkbox"/>	1000.000	999.263	3031757.84	0.6060	A	6.9	-0.1
11	<input type="checkbox"/>			136.97	0.0000	P	14.0	

$$y = 6.0638E-004 * x + 3.4340E-005$$

$$R = 1.0000$$

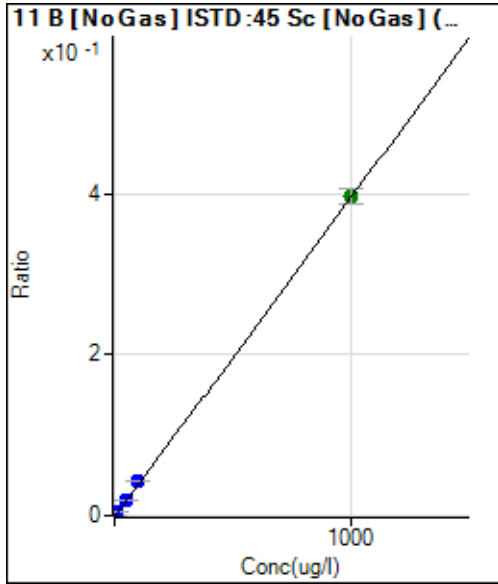
$$DL = 0.00186 \text{ ug/l}$$

$$BEC = 0.05663 \text{ ug/l}$$

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	1109.15	0.0002	P	2.3	
2	<input type="checkbox"/>			1071.80	0.0002	P	4.9	
3	<input type="checkbox"/>	0.050	-0.025	1070.47	0.0002	P	3.7	-150.3
4	<input type="checkbox"/>	0.100	0.006	1128.50	0.0002	P	7.1	-93.6
5	<input type="checkbox"/>	0.500	0.472	2020.95	0.0004	P	2.9	-5.5
6	<input type="checkbox"/>	1.000	0.995	3148.26	0.0006	P	2.5	-0.5
7	<input type="checkbox"/>	10.000	11.213	23332.60	0.0047	P	4.4	12.1
8	<input type="checkbox"/>	50.000	49.065	101497.95	0.0197	P	4.5	-1.9
9	<input type="checkbox"/>	100.000	106.170	213796.26	0.0424	P	1.5	6.2
10	<input type="checkbox"/>	1000.000	999.418	1989791.14	0.3975	A	4.8	-0.1
11	<input type="checkbox"/>			9844.50	0.0019	P	3.0	

$y = 3.9748E-004 * x + 2.2456E-004$

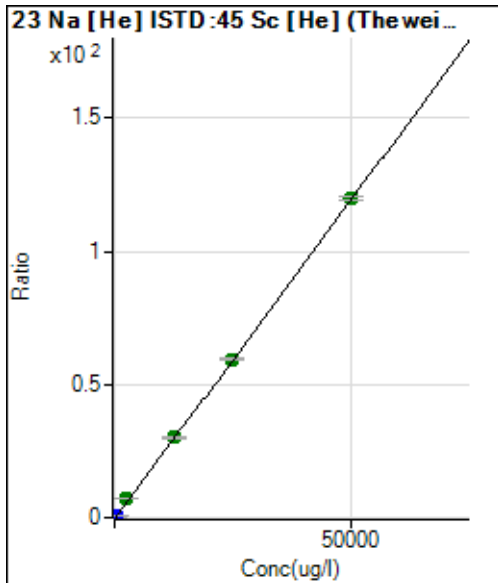
R = 1.0000

DL = 0.03847 ug/l

BEC = 0.5649 ug/l

Weight: 1/y

Min Conc: <None>



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	27065.42	0.0734	P	0.6	
2	<input type="checkbox"/>	6.250	8.578	34723.30	0.0940	P	0.6	37.2
3	<input type="checkbox"/>	12.500	14.081	39400.28	0.1072	P	0.6	12.6
4	<input type="checkbox"/>	25.000	30.138	53744.38	0.1456	P	1.6	20.6
5	<input type="checkbox"/>	125.000	139.574	152202.44	0.4078	P	1.6	11.7
6	<input type="checkbox"/>	250.000	303.309	297349.19	0.8000	P	1.6	21.3
7	<input type="checkbox"/>	2500.000	2906.198	2649492.29	7.0349	A	0.8	16.2
8	<input type="checkbox"/>	12500.00	12530.51	11542134.41	30.0889	A	2.1	0.2
9	<input type="checkbox"/>	25000.00	24813.24	22933665.21	59.5108	A	0.8	-0.7
10	<input type="checkbox"/>	50000.00	50065.13	46010473.76	119.999	A	1.4	0.1
11	<input type="checkbox"/>			31323.61	0.0830	P	1.9	

$y = 0.0024 * x + 0.0734$

R = 1.0000

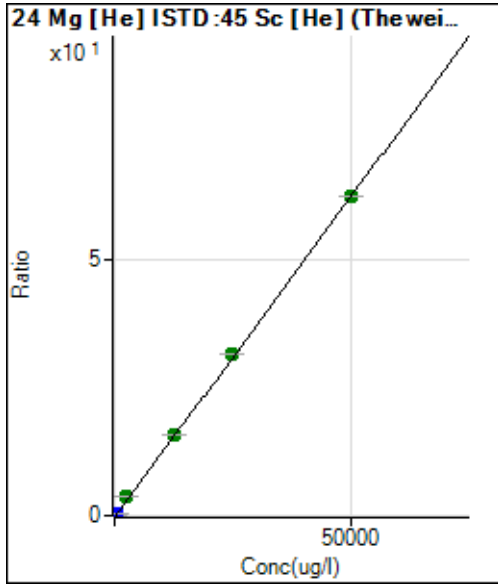
DL = 0.5141 ug/l

BEC = 30.65 ug/l

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	898.25	0.0024	P	3.5	
2	<input type="checkbox"/>	6.250	7.539	4381.95	0.0119	P	3.1	20.6
3	<input type="checkbox"/>	12.500	16.171	8325.81	0.0226	P	1.9	29.4
4	<input type="checkbox"/>	25.000	33.577	16383.13	0.0444	P	1.5	34.3
5	<input type="checkbox"/>	125.000	151.568	71601.25	0.1918	P	0.8	21.3
6	<input type="checkbox"/>	250.000	322.286	150606.53	0.4051	P	0.8	28.9
7	<input type="checkbox"/>	2500.000	2934.818	1382068.09	3.6695	A	1.9	17.4
8	<input type="checkbox"/>	12500.00	12654.46	6066247.45	15.8143	A	1.4	1.2
9	<input type="checkbox"/>	25000.00	25229.47	12149565.25	31.5269	A	0.5	0.9
10	<input type="checkbox"/>	50000.00	49824.47	23873872.87	62.2586	A	0.5	-0.4
11	<input type="checkbox"/>			1031.33	0.0027	P	6.9	

$y = 0.0012 * x + 0.0024$

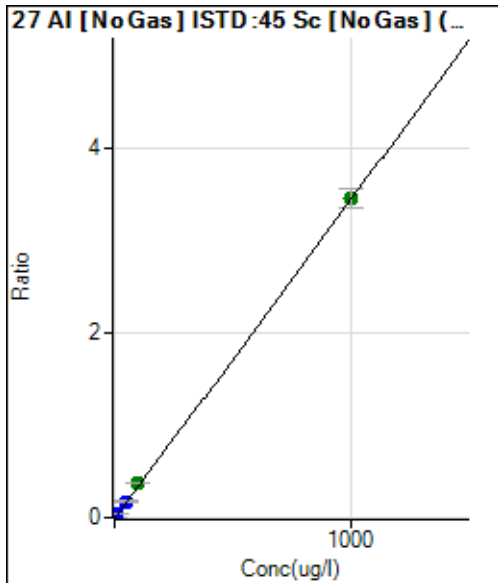
R = 1.0000

DL = 0.203 ug/l

BEC = 1.95 ug/l

Weight: 1/y

Min Conc: <None>



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	29702.99	0.0060	P	6.7	
2	<input type="checkbox"/>			30487.78	0.0062	P	7.6	
3	<input type="checkbox"/>	0.050	-0.230	26060.54	0.0052	P	2.7	-560.6
4	<input type="checkbox"/>	0.100	-0.328	24251.91	0.0049	P	3.1	-427.5
5	<input type="checkbox"/>	0.500	0.037	30122.46	0.0061	P	1.5	-92.5
6	<input type="checkbox"/>	1.000	0.538	39992.12	0.0079	P	2.4	-46.2
7	<input type="checkbox"/>	10.000	10.906	218237.17	0.0438	P	1.9	9.1
8	<input type="checkbox"/>	50.000	49.459	911965.37	0.1772	P	3.2	-1.1
9	<input type="checkbox"/>	100.000	105.443	1869903.93	0.3710	A	0.6	5.4
10	<input type="checkbox"/>	1000.000	999.474	17346892.38	3.4656	A	5.7	-0.1
11	<input type="checkbox"/>			16217.73	0.0032	P	2.3	

$y = 0.0035 * x + 0.0060$

R = 1.0000

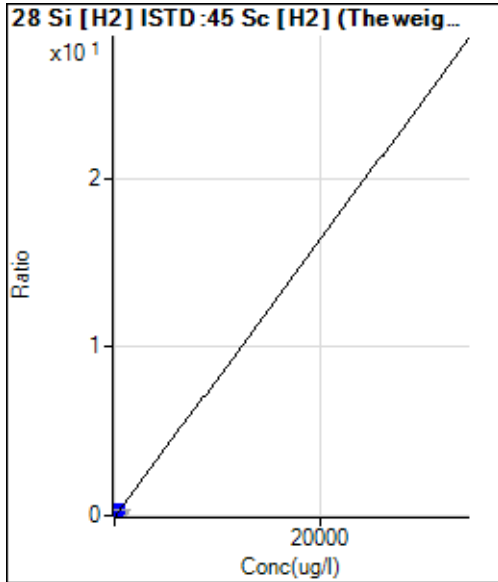
DL = 0.3507 ug/l

BEC = 1.738 ug/l

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	16307.40	0.0041	P	1.7	
2	<input type="checkbox"/>			15016.88	0.0038	P	2.0	
3	<input type="checkbox"/>	0.200	-0.262	15055.58	0.0039	P	9.0	-231.1
4	<input type="checkbox"/>	0.400	-0.641	13921.38	0.0036	P	3.7	-260.2
5	<input type="checkbox"/>	2.000	0.715	18659.79	0.0047	P	1.5	-64.3
6	<input type="checkbox"/>	4.000	3.197	25749.69	0.0068	P	1.1	-20.1
7	<input type="checkbox"/>	40.000	41.866	148394.39	0.0387	P	0.4	4.7
8	<input type="checkbox"/>	200.000	204.261	639913.39	0.1729	P	2.1	2.1
9	<input type="checkbox"/>	400.000	397.698	1205336.85	0.3328	P	1.4	-0.6
10	<input type="checkbox"/>			12898.07	0.0038	P	1.6	
11	<input type="checkbox"/>			8681.34	0.0022	P	4.5	

$y = 8.2639E-004 * x + 0.0041$

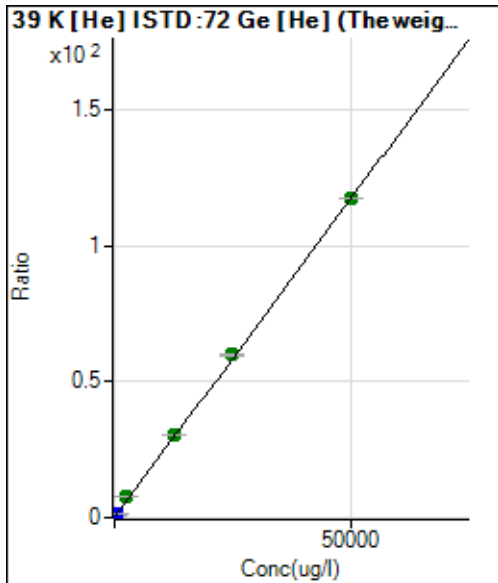
R = 0.9999

DL = 0.2587 ug/l

BEC = 4.974 ug/l

Weight: 1/y

Min Conc: <None>



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	176017.41	0.7301	P	2.3	
2	<input type="checkbox"/>	6.250	13.164	182735.48	0.7610	P	2.8	110.6
3	<input type="checkbox"/>	12.500	19.252	186237.39	0.7752	P	1.1	54.0
4	<input type="checkbox"/>	25.000	40.511	197028.46	0.8250	P	0.4	62.0
5	<input type="checkbox"/>	125.000	149.208	259917.31	1.0796	P	0.7	19.4
6	<input type="checkbox"/>	250.000	321.946	356951.92	1.4842	P	1.2	28.8
7	<input type="checkbox"/>	2500.000	2944.950	1861559.61	7.6280	A	3.0	17.8
8	<input type="checkbox"/>	12500.00	12687.45	7591995.79	30.4475	A	2.0	1.5
9	<input type="checkbox"/>	25000.00	25249.80	15004225.47	59.8719	A	0.5	1.0
10	<input type="checkbox"/>	50000.00	49805.55	29547060.67	117.388	A	0.4	-0.4
11	<input type="checkbox"/>			503248.90	2.0953	P	1.5	

$y = 0.0023 * x + 0.7301$

R = 0.9999

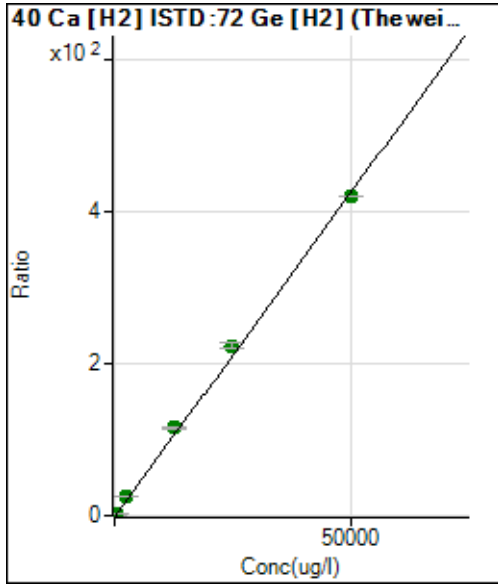
DL = 21.54 ug/l

BEC = 311.7 ug/l

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	265446.57	0.2055	P	2.8	
2	<input type="checkbox"/>	6.250	14.853	419743.79	0.3326	P	1.2	137.6
3	<input type="checkbox"/>	12.500	18.016	457111.97	0.3597	P	1.5	44.1
4	<input type="checkbox"/>	25.000	36.607	652837.10	0.5187	P	1.0	46.4
5	<input type="checkbox"/>	125.000	161.287	1983536.74	1.5853	A	0.8	29.0
6	<input type="checkbox"/>	250.000	331.832	3819507.34	3.0443	A	1.8	32.7
7	<input type="checkbox"/>	2500.000	3080.375	33346747.65	26.5572	A	0.5	23.2
8	<input type="checkbox"/>	12500.00	13496.04	145907313.8	115.660	A	2.4	8.0
9	<input type="checkbox"/>	25000.00	26088.78	275526450.0	223.387	A	3.6	4.4
10	<input type="checkbox"/>	50000.00	49177.07	501445888.2	420.901	A	0.6	-1.6
11	<input type="checkbox"/>			287198.08	0.2284	P	3.2	

$y = 0.0086 * x + 0.2055$

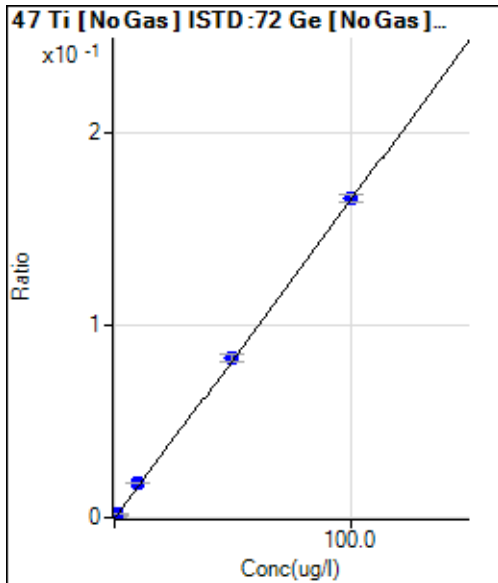
$R = 0.9995$

DL = 2.01 ug/l

BEC = 24.03 ug/l

Weight: 1/y

Min Conc: <None>



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	442.12	0.0003	P	6.9	
2	<input type="checkbox"/>	0.025	0.052	538.89	0.0004	P	13.4	109.8
3	<input type="checkbox"/>	0.050	0.067	595.61	0.0004	P	8.7	33.6
4	<input type="checkbox"/>	0.100	0.156	777.48	0.0006	P	12.5	56.0
5	<input type="checkbox"/>	0.500	0.565	1673.45	0.0013	P	0.7	13.1
6	<input type="checkbox"/>	1.000	1.173	3038.38	0.0023	P	4.4	17.3
7	<input type="checkbox"/>	10.000	10.795	24272.62	0.0182	P	1.8	7.9
8	<input type="checkbox"/>	50.000	49.774	110763.78	0.0826	P	4.5	-0.5
9	<input type="checkbox"/>	100.000	100.031	226700.82	0.1656	P	3.0	0.0
10	<input type="checkbox"/>			17321.21	0.0131	P	5.0	
11	<input type="checkbox"/>			545.56	0.0004	P	9.4	

$y = 0.0017 * x + 3.2766E-004$

$R = 1.0000$

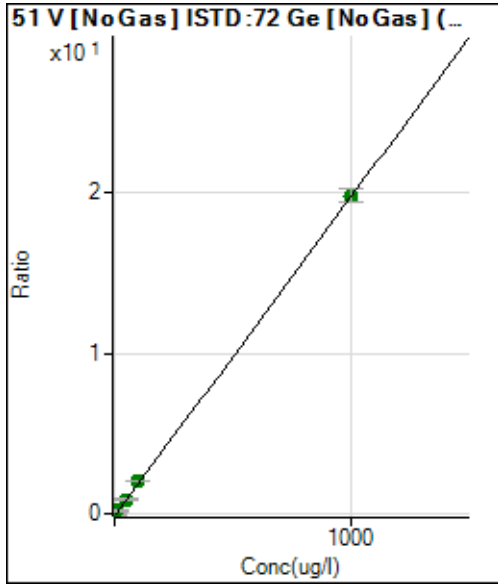
DL = 0.0411 ug/l

BEC = 0.1983 ug/l

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	-76872.86	-0.0571	A	-191.	
2	<input type="checkbox"/>	0.025	-4.226	-184425.61	-0.1412	A	-27.8	-17003.
3	<input type="checkbox"/>	0.050	-3.186	-165107.71	-0.1205	A	-82.6	-6473.0
4	<input type="checkbox"/>	0.100	-2.938	-153347.36	-0.1156	A	-48.8	-3037.8
5	<input type="checkbox"/>	0.500	-0.378	-85999.21	-0.0647	A	-143.	-175.7
6	<input type="checkbox"/>	1.000	4.321	40148.70	0.0288	A	405.1	332.1
7	<input type="checkbox"/>	10.000	11.596	232598.02	0.1735	A	55.9	16.0
8	<input type="checkbox"/>	50.000	47.003	1178445.70	0.8778	A	1.8	-6.0
9	<input type="checkbox"/>	100.000	104.016	2753213.45	2.0119	A	4.4	4.0
10	<input type="checkbox"/>	1000.000	999.730	26150806.52	19.8294	A	4.5	0.0
11	<input type="checkbox"/>			-13959.41	-0.0101	A	-867.	

$y = 0.0199 * x - 0.0571$

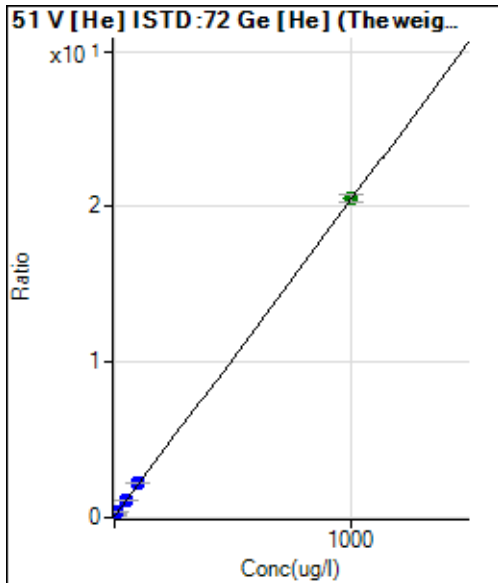
R = 1.0000

DL = 16.46 ug/l

BEC = -2.873 ug/l

Weight: 1/y

Min Conc: <None>



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	44240.55	0.1835	P	2.0	
2	<input type="checkbox"/>	0.025	-0.368	42265.96	0.1760	P	2.1	-1570.8
3	<input type="checkbox"/>	0.050	-0.075	43714.64	0.1820	P	0.0	-249.3
4	<input type="checkbox"/>	0.100	0.132	44462.30	0.1862	P	0.5	32.1
5	<input type="checkbox"/>	0.500	0.486	46553.16	0.1934	P	1.8	-2.7
6	<input type="checkbox"/>	1.000	1.054	49290.85	0.2050	P	0.9	5.4
7	<input type="checkbox"/>	10.000	10.124	95099.93	0.3897	P	0.2	1.2
8	<input type="checkbox"/>	50.000	46.435	281500.69	1.1291	P	1.3	-7.1
9	<input type="checkbox"/>	100.000	99.945	556054.62	2.2188	P	0.8	-0.1
10	<input type="checkbox"/>	1000.000	1000.182	5172936.66	20.5521	A	2.3	0.0
11	<input type="checkbox"/>			32378.82	0.1348	P	1.2	

$y = 0.0204 * x + 0.1835$

R = 1.0000

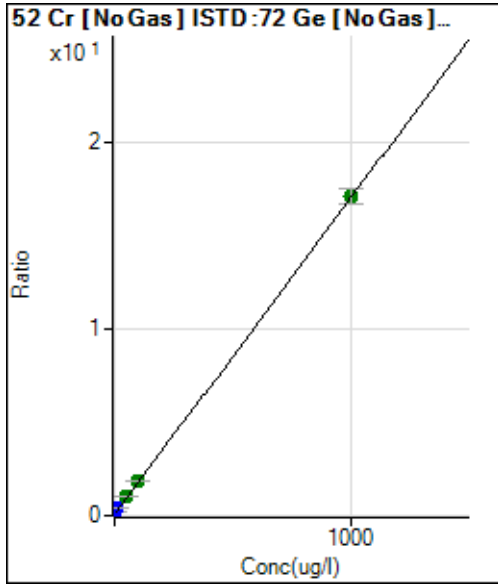
DL = 0.5353 ug/l

BEC = 9.01 ug/l

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	219299.26	0.1626	P	0.9	
2	<input type="checkbox"/>	0.025	-0.255	206047.20	0.1582	P	3.0	-1121.9
3	<input type="checkbox"/>	0.050	-0.236	215730.97	0.1586	P	3.3	-571.3
4	<input type="checkbox"/>	0.100	-0.045	214958.39	0.1618	P	3.9	-145.3
5	<input type="checkbox"/>	0.500	0.511	227078.39	0.1712	P	0.7	2.3
6	<input type="checkbox"/>	1.000	1.061	242090.69	0.1805	P	2.0	6.1
7	<input type="checkbox"/>	10.000	12.177	492566.99	0.3686	P	1.1	21.8
8	<input type="checkbox"/>	50.000	50.118	1356114.60	1.0106	A	1.9	0.2
9	<input type="checkbox"/>	100.000	100.372	2547084.33	1.8610	A	3.6	0.4
10	<input type="checkbox"/>	1000.000	999.935	22527404.94	17.0825	A	4.7	0.0
11	<input type="checkbox"/>			186865.43	0.1407	P	1.4	

$y = 0.0169 * x + 0.1626$

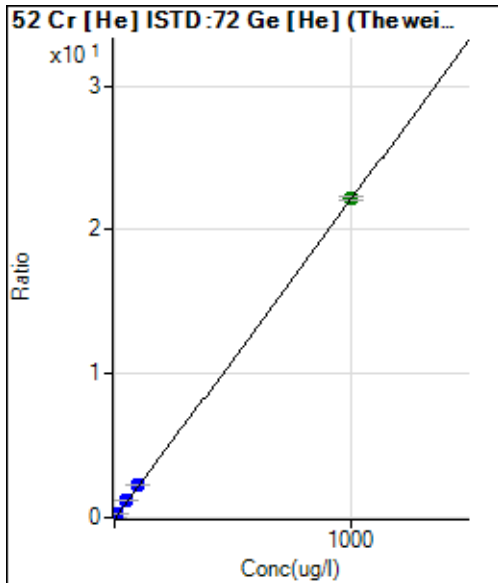
R = 1.0000

DL = 0.2553 ug/l

BEC = 9.607 ug/l

Weight: 1/y

Min Conc: <None>



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	2791.39	0.0116	P	3.2	
2	<input type="checkbox"/>	0.025	0.038	2983.65	0.0124	P	3.1	52.9
3	<input type="checkbox"/>	0.050	0.087	3244.82	0.0135	P	4.0	74.2
4	<input type="checkbox"/>	0.100	0.149	3556.01	0.0149	P	2.2	49.3
5	<input type="checkbox"/>	0.500	0.611	6053.50	0.0251	P	0.5	22.2
6	<input type="checkbox"/>	1.000	1.242	9417.51	0.0392	P	0.6	24.2
7	<input type="checkbox"/>	10.000	11.677	66100.04	0.2709	P	0.6	16.8
8	<input type="checkbox"/>	50.000	50.942	284907.85	1.1427	P	0.4	1.9
9	<input type="checkbox"/>	100.000	103.403	578297.79	2.3076	P	0.5	3.4
10	<input type="checkbox"/>	1000.000	999.595	5589799.99	22.2072	A	1.3	0.0
11	<input type="checkbox"/>			2893.64	0.0120	P	2.5	

$y = 0.0222 * x + 0.0116$

R = 1.0000

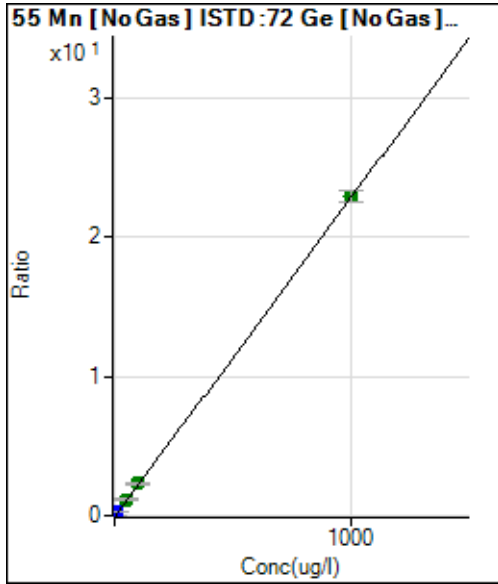
DL = 0.04937 ug/l

BEC = 0.5212 ug/l

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	15201.11	0.0113	P	6.8	
2	<input type="checkbox"/>	0.025	0.034	15687.27	0.0121	P	5.2	36.8
3	<input type="checkbox"/>	0.050	0.037	16489.84	0.0121	P	2.4	-26.1
4	<input type="checkbox"/>	0.100	0.121	18644.83	0.0140	P	2.8	20.5
5	<input type="checkbox"/>	0.500	0.592	32938.15	0.0248	P	2.2	18.5
6	<input type="checkbox"/>	1.000	1.242	53260.67	0.0397	P	4.1	24.2
7	<input type="checkbox"/>	10.000	11.961	381099.31	0.2852	P	1.3	19.6
8	<input type="checkbox"/>	50.000	50.550	1568691.73	1.1688	A	1.0	1.1
9	<input type="checkbox"/>	100.000	100.248	3158273.17	2.3069	A	3.4	0.2
10	<input type="checkbox"/>	1000.000	999.928	30222014.25	22.9092	A	3.5	0.0
11	<input type="checkbox"/>			17805.43	0.0134	P	1.2	

$$y = 0.0229 * x + 0.0113$$

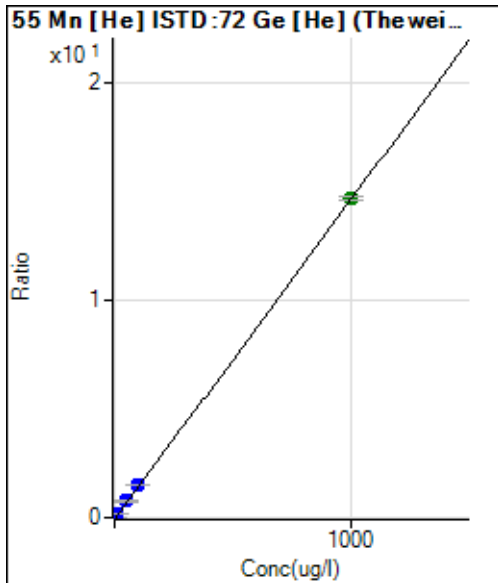
$$R = 1.0000$$

$$DL = 0.1009 \text{ ug/l}$$

$$BEC = 0.4922 \text{ ug/l}$$

$$\text{Weight: } 1/y$$

$$\text{Min Conc: } <\text{None}>$$



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	312.27	0.0013	P	15.2	
2	<input type="checkbox"/>	0.025	0.029	412.59	0.0017	P	6.3	14.6
3	<input type="checkbox"/>	0.050	0.047	476.91	0.0020	P	4.0	-6.5
4	<input type="checkbox"/>	0.100	0.125	748.54	0.0031	P	4.3	24.8
5	<input type="checkbox"/>	0.500	0.574	2346.39	0.0097	P	2.7	14.7
6	<input type="checkbox"/>	1.000	1.267	4799.50	0.0200	P	0.9	26.7
7	<input type="checkbox"/>	10.000	11.667	42245.51	0.1731	P	1.1	16.7
8	<input type="checkbox"/>	50.000	51.154	188117.92	0.7546	P	1.0	2.3
9	<input type="checkbox"/>	100.000	103.168	381040.38	1.5205	P	0.5	3.2
10	<input type="checkbox"/>	1000.000	999.608	3705225.66	14.7207	A	0.7	0.0
11	<input type="checkbox"/>			305.61	0.0013	P	9.2	

$$y = 0.0147 * x + 0.0013$$

$$R = 1.0000$$

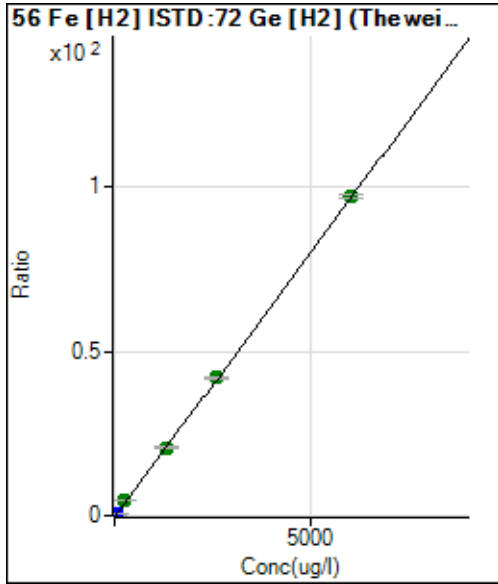
$$DL = 0.04004 \text{ ug/l}$$

$$BEC = 0.08806 \text{ ug/l}$$

$$\text{Weight: } 1/y$$

$$\text{Min Conc: } <\text{None}>$$

Calibration for 028SMPL.d



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	22135.56	0.0171	P	1.1	
2	<input type="checkbox"/>	0.650	0.868	39368.80	0.0312	P	0.4	33.5
3	<input type="checkbox"/>	1.300	1.570	54106.67	0.0426	P	1.2	20.8
4	<input type="checkbox"/>	2.600	3.314	89138.04	0.0708	P	0.5	27.4
5	<input type="checkbox"/>	13.000	14.891	323280.47	0.2584	P	1.3	14.5
6	<input type="checkbox"/>	26.000	32.026	672425.74	0.5360	P	0.6	23.2
7	<input type="checkbox"/>	260.000	294.512	6011806.13	4.7883	A	2.0	13.3
8	<input type="checkbox"/>	1300.000	1281.284	26204018.09	20.7742	A	1.4	-1.4
9	<input type="checkbox"/>	2600.000	2595.662	51898733.16	42.0675	A	1.1	-0.2
10	<input type="checkbox"/>	6000.000	6004.409	115898285.0	97.2900	A	1.3	0.1
11	<input type="checkbox"/>			24100.58	0.0192	P	3.8	

$y = 0.0162 * x + 0.0171$

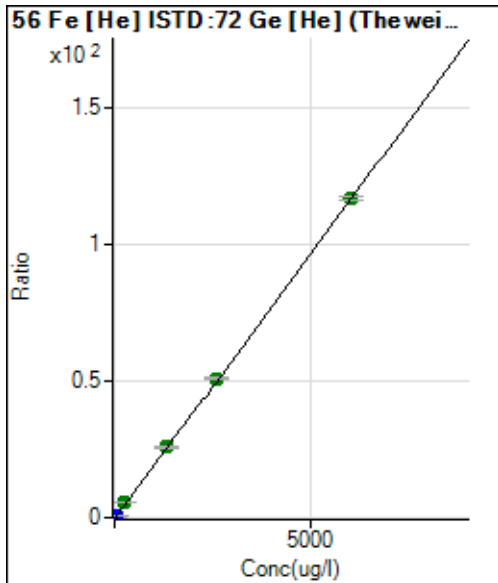
R = 1.0000

DL = 0.0358 ug/l

BEC = 1.058 ug/l

Weight: 1/y

Min Conc: <None>



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	10768.14	0.0447	P	0.1	
2	<input type="checkbox"/>	0.650	0.880	14840.76	0.0618	P	1.7	35.3
3	<input type="checkbox"/>	1.300	1.617	18293.09	0.0761	P	0.2	24.4
4	<input type="checkbox"/>	2.600	3.336	26179.65	0.1096	P	0.5	28.3
5	<input type="checkbox"/>	13.000	14.989	81018.18	0.3365	P	1.2	15.3
6	<input type="checkbox"/>	26.000	32.115	161132.88	0.6700	P	0.7	23.5
7	<input type="checkbox"/>	260.000	296.513	1419923.80	5.8183	A	0.6	14.0
8	<input type="checkbox"/>	1300.000	1316.898	6403064.45	25.6870	A	3.7	1.3
9	<input type="checkbox"/>	2600.000	2614.098	12767594.85	50.9457	A	1.2	0.5
10	<input type="checkbox"/>	6000.000	5988.616	29361468.56	116.653	A	0.7	-0.2
11	<input type="checkbox"/>			12711.62	0.0529	P	3.4	

$y = 0.0195 * x + 0.0447$

R = 1.0000

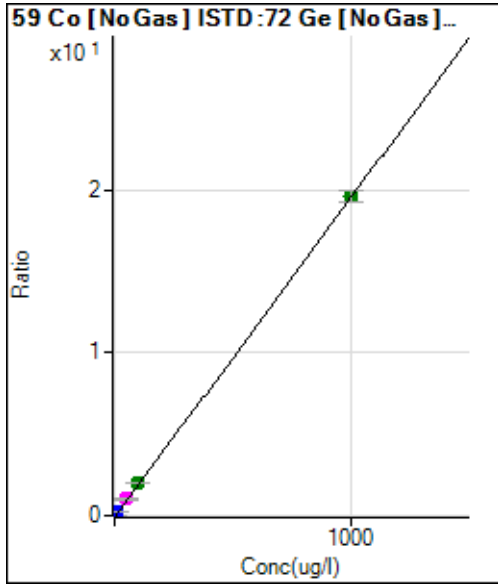
DL = 0.009781 ug/l

BEC = 2.294 ug/l

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	509.00	0.0004	P	10.2	
2	<input type="checkbox"/>	0.025	0.027	1191.02	0.0009	P	9.2	9.5
3	<input type="checkbox"/>	0.050	0.068	2335.56	0.0017	P	2.2	36.4
4	<input type="checkbox"/>	0.100	0.143	4238.91	0.0032	P	2.2	43.2
5	<input type="checkbox"/>	0.500	0.583	15670.68	0.0118	P	1.3	16.5
6	<input type="checkbox"/>	1.000	1.262	33751.93	0.0252	P	0.7	26.2
7	<input type="checkbox"/>	10.000	11.912	313088.97	0.2343	P	2.1	19.1
8	<input type="checkbox"/>	50.000	51.214	1349645.03	1.0060	M	3.7	2.4
9	<input type="checkbox"/>	100.000	101.043	2716611.75	1.9845	A	3.1	1.0
10	<input type="checkbox"/>	1000.000	999.816	25895076.56	19.6331	A	3.9	0.0
11	<input type="checkbox"/>			791.79	0.0006	P	8.7	

$y = 0.0196 * x + 3.7742E-004$

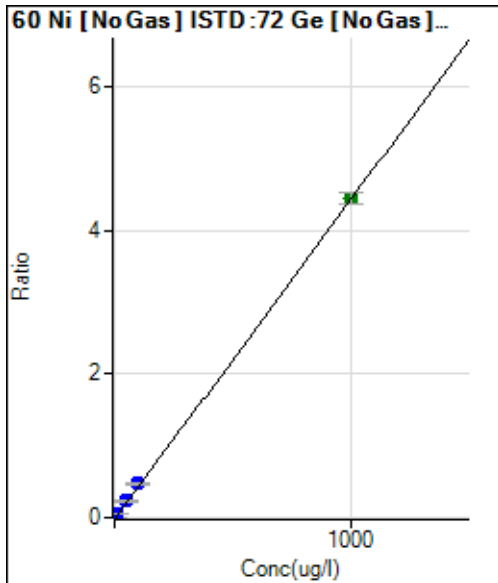
R = 1.0000

DL = 0.00589 ug/l

BEC = 0.01922 ug/l

Weight: 1/y

Min Conc: <None>



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	1610.24	0.0012	P	10.7	
2	<input type="checkbox"/>	0.025	0.033	1746.65	0.0013	P	3.0	32.2
3	<input type="checkbox"/>	0.050	0.015	1713.37	0.0013	P	3.9	-70.8
4	<input type="checkbox"/>	0.100	0.080	2062.73	0.0016	P	6.3	-19.6
5	<input type="checkbox"/>	0.500	0.550	4827.92	0.0036	P	2.9	10.0
6	<input type="checkbox"/>	1.000	1.166	8558.88	0.0064	P	4.2	16.6
7	<input type="checkbox"/>	10.000	12.023	73086.81	0.0547	P	1.8	20.2
8	<input type="checkbox"/>	50.000	51.842	311052.29	0.2319	P	3.9	3.7
9	<input type="checkbox"/>	100.000	106.225	648736.96	0.4738	P	2.3	6.2
10	<input type="checkbox"/>	1000.000	999.265	5866113.50	4.4474	A	3.8	-0.1
11	<input type="checkbox"/>			1716.70	0.0013	P	8.2	

$y = 0.0044 * x + 0.0012$

R = 1.0000

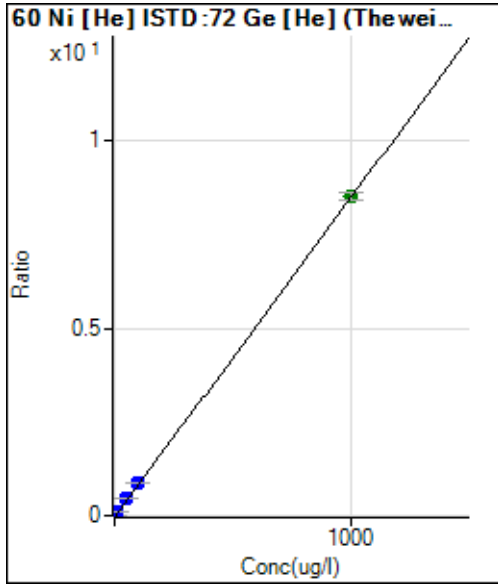
DL = 0.08596 ug/l

BEC = 0.2684 ug/l

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	307.78	0.0013	P	5.8	
2	<input type="checkbox"/>	0.025	0.027	362.23	0.0015	P	15.6	8.2
3	<input type="checkbox"/>	0.050	0.057	424.45	0.0018	P	10.4	14.8
4	<input type="checkbox"/>	0.100	0.127	563.35	0.0024	P	5.2	26.8
5	<input type="checkbox"/>	0.500	0.560	1457.86	0.0061	P	4.2	12.0
6	<input type="checkbox"/>	1.000	1.241	2852.52	0.0119	P	3.1	24.1
7	<input type="checkbox"/>	10.000	11.931	25144.94	0.1030	P	1.3	19.3
8	<input type="checkbox"/>	50.000	51.683	110209.40	0.4421	P	2.0	3.4
9	<input type="checkbox"/>	100.000	104.219	223079.38	0.8901	P	0.7	4.2
10	<input type="checkbox"/>	1000.000	999.474	2145772.45	8.5257	A	1.9	-0.1
11	<input type="checkbox"/>			278.89	0.0012	P	2.7	

$$y = 0.0085 * x + 0.0013$$

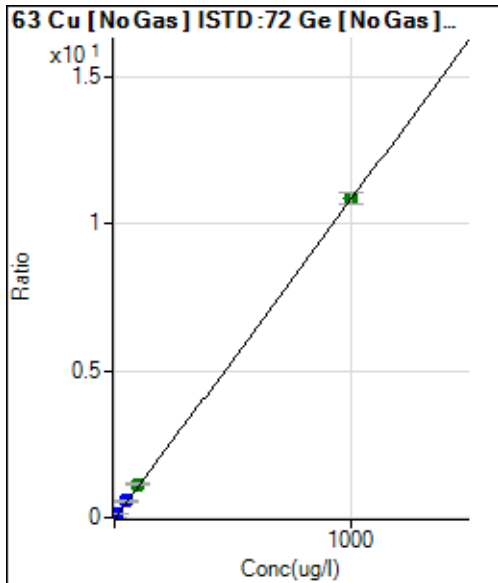
$$R = 1.0000$$

$$DL = 0.02597 \text{ ug/l}$$

$$BEC = 0.1497 \text{ ug/l}$$

Weight: 1/y

Min Conc: <None>



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	3115.59	0.0023	P	2.9	
2	<input type="checkbox"/>	0.025	0.033	3470.48	0.0027	P	6.9	31.4
3	<input type="checkbox"/>	0.050	0.026	3535.19	0.0026	P	1.5	-47.0
4	<input type="checkbox"/>	0.100	0.082	4255.67	0.0032	P	1.8	-18.0
5	<input type="checkbox"/>	0.500	0.546	10947.84	0.0083	P	0.9	9.3
6	<input type="checkbox"/>	1.000	1.216	20834.49	0.0155	P	3.6	21.6
7	<input type="checkbox"/>	10.000	11.835	175182.14	0.1311	P	0.7	18.4
8	<input type="checkbox"/>	50.000	51.963	761537.63	0.5677	P	4.3	3.9
9	<input type="checkbox"/>	100.000	104.641	1562090.20	1.1408	A	1.8	4.6
10	<input type="checkbox"/>	1000.000	999.419	14347145.86	10.8765	A	3.5	-0.1
11	<input type="checkbox"/>			3732.65	0.0028	P	1.8	

$$y = 0.0109 * x + 0.0023$$

$$R = 1.0000$$

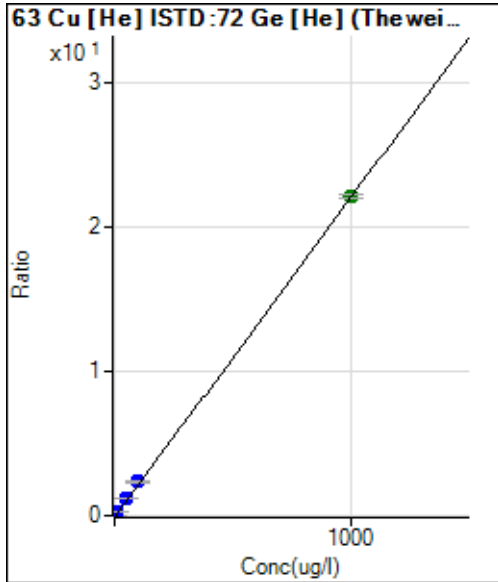
$$DL = 0.01878 \text{ ug/l}$$

$$BEC = 0.2123 \text{ ug/l}$$

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	811.20	0.0034	P	4.1	
2	<input type="checkbox"/>	0.025	0.032	975.51	0.0041	P	3.5	26.1
3	<input type="checkbox"/>	0.050	0.053	1088.16	0.0045	P	4.3	5.3
4	<input type="checkbox"/>	0.100	0.118	1429.79	0.0060	P	1.6	18.5
5	<input type="checkbox"/>	0.500	0.582	3909.41	0.0162	P	1.7	16.3
6	<input type="checkbox"/>	1.000	1.300	7731.16	0.0321	P	1.3	30.0
7	<input type="checkbox"/>	10.000	12.212	66802.70	0.2737	P	0.8	22.1
8	<input type="checkbox"/>	50.000	52.418	290167.51	1.1639	P	0.8	4.8
9	<input type="checkbox"/>	100.000	105.419	585731.06	2.3373	P	0.5	5.4
10	<input type="checkbox"/>	1000.000	999.315	5569166.11	22.1273	A	1.6	-0.1
11	<input type="checkbox"/>			953.18	0.0040	P	2.8	

$y = 0.0221 * x + 0.0034$

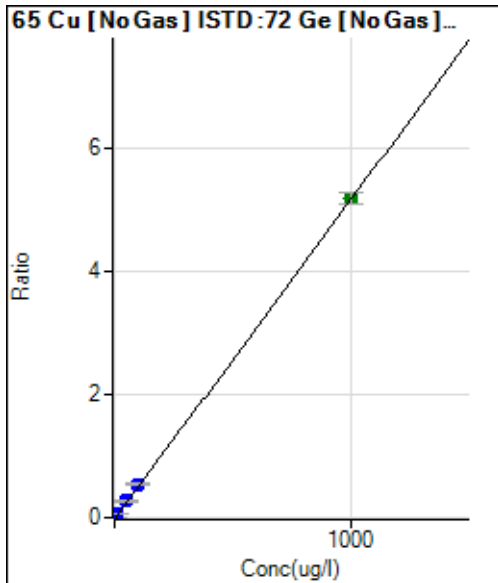
$R = 1.0000$

DL = 0.01874 ug/l

BEC = 0.152 ug/l

Weight: 1/y

Min Conc: <None>



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	3022.20	0.0022	P	4.7	
2	<input type="checkbox"/>	0.025	0.015	3016.20	0.0023	P	6.1	-40.5
3	<input type="checkbox"/>	0.050	-0.020	2911.47	0.0021	P	2.1	-139.2
4	<input type="checkbox"/>	0.100	0.019	3108.25	0.0023	P	4.3	-81.0
5	<input type="checkbox"/>	0.500	0.457	6121.75	0.0046	P	0.8	-8.6
6	<input type="checkbox"/>	1.000	1.136	10917.80	0.0081	P	4.4	13.6
7	<input type="checkbox"/>	10.000	11.580	83393.11	0.0624	P	1.2	15.8
8	<input type="checkbox"/>	50.000	51.227	360057.76	0.2684	P	3.8	2.5
9	<input type="checkbox"/>	100.000	104.248	744489.92	0.5439	P	2.8	4.2
10	<input type="checkbox"/>	1000.000	999.498	6852350.28	5.1952	A	3.9	-0.1
11	<input type="checkbox"/>			2421.85	0.0018	P	2.9	

$y = 0.0052 * x + 0.0022$

$R = 1.0000$

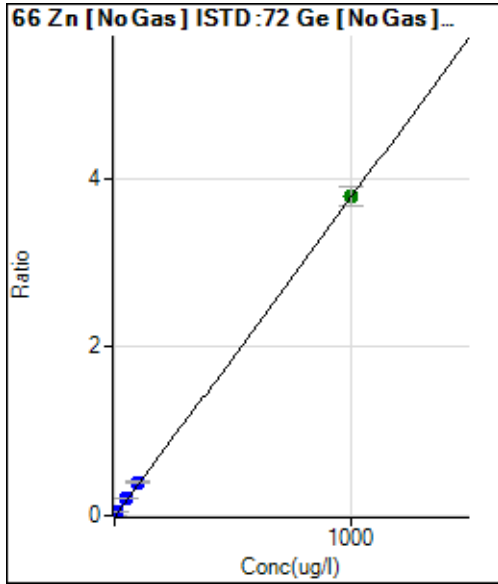
DL = 0.06123 ug/l

BEC = 0.4313 ug/l

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	3187.76	0.0024	P	5.8	
2	<input type="checkbox"/>			5999.86	0.0046	P	5.0	
3	<input type="checkbox"/>	0.050	-0.012	3151.32	0.0023	P	1.7	-124.9
4	<input type="checkbox"/>	0.100	0.063	3460.73	0.0026	P	7.6	-37.0
5	<input type="checkbox"/>	0.500	0.461	5450.43	0.0041	P	2.9	-7.8
6	<input type="checkbox"/>	1.000	1.059	8551.94	0.0064	P	0.9	5.9
7	<input type="checkbox"/>	10.000	11.428	61017.87	0.0457	P	2.0	14.3
8	<input type="checkbox"/>	50.000	52.721	271185.02	0.2021	P	2.7	5.4
9	<input type="checkbox"/>	100.000	104.553	545516.45	0.3985	P	2.7	4.6
10	<input type="checkbox"/>	1000.000	999.394	4994996.12	3.7889	A	6.1	-0.1
11	<input type="checkbox"/>			4073.77	0.0031	P	4.7	

$y = 0.0038 * x + 0.0024$

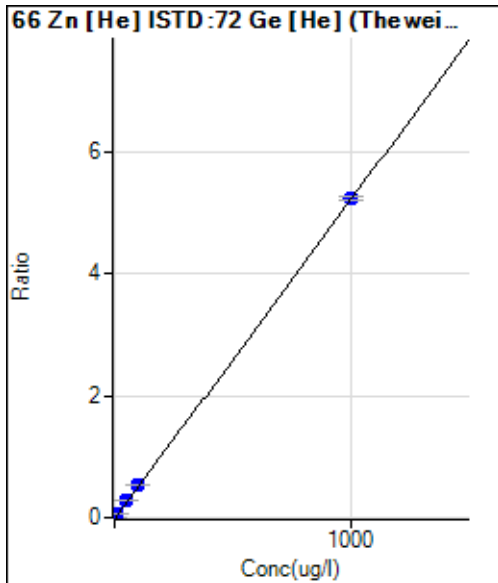
R = 1.0000

DL = 0.1094 ug/l

BEC = 0.6237 ug/l

Weight: 1/y

Min Conc: <None>



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	617.79	0.0026	P	5.1	
2	<input type="checkbox"/>			1360.07	0.0057	P	3.1	
3	<input type="checkbox"/>	0.050	0.095	735.58	0.0031	P	7.5	90.4
4	<input type="checkbox"/>	0.100	0.136	782.25	0.0033	P	7.4	35.9
5	<input type="checkbox"/>	0.500	0.573	1340.07	0.0056	P	2.5	14.5
6	<input type="checkbox"/>	1.000	1.160	2079.05	0.0086	P	3.1	16.0
7	<input type="checkbox"/>	10.000	11.752	15659.56	0.0642	P	3.7	17.5
8	<input type="checkbox"/>	50.000	51.991	68601.59	0.2751	P	0.1	4.0
9	<input type="checkbox"/>	100.000	103.719	136920.28	0.5464	P	0.6	3.7
10	<input type="checkbox"/>	1000.000	999.511	1319668.45	5.2429	P	1.2	0.0
11	<input type="checkbox"/>			860.03	0.0036	P	5.3	

$y = 0.0052 * x + 0.0026$

R = 1.0000

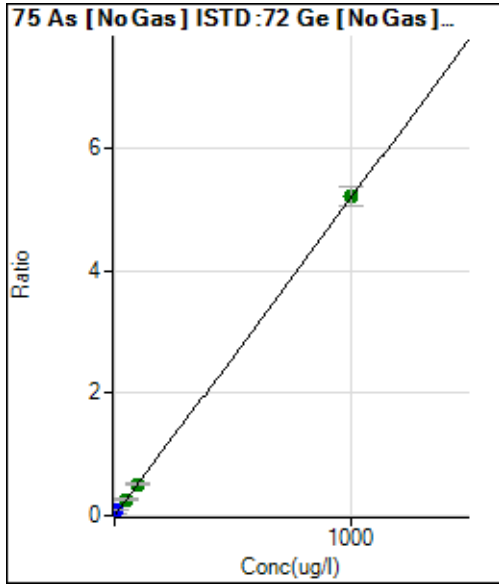
DL = 0.07506 ug/l

BEC = 0.4889 ug/l

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	38264.96	0.0283	P	34.4	
2	<input type="checkbox"/>	0.025	-0.343	34455.55	0.0266	P	42.3	-1472.0
3	<input type="checkbox"/>	0.050	1.074	46160.08	0.0339	P	28.4	2047.5
4	<input type="checkbox"/>	0.100	-0.187	36322.83	0.0274	P	27.9	-287.1
5	<input type="checkbox"/>	0.500	0.122	38412.00	0.0290	P	19.4	-75.6
6	<input type="checkbox"/>	1.000	1.555	48835.54	0.0364	P	14.9	55.5
7	<input type="checkbox"/>	10.000	13.125	128889.23	0.0965	P	10.8	31.3
8	<input type="checkbox"/>	50.000	45.805	357080.79	0.2661	A	3.2	-8.4
9	<input type="checkbox"/>	100.000	94.012	706417.17	0.5164	A	6.4	-6.0
10	<input type="checkbox"/>	1000.000	1000.777	6886574.26	5.2238	A	5.9	0.1
11	<input type="checkbox"/>			30307.35	0.0228	P	31.3	

$$y = 0.0052 * x + 0.0283$$

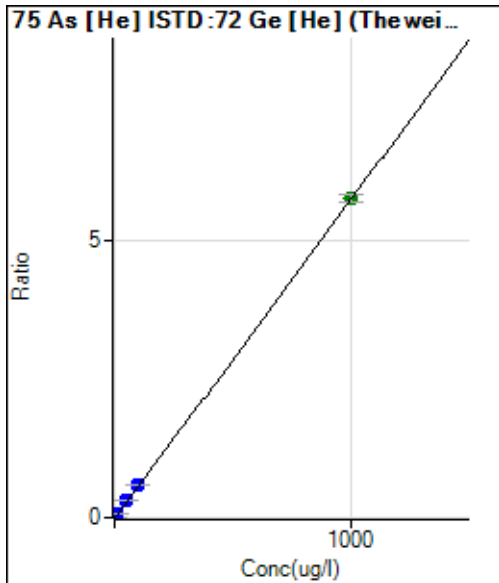
$$R = 1.0000$$

$$DL = 5.629 \text{ ug/l}$$

$$BEC = 5.46 \text{ ug/l}$$

Weight: 1/y

Min Conc: <None>



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	1779.74	0.0074	P	2.8	
2	<input type="checkbox"/>	0.025	-0.041	1716.87	0.0071	P	1.1	-262.2
3	<input type="checkbox"/>	0.050	0.021	1802.14	0.0075	P	1.6	-59.0
4	<input type="checkbox"/>	0.100	0.092	1889.89	0.0079	P	1.6	-8.2
5	<input type="checkbox"/>	0.500	0.526	2509.37	0.0104	P	1.5	5.2
6	<input type="checkbox"/>	1.000	1.180	3414.47	0.0142	P	1.2	18.0
7	<input type="checkbox"/>	10.000	11.415	17890.53	0.0733	P	1.4	14.1
8	<input type="checkbox"/>	50.000	50.806	75000.62	0.3008	P	0.8	1.6
9	<input type="checkbox"/>	100.000	103.810	152110.38	0.6070	P	0.5	3.8
10	<input type="checkbox"/>	1000.000	999.564	1454901.75	5.7807	A	2.0	0.0
11	<input type="checkbox"/>			1500.18	0.0062	P	0.5	

$$y = 0.0058 * x + 0.0074$$

$$R = 1.0000$$

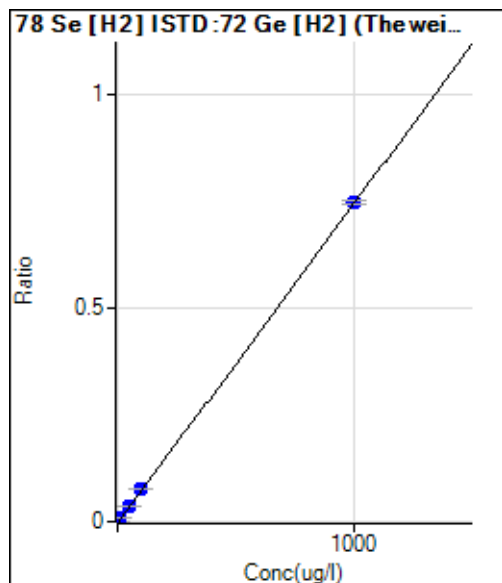
$$DL = 0.1067 \text{ ug/l}$$

$$BEC = 1.278 \text{ ug/l}$$

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	157.56	0.0001	P	2.4	
2	<input type="checkbox"/>	0.025	0.010	163.78	0.0001	P	3.0	-58.5
3	<input type="checkbox"/>	0.050	0.045	197.89	0.0002	P	2.0	-9.9
4	<input type="checkbox"/>	0.100	0.121	267.56	0.0002	P	2.2	21.0
5	<input type="checkbox"/>	0.500	0.550	667.46	0.0005	P	1.5	10.0
6	<input type="checkbox"/>	1.000	1.174	1254.50	0.0010	P	1.9	17.4
7	<input type="checkbox"/>	10.000	11.290	10756.42	0.0086	P	1.6	12.9
8	<input type="checkbox"/>	50.000	49.749	47095.93	0.0373	P	0.6	-0.5
9	<input type="checkbox"/>	100.000	103.136	95329.37	0.0773	P	0.9	3.1
10	<input type="checkbox"/>	1000.000	999.686	890979.81	0.7479	P	1.2	0.0
11	<input type="checkbox"/>			196.11	0.0002	P	5.4	

$$y = 7.4804E-004 * x + 1.2199E-004$$

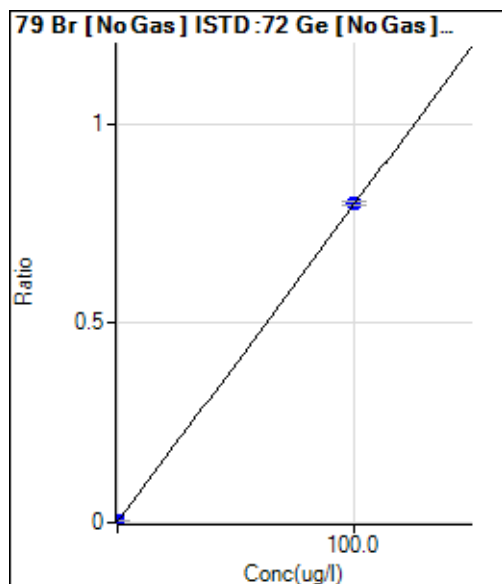
$$R = 1.0000$$

$$DL = 0.01162 \text{ ug/l}$$

$$BEC = 0.1631 \text{ ug/l}$$

$$\text{Weight: } 1/y$$

$$\text{Min Conc: } <\text{None}>$$



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	7680.14	0.0057	P	6.7	
2	<input type="checkbox"/>			10822.63	0.0083	P	8.5	
3	<input type="checkbox"/>			10426.45	0.0077	P	1.0	
4	<input type="checkbox"/>			11182.20	0.0084	P	4.8	
5	<input type="checkbox"/>			11465.16	0.0086	P	4.0	
6	<input type="checkbox"/>			10825.97	0.0081	P	3.5	
7	<input type="checkbox"/>			11222.17	0.0084	P	10.1	
8	<input type="checkbox"/>			14085.72	0.0105	P	7.1	
9	<input type="checkbox"/>			12390.77	0.0091	P	3.2	
10	<input type="checkbox"/>			13063.35	0.0099	P	0.5	
11	<input type="checkbox"/>	100.000	100.000	1064709.01	0.8016	P	1.8	0.0

$$y = 0.0080 * x + 0.0057$$

$$R = 1.0000$$

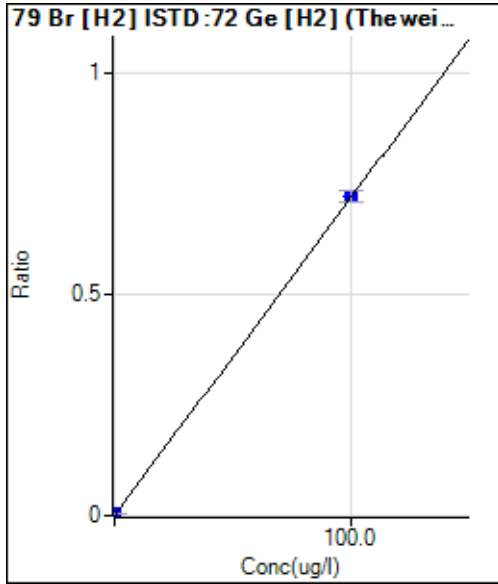
$$DL = 0.1428 \text{ ug/l}$$

$$BEC = 0.7155 \text{ ug/l}$$

$$\text{Weight: } 1/y$$

$$\text{Min Conc: } <\text{None}>$$

Calibration for 028SMPL.d



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	5842.96	0.0045	P	4.1	
2	<input type="checkbox"/>			8781.97	0.0070	P	3.1	
3	<input type="checkbox"/>			8915.10	0.0070	P	5.2	
4	<input type="checkbox"/>			9018.30	0.0072	P	3.6	
5	<input type="checkbox"/>			8728.68	0.0070	P	2.0	
6	<input type="checkbox"/>			8595.54	0.0069	P	1.8	
7	<input type="checkbox"/>			9188.03	0.0073	P	4.5	
8	<input type="checkbox"/>			11818.04	0.0094	P	6.4	
9	<input type="checkbox"/>			11431.87	0.0093	P	2.6	
10	<input type="checkbox"/>			33472.25	0.0281	P	2.9	
11	<input type="checkbox"/>	100.000	100.000	908682.94	0.7226	P	3.5	0.0

$y = 0.0072 * x + 0.0045$

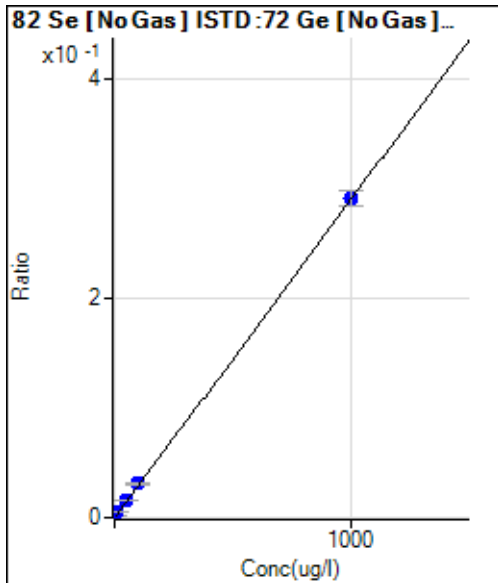
$R = 1.0000$

DL = 0.07699 ug/l

BEC = 0.63 ug/l

Weight: 1/y

Min Conc: <None>



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	1645.74	0.0012	P	6.6	
2	<input type="checkbox"/>	0.025	1.660	2219.06	0.0017	P	8.3	6541.9
3	<input type="checkbox"/>	0.050	1.107	2098.62	0.0015	P	8.7	2115.0
4	<input type="checkbox"/>	0.100	0.470	1803.67	0.0014	P	13.9	370.4
5	<input type="checkbox"/>	0.500	1.780	2304.74	0.0017	P	5.9	256.0
6	<input type="checkbox"/>	1.000	2.235	2507.90	0.0019	P	4.0	123.5
7	<input type="checkbox"/>	10.000	12.023	6298.97	0.0047	P	5.0	20.2
8	<input type="checkbox"/>	50.000	51.426	21684.39	0.0162	P	4.8	2.9
9	<input type="checkbox"/>	100.000	103.141	42702.96	0.0312	P	3.6	3.1
10	<input type="checkbox"/>	1000.000	999.592	384690.35	0.2917	P	4.6	0.0
11	<input type="checkbox"/>			2448.54	0.0018	P	8.2	

$y = 2.9062E-004 * x + 0.0012$

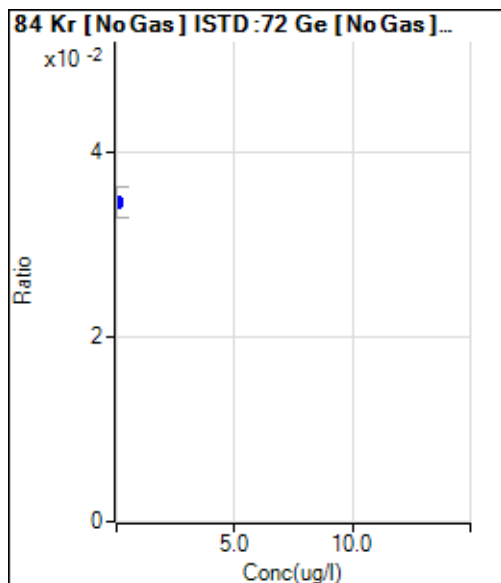
$R = 1.0000$

DL = 0.8252 ug/l

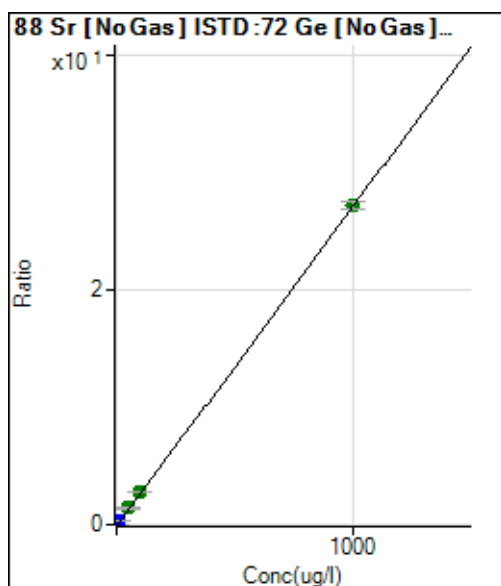
BEC = 4.199 ug/l

Weight: 1/y

Min Conc: <None>



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000		46622.89	0.0346	P	9.3	
2	<input type="checkbox"/>			56248.39	0.0432	P	8.7	
3	<input type="checkbox"/>			55582.05	0.0409	P	8.0	
4	<input type="checkbox"/>			49334.30	0.0372	P	14.2	
5	<input type="checkbox"/>			52041.62	0.0392	P	2.1	
6	<input type="checkbox"/>			55002.70	0.0410	P	7.6	
7	<input type="checkbox"/>			57427.54	0.0430	P	9.8	
8	<input type="checkbox"/>			67203.68	0.0501	P	10.9	
9	<input type="checkbox"/>			79200.44	0.0579	P	10.8	
10	<input type="checkbox"/>			283477.70	0.2149	P	4.1	
11	<input type="checkbox"/>			51763.72	0.0390	P	10.9	



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	868.31	0.0006	P	6.6	
2	<input type="checkbox"/>	0.025	0.033	2019.48	0.0016	P	3.8	33.3
3	<input type="checkbox"/>	0.050	0.063	3204.01	0.0024	P	0.9	25.7
4	<input type="checkbox"/>	0.100	0.136	5769.72	0.0043	P	8.0	35.8
5	<input type="checkbox"/>	0.500	0.613	22969.39	0.0173	P	2.5	22.6
6	<input type="checkbox"/>	1.000	1.273	47320.50	0.0353	P	3.0	27.3
7	<input type="checkbox"/>	10.000	12.154	442932.85	0.3314	P	3.1	21.5
8	<input type="checkbox"/>	50.000	51.721	1889330.82	1.4082	A	4.9	3.4
9	<input type="checkbox"/>	100.000	102.384	3816189.98	2.7870	A	2.7	2.4
10	<input type="checkbox"/>	1000.000	999.654	35895114.03	27.2061	A	2.7	0.0
11	<input type="checkbox"/>			1121.16	0.0008	P	24.5	

$$y = 0.0272 * x + 6.4383E-004$$

$$R = 1.0000$$

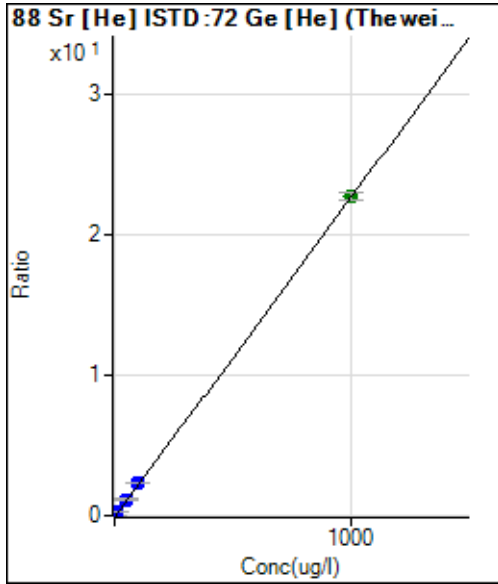
$$DL = 0.00471 \text{ ug/l}$$

$$BEC = 0.02366 \text{ ug/l}$$

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	187.78	0.0008	P	3.3	
2	<input type="checkbox"/>	0.025	0.034	374.45	0.0016	P	13.0	37.5
3	<input type="checkbox"/>	0.050	0.066	548.90	0.0023	P	8.0	32.6
4	<input type="checkbox"/>	0.100	0.130	891.14	0.0037	P	6.8	30.1
5	<input type="checkbox"/>	0.500	0.579	3352.63	0.0139	P	2.3	15.8
6	<input type="checkbox"/>	1.000	1.246	6989.52	0.0291	P	1.5	24.6
7	<input type="checkbox"/>	10.000	11.388	63278.60	0.2593	P	2.6	13.9
8	<input type="checkbox"/>	50.000	50.933	288477.47	1.1571	P	1.6	1.9
9	<input type="checkbox"/>	100.000	104.064	592287.51	2.3634	P	0.8	4.1
10	<input type="checkbox"/>	1000.000	999.533	5711619.84	22.6937	A	2.1	0.0
11	<input type="checkbox"/>			228.89	0.0010	P	26.6	

$$y = 0.0227 * x + 7.7876E-004$$

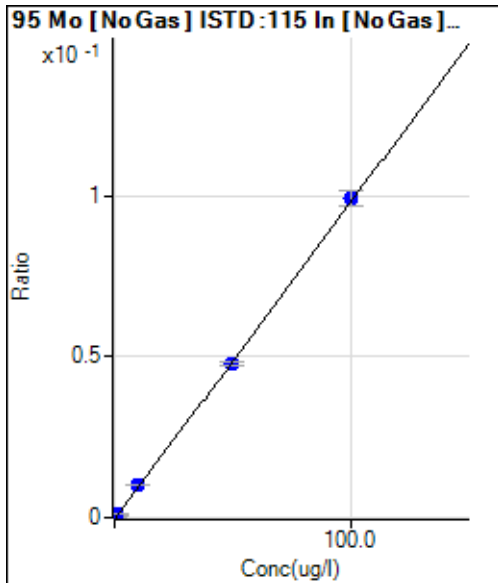
$$R = 1.0000$$

$$DL = 0.003366 \text{ ug/l}$$

$$BEC = 0.0343 \text{ ug/l}$$

$$\text{Weight: } 1/y$$

$$\text{Min Conc: } <\text{None}>$$



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	41.11	0.0000	P	11.6	
2	<input type="checkbox"/>	0.025	0.023	215.56	0.0000	P	9.9	-6.9
3	<input type="checkbox"/>	0.050	0.055	458.90	0.0001	P	8.0	9.1
4	<input type="checkbox"/>	0.100	0.123	947.82	0.0001	P	4.7	22.6
5	<input type="checkbox"/>	0.500	0.495	3838.32	0.0005	P	2.9	-0.9
6	<input type="checkbox"/>	1.000	1.078	8230.20	0.0011	P	4.0	7.8
7	<input type="checkbox"/>	10.000	10.603	79611.44	0.0105	P	0.2	6.0
8	<input type="checkbox"/>	50.000	48.428	359471.28	0.0477	P	2.3	-3.1
9	<input type="checkbox"/>	100.000	100.725	724535.27	0.0993	P	5.3	0.7
10	<input type="checkbox"/>			384.45	0.0001	P	10.8	
11	<input type="checkbox"/>			132.22	0.0000	P	12.6	

$$y = 9.8549E-004 * x + 5.3020E-006$$

$$R = 0.9998$$

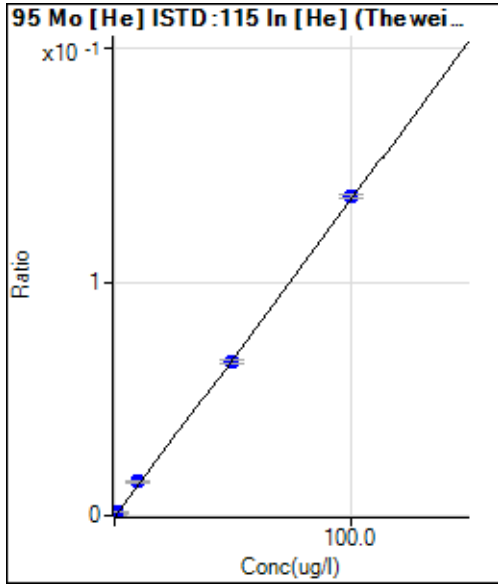
$$DL = 0.00187 \text{ ug/l}$$

$$BEC = 0.00538 \text{ ug/l}$$

$$\text{Weight: } 1/y$$

$$\text{Min Conc: } <\text{None}>$$

Calibration for 028SMPL.d



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	20.00	0.0000	P	32.0	
2	<input type="checkbox"/>	0.025	0.020	82.22	0.0000	P	35.6	-19.9
3	<input type="checkbox"/>	0.050	0.057	190.00	0.0001	P	4.7	13.8
4	<input type="checkbox"/>	0.100	0.104	332.23	0.0001	P	12.5	3.6
5	<input type="checkbox"/>	0.500	0.543	1656.77	0.0007	P	1.8	8.7
6	<input type="checkbox"/>	1.000	1.136	3424.88	0.0016	P	4.4	13.6
7	<input type="checkbox"/>	10.000	10.642	32827.74	0.0145	P	2.7	6.4
8	<input type="checkbox"/>	50.000	48.585	146933.92	0.0661	P	2.7	-2.8
9	<input type="checkbox"/>	100.000	100.642	297201.35	0.1368	P	1.0	0.6
10	<input type="checkbox"/>			141.12	0.0001	P	14.0	
11	<input type="checkbox"/>			41.11	0.0000	P	30.6	

$$y = 0.0014 * x + 9.0756E-006$$

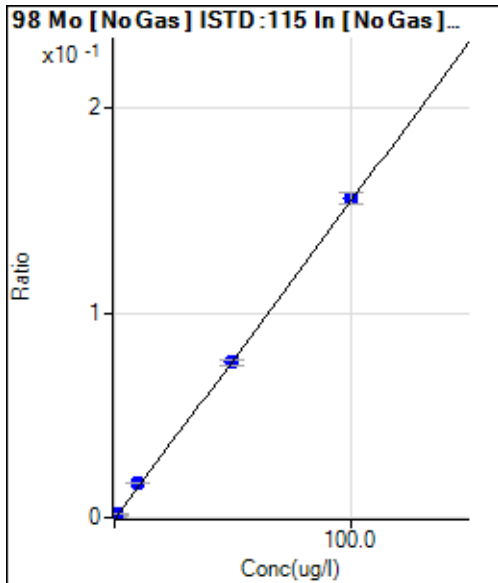
$$R = 0.9999$$

$$DL = 0.006412 \text{ ug/l}$$

$$BEC = 0.006676 \text{ ug/l}$$

Weight: 1/y

Min Conc: <None>



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	39.14	0.0000	P	37.0	
2	<input type="checkbox"/>	0.025	0.024	320.40	0.0000	P	3.4	-5.2
3	<input type="checkbox"/>	0.050	0.050	643.75	0.0001	P	3.9	0.2
4	<input type="checkbox"/>	0.100	0.114	1370.56	0.0002	P	5.1	14.1
5	<input type="checkbox"/>	0.500	0.496	6031.67	0.0008	P	2.1	-0.8
6	<input type="checkbox"/>	1.000	1.099	13208.88	0.0017	P	3.1	9.9
7	<input type="checkbox"/>	10.000	10.753	127281.00	0.0167	P	1.7	7.5
8	<input type="checkbox"/>	50.000	48.943	572762.69	0.0761	P	3.9	-2.1
9	<input type="checkbox"/>	100.000	100.452	1139773.27	0.1561	P	3.5	0.5
10	<input type="checkbox"/>			1102.76	0.0002	P	11.5	
11	<input type="checkbox"/>			96.03	0.0000	P	32.7	

$$y = 0.0016 * x + 5.0435E-006$$

$$R = 0.9999$$

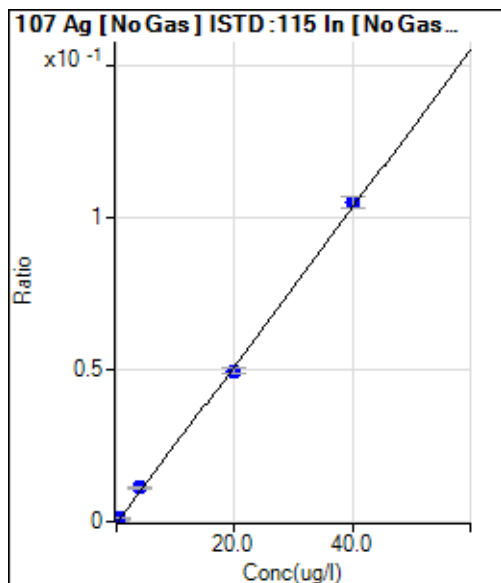
$$DL = 0.0036 \text{ ug/l}$$

$$BEC = 0.003245 \text{ ug/l}$$

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	39.35	0.0000	P	24.8	
2	<input type="checkbox"/>	0.010	0.011	258.10	0.0000	P	8.6	10.8
3	<input type="checkbox"/>	0.020	0.021	459.53	0.0001	P	3.2	4.4
4	<input type="checkbox"/>	0.040	0.049	985.77	0.0001	P	6.2	21.5
5	<input type="checkbox"/>	0.200	0.207	4207.65	0.0005	P	2.6	3.3
6	<input type="checkbox"/>	0.400	0.440	8846.99	0.0011	P	3.7	10.1
7	<input type="checkbox"/>	4.000	4.294	84845.11	0.0111	P	2.5	7.3
8	<input type="checkbox"/>	20.000	19.086	372830.53	0.0495	P	4.6	-4.6
9	<input type="checkbox"/>	40.000	40.427	765617.97	0.1049	P	4.2	1.1
10	<input type="checkbox"/>			4859807.60	0.6763	A	18.6	
11	<input type="checkbox"/>			1508.69	0.0002	P	13.3	

$$y = 0.0026 * x + 5.0618E-006$$

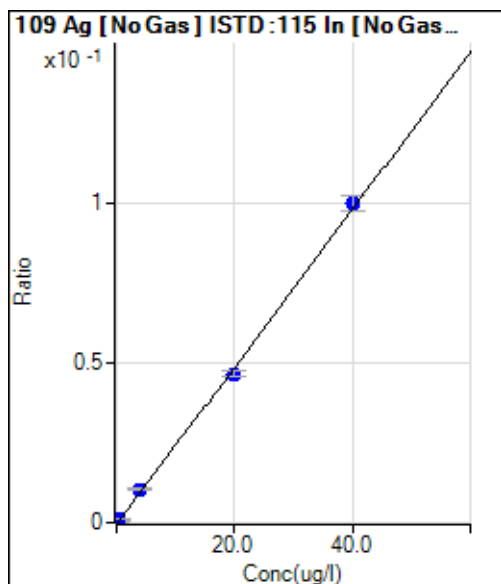
$$R = 0.9996$$

$$DL = 0.00145 \text{ ug/l}$$

$$BEC = 0.001951 \text{ ug/l}$$

Weight: 1/y

Min Conc: <None>



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	35.35	0.0000	P	31.9	
2	<input type="checkbox"/>	0.010	0.010	222.76	0.0000	P	26.9	0.3
3	<input type="checkbox"/>	0.020	0.022	460.19	0.0001	P	2.7	11.0
4	<input type="checkbox"/>	0.040	0.046	891.72	0.0001	P	4.0	15.8
5	<input type="checkbox"/>	0.200	0.202	3914.12	0.0005	P	1.2	1.2
6	<input type="checkbox"/>	0.400	0.454	8665.47	0.0011	P	3.6	13.5
7	<input type="checkbox"/>	4.000	4.266	80058.00	0.0105	P	3.2	6.7
8	<input type="checkbox"/>	20.000	18.906	350769.38	0.0466	P	3.8	-5.5
9	<input type="checkbox"/>	40.000	40.520	728749.27	0.0998	P	4.5	1.3
10	<input type="checkbox"/>			4626655.98	0.6491	A	22.9	
11	<input type="checkbox"/>			1437.32	0.0002	P	9.7	

$$y = 0.0025 * x + 4.5539E-006$$

$$R = 0.9995$$

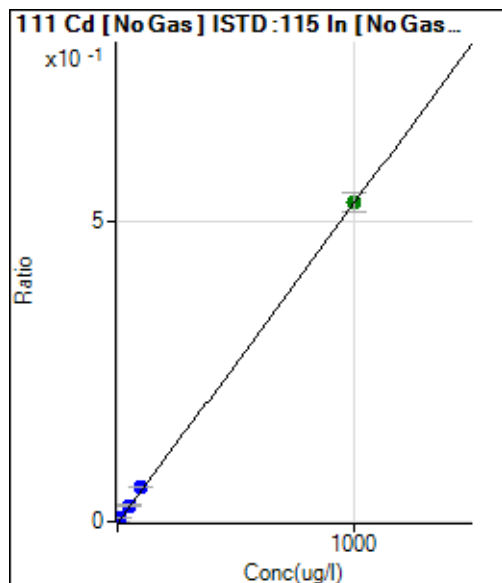
$$DL = 0.001768 \text{ ug/l}$$

$$BEC = 0.001848 \text{ ug/l}$$

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	4.34	0.0000	P	212.5	
2	<input type="checkbox"/>	0.025	0.029	124.19	0.0000	P	11.6	17.7
3	<input type="checkbox"/>	0.050	0.057	239.42	0.0000	P	1.4	13.5
4	<input type="checkbox"/>	0.100	0.129	522.53	0.0001	P	7.1	29.2
5	<input type="checkbox"/>	0.500	0.550	2288.35	0.0003	P	2.5	10.0
6	<input type="checkbox"/>	1.000	1.196	4929.47	0.0006	P	2.5	19.6
7	<input type="checkbox"/>	10.000	11.333	46078.18	0.0061	P	1.8	13.3
8	<input type="checkbox"/>	50.000	50.256	202070.22	0.0268	P	4.0	0.5
9	<input type="checkbox"/>	100.000	108.327	422292.18	0.0578	P	3.7	8.3
10	<input type="checkbox"/>	1000.000	999.141	3822153.86	0.5335	A	5.6	-0.1
11	<input type="checkbox"/>			82.18	0.0000	P	15.6	

$$y = 5.3396E-004 * x + 5.4290E-007$$

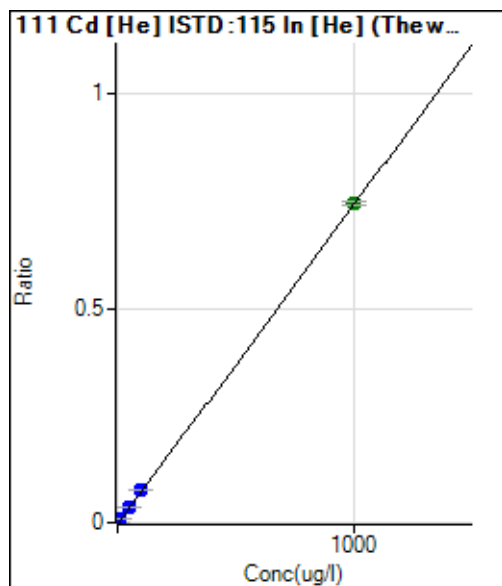
R = 1.0000

DL = 0.006482 ug/l

BEC = 0.001017 ug/l

Weight: 1/y

Min Conc: <None>



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	3.78	0.0000	P	15.5	
2	<input type="checkbox"/>	0.025	0.026	48.00	0.0000	P	2.0	4.7
3	<input type="checkbox"/>	0.050	0.058	98.89	0.0000	P	5.4	16.0
4	<input type="checkbox"/>	0.100	0.114	192.00	0.0001	P	1.1	14.0
5	<input type="checkbox"/>	0.500	0.550	912.58	0.0004	P	3.1	10.0
6	<input type="checkbox"/>	1.000	1.196	1971.80	0.0009	P	1.1	19.6
7	<input type="checkbox"/>	10.000	10.894	18423.01	0.0081	P	1.0	8.9
8	<input type="checkbox"/>	50.000	49.425	82002.41	0.0369	P	2.1	-1.2
9	<input type="checkbox"/>	100.000	103.544	167731.99	0.0772	P	2.0	3.5
10	<input type="checkbox"/>	1000.000	999.665	1618225.03	0.7456	A	0.6	0.0
11	<input type="checkbox"/>			23.55	0.0000	P	5.1	

$$y = 7.4584E-004 * x + 1.7213E-006$$

R = 1.0000

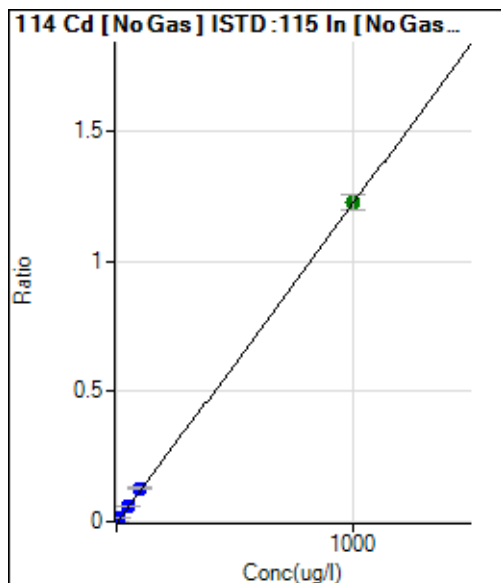
DL = 0.001075 ug/l

BEC = 0.002308 ug/l

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	-5.27	0.0000	P	-390.	
2	<input type="checkbox"/>	0.025	0.027	248.14	0.0000	P	7.9	7.8
3	<input type="checkbox"/>	0.050	0.056	529.84	0.0001	P	6.7	12.2
4	<input type="checkbox"/>	0.100	0.120	1105.71	0.0001	P	4.3	20.3
5	<input type="checkbox"/>	0.500	0.517	4931.42	0.0006	P	2.4	3.4
6	<input type="checkbox"/>	1.000	1.123	10635.35	0.0014	P	3.2	12.3
7	<input type="checkbox"/>	10.000	10.847	101454.97	0.0133	P	2.3	8.5
8	<input type="checkbox"/>	50.000	48.135	445252.90	0.0591	P	4.0	-3.7
9	<input type="checkbox"/>	100.000	104.036	933046.91	0.1278	P	3.7	4.0
10	<input type="checkbox"/>	1000.000	999.681	8802311.75	1.2280	A	4.9	0.0
11	<input type="checkbox"/>			162.23	0.0000	P	11.7	

$$y = 0.0012 * x - 7.1696E-007$$

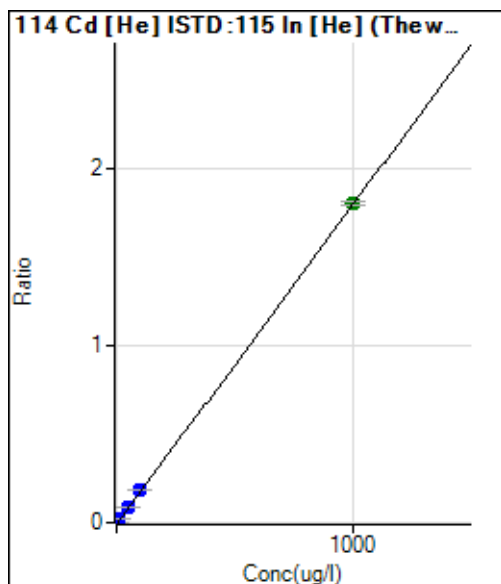
$$R = 1.0000$$

$$DL = 0.006834 \text{ ug/l}$$

$$BEC = -0.0005836 \text{ ug/l}$$

Weight: 1/y

Min Conc: <None>



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	7.92	0.0000	P	15.0	
2	<input type="checkbox"/>	0.025	0.026	112.71	0.0000	P	4.8	2.4
3	<input type="checkbox"/>	0.050	0.055	225.60	0.0001	P	6.9	9.5
4	<input type="checkbox"/>	0.100	0.121	492.86	0.0002	P	1.0	21.1
5	<input type="checkbox"/>	0.500	0.531	2135.66	0.0010	P	1.0	6.2
6	<input type="checkbox"/>	1.000	1.180	4714.91	0.0021	P	0.9	18.0
7	<input type="checkbox"/>	10.000	10.810	44331.69	0.0196	P	1.0	8.1
8	<input type="checkbox"/>	50.000	49.029	197289.58	0.0887	P	1.4	-1.9
9	<input type="checkbox"/>	100.000	103.475	406493.88	0.1872	P	1.9	3.5
10	<input type="checkbox"/>	1000.000	999.693	3924043.50	1.8082	A	1.0	0.0
11	<input type="checkbox"/>			56.66	0.0000	P	9.3	

$$y = 0.0018 * x + 3.6040E-006$$

$$R = 1.0000$$

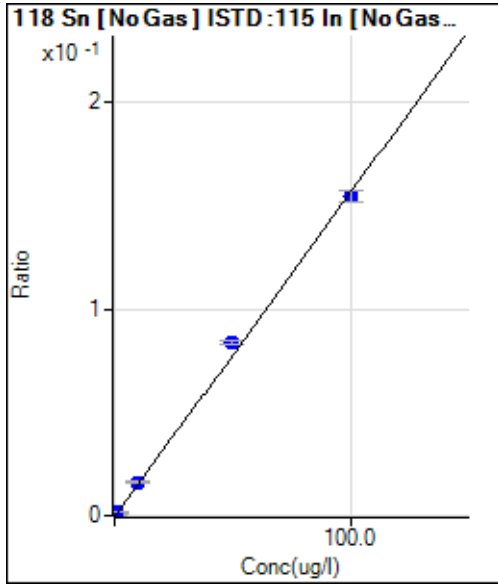
$$DL = 0.000895 \text{ ug/l}$$

$$BEC = 0.001993 \text{ ug/l}$$

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	1433.90	0.0002	P	3.8	
2	<input type="checkbox"/>	0.025	0.194	3739.77	0.0005	P	7.0	676.8
3	<input type="checkbox"/>	0.050	0.050	2046.09	0.0003	P	2.4	0.6
4	<input type="checkbox"/>	0.100	0.116	2751.50	0.0004	P	3.7	15.5
5	<input type="checkbox"/>	0.500	0.504	7600.34	0.0010	P	2.1	0.9
6	<input type="checkbox"/>	1.000	1.027	13879.48	0.0018	P	2.7	2.7
7	<input type="checkbox"/>	10.000	10.235	123888.77	0.0163	P	0.4	2.3
8	<input type="checkbox"/>	50.000	53.469	634278.93	0.0842	P	2.3	6.9
9	<input type="checkbox"/>	100.000	98.242	1128593.65	0.1546	P	3.8	-1.8
10	<input type="checkbox"/>			1873.17	0.0003	P	10.2	
11	<input type="checkbox"/>			3563.39	0.0005	P	6.5	

$y = 0.0016 * x + 1.8452E-004$

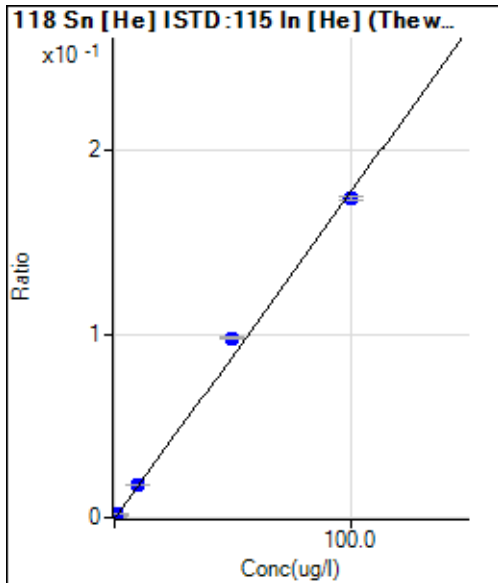
R = 0.9992

DL = 0.01333 ug/l

BEC = 0.1174 ug/l

Weight: 1/y

Min Conc: <None>



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	373.34	0.0002	P	14.2	
2	<input type="checkbox"/>	0.025	0.205	1212.28	0.0005	P	4.3	722.0
3	<input type="checkbox"/>	0.050	0.080	685.58	0.0003	P	3.1	59.1
4	<input type="checkbox"/>	0.100	0.145	947.82	0.0004	P	5.0	44.8
5	<input type="checkbox"/>	0.500	0.509	2389.11	0.0011	P	0.7	1.9
6	<input type="checkbox"/>	1.000	1.103	4713.04	0.0021	P	4.5	10.3
7	<input type="checkbox"/>	10.000	10.066	41084.25	0.0181	P	0.5	0.7
8	<input type="checkbox"/>	50.000	54.875	218101.01	0.0980	P	0.8	9.8
9	<input type="checkbox"/>	100.000	97.555	378235.37	0.1741	P	1.5	-2.4
10	<input type="checkbox"/>			610.02	0.0003	P	9.3	
11	<input type="checkbox"/>			1350.07	0.0006	P	4.8	

$y = 0.0018 * x + 1.7012E-004$

R = 0.9985

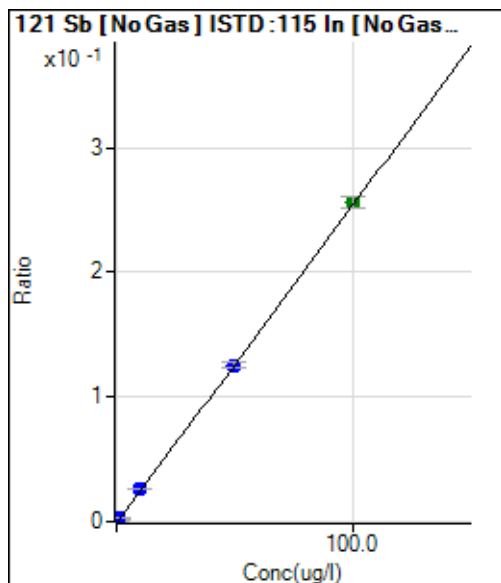
DL = 0.04068 ug/l

BEC = 0.0954 ug/l

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	211.69	0.0000	P	5.9	
2	<input type="checkbox"/>	0.025	0.028	749.43	0.0001	P	5.3	10.8
3	<input type="checkbox"/>	0.050	0.050	1200.51	0.0002	P	2.6	-0.2
4	<input type="checkbox"/>	0.100	0.113	2379.11	0.0003	P	1.4	13.3
5	<input type="checkbox"/>	0.500	0.493	10004.89	0.0013	P	2.1	-1.3
6	<input type="checkbox"/>	1.000	1.081	21511.88	0.0028	P	2.5	8.1
7	<input type="checkbox"/>	10.000	10.428	202955.32	0.0267	P	1.8	4.3
8	<input type="checkbox"/>	50.000	49.174	945822.56	0.1256	P	2.9	-1.7
9	<input type="checkbox"/>	100.000	100.370	1871352.67	0.2563	A	3.8	0.4
10	<input type="checkbox"/>			1447.89	0.0002	P	9.1	
11	<input type="checkbox"/>			383.04	0.0001	P	13.7	

$$y = 0.0026 * x + 2.7276E-005$$

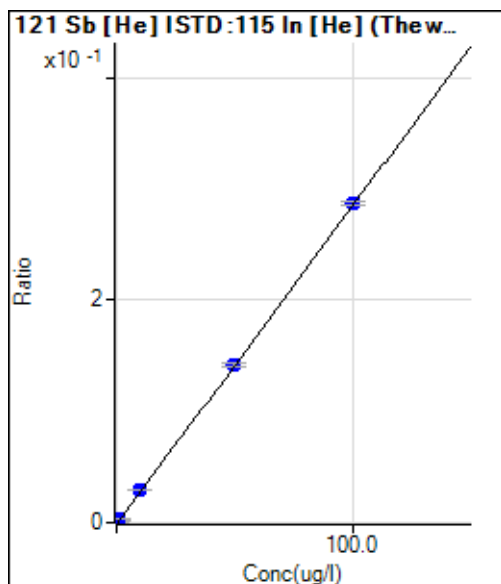
$$R = 0.9999$$

$$DL = 0.00189 \text{ ug/l}$$

$$BEC = 0.01068 \text{ ug/l}$$

$$\text{Weight: } 1/y$$

$$\text{Min Conc: } <\text{None}>$$



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	72.34	0.0000	P	1.4	
2	<input type="checkbox"/>	0.025	0.028	253.03	0.0001	P	5.7	10.4
3	<input type="checkbox"/>	0.050	0.051	390.71	0.0002	P	7.1	1.1
4	<input type="checkbox"/>	0.100	0.111	775.43	0.0004	P	1.7	10.7
5	<input type="checkbox"/>	0.500	0.501	3254.04	0.0015	P	1.4	0.2
6	<input type="checkbox"/>	1.000	1.111	7100.17	0.0032	P	0.6	11.1
7	<input type="checkbox"/>	10.000	10.244	66655.92	0.0294	P	1.6	2.4
8	<input type="checkbox"/>	50.000	49.491	315709.95	0.1419	P	2.6	-1.0
9	<input type="checkbox"/>	100.000	100.229	624288.57	0.2874	P	1.0	0.2
10	<input type="checkbox"/>			440.38	0.0002	P	2.0	
11	<input type="checkbox"/>			124.35	0.0001	P	11.1	

$$y = 0.0029 * x + 3.2895E-005$$

$$R = 1.0000$$

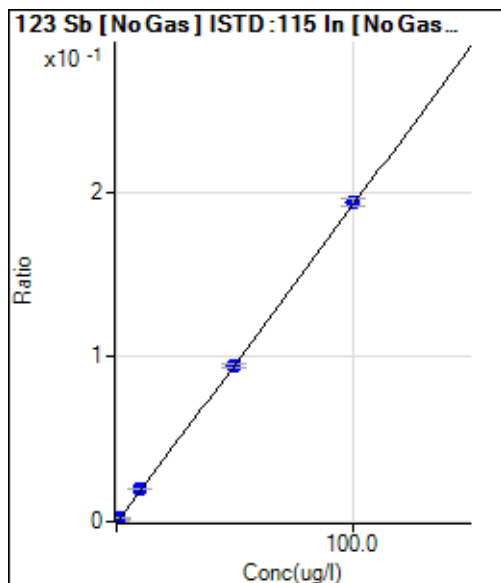
$$DL = 0.0004755 \text{ ug/l}$$

$$BEC = 0.01147 \text{ ug/l}$$

$$\text{Weight: } 1/y$$

$$\text{Min Conc: } <\text{None}>$$

Calibration for 028SMPL.d



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	166.02	0.0000	P	6.6	
2	<input type="checkbox"/>	0.025	0.025	525.73	0.0001	P	4.8	-1.8
3	<input type="checkbox"/>	0.050	0.051	925.79	0.0001	P	7.0	1.3
4	<input type="checkbox"/>	0.100	0.113	1805.63	0.0002	P	0.4	13.3
5	<input type="checkbox"/>	0.500	0.490	7533.11	0.0010	P	1.8	-1.9
6	<input type="checkbox"/>	1.000	1.083	16294.72	0.0021	P	4.2	8.3
7	<input type="checkbox"/>	10.000	10.432	153597.68	0.0202	P	2.3	4.3
8	<input type="checkbox"/>	50.000	49.024	713264.02	0.0947	P	3.6	-2.0
9	<input type="checkbox"/>	100.000	100.444	1416993.58	0.1940	P	2.5	0.4
10	<input type="checkbox"/>			1405.55	0.0002	P	11.6	
11	<input type="checkbox"/>			278.03	0.0000	P	13.4	

$$y = 0.0019 * x + 2.1391E-005$$

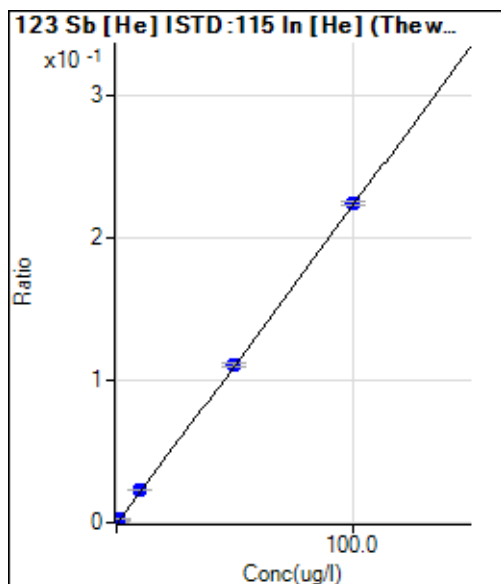
$$R = 0.9999$$

$$DL = 0.002177 \text{ ug/l}$$

$$BEC = 0.01107 \text{ ug/l}$$

Weight: 1/y

Min Conc: <None>



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	63.01	0.0000	P	6.8	
2	<input type="checkbox"/>	0.025	0.024	185.69	0.0001	P	4.8	-4.5
3	<input type="checkbox"/>	0.050	0.051	314.04	0.0001	P	2.2	1.9
4	<input type="checkbox"/>	0.100	0.108	601.41	0.0003	P	1.2	8.4
5	<input type="checkbox"/>	0.500	0.500	2546.16	0.0011	P	0.7	0.0
6	<input type="checkbox"/>	1.000	1.109	5545.65	0.0025	P	1.3	10.9
7	<input type="checkbox"/>	10.000	10.293	52376.78	0.0231	P	1.4	2.9
8	<input type="checkbox"/>	50.000	49.485	246868.82	0.1110	P	1.3	-1.0
9	<input type="checkbox"/>	100.000	100.227	488116.80	0.2247	P	1.2	0.2
10	<input type="checkbox"/>			345.04	0.0002	P	1.5	
11	<input type="checkbox"/>			106.68	0.0000	P	10.7	

$$y = 0.0022 * x + 2.8639E-005$$

$$R = 1.0000$$

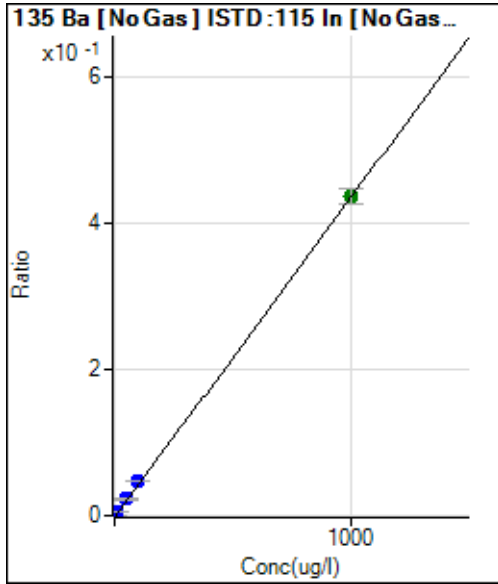
$$DL = 0.002596 \text{ ug/l}$$

$$BEC = 0.01277 \text{ ug/l}$$

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	252.84	0.0000	P	34.8	
2	<input type="checkbox"/>	0.025	0.030	349.31	0.0000	P	16.0	18.2
3	<input type="checkbox"/>	0.050	0.045	405.87	0.0001	P	1.1	-10.4
4	<input type="checkbox"/>	0.100	0.124	652.06	0.0001	P	3.9	23.6
5	<input type="checkbox"/>	0.500	0.553	2132.62	0.0003	P	9.0	10.6
6	<input type="checkbox"/>	1.000	1.191	4268.87	0.0006	P	3.7	19.1
7	<input type="checkbox"/>	10.000	11.500	38550.43	0.0051	P	3.2	15.0
8	<input type="checkbox"/>	50.000	51.350	169393.99	0.0225	P	4.0	2.7
9	<input type="checkbox"/>	100.000	109.436	349876.59	0.0479	P	1.8	9.4
10	<input type="checkbox"/>	1000.000	998.974	3132191.32	0.4370	A	4.3	-0.1
11	<input type="checkbox"/>			242.86	0.0000	P	25.5	

$$y = 4.3746E-004 * x + 3.2674E-005$$

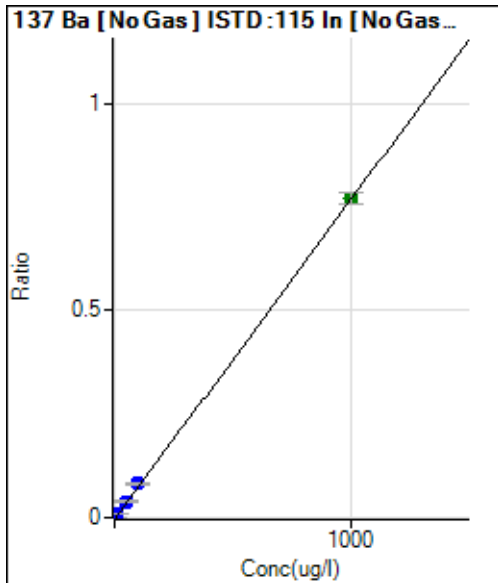
R = 1.0000

DL = 0.07803 ug/l

BEC = 0.07469 ug/l

Weight: 1/y

Min Conc: <None>



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	462.43	0.0001	P	25.2	
2	<input type="checkbox"/>	0.025	0.035	662.04	0.0001	P	14.7	38.2
3	<input type="checkbox"/>	0.050	0.037	688.65	0.0001	P	13.8	-25.4
4	<input type="checkbox"/>	0.100	0.123	1161.08	0.0002	P	11.7	22.8
5	<input type="checkbox"/>	0.500	0.532	3659.90	0.0005	P	8.7	6.4
6	<input type="checkbox"/>	1.000	1.187	7530.47	0.0010	P	7.2	18.7
7	<input type="checkbox"/>	10.000	11.037	65366.95	0.0086	P	0.9	10.4
8	<input type="checkbox"/>	50.000	50.358	293310.39	0.0390	P	4.0	0.7
9	<input type="checkbox"/>	100.000	106.086	598578.78	0.0820	P	4.1	6.1
10	<input type="checkbox"/>	1000.000	999.363	5532230.16	0.7719	A	4.2	-0.1
11	<input type="checkbox"/>			422.51	0.0001	P	15.6	

$$y = 7.7233E-004 * x + 5.9765E-005$$

R = 1.0000

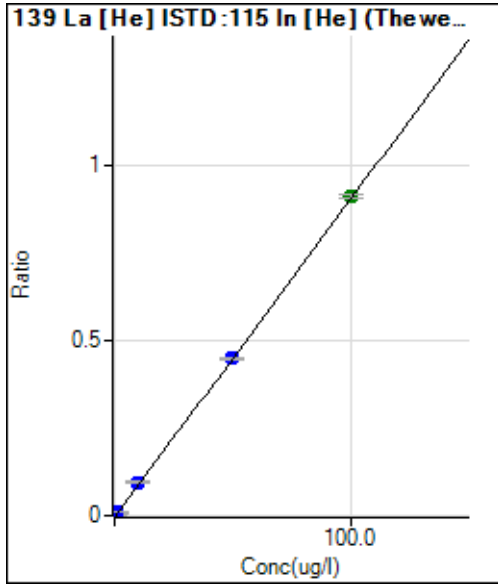
DL = 0.05845 ug/l

BEC = 0.07738 ug/l

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	22.22	0.0000	P	47.8	
2	<input type="checkbox"/>	0.025	0.030	633.35	0.0003	P	9.0	18.6
3	<input type="checkbox"/>	0.050	0.054	1102.27	0.0005	P	3.9	7.9
4	<input type="checkbox"/>	0.100	0.123	2496.91	0.0011	P	2.2	22.7
5	<input type="checkbox"/>	0.500	0.533	10777.56	0.0049	P	2.3	6.6
6	<input type="checkbox"/>	1.000	1.156	23246.14	0.0105	P	2.3	15.6
7	<input type="checkbox"/>	10.000	10.469	216134.31	0.0954	P	2.6	4.7
8	<input type="checkbox"/>	50.000	49.285	998521.61	0.4489	P	2.2	-1.4
9	<input type="checkbox"/>	100.000	100.309	1984151.78	0.9135	A	1.8	0.3
10	<input type="checkbox"/>			215.56	0.0001	P	14.0	
11	<input type="checkbox"/>			36.67	0.0000	P	39.9	

$$y = 0.0091 * x + 1.0096E-005$$

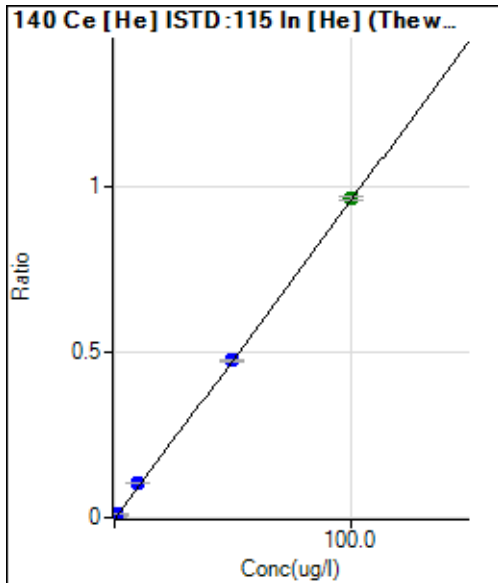
$$R = 1.0000$$

$$DL = 0.001589 \text{ ug/l}$$

$$BEC = 0.001109 \text{ ug/l}$$

Weight: 1/y

Min Conc: <None>



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	20.00	0.0000	P	58.2	
2	<input type="checkbox"/>	0.025	0.029	642.24	0.0003	P	6.6	14.1
3	<input type="checkbox"/>	0.050	0.056	1208.95	0.0006	P	4.9	12.1
4	<input type="checkbox"/>	0.100	0.118	2533.58	0.0011	P	3.4	17.6
5	<input type="checkbox"/>	0.500	0.528	11323.56	0.0051	P	2.2	5.7
6	<input type="checkbox"/>	1.000	1.134	24169.98	0.0110	P	1.0	13.4
7	<input type="checkbox"/>	10.000	10.645	233037.67	0.1028	P	0.7	6.5
8	<input type="checkbox"/>	50.000	49.368	1060408.03	0.4767	P	1.3	-1.3
9	<input type="checkbox"/>	100.000	100.250	2102195.32	0.9679	A	1.8	0.2
10	<input type="checkbox"/>			432.23	0.0002	P	15.1	
11	<input type="checkbox"/>			40.00	0.0000	P	46.8	

$$y = 0.0097 * x + 9.0430E-006$$

$$R = 1.0000$$

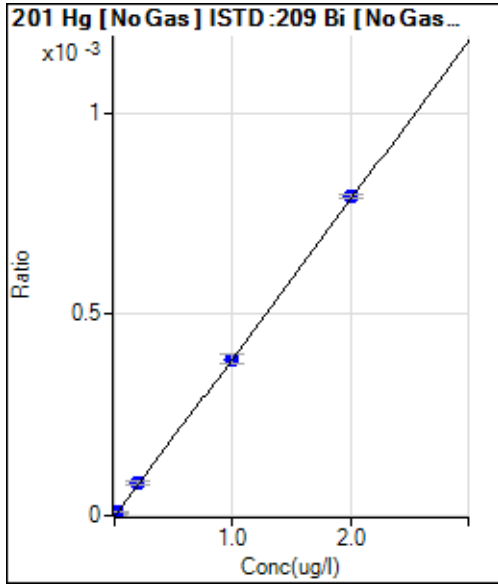
$$DL = 0.001636 \text{ ug/l}$$

$$BEC = 0.0009366 \text{ ug/l}$$

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	8.67	0.0000	P	22.3	
2	<input type="checkbox"/>			10.00	0.0000	P	9.6	
3	<input type="checkbox"/>	0.001	0.001	10.00	0.0000	P	11.1	-12.9
4	<input type="checkbox"/>	0.002	0.001	9.67	0.0000	P	77.4	-62.5
5	<input type="checkbox"/>	0.010	0.008	23.33	0.0000	P	2.3	-21.0
6	<input type="checkbox"/>	0.020	0.023	49.99	0.0000	P	6.7	15.4
7	<input type="checkbox"/>	0.200	0.202	374.27	0.0001	P	9.3	0.9
8	<input type="checkbox"/>	1.000	0.983	1716.10	0.0004	P	5.5	-1.7
9	<input type="checkbox"/>	2.000	2.008	3451.76	0.0008	P	1.4	0.4
10	<input type="checkbox"/>			14.67	0.0000	P	38.4	
11	<input type="checkbox"/>			12.33	0.0000	P	27.5	

$y = 3.9375E-004 * x + 1.8011E-006$

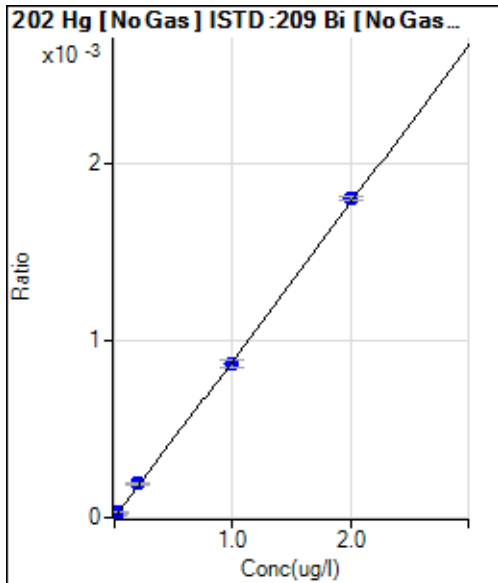
R = 1.0000

DL = 0.003054 ug/l

BEC = 0.004574 ug/l

Weight: 1/y

Min Conc: <None>



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	39.32	0.0000	P	11.8	
2	<input type="checkbox"/>			46.32	0.0000	P	8.0	
3	<input type="checkbox"/>	0.001	0.002	46.66	0.0000	P	13.6	99.0
4	<input type="checkbox"/>	0.002	0.004	55.32	0.0000	P	15.4	110.0
5	<input type="checkbox"/>	0.010	0.010	80.32	0.0000	P	5.5	-2.1
6	<input type="checkbox"/>	0.020	0.024	134.97	0.0000	P	7.7	19.4
7	<input type="checkbox"/>	0.200	0.208	890.19	0.0002	P	5.2	4.2
8	<input type="checkbox"/>	1.000	0.964	3816.45	0.0009	P	5.2	-3.6
9	<input type="checkbox"/>	2.000	2.017	7837.06	0.0018	P	1.0	0.9
10	<input type="checkbox"/>			59.99	0.0000	P	7.3	
11	<input type="checkbox"/>			49.32	0.0000	P	12.3	

$y = 8.8827E-004 * x + 8.2024E-006$

R = 0.9998

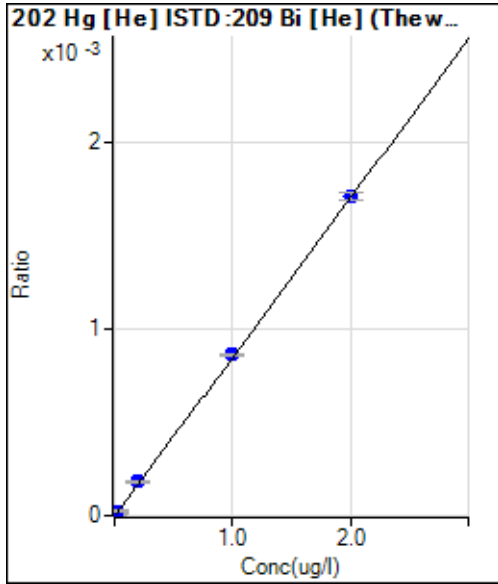
DL = 0.003261 ug/l

BEC = 0.009234 ug/l

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	15.67	0.0000	P	30.3	
2	<input type="checkbox"/>			13.00	0.0000	P	34.3	
3	<input type="checkbox"/>	0.001	0.000	15.00	0.0000	P	13.0	-109.6
4	<input type="checkbox"/>	0.002	0.002	20.67	0.0000	P	12.4	21.9
5	<input type="checkbox"/>	0.010	0.010	38.99	0.0000	P	9.4	1.0
6	<input type="checkbox"/>	0.020	0.023	66.32	0.0000	P	8.2	14.7
7	<input type="checkbox"/>	0.200	0.210	498.24	0.0002	P	4.9	4.8
8	<input type="checkbox"/>	1.000	1.003	2203.74	0.0009	P	1.5	0.3
9	<input type="checkbox"/>	2.000	1.998	4402.18	0.0017	P	2.7	-0.1
10	<input type="checkbox"/>			23.33	0.0000	P	34.9	
11	<input type="checkbox"/>			14.00	0.0000	P	13.7	

$y = 8.5279E-004 * x + 5.7216E-006$

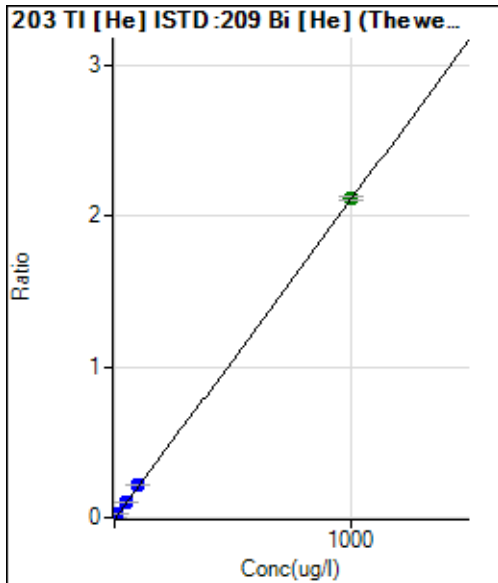
R = 1.0000

DL = 0.006095 ug/l

BEC = 0.006709 ug/l

Weight: 1/y

Min Conc: <None>



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	111.38	0.0000	P	26.8	
2	<input type="checkbox"/>	0.025	0.020	222.09	0.0001	P	8.1	-18.7
3	<input type="checkbox"/>	0.050	0.053	410.17	0.0002	P	6.6	6.9
4	<input type="checkbox"/>	0.100	0.119	777.67	0.0003	P	3.1	18.9
5	<input type="checkbox"/>	0.500	0.536	3203.01	0.0012	P	1.1	7.2
6	<input type="checkbox"/>	1.000	1.172	6634.99	0.0025	P	1.7	17.2
7	<input type="checkbox"/>	10.000	10.769	61787.56	0.0229	P	3.1	7.7
8	<input type="checkbox"/>	50.000	50.308	273124.62	0.1067	P	1.8	0.6
9	<input type="checkbox"/>	100.000	103.368	564531.03	0.2192	P	3.0	3.4
10	<input type="checkbox"/>	1000.000	999.640	5374805.67	2.1196	A	0.8	0.0
11	<input type="checkbox"/>			1283.92	0.0005	P	7.1	

$y = 0.0021 * x + 4.0886E-005$

R = 1.0000

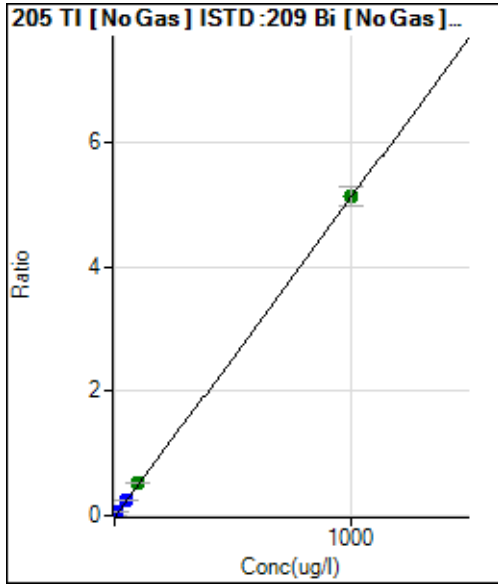
DL = 0.0155 ug/l

BEC = 0.01928 ug/l

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	473.35	0.0001	P	3.6	
2	<input type="checkbox"/>	0.025	0.024	1055.60	0.0002	P	2.6	-5.5
3	<input type="checkbox"/>	0.050	0.053	1734.57	0.0004	P	5.3	6.2
4	<input type="checkbox"/>	0.100	0.112	3118.17	0.0007	P	3.1	11.8
5	<input type="checkbox"/>	0.500	0.518	13119.87	0.0028	P	2.7	3.5
6	<input type="checkbox"/>	1.000	1.154	27693.30	0.0060	P	3.2	15.4
7	<input type="checkbox"/>	10.000	10.786	256058.02	0.0556	P	2.9	7.9
8	<input type="checkbox"/>	50.000	48.802	1108810.15	0.2511	P	3.9	-2.4
9	<input type="checkbox"/>	100.000	102.198	2289305.78	0.5258	A	2.8	2.2
10	<input type="checkbox"/>	1000.000	999.832	22053664.53	5.1431	A	6.0	0.0
11	<input type="checkbox"/>			6185.95	0.0013	P	13.2	

$y = 0.0051 * x + 9.8648E-005$

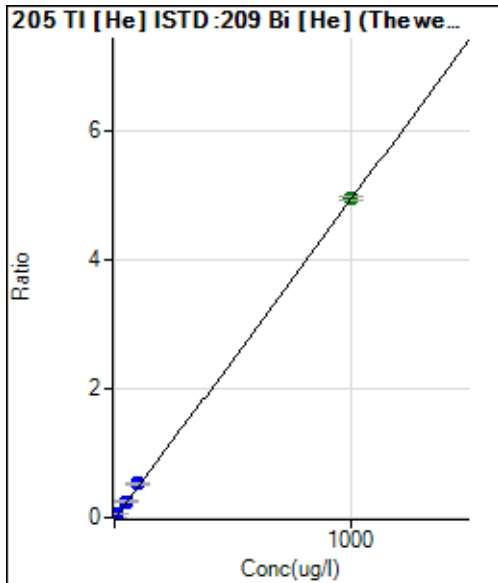
R = 1.0000

DL = 0.002079 ug/l

BEC = 0.01918 ug/l

Weight: 1/y

Min Conc: <None>



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	240.76	0.0001	P	13.1	
2	<input type="checkbox"/>	0.025	0.028	596.92	0.0002	P	8.0	11.7
3	<input type="checkbox"/>	0.050	0.054	947.75	0.0004	P	4.1	8.5
4	<input type="checkbox"/>	0.100	0.118	1776.84	0.0007	P	2.8	17.5
5	<input type="checkbox"/>	0.500	0.538	7480.45	0.0027	P	3.3	7.6
6	<input type="checkbox"/>	1.000	1.203	15865.80	0.0060	P	1.3	20.3
7	<input type="checkbox"/>	10.000	11.048	147874.86	0.0547	P	2.6	10.5
8	<input type="checkbox"/>	50.000	51.085	647095.92	0.2528	P	0.3	2.2
9	<input type="checkbox"/>	100.000	105.417	1343521.09	0.5216	P	1.8	5.4
10	<input type="checkbox"/>	1000.000	999.393	12536974.00	4.9440	A	0.9	-0.1
11	<input type="checkbox"/>			3078.93	0.0012	P	9.6	

$y = 0.0049 * x + 8.8135E-005$

R = 1.0000

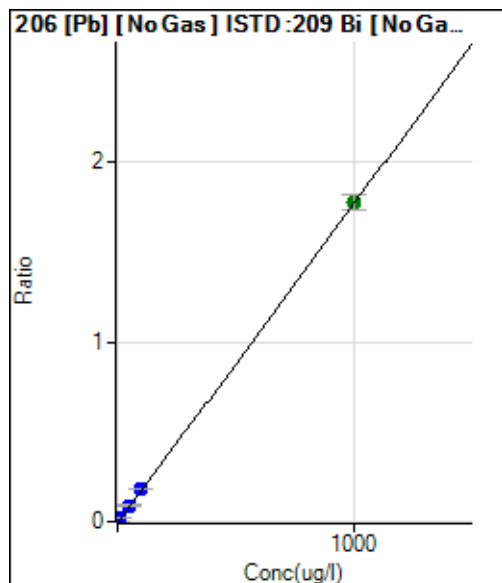
DL = 0.006985 ug/l

BEC = 0.01782 ug/l

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	128.89	0.0000	P	9.2	
2	<input type="checkbox"/>	0.025	0.023	321.12	0.0001	P	3.1	-9.9
3	<input type="checkbox"/>	0.050	0.051	553.35	0.0001	P	11.4	2.7
4	<input type="checkbox"/>	0.100	0.117	1087.83	0.0002	P	7.7	17.0
5	<input type="checkbox"/>	0.500	0.532	4627.50	0.0010	P	0.5	6.4
6	<input type="checkbox"/>	1.000	1.154	9549.05	0.0021	P	2.1	15.4
7	<input type="checkbox"/>	10.000	10.725	88079.40	0.0191	P	3.3	7.3
8	<input type="checkbox"/>	50.000	49.961	392644.18	0.0890	P	5.9	-0.1
9	<input type="checkbox"/>	100.000	103.223	800246.22	0.1838	P	0.7	3.2
10	<input type="checkbox"/>	1000.000	999.672	7629655.86	1.7796	A	5.1	0.0
11	<input type="checkbox"/>			305.56	0.0001	P	13.8	

$$y = 0.0018 * x + 2.6873E-005$$

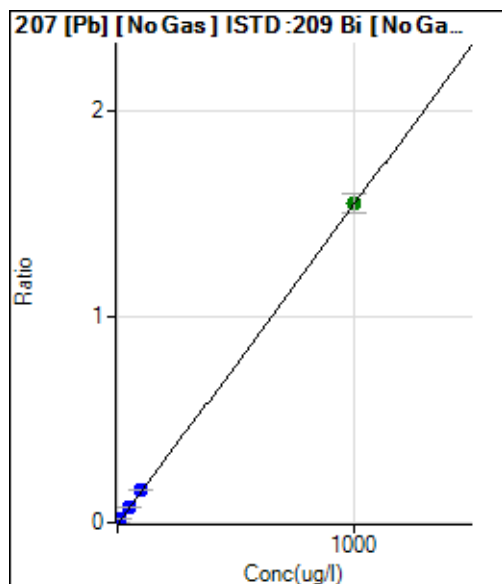
$$R = 1.0000$$

$$DL = 0.004146 \text{ ug/l}$$

$$BEC = 0.0151 \text{ ug/l}$$

Weight: 1/y

Min Conc: <None>



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	122.22	0.0000	P	7.9	
2	<input type="checkbox"/>	0.025	0.024	302.23	0.0001	P	16.4	-2.8
3	<input type="checkbox"/>	0.050	0.052	491.12	0.0001	P	8.6	3.2
4	<input type="checkbox"/>	0.100	0.110	907.81	0.0002	P	2.5	10.2
5	<input type="checkbox"/>	0.500	0.507	3853.91	0.0008	P	4.1	1.4
6	<input type="checkbox"/>	1.000	1.157	8340.45	0.0018	P	2.6	15.7
7	<input type="checkbox"/>	10.000	10.829	77399.52	0.0168	P	2.6	8.3
8	<input type="checkbox"/>	50.000	48.665	332830.23	0.0754	P	6.0	-2.7
9	<input type="checkbox"/>	100.000	103.004	694861.04	0.1596	P	1.5	3.0
10	<input type="checkbox"/>	1000.000	999.758	6637576.91	1.5488	A	5.8	0.0
11	<input type="checkbox"/>			277.78	0.0001	P	18.9	

$$y = 0.0015 * x + 2.5452E-005$$

$$R = 1.0000$$

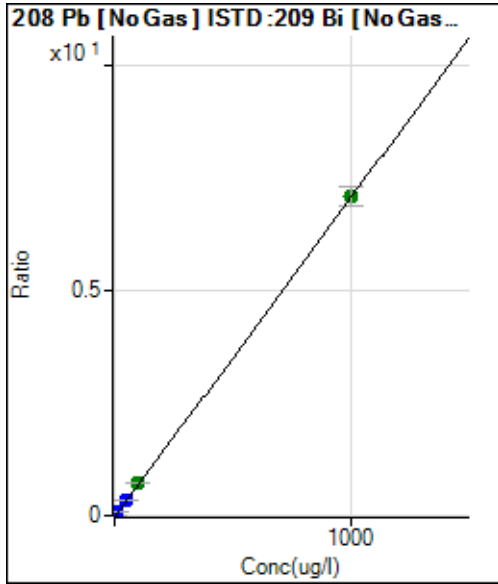
$$DL = 0.003905 \text{ ug/l}$$

$$BEC = 0.01643 \text{ ug/l}$$

Weight: 1/y

Min Conc: <None>

Calibration for 028SMPL.d



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	512.23	0.0001	P	2.4	
2	<input type="checkbox"/>	0.025	0.026	1385.60	0.0003	P	4.2	3.0
3	<input type="checkbox"/>	0.050	0.053	2256.76	0.0005	P	2.5	6.3
4	<input type="checkbox"/>	0.100	0.116	4301.42	0.0009	P	4.0	16.1
5	<input type="checkbox"/>	0.500	0.516	17880.31	0.0038	P	2.6	3.2
6	<input type="checkbox"/>	1.000	1.144	37695.42	0.0082	P	2.0	14.4
7	<input type="checkbox"/>	10.000	10.786	352659.03	0.0765	P	2.2	7.9
8	<input type="checkbox"/>	50.000	49.237	1541069.75	0.3490	P	4.2	-1.5
9	<input type="checkbox"/>	100.000	103.156	3183701.67	0.7312	A	1.2	3.2
10	<input type="checkbox"/>	1000.000	999.715	30364933.78	7.0851	A	5.9	0.0
11	<input type="checkbox"/>			1210.03	0.0003	P	3.0	

$$y = 0.0071 * x + 1.0670E-004$$

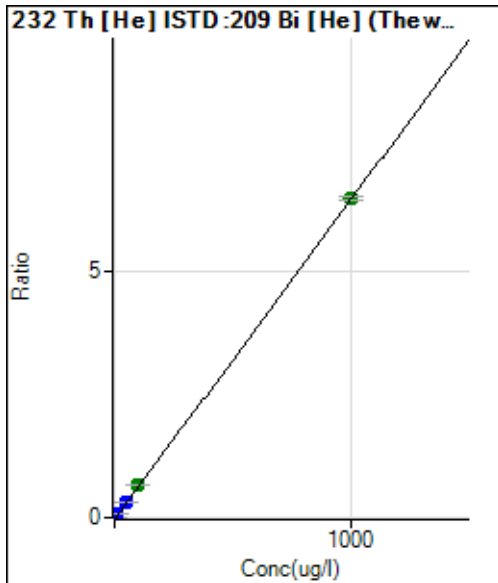
$$R = 1.0000$$

$$DL = 0.001066 \text{ ug/l}$$

$$BEC = 0.01506 \text{ ug/l}$$

$$\text{Weight: } 1/y$$

$$\text{Min Conc: } <\text{None}>$$



	R _j ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	166.74	0.0001	P	17.9	
2	<input type="checkbox"/>	0.025	0.017	456.86	0.0002	P	4.8	-31.0
3	<input type="checkbox"/>	0.050	0.038	809.02	0.0003	P	3.3	-24.8
4	<input type="checkbox"/>	0.100	0.083	1586.07	0.0006	P	4.3	-16.9
5	<input type="checkbox"/>	0.500	0.424	7620.62	0.0028	P	3.1	-15.2
6	<input type="checkbox"/>	1.000	1.028	17596.85	0.0067	P	1.4	2.8
7	<input type="checkbox"/>	10.000	10.180	177856.31	0.0658	P	1.2	1.8
8	<input type="checkbox"/>	50.000	48.556	803136.73	0.3138	P	2.0	-2.9
9	<input type="checkbox"/>	100.000	102.899	1712460.99	0.6649	A	2.1	2.9
10	<input type="checkbox"/>	1000.000	999.780	16379876.57	6.4593	A	1.1	0.0
11	<input type="checkbox"/>			1031.12	0.0004	P	4.5	

$$y = 0.0065 * x + 6.1236E-005$$

$$R = 1.0000$$

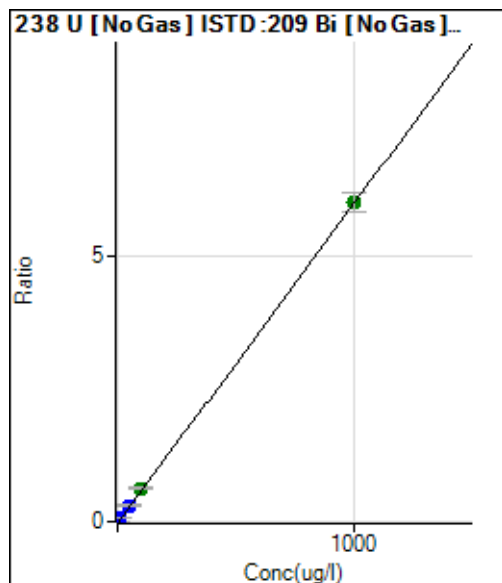
$$DL = 0.005102 \text{ ug/l}$$

$$BEC = 0.009478 \text{ ug/l}$$

$$\text{Weight: } 1/y$$

$$\text{Min Conc: } <\text{None}>$$

Calibration for 028SMPL.d



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	0.000	0.000	33.99	0.0000	P	16.1	
2	<input type="checkbox"/>	0.025	0.026	796.20	0.0002	P	4.2	5.9
3	<input type="checkbox"/>	0.050	0.055	1580.12	0.0003	P	5.3	10.4
4	<input type="checkbox"/>	0.100	0.117	3296.43	0.0007	P	2.2	17.4
5	<input type="checkbox"/>	0.500	0.512	14660.27	0.0031	P	2.9	2.5
6	<input type="checkbox"/>	1.000	1.136	31366.51	0.0068	P	1.5	13.6
7	<input type="checkbox"/>	10.000	11.036	305525.62	0.0663	P	2.3	10.4
8	<input type="checkbox"/>	50.000	50.455	1337928.84	0.3032	P	6.1	0.9
9	<input type="checkbox"/>	100.000	104.870	2744299.69	0.6301	A	2.3	4.9
10	<input type="checkbox"/>	1000.000	999.480	25733864.71	6.0052	A	6.0	-0.1
11	<input type="checkbox"/>			295.61	0.0001	P	12.2	

$$y = 0.0060 * x + 7.0925E-006$$

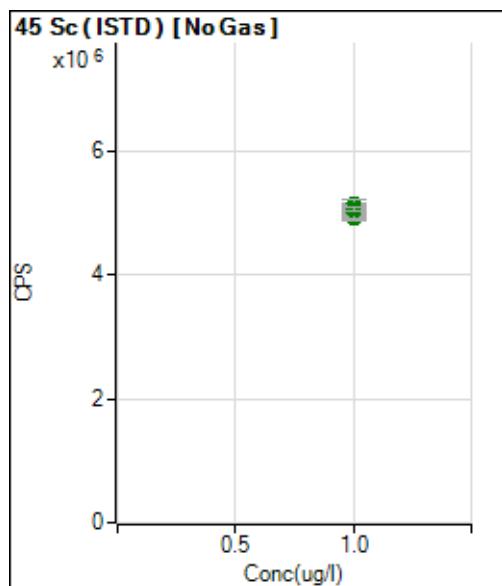
$$R = 1.0000$$

$$DL = 0.0005704 \text{ ug/l}$$

$$BEC = 0.00118 \text{ ug/l}$$

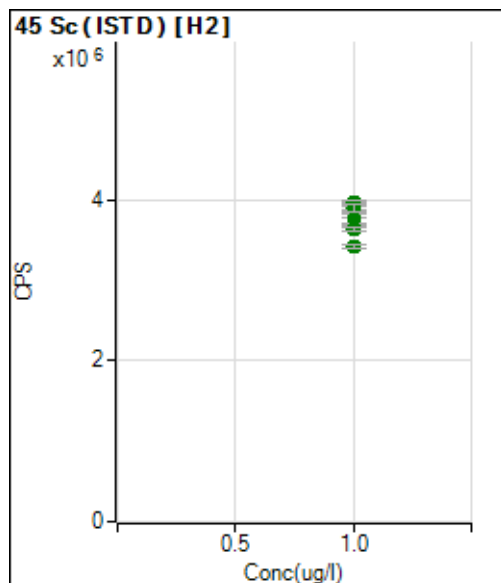
Weight: 1/y

Min Conc: <None>

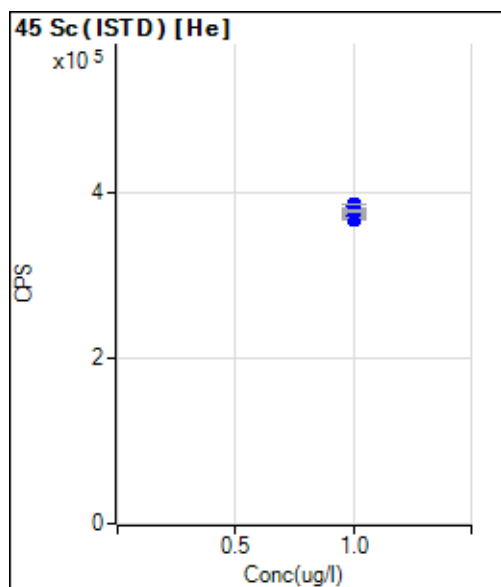


	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	1.000		4940529.69		A	1.8	
2	<input type="checkbox"/>	1.000		4939131.29		A	1.1	
3	<input type="checkbox"/>	1.000		4991782.14		A	2.4	
4	<input type="checkbox"/>	1.000		4968702.98		A	2.3	
5	<input type="checkbox"/>	1.000		4901965.52		A	1.2	
6	<input type="checkbox"/>	1.000		5078571.95		A	2.8	
7	<input type="checkbox"/>	1.000		4987316.28		A	2.3	
8	<input type="checkbox"/>	1.000		5149221.43		A	3.0	
9	<input type="checkbox"/>	1.000		5040561.76		A	2.8	
10	<input type="checkbox"/>	1.000		5012624.93		A	4.1	
11	<input type="checkbox"/>	1.000		5054621.31		A	1.1	

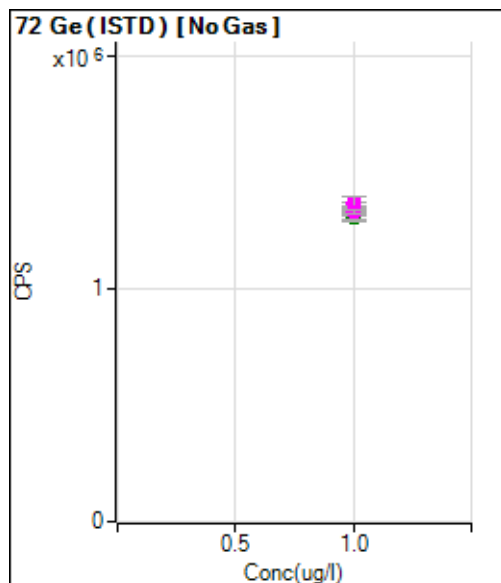
Calibration for 028SMPL.d



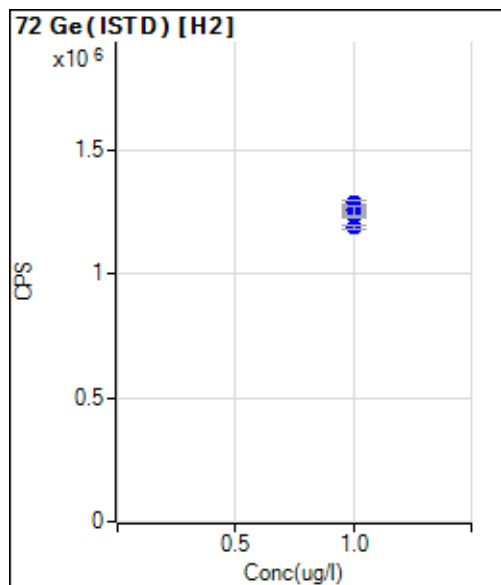
	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	1.000		3968260.59		A	1.8	
2	<input type="checkbox"/>	1.000		3949677.53		A	0.7	
3	<input type="checkbox"/>	1.000		3866155.16		A	0.4	
4	<input type="checkbox"/>	1.000		3889695.91		A	2.5	
5	<input type="checkbox"/>	1.000		3969200.46		A	0.7	
6	<input type="checkbox"/>	1.000		3813922.27		A	2.4	
7	<input type="checkbox"/>	1.000		3833667.46		A	0.1	
8	<input type="checkbox"/>	1.000		3701262.71		A	0.8	
9	<input type="checkbox"/>	1.000		3622633.47		A	1.3	
10	<input type="checkbox"/>	1.000		3427312.47		A	1.2	
11	<input type="checkbox"/>	1.000		3899489.54		A	2.7	



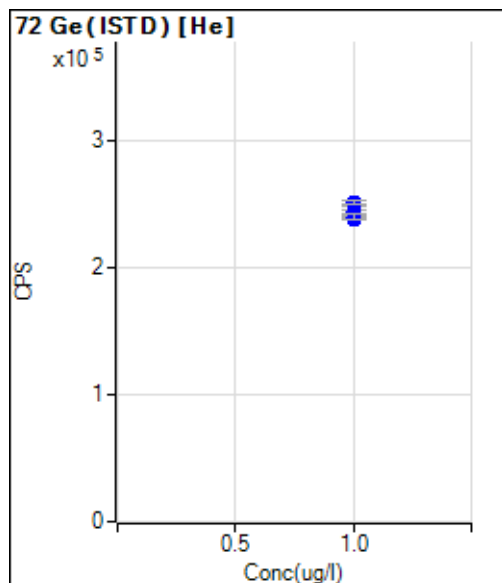
	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	1.000		368593.50		P	0.4	
2	<input type="checkbox"/>	1.000		369501.94		P	1.1	
3	<input type="checkbox"/>	1.000		367684.39		P	0.9	
4	<input type="checkbox"/>	1.000		369104.21		P	1.2	
5	<input type="checkbox"/>	1.000		373283.32		P	0.9	
6	<input type="checkbox"/>	1.000		371767.84		P	1.8	
7	<input type="checkbox"/>	1.000		376639.41		P	1.3	
8	<input type="checkbox"/>	1.000		383554.50		P	1.3	
9	<input type="checkbox"/>	1.000		385374.12		P	0.2	
10	<input type="checkbox"/>	1.000		383455.23		P	0.9	
11	<input type="checkbox"/>	1.000		377238.97		P	0.6	



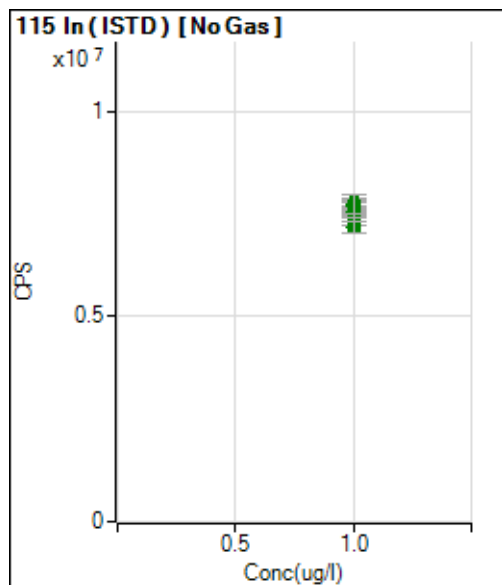
	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	1.000		1349055.62		A	0.8	
2	<input type="checkbox"/>	1.000		1302073.09		A	1.7	
3	<input type="checkbox"/>	1.000		1360879.15		M	1.5	
4	<input type="checkbox"/>	1.000		1329104.41		M	1.4	
5	<input type="checkbox"/>	1.000		1326264.85		A	0.5	
6	<input type="checkbox"/>	1.000		1341415.83		M	1.6	
7	<input type="checkbox"/>	1.000		1336415.12		A	1.0	
8	<input type="checkbox"/>	1.000		1342176.71		A	1.8	
9	<input type="checkbox"/>	1.000		1369691.34		M	3.1	
10	<input type="checkbox"/>	1.000		1320269.74		A	3.9	
11	<input type="checkbox"/>	1.000		1328340.88		M	0.7	



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	1.000		1291671.03		P	0.8	
2	<input type="checkbox"/>	1.000		1262085.50		P	0.3	
3	<input type="checkbox"/>	1.000		1271050.62		P	1.3	
4	<input type="checkbox"/>	1.000		1258721.38		P	1.7	
5	<input type="checkbox"/>	1.000		1251220.85		P	0.4	
6	<input type="checkbox"/>	1.000		1254548.61		P	1.0	
7	<input type="checkbox"/>	1.000		1255655.92		P	1.0	
8	<input type="checkbox"/>	1.000		1261420.37		P	0.5	
9	<input type="checkbox"/>	1.000		1233774.79		P	1.3	
10	<input type="checkbox"/>	1.000		1191422.22		P	1.5	
11	<input type="checkbox"/>	1.000		1258323.17		P	2.8	

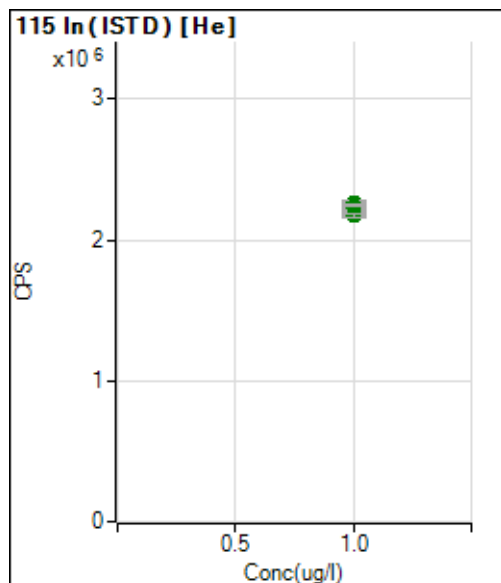


	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	1.000		241115.73		P	1.3	
2	<input type="checkbox"/>	1.000		240183.57		P	1.0	
3	<input type="checkbox"/>	1.000		240235.01		P	0.3	
4	<input type="checkbox"/>	1.000		238812.24		P	0.9	
5	<input type="checkbox"/>	1.000		240762.61		P	1.5	
6	<input type="checkbox"/>	1.000		240496.23		P	0.2	
7	<input type="checkbox"/>	1.000		244056.28		P	1.1	
8	<input type="checkbox"/>	1.000		249325.43		P	0.9	
9	<input type="checkbox"/>	1.000		250607.33		P	0.3	
10	<input type="checkbox"/>	1.000		251704.82		P	0.7	
11	<input type="checkbox"/>	1.000		240216.62		P	1.5	

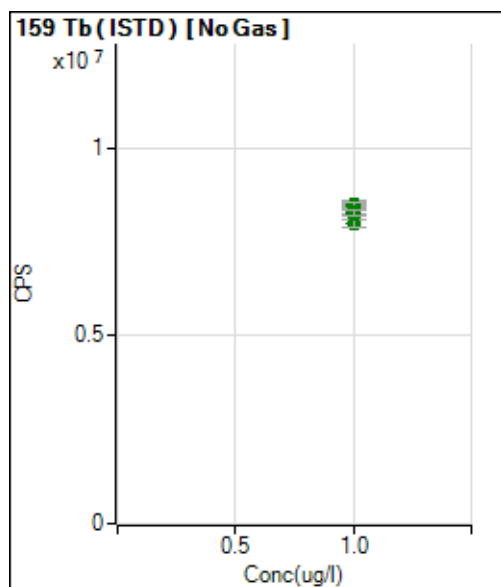


	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	1.000		7768132.51		A	2.4	
2	<input type="checkbox"/>	1.000		7647168.71		A	3.1	
3	<input type="checkbox"/>	1.000		7764445.01		A	1.9	
4	<input type="checkbox"/>	1.000		7515695.21		A	1.3	
5	<input type="checkbox"/>	1.000		7776907.61		A	1.9	
6	<input type="checkbox"/>	1.000		7716047.15		A	2.1	
7	<input type="checkbox"/>	1.000		7614842.03		A	1.0	
8	<input type="checkbox"/>	1.000		7532861.28		A	1.5	
9	<input type="checkbox"/>	1.000		7305627.40		A	2.7	
10	<input type="checkbox"/>	1.000		7175709.15		A	4.3	
11	<input type="checkbox"/>	1.000		7690792.89		A	7.1	

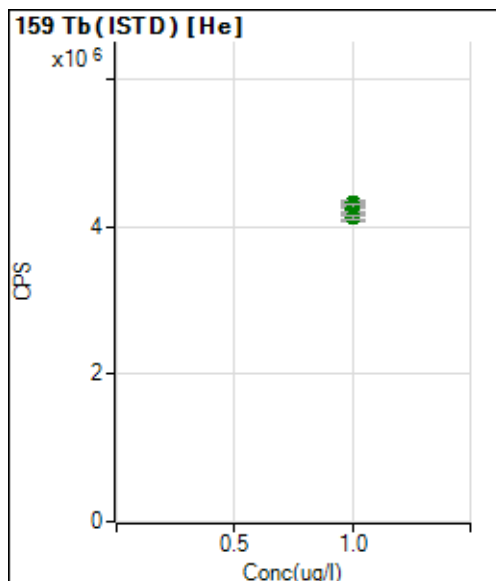
Calibration for 028SMPL.d



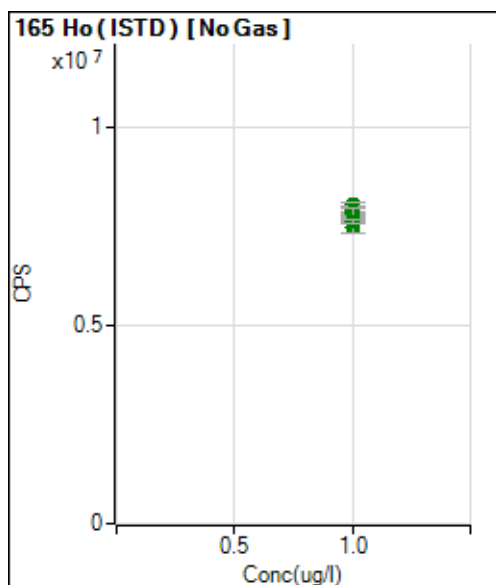
	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	1.000		2198770.86		A	2.1	
2	<input type="checkbox"/>	1.000		2259492.99		A	1.2	
3	<input type="checkbox"/>	1.000		2197676.84		A	0.3	
4	<input type="checkbox"/>	1.000		2214038.34		A	1.9	
5	<input type="checkbox"/>	1.000		2215135.51		A	0.5	
6	<input type="checkbox"/>	1.000		2205431.88		A	0.7	
7	<input type="checkbox"/>	1.000		2267125.02		A	1.0	
8	<input type="checkbox"/>	1.000		2225111.26		A	2.2	
9	<input type="checkbox"/>	1.000		2172258.59		A	1.4	
10	<input type="checkbox"/>	1.000		2170323.08		A	1.2	
11	<input type="checkbox"/>	1.000		2241178.38		A	0.6	



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	1.000		8462548.29		A	1.5	
2	<input type="checkbox"/>	1.000		8487390.63		A	1.4	
3	<input type="checkbox"/>	1.000		8472908.13		A	2.5	
4	<input type="checkbox"/>	1.000		8420315.12		A	1.0	
5	<input type="checkbox"/>	1.000		8349769.79		A	2.4	
6	<input type="checkbox"/>	1.000		8508473.90		A	2.2	
7	<input type="checkbox"/>	1.000		8376041.58		A	0.7	
8	<input type="checkbox"/>	1.000		8459904.29		A	2.9	
9	<input type="checkbox"/>	1.000		8292492.61		A	1.5	
10	<input type="checkbox"/>	1.000		8003140.20		A	2.6	
11	<input type="checkbox"/>	1.000		8254811.60		A	1.8	

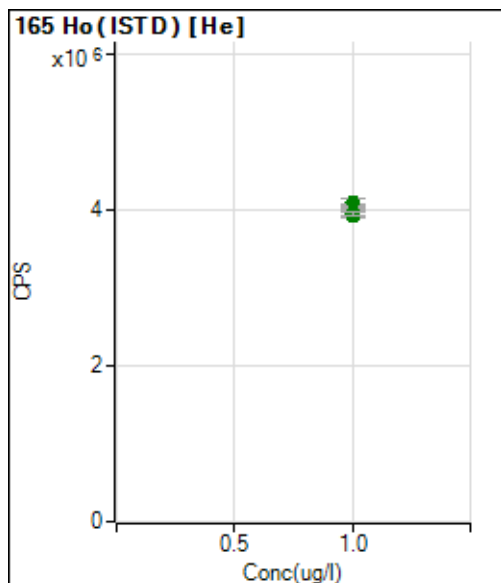


	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	1.000		4299210.15		A	1.2	
2	<input type="checkbox"/>	1.000		4293668.72		A	1.8	
3	<input type="checkbox"/>	1.000		4328387.82		A	1.6	
4	<input type="checkbox"/>	1.000		4224602.11		A	2.3	
5	<input type="checkbox"/>	1.000		4282472.69		A	0.8	
6	<input type="checkbox"/>	1.000		4175302.29		A	1.4	
7	<input type="checkbox"/>	1.000		4208486.57		A	2.3	
8	<input type="checkbox"/>	1.000		4257519.77		A	2.3	
9	<input type="checkbox"/>	1.000		4177273.17		A	1.6	
10	<input type="checkbox"/>	1.000		4123029.60		A	2.9	
11	<input type="checkbox"/>	1.000		4119370.32		A	0.9	

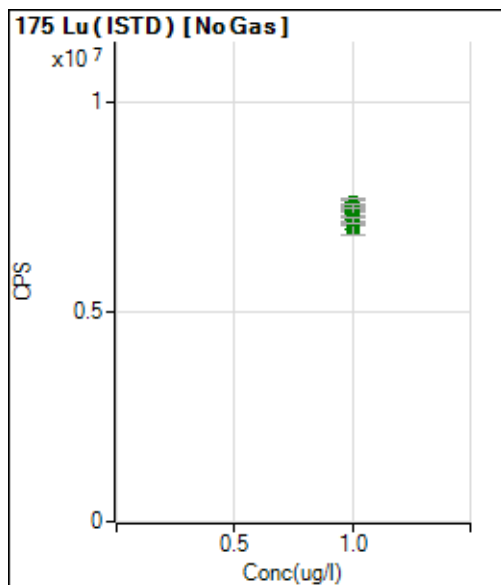


	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	1.000		8063995.43		A	1.2	
2	<input type="checkbox"/>	1.000		7910262.64		A	3.1	
3	<input type="checkbox"/>	1.000		7756214.07		A	1.1	
4	<input type="checkbox"/>	1.000		7852572.35		A	3.0	
5	<input type="checkbox"/>	1.000		7734697.65		A	3.2	
6	<input type="checkbox"/>	1.000		7873964.00		A	3.1	
7	<input type="checkbox"/>	1.000		7891406.65		A	1.5	
8	<input type="checkbox"/>	1.000		7812632.30		A	3.4	
9	<input type="checkbox"/>	1.000		7650951.46		A	2.0	
10	<input type="checkbox"/>	1.000		7471154.64		A	3.2	
11	<input type="checkbox"/>	1.000		7625984.88		A	1.7	

Calibration for 028SMPL.d

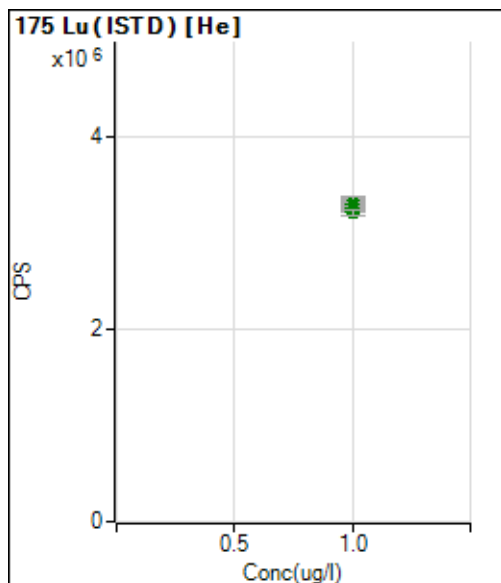


	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	1.000		4068594.39		A	0.7	
2	<input type="checkbox"/>	1.000		4102140.12		A	2.2	
3	<input type="checkbox"/>	1.000		4045490.35		A	1.5	
4	<input type="checkbox"/>	1.000		4026810.42		A	1.7	
5	<input type="checkbox"/>	1.000		4070212.62		A	0.3	
6	<input type="checkbox"/>	1.000		3956636.60		A	1.8	
7	<input type="checkbox"/>	1.000		4020995.86		A	1.5	
8	<input type="checkbox"/>	1.000		3965403.26		A	2.3	
9	<input type="checkbox"/>	1.000		3970860.04		A	2.6	
10	<input type="checkbox"/>	1.000		3939135.90		A	1.9	
11	<input type="checkbox"/>	1.000		3959320.25		A	1.4	

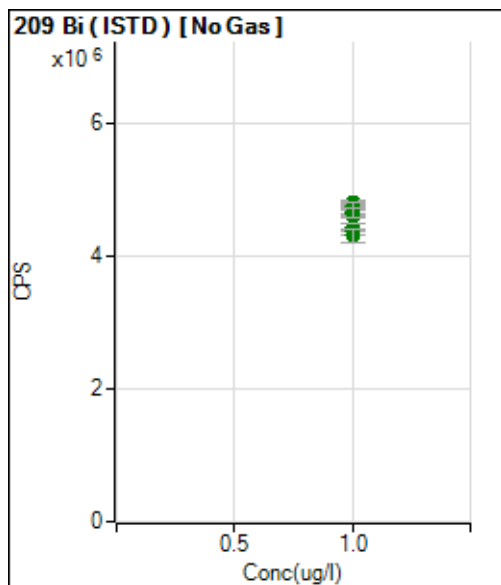


	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	1.000		7611509.94		A	2.0	
2	<input type="checkbox"/>	1.000		7468331.66		A	4.7	
3	<input type="checkbox"/>	1.000		7337784.14		A	1.6	
4	<input type="checkbox"/>	1.000		7380772.96		A	2.2	
5	<input type="checkbox"/>	1.000		7334311.09		A	2.0	
6	<input type="checkbox"/>	1.000		7410239.51		A	3.4	
7	<input type="checkbox"/>	1.000		7529619.25		A	0.9	
8	<input type="checkbox"/>	1.000		7358900.20		A	3.7	
9	<input type="checkbox"/>	1.000		7100925.31		A	1.7	
10	<input type="checkbox"/>	1.000		6971101.01		A	4.3	
11	<input type="checkbox"/>	1.000		7184750.02		A	1.8	

Calibration for 028SMPL.d

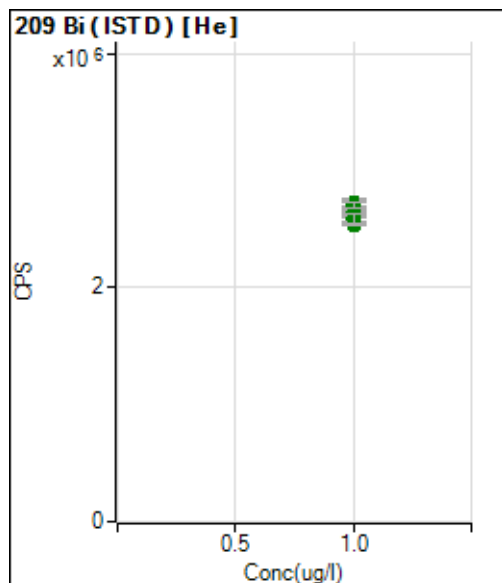


	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	1.000		3293986.55		A	0.6	
2	<input type="checkbox"/>	1.000		3293593.29		A	2.5	
3	<input type="checkbox"/>	1.000		3308709.32		A	2.0	
4	<input type="checkbox"/>	1.000		3250735.96		A	1.3	
5	<input type="checkbox"/>	1.000		3314624.61		A	1.9	
6	<input type="checkbox"/>	1.000		3244828.83		A	2.4	
7	<input type="checkbox"/>	1.000		3275978.52		A	0.7	
8	<input type="checkbox"/>	1.000		3299967.43		A	4.0	
9	<input type="checkbox"/>	1.000		3282057.65		A	2.5	
10	<input type="checkbox"/>	1.000		3248376.41		A	2.1	
11	<input type="checkbox"/>	1.000		3210656.01		A	1.8	



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	1.000		4800167.78		A	1.7	
2	<input type="checkbox"/>	1.000		4793248.75		A	1.3	
3	<input type="checkbox"/>	1.000		4668178.99		A	2.7	
4	<input type="checkbox"/>	1.000		4627852.11		A	2.0	
5	<input type="checkbox"/>	1.000		4752360.92		A	1.4	
6	<input type="checkbox"/>	1.000		4589468.52		A	1.2	
7	<input type="checkbox"/>	1.000		4607721.32		A	1.0	
8	<input type="checkbox"/>	1.000		4418600.25		A	3.0	
9	<input type="checkbox"/>	1.000		4354589.62		A	1.5	
10	<input type="checkbox"/>	1.000		4294424.80		A	5.4	
11	<input type="checkbox"/>	1.000		4639055.83		A	3.1	

Calibration for 028SMPL.d



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	De t	RSD	%RE
1	<input type="checkbox"/>	1.000		2729368.24		A	2.2	
2	<input type="checkbox"/>	1.000		2642177.89		A	2.9	
3	<input type="checkbox"/>	1.000		2658730.07		A	0.4	
4	<input type="checkbox"/>	1.000		2654820.63		A	2.5	
5	<input type="checkbox"/>	1.000		2720987.30		A	1.8	
6	<input type="checkbox"/>	1.000		2626942.89		A	2.7	
7	<input type="checkbox"/>	1.000		2702144.79		A	1.5	
8	<input type="checkbox"/>	1.000		2559652.03		A	1.0	
9	<input type="checkbox"/>	1.000		2576539.71		A	2.5	
10	<input type="checkbox"/>	1.000		2535893.46		A	0.7	
11	<input type="checkbox"/>	1.000		2595650.72		A	3.0	

ICPMS207-B Analytical Data

Sample Name Rinse
File Name 001BLKV.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 10:52:31
Sample Type BlkVrfy
Total Dilution 1.0000
Comment ICPMS-6020-W-D
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas		ug/l	5268.37
Be	9	45	1	No Gas		ug/l	162.64
B	11	45	1	No Gas		ug/l	1225.88
Na	23	45	3	He		ug/l	28722.94
Mg	24	45	3	He		ug/l	1081.23
Al	27	45	1	No Gas		ug/l	43564.92
Si	28	45	2	H2		ug/l	16698.01
K	39	72	3	He		ug/l	174279.48
Ca	40	72	2	H2		ug/l	267790.20
Ti	47	72	1	No Gas		ug/l	522.21
V	51	72	1	No Gas		ug/l	-243383.68
V	51	72	3	He		ug/l	39438.10
Cr	52	72	1	No Gas		ug/l	200195.91
Cr	52	72	3	He		ug/l	2643.59
Mn	55	72	1	No Gas		ug/l	14981.22
Mn	55	72	3	He		ug/l	297.28
Fe	56	72	2	H2		ug/l	22267.60
Fe	56	72	3	He		ug/l	10592.80
Co	59	72	1	No Gas		ug/l	518.98
Ni	60	72	1	No Gas		ug/l	1982.88
Ni	60	72	3	He		ug/l	310.01
Cu	63	72	1	No Gas		ug/l	3455.14
Cu	63	72	3	He		ug/l	858.52
Cu	65	72	1	No Gas		ug/l	3361.74
Zn	66	72	1	No Gas		ug/l	3457.41
Zn	66	72	3	He		ug/l	690.02
As	75	72	1	No Gas		ug/l	39343.95
As	75	72	3	He		ug/l	1592.39
Se	78	72	2	H2		ug/l	149.56
Br	79	72	1	No Gas		ug/l	7294.08
Br	79	72	2	H2		ug/l	5217.28
Se	82	72	1	No Gas		ug/l	2081.70
Kr	84	72	1	No Gas		ug/l	59403.18
Sr	88	72	1	No Gas		ug/l	798.44
Sr	88	72	3	He		ug/l	208.89
Mo	95	115	1	No Gas		ug/l	45.55
Mo	95	115	3	He		ug/l	13.33
Mo	98	115	1	No Gas		ug/l	17.68
Ag	107	115	1	No Gas		ug/l	46.02
Ag	109	115	1	No Gas		ug/l	29.35
Cd	111	115	1	No Gas		ug/l	32.69

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He		ug/l	4.67
Cd	114	115	1	No Gas		ug/l	20.13
Cd	114	115	3	He		ug/l	4.96
Sn	118	115	1	No Gas		ug/l	1357.38
Sn	118	115	3	He		ug/l	437.79
Sb	121	115	1	No Gas		ug/l	261.69
Sb	121	115	3	He		ug/l	79.68
Sb	123	115	1	No Gas		ug/l	193.35
Sb	123	115	3	He		ug/l	66.01
Ba	135	115	1	No Gas		ug/l	269.47
Ba	137	115	1	No Gas		ug/l	462.42
La	139	115	3	He		ug/l	17.78
Ce	140	115	3	He		ug/l	18.89
Hg	201	209	1	No Gas		ug/l	6.00
Hg	202	209	1	No Gas		ug/l	42.99
Hg	202	209	3	He		ug/l	7.67
Tl	203	209	3	He		ug/l	115.38
Tl	205	209	1	No Gas		ug/l	506.68
Tl	205	209	3	He		ug/l	270.11
[Pb]	206	209	1	No Gas		ug/l	128.89
[Pb]	207	209	1	No Gas		ug/l	93.33
Pb	208	209	1	No Gas		ug/l	482.23
Th	232	209	3	He		ug/l	141.39
U	238	209	1	No Gas		ug/l	45.66

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	5130622.38	
Sc	45	2	H2	4005446.75	
Sc	45	3	He	363240.72	
Ge	72	1	No Gas	1458757.65	
Ge	72	2	H2	1264915.55	
Ge	72	3	He	237019.74	
In	115	1	No Gas	8361029.31	
In	115	3	He	2279355.54	
Tb	159	1	No Gas	8441436.66	
Tb	159	3	He	4313728.32	
Ho	165	1	No Gas	7818983.65	
Ho	165	3	He	4068125.64	
Lu	175	1	No Gas	7367603.07	
Lu	175	3	He	3330321.77	
Bi	209	1	No Gas	5721075.17	
Bi	209	3	He	2834017.52	

ICPMS207-B Analytical Data

Sample Name Cal Blk
File Name 002CALB.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 10:58:42
Sample Type CalBlk
Total Dilution 1.0000
Comment ICPMS-6020-W-D
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	0.000	ug/l	4667.94
Be	9	45	1	No Gas	0.000	ug/l	169.64
B	11	45	1	No Gas	0.000	ug/l	1109.15
Na	23	45	3	He	0.000	ug/l	27065.42
Mg	24	45	3	He	0.000	ug/l	898.25
Al	27	45	1	No Gas	0.000	ug/l	29702.99
Si	28	45	2	H2	0.000	ug/l	16307.40
K	39	72	3	He	0.000	ug/l	176017.41
Ca	40	72	2	H2	0.000	ug/l	265446.57
Ti	47	72	1	No Gas	0.000	ug/l	442.12
V	51	72	1	No Gas	0.000	ug/l	-76872.86
V	51	72	3	He	0.000	ug/l	44240.55
Cr	52	72	1	No Gas	0.000	ug/l	219299.26
Cr	52	72	3	He	0.000	ug/l	2791.39
Mn	55	72	1	No Gas	0.000	ug/l	15201.11
Mn	55	72	3	He	0.000	ug/l	312.27
Fe	56	72	2	H2	0.000	ug/l	22135.56
Fe	56	72	3	He	0.000	ug/l	10768.14
Co	59	72	1	No Gas	0.000	ug/l	509.00
Ni	60	72	1	No Gas	0.000	ug/l	1610.24
Ni	60	72	3	He	0.000	ug/l	307.78
Cu	63	72	1	No Gas	0.000	ug/l	3115.59
Cu	63	72	3	He	0.000	ug/l	811.20
Cu	65	72	1	No Gas	0.000	ug/l	3022.20
Zn	66	72	1	No Gas	0.000	ug/l	3187.76
Zn	66	72	3	He	0.000	ug/l	617.79
As	75	72	1	No Gas	0.000	ug/l	38264.96
As	75	72	3	He	0.000	ug/l	1779.74
Se	78	72	2	H2	0.000	ug/l	157.56
Br	79	72	1	No Gas	0.000	ug/l	7680.14
Br	79	72	2	H2	0.000	ug/l	5842.96
Se	82	72	1	No Gas	0.000	ug/l	1645.74
Kr	84	72	1	No Gas		ug/l	46622.89
Sr	88	72	1	No Gas	0.000	ug/l	868.31
Sr	88	72	3	He	0.000	ug/l	187.78
Mo	95	115	1	No Gas	0.000	ug/l	41.11
Mo	95	115	3	He	0.000	ug/l	20.00
Mo	98	115	1	No Gas	0.000	ug/l	39.14
Ag	107	115	1	No Gas	0.000	ug/l	39.35
Ag	109	115	1	No Gas	0.000	ug/l	35.35
Cd	111	115	1	No Gas	0.000	ug/l	4.34

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	0.000	ug/l	3.78
Cd	114	115	1	No Gas	0.000	ug/l	-5.27
Cd	114	115	3	He	0.000	ug/l	7.92
Sn	118	115	1	No Gas	0.000	ug/l	1433.90
Sn	118	115	3	He	0.000	ug/l	373.34
Sb	121	115	1	No Gas	0.000	ug/l	211.69
Sb	121	115	3	He	0.000	ug/l	72.34
Sb	123	115	1	No Gas	0.000	ug/l	166.02
Sb	123	115	3	He	0.000	ug/l	63.01
Ba	135	115	1	No Gas	0.000	ug/l	252.84
Ba	137	115	1	No Gas	0.000	ug/l	462.43
La	139	115	3	He	0.000	ug/l	22.22
Ce	140	115	3	He	0.000	ug/l	20.00
Hg	201	209	1	No Gas	0.000	ug/l	8.67
Hg	202	209	1	No Gas	0.000	ug/l	39.32
Hg	202	209	3	He	0.000	ug/l	15.67
Tl	203	209	3	He	0.000	ug/l	111.38
Tl	205	209	1	No Gas	0.000	ug/l	473.35
Tl	205	209	3	He	0.000	ug/l	240.76
[Pb]	206	209	1	No Gas	0.000	ug/l	128.89
[Pb]	207	209	1	No Gas	0.000	ug/l	122.22
Pb	208	209	1	No Gas	0.000	ug/l	512.23
Th	232	209	3	He	0.000	ug/l	166.74
U	238	209	1	No Gas	0.000	ug/l	33.99

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	4940529.69	100.0
Sc	45	2	H2	3968260.59	100.0
Sc	45	3	He	368593.50	100.0
Ge	72	1	No Gas	1349055.62	100.0
Ge	72	2	H2	1291671.03	100.0
Ge	72	3	He	241115.73	100.0
In	115	1	No Gas	7768132.51	100.0
In	115	3	He	2198770.86	100.0
Tb	159	1	No Gas	8462548.29	100.0
Tb	159	3	He	4299210.15	100.0
Ho	165	1	No Gas	8063995.43	100.0
Ho	165	3	He	4068594.39	100.0
Lu	175	1	No Gas	7611509.94	100.0
Lu	175	3	He	3293986.55	100.0
Bi	209	1	No Gas	4800167.78	100.0
Bi	209	3	He	2729368.24	100.0

ICPMS207-B Analytical Data

Sample Name 0.025 ppb STD
File Name 003CAL.S.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 11:05:41
Sample Type CalStd
Total Dilution 1.0000
Comment ICPMS-6020B-Cal
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	0.299	ug/l	6418.61
Be	9	45	1	No Gas	0.017	ug/l	219.96
B	11	45	1	No Gas	-0.019	ug/l	1071.80
Na	23	45	3	He	8.578	ug/l	34723.30
Mg	24	45	3	He	7.539	ug/l	4381.95
Al	27	45	1	No Gas	0.046	ug/l	30487.78
Si	28	45	2	H2	-0.373	ug/l	15016.88
K	39	72	3	He	13.164	ug/l	182735.48
Ca	40	72	2	H2	14.853	ug/l	419743.79
Ti	47	72	1	No Gas	0.052	ug/l	538.89
V	51	72	1	No Gas	-4.226	ug/l	-184425.61
V	51	72	3	He	-0.368	ug/l	42265.96
Cr	52	72	1	No Gas	-0.255	ug/l	206047.20
Cr	52	72	3	He	0.038	ug/l	2983.65
Mn	55	72	1	No Gas	0.034	ug/l	15687.27
Mn	55	72	3	He	0.029	ug/l	412.59
Fe	56	72	2	H2	0.868	ug/l	39368.80
Fe	56	72	3	He	0.880	ug/l	14840.76
Co	59	72	1	No Gas	0.027	ug/l	1191.02
Ni	60	72	1	No Gas	0.033	ug/l	1746.65
Ni	60	72	3	He	0.027	ug/l	362.23
Cu	63	72	1	No Gas	0.033	ug/l	3470.48
Cu	63	72	3	He	0.032	ug/l	975.51
Cu	65	72	1	No Gas	0.015	ug/l	3016.20
Zn	66	72	1	No Gas	0.593	ug/l	5999.86
Zn	66	72	3	He	0.591	ug/l	1360.07
As	75	72	1	No Gas	-0.343	ug/l	34455.55
As	75	72	3	He	-0.041	ug/l	1716.87
Se	78	72	2	H2	0.010	ug/l	163.78
Br	79	72	1	No Gas	0.330	ug/l	10822.63
Br	79	72	2	H2	0.339	ug/l	8781.97
Se	82	72	1	No Gas	1.660	ug/l	2219.06
Kr	84	72	1	No Gas		ug/l	56248.39
Sr	88	72	1	No Gas	0.033	ug/l	2019.48
Sr	88	72	3	He	0.034	ug/l	374.45
Mo	95	115	1	No Gas	0.023	ug/l	215.56
Mo	95	115	3	He	0.020	ug/l	82.22
Mo	98	115	1	No Gas	0.024	ug/l	320.40
Ag	107	115	1	No Gas	0.011	ug/l	258.10
Ag	109	115	1	No Gas	0.010	ug/l	222.76
Cd	111	115	1	No Gas	0.029	ug/l	124.19

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	0.026	ug/l	48.00
Cd	114	115	1	No Gas	0.027	ug/l	248.14
Cd	114	115	3	He	0.026	ug/l	112.71
Sn	118	115	1	No Gas	0.194	ug/l	3739.77
Sn	118	115	3	He	0.205	ug/l	1212.28
Sb	121	115	1	No Gas	0.028	ug/l	749.43
Sb	121	115	3	He	0.028	ug/l	253.03
Sb	123	115	1	No Gas	0.025	ug/l	525.73
Sb	123	115	3	He	0.024	ug/l	185.69
Ba	135	115	1	No Gas	0.030	ug/l	349.31
Ba	137	115	1	No Gas	0.035	ug/l	662.04
La	139	115	3	He	0.030	ug/l	633.35
Ce	140	115	3	He	0.029	ug/l	642.24
Hg	201	209	1	No Gas	0.001	ug/l	10.00
Hg	202	209	1	No Gas	0.002	ug/l	46.32
Hg	202	209	3	He	-0.001	ug/l	13.00
Tl	203	209	3	He	0.020	ug/l	222.09
Tl	205	209	1	No Gas	0.024	ug/l	1055.60
Tl	205	209	3	He	0.028	ug/l	596.92
[Pb]	206	209	1	No Gas	0.023	ug/l	321.12
[Pb]	207	209	1	No Gas	0.024	ug/l	302.23
Pb	208	209	1	No Gas	0.026	ug/l	1385.60
Th	232	209	3	He	0.017	ug/l	456.86
U	238	209	1	No Gas	0.026	ug/l	796.20

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	4939131.29	100.0
Sc	45	2	H2	3949677.53	99.5
Sc	45	3	He	369501.94	100.2
Ge	72	1	No Gas	1302073.09	96.5
Ge	72	2	H2	1262085.50	97.7
Ge	72	3	He	240183.57	99.6
In	115	1	No Gas	7647168.71	98.4
In	115	3	He	2259492.99	102.8
Tb	159	1	No Gas	8487390.63	100.3
Tb	159	3	He	4293668.72	99.9
Ho	165	1	No Gas	7910262.64	98.1
Ho	165	3	He	4102140.12	100.8
Lu	175	1	No Gas	7468331.66	98.1
Lu	175	3	He	3293593.29	100.0
Bi	209	1	No Gas	4793248.75	99.9
Bi	209	3	He	2642177.89	96.8

ICPMS207-B Analytical Data

Sample Name 0.05 ppb STD
File Name 004CAL.S.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 11:12:15
Sample Type CalStd
Total Dilution 1.0000
Comment ICPMS-6020B-Cal
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	0.584	ug/l	8168.15
Be	9	45	1	No Gas	0.101	ug/l	481.39
B	11	45	1	No Gas	-0.025	ug/l	1070.47
Na	23	45	3	He	14.081	ug/l	39400.28
Mg	24	45	3	He	16.171	ug/l	8325.81
Al	27	45	1	No Gas	-0.230	ug/l	26060.54
Si	28	45	2	H2	-0.262	ug/l	15055.58
K	39	72	3	He	19.252	ug/l	186237.39
Ca	40	72	2	H2	18.016	ug/l	457111.97
Ti	47	72	1	No Gas	0.067	ug/l	595.61
V	51	72	1	No Gas	-3.186	ug/l	-165107.71
V	51	72	3	He	-0.075	ug/l	43714.64
Cr	52	72	1	No Gas	-0.236	ug/l	215730.97
Cr	52	72	3	He	0.087	ug/l	3244.82
Mn	55	72	1	No Gas	0.037	ug/l	16489.84
Mn	55	72	3	He	0.047	ug/l	476.91
Fe	56	72	2	H2	1.570	ug/l	54106.67
Fe	56	72	3	He	1.617	ug/l	18293.09
Co	59	72	1	No Gas	0.068	ug/l	2335.56
Ni	60	72	1	No Gas	0.015	ug/l	1713.37
Ni	60	72	3	He	0.057	ug/l	424.45
Cu	63	72	1	No Gas	0.026	ug/l	3535.19
Cu	63	72	3	He	0.053	ug/l	1088.16
Cu	65	72	1	No Gas	-0.020	ug/l	2911.47
Zn	66	72	1	No Gas	-0.012	ug/l	3151.32
Zn	66	72	3	He	0.095	ug/l	735.58
As	75	72	1	No Gas	1.074	ug/l	46160.08
As	75	72	3	He	0.021	ug/l	1802.14
Se	78	72	2	H2	0.045	ug/l	197.89
Br	79	72	1	No Gas	0.247	ug/l	10426.45
Br	79	72	2	H2	0.347	ug/l	8915.10
Se	82	72	1	No Gas	1.107	ug/l	2098.62
Kr	84	72	1	No Gas		ug/l	55582.05
Sr	88	72	1	No Gas	0.063	ug/l	3204.01
Sr	88	72	3	He	0.066	ug/l	548.90
Mo	95	115	1	No Gas	0.055	ug/l	458.90
Mo	95	115	3	He	0.057	ug/l	190.00
Mo	98	115	1	No Gas	0.050	ug/l	643.75
Ag	107	115	1	No Gas	0.021	ug/l	459.53
Ag	109	115	1	No Gas	0.022	ug/l	460.19
Cd	111	115	1	No Gas	0.057	ug/l	239.42

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	0.058	ug/l	98.89
Cd	114	115	1	No Gas	0.056	ug/l	529.84
Cd	114	115	3	He	0.055	ug/l	225.60
Sn	118	115	1	No Gas	0.050	ug/l	2046.09
Sn	118	115	3	He	0.080	ug/l	685.58
Sb	121	115	1	No Gas	0.050	ug/l	1200.51
Sb	121	115	3	He	0.051	ug/l	390.71
Sb	123	115	1	No Gas	0.051	ug/l	925.79
Sb	123	115	3	He	0.051	ug/l	314.04
Ba	135	115	1	No Gas	0.045	ug/l	405.87
Ba	137	115	1	No Gas	0.037	ug/l	688.65
La	139	115	3	He	0.054	ug/l	1102.27
Ce	140	115	3	He	0.056	ug/l	1208.95
Hg	201	209	1	No Gas	0.001	ug/l	10.00
Hg	202	209	1	No Gas	0.002	ug/l	46.66
Hg	202	209	3	He	0.000	ug/l	15.00
Tl	203	209	3	He	0.053	ug/l	410.17
Tl	205	209	1	No Gas	0.053	ug/l	1734.57
Tl	205	209	3	He	0.054	ug/l	947.75
[Pb]	206	209	1	No Gas	0.051	ug/l	553.35
[Pb]	207	209	1	No Gas	0.052	ug/l	491.12
Pb	208	209	1	No Gas	0.053	ug/l	2256.76
Th	232	209	3	He	0.038	ug/l	809.02
U	238	209	1	No Gas	0.055	ug/l	1580.12

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	4991782.14	101.0
Sc	45	2	H2	3866155.16	97.4
Sc	45	3	He	367684.39	99.8
Ge	72	1	No Gas	1360879.15	100.9
Ge	72	2	H2	1271050.62	98.4
Ge	72	3	He	240235.01	99.6
In	115	1	No Gas	7764445.01	100.0
In	115	3	He	2197676.84	100.0
Tb	159	1	No Gas	8472908.13	100.1
Tb	159	3	He	4328387.82	100.7
Ho	165	1	No Gas	7756214.07	96.2
Ho	165	3	He	4045490.35	99.4
Lu	175	1	No Gas	7337784.14	96.4
Lu	175	3	He	3308709.32	100.4
Bi	209	1	No Gas	4668178.99	97.3
Bi	209	3	He	2658730.07	97.4

ICPMS207-B Analytical Data

Sample Name 0.10 ppb STD
File Name 005CAL5.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 11:18:50
Sample Type CalStd
Total Dilution 1.0000
Comment ICPMS-6020B-Cal
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	1.395	ug/l	12902.00
Be	9	45	1	No Gas	0.113	ug/l	511.24
B	11	45	1	No Gas	0.006	ug/l	1128.50
Na	23	45	3	He	30.138	ug/l	53744.38
Mg	24	45	3	He	33.577	ug/l	16383.13
Al	27	45	1	No Gas	-0.328	ug/l	24251.91
Si	28	45	2	H2	-0.641	ug/l	13921.38
K	39	72	3	He	40.511	ug/l	197028.46
Ca	40	72	2	H2	36.607	ug/l	652837.10
Ti	47	72	1	No Gas	0.156	ug/l	777.48
V	51	72	1	No Gas	-2.938	ug/l	-153347.36
V	51	72	3	He	0.132	ug/l	44462.30
Cr	52	72	1	No Gas	-0.045	ug/l	214958.39
Cr	52	72	3	He	0.149	ug/l	3556.01
Mn	55	72	1	No Gas	0.121	ug/l	18644.83
Mn	55	72	3	He	0.125	ug/l	748.54
Fe	56	72	2	H2	3.314	ug/l	89138.04
Fe	56	72	3	He	3.336	ug/l	26179.65
Co	59	72	1	No Gas	0.143	ug/l	4238.91
Ni	60	72	1	No Gas	0.080	ug/l	2062.73
Ni	60	72	3	He	0.127	ug/l	563.35
Cu	63	72	1	No Gas	0.082	ug/l	4255.67
Cu	63	72	3	He	0.118	ug/l	1429.79
Cu	65	72	1	No Gas	0.019	ug/l	3108.25
Zn	66	72	1	No Gas	0.063	ug/l	3460.73
Zn	66	72	3	He	0.136	ug/l	782.25
As	75	72	1	No Gas	-0.187	ug/l	36322.83
As	75	72	3	He	0.092	ug/l	1889.89
Se	78	72	2	H2	0.121	ug/l	267.56
Br	79	72	1	No Gas	0.341	ug/l	11182.20
Br	79	72	2	H2	0.368	ug/l	9018.30
Se	82	72	1	No Gas	0.470	ug/l	1803.67
Kr	84	72	1	No Gas		ug/l	49334.30
Sr	88	72	1	No Gas	0.136	ug/l	5769.72
Sr	88	72	3	He	0.130	ug/l	891.14
Mo	95	115	1	No Gas	0.123	ug/l	947.82
Mo	95	115	3	He	0.104	ug/l	332.23
Mo	98	115	1	No Gas	0.114	ug/l	1370.56
Ag	107	115	1	No Gas	0.049	ug/l	985.77
Ag	109	115	1	No Gas	0.046	ug/l	891.72
Cd	111	115	1	No Gas	0.129	ug/l	522.53

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	0.114	ug/l	192.00
Cd	114	115	1	No Gas	0.120	ug/l	1105.71
Cd	114	115	3	He	0.121	ug/l	492.86
Sn	118	115	1	No Gas	0.116	ug/l	2751.50
Sn	118	115	3	He	0.145	ug/l	947.82
Sb	121	115	1	No Gas	0.113	ug/l	2379.11
Sb	121	115	3	He	0.111	ug/l	775.43
Sb	123	115	1	No Gas	0.113	ug/l	1805.63
Sb	123	115	3	He	0.108	ug/l	601.41
Ba	135	115	1	No Gas	0.124	ug/l	652.06
Ba	137	115	1	No Gas	0.123	ug/l	1161.08
La	139	115	3	He	0.123	ug/l	2496.91
Ce	140	115	3	He	0.118	ug/l	2533.58
Hg	201	209	1	No Gas	0.001	ug/l	9.67
Hg	202	209	1	No Gas	0.004	ug/l	55.32
Hg	202	209	3	He	0.002	ug/l	20.67
Tl	203	209	3	He	0.119	ug/l	777.67
Tl	205	209	1	No Gas	0.112	ug/l	3118.17
Tl	205	209	3	He	0.118	ug/l	1776.84
[Pb]	206	209	1	No Gas	0.117	ug/l	1087.83
[Pb]	207	209	1	No Gas	0.110	ug/l	907.81
Pb	208	209	1	No Gas	0.116	ug/l	4301.42
Th	232	209	3	He	0.083	ug/l	1586.07
U	238	209	1	No Gas	0.117	ug/l	3296.43

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	4968702.98	100.6
Sc	45	2	H2	3889695.91	98.0
Sc	45	3	He	369104.21	100.1
Ge	72	1	No Gas	1329104.41	98.5
Ge	72	2	H2	1258721.38	97.4
Ge	72	3	He	238812.24	99.0
In	115	1	No Gas	7515695.21	96.8
In	115	3	He	2214038.34	100.7
Tb	159	1	No Gas	8420315.12	99.5
Tb	159	3	He	4224602.11	98.3
Ho	165	1	No Gas	7852572.35	97.4
Ho	165	3	He	4026810.42	99.0
Lu	175	1	No Gas	7380772.96	97.0
Lu	175	3	He	3250735.96	98.7
Bi	209	1	No Gas	4627852.11	96.4
Bi	209	3	He	2654820.63	97.3

ICPMS207-B Analytical Data

Sample Name 0.5 ppb STD
File Name 006CAL.S.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 11:25:24
Sample Type CalStd
Total Dilution 1.0000
Comment ICPMS-6020B-Cal
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	6.882	ug/l	44598.48
Be	9	45	1	No Gas	0.556	ug/l	1821.08
B	11	45	1	No Gas	0.472	ug/l	2020.95
Na	23	45	3	He	139.574	ug/l	152202.44
Mg	24	45	3	He	151.568	ug/l	71601.25
Al	27	45	1	No Gas	0.037	ug/l	30122.46
Si	28	45	2	H2	0.715	ug/l	18659.79
K	39	72	3	He	149.208	ug/l	259917.31
Ca	40	72	2	H2	161.287	ug/l	1983536.74
Ti	47	72	1	No Gas	0.565	ug/l	1673.45
V	51	72	1	No Gas	-0.378	ug/l	-85999.21
V	51	72	3	He	0.486	ug/l	46553.16
Cr	52	72	1	No Gas	0.511	ug/l	227078.39
Cr	52	72	3	He	0.611	ug/l	6053.50
Mn	55	72	1	No Gas	0.592	ug/l	32938.15
Mn	55	72	3	He	0.574	ug/l	2346.39
Fe	56	72	2	H2	14.891	ug/l	323280.47
Fe	56	72	3	He	14.989	ug/l	81018.18
Co	59	72	1	No Gas	0.583	ug/l	15670.68
Ni	60	72	1	No Gas	0.550	ug/l	4827.92
Ni	60	72	3	He	0.560	ug/l	1457.86
Cu	63	72	1	No Gas	0.546	ug/l	10947.84
Cu	63	72	3	He	0.582	ug/l	3909.41
Cu	65	72	1	No Gas	0.457	ug/l	6121.75
Zn	66	72	1	No Gas	0.461	ug/l	5450.43
Zn	66	72	3	He	0.573	ug/l	1340.07
As	75	72	1	No Gas	0.122	ug/l	38412.00
As	75	72	3	He	0.526	ug/l	2509.37
Se	78	72	2	H2	0.550	ug/l	667.46
Br	79	72	1	No Gas	0.371	ug/l	11465.16
Br	79	72	2	H2	0.341	ug/l	8728.68
Se	82	72	1	No Gas	1.780	ug/l	2304.74
Kr	84	72	1	No Gas		ug/l	52041.62
Sr	88	72	1	No Gas	0.613	ug/l	22969.39
Sr	88	72	3	He	0.579	ug/l	3352.63
Mo	95	115	1	No Gas	0.495	ug/l	3838.32
Mo	95	115	3	He	0.543	ug/l	1656.77
Mo	98	115	1	No Gas	0.496	ug/l	6031.67
Ag	107	115	1	No Gas	0.207	ug/l	4207.65
Ag	109	115	1	No Gas	0.202	ug/l	3914.12
Cd	111	115	1	No Gas	0.550	ug/l	2288.35

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	0.550	ug/l	912.58
Cd	114	115	1	No Gas	0.517	ug/l	4931.42
Cd	114	115	3	He	0.531	ug/l	2135.66
Sn	118	115	1	No Gas	0.504	ug/l	7600.34
Sn	118	115	3	He	0.509	ug/l	2389.11
Sb	121	115	1	No Gas	0.493	ug/l	10004.89
Sb	121	115	3	He	0.501	ug/l	3254.04
Sb	123	115	1	No Gas	0.490	ug/l	7533.11
Sb	123	115	3	He	0.500	ug/l	2546.16
Ba	135	115	1	No Gas	0.553	ug/l	2132.62
Ba	137	115	1	No Gas	0.532	ug/l	3659.90
La	139	115	3	He	0.533	ug/l	10777.56
Ce	140	115	3	He	0.528	ug/l	11323.56
Hg	201	209	1	No Gas	0.008	ug/l	23.33
Hg	202	209	1	No Gas	0.010	ug/l	80.32
Hg	202	209	3	He	0.010	ug/l	38.99
Tl	203	209	3	He	0.536	ug/l	3203.01
Tl	205	209	1	No Gas	0.518	ug/l	13119.87
Tl	205	209	3	He	0.538	ug/l	7480.45
[Pb]	206	209	1	No Gas	0.532	ug/l	4627.50
[Pb]	207	209	1	No Gas	0.507	ug/l	3853.91
Pb	208	209	1	No Gas	0.516	ug/l	17880.31
Th	232	209	3	He	0.424	ug/l	7620.62
U	238	209	1	No Gas	0.512	ug/l	14660.27

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	4901965.52	99.2
Sc	45	2	H2	3969200.46	100.0
Sc	45	3	He	373283.32	101.3
Ge	72	1	No Gas	1326264.85	98.3
Ge	72	2	H2	1251220.85	96.9
Ge	72	3	He	240762.61	99.9
In	115	1	No Gas	7776907.61	100.1
In	115	3	He	2215135.51	100.7
Tb	159	1	No Gas	8349769.79	98.7
Tb	159	3	He	4282472.69	99.6
Ho	165	1	No Gas	7734697.65	95.9
Ho	165	3	He	4070212.62	100.0
Lu	175	1	No Gas	7334311.09	96.4
Lu	175	3	He	3314624.61	100.6
Bi	209	1	No Gas	4752360.92	99.0
Bi	209	3	He	2720987.30	99.7

ICPMS207-B Analytical Data

Sample Name 1 ppb STD
File Name 007CAL.S.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 11:31:58
Sample Type CalStd
Total Dilution 1.0000
Comment ICPMS-6020B-Cal
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	14.857	ug/l	94157.94
Be	9	45	1	No Gas	1.136	ug/l	3670.38
B	11	45	1	No Gas	0.995	ug/l	3148.26
Na	23	45	3	He	303.309	ug/l	297349.19
Mg	24	45	3	He	322.286	ug/l	150606.53
Al	27	45	1	No Gas	0.538	ug/l	39992.12
Si	28	45	2	H2	3.197	ug/l	25749.69
K	39	72	3	He	321.946	ug/l	356951.92
Ca	40	72	2	H2	331.832	ug/l	3819507.34
Ti	47	72	1	No Gas	1.173	ug/l	3038.38
V	51	72	1	No Gas	4.321	ug/l	40148.70
V	51	72	3	He	1.054	ug/l	49290.85
Cr	52	72	1	No Gas	1.061	ug/l	242090.69
Cr	52	72	3	He	1.242	ug/l	9417.51
Mn	55	72	1	No Gas	1.242	ug/l	53260.67
Mn	55	72	3	He	1.267	ug/l	4799.50
Fe	56	72	2	H2	32.026	ug/l	672425.74
Fe	56	72	3	He	32.115	ug/l	161132.88
Co	59	72	1	No Gas	1.262	ug/l	33751.93
Ni	60	72	1	No Gas	1.166	ug/l	8558.88
Ni	60	72	3	He	1.241	ug/l	2852.52
Cu	63	72	1	No Gas	1.216	ug/l	20834.49
Cu	63	72	3	He	1.300	ug/l	7731.16
Cu	65	72	1	No Gas	1.136	ug/l	10917.80
Zn	66	72	1	No Gas	1.059	ug/l	8551.94
Zn	66	72	3	He	1.160	ug/l	2079.05
As	75	72	1	No Gas	1.555	ug/l	48835.54
As	75	72	3	He	1.180	ug/l	3414.47
Se	78	72	2	H2	1.174	ug/l	1254.50
Br	79	72	1	No Gas	0.298	ug/l	10825.97
Br	79	72	2	H2	0.324	ug/l	8595.54
Se	82	72	1	No Gas	2.235	ug/l	2507.90
Kr	84	72	1	No Gas		ug/l	55002.70
Sr	88	72	1	No Gas	1.273	ug/l	47320.50
Sr	88	72	3	He	1.246	ug/l	6989.52
Mo	95	115	1	No Gas	1.078	ug/l	8230.20
Mo	95	115	3	He	1.136	ug/l	3424.88
Mo	98	115	1	No Gas	1.099	ug/l	13208.88
Ag	107	115	1	No Gas	0.440	ug/l	8846.99
Ag	109	115	1	No Gas	0.454	ug/l	8665.47
Cd	111	115	1	No Gas	1.196	ug/l	4929.47

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	1.196	ug/l	1971.80
Cd	114	115	1	No Gas	1.123	ug/l	10635.35
Cd	114	115	3	He	1.180	ug/l	4714.91
Sn	118	115	1	No Gas	1.027	ug/l	13879.48
Sn	118	115	3	He	1.103	ug/l	4713.04
Sb	121	115	1	No Gas	1.081	ug/l	21511.88
Sb	121	115	3	He	1.111	ug/l	7100.17
Sb	123	115	1	No Gas	1.083	ug/l	16294.72
Sb	123	115	3	He	1.109	ug/l	5545.65
Ba	135	115	1	No Gas	1.191	ug/l	4268.87
Ba	137	115	1	No Gas	1.187	ug/l	7530.47
La	139	115	3	He	1.156	ug/l	23246.14
Ce	140	115	3	He	1.134	ug/l	24169.98
Hg	201	209	1	No Gas	0.023	ug/l	49.99
Hg	202	209	1	No Gas	0.024	ug/l	134.97
Hg	202	209	3	He	0.023	ug/l	66.32
Tl	203	209	3	He	1.172	ug/l	6634.99
Tl	205	209	1	No Gas	1.154	ug/l	27693.30
Tl	205	209	3	He	1.203	ug/l	15865.80
[Pb]	206	209	1	No Gas	1.154	ug/l	9549.05
[Pb]	207	209	1	No Gas	1.157	ug/l	8340.45
Pb	208	209	1	No Gas	1.144	ug/l	37695.42
Th	232	209	3	He	1.028	ug/l	17596.85
U	238	209	1	No Gas	1.136	ug/l	31366.51

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	5078571.95	102.8
Sc	45	2	H2	3813922.27	96.1
Sc	45	3	He	371767.84	100.9
Ge	72	1	No Gas	1341415.83	99.4
Ge	72	2	H2	1254548.61	97.1
Ge	72	3	He	240496.23	99.7
In	115	1	No Gas	7716047.15	99.3
In	115	3	He	2205431.88	100.3
Tb	159	1	No Gas	8508473.90	100.5
Tb	159	3	He	4175302.29	97.1
Ho	165	1	No Gas	7873964.00	97.6
Ho	165	3	He	3956636.60	97.2
Lu	175	1	No Gas	7410239.51	97.4
Lu	175	3	He	3244828.83	98.5
Bi	209	1	No Gas	4589468.52	95.6
Bi	209	3	He	2626942.89	96.2

ICPMS207-B Analytical Data

Sample Name 10 ppb STD
File Name 008CAL.S.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 11:38:31
Sample Type CalStd
Total Dilution 1.0000
Comment ICPMS-6020B-Cal
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	145.005	ug/l	861650.07
Be	9	45	1	No Gas	11.517	ug/l	34987.43
B	11	45	1	No Gas	11.213	ug/l	23332.60
Na	23	45	3	He	2906.198	ug/l	2649492.29
Mg	24	45	3	He	2934.818	ug/l	1382068.09
Al	27	45	1	No Gas	10.906	ug/l	218237.17
Si	28	45	2	H2	41.866	ug/l	148394.39
K	39	72	3	He	2944.950	ug/l	1861559.61
Ca	40	72	2	H2	3080.375	ug/l	33346747.65
Ti	47	72	1	No Gas	10.795	ug/l	24272.62
V	51	72	1	No Gas	11.596	ug/l	232598.02
V	51	72	3	He	10.124	ug/l	95099.93
Cr	52	72	1	No Gas	12.177	ug/l	492566.99
Cr	52	72	3	He	11.677	ug/l	66100.04
Mn	55	72	1	No Gas	11.961	ug/l	381099.31
Mn	55	72	3	He	11.667	ug/l	42245.51
Fe	56	72	2	H2	294.512	ug/l	6011806.13
Fe	56	72	3	He	296.513	ug/l	1419923.80
Co	59	72	1	No Gas	11.912	ug/l	313088.97
Ni	60	72	1	No Gas	12.023	ug/l	73086.81
Ni	60	72	3	He	11.931	ug/l	25144.94
Cu	63	72	1	No Gas	11.835	ug/l	175182.14
Cu	63	72	3	He	12.212	ug/l	66802.70
Cu	65	72	1	No Gas	11.580	ug/l	83393.11
Zn	66	72	1	No Gas	11.428	ug/l	61017.87
Zn	66	72	3	He	11.752	ug/l	15659.56
As	75	72	1	No Gas	13.125	ug/l	128889.23
As	75	72	3	He	11.415	ug/l	17890.53
Se	78	72	2	H2	11.290	ug/l	10756.42
Br	79	72	1	No Gas	0.340	ug/l	11222.17
Br	79	72	2	H2	0.389	ug/l	9188.03
Se	82	72	1	No Gas	12.023	ug/l	6298.97
Kr	84	72	1	No Gas		ug/l	57427.54
Sr	88	72	1	No Gas	12.154	ug/l	442932.85
Sr	88	72	3	He	11.388	ug/l	63278.60
Mo	95	115	1	No Gas	10.603	ug/l	79611.44
Mo	95	115	3	He	10.642	ug/l	32827.74
Mo	98	115	1	No Gas	10.753	ug/l	127281.00
Ag	107	115	1	No Gas	4.294	ug/l	84845.11
Ag	109	115	1	No Gas	4.266	ug/l	80058.00
Cd	111	115	1	No Gas	11.333	ug/l	46078.18

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	10.894	ug/l	18423.01
Cd	114	115	1	No Gas	10.847	ug/l	101454.97
Cd	114	115	3	He	10.810	ug/l	44331.69
Sn	118	115	1	No Gas	10.235	ug/l	123888.77
Sn	118	115	3	He	10.066	ug/l	41084.25
Sb	121	115	1	No Gas	10.428	ug/l	202955.32
Sb	121	115	3	He	10.244	ug/l	66655.92
Sb	123	115	1	No Gas	10.432	ug/l	153597.68
Sb	123	115	3	He	10.293	ug/l	52376.78
Ba	135	115	1	No Gas	11.500	ug/l	38550.43
Ba	137	115	1	No Gas	11.037	ug/l	65366.95
La	139	115	3	He	10.469	ug/l	216134.31
Ce	140	115	3	He	10.645	ug/l	233037.67
Hg	201	209	1	No Gas	0.202	ug/l	374.27
Hg	202	209	1	No Gas	0.208	ug/l	890.19
Hg	202	209	3	He	0.210	ug/l	498.24
Tl	203	209	3	He	10.769	ug/l	61787.56
Tl	205	209	1	No Gas	10.786	ug/l	256058.02
Tl	205	209	3	He	11.048	ug/l	147874.86
[Pb]	206	209	1	No Gas	10.725	ug/l	88079.40
[Pb]	207	209	1	No Gas	10.829	ug/l	77399.52
Pb	208	209	1	No Gas	10.786	ug/l	352659.03
Th	232	209	3	He	10.180	ug/l	177856.31
U	238	209	1	No Gas	11.036	ug/l	305525.62

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	4987316.28	100.9
Sc	45	2	H2	3833667.46	96.6
Sc	45	3	He	376639.41	102.2
Ge	72	1	No Gas	1336415.12	99.1
Ge	72	2	H2	1255655.92	97.2
Ge	72	3	He	244056.28	101.2
In	115	1	No Gas	7614842.03	98.0
In	115	3	He	2267125.02	103.1
Tb	159	1	No Gas	8376041.58	99.0
Tb	159	3	He	4208486.57	97.9
Ho	165	1	No Gas	7891406.65	97.9
Ho	165	3	He	4020995.86	98.8
Lu	175	1	No Gas	7529619.25	98.9
Lu	175	3	He	3275978.52	99.5
Bi	209	1	No Gas	4607721.32	96.0
Bi	209	3	He	2702144.79	99.0

ICPMS207-B Analytical Data

Sample Name 50 ppb STD
File Name 009CAL.S.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 11:45:03
Sample Type CalStd
Total Dilution 1.0000
Comment ICPMS-6020B-Cal
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	612.641	ug/l	3739561.40
Be	9	45	1	No Gas	48.917	ug/l	152774.30
B	11	45	1	No Gas	49.065	ug/l	101497.95
Na	23	45	3	He	12530.515	ug/l	11542134.41
Mg	24	45	3	He	12654.464	ug/l	6066247.45
Al	27	45	1	No Gas	49.459	ug/l	911965.37
Si	28	45	2	H2	204.261	ug/l	639913.39
K	39	72	3	He	12687.451	ug/l	7591995.79
Ca	40	72	2	H2	13496.042	ug/l	145907313.84
Ti	47	72	1	No Gas	49.774	ug/l	110763.78
V	51	72	1	No Gas	47.003	ug/l	1178445.70
V	51	72	3	He	46.435	ug/l	281500.69
Cr	52	72	1	No Gas	50.118	ug/l	1356114.60
Cr	52	72	3	He	50.942	ug/l	284907.85
Mn	55	72	1	No Gas	50.550	ug/l	1568691.73
Mn	55	72	3	He	51.154	ug/l	188117.92
Fe	56	72	2	H2	1281.284	ug/l	26204018.09
Fe	56	72	3	He	1316.898	ug/l	6403064.45
Co	59	72	1	No Gas	51.214	ug/l	1349645.03
Ni	60	72	1	No Gas	51.842	ug/l	311052.29
Ni	60	72	3	He	51.683	ug/l	110209.40
Cu	63	72	1	No Gas	51.963	ug/l	761537.63
Cu	63	72	3	He	52.418	ug/l	290167.51
Cu	65	72	1	No Gas	51.227	ug/l	360057.76
Zn	66	72	1	No Gas	52.721	ug/l	271185.02
Zn	66	72	3	He	51.991	ug/l	68601.59
As	75	72	1	No Gas	45.805	ug/l	357080.79
As	75	72	3	He	50.806	ug/l	75000.62
Se	78	72	2	H2	49.749	ug/l	47095.93
Br	79	72	1	No Gas	0.602	ug/l	14085.72
Br	79	72	2	H2	0.675	ug/l	11818.04
Se	82	72	1	No Gas	51.426	ug/l	21684.39
Kr	84	72	1	No Gas		ug/l	67203.68
Sr	88	72	1	No Gas	51.721	ug/l	1889330.82
Sr	88	72	3	He	50.933	ug/l	288477.47
Mo	95	115	1	No Gas	48.428	ug/l	359471.28
Mo	95	115	3	He	48.585	ug/l	146933.92
Mo	98	115	1	No Gas	48.943	ug/l	572762.69
Ag	107	115	1	No Gas	19.086	ug/l	372830.53
Ag	109	115	1	No Gas	18.906	ug/l	350769.38
Cd	111	115	1	No Gas	50.256	ug/l	202070.22

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	49.425	ug/l	82002.41
Cd	114	115	1	No Gas	48.135	ug/l	445252.90
Cd	114	115	3	He	49.029	ug/l	197289.58
Sn	118	115	1	No Gas	53.469	ug/l	634278.93
Sn	118	115	3	He	54.875	ug/l	218101.01
Sb	121	115	1	No Gas	49.174	ug/l	945822.56
Sb	121	115	3	He	49.491	ug/l	315709.95
Sb	123	115	1	No Gas	49.024	ug/l	713264.02
Sb	123	115	3	He	49.485	ug/l	246868.82
Ba	135	115	1	No Gas	51.350	ug/l	169393.99
Ba	137	115	1	No Gas	50.358	ug/l	293310.39
La	139	115	3	He	49.285	ug/l	998521.61
Ce	140	115	3	He	49.368	ug/l	1060408.03
Hg	201	209	1	No Gas	0.983	ug/l	1716.10
Hg	202	209	1	No Gas	0.964	ug/l	3816.45
Hg	202	209	3	He	1.003	ug/l	2203.74
Tl	203	209	3	He	50.308	ug/l	273124.62
Tl	205	209	1	No Gas	48.802	ug/l	1108810.15
Tl	205	209	3	He	51.085	ug/l	647095.92
[Pb]	206	209	1	No Gas	49.961	ug/l	392644.18
[Pb]	207	209	1	No Gas	48.665	ug/l	332830.23
Pb	208	209	1	No Gas	49.237	ug/l	1541069.75
Th	232	209	3	He	48.556	ug/l	803136.73
U	238	209	1	No Gas	50.455	ug/l	1337928.84

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	5149221.43	104.2
Sc	45	2	H2	3701262.71	93.3
Sc	45	3	He	383554.50	104.1
Ge	72	1	No Gas	1342176.71	99.5
Ge	72	2	H2	1261420.37	97.7
Ge	72	3	He	249325.43	103.4
In	115	1	No Gas	7532861.28	97.0
In	115	3	He	2225111.26	101.2
Tb	159	1	No Gas	8459904.29	100.0
Tb	159	3	He	4257519.77	99.0
Ho	165	1	No Gas	7812632.30	96.9
Ho	165	3	He	3965403.26	97.5
Lu	175	1	No Gas	7358900.20	96.7
Lu	175	3	He	3299967.43	100.2
Bi	209	1	No Gas	4418600.25	92.1
Bi	209	3	He	2559652.03	93.8

ICPMS207-B Analytical Data

Sample Name 100 ppb STD
File Name 010CAL.S.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 11:51:31
Sample Type CalStd
Total Dilution 1.0000
Comment ICPMS-6020B-Cal
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	1281.486	ug/l	7651618.31
Be	9	45	1	No Gas	107.763	ug/l	329439.66
B	11	45	1	No Gas	106.170	ug/l	213796.26
Na	23	45	3	He	24813.240	ug/l	22933665.21
Mg	24	45	3	He	25229.474	ug/l	12149565.25
Al	27	45	1	No Gas	105.443	ug/l	1869903.93
Si	28	45	2	H2	397.698	ug/l	1205336.85
K	39	72	3	He	25249.804	ug/l	15004225.47
Ca	40	72	2	H2	26088.780	ug/l	275526450.08
Ti	47	72	1	No Gas	100.031	ug/l	226700.82
V	51	72	1	No Gas	104.016	ug/l	2753213.45
V	51	72	3	He	99.945	ug/l	556054.62
Cr	52	72	1	No Gas	100.372	ug/l	2547084.33
Cr	52	72	3	He	103.403	ug/l	578297.79
Mn	55	72	1	No Gas	100.248	ug/l	3158273.17
Mn	55	72	3	He	103.168	ug/l	381040.38
Fe	56	72	2	H2	2595.662	ug/l	51898733.16
Fe	56	72	3	He	2614.098	ug/l	12767594.85
Co	59	72	1	No Gas	101.043	ug/l	2716611.75
Ni	60	72	1	No Gas	106.225	ug/l	648736.96
Ni	60	72	3	He	104.219	ug/l	223079.38
Cu	63	72	1	No Gas	104.641	ug/l	1562090.20
Cu	63	72	3	He	105.419	ug/l	585731.06
Cu	65	72	1	No Gas	104.248	ug/l	744489.92
Zn	66	72	1	No Gas	104.553	ug/l	545516.45
Zn	66	72	3	He	103.719	ug/l	136920.28
As	75	72	1	No Gas	94.012	ug/l	706417.17
As	75	72	3	He	103.810	ug/l	152110.38
Se	78	72	2	H2	103.136	ug/l	95329.37
Br	79	72	1	No Gas	0.422	ug/l	12390.77
Br	79	72	2	H2	0.661	ug/l	11431.87
Se	82	72	1	No Gas	103.141	ug/l	42702.96
Kr	84	72	1	No Gas		ug/l	79200.44
Sr	88	72	1	No Gas	102.384	ug/l	3816189.98
Sr	88	72	3	He	104.064	ug/l	592287.51
Mo	95	115	1	No Gas	100.725	ug/l	724535.27
Mo	95	115	3	He	100.642	ug/l	297201.35
Mo	98	115	1	No Gas	100.452	ug/l	1139773.27
Ag	107	115	1	No Gas	40.427	ug/l	765617.97
Ag	109	115	1	No Gas	40.520	ug/l	728749.27
Cd	111	115	1	No Gas	108.327	ug/l	422292.18

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	103.544	ug/l	167731.99
Cd	114	115	1	No Gas	104.036	ug/l	933046.91
Cd	114	115	3	He	103.475	ug/l	406493.88
Sn	118	115	1	No Gas	98.242	ug/l	1128593.65
Sn	118	115	3	He	97.555	ug/l	378235.37
Sb	121	115	1	No Gas	100.370	ug/l	1871352.67
Sb	121	115	3	He	100.229	ug/l	624288.57
Sb	123	115	1	No Gas	100.444	ug/l	1416993.58
Sb	123	115	3	He	100.227	ug/l	488116.80
Ba	135	115	1	No Gas	109.436	ug/l	349876.59
Ba	137	115	1	No Gas	106.086	ug/l	598578.78
La	139	115	3	He	100.309	ug/l	1984151.78
Ce	140	115	3	He	100.250	ug/l	2102195.32
Hg	201	209	1	No Gas	2.008	ug/l	3451.76
Hg	202	209	1	No Gas	2.017	ug/l	7837.06
Hg	202	209	3	He	1.998	ug/l	4402.18
Tl	203	209	3	He	103.368	ug/l	564531.03
Tl	205	209	1	No Gas	102.198	ug/l	2289305.78
Tl	205	209	3	He	105.417	ug/l	1343521.09
[Pb]	206	209	1	No Gas	103.223	ug/l	800246.22
[Pb]	207	209	1	No Gas	103.004	ug/l	694861.04
Pb	208	209	1	No Gas	103.156	ug/l	3183701.67
Th	232	209	3	He	102.899	ug/l	1712460.99
U	238	209	1	No Gas	104.870	ug/l	2744299.69

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	5040561.76	102.0
Sc	45	2	H2	3622633.47	91.3
Sc	45	3	He	385374.12	104.6
Ge	72	1	No Gas	1369691.34	101.5
Ge	72	2	H2	1233774.79	95.5
Ge	72	3	He	250607.33	103.9
In	115	1	No Gas	7305627.40	94.0
In	115	3	He	2172258.59	98.8
Tb	159	1	No Gas	8292492.61	98.0
Tb	159	3	He	4177273.17	97.2
Ho	165	1	No Gas	7650951.46	94.9
Ho	165	3	He	3970860.04	97.6
Lu	175	1	No Gas	7100925.31	93.3
Lu	175	3	He	3282057.65	99.6
Bi	209	1	No Gas	4354589.62	90.7
Bi	209	3	He	2576539.71	94.4

ICPMS207-B Analytical Data

Sample Name 1000 ppb STD
File Name 011CAL.S.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 11:57:45
Sample Type CalStd
Total Dilution 1.0000
Comment ICPMS-6020B-Cal
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	2486.333	ug/l	14738523.74
Be	9	45	1	No Gas	999.263	ug/l	3031757.84
B	11	45	1	No Gas	999.418	ug/l	1989791.14
Na	23	45	3	He	50065.135	ug/l	46010473.76
Mg	24	45	3	He	49824.473	ug/l	23873872.87
Al	27	45	1	No Gas	999.474	ug/l	17346892.38
Si	28	45	2	H2	-0.419	ug/l	12898.07
K	39	72	3	He	49805.557	ug/l	29547060.67
Ca	40	72	2	H2	49177.073	ug/l	501445888.22
Ti	47	72	1	No Gas	7.742	ug/l	17321.21
V	51	72	1	No Gas	999.730	ug/l	26150806.52
V	51	72	3	He	1000.182	ug/l	5172936.66
Cr	52	72	1	No Gas	999.935	ug/l	22527404.94
Cr	52	72	3	He	999.595	ug/l	5589799.99
Mn	55	72	1	No Gas	999.928	ug/l	30222014.25
Mn	55	72	3	He	999.608	ug/l	3705225.66
Fe	56	72	2	H2	6004.409	ug/l	115898285.04
Fe	56	72	3	He	5988.616	ug/l	29361468.56
Co	59	72	1	No Gas	999.816	ug/l	25895076.56
Ni	60	72	1	No Gas	999.265	ug/l	5866113.50
Ni	60	72	3	He	999.474	ug/l	2145772.45
Cu	63	72	1	No Gas	999.419	ug/l	14347145.86
Cu	63	72	3	He	999.315	ug/l	5569166.11
Cu	65	72	1	No Gas	999.498	ug/l	6852350.28
Zn	66	72	1	No Gas	999.394	ug/l	4994996.12
Zn	66	72	3	He	999.511	ug/l	1319668.45
As	75	72	1	No Gas	1000.777	ug/l	6886574.26
As	75	72	3	He	999.564	ug/l	1454901.75
Se	78	72	2	H2	999.686	ug/l	890979.81
Br	79	72	1	No Gas	0.528	ug/l	13063.35
Br	79	72	2	H2	3.283	ug/l	33472.25
Se	82	72	1	No Gas	999.592	ug/l	384690.35
Kr	84	72	1	No Gas		ug/l	283477.70
Sr	88	72	1	No Gas	999.654	ug/l	35895114.03
Sr	88	72	3	He	999.533	ug/l	5711619.84
Mo	95	115	1	No Gas	0.049	ug/l	384.45
Mo	95	115	3	He	0.041	ug/l	141.12
Mo	98	115	1	No Gas	0.096	ug/l	1102.76
Ag	107	115	1	No Gas	260.707	ug/l	4859807.60
Ag	109	115	1	No Gas	263.450	ug/l	4626655.98
Cd	111	115	1	No Gas	999.141	ug/l	3822153.86

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	999.665	ug/l	1618225.03
Cd	114	115	1	No Gas	999.681	ug/l	8802311.75
Cd	114	115	3	He	999.693	ug/l	3924043.50
Sn	118	115	1	No Gas	0.048	ug/l	1873.17
Sn	118	115	3	He	0.062	ug/l	610.02
Sb	121	115	1	No Gas	0.068	ug/l	1447.89
Sb	121	115	3	He	0.059	ug/l	440.38
Sb	123	115	1	No Gas	0.091	ug/l	1405.55
Sb	123	115	3	He	0.058	ug/l	345.04
Ba	135	115	1	No Gas	998.974	ug/l	3132191.32
Ba	137	115	1	No Gas	999.363	ug/l	5532230.16
La	139	115	3	He	0.010	ug/l	215.56
Ce	140	115	3	He	0.020	ug/l	432.23
Hg	201	209	1	No Gas	0.004	ug/l	14.67
Hg	202	209	1	No Gas	0.007	ug/l	59.99
Hg	202	209	3	He	0.004	ug/l	23.33
Tl	203	209	3	He	999.640	ug/l	5374805.67
Tl	205	209	1	No Gas	999.832	ug/l	22053664.53
Tl	205	209	3	He	999.393	ug/l	12536974.00
[Pb]	206	209	1	No Gas	999.672	ug/l	7629655.86
[Pb]	207	209	1	No Gas	999.758	ug/l	6637576.91
Pb	208	209	1	No Gas	999.715	ug/l	30364933.78
Th	232	209	3	He	999.780	ug/l	16379876.57
U	238	209	1	No Gas	999.480	ug/l	25733864.71

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	5012624.93	101.5
Sc	45	2	H2	3427312.47	86.4
Sc	45	3	He	383455.23	104.0
Ge	72	1	No Gas	1320269.74	97.9
Ge	72	2	H2	1191422.22	92.2
Ge	72	3	He	251704.82	104.4
In	115	1	No Gas	7175709.15	92.4
In	115	3	He	2170323.08	98.7
Tb	159	1	No Gas	8003140.20	94.6
Tb	159	3	He	4123029.60	95.9
Ho	165	1	No Gas	7471154.64	92.6
Ho	165	3	He	3939135.90	96.8
Lu	175	1	No Gas	6971101.01	91.6
Lu	175	3	He	3248376.41	98.6
Bi	209	1	No Gas	4294424.80	89.5
Bi	209	3	He	2535893.46	92.9

ICPMS207-B Analytical Data

Sample Name 100 ppb Br STD
File Name 012CAL.S.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 12:03:29
Sample Type CalStd
Total Dilution 1.0000
Comment ICPMS-6020-W-D
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	0.740	ug/l	9211.15
Be	9	45	1	No Gas	-0.012	ug/l	136.97
B	11	45	1	No Gas	4.336	ug/l	9844.50
Na	23	45	3	He	4.012	ug/l	31323.61
Mg	24	45	3	He	0.238	ug/l	1031.33
Al	27	45	1	No Gas	-0.811	ug/l	16217.73
Si	28	45	2	H2	-2.278	ug/l	8681.34
K	39	72	3	He	582.827	ug/l	503248.90
Ca	40	72	2	H2	2.670	ug/l	287198.08
Ti	47	72	1	No Gas	0.050	ug/l	545.56
V	51	72	1	No Gas	2.363	ug/l	-13959.41
V	51	72	3	He	-2.390	ug/l	32378.82
Cr	52	72	1	No Gas	-1.293	ug/l	186865.43
Cr	52	72	3	He	0.021	ug/l	2893.64
Mn	55	72	1	No Gas	0.093	ug/l	17805.43
Mn	55	72	3	He	-0.002	ug/l	305.61
Fe	56	72	2	H2	0.125	ug/l	24100.58
Fe	56	72	3	He	0.425	ug/l	12711.62
Co	59	72	1	No Gas	0.011	ug/l	791.79
Ni	60	72	1	No Gas	0.022	ug/l	1716.70
Ni	60	72	3	He	-0.014	ug/l	278.89
Cu	63	72	1	No Gas	0.046	ug/l	3732.65
Cu	63	72	3	He	0.027	ug/l	953.18
Cu	65	72	1	No Gas	-0.080	ug/l	2421.85
Zn	66	72	1	No Gas	0.186	ug/l	4073.77
Zn	66	72	3	He	0.194	ug/l	860.03
As	75	72	1	No Gas	-1.059	ug/l	30307.35
As	75	72	3	He	-0.197	ug/l	1500.18
Se	78	72	2	H2	0.045	ug/l	196.11
Br	79	72	1	No Gas	100.000	ug/l	1064709.01
Br	79	72	2	H2	100.000	ug/l	908682.94
Se	82	72	1	No Gas	2.144	ug/l	2448.54
Kr	84	72	1	No Gas		ug/l	51763.72
Sr	88	72	1	No Gas	0.007	ug/l	1121.16
Sr	88	72	3	He	0.008	ug/l	228.89
Mo	95	115	1	No Gas	0.012	ug/l	132.22
Mo	95	115	3	He	0.007	ug/l	41.11
Mo	98	115	1	No Gas	0.005	ug/l	96.03
Ag	107	115	1	No Gas	0.074	ug/l	1508.69
Ag	109	115	1	No Gas	0.074	ug/l	1437.32
Cd	111	115	1	No Gas	0.019	ug/l	82.18

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	0.012	ug/l	23.55
Cd	114	115	1	No Gas	0.018	ug/l	162.23
Cd	114	115	3	He	0.012	ug/l	56.66
Sn	118	115	1	No Gas	0.178	ug/l	3563.39
Sn	118	115	3	He	0.242	ug/l	1350.07
Sb	121	115	1	No Gas	0.009	ug/l	383.04
Sb	121	115	3	He	0.008	ug/l	124.35
Sb	123	115	1	No Gas	0.008	ug/l	278.03
Sb	123	115	3	He	0.008	ug/l	106.68
Ba	135	115	1	No Gas	-0.002	ug/l	242.86
Ba	137	115	1	No Gas	-0.006	ug/l	422.51
La	139	115	3	He	0.001	ug/l	36.67
Ce	140	115	3	He	0.001	ug/l	40.00
Hg	201	209	1	No Gas	0.002	ug/l	12.33
Hg	202	209	1	No Gas	0.003	ug/l	49.32
Hg	202	209	3	He	0.000	ug/l	14.00
Tl	203	209	3	He	0.214	ug/l	1283.92
Tl	205	209	1	No Gas	0.240	ug/l	6185.95
Tl	205	209	3	He	0.222	ug/l	3078.93
[Pb]	206	209	1	No Gas	0.022	ug/l	305.56
[Pb]	207	209	1	No Gas	0.022	ug/l	277.78
Pb	208	209	1	No Gas	0.022	ug/l	1210.03
Th	232	209	3	He	0.052	ug/l	1031.12
U	238	209	1	No Gas	0.009	ug/l	295.61

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	5054621.31	102.3
Sc	45	2	H2	3899489.54	98.3
Sc	45	3	He	377238.97	102.3
Ge	72	1	No Gas	1328340.88	98.5
Ge	72	2	H2	1258323.17	97.4
Ge	72	3	He	240216.62	99.6
In	115	1	No Gas	7690792.89	99.0
In	115	3	He	2241178.38	101.9
Tb	159	1	No Gas	8254811.60	97.5
Tb	159	3	He	4119370.32	95.8
Ho	165	1	No Gas	7625984.88	94.6
Ho	165	3	He	3959320.25	97.3
Lu	175	1	No Gas	7184750.02	94.4
Lu	175	3	He	3210656.01	97.5
Bi	209	1	No Gas	4639055.83	96.6
Bi	209	3	He	2595650.72	95.1

ICPMS207-B Analytical Data

Sample Name Rinse
File Name 013BLKV.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 12:09:48
Sample Type BlkVrfy
Total Dilution 1.0000
Comment ICPMS-6020-W-D
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	0.217	ug/l	5981.59
Be	9	45	1	No Gas	-0.027	ug/l	88.31
B	11	45	1	No Gas	2.817	ug/l	6689.50
Na	23	45	3	He	-0.263	ug/l	26880.65
Mg	24	45	3	He	0.624	ug/l	1187.70
Al	27	45	1	No Gas	-0.405	ug/l	22960.96
Si	28	45	2	H2	-2.453	ug/l	7722.43
K	39	72	3	He	40.133	ug/l	196099.16
Ca	40	72	2	H2	0.510	ug/l	257199.97
Ti	47	72	1	No Gas	-0.024	ug/l	385.40
V	51	72	1	No Gas	2.233	ug/l	-17165.37
V	51	72	3	He	-2.333	ug/l	32354.29
Cr	52	72	1	No Gas	-1.543	ug/l	182576.18
Cr	52	72	3	He	0.010	ug/l	2806.95
Mn	55	72	1	No Gas	0.030	ug/l	15997.01
Mn	55	72	3	He	-0.015	ug/l	254.28
Fe	56	72	2	H2	-0.018	ug/l	20638.66
Fe	56	72	3	He	0.253	ug/l	11801.62
Co	59	72	1	No Gas	0.002	ug/l	552.25
Ni	60	72	1	No Gas	-0.038	ug/l	1374.01
Ni	60	72	3	He	-0.016	ug/l	271.12
Cu	63	72	1	No Gas	-0.010	ug/l	2950.82
Cu	63	72	3	He	0.002	ug/l	812.19
Cu	65	72	1	No Gas	-0.143	ug/l	2007.62
Zn	66	72	1	No Gas	-0.229	ug/l	2000.52
Zn	66	72	3	He	-0.114	ug/l	467.79
As	75	72	1	No Gas	-2.423	ug/l	21047.89
As	75	72	3	He	-0.262	ug/l	1396.04
Se	78	72	2	H2	-0.017	ug/l	133.89
Br	79	72	1	No Gas	0.742	ug/l	15537.60
Br	79	72	2	H2	0.641	ug/l	11188.87
Se	82	72	1	No Gas	0.771	ug/l	1933.89
Kr	84	72	1	No Gas		ug/l	50118.41
Sr	88	72	1	No Gas	-0.001	ug/l	825.06
Sr	88	72	3	He	-0.002	ug/l	174.45
Mo	95	115	1	No Gas	-0.001	ug/l	31.11
Mo	95	115	3	He	0.001	ug/l	23.33
Mo	98	115	1	No Gas	0.000	ug/l	37.69
Ag	107	115	1	No Gas	0.006	ug/l	157.40
Ag	109	115	1	No Gas	0.006	ug/l	142.72
Cd	111	115	1	No Gas	0.015	ug/l	62.19

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	0.004	ug/l	9.89
Cd	114	115	1	No Gas	0.009	ug/l	75.09
Cd	114	115	3	He	0.005	ug/l	27.30
Sn	118	115	1	No Gas	-0.023	ug/l	1107.85
Sn	118	115	3	He	0.010	ug/l	408.90
Sb	121	115	1	No Gas	0.001	ug/l	232.69
Sb	121	115	3	He	0.002	ug/l	82.68
Sb	123	115	1	No Gas	0.001	ug/l	174.35
Sb	123	115	3	He	-0.001	ug/l	58.68
Ba	135	115	1	No Gas	-0.004	ug/l	229.55
Ba	137	115	1	No Gas	-0.009	ug/l	395.89
La	139	115	3	He	0.000	ug/l	15.56
Ce	140	115	3	He	0.000	ug/l	14.44
Hg	201	209	1	No Gas	0.001	ug/l	10.67
Hg	202	209	1	No Gas	0.000	ug/l	35.32
Hg	202	209	3	He	-0.001	ug/l	12.67
Tl	203	209	3	He	0.074	ug/l	507.55
Tl	205	209	1	No Gas	0.061	ug/l	1870.15
Tl	205	209	3	He	0.077	ug/l	1203.21
[Pb]	206	209	1	No Gas	0.004	ug/l	154.45
[Pb]	207	209	1	No Gas	0.006	ug/l	157.78
Pb	208	209	1	No Gas	0.006	ug/l	667.79
Th	232	209	3	He	0.015	ug/l	405.50
U	238	209	1	No Gas	0.002	ug/l	96.31

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	4976783.38	100.7
Sc	45	2	H2	3708401.73	93.5
Sc	45	3	He	369253.94	100.2
Ge	72	1	No Gas	1338455.37	99.2
Ge	72	2	H2	1225484.97	94.9
Ge	72	3	He	237946.03	98.7
In	115	1	No Gas	7493500.85	96.5
In	115	3	He	2180828.10	99.2
Tb	159	1	No Gas	8438011.26	99.7
Tb	159	3	He	4167805.84	96.9
Ho	165	1	No Gas	7746594.81	96.1
Ho	165	3	He	3950049.39	97.1
Lu	175	1	No Gas	7249586.52	95.2
Lu	175	3	He	3256479.20	98.9
Bi	209	1	No Gas	4531002.99	94.4
Bi	209	3	He	2575197.50	94.4

ICPMS207-B Analytical Data

Sample Name QCS
File Name 014_QC1.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 12:15:58
Sample Type QC1
Total Dilution 1.0000
Comment ICPMS-6020-W-D
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	50.876	ug/l	307523.82
Be	9	45	1	No Gas	24.390	ug/l	74464.20
B	11	45	1	No Gas	52.294	ug/l	105543.19
Na	23	45	3	He	2649.550	ug/l	2415749.89
Mg	24	45	3	He	2695.330	ug/l	1268381.85
Al	27	45	1	No Gas	254.451	ug/l	4454560.14
Si	28	45	2	H2	516.603	ug/l	1559236.39
K	39	72	3	He	2767.132	ug/l	1746775.58
Ca	40	72	2	H2	2746.611	ug/l	29700720.92
Ti	47	72	1	No Gas	48.241	ug/l	105402.71
V	51	72	1	No Gas	47.644	ug/l	1173242.85
V	51	72	3	He	49.782	ug/l	290004.54
Cr	52	72	1	No Gas	51.377	ug/l	1359169.51
Cr	52	72	3	He	52.774	ug/l	286680.70
Mn	55	72	1	No Gas	257.056	ug/l	7767589.65
Mn	55	72	3	He	265.793	ug/l	948346.37
Fe	56	72	2	H2	259.833	ug/l	5296092.83
Fe	56	72	3	He	270.005	ug/l	1284387.56
Co	59	72	1	No Gas	52.489	ug/l	1358099.52
Ni	60	72	1	No Gas	52.291	ug/l	308037.23
Ni	60	72	3	He	53.674	ug/l	111201.34
Cu	63	72	1	No Gas	53.258	ug/l	766346.39
Cu	63	72	3	He	55.012	ug/l	295807.05
Cu	65	72	1	No Gas	52.422	ug/l	361747.75
Zn	66	72	1	No Gas	51.977	ug/l	262498.27
Zn	66	72	3	He	53.877	ug/l	69032.53
As	75	72	1	No Gas	48.906	ug/l	371617.49
As	75	72	3	He	51.836	ug/l	74306.30
Se	78	72	2	H2	51.161	ug/l	48109.90
Br	79	72	1	No Gas	0.708	ug/l	14924.78
Br	79	72	2	H2	0.826	ug/l	13096.63
Se	82	72	1	No Gas	51.963	ug/l	21497.89
Kr	84	72	1	No Gas		ug/l	66428.24
Sr	88	72	1	No Gas	53.648	ug/l	1923843.72
Sr	88	72	3	He	52.204	ug/l	287240.04
Mo	95	115	1	No Gas	47.503	ug/l	352102.43
Mo	95	115	3	He	48.658	ug/l	145848.26
Mo	98	115	1	No Gas	47.540	ug/l	555614.76
Ag	107	115	1	No Gas	23.608	ug/l	460565.58
Ag	109	115	1	No Gas	23.707	ug/l	439229.98
Cd	111	115	1	No Gas	25.143	ug/l	100969.45

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	24.855	ug/l	40869.92
Cd	114	115	1	No Gas	24.141	ug/l	223011.94
Cd	114	115	3	He	24.818	ug/l	98950.79
Sn	118	115	1	No Gas	46.328	ug/l	548873.37
Sn	118	115	3	He	47.309	ug/l	186345.86
Sb	121	115	1	No Gas	43.262	ug/l	830884.87
Sb	121	115	3	He	43.923	ug/l	277650.73
Sb	123	115	1	No Gas	43.534	ug/l	632475.13
Sb	123	115	3	He	44.293	ug/l	218953.30
Ba	135	115	1	No Gas	50.905	ug/l	167694.51
Ba	137	115	1	No Gas	48.617	ug/l	282811.97
La	139	115	3	He	49.559	ug/l	994850.55
Ce	140	115	3	He	50.874	ug/l	1082516.05
Hg	201	209	1	No Gas	0.970	ug/l	1739.44
Hg	202	209	1	No Gas	0.955	ug/l	3881.46
Hg	202	209	3	He	1.001	ug/l	2224.08
Tl	203	209	3	He	49.581	ug/l	272243.54
Tl	205	209	1	No Gas	47.871	ug/l	1116457.86
Tl	205	209	3	He	49.631	ug/l	635816.69
[Pb]	206	209	1	No Gas	48.375	ug/l	390389.90
[Pb]	207	209	1	No Gas	48.466	ug/l	340409.65
Pb	208	209	1	No Gas	48.328	ug/l	1552798.01
Th	232	209	3	He	47.955	ug/l	802182.67
U	238	209	1	No Gas	51.388	ug/l	1399408.69

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	5026779.07	101.7
Sc	45	2	H2	3617553.69	91.2
Sc	45	3	He	376318.19	102.1
Ge	72	1	No Gas	1317813.10	97.7
Ge	72	2	H2	1253173.10	97.0
Ge	72	3	He	242252.76	100.5
In	115	1	No Gas	7522236.49	96.8
In	115	3	He	2205633.28	100.3
Tb	159	1	No Gas	8100882.42	95.7
Tb	159	3	He	4201305.22	97.7
Ho	165	1	No Gas	7674496.57	95.2
Ho	165	3	He	3932491.78	96.7
Lu	175	1	No Gas	7257701.61	95.4
Lu	175	3	He	3210869.04	97.5
Bi	209	1	No Gas	4532905.49	94.4
Bi	209	3	He	2588796.61	94.8

ICPMS207-B Analytical Data

Sample Name CCV
File Name 015_CCV.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 12:22:04
Sample Type CCV
Total Dilution 1.0000
Comment ICPMS-6020-W-D
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	615.690	ug/l	3635738.84
Be	9	45	1	No Gas	48.329	ug/l	146050.29
B	11	45	1	No Gas	50.780	ug/l	101593.62
Na	23	45	3	He	12676.593	ug/l	11542288.71
Mg	24	45	3	He	12843.354	ug/l	6086727.90
Al	27	45	1	No Gas	48.420	ug/l	864155.02
Si	28	45	2	H2	201.489	ug/l	621726.32
K	39	72	3	He	12940.798	ug/l	7605247.11
Ca	40	72	2	H2	12864.652	ug/l	138587744.53
Ti	47	72	1	No Gas	47.942	ug/l	107375.80
V	51	72	1	No Gas	49.805	ug/l	1261781.31
V	51	72	3	He	47.542	ug/l	282152.16
Cr	52	72	1	No Gas	48.533	ug/l	1328359.34
Cr	52	72	3	He	50.875	ug/l	279608.44
Mn	55	72	1	No Gas	49.923	ug/l	1559070.61
Mn	55	72	3	He	51.321	ug/l	185464.01
Fe	56	72	2	H2	1305.515	ug/l	26604345.49
Fe	56	72	3	He	1335.034	ug/l	6380388.08
Co	59	72	1	No Gas	50.397	ug/l	1336758.03
Ni	60	72	1	No Gas	51.457	ug/l	310800.85
Ni	60	72	3	He	51.793	ug/l	108546.96
Cu	63	72	1	No Gas	50.540	ug/l	745688.39
Cu	63	72	3	He	52.610	ug/l	286192.95
Cu	65	72	1	No Gas	50.046	ug/l	354140.59
Zn	66	72	1	No Gas	51.112	ug/l	264717.00
Zn	66	72	3	He	52.880	ug/l	68556.94
As	75	72	1	No Gas	50.726	ug/l	393790.31
As	75	72	3	He	50.699	ug/l	73554.72
Se	78	72	2	H2	50.206	ug/l	47354.75
Br	79	72	1	No Gas	0.654	ug/l	14731.70
Br	79	72	2	H2	0.680	ug/l	11821.38
Se	82	72	1	No Gas	50.624	ug/l	21516.99
Kr	84	72	1	No Gas		ug/l	64450.79
Sr	88	72	1	No Gas	49.224	ug/l	1810668.75
Sr	88	72	3	He	49.993	ug/l	278269.72
Mo	95	115	1	No Gas	48.842	ug/l	353371.72
Mo	95	115	3	He	52.038	ug/l	148449.50
Mo	98	115	1	No Gas	50.182	ug/l	572600.73
Ag	107	115	1	No Gas	19.256	ug/l	366712.69
Ag	109	115	1	No Gas	18.998	ug/l	343645.89
Cd	111	115	1	No Gas	50.601	ug/l	198371.71

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	51.260	ug/l	80214.59
Cd	114	115	1	No Gas	48.744	ug/l	439618.17
Cd	114	115	3	He	51.085	ug/l	193861.50
Sn	118	115	1	No Gas	54.227	ug/l	627056.79
Sn	118	115	3	He	57.206	ug/l	214369.78
Sb	121	115	1	No Gas	49.710	ug/l	932135.40
Sb	121	115	3	He	51.363	ug/l	309068.84
Sb	123	115	1	No Gas	49.486	ug/l	701957.50
Sb	123	115	3	He	51.505	ug/l	242308.44
Ba	135	115	1	No Gas	51.113	ug/l	164411.99
Ba	137	115	1	No Gas	50.023	ug/l	284112.17
La	139	115	3	He	50.774	ug/l	970256.92
Ce	140	115	3	He	50.761	ug/l	1028274.84
Hg	201	209	1	No Gas	0.992	ug/l	1664.11
Hg	202	209	1	No Gas	0.993	ug/l	3772.45
Hg	202	209	3	He	1.023	ug/l	2187.08
Tl	203	209	3	He	50.327	ug/l	265755.72
Tl	205	209	1	No Gas	50.301	ug/l	1097256.40
Tl	205	209	3	He	51.026	ug/l	628793.77
[Pb]	206	209	1	No Gas	50.101	ug/l	378198.53
[Pb]	207	209	1	No Gas	49.920	ug/l	327970.63
Pb	208	209	1	No Gas	50.143	ug/l	1506987.09
Th	232	209	3	He	48.888	ug/l	786703.99
U	238	209	1	No Gas	51.173	ug/l	1303480.66

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	4977573.84	100.7
Sc	45	2	H2	3643792.10	91.8
Sc	45	3	He	379237.24	102.9
Ge	72	1	No Gas	1351226.10	100.2
Ge	72	2	H2	1256909.68	97.3
Ge	72	3	He	245045.54	101.6
In	115	1	No Gas	7342205.20	94.5
In	115	3	He	2098365.36	95.4
Tb	159	1	No Gas	8041647.09	95.0
Tb	159	3	He	4115654.47	95.7
Ho	165	1	No Gas	7509456.90	93.1
Ho	165	3	He	3843239.43	94.5
Lu	175	1	No Gas	7153198.05	94.0
Lu	175	3	He	3210148.03	97.5
Bi	209	1	No Gas	4241373.95	88.4
Bi	209	3	He	2491354.54	91.3

ICPMS207-B Analytical Data

Sample Name CCB
File Name 016_CCB.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 12:28:12
Sample Type CCB
Total Dilution 1.0000
Comment ICPMS-6020-W-D
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	0.240	ug/l	5963.58
Be	9	45	1	No Gas	-0.029	ug/l	81.98
B	11	45	1	No Gas	2.146	ug/l	5225.67
Na	23	45	3	He	-0.136	ug/l	26700.34
Mg	24	45	3	He	-0.040	ug/l	871.63
Al	27	45	1	No Gas	-0.962	ug/l	13033.50
Si	28	45	2	H2	-2.484	ug/l	7612.33
K	39	72	3	He	36.578	ug/l	192869.04
Ca	40	72	2	H2	0.131	ug/l	256380.87
Ti	47	72	1	No Gas	-0.011	ug/l	410.42
V	51	72	1	No Gas	0.398	ug/l	-64571.65
V	51	72	3	He	-1.222	ug/l	37490.91
Cr	52	72	1	No Gas	-0.909	ug/l	195321.25
Cr	52	72	3	He	0.041	ug/l	2951.43
Mn	55	72	1	No Gas	0.044	ug/l	16310.03
Mn	55	72	3	He	-0.019	ug/l	239.62
Fe	56	72	2	H2	0.006	ug/l	21390.41
Fe	56	72	3	He	0.391	ug/l	12357.63
Co	59	72	1	No Gas	0.002	ug/l	548.92
Ni	60	72	1	No Gas	-0.050	ug/l	1287.51
Ni	60	72	3	He	-0.035	ug/l	232.23
Cu	63	72	1	No Gas	-0.030	ug/l	2636.63
Cu	63	72	3	He	-0.013	ug/l	726.21
Cu	65	72	1	No Gas	-0.190	ug/l	1663.43
Zn	66	72	1	No Gas	-0.236	ug/l	1947.02
Zn	66	72	3	He	-0.079	ug/l	507.79
As	75	72	1	No Gas	-1.547	ug/l	26927.85
As	75	72	3	He	-0.164	ug/l	1521.65
Se	78	72	2	H2	-0.020	ug/l	133.00
Br	79	72	1	No Gas	0.241	ug/l	10093.54
Br	79	72	2	H2	0.193	ug/l	7327.38
Se	82	72	1	No Gas	0.542	ug/l	1831.68
Kr	84	72	1	No Gas		ug/l	51083.56
Sr	88	72	1	No Gas	-0.002	ug/l	775.15
Sr	88	72	3	He	0.001	ug/l	187.78
Mo	95	115	1	No Gas	0.010	ug/l	108.89
Mo	95	115	3	He	0.010	ug/l	48.89
Mo	98	115	1	No Gas	0.008	ug/l	135.33
Ag	107	115	1	No Gas	0.001	ug/l	54.02
Ag	109	115	1	No Gas	0.001	ug/l	58.69
Cd	111	115	1	No Gas	0.004	ug/l	19.63

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	0.002	ug/l	7.78
Cd	114	115	1	No Gas	0.003	ug/l	24.35
Cd	114	115	3	He	0.002	ug/l	16.53
Sn	118	115	1	No Gas	-0.007	ug/l	1287.51
Sn	118	115	3	He	0.007	ug/l	400.01
Sb	121	115	1	No Gas	0.013	ug/l	451.72
Sb	121	115	3	He	0.015	ug/l	169.35
Sb	123	115	1	No Gas	0.013	ug/l	345.04
Sb	123	115	3	He	0.016	ug/l	143.02
Ba	135	115	1	No Gas	-0.017	ug/l	186.30
Ba	137	115	1	No Gas	-0.003	ug/l	425.83
La	139	115	3	He	0.000	ug/l	13.33
Ce	140	115	3	He	0.000	ug/l	13.34
Hg	201	209	1	No Gas	0.003	ug/l	13.67
Hg	202	209	1	No Gas	0.006	ug/l	57.66
Hg	202	209	3	He	0.002	ug/l	18.33
Tl	203	209	3	He	0.083	ug/l	558.90
Tl	205	209	1	No Gas	0.075	ug/l	2115.74
Tl	205	209	3	He	0.082	ug/l	1271.91
[Pb]	206	209	1	No Gas	0.003	ug/l	138.89
[Pb]	207	209	1	No Gas	0.004	ug/l	141.11
Pb	208	209	1	No Gas	0.005	ug/l	611.12
Th	232	209	3	He	0.023	ug/l	536.23
U	238	209	1	No Gas	0.001	ug/l	66.66

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	4854476.22	98.3
Sc	45	2	H2	3700588.32	93.3
Sc	45	3	He	365303.93	99.1
Ge	72	1	No Gas	1327992.90	98.4
Ge	72	2	H2	1240871.91	96.1
Ge	72	3	He	236427.14	98.1
In	115	1	No Gas	7437122.18	95.7
In	115	3	He	2191433.91	99.7
Tb	159	1	No Gas	8146857.93	96.3
Tb	159	3	He	4083665.65	95.0
Ho	165	1	No Gas	7469791.14	92.6
Ho	165	3	He	3848923.97	94.6
Lu	175	1	No Gas	6977391.21	91.7
Lu	175	3	He	3157319.87	95.9
Bi	209	1	No Gas	4369931.78	91.0
Bi	209	3	He	2564383.67	94.0

ICPMS207-B Analytical Data

Sample Name LRB
File Name 017MBLK.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 12:34:23
Sample Type MBLK
Total Dilution 1.0000
Comment ICPMS-6020-W-D
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	-0.016	ug/l	4579.87
Be	9	45	1	No Gas	-0.034	ug/l	66.66
B	11	45	1	No Gas	1.732	ug/l	4512.49
Na	23	45	3	He	7.095	ug/l	33050.70
Mg	24	45	3	He	0.811	ug/l	1260.89
Al	27	45	1	No Gas	-0.810	ug/l	15870.65
Si	28	45	2	H2	-2.008	ug/l	8927.50
K	39	72	3	He	37.895	ug/l	192765.42
Ca	40	72	2	H2	21.088	ug/l	468980.29
Ti	47	72	1	No Gas	-0.046	ug/l	328.67
V	51	72	1	No Gas	-0.047	ug/l	-75232.60
V	51	72	3	He	-1.330	ug/l	36811.39
Cr	52	72	1	No Gas	-0.892	ug/l	193232.27
Cr	52	72	3	He	0.023	ug/l	2842.52
Mn	55	72	1	No Gas	0.033	ug/l	15750.57
Mn	55	72	3	He	-0.010	ug/l	270.62
Fe	56	72	2	H2	0.049	ug/l	21791.38
Fe	56	72	3	He	0.332	ug/l	12032.05
Co	59	72	1	No Gas	0.004	ug/l	585.52
Ni	60	72	1	No Gas	-0.059	ug/l	1217.64
Ni	60	72	3	He	-0.030	ug/l	240.00
Cu	63	72	1	No Gas	-0.041	ug/l	2434.52
Cu	63	72	3	He	-0.016	ug/l	707.21
Cu	65	72	1	No Gas	-0.191	ug/l	1636.09
Zn	66	72	1	No Gas	0.046	ug/l	3321.25
Zn	66	72	3	He	0.173	ug/l	816.69
As	75	72	1	No Gas	0.745	ug/l	42171.75
As	75	72	3	He	-0.142	ug/l	1544.21
Se	78	72	2	H2	-0.034	ug/l	116.89
Br	79	72	1	No Gas	0.252	ug/l	10063.59
Br	79	72	2	H2	0.261	ug/l	7776.69
Se	82	72	1	No Gas	1.047	ug/l	1993.77
Kr	84	72	1	No Gas		ug/l	51938.13
Sr	88	72	1	No Gas	0.250	ug/l	9944.58
Sr	88	72	3	He	0.016	ug/l	268.89
Mo	95	115	1	No Gas	0.004	ug/l	71.11
Mo	95	115	3	He	0.003	ug/l	28.89
Mo	98	115	1	No Gas	0.002	ug/l	60.82
Ag	107	115	1	No Gas	0.000	ug/l	37.35
Ag	109	115	1	No Gas	0.000	ug/l	36.68
Cd	111	115	1	No Gas	0.004	ug/l	20.66

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	0.001	ug/l	5.67
Cd	114	115	1	No Gas	0.002	ug/l	16.61
Cd	114	115	3	He	0.002	ug/l	14.19
Sn	118	115	1	No Gas	-0.035	ug/l	968.12
Sn	118	115	3	He	-0.006	ug/l	351.12
Sb	121	115	1	No Gas	0.006	ug/l	315.04
Sb	121	115	3	He	0.009	ug/l	132.35
Sb	123	115	1	No Gas	0.005	ug/l	232.36
Sb	123	115	3	He	0.009	ug/l	106.01
Ba	135	115	1	No Gas	-0.011	ug/l	209.59
Ba	137	115	1	No Gas	-0.013	ug/l	372.60
La	139	115	3	He	0.000	ug/l	25.56
Ce	140	115	3	He	0.000	ug/l	20.00
Hg	201	209	1	No Gas	0.002	ug/l	11.67
Hg	202	209	1	No Gas	0.003	ug/l	47.66
Hg	202	209	3	He	0.004	ug/l	22.33
Tl	203	209	3	He	0.035	ug/l	293.45
Tl	205	209	1	No Gas	0.025	ug/l	1027.83
Tl	205	209	3	He	0.032	ug/l	638.27
[Pb]	206	209	1	No Gas	0.004	ug/l	151.12
[Pb]	207	209	1	No Gas	-0.001	ug/l	105.56
Pb	208	209	1	No Gas	0.002	ug/l	538.90
Th	232	209	3	He	0.008	ug/l	285.45
U	238	209	1	No Gas	0.001	ug/l	58.32

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	4943428.12	100.1
Sc	45	2	H2	3642787.74	91.8
Sc	45	3	He	365521.97	99.2
Ge	72	1	No Gas	1311234.49	97.2
Ge	72	2	H2	1215539.90	94.1
Ge	72	3	He	235403.12	97.6
In	115	1	No Gas	7482591.57	96.3
In	115	3	He	2204327.68	100.3
Tb	159	1	No Gas	8287221.62	97.9
Tb	159	3	He	4116518.77	95.8
Ho	165	1	No Gas	7630923.26	94.6
Ho	165	3	He	3898417.29	95.8
Lu	175	1	No Gas	7262705.16	95.4
Lu	175	3	He	3202102.56	97.2
Bi	209	1	No Gas	4507628.03	93.9
Bi	209	3	He	2570860.20	94.2

ICPMS207-B Analytical Data

Sample Name LFB
File Name 018_LFB.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 12:40:34
Sample Type LFB
Total Dilution 1.0300
Comment ICPMS-6020-W-D
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	2443.639	ug/l	13279556.18
Be	9	45	1	No Gas	49.609	ug/l	138097.68
B	11	45	1	No Gas	52.175	ug/l	96153.59
Na	23	45	3	He	51421.296	ug/l	43842938.79
Mg	24	45	3	He	52354.328	ug/l	23271730.06
Al	27	45	1	No Gas	50.269	ug/l	826264.14
Si	28	45	2	H2	183.147	ug/l	508106.65
K	39	72	3	He	52389.231	ug/l	28349153.75
Ca	40	72	2	H2	47067.660	ug/l	477384921.44
Ti	47	72	1	No Gas	53.222	ug/l	112556.01
V	51	72	1	No Gas	51.042	ug/l	1219488.49
V	51	72	3	He	51.637	ug/l	284814.70
Cr	52	72	1	No Gas	51.413	ug/l	1322592.92
Cr	52	72	3	He	52.362	ug/l	269684.60
Mn	55	72	1	No Gas	48.754	ug/l	1437902.10
Mn	55	72	3	He	51.793	ug/l	175441.52
Fe	56	72	2	H2	4997.182	ug/l	95954445.23
Fe	56	72	3	He	5140.796	ug/l	22987355.71
Co	59	72	1	No Gas	49.977	ug/l	1251282.64
Ni	60	72	1	No Gas	51.476	ug/l	293441.76
Ni	60	72	3	He	52.506	ug/l	103122.31
Cu	63	72	1	No Gas	50.600	ug/l	704819.04
Cu	63	72	3	He	52.879	ug/l	269616.26
Cu	65	72	1	No Gas	49.371	ug/l	329883.11
Zn	66	72	1	No Gas	50.899	ug/l	248885.95
Zn	66	72	3	He	53.489	ug/l	64995.12
As	75	72	1	No Gas	46.910	ug/l	347820.02
As	75	72	3	He	51.989	ug/l	70690.30
Se	78	72	2	H2	49.094	ug/l	43670.63
Br	79	72	1	No Gas	0.951	ug/l	17139.52
Br	79	72	2	H2	0.811	ug/l	12434.08
Se	82	72	1	No Gas	49.269	ug/l	19855.64
Kr	84	72	1	No Gas		ug/l	61783.56
Sr	88	72	1	No Gas	49.876	ug/l	1731220.21
Sr	88	72	3	He	51.118	ug/l	266701.01
Mo	95	115	1	No Gas	50.062	ug/l	334263.97
Mo	95	115	3	He	51.988	ug/l	140707.76
Mo	98	115	1	No Gas	51.543	ug/l	542789.20
Ag	107	115	1	No Gas	19.169	ug/l	336962.14
Ag	109	115	1	No Gas	19.469	ug/l	324999.85
Cd	111	115	1	No Gas	51.738	ug/l	187163.48

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	50.768	ug/l	75376.40
Cd	114	115	1	No Gas	49.731	ug/l	413887.09
Cd	114	115	3	He	50.755	ug/l	182736.20
Sn	118	115	1	No Gas	48.317	ug/l	515813.37
Sn	118	115	3	He	49.176	ug/l	174872.72
Sb	121	115	1	No Gas	47.869	ug/l	828329.53
Sb	121	115	3	He	48.452	ug/l	276568.41
Sb	123	115	1	No Gas	47.818	ug/l	625982.97
Sb	123	115	3	He	48.192	ug/l	215100.13
Ba	135	115	1	No Gas	53.217	ug/l	157948.98
Ba	137	115	1	No Gas	51.739	ug/l	271139.85
La	139	115	3	He	51.003	ug/l	924428.07
Ce	140	115	3	He	50.679	ug/l	973845.89
Hg	201	209	1	No Gas	1.007	ug/l	1618.45
Hg	202	209	1	No Gas	1.005	ug/l	3655.11
Hg	202	209	3	He	1.017	ug/l	2048.75
Tl	203	209	3	He	50.276	ug/l	250209.96
Tl	205	209	1	No Gas	50.268	ug/l	1049728.69
Tl	205	209	3	He	51.126	ug/l	593735.92
[Pb]	206	209	1	No Gas	49.069	ug/l	354638.74
[Pb]	207	209	1	No Gas	49.760	ug/l	312908.13
Pb	208	209	1	No Gas	49.560	ug/l	1425967.44
Th	232	209	3	He	49.798	ug/l	755144.60
U	238	209	1	No Gas	52.041	ug/l	1268867.54

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	4722730.81	95.6
Sc	45	2	H2	3364051.79	84.8
Sc	45	3	He	366419.52	99.4
Ge	72	1	No Gas	1313380.73	97.4
Ge	72	2	H2	1220951.05	94.5
Ge	72	3	He	236568.59	98.1
In	115	1	No Gas	6980189.34	89.9
In	115	3	He	2050587.20	93.3
Tb	159	1	No Gas	7902663.22	93.4
Tb	159	3	He	4086186.04	95.0
Ho	165	1	No Gas	7419600.12	92.0
Ho	165	3	He	3815410.69	93.8
Lu	175	1	No Gas	7111966.77	93.4
Lu	175	3	He	3084804.02	93.6
Bi	209	1	No Gas	4184770.08	87.2
Bi	209	3	He	2417394.20	88.6

ICPMS207-B Analytical Data

Sample Name ICSA
File Name 019ICSA.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 12:46:43
Sample Type ICSA
Total Dilution 1.0000
Comment ICPMS-6020-W-D
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	1.026	ug/l	10241.57
Be	9	45	1	No Gas	-0.041	ug/l	43.66
B	11	45	1	No Gas	1.547	ug/l	3980.13
Na	23	45	3	He	103258.903	ug/l	87729467.58
Mg	24	45	3	He	41459.026	ug/l	18369329.94
Al	27	45	1	No Gas	38931.932	ug/l	638684301.60
Si	28	45	2	H2	-1.301	ug/l	9452.89
K	39	72	3	He	41578.525	ug/l	22641111.88
Ca	40	72	2	H2	109828.187	ug/l	1054025441.65
Ti	47	72	1	No Gas	779.316	ug/l	1675934.38
V	51	72	1	No Gas	1.910	ug/l	-24721.96
V	51	72	3	He	-7.055	ug/l	9182.91
Cr	52	72	1	No Gas	-3.605	ug/l	132187.80
Cr	52	72	3	He	0.843	ug/l	6991.69
Mn	55	72	1	No Gas	0.314	ug/l	24028.61
Mn	55	72	3	He	0.196	ug/l	966.17
Fe	56	72	2	H2	103334.401	ug/l	1877361495.36
Fe	56	72	3	He	103910.556	ug/l	466910293.85
Co	59	72	1	No Gas	0.336	ug/l	9064.86
Ni	60	72	1	No Gas	0.968	ug/l	7157.56
Ni	60	72	3	He	0.130	ug/l	550.01
Cu	63	72	1	No Gas	1.223	ug/l	20313.54
Cu	63	72	3	He	0.057	ug/l	1066.82
Cu	65	72	1	No Gas	0.674	ug/l	7470.91
Zn	66	72	1	No Gas	0.910	ug/l	7556.01
Zn	66	72	3	He	0.464	ug/l	1152.28
As	75	72	1	No Gas	-0.648	ug/l	32530.83
As	75	72	3	He	-0.531	ug/l	995.55
Se	78	72	2	H2	0.030	ug/l	162.11
Br	79	72	1	No Gas	0.770	ug/l	15387.70
Br	79	72	2	H2	0.489	ug/l	9014.94
Se	82	72	1	No Gas	0.081	ug/l	1619.74
Kr	84	72	1	No Gas		ug/l	51014.00
Sr	88	72	1	No Gas	1.277	ug/l	46045.91
Sr	88	72	3	He	1.265	ug/l	6810.54
Mo	95	115	1	No Gas	825.827	ug/l	5702024.08
Mo	95	115	3	He	867.548	ug/l	2387796.70
Mo	98	115	1	No Gas	835.820	ug/l	9100288.98
Ag	107	115	1	No Gas	0.007	ug/l	157.40
Ag	109	115	1	No Gas	0.006	ug/l	136.06
Cd	111	115	1	No Gas	0.026	ug/l	101.49

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	0.276	ug/l	420.67
Cd	114	115	1	No Gas	0.049	ug/l	418.66
Cd	114	115	3	He	0.204	ug/l	753.64
Sn	118	115	1	No Gas	0.134	ug/l	2771.46
Sn	118	115	3	He	0.154	ug/l	898.92
Sb	121	115	1	No Gas	0.292	ug/l	5414.92
Sb	121	115	3	He	0.329	ug/l	1976.00
Sb	123	115	1	No Gas	0.298	ug/l	4176.38
Sb	123	115	3	He	0.333	ug/l	1567.58
Ba	135	115	1	No Gas	0.057	ug/l	402.54
Ba	137	115	1	No Gas	0.040	ug/l	635.43
La	139	115	3	He	0.010	ug/l	202.22
Ce	140	115	3	He	0.003	ug/l	67.78
Hg	201	209	1	No Gas	0.005	ug/l	15.33
Hg	202	209	1	No Gas	0.004	ug/l	48.66
Hg	202	209	3	He	0.001	ug/l	15.00
Tl	203	209	3	He	0.039	ug/l	300.12
Tl	205	209	1	No Gas	0.040	ug/l	1290.07
Tl	205	209	3	He	0.044	ug/l	749.66
[Pb]	206	209	1	No Gas	0.019	ug/l	258.89
[Pb]	207	209	1	No Gas	0.017	ug/l	221.12
Pb	208	209	1	No Gas	0.018	ug/l	1003.36
Th	232	209	3	He	0.031	ug/l	642.94
U	238	209	1	No Gas	0.002	ug/l	87.65

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	4743796.54	96.0
Sc	45	2	H2	3114854.79	78.5
Sc	45	3	He	354572.50	96.2
Ge	72	1	No Gas	1301132.68	96.4
Ge	72	2	H2	1121465.28	86.8
Ge	72	3	He	230802.15	95.7
In	115	1	No Gas	7007062.82	90.2
In	115	3	He	2024707.49	92.1
Tb	159	1	No Gas	8232298.88	97.3
Tb	159	3	He	4065054.08	94.6
Ho	165	1	No Gas	7640567.43	94.7
Ho	165	3	He	3885063.99	95.5
Lu	175	1	No Gas	7233675.92	95.0
Lu	175	3	He	3158196.50	95.9
Bi	209	1	No Gas	4230479.27	88.1
Bi	209	3	He	2445531.98	89.6

ICPMS207-B Analytical Data

Sample Name ICSAB
File Name 020ICSB.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 12:52:52
Sample Type ICSAB
Total Dilution 1.0000
Comment ICPMS-6020-W-D
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	0.540	ug/l	7339.39
Be	9	45	1	No Gas	-0.041	ug/l	43.32
B	11	45	1	No Gas	1.002	ug/l	2886.78
Na	23	45	3	He	102762.054	ug/l	84209329.30
Mg	24	45	3	He	42268.566	ug/l	18062034.11
Al	27	45	1	No Gas	35793.714	ug/l	573588067.01
Si	28	45	2	H2	26.207	ug/l	81042.31
K	39	72	3	He	40856.472	ug/l	21527871.90
Ca	40	72	2	H2	112604.677	ug/l	1101330812.02
Ti	47	72	1	No Gas	779.044	ug/l	1569695.93
V	51	72	1	No Gas	22.889	ug/l	485303.62
V	51	72	3	He	12.969	ug/l	99915.13
Cr	52	72	1	No Gas	16.089	ug/l	530018.96
Cr	52	72	3	He	21.627	ug/l	109793.94
Mn	55	72	1	No Gas	20.567	ug/l	587935.70
Mn	55	72	3	He	20.585	ug/l	67962.30
Fe	56	72	2	H2	100165.730	ug/l	1854986708.03
Fe	56	72	3	He	104702.853	ug/l	455165399.37
Co	59	72	1	No Gas	20.507	ug/l	491362.24
Ni	60	72	1	No Gas	20.831	ug/l	114451.64
Ni	60	72	3	He	21.029	ug/l	40325.46
Cu	63	72	1	No Gas	20.445	ug/l	274004.67
Cu	63	72	3	He	21.081	ug/l	104947.00
Cu	65	72	1	No Gas	20.097	ug/l	130025.28
Zn	66	72	1	No Gas	10.622	ug/l	51940.80
Zn	66	72	3	He	10.297	ug/l	12624.40
As	75	72	1	No Gas	8.870	ug/l	90681.74
As	75	72	3	He	9.542	ug/l	13953.38
Se	78	72	2	H2	10.306	ug/l	8951.42
Br	79	72	1	No Gas	0.731	ug/l	14039.06
Br	79	72	2	H2	0.515	ug/l	9394.44
Se	82	72	1	No Gas	11.243	ug/l	5471.66
Kr	84	72	1	No Gas		ug/l	49707.59
Sr	88	72	1	No Gas	1.294	ug/l	43723.40
Sr	88	72	3	He	1.233	ug/l	6420.37
Mo	95	115	1	No Gas	778.884	ug/l	5401088.08
Mo	95	115	3	He	876.330	ug/l	2340757.43
Mo	98	115	1	No Gas	777.021	ug/l	8497384.88
Ag	107	115	1	No Gas	4.557	ug/l	83220.30
Ag	109	115	1	No Gas	4.530	ug/l	78557.32
Cd	111	115	1	No Gas	9.741	ug/l	36605.28

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	10.201	ug/l	14951.51
Cd	114	115	1	No Gas	9.421	ug/l	81435.93
Cd	114	115	3	He	10.132	ug/l	36015.45
Sn	118	115	1	No Gas	0.015	ug/l	1467.17
Sn	118	115	3	He	0.045	ug/l	493.34
Sb	121	115	1	No Gas	0.116	ug/l	2271.76
Sb	121	115	3	He	0.138	ug/l	843.45
Sb	123	115	1	No Gas	0.112	ug/l	1679.94
Sb	123	115	3	He	0.146	ug/l	699.09
Ba	135	115	1	No Gas	0.065	ug/l	429.16
Ba	137	115	1	No Gas	0.041	ug/l	645.40
La	139	115	3	He	0.009	ug/l	185.56
Ce	140	115	3	He	0.003	ug/l	74.45
Hg	201	209	1	No Gas	0.004	ug/l	15.00
Hg	202	209	1	No Gas	0.000	ug/l	35.99
Hg	202	209	3	He	0.002	ug/l	17.00
Tl	203	209	3	He	0.018	ug/l	190.08
Tl	205	209	1	No Gas	0.014	ug/l	747.80
Tl	205	209	3	He	0.019	ug/l	434.18
[Pb]	206	209	1	No Gas	0.015	ug/l	235.56
[Pb]	207	209	1	No Gas	0.013	ug/l	201.11
Pb	208	209	1	No Gas	0.016	ug/l	956.68
Th	232	209	3	He	0.017	ug/l	400.17
U	238	209	1	No Gas	0.002	ug/l	74.99

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	4635907.16	93.8
Sc	45	2	H2	3144716.50	79.2
Sc	45	3	He	341994.35	92.8
Ge	72	1	No Gas	1219198.95	90.4
Ge	72	2	H2	1143214.24	88.5
Ge	72	3	He	223258.29	92.6
In	115	1	No Gas	7037439.23	90.6
In	115	3	He	1964959.32	89.4
Tb	159	1	No Gas	8059219.45	95.2
Tb	159	3	He	3973239.72	92.4
Ho	165	1	No Gas	7502606.30	93.0
Ho	165	3	He	3799560.78	93.4
Lu	175	1	No Gas	7268028.29	95.5
Lu	175	3	He	3085582.35	93.7
Bi	209	1	No Gas	4412331.74	91.9
Bi	209	3	He	2376202.55	87.1

ICPMS207-B Analytical Data

Sample Name Rinse
File Name 021BLKV.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 12:59:04
Sample Type BlkVrfy
Total Dilution 1.0000
Comment ICPMS-6020-W-D
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	0.728	ug/l	8196.84
Be	9	45	1	No Gas	-0.042	ug/l	38.99
B	11	45	1	No Gas	0.666	ug/l	2217.72
Na	23	45	3	He	19.600	ug/l	41481.43
Mg	24	45	3	He	1.040	ug/l	1287.50
Al	27	45	1	No Gas	-0.175	ug/l	24518.72
Si	28	45	2	H2	-2.949	ug/l	6313.21
K	39	72	3	He	23.633	ug/l	177668.83
Ca	40	72	2	H2	1.341	ug/l	268665.74
Ti	47	72	1	No Gas	-0.032	ug/l	333.68
V	51	72	1	No Gas	2.557	ug/l	-7141.65
V	51	72	3	He	-7.042	ug/l	9062.85
Cr	52	72	1	No Gas	-6.507	ug/l	63674.30
Cr	52	72	3	He	-0.029	ug/l	2473.55
Mn	55	72	1	No Gas	0.051	ug/l	15094.50
Mn	55	72	3	He	-0.030	ug/l	194.30
Fe	56	72	2	H2	0.781	ug/l	36871.44
Fe	56	72	3	He	0.499	ug/l	12299.23
Co	59	72	1	No Gas	-0.001	ug/l	425.83
Ni	60	72	1	No Gas	0.036	ug/l	1643.50
Ni	60	72	3	He	-0.021	ug/l	248.89
Cu	63	72	1	No Gas	-0.032	ug/l	2384.49
Cu	63	72	3	He	-0.022	ug/l	652.22
Cu	65	72	1	No Gas	-0.179	ug/l	1586.72
Zn	66	72	1	No Gas	-0.202	ug/l	1939.17
Zn	66	72	3	He	-0.109	ug/l	451.12
As	75	72	1	No Gas	-0.811	ug/l	29255.18
As	75	72	3	He	-0.749	ug/l	692.00
Se	78	72	2	H2	-0.084	ug/l	73.22
Br	79	72	1	No Gas	0.207	ug/l	8888.52
Br	79	72	2	H2	0.156	ug/l	6987.86
Se	82	72	1	No Gas	1.243	ug/l	1915.88
Kr	84	72	1	No Gas		ug/l	49201.03
Sr	88	72	1	No Gas	-0.004	ug/l	648.73
Sr	88	72	3	He	0.003	ug/l	190.00
Mo	95	115	1	No Gas	0.066	ug/l	506.68
Mo	95	115	3	He	0.059	ug/l	184.45
Mo	98	115	1	No Gas	0.071	ug/l	836.91
Ag	107	115	1	No Gas	0.000	ug/l	40.68
Ag	109	115	1	No Gas	0.000	ug/l	33.35
Cd	111	115	1	No Gas	0.001	ug/l	7.01

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	0.002	ug/l	7.11
Cd	114	115	1	No Gas	0.001	ug/l	0.09
Cd	114	115	3	He	0.001	ug/l	11.92
Sn	118	115	1	No Gas	-0.010	ug/l	1230.95
Sn	118	115	3	He	-0.009	ug/l	320.01
Sb	121	115	1	No Gas	0.034	ug/l	836.44
Sb	121	115	3	He	0.039	ug/l	298.37
Sb	123	115	1	No Gas	0.033	ug/l	623.08
Sb	123	115	3	He	0.038	ug/l	234.36
Ba	135	115	1	No Gas	-0.007	ug/l	216.24
Ba	137	115	1	No Gas	-0.015	ug/l	349.31
La	139	115	3	He	0.000	ug/l	14.44
Ce	140	115	3	He	0.000	ug/l	20.00
Hg	201	209	1	No Gas	0.001	ug/l	9.00
Hg	202	209	1	No Gas	0.000	ug/l	36.32
Hg	202	209	3	He	-0.001	ug/l	12.00
Tl	203	209	3	He	0.006	ug/l	132.72
Tl	205	209	1	No Gas	0.005	ug/l	560.01
Tl	205	209	3	He	0.012	ug/l	363.49
[Pb]	206	209	1	No Gas	-0.001	ug/l	110.00
[Pb]	207	209	1	No Gas	-0.002	ug/l	96.66
Pb	208	209	1	No Gas	-0.001	ug/l	440.00
Th	232	209	3	He	0.001	ug/l	175.41
U	238	209	1	No Gas	0.000	ug/l	40.99

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	4534091.62	91.8
Sc	45	2	H2	3773018.41	95.1
Sc	45	3	He	344589.72	93.5
Ge	72	1	No Gas	1214027.13	90.0
Ge	72	2	H2	1238122.75	95.9
Ge	72	3	He	226211.91	93.8
In	115	1	No Gas	7254348.42	93.4
In	115	3	He	2072968.00	94.3
Tb	159	1	No Gas	7862743.46	92.9
Tb	159	3	He	3925062.66	91.3
Ho	165	1	No Gas	7368461.12	91.4
Ho	165	3	He	3710292.19	91.2
Lu	175	1	No Gas	7002619.40	92.0
Lu	175	3	He	2937027.65	89.2
Bi	209	1	No Gas	4483757.23	93.4
Bi	209	3	He	2480976.89	90.9

ICPMS207-B Analytical Data

Sample Name CCV
File Name 022_CC.V.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 13:05:14
Sample Type CCV
Total Dilution 1.0000
Comment ICPMS-6020-W-D
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	503.126	ug/l	2554020.78
Be	9	45	1	No Gas	42.141	ug/l	109473.66
B	11	45	1	No Gas	44.676	ug/l	76946.28
Na	23	45	3	He	13015.468	ug/l	10859703.03
Mg	24	45	3	He	13048.955	ug/l	5666601.58
Al	27	45	1	No Gas	44.570	ug/l	685896.87
Si	28	45	2	H2	202.716	ug/l	635705.09
K	39	72	3	He	12955.324	ug/l	6985739.06
Ca	40	72	2	H2	13373.189	ug/l	144987193.75
Ti	47	72	1	No Gas	47.507	ug/l	94686.47
V	51	72	1	No Gas	48.096	ug/l	1080501.59
V	51	72	3	He	44.099	ug/l	243164.36
Cr	52	72	1	No Gas	45.768	ug/l	1125503.91
Cr	52	72	3	He	52.143	ug/l	262843.78
Mn	55	72	1	No Gas	49.235	ug/l	1367832.01
Mn	55	72	3	He	51.160	ug/l	169622.33
Fe	56	72	2	H2	1306.274	ug/l	26793846.03
Fe	56	72	3	He	1346.750	ug/l	5905591.22
Co	59	72	1	No Gas	49.825	ug/l	1175712.38
Ni	60	72	1	No Gas	50.092	ug/l	269192.18
Ni	60	72	3	He	52.816	ug/l	101572.49
Cu	63	72	1	No Gas	50.518	ug/l	663025.14
Cu	63	72	3	He	53.851	ug/l	268718.26
Cu	65	72	1	No Gas	49.236	ug/l	309998.71
Zn	66	72	1	No Gas	51.543	ug/l	237430.80
Zn	66	72	3	He	52.967	ug/l	62982.16
As	75	72	1	No Gas	50.542	ug/l	349241.07
As	75	72	3	He	50.293	ug/l	66950.64
Se	78	72	2	H2	50.663	ug/l	48099.32
Br	79	72	1	No Gas	0.587	ug/l	12467.35
Br	79	72	2	H2	0.593	ug/l	11115.56
Se	82	72	1	No Gas	50.599	ug/l	19127.89
Kr	84	72	1	No Gas		ug/l	56339.03
Sr	88	72	1	No Gas	52.034	ug/l	1701873.26
Sr	88	72	3	He	49.773	ug/l	254134.28
Mo	95	115	1	No Gas	48.749	ug/l	329051.58
Mo	95	115	3	He	52.588	ug/l	138039.78
Mo	98	115	1	No Gas	48.809	ug/l	519518.57
Ag	107	115	1	No Gas	18.839	ug/l	334722.32
Ag	109	115	1	No Gas	18.884	ug/l	318657.25
Cd	111	115	1	No Gas	50.930	ug/l	186247.91

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	51.172	ug/l	73690.67
Cd	114	115	1	No Gas	48.977	ug/l	412040.77
Cd	114	115	3	He	50.982	ug/l	178041.63
Sn	118	115	1	No Gas	54.258	ug/l	585286.75
Sn	118	115	3	He	55.804	ug/l	192460.12
Sb	121	115	1	No Gas	49.849	ug/l	871947.30
Sb	121	115	3	He	50.390	ug/l	279017.97
Sb	123	115	1	No Gas	49.929	ug/l	660666.97
Sb	123	115	3	He	50.779	ug/l	219849.28
Ba	135	115	1	No Gas	51.154	ug/l	153482.17
Ba	137	115	1	No Gas	50.836	ug/l	269295.50
La	139	115	3	He	50.837	ug/l	893873.87
Ce	140	115	3	He	50.269	ug/l	937083.96
Hg	201	209	1	No Gas	0.977	ug/l	1635.44
Hg	202	209	1	No Gas	0.966	ug/l	3665.11
Hg	202	209	3	He	1.019	ug/l	2024.75
Tl	203	209	3	He	49.829	ug/l	244705.88
Tl	205	209	1	No Gas	48.207	ug/l	1049558.04
Tl	205	209	3	He	50.655	ug/l	580386.73
[Pb]	206	209	1	No Gas	48.909	ug/l	368429.27
[Pb]	207	209	1	No Gas	48.389	ug/l	317208.71
Pb	208	209	1	No Gas	48.755	ug/l	1462295.15
Th	232	209	3	He	48.482	ug/l	725408.67
U	238	209	1	No Gas	49.311	ug/l	1253544.77

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	4280991.56	86.7
Sc	45	2	H2	3704469.91	93.4
Sc	45	3	He	347554.07	94.3
Ge	72	1	No Gas	1201625.43	89.1
Ge	72	2	H2	1265244.15	98.0
Ge	72	3	He	224852.64	93.3
In	115	1	No Gas	6848579.02	88.2
In	115	3	He	1930770.40	87.8
Tb	159	1	No Gas	7945416.75	93.9
Tb	159	3	He	3813974.47	88.7
Ho	165	1	No Gas	7372609.80	91.4
Ho	165	3	He	3620129.09	89.0
Lu	175	1	No Gas	6940129.26	91.2
Lu	175	3	He	2938731.75	89.2
Bi	209	1	No Gas	4231186.58	88.1
Bi	209	3	He	2315190.07	84.8

ICPMS207-B Analytical Data

Sample Name CCB
File Name 023_CCB.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 13:11:22
Sample Type CCB
Total Dilution 1.0000
Comment ICPMS-6020-W-D
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	0.743	ug/l	7350.06
Be	9	45	1	No Gas	-0.039	ug/l	42.66
B	11	45	1	No Gas	0.647	ug/l	1940.24
Na	23	45	3	He	13.303	ug/l	34108.55
Mg	24	45	3	He	0.145	ug/l	848.35
Al	27	45	1	No Gas	-0.914	ug/l	11476.65
Si	28	45	2	H2	-2.861	ug/l	6469.34
K	39	72	3	He	16.089	ug/l	161153.24
Ca	40	72	2	H2	0.213	ug/l	262443.76
Ti	47	72	1	No Gas	-0.077	ug/l	230.23
V	51	72	1	No Gas	4.142	ug/l	29129.37
V	51	72	3	He	-5.947	ug/l	13091.40
Cr	52	72	1	No Gas	-5.986	ug/l	70599.18
Cr	52	72	3	He	0.038	ug/l	2606.91
Mn	55	72	1	No Gas	0.047	ug/l	14228.69
Mn	55	72	3	He	-0.022	ug/l	204.29
Fe	56	72	2	H2	0.140	ug/l	24560.21
Fe	56	72	3	He	0.430	ug/l	11128.76
Co	59	72	1	No Gas	-0.002	ug/l	392.56
Ni	60	72	1	No Gas	-0.062	ug/l	1057.95
Ni	60	72	3	He	-0.043	ug/l	191.11
Cu	63	72	1	No Gas	-0.064	ug/l	1860.20
Cu	63	72	3	He	-0.016	ug/l	629.89
Cu	65	72	1	No Gas	-0.250	ug/l	1083.14
Zn	66	72	1	No Gas	-0.284	ug/l	1483.17
Zn	66	72	3	He	-0.097	ug/l	431.12
As	75	72	1	No Gas	-0.605	ug/l	29089.77
As	75	72	3	He	-0.679	ug/l	726.00
Se	78	72	2	H2	-0.062	ug/l	95.34
Br	79	72	1	No Gas	0.180	ug/l	8222.77
Br	79	72	2	H2	0.133	ug/l	6931.25
Se	82	72	1	No Gas	1.156	ug/l	1792.73
Kr	84	72	1	No Gas		ug/l	45355.28
Sr	88	72	1	No Gas	-0.004	ug/l	605.48
Sr	88	72	3	He	0.002	ug/l	174.45
Mo	95	115	1	No Gas	0.019	ug/l	165.56
Mo	95	115	3	He	0.021	ug/l	73.34
Mo	98	115	1	No Gas	0.023	ug/l	285.15
Ag	107	115	1	No Gas	0.000	ug/l	35.35
Ag	109	115	1	No Gas	0.000	ug/l	37.35
Cd	111	115	1	No Gas	0.007	ug/l	31.80

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	0.002	ug/l	5.67
Cd	114	115	1	No Gas	0.004	ug/l	32.00
Cd	114	115	3	He	0.001	ug/l	8.67
Sn	118	115	1	No Gas	-0.016	ug/l	1111.18
Sn	118	115	3	He	0.018	ug/l	386.67
Sb	121	115	1	No Gas	0.013	ug/l	415.05
Sb	121	115	3	He	0.017	ug/l	154.02
Sb	123	115	1	No Gas	0.015	ug/l	347.71
Sb	123	115	3	He	0.016	ug/l	124.68
Ba	135	115	1	No Gas	-0.019	ug/l	169.67
Ba	137	115	1	No Gas	-0.015	ug/l	336.01
La	139	115	3	He	0.000	ug/l	16.67
Ce	140	115	3	He	0.000	ug/l	15.56
Hg	201	209	1	No Gas	0.002	ug/l	11.33
Hg	202	209	1	No Gas	0.002	ug/l	45.66
Hg	202	209	3	He	0.000	ug/l	13.00
Tl	203	209	3	He	0.071	ug/l	466.86
Tl	205	209	1	No Gas	0.069	ug/l	2007.95
Tl	205	209	3	He	0.072	ug/l	1081.81
[Pb]	206	209	1	No Gas	0.000	ug/l	116.67
[Pb]	207	209	1	No Gas	-0.001	ug/l	107.78
Pb	208	209	1	No Gas	-0.001	ug/l	445.56
Th	232	209	3	He	0.015	ug/l	377.49
U	238	209	1	No Gas	0.001	ug/l	46.66

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	4026634.96	81.5
Sc	45	2	H2	3722622.26	93.8
Sc	45	3	He	323978.29	87.9
Ge	72	1	No Gas	1152325.32	85.4
Ge	72	2	H2	1265860.58	98.0
Ge	72	3	He	209893.24	87.1
In	115	1	No Gas	6992492.07	90.0
In	115	3	He	1914282.09	87.1
Tb	159	1	No Gas	8002859.19	94.6
Tb	159	3	He	3794587.32	88.3
Ho	165	1	No Gas	7493477.59	92.9
Ho	165	3	He	3612834.45	88.8
Lu	175	1	No Gas	7079960.59	93.0
Lu	175	3	He	2846290.62	86.4
Bi	209	1	No Gas	4391095.18	91.5
Bi	209	3	He	2436144.35	89.3

ICPMS207-B Analytical Data

Sample Name MB-162274
File Name 024ARef.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 13:17:33
Sample Type AIRRef
Total Dilution 1.0000
Comment ICPMS-6020-W-T
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	1.012	ug/l	7178.58
Be	9	45	1	No Gas	-0.037	ug/l	39.99
B	11	45	1	No Gas	1.186	ug/l	2328.45
Na	23	45	3	He	25.287	ug/l	38121.47
Mg	24	45	3	He	1.794	ug/l	1330.76
Al	27	45	1	No Gas	0.742	ug/l	28717.61
Si	28	45	2	H2	9.748	ug/l	41529.92
K	39	72	3	He	-8.500	ug/l	134477.86
Ca	40	72	2	H2	30.018	ug/l	528189.94
Ti	47	72	1	No Gas	0.276	ug/l	799.17
V	51	72	1	No Gas	5.101	ug/l	48579.38
V	51	72	3	He	-4.651	ug/l	16804.06
Cr	52	72	1	No Gas	-4.417	ug/l	89620.77
Cr	52	72	3	He	0.368	ug/l	3740.49
Mn	55	72	1	No Gas	1.047	ug/l	36002.50
Mn	55	72	3	He	0.074	ug/l	450.92
Fe	56	72	2	H2	0.885	ug/l	35968.37
Fe	56	72	3	He	1.201	ug/l	12886.96
Co	59	72	1	No Gas	0.032	ug/l	1021.35
Ni	60	72	1	No Gas	-0.040	ug/l	1034.65
Ni	60	72	3	He	-0.009	ug/l	227.78
Cu	63	72	1	No Gas	0.066	ug/l	3075.56
Cu	63	72	3	He	0.178	ug/l	1383.46
Cu	65	72	1	No Gas	-0.118	ug/l	1656.76
Zn	66	72	1	No Gas	0.504	ug/l	4344.88
Zn	66	72	3	He	0.732	ug/l	1212.28
As	75	72	1	No Gas	0.292	ug/l	30210.73
As	75	72	3	He	-0.372	ug/l	990.55
Se	78	72	2	H2	-0.014	ug/l	127.22
Br	79	72	1	No Gas	0.824	ug/l	12557.33
Br	79	72	2	H2	0.784	ug/l	11598.34
Se	82	72	1	No Gas	0.974	ug/l	1553.19
Kr	84	72	1	No Gas		ug/l	43202.99
Sr	88	72	1	No Gas	0.022	ug/l	1257.56
Sr	88	72	3	He	0.022	ug/l	243.34
Mo	95	115	1	No Gas	0.062	ug/l	408.90
Mo	95	115	3	He	0.076	ug/l	190.00
Mo	98	115	1	No Gas	0.063	ug/l	626.21
Ag	107	115	1	No Gas	0.001	ug/l	38.68
Ag	109	115	1	No Gas	0.000	ug/l	33.35
Cd	111	115	1	No Gas	0.002	ug/l	10.12

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	0.001	ug/l	4.00
Cd	114	115	1	No Gas	0.000	ug/l	-1.53
Cd	114	115	3	He	0.000	ug/l	6.15
Sn	118	115	1	No Gas	0.112	ug/l	2212.47
Sn	118	115	3	He	0.133	ug/l	690.02
Sb	121	115	1	No Gas	0.030	ug/l	628.08
Sb	121	115	3	He	0.031	ug/l	204.35
Sb	123	115	1	No Gas	0.032	ug/l	510.06
Sb	123	115	3	He	0.034	ug/l	176.69
Ba	135	115	1	No Gas	-0.003	ug/l	192.96
Ba	137	115	1	No Gas	-0.005	ug/l	349.31
La	139	115	3	He	0.000	ug/l	18.89
Ce	140	115	3	He	0.001	ug/l	35.56
Hg	201	209	1	No Gas	0.005	ug/l	16.67
Hg	202	209	1	No Gas	0.027	ug/l	141.97
Hg	202	209	3	He	0.029	ug/l	67.99
Tl	203	209	3	He	0.062	ug/l	386.83
Tl	205	209	1	No Gas	0.047	ug/l	1490.10
Tl	205	209	3	He	0.062	ug/l	885.05
[Pb]	206	209	1	No Gas	0.034	ug/l	387.79
[Pb]	207	209	1	No Gas	0.024	ug/l	278.89
Pb	208	209	1	No Gas	0.031	ug/l	1426.71
Th	232	209	3	He	0.094	ug/l	1504.03
U	238	209	1	No Gas	0.000	ug/l	45.32

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	3395114.76	68.7
Sc	45	2	H2	3413759.22	86.0
Sc	45	3	He	284586.28	77.2
Ge	72	1	No Gas	1030455.05	76.4
Ge	72	2	H2	1142516.48	88.5
Ge	72	3	He	189344.49	78.5
In	115	1	No Gas	6166087.20	79.4
In	115	3	He	1695876.68	77.1
Tb	159	1	No Gas	7629800.99	90.2
Tb	159	3	He	3544792.14	82.5
Ho	165	1	No Gas	6967613.72	86.4
Ho	165	3	He	3330228.00	81.9
Lu	175	1	No Gas	6674106.53	87.7
Lu	175	3	He	2605212.91	79.1
Bi	209	1	No Gas	4472740.51	93.2
Bi	209	3	He	2242888.72	82.2

ICPMS207-B Analytical Data

Sample Name LCS4-162274
File Name 025LCS4.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 13:23:43
Sample Type LCS4
Total Dilution 1.0000
Comment ICPMS-6020-W-T
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	86.572	ug/l	325066.16
Be	9	45	1	No Gas	43.822	ug/l	83299.49
B	11	45	1	No Gas	93.197	ug/l	116756.19
Na	23	45	3	He	5568.627	ug/l	3945566.09
Mg	24	45	3	He	5652.780	ug/l	2078558.30
Al	27	45	1	No Gas	468.420	ug/l	5110127.21
Si	28	45	2	H2	982.652	ug/l	2780868.81
K	39	72	3	He	5167.361	ug/l	2513062.04
Ca	40	72	2	H2	5195.109	ug/l	52809055.53
Ti	47	72	1	No Gas	87.508	ug/l	145238.33
V	51	72	1	No Gas	90.573	ug/l	1746062.11
V	51	72	3	He	100.484	ug/l	436637.99
Cr	52	72	1	No Gas	91.537	ug/l	1713676.45
Cr	52	72	3	He	107.676	ug/l	470484.40
Mn	55	72	1	No Gas	494.248	ug/l	11356899.41
Mn	55	72	3	He	529.771	ug/l	1527822.20
Fe	56	72	2	H2	516.833	ug/l	9923142.06
Fe	56	72	3	He	541.608	ug/l	2073718.52
Co	59	72	1	No Gas	98.449	ug/l	1938400.82
Ni	60	72	1	No Gas	99.475	ug/l	445572.50
Ni	60	72	3	He	110.439	ug/l	184693.56
Cu	63	72	1	No Gas	102.403	ug/l	1119608.79
Cu	63	72	3	He	112.540	ug/l	488548.26
Cu	65	72	1	No Gas	101.175	ug/l	529625.62
Zn	66	72	1	No Gas	104.443	ug/l	399366.23
Zn	66	72	3	He	104.670	ug/l	107967.85
As	75	72	1	No Gas	106.069	ug/l	580692.44
As	75	72	3	He	101.762	ug/l	116539.31
Se	78	72	2	H2	101.210	ug/l	89682.52
Br	79	72	1	No Gas	0.796	ug/l	12054.52
Br	79	72	2	H2	0.914	ug/l	13113.31
Se	82	72	1	No Gas	105.159	ug/l	31901.02
Kr	84	72	1	No Gas		ug/l	62575.42
Sr	88	72	1	No Gas	111.720	ug/l	3051723.95
Sr	88	72	3	He	100.693	ug/l	447774.89
Mo	95	115	1	No Gas	99.293	ug/l	593077.48
Mo	95	115	3	He	108.580	ug/l	255208.34
Mo	98	115	1	No Gas	101.667	ug/l	957664.25
Ag	107	115	1	No Gas	9.675	ug/l	152319.01
Ag	109	115	1	No Gas	9.782	ug/l	146069.12
Cd	111	115	1	No Gas	53.039	ug/l	171541.99

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	51.830	ug/l	66836.60
Cd	114	115	1	No Gas	51.296	ug/l	381827.02
Cd	114	115	3	He	51.554	ug/l	161230.98
Sn	118	115	1	No Gas	97.998	ug/l	936433.67
Sn	118	115	3	He	97.247	ug/l	300168.08
Sb	121	115	1	No Gas	102.464	ug/l	1589405.78
Sb	121	115	3	He	99.406	ug/l	492903.41
Sb	123	115	1	No Gas	106.570	ug/l	1248875.74
Sb	123	115	3	He	101.755	ug/l	394551.44
Ba	135	115	1	No Gas	103.263	ug/l	274038.83
Ba	137	115	1	No Gas	101.626	ug/l	476889.75
La	139	115	3	He	108.204	ug/l	1703628.14
Ce	140	115	3	He	109.902	ug/l	1834597.99
Hg	201	209	1	No Gas	0.006	ug/l	16.33
Hg	202	209	1	No Gas	0.029	ug/l	138.97
Hg	202	209	3	He	0.021	ug/l	51.99
Tl	203	209	3	He	101.874	ug/l	474785.13
Tl	205	209	1	No Gas	104.824	ug/l	2206520.23
Tl	205	209	3	He	104.397	ug/l	1135141.18
[Pb]	206	209	1	No Gas	101.104	ug/l	738388.11
[Pb]	207	209	1	No Gas	101.102	ug/l	641790.88
Pb	208	209	1	No Gas	102.603	ug/l	2982814.21
Th	232	209	3	He	99.768	ug/l	1416631.32
U	238	209	1	No Gas	107.138	ug/l	2637666.23

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	3203989.29	64.9
Sc	45	2	H2	3408464.18	85.9
Sc	45	3	He	294174.92	79.8
Ge	72	1	No Gas	1010689.04	74.9
Ge	72	2	H2	1182764.70	91.6
Ge	72	3	He	195827.64	81.2
In	115	1	No Gas	6185165.00	79.6
In	115	3	He	1729254.45	78.6
Tb	159	1	No Gas	7508694.94	88.7
Tb	159	3	He	3525396.97	82.0
Ho	165	1	No Gas	6806606.47	84.4
Ho	165	3	He	3414291.80	83.9
Lu	175	1	No Gas	6691362.59	87.9
Lu	175	3	He	2678236.71	81.3
Bi	209	1	No Gas	4164249.04	86.8
Bi	209	3	He	2197526.55	80.5

ICPMS207-B Analytical Data

Sample Name Rinse
File Name 026BLKV.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 13:29:41
Sample Type BkVrfy
Total Dilution 1.0000
Comment ICPMS-6020-W-D
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	0.293	ug/l	5202.98
Be	9	45	1	No Gas	-0.040	ug/l	39.66
B	11	45	1	No Gas	0.472	ug/l	1660.09
Na	23	45	3	He	8.660	ug/l	30412.88
Mg	24	45	3	He	0.877	ug/l	1141.12
Al	27	45	1	No Gas	-0.379	ug/l	18943.13
Si	28	45	2	H2	-2.869	ug/l	6414.63
K	39	72	3	He	-11.648	ug/l	149630.20
Ca	40	72	2	H2	0.309	ug/l	259804.56
Ti	47	72	1	No Gas	-0.095	ug/l	198.53
V	51	72	1	No Gas	2.036	ug/l	-19460.11
V	51	72	3	He	-6.284	ug/l	11818.12
Cr	52	72	1	No Gas	-6.543	ug/l	60267.15
Cr	52	72	3	He	0.029	ug/l	2599.13
Mn	55	72	1	No Gas	-0.002	ug/l	13056.60
Mn	55	72	3	He	-0.007	ug/l	254.62
Fe	56	72	2	H2	0.054	ug/l	22488.12
Fe	56	72	3	He	0.145	ug/l	10110.34
Co	59	72	1	No Gas	-0.001	ug/l	419.18
Ni	60	72	1	No Gas	-0.124	ug/l	748.54
Ni	60	72	3	He	-0.011	ug/l	252.23
Cu	63	72	1	No Gas	-0.090	ug/l	1550.71
Cu	63	72	3	He	-0.029	ug/l	577.90
Cu	65	72	1	No Gas	-0.291	ug/l	845.03
Zn	66	72	1	No Gas	-0.011	ug/l	2701.00
Zn	66	72	3	He	0.248	ug/l	822.25
As	75	72	1	No Gas	-1.440	ug/l	24275.69
As	75	72	3	He	-0.761	ug/l	635.73
Se	78	72	2	H2	-0.068	ug/l	89.11
Br	79	72	1	No Gas	0.101	ug/l	7553.72
Br	79	72	2	H2	0.061	ug/l	6195.73
Se	82	72	1	No Gas	0.448	ug/l	1569.98
Kr	84	72	1	No Gas		ug/l	42822.54
Sr	88	72	1	No Gas	-0.002	ug/l	672.02
Sr	88	72	3	He	0.003	ug/l	180.00
Mo	95	115	1	No Gas	0.006	ug/l	78.89
Mo	95	115	3	He	0.010	ug/l	42.22
Mo	98	115	1	No Gas	0.008	ug/l	117.85
Ag	107	115	1	No Gas	0.000	ug/l	41.35
Ag	109	115	1	No Gas	0.000	ug/l	39.35
Cd	111	115	1	No Gas	0.006	ug/l	27.14

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	0.002	ug/l	6.45
Cd	114	115	1	No Gas	0.004	ug/l	31.59
Cd	114	115	3	He	0.002	ug/l	13.42
Sn	118	115	1	No Gas	-0.009	ug/l	1197.68
Sn	118	115	3	He	0.019	ug/l	387.79
Sb	121	115	1	No Gas	0.015	ug/l	470.39
Sb	121	115	3	He	0.015	ug/l	143.35
Sb	123	115	1	No Gas	0.015	ug/l	354.71
Sb	123	115	3	He	0.012	ug/l	106.34
Ba	135	115	1	No Gas	-0.024	ug/l	156.36
Ba	137	115	1	No Gas	-0.008	ug/l	379.26
La	139	115	3	He	0.000	ug/l	17.78
Ce	140	115	3	He	0.000	ug/l	16.66
Hg	201	209	1	No Gas	0.000	ug/l	8.33
Hg	202	209	1	No Gas	-0.001	ug/l	34.99
Hg	202	209	3	He	0.000	ug/l	13.67
Tl	203	209	3	He	0.110	ug/l	653.61
Tl	205	209	1	No Gas	0.107	ug/l	2992.59
Tl	205	209	3	He	0.114	ug/l	1552.72
[Pb]	206	209	1	No Gas	0.002	ug/l	142.22
[Pb]	207	209	1	No Gas	0.004	ug/l	147.78
Pb	208	209	1	No Gas	0.005	ug/l	643.34
Th	232	209	3	He	0.013	ug/l	344.14
U	238	209	1	No Gas	0.001	ug/l	57.32

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	4029425.26	81.6
Sc	45	2	H2	3689682.50	93.0
Sc	45	3	He	322952.51	87.6
Ge	72	1	No Gas	1162778.25	86.2
Ge	72	2	H2	1248038.07	96.6
Ge	72	3	He	212878.57	88.3
In	115	1	No Gas	7051399.49	90.8
In	115	3	He	1893923.21	86.1
Tb	159	1	No Gas	8263502.58	97.6
Tb	159	3	He	3838418.39	89.3
Ho	165	1	No Gas	7754626.23	96.2
Ho	165	3	He	3641533.41	89.5
Lu	175	1	No Gas	7416706.34	97.4
Lu	175	3	He	2906500.69	88.2
Bi	209	1	No Gas	4617274.48	96.2
Bi	209	3	He	2382704.29	87.3

ICPMS207-B Analytical Data

Sample Name B21121402-002C
File Name 027SMPL.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 13:35:51
Sample Type Sample
Total Dilution 1.0000
Comment ICPMS-6020-W-T
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	10.090	ug/l	44642.15
Be	9	45	1	No Gas	-0.043	ug/l	29.66
B	11	45	1	No Gas	39.590	ug/l	55245.38
Na	23	45	3	He	416445.934	ug/l	292354206.76
Mg	24	45	3	He	269032.302	ug/l	98516986.07
Al	27	45	1	No Gas	1.967	ug/l	44334.60
Si	28	45	2	H2	22746.765	ug/l	50310301.30
K	39	72	3	He	7570.093	ug/l	3555481.82
Ca	40	72	2	H2	133976.586	ug/l	1163663302.31
Ti	47	72	1	No Gas	1.806	ug/l	3378.80
V	51	72	1	No Gas	12.078	ug/l	187550.21
V	51	72	3	He	11.538	ug/l	80601.16
Cr	52	72	1	No Gas	10.552	ug/l	348241.45
Cr	52	72	3	He	15.356	ug/l	67905.82
Mn	55	72	1	No Gas	3.852	ug/l	101547.86
Mn	55	72	3	He	2.661	ug/l	7795.18
Fe	56	72	2	H2	112.408	ug/l	1865951.26
Fe	56	72	3	He	115.370	ug/l	441148.17
Co	59	72	1	No Gas	1.159	ug/l	23625.66
Ni	60	72	1	No Gas	61.290	ug/l	279779.63
Ni	60	72	3	He	70.066	ug/l	115324.26
Cu	63	72	1	No Gas	2.381	ug/l	28829.96
Cu	63	72	3	He	0.753	ug/l	3857.74
Cu	65	72	1	No Gas	1.438	ug/l	9914.69
Zn	66	72	1	No Gas	1.663	ug/l	8849.84
Zn	66	72	3	He	1.237	ug/l	1742.34
As	75	72	1	No Gas	1.907	ug/l	38884.44
As	75	72	3	He	1.495	ug/l	3084.93
Se	78	72	2	H2	4.567	ug/l	3591.67
Br	79	72	1	No Gas	85.411	ug/l	699117.24
Br	79	72	2	H2	80.102	ug/l	588463.54
Se	82	72	1	No Gas	6.883	ug/l	3300.22
Kr	84	72	1	No Gas		ug/l	459137.32
Sr	88	72	1	No Gas	2390.478	ug/l	66410544.37
Sr	88	72	3	He	2360.500	ug/l	10323077.56
Mo	95	115	1	No Gas	1.285	ug/l	7823.29
Mo	95	115	3	He	1.508	ug/l	3432.65
Mo	98	115	1	No Gas	1.319	ug/l	12584.70
Ag	107	115	1	No Gas	0.005	ug/l	108.05
Ag	109	115	1	No Gas	0.003	ug/l	68.03
Cd	111	115	1	No Gas	0.007	ug/l	28.26

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	0.007	ug/l	11.00
Cd	114	115	1	No Gas	0.006	ug/l	38.91
Cd	114	115	3	He	0.006	ug/l	23.23
Sn	118	115	1	No Gas	0.111	ug/l	2205.80
Sn	118	115	3	He	0.174	ug/l	802.25
Sb	121	115	1	No Gas	0.186	ug/l	3091.32
Sb	121	115	3	He	0.188	ug/l	955.13
Sb	123	115	1	No Gas	0.252	ug/l	3124.67
Sb	123	115	3	He	0.198	ug/l	789.44
Ba	135	115	1	No Gas	74.727	ug/l	200901.76
Ba	137	115	1	No Gas	75.112	ug/l	357149.64
La	139	115	3	He	0.001	ug/l	38.89
Ce	140	115	3	He	0.002	ug/l	51.11
Hg	201	209	1	No Gas	0.014	ug/l	29.99
Hg	202	209	1	No Gas	0.067	ug/l	277.95
Hg	202	209	3	He	0.054	ug/l	113.65
Tl	203	209	3	He	0.054	ug/l	341.47
Tl	205	209	1	No Gas	0.043	ug/l	1304.52
Tl	205	209	3	He	0.057	ug/l	813.02
[Pb]	206	209	1	No Gas	0.038	ug/l	390.01
[Pb]	207	209	1	No Gas	0.035	ug/l	327.79
Pb	208	209	1	No Gas	0.038	ug/l	1550.05
Th	232	209	3	He	0.080	ug/l	1269.91
U	238	209	1	No Gas	0.073	ug/l	1835.10

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	3502098.86	70.9
Sc	45	2	H2	2677418.36	67.5
Sc	45	3	He	293050.26	79.5
Ge	72	1	No Gas	1029852.29	76.3
Ge	72	2	H2	1015148.75	78.6
Ge	72	3	He	192625.25	79.9
In	115	1	No Gas	6240031.92	80.3
In	115	3	He	1667210.31	75.8
Tb	159	1	No Gas	7617135.98	90.0
Tb	159	3	He	3557886.54	82.8
Ho	165	1	No Gas	7171404.59	88.9
Ho	165	3	He	3394522.14	83.4
Lu	175	1	No Gas	6897888.90	90.6
Lu	175	3	He	2715555.64	82.4
Bi	209	1	No Gas	4157614.66	86.6
Bi	209	3	He	2204710.99	80.8

ICPMS207-B Analytical Data

Sample Name B21121402-003C
File Name 028SMPL.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 13:42:00
Sample Type Sample
Total Dilution 1.0000
Comment ICPMS-6020-W-T
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	0.260	ug/l	4627.91
Be	9	45	1	No Gas	-0.046	ug/l	25.66
B	11	45	1	No Gas	63.625	ug/l	93970.69
Na	23	45	3	He	39606.906	ug/l	28501850.13
Mg	24	45	3	He	9535.193	ug/l	3576951.99
Al	27	45	1	No Gas	13.666	ug/l	196539.47
Si	28	45	2	H2	22948.695	ug/l	63138440.59
K	39	72	3	He	1824.825	ug/l	985924.87
Ca	40	72	2	H2	7917.596	ug/l	76184894.71
Ti	47	72	1	No Gas	2.571	ug/l	4972.53
V	51	72	1	No Gas	18.325	ug/l	328046.45
V	51	72	3	He	23.501	ug/l	130453.60
Cr	52	72	1	No Gas	1.503	ug/l	204703.89
Cr	52	72	3	He	4.334	ug/l	21244.26
Mn	55	72	1	No Gas	9.595	ug/l	250910.10
Mn	55	72	3	He	8.737	ug/l	25605.07
Fe	56	72	2	H2	231.833	ug/l	4230709.52
Fe	56	72	3	He	235.709	ug/l	913186.40
Co	59	72	1	No Gas	0.133	ug/l	3257.24
Ni	60	72	1	No Gas	0.612	ug/l	4265.53
Ni	60	72	3	He	0.500	ug/l	1091.16
Cu	63	72	1	No Gas	0.724	ug/l	11078.65
Cu	63	72	3	He	0.590	ug/l	3239.05
Cu	65	72	1	No Gas	0.443	ug/l	4940.16
Zn	66	72	1	No Gas	16.874	ug/l	71978.23
Zn	66	72	3	He	18.302	ug/l	19413.00
As	75	72	1	No Gas	0.159	ug/l	30510.54
As	75	72	3	He	0.153	ug/l	1628.39
Se	78	72	2	H2	0.177	ug/l	285.11
Br	79	72	1	No Gas	6.131	ug/l	59554.35
Br	79	72	2	H2	5.919	ug/l	52731.16
Se	82	72	1	No Gas	0.840	ug/l	1607.06
Kr	84	72	1	No Gas		ug/l	52770.27
Sr	88	72	1	No Gas	62.108	ug/l	1836851.59
Sr	88	72	3	He	58.137	ug/l	260218.00
Mo	95	115	1	No Gas	0.803	ug/l	5166.52
Mo	95	115	3	He	0.932	ug/l	2260.20
Mo	98	115	1	No Gas	0.826	ug/l	8355.49
Ag	107	115	1	No Gas	0.005	ug/l	116.71
Ag	109	115	1	No Gas	0.003	ug/l	82.70
Cd	111	115	1	No Gas	0.006	ug/l	22.94

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	0.002	ug/l	5.45
Cd	114	115	1	No Gas	0.002	ug/l	10.70
Cd	114	115	3	He	0.002	ug/l	13.50
Sn	118	115	1	No Gas	0.203	ug/l	3253.94
Sn	118	115	3	He	0.244	ug/l	1072.27
Sb	121	115	1	No Gas	0.032	ug/l	700.76
Sb	121	115	3	He	0.033	ug/l	225.03
Sb	123	115	1	No Gas	0.033	ug/l	558.07
Sb	123	115	3	He	0.036	ug/l	193.69
Ba	135	115	1	No Gas	2.204	ug/l	6425.43
Ba	137	115	1	No Gas	2.293	ug/l	11828.34
La	139	115	3	He	0.007	ug/l	127.78
Ce	140	115	3	He	0.015	ug/l	270.00
Hg	201	209	1	No Gas	0.006	ug/l	17.67
Hg	202	209	1	No Gas	0.043	ug/l	208.63
Hg	202	209	3	He	0.036	ug/l	83.65
Tl	203	209	3	He	0.035	ug/l	268.11
Tl	205	209	1	No Gas	0.025	ug/l	1032.27
Tl	205	209	3	He	0.032	ug/l	576.24
[Pb]	206	209	1	No Gas	0.118	ug/l	1066.72
[Pb]	207	209	1	No Gas	0.123	ug/l	973.38
Pb	208	209	1	No Gas	0.121	ug/l	4354.76
Th	232	209	3	He	0.044	ug/l	798.35
U	238	209	1	No Gas	0.007	ug/l	211.29

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	3798836.96	76.9
Sc	45	2	H2	3330007.18	83.9
Sc	45	3	He	300289.46	81.5
Ge	72	1	No Gas	1101821.16	81.7
Ge	72	2	H2	1121371.48	86.8
Ge	72	3	He	197043.71	81.7
In	115	1	No Gas	6627346.85	85.3
In	115	3	He	1775486.06	80.7
Tb	159	1	No Gas	797554.75	94.2
Tb	159	3	He	3652293.86	85.0
Ho	165	1	No Gas	7605166.67	94.3
Ho	165	3	He	3509594.55	86.3
Lu	175	1	No Gas	7223172.56	94.9
Lu	175	3	He	2842554.59	86.3
Bi	209	1	No Gas	4590517.45	95.6
Bi	209	3	He	2322656.60	85.1

ICPMS207-B Analytical Data

Sample Name B21121402-001C
File Name 029SMPL.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 13:48:07
Sample Type Sample
Total Dilution 1.0000
Comment ICPMS-6020-W-T
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	0.308	ug/l	4812.04
Be	9	45	1	No Gas	-0.045	ug/l	26.33
B	11	45	1	No Gas	56.046	ug/l	82579.06
Na	23	45	3	He	169391.846	ug/l	124068895.93
Mg	24	45	3	He	48275.920	ug/l	18442359.92
Al	27	45	1	No Gas	35.627	ug/l	474230.20
Si	28	45	2	H2	24260.320	ug/l	63244645.74
K	39	72	3	He	2222.568	ug/l	1202812.99
Ca	40	72	2	H2	25981.637	ug/l	245064565.93
Ti	47	72	1	No Gas	4.054	ug/l	7604.75
V	51	72	1	No Gas	21.813	ug/l	407673.54
V	51	72	3	He	21.822	ug/l	127226.50
Cr	52	72	1	No Gas	17.136	ug/l	491176.77
Cr	52	72	3	He	20.806	ug/l	95952.37
Mn	55	72	1	No Gas	3.412	ug/l	96979.94
Mn	55	72	3	He	2.235	ug/l	6929.92
Fe	56	72	2	H2	206.203	ug/l	3698942.46
Fe	56	72	3	He	205.971	ug/l	821703.24
Co	59	72	1	No Gas	0.162	ug/l	3856.21
Ni	60	72	1	No Gas	2.801	ug/l	14801.58
Ni	60	72	3	He	2.788	ug/l	5076.47
Cu	63	72	1	No Gas	2.942	ug/l	37208.14
Cu	63	72	3	He	2.575	ug/l	12231.00
Cu	65	72	1	No Gas	2.302	ug/l	15415.02
Zn	66	72	1	No Gas	140.944	ug/l	582061.80
Zn	66	72	3	He	150.656	ug/l	160567.56
As	75	72	1	No Gas	-1.347	ug/l	23026.06
As	75	72	3	He	0.354	ug/l	1909.96
Se	78	72	2	H2	0.255	ug/l	344.89
Br	79	72	1	No Gas	17.769	ug/l	159773.22
Br	79	72	2	H2	17.214	ug/l	141172.67
Se	82	72	1	No Gas	1.047	ug/l	1653.08
Kr	84	72	1	No Gas		ug/l	90072.01
Sr	88	72	1	No Gas	263.240	ug/l	7770836.18
Sr	88	72	3	He	250.207	ug/l	1151175.51
Mo	95	115	1	No Gas	2.896	ug/l	18319.61
Mo	95	115	3	He	3.280	ug/l	8095.68
Mo	98	115	1	No Gas	2.970	ug/l	29585.14
Ag	107	115	1	No Gas	0.283	ug/l	4740.03
Ag	109	115	1	No Gas	0.280	ug/l	4442.49
Cd	111	115	1	No Gas	0.022	ug/l	79.50

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	0.013	ug/l	21.00
Cd	114	115	1	No Gas	0.010	ug/l	72.57
Cd	114	115	3	He	0.006	ug/l	24.74
Sn	118	115	1	No Gas	1.676	ug/l	18045.91
Sn	118	115	3	He	1.694	ug/l	5779.01
Sb	121	115	1	No Gas	0.850	ug/l	14069.78
Sb	121	115	3	He	0.841	ug/l	4425.81
Sb	123	115	1	No Gas	0.860	ug/l	10779.22
Sb	123	115	3	He	0.844	ug/l	3478.79
Ba	135	115	1	No Gas	12.439	ug/l	35147.93
Ba	137	115	1	No Gas	12.001	ug/l	59836.52
La	139	115	3	He	0.018	ug/l	314.45
Ce	140	115	3	He	0.040	ug/l	722.25
Hg	201	209	1	No Gas	0.009	ug/l	23.33
Hg	202	209	1	No Gas	0.039	ug/l	186.63
Hg	202	209	3	He	0.032	ug/l	75.32
Tl	203	209	3	He	0.023	ug/l	207.42
Tl	205	209	1	No Gas	0.015	ug/l	765.58
Tl	205	209	3	He	0.023	ug/l	469.53
[Pb]	206	209	1	No Gas	0.511	ug/l	4112.88
[Pb]	207	209	1	No Gas	0.498	ug/l	3497.15
Pb	208	209	1	No Gas	0.501	ug/l	16095.02
Th	232	209	3	He	0.032	ug/l	608.93
U	238	209	1	No Gas	0.021	ug/l	578.56

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	3688886.96	74.7
Sc	45	2	H2	3153742.53	79.5
Sc	45	3	He	305716.19	82.9
Ge	72	1	No Gas	1088911.31	80.7
Ge	72	2	H2	1101821.06	85.3
Ge	72	3	He	202625.49	84.0
In	115	1	No Gas	6451358.09	83.0
In	115	3	He	1811653.64	82.4
Tb	159	1	No Gas	7860165.83	92.9
Tb	159	3	He	3721796.72	86.6
Ho	165	1	No Gas	7295498.26	90.5
Ho	165	3	He	3528485.91	86.7
Lu	175	1	No Gas	7163633.95	94.1
Lu	175	3	He	2813862.91	85.4
Bi	209	1	No Gas	4450853.49	92.7
Bi	209	3	He	2297375.40	84.2

ICPMS207-B Analytical Data

Sample Name B21121402-001CDIL
File Name 030SMPL.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 13:54:16
Sample Type Sample
Total Dilution 5.0000
Comment ICPMS-6020-W-T
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	0.002	ug/l	3841.37
Be	9	45	1	No Gas	-0.242	ug/l	20.33
B	11	45	1	No Gas	55.268	ug/l	18766.50
Na	23	45	3	He	166416.473	ug/l	25830554.34
Mg	24	45	3	He	47231.634	ug/l	3821875.98
Al	27	45	1	No Gas	39.442	ug/l	135373.16
Si	28	45	2	H2	23935.648	ug/l	14242733.43
K	39	72	3	He	2097.838	ug/l	366328.66
Ca	40	72	2	H2	27752.033	ug/l	58339794.82
Ti	47	72	1	No Gas	3.993	ug/l	1902.28
V	51	72	1	No Gas	10.771	ug/l	-16498.67
V	51	72	3	He	11.133	ug/l	48933.21
Cr	52	72	1	No Gas	-1.387	ug/l	182599.74
Cr	52	72	3	He	20.467	ug/l	21920.83
Mn	55	72	1	No Gas	4.431	ug/l	36526.18
Mn	55	72	3	He	2.427	ug/l	1806.42
Fe	56	72	2	H2	200.008	ug/l	813691.57
Fe	56	72	3	He	202.255	ug/l	177996.18
Co	59	72	1	No Gas	0.163	ug/l	1177.72
Ni	60	72	1	No Gas	2.542	ug/l	3999.30
Ni	60	72	3	He	2.687	ug/l	1253.39
Cu	63	72	1	No Gas	2.938	ug/l	10067.52
Cu	63	72	3	He	2.675	ug/l	3252.72
Cu	65	72	1	No Gas	1.506	ug/l	4401.11
Zn	66	72	1	No Gas	144.762	ug/l	129625.83
Zn	66	72	3	He	150.884	ug/l	34390.48
As	75	72	1	No Gas	7.422	ug/l	41764.48
As	75	72	3	He	-1.340	ug/l	1248.03
Se	78	72	2	H2	-0.003	ug/l	148.67
Br	79	72	1	No Gas	20.433	ug/l	44226.63
Br	79	72	2	H2	19.770	ug/l	40259.44
Se	82	72	1	No Gas	5.298	ug/l	1769.67
Kr	84	72	1	No Gas		ug/l	55544.41
Sr	88	72	1	No Gas	264.023	ug/l	1662950.95
Sr	88	72	3	He	239.702	ug/l	232965.81
Mo	95	115	1	No Gas	2.594	ug/l	3729.40
Mo	95	115	3	He	3.033	ug/l	1603.43
Mo	98	115	1	No Gas	2.647	ug/l	5974.28
Ag	107	115	1	No Gas	0.264	ug/l	1023.78
Ag	109	115	1	No Gas	0.268	ug/l	984.43
Cd	111	115	1	No Gas	0.049	ug/l	42.32

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	0.033	ug/l	12.78
Cd	114	115	1	No Gas	0.024	ug/l	38.47
Cd	114	115	3	He	0.016	ug/l	18.11
Sn	118	115	1	No Gas	1.501	ug/l	4738.13
Sn	118	115	3	He	1.754	ug/l	1531.20
Sb	121	115	1	No Gas	0.793	ug/l	3118.99
Sb	121	115	3	He	0.821	ug/l	968.47
Sb	123	115	1	No Gas	0.803	ug/l	2392.45
Sb	123	115	3	He	0.828	ug/l	770.43
Ba	135	115	1	No Gas	12.054	ug/l	7846.70
Ba	137	115	1	No Gas	11.225	ug/l	12937.05
La	139	115	3	He	0.033	ug/l	136.67
Ce	140	115	3	He	0.096	ug/l	374.57
Hg	201	209	1	No Gas	0.014	ug/l	13.67
Hg	202	209	1	No Gas	0.026	ug/l	60.32
Hg	202	209	3	He	0.025	ug/l	24.33
Tl	203	209	3	He	0.042	ug/l	141.39
Tl	205	209	1	No Gas	0.022	ug/l	568.91
Tl	205	209	3	He	0.052	ug/l	337.47
[Pb]	206	209	1	No Gas	0.538	ug/l	1026.71
[Pb]	207	209	1	No Gas	0.508	ug/l	858.92
Pb	208	209	1	No Gas	0.535	ug/l	4063.60
Th	232	209	3	He	0.006	ug/l	168.74
U	238	209	1	No Gas	0.023	ug/l	165.64

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	4062983.25	82.2
Sc	45	2	H2	3596789.72	90.6
Sc	45	3	He	323749.65	87.8
Ge	72	1	No Gas	1157444.58	85.8
Ge	72	2	H2	1223388.32	94.7
Ge	72	3	He	213910.55	88.7
In	115	1	No Gas	7226080.03	93.0
In	115	3	He	1924781.01	87.5
Tb	159	1	No Gas	8536133.75	100.9
Tb	159	3	He	4011925.14	93.3
Ho	165	1	No Gas	8033317.04	99.6
Ho	165	3	He	3862244.71	94.9
Lu	175	1	No Gas	7711060.37	101.3
Lu	175	3	He	3038218.84	92.2
Bi	209	1	No Gas	4699334.60	97.9
Bi	209	3	He	2424860.68	88.8

ICPMS207-B Analytical Data

Sample Name B21121402-001CPDS1
File Name 031ARef.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 14:00:25
Sample Type AllRef
Total Dilution 1.0300
Comment ICPMS-6020-W-T
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	1916.237	ug/l	7690983.63
Be	9	45	1	No Gas	40.079	ug/l	82396.42
B	11	45	1	No Gas	98.891	ug/l	133904.37
Na	23	45	3	He	211969.154	ug/l	151095773.30
Mg	24	45	3	He	99088.152	ug/l	36845372.29
Al	27	45	1	No Gas	79.466	ug/l	952293.31
Si	28	45	2	H2	24120.809	ug/l	55540066.75
K	39	72	3	He	52035.997	ug/l	24150116.86
Ca	40	72	2	H2	65669.102	ug/l	603081533.62
Ti	47	72	1	No Gas	48.935	ug/l	86595.02
V	51	72	1	No Gas	63.171	ug/l	1278313.31
V	51	72	3	He	77.699	ug/l	348755.47
Cr	52	72	1	No Gas	60.701	ug/l	1273683.56
Cr	52	72	3	He	72.227	ug/l	318136.86
Mn	55	72	1	No Gas	49.497	ug/l	1221257.11
Mn	55	72	3	He	52.232	ug/l	151713.09
Fe	56	72	2	H2	5121.350	ug/l	89053579.61
Fe	56	72	3	He	5375.012	ug/l	20615315.84
Co	59	72	1	No Gas	45.716	ug/l	958016.05
Ni	60	72	1	No Gas	47.378	ug/l	226166.69
Ni	60	72	3	He	53.982	ug/l	90907.81
Cu	63	72	1	No Gas	47.590	ug/l	554621.18
Cu	63	72	3	He	55.271	ug/l	241642.61
Cu	65	72	1	No Gas	47.222	ug/l	264070.57
Zn	66	72	1	No Gas	184.035	ug/l	746225.96
Zn	66	72	3	He	198.791	ug/l	205730.48
As	75	72	1	No Gas	52.229	ug/l	320333.18
As	75	72	3	He	51.414	ug/l	59964.25
Se	78	72	2	H2	49.627	ug/l	39972.16
Br	79	72	1	No Gas	18.007	ug/l	159016.55
Br	79	72	2	H2	17.160	ug/l	137233.75
Se	82	72	1	No Gas	47.978	ug/l	16208.56
Kr	84	72	1	No Gas		ug/l	96695.65
Sr	88	72	1	No Gas	298.236	ug/l	8653598.03
Sr	88	72	3	He	301.937	ug/l	1349778.10
Mo	95	115	1	No Gas	50.777	ug/l	301980.16
Mo	95	115	3	He	58.398	ug/l	134163.47
Mo	98	115	1	No Gas	51.529	ug/l	483230.23
Ag	107	115	1	No Gas	18.803	ug/l	294302.86
Ag	109	115	1	No Gas	18.724	ug/l	278329.97
Cd	111	115	1	No Gas	50.615	ug/l	163058.24

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	51.239	ug/l	64575.10
Cd	114	115	1	No Gas	48.667	ug/l	360696.04
Cd	114	115	3	He	51.238	ug/l	156587.02
Sn	118	115	1	No Gas	49.460	ug/l	470155.55
Sn	118	115	3	He	51.426	ug/l	155244.27
Sb	121	115	1	No Gas	49.698	ug/l	765843.01
Sb	121	115	3	He	50.782	ug/l	246087.50
Sb	123	115	1	No Gas	50.024	ug/l	583126.82
Sb	123	115	3	He	51.361	ug/l	194601.90
Ba	135	115	1	No Gas	64.884	ug/l	171436.76
Ba	137	115	1	No Gas	64.774	ug/l	302249.24
La	139	115	3	He	51.225	ug/l	788268.57
Ce	140	115	3	He	51.812	ug/l	845166.03
Hg	201	209	1	No Gas	0.987	ug/l	1579.11
Hg	202	209	1	No Gas	1.028	ug/l	3728.45
Hg	202	209	3	He	1.039	ug/l	1917.76
Tl	203	209	3	He	49.947	ug/l	227879.83
Tl	205	209	1	No Gas	48.183	ug/l	1002924.46
Tl	205	209	3	He	50.538	ug/l	537864.97
[Pb]	206	209	1	No Gas	49.868	ug/l	359228.96
[Pb]	207	209	1	No Gas	48.774	ug/l	305690.35
Pb	208	209	1	No Gas	49.310	ug/l	1413979.12
Th	232	209	3	He	49.835	ug/l	692610.81
U	238	209	1	No Gas	51.266	ug/l	1245930.83

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	3487215.01	70.6
Sc	45	2	H2	2869575.26	72.3
Sc	45	3	He	306470.28	83.1
Ge	72	1	No Gas	1098157.25	81.4
Ge	72	2	H2	1105325.40	85.6
Ge	72	3	He	202833.98	84.1
In	115	1	No Gas	6214294.04	80.0
In	115	3	He	1740934.74	79.2
Tb	159	1	No Gas	7531348.17	89.0
Tb	159	3	He	3644765.16	84.8
Ho	165	1	No Gas	7125461.88	88.4
Ho	165	3	He	3455620.34	84.9
Lu	175	1	No Gas	6813164.17	89.5
Lu	175	3	He	2766401.12	84.0
Bi	209	1	No Gas	4166509.23	86.8
Bi	209	3	He	2215268.97	81.2

ICPMS207-B Analytical Data

Sample Name B21121402-001CMS4
File Name 032MS4.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 14:06:31
Sample Type MS4
Total Dilution 1.0000
Comment ICPMS-6020-W-T
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	79.242	ug/l	367613.54
Be	9	45	1	No Gas	40.933	ug/l	96244.52
B	11	45	1	No Gas	140.030	ug/l	216589.41
Na	23	45	3	He	169145.182	ug/l	129012986.97
Mg	24	45	3	He	52680.170	ug/l	20958484.41
Al	27	45	1	No Gas	477.117	ug/l	6428497.96
Si	28	45	2	H2	31351.285	ug/l	82538037.98
K	39	72	3	He	7256.525	ug/l	3725749.25
Ca	40	72	2	H2	30071.740	ug/l	299169505.63
Ti	47	72	1	No Gas	91.444	ug/l	165362.34
V	51	72	1	No Gas	112.968	ug/l	2388191.10
V	51	72	3	He	128.492	ug/l	588504.87
Cr	52	72	1	No Gas	109.198	ug/l	2196947.67
Cr	52	72	3	He	123.940	ug/l	580792.07
Mn	55	72	1	No Gas	475.382	ug/l	11913901.15
Mn	55	72	3	He	513.808	ug/l	1590546.25
Fe	56	72	2	H2	690.320	ug/l	13015631.11
Fe	56	72	3	He	732.076	ug/l	3005625.63
Co	59	72	1	No Gas	94.092	ug/l	2018661.56
Ni	60	72	1	No Gas	98.653	ug/l	481154.26
Ni	60	72	3	He	107.564	ug/l	193071.27
Cu	63	72	1	No Gas	100.647	ug/l	1199070.63
Cu	63	72	3	He	110.802	ug/l	516251.96
Cu	65	72	1	No Gas	98.328	ug/l	560536.42
Zn	66	72	1	No Gas	247.175	ug/l	1025884.82
Zn	66	72	3	He	259.506	ug/l	286471.51
As	75	72	1	No Gas	94.308	ug/l	566564.07
As	75	72	3	He	102.669	ug/l	126169.55
Se	78	72	2	H2	100.414	ug/l	87421.98
Br	79	72	1	No Gas	20.704	ug/l	186455.31
Br	79	72	2	H2	18.758	ug/l	161766.56
Se	82	72	1	No Gas	100.173	ug/l	33165.37
Kr	84	72	1	No Gas		ug/l	116988.17
Sr	88	72	1	No Gas	377.228	ug/l	11206909.70
Sr	88	72	3	He	366.855	ug/l	1750519.05
Mo	95	115	1	No Gas	100.359	ug/l	627515.29
Mo	95	115	3	He	113.805	ug/l	279537.80
Mo	98	115	1	No Gas	100.900	ug/l	996280.77
Ag	107	115	1	No Gas	9.547	ug/l	157539.24
Ag	109	115	1	No Gas	9.473	ug/l	148450.43
Cd	111	115	1	No Gas	51.504	ug/l	174523.67

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	51.620	ug/l	69567.73
Cd	114	115	1	No Gas	49.673	ug/l	387434.51
Cd	114	115	3	He	51.627	ug/l	168731.13
Sn	118	115	1	No Gas	99.937	ug/l	998254.58
Sn	118	115	3	He	102.274	ug/l	329851.22
Sb	121	115	1	No Gas	102.702	ug/l	1666041.76
Sb	121	115	3	He	103.791	ug/l	537729.96
Sb	123	115	1	No Gas	106.319	ug/l	1303645.22
Sb	123	115	3	He	106.362	ug/l	430868.14
Ba	135	115	1	No Gas	110.978	ug/l	309131.05
Ba	137	115	1	No Gas	111.085	ug/l	544860.13
La	139	115	3	He	110.008	ug/l	1809812.61
Ce	140	115	3	He	109.831	ug/l	1915641.76
Hg	201	209	1	No Gas	0.008	ug/l	20.33
Hg	202	209	1	No Gas	0.046	ug/l	205.29
Hg	202	209	3	He	0.032	ug/l	72.66
Tl	203	209	3	He	103.129	ug/l	481508.72
Tl	205	209	1	No Gas	98.961	ug/l	2134578.39
Tl	205	209	3	He	105.680	ug/l	1151325.44
[Pb]	206	209	1	No Gas	98.833	ug/l	737221.57
[Pb]	207	209	1	No Gas	98.426	ug/l	637943.86
Pb	208	209	1	No Gas	99.327	ug/l	2945332.33
Th	232	209	3	He	104.661	ug/l	1489361.03
U	238	209	1	No Gas	105.237	ug/l	2652191.45

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	3960579.88	80.2
Sc	45	2	H2	3185534.28	80.3
Sc	45	3	He	318370.52	86.4
Ge	72	1	No Gas	1100665.08	81.6
Ge	72	2	H2	1162053.74	90.0
Ge	72	3	He	210168.94	87.2
In	115	1	No Gas	6469602.41	83.3
In	115	3	He	1807008.59	82.2
Tb	159	1	No Gas	7855514.72	92.8
Tb	159	3	He	3630063.24	84.4
Ho	165	1	No Gas	7384906.10	91.6
Ho	165	3	He	3464964.35	85.2
Lu	175	1	No Gas	7129508.84	93.7
Lu	175	3	He	2825210.13	85.8
Bi	209	1	No Gas	4266545.62	88.9
Bi	209	3	He	2201976.04	80.7

ICPMS207-B Analytical Data

Sample Name B21121402-001CMSD4
File Name 033MSD4.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 14:12:29
Sample Type MSD4
Total Dilution 1.0000
Comment ICPMS-6020-W-T
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	83.233	ug/l	361263.50
Be	9	45	1	No Gas	42.569	ug/l	93747.07
B	11	45	1	No Gas	148.441	ug/l	214936.74
Na	23	45	3	He	173711.830	ug/l	133007419.13
Mg	24	45	3	He	52976.873	ug/l	21155206.59
Al	27	45	1	No Gas	510.723	ug/l	6440537.96
Si	28	45	2	H2	32123.356	ug/l	81632346.39
K	39	72	3	He	7448.149	ug/l	3791346.54
Ca	40	72	2	H2	29996.537	ug/l	296472251.81
Ti	47	72	1	No Gas	94.301	ug/l	167988.64
V	51	72	1	No Gas	112.533	ug/l	2346515.00
V	51	72	3	He	130.006	ug/l	590621.57
Cr	52	72	1	No Gas	113.273	ug/l	2236356.07
Cr	52	72	3	He	125.796	ug/l	585163.03
Mn	55	72	1	No Gas	476.716	ug/l	11758857.79
Mn	55	72	3	He	527.262	ug/l	1619984.76
Fe	56	72	2	H2	678.661	ug/l	12712816.33
Fe	56	72	3	He	735.256	ug/l	2996533.64
Co	59	72	1	No Gas	94.718	ug/l	2001761.42
Ni	60	72	1	No Gas	99.444	ug/l	477387.14
Ni	60	72	3	He	110.074	ug/l	196085.79
Cu	63	72	1	No Gas	101.976	ug/l	1195410.07
Cu	63	72	3	He	112.047	ug/l	518207.57
Cu	65	72	1	No Gas	101.025	ug/l	567029.75
Zn	66	72	1	No Gas	248.696	ug/l	1015866.87
Zn	66	72	3	He	257.087	ug/l	281741.99
As	75	72	1	No Gas	99.640	ug/l	586978.67
As	75	72	3	He	104.281	ug/l	127189.61
Se	78	72	2	H2	101.499	ug/l	87786.77
Br	79	72	1	No Gas	19.794	ug/l	175589.13
Br	79	72	2	H2	18.346	ug/l	157314.40
Se	82	72	1	No Gas	104.924	ug/l	34114.66
Kr	84	72	1	No Gas		ug/l	112345.51
Sr	88	72	1	No Gas	376.168	ug/l	11011201.32
Sr	88	72	3	He	369.652	ug/l	1750859.45
Mo	95	115	1	No Gas	106.371	ug/l	631964.18
Mo	95	115	3	He	116.227	ug/l	283492.72
Mo	98	115	1	No Gas	107.901	ug/l	1012435.54
Ag	107	115	1	No Gas	10.079	ug/l	157792.16
Ag	109	115	1	No Gas	9.964	ug/l	148186.05
Cd	111	115	1	No Gas	55.094	ug/l	177430.82

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	52.862	ug/l	70733.92
Cd	114	115	1	No Gas	52.658	ug/l	390000.46
Cd	114	115	3	He	52.206	ug/l	169406.79
Sn	118	115	1	No Gas	105.725	ug/l	1003875.15
Sn	118	115	3	He	103.206	ug/l	330474.57
Sb	121	115	1	No Gas	109.973	ug/l	1692880.71
Sb	121	115	3	He	105.081	ug/l	540572.57
Sb	123	115	1	No Gas	112.270	ug/l	1308025.23
Sb	123	115	3	He	107.541	ug/l	432608.08
Ba	135	115	1	No Gas	122.436	ug/l	322786.45
Ba	137	115	1	No Gas	118.759	ug/l	552113.72
La	139	115	3	He	111.805	ug/l	1826402.91
Ce	140	115	3	He	112.880	ug/l	1954806.31
Hg	201	209	1	No Gas	0.010	ug/l	23.33
Hg	202	209	1	No Gas	0.040	ug/l	179.97
Hg	202	209	3	He	0.036	ug/l	81.31
Tl	203	209	3	He	103.137	ug/l	488703.85
Tl	205	209	1	No Gas	102.738	ug/l	2178901.06
Tl	205	209	3	He	104.392	ug/l	1154051.86
[Pb]	206	209	1	No Gas	101.858	ug/l	747515.36
[Pb]	207	209	1	No Gas	100.487	ug/l	641464.08
Pb	208	209	1	No Gas	103.966	ug/l	3037370.03
Th	232	209	3	He	101.933	ug/l	1471590.02
U	238	209	1	No Gas	111.169	ug/l	2749731.55

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	3701527.66	74.9
Sc	45	2	H2	3074524.99	77.5
Sc	45	3	He	319585.86	86.7
Ge	72	1	No Gas	1078261.90	79.9
Ge	72	2	H2	1154432.24	89.4
Ge	72	3	He	208651.98	86.5
In	115	1	No Gas	6128473.25	78.9
In	115	3	He	1794179.26	81.6
Tb	159	1	No Gas	7411514.33	87.6
Tb	159	3	He	3703508.22	86.1
Ho	165	1	No Gas	6927415.97	85.9
Ho	165	3	He	3591397.60	88.3
Lu	175	1	No Gas	6650619.03	87.4
Lu	175	3	He	2779411.50	84.4
Bi	209	1	No Gas	4164159.62	86.8
Bi	209	3	He	2234386.15	81.9

ICPMS207-B Analytical Data

Sample Name CCV
File Name 034_CCV.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 14:18:27
Sample Type CCV
Total Dilution 1.0000
Comment ICPMS-6020-W-D
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	525.020	ug/l	2660918.97
Be	9	45	1	No Gas	41.094	ug/l	106573.83
B	11	45	1	No Gas	44.136	ug/l	75878.31
Na	23	45	3	He	13149.509	ug/l	11071372.20
Mg	24	45	3	He	13064.538	ug/l	5725767.21
Al	27	45	1	No Gas	44.080	ug/l	677441.52
Si	28	45	2	H2	203.650	ug/l	630450.75
K	39	72	3	He	12523.575	ug/l	6913447.40
Ca	40	72	2	H2	12523.908	ug/l	136805559.08
Ti	47	72	1	No Gas	43.515	ug/l	92437.94
V	51	72	1	No Gas	45.809	ug/l	1092167.57
V	51	72	3	He	48.526	ug/l	269424.18
Cr	52	72	1	No Gas	44.011	ug/l	1161286.47
Cr	52	72	3	He	50.868	ug/l	262353.12
Mn	55	72	1	No Gas	46.904	ug/l	1389883.78
Mn	55	72	3	He	50.472	ug/l	171167.66
Fe	56	72	2	H2	1326.175	ug/l	27407717.17
Fe	56	72	3	He	1327.030	ug/l	5951464.48
Co	59	72	1	No Gas	46.487	ug/l	1169680.47
Ni	60	72	1	No Gas	46.591	ug/l	267019.52
Ni	60	72	3	He	52.481	ug/l	103204.54
Cu	63	72	1	No Gas	46.354	ug/l	648776.97
Cu	63	72	3	He	53.524	ug/l	273231.23
Cu	65	72	1	No Gas	46.073	ug/l	309372.37
Zn	66	72	1	No Gas	48.715	ug/l	239340.23
Zn	66	72	3	He	52.183	ug/l	63484.19
As	75	72	1	No Gas	47.302	ug/l	350744.37
As	75	72	3	He	49.732	ug/l	67743.67
Se	78	72	2	H2	50.213	ug/l	48027.84
Br	79	72	1	No Gas	1.101	ug/l	18525.23
Br	79	72	2	H2	1.309	ug/l	17749.01
Se	82	72	1	No Gas	46.785	ug/l	18972.53
Kr	84	72	1	No Gas		ug/l	58450.73
Sr	88	72	1	No Gas	49.145	ug/l	1713102.93
Sr	88	72	3	He	48.624	ug/l	253989.72
Mo	95	115	1	No Gas	47.679	ug/l	331561.78
Mo	95	115	3	He	51.714	ug/l	140533.85
Mo	98	115	1	No Gas	48.561	ug/l	532421.51
Ag	107	115	1	No Gas	18.919	ug/l	346264.96
Ag	109	115	1	No Gas	18.820	ug/l	327171.48
Cd	111	115	1	No Gas	50.490	ug/l	190231.21

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	50.395	ug/l	75123.45
Cd	114	115	1	No Gas	48.874	ug/l	423605.39
Cd	114	115	3	He	49.887	ug/l	180342.25
Sn	118	115	1	No Gas	53.879	ug/l	598774.15
Sn	118	115	3	He	55.706	ug/l	198897.78
Sb	121	115	1	No Gas	49.932	ug/l	899920.74
Sb	121	115	3	He	49.616	ug/l	284407.34
Sb	123	115	1	No Gas	50.597	ug/l	689733.89
Sb	123	115	3	He	50.209	ug/l	225023.82
Ba	135	115	1	No Gas	51.073	ug/l	157852.07
Ba	137	115	1	No Gas	50.254	ug/l	274300.71
La	139	115	3	He	50.129	ug/l	912389.20
Ce	140	115	3	He	49.702	ug/l	959078.71
Hg	201	209	1	No Gas	0.939	ug/l	1750.10
Hg	202	209	1	No Gas	0.931	ug/l	3934.46
Hg	202	209	3	He	1.007	ug/l	2112.42
Tl	203	209	3	He	49.003	ug/l	253963.64
Tl	205	209	1	No Gas	47.570	ug/l	1153487.50
Tl	205	209	3	He	50.244	ug/l	607504.56
[Pb]	206	209	1	No Gas	47.269	ug/l	396682.61
[Pb]	207	209	1	No Gas	46.705	ug/l	341079.07
Pb	208	209	1	No Gas	47.244	ug/l	1578346.58
Th	232	209	3	He	47.910	ug/l	756458.92
U	238	209	1	No Gas	48.608	ug/l	1376303.39

Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	4271154.57	86.5
Sc	45	2	H2	3659103.35	92.2
Sc	45	3	He	350712.39	95.1
Ge	72	1	No Gas	1281130.47	95.0
Ge	72	2	H2	1274786.07	98.7
Ge	72	3	He	229965.65	95.4
In	115	1	No Gas	7056224.38	90.8
In	115	3	He	1998777.78	90.9
Tb	159	1	No Gas	8336452.30	98.5
Tb	159	3	He	3948941.25	91.9
Ho	165	1	No Gas	7852239.83	97.4
Ho	165	3	He	3718066.71	91.4
Lu	175	1	No Gas	7561625.42	99.3
Lu	175	3	He	2997401.54	91.0
Bi	209	1	No Gas	4712001.72	98.2
Bi	209	3	He	2443392.70	89.5

ICPMS207-B Analytical Data

Sample Name CCB
File Name 035_CCB.d
Data Path Name D:\Agilent\ICPMH\1\DATA\211220ADoD.b
Acq Time 2021-12-20 14:24:36
Sample Type CCB
Total Dilution 1.0000
Comment ICPMS-6020-W-D
Operator CAR/SRH/JPV/AEM
Method SW6020/ SW6020B

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Li	7	45	1	No Gas	0.559	ug/l	6319.86
Be	9	45	1	No Gas	-0.042	ug/l	34.99
B	11	45	1	No Gas	0.898	ug/l	2287.10
Na	23	45	3	He	47.311	ug/l	59529.27
Mg	24	45	3	He	1.617	ug/l	1420.59
Al	27	45	1	No Gas	-1.100	ug/l	8685.90
Si	28	45	2	H2	2.005	ug/l	21502.69
K	39	72	3	He	-8.200	ug/l	147599.44
Ca	40	72	2	H2	0.476	ug/l	259067.99
Ti	47	72	1	No Gas	-0.068	ug/l	250.25
V	51	72	1	No Gas	4.078	ug/l	27990.20
V	51	72	3	He	-1.334	ug/l	32454.59
Cr	52	72	1	No Gas	-3.989	ug/l	110142.46
Cr	52	72	3	He	0.075	ug/l	2750.27
Mn	55	72	1	No Gas	0.112	ug/l	16053.61
Mn	55	72	3	He	0.010	ug/l	300.61
Fe	56	72	2	H2	0.059	ug/l	22372.86
Fe	56	72	3	He	0.429	ug/l	11008.55
Co	59	72	1	No Gas	-0.002	ug/l	402.54
Ni	60	72	1	No Gas	-0.088	ug/l	931.52
Ni	60	72	3	He	-0.020	ug/l	228.89
Cu	63	72	1	No Gas	-0.088	ug/l	1560.71
Cu	63	72	3	He	-0.022	ug/l	596.89
Cu	65	72	1	No Gas	-0.283	ug/l	895.05
Zn	66	72	1	No Gas	-0.272	ug/l	1542.05
Zn	66	72	3	He	-0.148	ug/l	371.12
As	75	72	1	No Gas	-0.450	ug/l	30135.02
As	75	72	3	He	-0.388	ug/l	1067.35
Se	78	72	2	H2	-0.028	ug/l	125.00
Br	79	72	1	No Gas	0.475	ug/l	10982.47
Br	79	72	2	H2	0.442	ug/l	9514.32
Se	82	72	1	No Gas	0.713	ug/l	1652.30
Kr	84	72	1	No Gas		ug/l	41845.47
Sr	88	72	1	No Gas	-0.001	ug/l	705.29
Sr	88	72	3	He	-0.001	ug/l	156.67
Mo	95	115	1	No Gas	0.011	ug/l	114.44
Mo	95	115	3	He	0.011	ug/l	44.45
Mo	98	115	1	No Gas	0.013	ug/l	174.10
Ag	107	115	1	No Gas	0.000	ug/l	30.01
Ag	109	115	1	No Gas	0.000	ug/l	30.01
Cd	111	115	1	No Gas	0.001	ug/l	8.71

ICPMS207-B Analytical Data

Name	Mass	ISTD	Tune Step	Tune Mode	Conc.	Units	CPS
Cd	111	115	3	He	0.001	ug/l	4.66
Cd	114	115	1	No Gas	0.003	ug/l	21.06
Cd	114	115	3	He	0.001	ug/l	10.99
Sn	118	115	1	No Gas	-0.018	ug/l	1091.22
Sn	118	115	3	He	0.017	ug/l	378.89
Sb	121	115	1	No Gas	0.028	ug/l	681.75
Sb	121	115	3	He	0.027	ug/l	210.02
Sb	123	115	1	No Gas	0.028	ug/l	519.40
Sb	123	115	3	He	0.030	ug/l	181.02
Ba	135	115	1	No Gas	-0.008	ug/l	202.93
Ba	137	115	1	No Gas	-0.014	ug/l	339.33
La	139	115	3	He	0.000	ug/l	14.44
Ce	140	115	3	He	0.000	ug/l	16.67
Hg	201	209	1	No Gas	0.004	ug/l	15.67
Hg	202	209	1	No Gas	0.003	ug/l	49.32
Hg	202	209	3	He	0.000	ug/l	14.33
Tl	203	209	3	He	0.249	ug/l	1353.28
Tl	205	209	1	No Gas	0.198	ug/l	5147.75
Tl	205	209	3	He	0.250	ug/l	3148.31
[Pb]	206	209	1	No Gas	0.000	ug/l	122.22
[Pb]	207	209	1	No Gas	0.000	ug/l	115.56
Pb	208	209	1	No Gas	0.001	ug/l	510.01
Th	232	209	3	He	0.021	ug/l	460.86
U	238	209	1	No Gas	0.001	ug/l	60.99

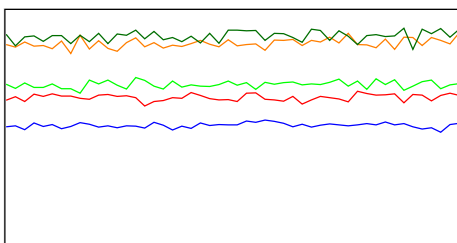
Name	Mass	Tune Step	Tune Mode	CPS	ISTD Recovery %
Sc	45	1	No Gas	3938270.98	79.7
Sc	45	2	H2	3731275.09	94.0
Sc	45	3	He	318744.47	86.5
Ge	72	1	No Gas	1158989.55	85.9
Ge	72	2	H2	1236102.36	95.7
Ge	72	3	He	207623.42	86.1
In	115	1	No Gas	6971270.30	89.7
In	115	3	He	1898702.03	86.4
Tb	159	1	No Gas	7972283.25	94.2
Tb	159	3	He	3794789.29	88.3
Ho	165	1	No Gas	7503919.91	93.1
Ho	165	3	He	3613143.51	88.8
Lu	175	1	No Gas	7351659.73	96.6
Lu	175	3	He	2899675.95	88.0
Bi	209	1	No Gas	4627941.63	96.4
Bi	209	3	He	2378257.96	87.1

Tune Report

Operator Name elim
Acq/Data Batch D:\Agilent\ICPMH1\DATA\220126DoD.b
Acq. Date-Time 2022-01-26 11:41:44
Report Comment ICPMS207-B JPV
Instrument Name G8403A JP17281923

[No Gas]

Sensitivity



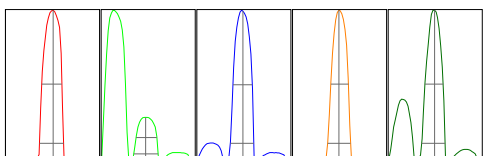
Mass	Range	Count	RSD%	Background
9	500000	315655	2.224	1.700
24	100000	68623	2.142	1.800
59	200000	102539	2.027	0.900
115	100000	86151	2.255	1.800
208	50000	44600	2.459	3.900

Sampling Period [sec] 0.514
 Integration Time [sec] 0.1

Oxide/Doubly Charged Ratio

Oxide 156 / 140 1.174 %
 Doubly Charged 70 / 140 0.860 %

Resolution/Axis



Mass	Peak Height	Axis	W-50%	W-10%
9	319839.38	9.05	0.65	0.774
24	69858.18	23.95	0.66	0.772
59	103471.88	59.00	0.62	0.744
115	85580.18	115.00	0.56	0.730
208	44690.29	208.00	0.58	0.752

Integration Time [sec] 0.1
 Acquisition Time [sec] 37.4
 Y Axis Linear

Tune Parameters

Plasma Parameters

Plasma Mode	---	Nebulizer Gas	0.91 L/min	Dilution Gas	0.18 L/min
RF Power	1600 W	Option Gas	---	Auxiliary Gas	0.90 L/min
RF Matching	1.00 V	Nebulizer Pump	0.10 rps	Plasma Gas	15.0 L/min
Sample Depth	8.0 mm	S/C Temp	2 °C		

Lens Parameters

Extract 1	0.0 V	Omega Lens	9.5 V	Deflect	14.2 V
Extract 2	-250.0 V	Cell Entrance	-30 V	Plate Bias	-35 V

Tune Report

Omega Bias -85 V Cell Exit -50 V

Cell Parameters

Use Gas No 3rd Gas Flow -- Energy Discrimination 5.0 V
 He Flow 0.0 mL/min OctP Bias -8.0 V
 H2 Flow 0.0 mL/min OctP RF 190 V

QP Parameters

Mass Gain 125 Axis Gain 0.9990 QP Bias -3.0 V
 Mass Offset 126 Axis Offset 0.10

Hardware Settings

Torch

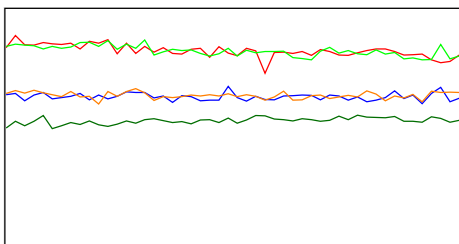
Torch H -1.1 mm Torch V -0.3 mm

EM

Discriminator 6.0 mV Analog HV 2273 V Pulse HV 1694 V

[H2]

Sensitivity



Mass	Range	Count	RSD%	Background
9	50000	41262	3.308	0.100
24	20000	16494	2.686	0.300
59	50000	31481	2.452	0.000
115	100000	63578	2.193	0.000
208	50000	26382	2.582	0.100

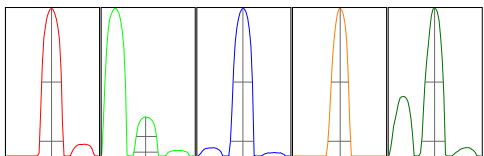
Sampling Period [sec] 0.514

Integration Time [sec] 0.1

Oxide/Doubly Charged Ratio

Oxide --
 Doubly Charged 70 / 140 0.842 %

Resolution/Axis



Mass	Peak Height	Axis	W-50%	W-10%
9	39764.80	9.00	0.63	0.764
24	15797.95	23.95	0.64	0.767
59	31151.09	59.00	0.61	0.740
115	62337.27	115.05	0.55	0.721
208	26354.09	208.00	0.58	0.753

Integration Time [sec] 0.1

Acquisition Time [sec] 37.4

Y Axis Linear

Tune Parameters

Plasma Parameters

Tune Report

Plasma Mode	--	Nebulizer Gas	0.91 L/min	Dilution Gas	0.18 L/min
RF Power	1600 W	Option Gas	--	Auxiliary Gas	0.90 L/min
RF Matching	1.00 V	Nebulizer Pump	0.10 rps	Plasma Gas	15.0 L/min
Sample Depth	8.0 mm	S/C Temp	2 °C		

Lens Parameters

Extract 1	0.0 V	Omega Lens	9.5 V	Deflect	3.2 V
Extract 2	-240.0 V	Cell Entrance	-30 V	Plate Bias	-80 V
Omega Bias	-90 V	Cell Exit	-50 V		

Cell Parameters

Use Gas	Yes	3rd Gas Flow	--	Energy Discrimination	5.0 V
He Flow	0.0 mL/min	OctP Bias	-18.0 V		
H2 Flow	3.8 mL/min	OctP RF	160 V		

QP Parameters

Mass Gain	125	Axis Gain	0.9990	QP Bias	-13.0 V
Mass Offset	126	Axis Offset	0.10		

Hardware Settings

Torch

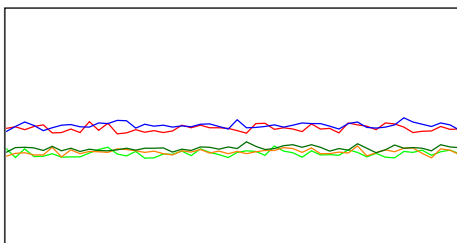
Torch H	-1.1 mm	Torch V	-0.3 mm
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EM

Discriminator	6.0 mV	Analog HV	2273 V	Pulse HV	1694 V
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[He]

Sensitivity



Mass	Range	Count	RSD%	Background
9	5000	2470	2.857	1.800
24	5000	1939	3.428	0.500
59	50000	25365	2.341	0.000
115	50000	19731	2.820	0.500
208	50000	20487	2.361	0.300

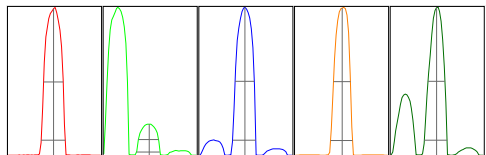
Sampling Period [sec]	0.514
Integration Time [sec]	0.1

Oxide/Doubly Charged Ratio

Oxide	--
Doubly Charged	70 / 140 0.900 %

Resolution/Axis

Tune Report



Mass	Peak Height	Axis	W-50%	W-10%
9	2478.34	9.00	0.62	0.773
24	1963.60	24.00	0.64	0.748
59	25585.13	59.00	0.61	0.737
115	19791.90	115.05	0.54	0.699
208	20414.35	208.00	0.54	0.728

Integration Time [sec] 0.1
 Acquisition Time [sec] 37.4
 Y Axis Linear

Tune Parameters

Plasma Parameters

Plasma Mode	--	Nebulizer Gas	0.91 L/min	Dilution Gas	0.18 L/min
RF Power	1600 W	Option Gas	--	Auxiliary Gas	0.90 L/min
RF Matching	1.00 V	Nebulizer Pump	0.10 rps	Plasma Gas	15.0 L/min
Sample Depth	8.0 mm	S/C Temp	2 °C		

Lens Parameters

Extract 1	0.0 V	Omega Lens	10.7 V	Deflect	0.4 V
Extract 2	-250.0 V	Cell Entrance	-30 V	Plate Bias	-80 V
Omega Bias	-85 V	Cell Exit	-50 V		

Cell Parameters

Use Gas	Yes	3rd Gas Flow	--	Energy Discrimination	5.0 V
He Flow	4.0 mL/min	OctP Bias	-18.0 V		
H2 Flow	0.0 mL/min	OctP RF	200 V		

QP Parameters

Mass Gain	125	Axis Gain	0.9990	QP Bias	-13.0 V
Mass Offset	126	Axis Offset	0.10		

Hardware Settings

Torch

Torch H	-1.1 mm	Torch V	-0.3 mm
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EM

Discriminator	6.0 mV	Analog HV	2273 V	Pulse HV	1694 V
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Energy Laboratories Inc

Standard LOG

Standard ID: ME211124 EL-MSICV-2
Standard Name: EL-MSICV-2
Date Prepared: 11/24/2021
Date Expires: 11/24/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number:
Balance ID:
Comments:

Type: Primary
BY: Amanda E. McDani
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Multi Analyte Custom Grade Solution	14023	500	mL	11/24

Final Volume: mL

Stock Source

Base Units

Amount Added

Analvtes

CAS

Conc: **ug/mL**

1.0 ACCREDITATION / REGISTRATION

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


2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
 Catalog Number: EL-MSICV-2
 Lot Number: R2-MEB696849
 Matrix: 3% (v/v) HNO₃
 tr. HF
 Value / Analyte(s):
 1 000 µg/mL ea:
 Silicon,
 100 µg/mL ea:
 Tin, Titanium,
 Molybdenum, Antimony

Second Source: Whenever possible, this solution was manufactured from a second set of concentrates in our manufacturing facility.

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Antimony, Sb	100.0 ± 0.6 µg/mL	Molybdenum, Mo	100.0 ± 0.5 µg/mL
Silicon, Si	1 000 ± 7 µg/mL	Tin, Sn	99.9 ± 0.4 µg/mL
Titanium, Ti	99.9 ± 0.6 µg/mL		

Density: 1.019 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Mo	ICP Assay	3134	130418
Sb	ICP Assay	3102a	140911
Si	ICP Assay	3150	130912
Sn	ICP Assay	3161a	070330
Sn	Calculated		See Sec. 4.2
Ti	ICP Assay	3162a	130925

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.

ID #: 14023

Opened: _____

Multi Analyte Custom Grade Solution

Expires: 9/14/2024

Rec'd: 7/7/2021

 Eneray Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

Characterization of CRM/RM by Two or More Methods

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

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

X_i = mean of Assay Method i with standard uncertainty $u_{char i}$
 w_i = the weighting factors for each method calculated using the inverse square of the variance:
 $w_i = (1/u_{char i}^2) / (\sum(1/u_{char i}^2))$

CRM/RM Expanded Uncertainty (\pm) = $U_{CRM/RM} = k (u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$
 k = coverage factor = 2
 $u_{char} = [\sum(w_i)^2 (u_{char i})^2]^{1/2}$ where $u_{char i}$ are the errors from each characterization method
 u_{bb} = bottle to bottle homogeneity standard uncertainty
 u_{lts} = long term stability standard uncertainty (storage)
 u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with
 $u_{char a}$ = the standard uncertainty of characterization Method A

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

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 14, 2020

- 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 14, 2024**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME211202 EL200.2MS
Standard Name: EL-200.2MS
Date Prepared: 12/2/2021
Date Expires: 12/2/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: P2-MEB685870
Balance ID:
Comments: Opened 8/11/2021; Expires 8/11/2022

Type: Primary
BY: Amanda E. McDani
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Multi Analyte Custom Grade Solution	14398	500	mL	12/2/

Final Volume: 500 mL

Stock Source

Base Units

Amount Added

Analvtes

CAS

Conc: **ug/mL**

300 Technology Drive
 Christiansburg, VA 24073 USA
 inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code:	Multi Analyte Custom Grade Solution	
Catalog Number:	EL-200.2MS	
Lot Number:	S2-MEB702960	
Matrix:	5% (v/v) HNO ₃	
Value / Analyte(s):	5 000 µg/mL ea:	Potassium, Sodium,
	Calcium,	
	Magnesium,	
	1 000 µg/mL ea:	
	Phosphorus,	
	500 µg/mL ea:	Iron,
	Manganese,	
	Aluminum,	
	100 µg/mL ea:	Boron, Cobalt, Copper, Nickel, Selenium, Thallium, Zinc,
	Arsenic,	
Barium,		
Chromium,		
Lithium,		
Lead,		
Strontium,		
Vanadium,		
50 µg/mL ea:	Beryllium,	
Cadmium,		
10 µg/mL ea:		
Silver		

ID #: 14398

Opened: _____

Multi Analyte Custom Grade Solution

Expires: 3/8/2025

Rec'd: 10/18/2021

 Energv Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Aluminum, Al	499.9 ± 1.9 µg/mL	Arsenic, As	100.0 ± 0.8 µg/mL
Barium, Ba	100.0 ± 0.4 µg/mL	Beryllium, Be	50.01 ± 0.30 µg/mL
Boron, B	100.0 ± 0.7 µg/mL	Cadmium, Cd	50.01 ± 0.22 µg/mL
Calcium, Ca	5 000 ± 20 µg/mL	Chromium, Cr	100.0 ± 0.7 µg/mL
Cobalt, Co	100.0 ± 0.5 µg/mL	Copper, Cu	100.0 ± 0.4 µg/mL
Iron, Fe	499.8 ± 2.1 µg/mL	Lead, Pb	100.0 ± 0.5 µg/mL
Lithium, Li	100.0 ± 0.4 µg/mL	Magnesium, Mg	5 000 ± 20 µg/mL
Manganese, Mn	500.1 ± 2.0 µg/mL	Nickel, Ni	100.0 ± 0.5 µg/mL
Phosphorus, P	1 000 ± 6 µg/mL	Potassium, K	5 000 ± 19 µg/mL
Selenium, Se	100.0 ± 0.8 µg/mL	Silver, Ag	10.00 ± 0.05 µg/mL
Sodium, Na	5 000 ± 18 µg/mL	Strontium, Sr	100.0 ± 0.4 µg/mL
Thallium, Tl	100.0 ± 0.7 µg/mL	Vanadium, V	100.0 ± 0.5 µg/mL
Zinc, Zn	100.1 ± 0.4 µg/mL		

Density: 1.097 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ag	ICP Assay	3151	160729
Ag	Volhard	999c	999c
Al	ICP Assay	3101a	140903
Al	EDTA	928	928
As	ICP Assay	3103a	100818
B	ICP Assay	3107	110830
Ba	ICP Assay	3104a	140909
Ba	Gravimetric		See Sec. 4.2
Be	ICP Assay	3105a	090514
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
Cd	ICP Assay	3108	130116
Cd	EDTA	928	928
Co	ICP Assay	3113	190630
Co	EDTA	928	928
Cr	ICP Assay	3112a	170630
Cu	ICP Assay	3114	121207
Cu	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
K	ICP Assay	3141a	140813
K	Gravimetric		See Sec. 4.2
Li	ICP Assay	3129a	100714
Li	Gravimetric		See Sec. 4.2
Mg	ICP Assay	3131a	140110
Mg	EDTA	928	928
Mn	ICP Assay	3132	050429
Mn	EDTA	928	928
Na	ICP Assay	3152a	120715
Na	Gravimetric		See Sec. 4.2
Ni	ICP Assay	3136	120619
Ni	EDTA	928	928
P	ICP Assay	3139a	060717
P	Acidimetric	84L	84L
Pb	ICP Assay	3128	101026
Pb	EDTA	928	928
Se	ICP Assay	3149	100901
Sr	EDTA	928	928
Sr	ICP Assay	Traceable to 3153a	K2-SR650985
Tl	ICP Assay	3158	151215
V	ICP Assay	3165	160906
V	EDTA	928	928
Zn	ICP Assay	3168a	120629
Zn	EDTA	928	928

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{Ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{Ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES ($\mu\text{g/mL}$)

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 08, 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

- March 08, 2025

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Spike LOG

Standard ID: ME211213 AUDIGSPK
Standard Name: AUDIGSPK
Date Prepared: 12/13/2021
Date Expires: 9/3/2022
Department: ME
Vendor:
Lot Number:
Balance ID:
Comments:

Type: Secondary
BY: Amanda E. McDani
Status: Open

<u>Stock Source</u>	<u>Base Units</u>	<u>Final Volume:</u>	<u>Amount Added</u>
ME211202A U Stock	ug/mL	50 mL	5 mL
ME 211025 Th Sec Th Secondary Stock	ug/mL		5 mL
ME210914 Ce 2nd Ce Secondary Stock	ug/mL		5 mL
ME210903 La Sec La Secondary Stock	ug/mL		5 mL
ME210920A AU 2n Au 2nd source Stock	ug/mL		15 mL
ME211025A Te Stock	ug/mL		15 mL
<u>Analvtes</u>	<u>CAS</u>	<u>Conc:</u>	<u>ug/mL</u>

Energy Laboratories Inc

Standard LOG

Standard ID: ME211202A
Standard Name: U Stock
Date Prepared: 12/2/2021
Date Expires: 12/2/2022
Department: ME
Vendor: SCP Science
Lot Number: S210517021
Balance ID:
Comments:

Type: Primary
BY: Amanda E. McDani
Status: New

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
ICP/ICPMS Standard Uranium	14419	500	mL	12/2/2022

Final Volume:
500 mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

U

1.0 DESCRIPTION:

PlasmaCAL ICP/ICPMS Standard - Uranium 1000 µg/ml
 Catalogue Number: 140-051-920/-921/-925
 Starting Material: Uranyl Nitrate 99.99%
 Lot Number: **S210517021**
 Matrix: 4% HNO₃ (See Section 3 for actual matrix)
 Expiration Date (End of month): **May 2023** (or 15 months after bottle is opened, whichever comes first)

2.0 CERTIFIED VALUES AND ASSOCIATED UNCERTAINTY:

Certified Concentration: **1004 µg/ml +/- 4 µg/ml**
985 µg/g +/- 4 µg/g
 Method of analysis: Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES)
 Traceability: NIST Standard Reference Material 3164 Lot: **080521**

Note: The uncertainty of the certified value has been calculated from applicable uncertainty contributors (u_i) including uncertainty established during characterization of the material (u_{char}), the between bottle variation (u_{bb}), short-term stability (u_{sts}) and long-term stability (u_{lts}) according to the model $u_c = \sqrt{(u_{char}^2 + u_{bb}^2 + u_{sts}^2 + u_{lts}^2)}$. This combined uncertainty has been further multiplied by a coverage factor (k) of 2 to provide a 95% confidence interval.

3.0 REFERENCE VALUES:

Density: **1.020 g/ml @ 24.0 °C**
 Actual Matrix: **4.0% (v/v) HNO₃**

% abundance of stable isotopes : ²³⁸U : 99.82% ; ²³⁵U : 0.18%
 Note : The uranyl nitrate comes from a depleted source of uranium.

ID #: 14419

Opened: _____
 ICP/ICPMS Standard Uranium
Expires: 5/31/2023
 Rec'd: 10/20/2021
 Enerav Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

Trace Metal Impurities as tested by ICP-MS:

Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)
Ag	<0.0010	Fe	<0.0018	Nd	<0.0010	Sn	<0.0010
Al	0.0252	Ga	<0.0010	Ni	<0.0010	Sr	<0.0025
As	<0.0010	Gd	<0.0010	Os	<0.0010	Ta	<0.0010
Au	<0.0010	Ge	<0.0010	P	<0.0026	Tb	<0.0010
B	<0.0015	Hf	<0.0010	Pb	<0.0010	Te	<0.0010
Ba	<0.0010	Hg	*	Pd	<0.0010	Th	<0.0010
Be	<0.0010	Ho	<0.0010	Pr	<0.0010	Ti	<0.0012
Bi	<0.0010	In	<0.0010	Pt	<0.0010	Tl	<0.0011
Ca	<0.0135	Ir	<0.0010	Rb	<0.0010	Tm	<0.0010
Cd	<0.0010	K	<0.0024	Re	<0.0010	U	N/A
Ce	<0.0010	La	<0.0010	Rh	<0.0010	V	<0.0010
Co	<0.0010	Li	<0.0010	Ru	<0.0010	W	<0.0020
Cr	<0.0010	Lu	<0.0010	S	*	Y	<0.0010
Cs	<0.0010	Mg	<0.0020	Sb	<0.0010	Yb	<0.0010
Cu	<0.0010	Mn	<0.0010	Sc	<0.0010	Zn	<0.0010
Dy	<0.0010	Mo	<0.0010	Se	<0.0010	Zr	<0.0010
Er	<0.0010	Na	<0.0010	Si	<0.1		
Eu	<0.0010	Nb	<0.0010	Sm	<0.0010		

*: Not tested

4.0 APPROVAL AND DATE OF CERTIFICATION:

Certification Approval: Yaling Sui, Chemist
 Certification Date: May 27, 2021

Yaling Sui

5.0 INTENDED USE / UTILISATION PRÉVUE:

- ICP Standards: For the calibration of, including but not limited to: ICP-AES, ICP-MS, FAAS, GFAA, XRF and DCP. / *Étalons ICP : Pour l'étalonnage d'instruments de mesure tels que: ICP-AES, ICP-MS, FAAS, GFAA, XRF et DCP.*
 - AA Standards: For the calibration of Flame (FAAS) and Graphite Furnace (GFAA) Atomic Absorption Spectrometers. / *Étalons AA : Pour l'étalonnage de spectromètres d'absorption atomique flamme (FAAS) et four au graphite (GFAA).*
 - Matrix Modifiers: For the optimization of analytical conditions to provide better Graphite Furnace Atomic Absorption (GFAA) instrument response and improved detection limits. / *Modificateur de matrice : Pour l'optimisation des conditions analytiques afin de fournir des meilleures réponses instrumentales et limites de détection pour SAA four au graphite.*
 - pH Standards: For the calibrating pH meters or for other wet chemistry applications. / *Étalons pH : Pour étalonnage de pH mètres et autres applications de chimie humide.*
 - Conductivity Standards: For electrolytic conductivity measurement as a calibration standard. / *Étalons de conductivité : Comme étalon pour les mesures de conductivité électrolytiques.*
 - IC Standards: for calibration of, but not limited to IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS or other wet chemistry applications. / *Étalons IC : Pour étalonnage d'instruments tels que : IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS et autres applications de chimie humide.*
- For any inquiries, please contact **SCP SCIENCE**. / *Pour toute question, veuillez contacter SCP SCIENCE.*

6.0 INSTRUCTIONS FOR USE / INSTRUCTIONS D'UTILISATION:

Handling and Storage / Manutention et entreposage: Keep product tightly capped when not in use. The solution should be opened for a minimum amount of time necessary to dispense the amount required. Do not pipet or use directly from container. Do not return unused portions back to container. Store under normal laboratory conditions. Avoid exposure to excessive sources of heat and humidity or direct sunlight. / *Garder les contenants bien fermés lorsque non utilisés. Le contenant devrait être ouvert seulement pour le temps requis afin de prélever la quantité nécessaire. Ne pas pipetter ou utiliser directement du contenant. Ne pas retourner les portions non-utilisées dans le contenant. Conserver dans des conditions normales de laboratoire. Éviter l'exposition à des sources de chaleur et d'humidité excessives ou à l'exposition solaire directe.*

Stability / Stabilité: This Standard is guaranteed to be stable and accurate to within the specified uncertainty of measurement up to the unopened expiry date, if sealed, or up to the opened expiry date (when indicated), whichever comes first, provided the solution is kept tightly capped and stored under the indicated storage conditions. Purchasers will be notified of any significant changes resulting in re-certification or withdrawal of the product prior to the expiration date. / *La stabilité et l'exactitude de cet étalon sont garanties d'être à l'intérieur de l'incertitude de mesure, jusqu'à la date d'expiration de la bouteille non-ouverte, si scellée, ou jusqu'à la date d'expiration de la bouteille ouverte (si indiquée), en presumant que le contenant est maintenu fermé et gardé dans les conditions d'entreposage indiquées. Les acheteurs seront avisés dans le cas où il y aura des changements significatifs nécessitant une re-certification ou un rappel du produit avant la date d'expiration.*

7.0 HAZARDOUS INFORMATION / INFORMATION SUR LES RISQUES POTENTIELS:

Please refer to the associated Safety Data Sheet (SDS) for information regarding this product (available at www.SCPSCIENCE.com). / *SVP vous référer à la Fiche Signalétique applicable pour de l'information sur ce produit (Disponible à www.SCPSCIENCE.com).*

8.0 HOMOGENEITY / HOMOGÉNÉITÉ:

This solution has been blended according to an in-house procedure and its homogeneity is guaranteed to be fit for purpose when a sample size sufficient for the intended method of analysis is used. / *Cette solution a été préparée selon une procédure maison et nous assurons que sa homogénéité est appropriée à l'emploi lorsqu'un échantillon suffisant pour la méthode d'analyse prévue est utilisé.*

9.0 TRACEABILITY / TRAÇABILITÉ:

This CRM (Certified Reference Material) is traceable to the NIST SRM (Standard Reference Material) indicated in section 2 through an unbroken chain of comparisons. In addition, balances used are regularly calibrated using weights which are traceable to NIST (National Institute of Standards and Technology) or NRC (National Research Council of Canada) standards. All conductivity meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable Thermometer and standards. All pH meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable thermometer and pH/MV simulator. / *Ce matériel de référence certifié est traçable au Matériel de Référence Standardisé de NIST indiqué à la section 2 par une chaîne de comparaison ininterrompue. De plus, les balances utilisées sont étalonnées régulièrement en utilisant des poids qui sont traçables au NIST (National Institute of Standards and Technology) ou au CRNC (Conseil National de Recherches Canada). Tout conductimètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et étalons traçables au NIST ou CNRC. Tout pH mètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et un simulateur pH/MV traçables au NIST ou au CNRC.*

10.0 PREPARATION / PRÉPARATION:

For the preparation of these solutions, 18 megohm/cm double deionized water, high-purity acids and glassware calibrated to ASTM Class A specifications are used. / *Une eau de 18 megohm/cm doublement déionisée, de l'acide de haute pureté, ainsi que de la verrerie étalonnée afin de satisfaire les spécifications Classe A de ASTM ont été utilisés pour la préparation de cet étalon.*

11.0 QUALITY SYSTEM CERTIFICATIONS / CERTIFICATIONS DE SYSTÈME QUALITÉ:

ISO 9001 Certification / Certification ISO 9001: This standard was produced in a facility which operates under a registered ISO 9001 Quality Management System. Please consult our web site for a copy of the most recent revision of our certificate of registration. / *Cet étalon a été fabriqué dans un laboratoire qui utilise un Système de Gestion de la Qualité enregistré à la norme ISO 9001. Veuillez consulter notre site web pour obtenir la version la plus récente de notre certificat d'enregistrement.*

ISO 17025 Accreditation / Accréditation ISO 17025: SCP SCIENCE (Corporate Headquarters) operates an ISO 17025 accredited laboratory. Please consult our web site for a copy of the most recent revision of our certificate and scope of accreditation. / *SCP SCIENCE (Siège social) est accréditée ISO 17025. Veuillez consulter notre site web afin d'obtenir la plus récente version de notre certificat d'accréditation ainsi que la portée de notre accréditation.*

ISO 17034 Accreditation / Accréditation ISO 17034 : SCP SCIENCE (Corporate Headquarters) is an ISO 17034 accredited Reference Material Producer. Please consult our website for a copy of our most recent certificate and scope of accreditation. / *SCP SCIENCE (Siège social) est un Fabricant de Matériaux de Référence Accrédité ISO 17034. Veuillez consulter notre site web afin d'obtenir la plus récente version de notre certificat d'accréditation ainsi que la portée de notre accréditation.*

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GERMANY
Alte Marktoberdorfer Straße 14, 87616
Marktoberdorf
Phone: +49 (0) 8342-89560-61
Fax: +49 (0) 8342-89560-69

Energy Laboratories Inc

Standard LOG

Standard ID: ME 211025 TH SECONDARY STOCK
Standard Name: Th Secondary Stock
Date Prepared: 10/25/2021
Date Expires: 10/25/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: S2-TH706436
Balance ID:
Comments: Opened 10/25/2021; Expires 10/25/2022

Type: Primary
BY: Stacy R. Hendricks
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Thorium Single Analyte Custom Grade Sol	14318	125	mL	10/25/2022

Final Volume:
500 mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
Catalog Number: CGTH1
Lot Number: S2-TH706436
Matrix: 5% (v/v) HNO3
Value / Analyte(s): 1 000 µg/mL ea:
Thorium
Starting Material: TH(NO3)4*4H2O
Starting Material Lot#: 2250
Starting Material Purity: 99.9905%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1001 ± 4 µg/mL
Density: 1.026 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1 **1001 ± 3 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #2 **1001 ± 6 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

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

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

ID #: 14318
Opened:
Thorium Single Analyte Custom Grade Solution
Expires: 7/4/2025
Rec'd: 9/24/2021
Energy Laboratories Inc 1120 So. 27th Street
Billings MT 59107

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

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 ($\mu\text{g/mL}$)

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

M Ag <	0.000448	M Eu <	0.000224	O Na	0.064077	M Se <	0.005827	M Zn	0.003183
O Al	0.010962	M Fe	0.012392	M Nb <	0.003138	i Si <		M Zr <	0.010310
M As <	0.038776	M Ga <	0.004931	M Nd	0.004697	M Sm	0.000871		
M Au <	0.000224	M Gd	0.000300	M Ni <	0.006724	M Sn <	0.028242		
M B <	0.021293	M Ge <	0.008965	M Os <	0.000224	M Sr	0.002582		
M Ba	0.001317	M Hf <	0.000224	i P <		M Ta <	0.001344		
M Be <	0.000224	M Hg <	0.000448	M Pb	0.003287	M Tb <	0.001793		
M Bi <	0.001793	M Ho <	0.001344	M Pd <	0.000448	M Te <	0.010086		
O Ca	0.051969	M In	0.000134	M Pr	0.001202	s Th <			
M Cd <	0.001344	M Ir <	0.000224	M Pt <	0.000224	M Ti <	0.004258		
M Ce	0.015420	O K	0.028928	M Rb <	0.005155	M Tl <	0.000224		
M Co <	0.001344	M La	0.003577	M Re <	0.000224	M Tm <	0.000224		
M Cr <	0.015465	M Li <	0.000448	M Rh <	0.000224	M U	0.006564		
M Cs <	0.013896	M Lu <	0.000224	M Ru <	0.000224	M V <	0.001793		
M Cu	0.001472	O Mg	0.027914	i S <		M W <	0.000224		
M Dy	0.000197	M Mn	0.001814	M Sb <	0.004931	M Y	0.000860		
M Er <	0.002241	M Mo <	0.000896	M Sc <	0.000672	M Yb <	0.000224		

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 - 232.04 +4 8 Th(OH) 3+ and Th(OH)22+

Chemical Compatibility -Soluble in HCl, and HNO3. Avoid H3PO4, H2SO4 and HF although solubilities may not be a problem depending upon pH and matrix (For example: ThF4 is soluble in acids). Avoid neutral to basic media. Th4+ is stable with most metals and inorganic anions forming an insoluble carbonate, oxide, fluoride, oxalate, sulfate and phosphate in neutral to slightly acidic media.

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

Th Containing Samples (Preparation and Solution) -Metal (Soluble in Aqua Regia); Oxide (The heated oxide is not soluble in acids except hot conc. H2SO4); Ores (Na2O2 fusion at 480 ± 20EC for 7 minutes, cool and treat sintered mass with 50 mL cold water and stand until disintegrated. The mass is transferred to a beaker and acidified with HCl with 25 mL excess HCl added. Any residue is collected on a Whatman No. 42 filter, dried and ignited to 1000 EC in Pt0 crucible and the ash treated with H2SO4 / HF and fumed. If residue remains, then treat it by peroxide fusion as above.)

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 232 amu	1 ppt	N/A	
ICP-OES 274.716 nm	0.08 / 0.008 µg/mL	1	Ti, Ta, Fe, V
ICP-OES 283.231 nm	0.07 / 0.007 µg/mL	1	U, Mo, Ti, Fe, Cr
ICP-OES 283.730 nm	0.07 / 0.007 µg/mL	1	U, Zr

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

July 04, 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

- July 04, 2025

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME210914 CE 2ND SOURCE
Standard Name: Ce Secondary Stock
Date Prepared: 9/14/2021
Date Expires: 9/14/2022
Department: ME
Vendor: SCP Science
Lot Number: S210208003
Balance ID:
Comments: opened 9/14/2021, expires 9/14/2022

Type: Primary
BY: Stacy R. Hendricks
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Cerium PlasmaCal Standard	14018	125	mL	9/14/2022

Final Volume:
125 mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

Ce

1.0 DESCRIPTION: *PlasmaCAL ICP/ICPMS Standard - Cerium 1000 µg/ml*
 Catalogue Number: 140-051-580/-581/-585
 Starting Material: Cerium(III) Nitrate Hexahydrate 99.99+%
 Lot Number: **S210208003**
 Matrix: 4% HNO₃ (See Section 3 for actual matrix)
 Expiration Date (End of month): **February 2023** (or 15 months after bottle is opened, whichever comes first)

2.0 CERTIFIED VALUES AND ASSOCIATED UNCERTAINTY:
 Certified Concentration: **1003 µg/ml +/- 4 µg/ml**
982 µg/g +/- 4 µg/g
 Method of analysis: Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES)
 Traceability: NIST Standard Reference Material 3110 Lot: **090504**

Note: The uncertainty of the certified value has been calculated from applicable uncertainty contributors (u_i) including uncertainty established during characterization of the material (u_{char}), the between bottle variation (u_{bb}), short-term stability (u_{sts}) and long-term stability (u_{lts}) according to the model $u_c = \sqrt{(u_{char}^2 + u_{bb}^2 + u_{sts}^2 + u_{lts}^2)}$. This combined uncertainty has been further multiplied by a coverage factor (k) of 2 to provide a 95% confidence interval.

3.0 REFERENCE VALUES:
 Density: **1.021 g/ml @ 22.5 °C**
 Actual Matrix: **4.0% (v/v) HNO₃**

Trace Metal Impurities as tested by ICP-MS:

ID #: 14018
 Opened: _____
 Cerium PlasmaCal Standard
Expires: 2/27/2023
 Rec'd: 7/6/2021
 Enerav Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)
Ag	<0.0010	Fe	<0.0018	Nd	0.0102	Sn	<0.0010
Al	0.0148	Ga	0.0526	Ni	0.0064	Sr	<0.0025
As	<0.0010	Gd	<0.0010	Os	<0.0010	Ta	<0.0010
Au	<0.0010	Ge	<0.0010	P	<0.0132	Tb	<0.0010
B	<0.0015	Hf	<0.0010	Pb	<0.0010	Te	<0.0010
Ba	<0.0010	Hg	*	Pd	<0.0010	Th	<0.0010
Be	<0.0010	Ho	<0.0010	Pr	0.0235	Ti	<0.0012
Bi	<0.0010	In	<0.0010	Pt	<0.0010	Tl	<0.0011
Ca	0.0375	Ir	<0.0010	Rb	<0.0010	Tm	<0.0010
Cd	<0.0010	K	<0.0024	Re	<0.0010	U	<0.0010
Ce	N/A	La	<0.10	Rh	<0.0010	V	<0.0010
Co	<0.0010	Li	<0.0010	Ru	<0.0010	W	<0.0020
Cr	<0.0010	Lu	<0.0010	S	*	Y	<0.0010
Cs	<0.0010	Mg	<0.0010	Sb	<0.0010	Yb	<0.0010
Cu	0.0121	Mn	<0.0010	Sc	<0.0010	Zn	<0.0010
Dy	<0.0010	Mo	<0.0010	Se	<0.0010	Zr	<0.0010
Er	<0.0010	Na	<0.0010	Si	<0.10		
Eu	0.0035	Nb	<0.0010	Sm	<0.0010		

*: Not tested

4.0 APPROVAL AND DATE OF CERTIFICATION:
 Certification Approval: Yaling Sui, Chemist
 Certification Date: February 22, 2021

Yaling Sui

5.0 INTENDED USE / UTILISATION PRÉVUE:

- ICP Standards: For the calibration of, including but not limited to: ICP-AES, ICP-MS, FAAS, GFAA, XRF and DCP. / *Étalons ICP : Pour l'étalonnage d'instruments de mesure tels que: ICP-AES, ICP-MS, FAAS, GFAA, XRF et DCP.*
 - AA Standards: For the calibration of Flame (FAAS) and Graphite Furnace (GFAA) Atomic Absorption Spectrometers. / *Étalons AA : Pour l'étalonnage de spectromètres d'absorption atomique flamme (GFAA) et four au graphite (GFAA).*
 - Matrix Modifiers: For the optimization of analytical conditions to provide better Graphite Furnace Atomic Absorption (GFAA) instrument response and improved detection limits. / *Modificateur de matrice : Pour l'optimisation des conditions analytiques afin de fournir des meilleures réponses instrumentales et limites de détection pour SAA four au graphite.*
 - pH Standards: For the calibrating pH meters or for other wet chemistry applications. / *Étalons pH : Pour étalonnage de pH mètres et autres applications de chimie humide.*
 - Conductivity Standards: For electrolytic conductivity measurement as a calibration standard. / *Étalons de conductivité : Comme étalon pour les mesures de conductivité électrolytiques.*
 - IC Standards: for calibration of, but not limited to IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS or other wet chemistry applications. / *Étalons IC : Pour étalonnage d'instruments tels que : IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS et autres applications de chimie humide.*
- For any inquiries, please contact **SCP SCIENCE**. / *Pour toute question, veuillez contacter SCP SCIENCE.*

6.0 INSTRUCTIONS FOR USE / INSTRUCTIONS D'UTILISATION:

Handling and Storage / Manutention et entreposage: Keep product tightly capped when not in use. The solution should be opened for a minimum amount of time necessary to dispense the amount required. Do not pipet or use directly from container. Do not return unused portions back to container. Store under normal laboratory conditions. Avoid exposure to excessive sources of heat and humidity or direct sunlight. / *Garder les contenants bien fermés lorsque non utilisés. Le contenant devrait être ouvert seulement pour le temps requis afin de prélever la quantité nécessaire. Ne pas pipetter ou utiliser directement du contenant. Ne pas retourner les portions non-utilisées dans le contenant. Conserver dans des conditions normales de laboratoire. Éviter l'exposition à des sources de chaleur et d'humidité excessives ou à l'exposition solaire directe.*

Stability / Stabilité: This Standard is guaranteed to be stable and accurate to within the specified uncertainty of measurement up to the unopened expiry date, if sealed, or up to the opened expiry date (when indicated), whichever comes first, provided the solution is kept tightly capped and stored under the indicated storage conditions. Purchasers will be notified of any significant changes resulting in re-certification or withdrawal of the product prior to the expiration date. / *La stabilité et l'exactitude de cet étalon sont garanties d'être à l'intérieur de l'incertitude de mesure, jusqu'à la date d'expiration de la bouteille non-ouverte, si scellée, ou jusqu'à la date d'expiration de la bouteille ouverte (si indiquée), en présupmant que le contenant est maintenu fermé et gardé dans les conditions d'entreposage indiquées. Les acheteurs seront avisés dans le cas où il y aura des changements significatifs nécessitant une re-certification ou un rappel du produit avant la date d'expiration.*

7.0 HAZARDOUS INFORMATION / INFORMATION SUR LES RISQUES POTENTIELS:

Please refer to the associated Safety Data Sheet (SDS) for information regarding this product (available at www.SCPSCIENCE.com). / *SVP vous référer à la Fiche Signalétique applicable pour de l'information sur ce produit (Disponible à www.SCPSCIENCE.com).*

8.0 HOMOGENEITY / HOMOGENÉITÉ:

This solution has been blended according to an in-house procedure and its homogeneity is guaranteed to be fit for purpose when a sample size sufficient for the intended method of analysis is used. / *Cette solution a été préparée selon une procédure maison et nous assurons que sa homogénéité est approprié à l'emploi lorsqu'un échantillon suffisant pour la méthode d'analyse prévue est utilisé.*

9.0 TRACEABILITY / TRAÇABILITÉ:

This CRM (Certified Reference Material) is traceable to the NIST SRM (Standard Reference Material) indicated in section 2 through an unbroken chain of comparisons. In addition, balances used are regularly calibrated using weights which are traceable to NIST (National Institute of Standards and Technology) or NRC (National Research Council of Canada) standards. All conductivity meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable Thermometer and standards. All pH meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable thermometer and pH/MV simulator. / *Ce matériel de référence certifié est traçable au Matériel de Référence Standardisé de NIST indiqué à la section 2 par une chaîne de comparaison ininterrompue. De plus, les balances utilisées sont étalonnées régulièrement en utilisant des poids qui sont traçables au NIST (National Institute of Standards and Technology) ou au CRNC (Conseil National de Recherches Canada). Tout conductimètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et étalons traçables au NIST ou CNRC. Tout pH mètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et un simulateur pH/MV traçables au NIST ou au CNRC.*

10.0 PREPARATION / PRÉPARATION:

For the preparation of these solutions, 18 megohm/cm double deionized water, high-purity acids and glassware calibrated to ASTM Class A specifications are used. / *Une eau de 18 megohm/cm doublement déionisée, de l'acide de haute pureté, ainsi que de la verrerie étalonnée afin de satisfaire les spécifications Classe A de ASTM ont été utilisés pour la préparation de cet étalon.*

11.0 QUALITY SYSTEM CERTIFICATIONS / CERTIFICATIONS DE SYSTÈME QUALITÉ:

ISO 9001 Certification / Certification ISO 9001: This standard was produced in a facility which operates under a registered ISO 9001 Quality Management System. Please consult our web site for a copy of the most recent revision of our certificate of registration. / *Cet étalon a été fabriqué dans un laboratoire qui utilise un Système de Gestion de la Qualité enregistré à la norme ISO 9001. Veuillez consulter notre site web pour obtenir la version la plus récente de notre certificat d'enregistrement.*

ISO 17025 Accreditation / Accréditation ISO 17025: SCP SCIENCE (Corporate Headquarters) operates an ISO 17025 accredited laboratory. Please consult our web site for a copy of the most recent revision of our certificate and scope of accreditation. / *SCP SCIENCE (Siège social) est accréditée ISO 17025. Veuillez consulter notre site web afin d'obtenir la plus récente version de notre certificat d'accréditation ainsi que la portée de notre accréditation.*

ISO 17034 Accreditation / Accréditation ISO 17034: SCP SCIENCE (Corporate Headquarters) is an ISO 17034 accredited Reference Material Producer. Please consult our website for a copy of our most recent certificate and scope of accreditation. / *SCP SCIENCE (Siège social) est un Fabricant de Matériaux de Référence Accrédité ISO 17034. Veuillez consulter notre site web afin d'obtenir la plus récente version de notre certificat d'accréditation ainsi que la portée de notre accréditation.*

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Fax: +1 (800) 253-5549

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SILIC 642, 91965
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Phone: +33 (0) 1 69 18 71 17
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GERMANY
Alte Marktoberdorfer Straße 14, 87616
Marktoberdorf
Phone: +49 (0) 8342-89560-61
Fax: +49 (0) 8342-89560-69

Energy Laboratories Inc

Standard LOG

Standard ID: ME210903 LA SECOND SOURCE
Standard Name: La Secondary Stock
Date Prepared: 9/3/2021
Date Expires: 9/3/2022
Department: ME
Vendor: SCP Science
Lot Number: S201029004
Balance ID:
Comments: Opened 9/3/2021; Expires 9/3/2022

Type: Primary
BY: Alyssa A. espinoza
Status: Empty/Disposed

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Lanthanum PlasmaCal Standard	14019	125	mL	9/3/2022

Final Volume:
mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

La

1.0 DESCRIPTION:

PlasmaCAL ICP/ICPMS Standard - Lanthanum 1000 µg/ml
 Catalogue Number: 140-051-570/-571/-575
 Starting Material: Lanthanum(III) Oxide 99.99+%
 Lot Number: **S201029004**
 Matrix: 4% HNO₃ (See Section 3 for actual matrix)
 Expiration Date (End of month): **November 2022** (or 15 months after bottle is opened, whichever comes first)

2.0 CERTIFIED VALUES AND ASSOCIATED UNCERTAINTY:

Certified Concentration: **1005 µg/ml +/- 4 µg/ml**
985 µg/g +/- 4 µg/g
 Method of analysis: Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES)
 Traceability: NIST Standard Reference Material 3127a Lot: **151030**

Note: The uncertainty of the certified value has been calculated from applicable uncertainty contributors (u_i) including uncertainty established during characterization of the material (u_{char}), the between bottle variation (u_{bb}), short-term stability (u_{sts}) and long-term stability (u_{lts}) according to the model $u_c = \sqrt{(u_{char}^2 + u_{bb}^2 + u_{sts}^2 + u_{lts}^2)}$. This combined uncertainty has been further multiplied by a coverage factor (k) of 2 to provide a 95% confidence interval.

ID #: 14019

Opened: _____
 Lanthanum PlasmaCal Standard
Expires: 11/30/2022
 Rec'd: 7/6/2021
 Energv Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

3.0 REFERENCE VALUES:

Density: **1.020 g/ml @ 23.4 °C**
 Actual Matrix: **4.0% (v/v) HNO₃**

Trace Metal Impurities as tested by ICP-AES:

Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)
Ag	<0.0049	Fe	<0.0102	Nd	<0.1595	Sn	<0.0307
Al	<0.0280	Ga	<0.0260	Ni	<0.0139	Sr	<0.0004
As	<0.0525	Gd	<0.0685	Os	*	Ta	<0.0635
Au	<0.0085	Ge	<0.0548	P	<0.0104	Tb	<0.0146
B	<0.2535	Hf	<0.0339	Pb	<0.2460	Te	<0.4025
Ba	<0.0025	Hg	*	Pd	<0.1410	Th	<0.0471
Be	<0.0022	Ho	<0.0065	Pr	<0.0274	Ti	<0.0013
Bi	<0.0780	In	<0.0105	Pt	<0.0533	Tl	<0.5600
Ca	0.0164	Ir	<0.0243	Rb	*	Tm	<0.0105
Cd	<0.0048	K	<0.0128	Re	<0.0076	U	<0.2490
Ce	<0.0393	La	N/A	Rh	<0.0163	V	<0.0049
Co	<0.0224	Li	<0.0006	Ru	<0.0304	W	<0.0443
Cr	<0.0063	Lu	<0.0021	S	<0.0515	Y	<0.0033
Cs	*	Mg	<0.0045	Sb	<0.0197	Yb	<0.0057
Cu	<0.0040	Mn	<0.0018	Sc	<0.0055	Zn	<0.0045
Dy	<0.0043	Mo	<0.0229	Se	<0.0249	Zr	<0.0061
Er	<0.0070	Na	<0.0038	Si	<0.0455		
Eu	<0.0086	Nb	<0.0112	Sm	<0.1105		

*: Not tested

4.0 APPROVAL AND DATE OF CERTIFICATION:

Certification Approval: Daniel Boisvert, Chemist
 Certification Date: November 04, 2020

Daniel Boisvert

5.0 INTENDED USE / UTILISATION PRÉVUE:

- ICP Standards: For the calibration of, including but not limited to: ICP-AES, ICP-MS, FAAS, GFAA, XRF and DCP. / *Étalons ICP : Pour l'étalonnage d'instruments de mesure tels que: ICP-AES, ICP-MS, FAAS, GFAA, XRF et DCP.*
 - AA Standards: For the calibration of Flame (FAAS) and Graphite Furnace (GFAA) Atomic Absorption Spectrometers. / *Étalons AA : Pour l'étalonnage de spectromètres d'absorption atomique flamme (GFAA) et four au graphite (GFAA).*
 - Matrix Modifiers: For the optimization of analytical conditions to provide better Graphite Furnace Atomic Absorption (GFAA) instrument response and improved detection limits. / *Modificateur de matrice : Pour l'optimisation des conditions analytiques afin de fournir des meilleurs réponses instrumentales et limites de détection pour SAA four au graphite.*
 - pH Standards: For the calibrating pH meters or for other wet chemistry applications. / *Étalons pH : Pour étalonnage de pH mètres et autres applications de chimie humide.*
 - Conductivity Standards: For electrolytic conductivity measurement as a calibration standard. / *Étalons de conductivité : Comme étalon pour les mesures de conductivité électrolytiques.*
 - IC Standards: for calibration of, but not limited to IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS or other wet chemistry applications. / *Étalons IC : Pour étalonnage d'instruments tels que : IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS et autres applications de chimie humide.*
- For any inquiries, please contact **SCP SCIENCE**. / *Pour toute question, veuillez contacter SCP SCIENCE.*

6.0 INSTRUCTIONS FOR USE / INSTRUCTIONS D'UTILISATION:

Handling and Storage / Manutention et entreposage: Keep product tightly capped when not in use. The solution should be opened for a minimum amount of time necessary to dispense the amount required. Do not pipet or use directly from container. Do not return unused portions back to container. Store under normal laboratory conditions. Avoid exposure to excessive sources of heat and humidity or direct sunlight. / *Garder les contenants bien fermés lorsque non utilisés. Le contenant devrait être ouvert seulement pour le temps requis afin de prélever la quantité nécessaire. Ne pas pipetter ou utiliser directement du contenant. Ne pas retourner les portions non-utilisées dans le contenant. Conserver dans des conditions normales de laboratoire. Éviter l'exposition à des sources de chaleur et d'humidité excessives ou à l'exposition solaire directe.*

Stability / Stabilité: This Standard is guaranteed to be stable and accurate to within the specified uncertainty of measurement up to the unopened expiry date, if sealed, or up to the opened expiry date (when indicated), whichever comes first, provided the solution is kept tightly capped and stored under the indicated storage conditions. Purchasers will be notified of any significant changes resulting in re-certification or withdrawal of the product prior to the expiration date. / *La stabilité et l'exactitude de cet étalon sont garanties d'être à l'intérieur de l'incertitude de mesure, jusqu'à la date d'expiration de la bouteille non-ouverte, si scellée, ou jusqu'à la date d'expiration de la bouteille ouverte (si indiquée), en présupmant que le contenant est maintenu fermé et gardé dans les conditions d'entreposage indiquées. Les acheteurs seront avisés dans le cas où il y aura des changements significatifs nécessitant une re-certification ou un rappel du produit avant la date d'expiration.*

7.0 HAZARDOUS INFORMATION / INFORMATION SUR LES RISQUES POTENTIELS:

Please refer to the associated Safety Data Sheet (SDS) for information regarding this product (available at www.SCPSCIENCE.com). / *SVP vous référer à la Fiche Signalétique applicable pour de l'information sur ce produit (Disponible à www.SCPSCIENCE.com).*

8.0 HOMOGENEITY / HOMOGÉNÉITÉ:

This solution has been blended according to an in-house procedure and its homogeneity is guaranteed to be fit for purpose when a sample size sufficient for the intended method of analysis is used. / *Cette solution a été préparée selon une procédure maison et nous assurons que sa homogénéité est approprié à l'emploi lorsqu'un échantillon suffisant pour la méthode d'analyse prévue est utilisé.*

9.0 TRACEABILITY / TRAÇABILITÉ:

This CRM (Certified Reference Material) is traceable to the NIST SRM (Standard Reference Material) indicated in section 2 through an unbroken chain of comparisons. In addition, balances used are regularly calibrated using weights which are traceable to NIST (National Institute of Standards and Technology) or NRC (National Research Council of Canada) standards. All conductivity meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable Thermometer and standards. All pH meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable thermometer and pH/MV simulator. / *Ce matériel de référence certifié est traçable au Matériel de Référence Standardisé de NIST indiqué à la section 2 par une chaîne de comparaison ininterrompue. De plus, les balances utilisées sont étalonnées régulièrement en utilisant des poids qui sont traçables au NIST (National Institute of Standards and Technology) ou au CRNC (Conseil National de Recherches Canada). Tout conductimètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et étalons traçables au NIST ou CNRC. Tout pH mètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et un simulateur pH/MV traçables au NIST ou au CNRC.*

10.0 PREPARATION / PRÉPARATION:

For the preparation of these solutions, 18 megohm/cm double deionized water, high-purity acids and glassware calibrated to ASTM Class A specifications are used. / *Une eau de 18 megohm/cm doublement déionisé, de l'acide de haute pureté, ainsi que de la verrerie étalonnée afin de satisfaire les spécifications Classe A de ASTM ont été utilisés pour la préparation de cet étalon.*

11.0 QUALITY SYSTEM CERTIFICATIONS / CERTIFICATIONS DE SYSTÈME QUALITÉ:

ISO 9001 Certification / Certification ISO 9001: This standard was produced in a facility which operates under a registered ISO 9001 Quality Management System. Please consult our web site for a copy of the most recent revision of our certificate of registration. / *Cet étalon a été fabriqué dans un laboratoire qui utilise un Système de Gestion de la Qualité enregistré à la norme ISO 9001. Veuillez consulter notre site web pour obtenir la version la plus récente de notre certificat d'enregistrement.*

ISO 17025 Accreditation / Accréditation ISO 17025: SCP SCIENCE (Corporate Headquarters) operates an ISO 17025 accredited laboratory. Please consult our web site for a copy of the most recent revision of our certificate and scope of accreditation. / *SCP SCIENCE (Siège social) est accréditée ISO 17025. Veuillez consulter notre site web afin d'obtenir la plus récente version de notre certificat d'accréditation ainsi que la portée de notre accréditation.*

ISO 17034 Accreditation / Accréditation ISO 17034 : SCP SCIENCE (Corporate Headquarters) is an ISO 17034 accredited Reference Material Producer. Please consult our website for a copy of our most recent certificate and scope of accreditation. / *SCP SCIENCE (Siège social) est un Fabricant de Matériaux de Référence Accrédité ISO 17034. Veuillez consulter notre site web afin d'obtenir la plus récente version de notre certificat d'accréditation ainsi que la portée de notre accréditation.*

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N.Y. 12919-4816
Phone: +1 (800) 361-6820
Fax: +1 (800) 253-5549

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SILIC 642, 91965
Villebon sur Yvette, France
Phone: +33 (0) 1 69 18 71 17
Fax: +33 (0) 1 60 92 05 67

GERMANY
Alte Marktoberdorfer Straße 14, 87616
Marktoberdorf
Phone: +49 (0) 8342-89560-61
Fax: +49 (0) 8342-89560-69

Energy Laboratories Inc

Standard LOG

Standard ID: ME210920A AU 2ND SOURCE
Standard Name: Au 2nd source Stock
Date Prepared: 9/20/2021
Date Expires: 12/20/2022
Department: ME
Vendor: SCP Science
Lot Number: S210720002
Balance ID:

Type: Primary
BY: Ron Hunt
Status: Empty/Disposed

Comments:

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
PlasmaCal Standard Gold 1000ug/ml	14229	500	mL	8/31/

Final Volume: 500 mL

Stock Source

Base Units

Amount Added

Analvtes

CAS

Conc: **ug/mL**

Au

1.0 DESCRIPTION: **PlasmaCAL ICP/ICPMS Standard - Gold 1000 µg/ml**
 Catalogue Number: 140-052-790/-791/-795
 Starting Material: Gold Metal 99.99+%
 Lot Number: **S210720002**
 Matrix: 10% HCl (See Section 3 for actual matrix)
 Expiration Date (End of month): **August 2023** (or 15 months after bottle is opened, whichever comes first)

2.0 CERTIFIED VALUES AND ASSOCIATED UNCERTAINTY:
 Certified Concentration: **1005 µg/ml +/- 4 µg/ml**
986 µg/g +/- 4 µg/g
 Method of analysis: Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES)
 Traceability: NIST Standard Reference Material 3121 Lot: **991806**

Note: The uncertainty of the certified value has been calculated from applicable uncertainty contributors (u_i) including uncertainty established during characterization of the material (u_{char}), the between bottle variation (u_{bb}), short-term stability (u_{sts}) and long-term stability (u_{lts}) according to the model $u_c = \sqrt{(u_{char}^2 + u_{bb}^2 + u_{sts}^2 + u_{lts}^2)}$. This combined uncertainty has been further multiplied by a coverage factor (k) of 2 to provide a 95% confidence interval.

3.0 REFERENCE VALUES:
 Density: **1.019 g/ml @ 23.0 °C**
 Actual Matrix: **10.0% (v/v) HCl**

ID #: 14229
 Opened: _____
 PlasmaCal Standard Gold 1000µg/ml
Expires: 8/31/2023
 Rec'd: 9/1/2021
 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

Trace Metal Impurities as tested by ICP-MS:

Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)
Ag	<0.0010	Fe	<0.0018	Nd	<0.0010	Sn	<0.0010
Al	<0.0010	Ga	<0.0010	Ni	0.0020	Sr	<0.0025
As	0.0210	Gd	<0.0010	Os	<0.0010	Ta	<0.0010
Au	N/A	Ge	<0.0010	P	<0.0026	Tb	<0.0010
B	<0.0015	Hf	<0.0010	Pb	<0.0010	Te	<0.0010
Ba	<0.0010	Hg	*	Pd	<0.0010	Th	<0.0010
Be	<0.0010	Ho	<0.0010	Pr	<0.0010	Ti	<0.0012
Bi	<0.0010	In	<0.0010	Pt	<0.0010	Tl	<0.0011
Ca	<0.0135	Ir	<0.0010	Rb	<0.0010	Tm	<0.0010
Cd	<0.0010	K	<0.0120	Re	<0.0010	U	<0.0010
Ce	<0.0010	La	0.0060	Rh	<0.0010	V	<0.0010
Co	<0.0010	Li	<0.0010	Ru	<0.0010	W	<0.0020
Cr	<0.0010	Lu	<0.0010	S	*	Y	<0.0010
Cs	0.0032	Mg	<0.0020	Sb	<0.0010	Yb	<0.0010
Cu	<0.0010	Mn	<0.0010	Sc	<0.0010	Zn	<0.0010
Dy	<0.0010	Mo	<0.0010	Se	<0.0010	Zr	<0.0010
Er	<0.0010	Na	0.0158	Si	<0.1		
Eu	<0.0010	Nb	<0.0010	Sm	<0.0010		

*: Not tested

4.0 APPROVAL AND DATE OF CERTIFICATION:
 Certification Approval: Daniel Boisvert, Chemist
 Certification Date: August 09, 2021

Daniel Boisvert

5.0 INTENDED USE / UTILISATION PRÉVUE:

- ICP Standards: For the calibration of, including but not limited to: ICP-AES, ICP-MS, FAAS, GFAA, XRF and DCP. / *Étalons ICP : Pour l'étalonnage d'instruments de mesure tels que: ICP-AES, ICP-MS, FAAS, GFAA, XRF et DCP.*
 - AA Standards: For the calibration of Flame (FAAS) and Graphite Furnace (GFAA) Atomic Absorption Spectrometers. / *Étalons AA : Pour l'étalonnage de spectromètres d'absorption atomique flamme (GFAA) et four au graphite (GFAA).*
 - Matrix Modifiers: For the optimization of analytical conditions to provide better Graphite Furnace Atomic Absorption (GFAA) instrument response and improved detection limits. / *Modificateur de matrice : Pour l'optimisation des conditions analytiques afin de fournir des meilleures réponses instrumentales et limites de détection pour SAA four au graphite.*
 - pH Standards: For the calibrating pH meters or for other wet chemistry applications. / *Étalons pH : Pour étalonnage de pH mètres et autres applications de chimie humide.*
 - Conductivity Standards: For electrolytic conductivity measurement as a calibration standard. / *Étalons de conductivité : Comme étalon pour les mesures de conductivité électrolytiques.*
 - IC Standards: for calibration of, but not limited to IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS or other wet chemistry applications. / *Étalons IC : Pour étalonnage d'instruments tels que : IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS et autres applications de chimie humide.*
- For any inquiries, please contact **SCP SCIENCE**. / *Pour toute question, veuillez contacter SCP SCIENCE.*

6.0 INSTRUCTIONS FOR USE / INSTRUCTIONS D'UTILISATION:

Handling and Storage / Manutention et entreposage: Keep product tightly capped when not in use. The solution should be opened for a minimum amount of time necessary to dispense the amount required. Do not pipet or use directly from container. Do not return unused portions back to container. Store under normal laboratory conditions. Avoid exposure to excessive sources of heat and humidity or direct sunlight. / *Garder les contenants bien fermés lorsque non utilisés. Le contenant devrait être ouvert seulement pour le temps requis afin de prélever la quantité nécessaire. Ne pas pipetter ou utiliser directement du contenant. Ne pas retourner les portions non-utilisées dans le contenant. Conserver dans des conditions normales de laboratoire. Éviter l'exposition à des sources de chaleur et d'humidité excessives ou à l'exposition solaire directe.*

Stability / Stabilité: This Standard is guaranteed to be stable and accurate to within the specified uncertainty of measurement up to the unopened expiry date, if sealed, or up to the opened expiry date (when indicated), whichever comes first, provided the solution is kept tightly capped and stored under the indicated storage conditions. Purchasers will be notified of any significant changes resulting in re-certification or withdrawal of the product prior to the expiration date. / *La stabilité et l'exactitude de cet étalon sont garanties d'être à l'intérieur de l'incertitude de mesure, jusqu'à la date d'expiration de la bouteille non-ouverte, si scellée, ou jusqu'à la date d'expiration de la bouteille ouverte (si indiquée), en présumant que le contenant est maintenu fermé et gardé dans les conditions d'entreposage indiquées. Les acheteurs seront avisés dans le cas où il y aura des changements significatifs nécessitant une re-certification ou un rappel du produit avant la date d'expiration.*

7.0 HAZARDOUS INFORMATION / INFORMATION SUR LES RISQUES POTENTIELS:

Please refer to the associated Safety Data Sheet (SDS) for information regarding this product (available at www.SCPSCIENCE.com). / *SVP vous référer à la Fiche Signalétique applicable pour ce produit (Disponible à www.SCPSCIENCE.com).*

8.0 HOMOGENEITY / HOMOGÉNÉITÉ:

This solution has been blended according to an in-house procedure and its homogeneity is guaranteed to be fit for purpose when a sample size sufficient for the intended method of analysis is used. / *Cette solution a été préparée selon une procédure maison et nous assurons que sa homogénéité est approprié à l'emploi lorsqu'un échantillon suffisant pour la méthode d'analyse prévue est utilisé.*

9.0 TRACEABILITY / TRAÇABILITÉ:

This CRM (Certified Reference Material) is traceable to the NIST SRM (Standard Reference Material) indicated in section 2 through an unbroken chain of comparisons. In addition, balances used are regularly calibrated using weights which are traceable to NIST (National Institute of Standards and Technology) or NRC (National Research Council of Canada) standards. All conductivity meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable thermometer and pH/MV simulator. / *Ce matériel de référence certifié est traçable au Matériel de Référence Standardisé de NIST indiqué à la section 2 par une chaîne de comparaison ininterrompue. De plus, les balances utilisées sont étalonnées régulièrement en utilisant des poids qui sont traçables au NIST (National Institute of Standards and Technology) ou au CRNC (Conseil National de Recherches Canada). Tout conductimètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et étalons traçables au NIST ou CNRC. Tout pH mètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et un simulateur pH/MV traçables au NIST ou au CNRC.*

10.0 PREPARATION / PRÉPARATION:

For the preparation of these solutions, 18 meghom/cm double deionized water, high-purity acids and glassware calibrated to ASTM Class A specifications are used. / *Une eau de 18 meghom/cm doublement déionisé, de l'acide de haute pureté, ainsi que de la verrerie étalonnée afin de satisfaire les spécifications Classe A de ASTM ont été utilisés pour la préparation de cet étalon.*

11.0 QUALITY SYSTEM CERTIFICATIONS / CERTIFICATIONS DE SYSTÈME QUALITÉ:

ISO 9001 Certification / Certification ISO 9001: This standard was produced in a facility which operates under a **registered** ISO 9001 Quality Management System. Please consult our web site for a copy of the most recent revision of our certificate of registration. / *Cet étalon a été fabriqué dans un laboratoire qui utilise un Système de Gestion de la Qualité enregistré à la norme ISO 9001. Veuillez consulter notre site web pour obtenir la version la plus récente de notre certificat d'enregistrement.*

ISO 17025 Accreditation / Accréditation ISO 17025: **SCP SCIENCE (Corporate Headquarters)** operates an ISO 17025 **accredited** laboratory. Please consult our web site for a copy of the most recent revision of our certificate and scope of accreditation. / *SCP SCIENCE (Siège social) est accréditée ISO 17025. Veuillez consulter notre site web afin d'obtenir la plus récente version de notre certificat d'accréditation ainsi que la portée de notre accréditation.*

ISO 17034 Accreditation / Accréditation ISO 17034 : **SCP SCIENCE (Corporate Headquarters)** is an ISO 17034 accredited Reference Material Producer. Please consult our website for a copy of our most recent certificate and scope of accreditation. / *SCP SCIENCE (Siège social) est un Fabricant de Matériaux de Référence Accrédité ISO 17034. Veuillez consulter notre site web afin d'obtenir la plus récente version de notre certificat d'accréditation ainsi que la portée de notre accréditation.*

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91140, Villebon-sur-Yvette
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Alte Marktberdorfer Straße 14, 87616
Marktberdorf
Phone: +49 (0) 8342-89560-61
Fax: +49 (0) 8342-89560-69

Energy Laboratories Inc

Standard LOG

Standard ID: ME211025A
Standard Name: Te Stock
Date Prepared: 10/25/2021
Date Expires: 10/25/2022
Department: ME
Vendor: SCP Science
Lot Number: S200130018
Balance ID:
Comments: Opened 10/25/2021; Expires 10/25/2022

Type: Primary
BY: Stacy R. Hendricks
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
ICP/ICPMS Standard Tellurium	14418	500	mL	10/25

Final Volume: 500 mL

Stock Source

Base Units

Amount Added

Analtes

CAS

Conc: **ug/mL**

Te

1.0 DESCRIPTION: *PlasmaCAL ICP/ICPMS Standard - Tellurium 1000 µg/ml*
 Catalogue Number: 140-051-520/-521/-525
 Starting Material: Tellurium Metal 99.99+%
 Lot Number: **S210615004**
 Matrix: 10% HNO₃ (See Section 3 for actual matrix)
 Expiration Date (End of month): **June 2023** (or 15 months after bottle is opened, whichever comes first)

2.0 CERTIFIED VALUES AND ASSOCIATED UNCERTAINTY:
 Certified Concentration: **1005 µg/ml +/- 5 µg/ml**
958 µg/g +/- 5 µg/g
 Method of analysis: Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES)
 Traceability: NIST Standard Reference Material 3156 Lot: **140830**

Note: The uncertainty of the certified value has been calculated from applicable uncertainty contributors (u_i) including uncertainty established during characterization of the material (u_{char}), the between bottle variation (u_{bb}), short-term stability (u_{sts}) and long-term stability (u_{lts}) according to the model $u_c = \sqrt{(u_{char}^2 + u_{bb}^2 + u_{sts}^2 + u_{lts}^2)}$. This combined uncertainty has been further multiplied by a coverage factor (k) of 2 to provide a 95% confidence interval.

3.0 REFERENCE VALUES:
 Density: **1.049 g/ml @ 25.5 °C**
 Actual Matrix: **10.0% (v/v) HNO₃**

ID #: 14418
 Opened: _____
 ICP/ICPMS Standard Tellurium
Expires: 6/30/2023
 Rec'd: 10/20/2021
 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

Trace Metal Impurities as tested by ICP-AES:

Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)
Ag	<0.0010	Fe	<0.0018	Nd	0.0449	Sn	<0.0010
Al	<0.0010	Ga	<0.0010	Ni	<0.0010	Sr	<0.0025
As	<0.0010	Gd	<0.0010	Os	<0.0010	Ta	<0.0010
Au	<0.0010	Ge	<0.0010	P	0.0184	Tb	<0.0010
B	<0.0015	Hf	<0.0010	Pb	<0.0010	Te	N/A
Ba	<0.0010	Hg	*	Pd	<0.0010	Th	<0.0010
Be	<0.0010	Ho	<0.0010	Pr	0.0028	Ti	<0.0012
Bi	<0.0010	In	0.0020	Pt	<0.0010	Tl	<0.0011
Ca	<0.0135	Ir	<0.0010	Rb	<0.0010	Tm	<0.0010
Cd	<0.0010	K	<0.0024	Re	<0.0010	U	<0.0010
Ce	<0.0010	La	<0.0010	Rh	<0.0010	V	<0.0010
Co	<0.0010	Li	<0.0010	Ru	<0.0010	W	<0.0020
Cr	<0.0010	Lu	<0.0010	S	*	Y	<0.0010
Cs	<0.0010	Mg	<0.0020	Sb	<0.0010	Yb	<0.0010
Cu	<0.0010	Mn	<0.0010	Sc	<0.0010	Zn	<0.0010
Dy	<0.0010	Mo	<0.0010	Se	<0.1	Zr	<0.0010
Er	<0.0010	Na	<0.0025	Si	<0.1		
Eu	<0.0010	Nb	<0.0010	Sm	<0.0010		

*: Not tested

4.0 APPROVAL AND DATE OF CERTIFICATION:
 Certification Approval: Daniel Boisvert, Chemist
 Certification Date: June 30, 2021

Daniel Boisvert

5.0 INTENDED USE / UTILISATION PRÉVUE:

- ICP Standards: For the calibration of, including but not limited to: ICP-AES, ICP-MS, FAAS, GFAA, XRF and DCP. / Étalons ICP : Pour l'étalonnage de instruments de mesure tels que: ICP-AES, ICP-MS, FAAS, GFAA, XRF et DCP.
 - AA Standards: For the calibration of Flame (FAAS) and Graphite Furnace (GFAA) Atomic Absorption Spectrometers. / Étalons AA : Pour l'étalonnage de spectromètres d'absorption atomique flamme (FAAS) et four au graphite (GFAA).
 - Matrix Modifiers: For the optimization of analytical conditions to provide better Graphite Furnace Atomic Absorption (GFAA) instrument response and improved detection limits. / Modificateur de matrice : Pour l'optimisation des conditions analytiques afin de fournir des meilleurs réponses instrumentales et limites de détection pour SAA four au graphite.
 - pH Standards: For the calibrating pH meters or for other wet chemistry applications. / Étalons pH : Pour étalonnage de pH mètres et autres applications de chimie humide.
 - Conductivity Standards: For electrolytic conductivity measurement as a calibration standard. / Étalons de conductivité : Comme étalon pour les mesures de conductivité électrolytiques.
 - IC Standards: For calibration of, but not limited to IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS or other wet chemistry applications. / Étalons IC : Pour étalonnage d'instruments tels que : IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS et autres applications de chimie humide.
- For any inquiries, please contact **SCP SCIENCE**. / Pour toute question, veuillez contacter **SCP SCIENCE**.

6.0 INSTRUCTIONS FOR USE / INSTRUCTIONS D'UTILISATION:

Handling and Storage / Manutention et entreposage: Keep product tightly capped when not in use. The solution should be opened for a minimum amount of time necessary to dispense the amount required. Do not pipet or use directly from container. Do not return unused portions back to container. Store under normal laboratory conditions. Avoid exposure to excessive sources of heat and humidity or direct sunlight. / Garder les contenants bien fermés lorsque non utilisés. Le contenant devrait être ouvert seulement pour le temps requis afin de prélever la quantité nécessaire. Ne pas pipetter ou utiliser directement du contenant. Ne pas retourner les portions non-utilisées dans le contenant. Conserver dans des conditions normales de laboratoire. Éviter l'exposition à des sources de chaleur et d'humidité excessives ou à l'exposition solaire directe.

Stability / Stabilité: This Standard is guaranteed to be stable and accurate to within the specified uncertainty of measurement up to the unopened expiry date, if sealed, or up to the opened expiry date (when indicated), whichever comes first, provided the solution is kept tightly capped and stored under the indicated storage conditions. Purchasers will be notified of any significant changes resulting in re-certification or withdrawal of the product prior to the expiration date. / La stabilité et l'exactitude de cet étalon sont garanties d'être à l'intérieur de l'incertitude de mesure, jusqu'à la date d'expiration de la bouteille non-ouverte, si scellée, ou jusqu'à la date d'expiration de la bouteille ouverte (si indiquée), en presumant que le contenant est maintenu fermé et gardé dans les conditions d'entreposage indiquées. Les acheteurs seront avisés dans le cas où il y aura des changements significatifs nécessitant une re-certification ou un rappel du produit avant la date d'expiration.

7.0 HAZARDOUS INFORMATION / INFORMATION SUR LES RISQUES POTENTIELS:

Please refer to the associated Safety Data Sheet (SDS) for information regarding this product (available at www.SCPSCIENCE.com). / SVP vous référer à la Fiche Signalétique applicable pour de l'information sur ce produit (Disponible à www.SCPSCIENCE.com).

8.0 HOMOGENEITY / HOMOGÉNÉITÉ:

This solution has been blended according to an in-house procedure and its homogeneity is guaranteed to be fit for purpose when a sample size sufficient for the intended method of analysis is used. / Cette solution a été préparée selon une procédure maison et nous assurons que sa homogénéité est approprié à l'emploi lorsqu'un échantillon suffisant pour la méthode d'analyse prévue est utilisé.

9.0 TRACEABILITY / TRAÇABILITÉ:

This CRM (Certified Reference Material) is traceable to the NIST SRM (Standard Reference Material) indicated in section 2 through an unbroken chain of comparisons. In addition, balances used are regularly calibrated using weights which are traceable to NIST (National Institute of Standards and Technology) or NRC (National Research Council of Canada) standards. All conductivity meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable thermometer and standards. All pH meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable thermometer and pH/MV simulator. / Ce matériel de référence certifié est traçable au Matériel de Référence Standardisé de NIST indiqué à la section 2 par une chaîne de comparaison ininterrompue. De plus, les balances utilisées sont étalonnées régulièrement en utilisant des poids qui sont traçables au NIST (National Institute of Standards and Technology) ou au CRNC (Conseil National de Recherches Canada). Tout conductimètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et étalons traçables au NIST ou au CNRC. Tout pH mètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et un simulateur pH/MV traçables au NIST ou au CNRC.

10.0 PREPARATION / PRÉPARATION:

For the preparation of these solutions, 18 megohm/cm double deionized water, high-purity acids and glassware calibrated to ASTM Class A specifications are used. / Une eau de 18 megohm/cm doublement déionisé, de l'acide de haute pureté, ainsi que de la verrerie étalonnée afin de satisfaire les spécifications Classe A de ASTM ont été utilisés pour la préparation de cet étalon.

11.0 QUALITY SYSTEM CERTIFICATIONS / CERTIFICATIONS DE SYSTÈME QUALITÉ:

ISO 9001 Certification / Certification ISO 9001: This standard was produced in a facility which operates under a registered ISO 9001 Quality Management System. Please consult our web site for a copy of the most recent revision of our certificate of registration. / Cet étalon a été fabriqué dans un laboratoire qui utilise un Système de Gestion de la Qualité enregistré à la norme ISO 9001. Veuillez consulter notre site web pour obtenir la version la plus récente de notre certificat d'enregistrement.

ISO 17025 Accreditation / Accréditation ISO 17025: SCP SCIENCE (Corporate Headquarters) operates an ISO 17025 accredited laboratory. Please consult our web site for a copy of the most recent revision of our certificate and scope of accreditation. / SCP SCIENCE (Siège social) est accréditée ISO 17025. Veuillez consulter notre site web afin d'obtenir la plus récente version de notre certificat d'accréditation ainsi que la portée de notre accréditation.

ISO 17034 Accreditation / Accréditation ISO 17034: SCP SCIENCE (Corporate Headquarters) is an ISO 17034 accredited Reference Material Producer. Please consult our website for a copy of our most recent certificate and scope of accreditation. / SCP SCIENCE (Siège social) est un Fabricant de Matériaux de Référence Accrédité ISO 17034. Veuillez consulter notre site web afin d'obtenir la plus récente version de notre certificat d'accréditation ainsi que la portée de notre accréditation.

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Energy Laboratories Inc

Standard LOG

Standard ID: ME211207 2008TS
Standard Name: 200.8 Tune Solution
Date Prepared: 12/7/2021
Date Expires: 12/7/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: R2-MEB691898
Balance ID:
Comments: Opened 12/7/2021; Expired 12/7/2022

Type: Primary
BY: Stacy R. Hendricks
Status: New

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Multi Analyte Custom Grade Solution	13795	125	mL	12/7/

Final Volume: 125 mL

Stock Source

Base Units

Amount Added

Analvtes

CAS

Conc: **ug/mL**

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
 Catalog Number: 2008TS
 Lot Number: R2-MEB691898
 Matrix: 3% (v/v) HNO3
 Value / Analyte(s): 10 µg/mL ea:
 Beryllium, Cobalt,
 Indium, Magnesium,
 Lead

ID #: 13795
 Opened: _____
 Multi Analyte Custom Grade Solution
Expires: 4/8/2024
 Rec'd: 4/29/2021
 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Beryllium, Be	10.01 ± 0.06 µg/mL	Cobalt, Co	10.01 ± 0.04 µg/mL
Indium, In	10.01 ± 0.04 µg/mL	Lead, Pb	10.01 ± 0.04 µg/mL
Magnesium, Mg	10.01 ± 0.05 µg/mL		

Density: 1.014 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Be	ICP Assay	3105a	090514
Co	EDTA	928	928
Co	ICP Assay	traceable to 3113	M2-CO661665
Co	Calculated		See Sec. 4.2
In	ICP Assay	3124a	110516
In	EDTA	928	928
In	Calculated		See Sec. 4.2
Mg	ICP Assay	3131a	140110
Mg	EDTA	928	928
Mg	Calculated		See Sec. 4.2
Pb	ICP Assay	3128	101026
Pb	EDTA	928	928
Pb	Calculated		See Sec. 4.2

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES ($\mu\text{g/mL}$)

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

April 08, 2020

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

11.2 Lot Expiration Date

- **April 08, 2024**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control



Certifying Officer:

Paul Gaines
CEO, Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME210901 1000 PPB STANDARD
 Standard Name: 1000 PPB Standard
 Date Prepared: 9/1/2021
 Date Expires: 1/4/2022
 Department: ME
 Vendor:
 Lot Number:
 Balance ID:
 Comments: Made fresh daily

Type: Secondary
 BY: Cindy Rohrer
 Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Nitric Acid, 69.0-70.0%,0000282671	14178	0.5	mL	4/11/2026
Hydrochloric Acid Instra Analyzed 000028	14028	0.25	mL	3/29/2026
Milli-Q H2O	391	48.25	mL	6/1/2100

Final Volume:
50 mL

<u>Stock Source</u>	Base Units	Amount Added
ME210726 MSCAL MSCAL 2B	ug/mL	0.5 mL
ME210610 MSCAL EL-MSCAL-5A	ug/mL	0.5 mL
ME210105AU Au Secondary Stock	ug/mL	0.01 mL

<u>Analytes</u>	CAS	Conc: ug/mL
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Energy Laboratories Inc

Standard LOG

Standard ID: ME210726 MSCAL2B
Standard Name: MSCAL 2B
Date Prepared: 7/26/2021
Date Expires: 7/26/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: S2-MEB702845
Balance ID:
Comments: Opened 7/26/2021; Expires 7/26/2022

Type: Primary
BY: Alyssa A. espinoza
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Multi Analyte Custom Grade Solution	13652		mL	7/26/2022

Final Volume:
mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

Energy Laboratories Inc

Standard LOG

Standard ID: ME210726 MSCAL2B
Standard Name: MSCAL 2B
Date Prepared: 7/26/2021
Date Expires: 7/26/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: S2-MEB702845
Balance ID:
Comments: Opened 7/26/2021; Expires 7/26/2022

Type: Primary
BY: Alyssa A. espinoza
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Multi Analyte Custom Grade Solution	13652		mL	7/26/2022

Final Volume:
mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
 Catalog Number: EL-MSCAL-2B
 Lot Number: S2-MEB702845
 Matrix: 5% (v/v) HNO3
 Value / Analyte(s):
 100 µg/mL ea:
 Aluminum,
 Boron,
 Beryllium,
 Cobalt,
 Copper,
 Manganese,
 Lead,
 Strontium,
 Thallium,
 Vanadium,
 40 µg/mL ea:
 Silver

Arsenic,
Barium,
Cadmium,
Chromium,
Iron,
Nickel,
Selenium,
Thorium,
Uranium,
Zinc,

ID #: 13652

Opened: _____

Multi Analyte Custom Grade Solution

Expires: 3/8/2025

Rec'd: 3/18/2021

Energy Laboratories Inc 1120 So. 27th Street
Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Aluminum, Al	100.0 ± 0.4 µg/mL	Arsenic, As	100.0 ± 0.9 µg/mL
Barium, Ba	100.0 ± 0.5 µg/mL	Beryllium, Be	100.0 ± 0.7 µg/mL
Boron, B	99.9 ± 0.7 µg/mL	Cadmium, Cd	100.0 ± 0.5 µg/mL
Chromium, Cr	100.0 ± 0.8 µg/mL	Cobalt, Co	100.0 ± 0.6 µg/mL
Copper, Cu	100.0 ± 0.5 µg/mL	Iron, Fe	100.1 ± 0.4 µg/mL
Lead, Pb	100.0 ± 0.6 µg/mL	Manganese, Mn	100.0 ± 0.5 µg/mL
Nickel, Ni	100.0 ± 0.6 µg/mL	Selenium, Se	100.0 ± 0.7 µg/mL
Silver, Ag	39.99 ± 0.18 µg/mL	Strontium, Sr	100.0 ± 0.4 µg/mL
Thallium, Tl	100.0 ± 0.6 µg/mL	Thorium, Th	100.0 ± 0.5 µg/mL
Uranium, U	100.0 ± 0.5 µg/mL	Vanadium, V	100.0 ± 0.5 µg/mL
Zinc, Zn	100.0 ± 0.5 µg/mL		

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

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ag	ICP Assay	3151	160729
Ag	Volhard	999c	999c
Al	ICP Assay	3101a	140903
Al	EDTA	928	928
As	ICP Assay	3103a	100818
B	ICP Assay	3107	110830
Ba	ICP Assay	3104a	140909
Ba	Gravimetric		See Sec. 4.2
Be	ICP Assay	3105a	090514
Cd	ICP Assay	3108	130116
Cd	EDTA	928	928
Co	ICP Assay	3113	190630
Co	EDTA	928	928
Cr	ICP Assay	3112a	170630
Cu	ICP Assay	3114	121207
Cu	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
Fe	Calculated		See Sec. 4.2
Mn	ICP Assay	3132	050429
Mn	EDTA	928	928
Ni	ICP Assay	3136	120619
Ni	EDTA	928	928
Pb	ICP Assay	3128	101026
Pb	EDTA	928	928
Se	ICP Assay	3149	100901
Se	Calculated		See Sec. 4.2
Sr	EDTA	928	928
Sr	ICP Assay	Traceable to 3153a	K2-SR650985
Sr	Calculated		See Sec. 4.2
Th	EDTA	928	928
Th	Calculated		See Sec. 4.2
Tl	ICP Assay	3158	151215
U	ICP Assay	3164	080521
U	Calculated		See Sec. 4.2
V	ICP Assay	3165	160906
V	EDTA	928	928
Zn	ICP Assay	3168a	120629
Zn	EDTA	928	928

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Certified Abundance:

IV's Certified Abundance

<u>Isotope</u>	<u>Atom %</u>
Uranium 238U	99.8 ± 0.1
Uranium 235U	0.24 ± 0.05

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 08, 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

- **March 08, 2025**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME210610 MSCAL-5A
Standard Name: EL-MSCAL-5A
Date Prepared: 6/10/2021
Date Expires: 6/10/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: P2-MEB687200
Balance ID:
Comments: Opened 6/10/21; Expires 6/10/22

Type: Primary
BY: Alyssa A. espinoza
Status: Empty/Disposed

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Multi Analyte Custom Grade Solution	13476	500	mL	6/10/2022

Final Volume:
500 mL

Stock Source

Base Units

Amount Added

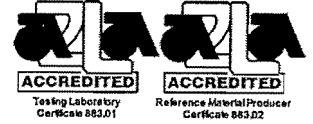
Analytes

CAS

Conc: **ug/mL**

1.0 ACCREDITATION / REGISTRATION

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


2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
 Catalog Number: EL-MSCAL-5A
 Lot Number: R2-MEB695692
 Matrix: 3% (v/v) HNO₃
 Value / Analyte(s):
 5 000 µg/mL ea:
 Calcium,
 Magnesium,
 500 µg/mL ea:
 Phosphorus,
 250 µg/mL ea:
 Lithium

ID #: 13476

 Opened: _____
 Multi Analyte Custom Grade Solution
Expires: 8/12/2024
 Rec'd: 1/15/2021
 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

 Potassium,
 Sodium,

Iron,

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Calcium, Ca	5 000 ± 20 µg/mL	iron, Fe	500.0 ± 2.1 µg/mL
Lithium, Li	250.0 ± 1.1 µg/mL	Magnesium, Mg	5 000 ± 20 µg/mL
Phosphorus, P	500.1 ± 2.9 µg/mL	Potassium, K	5 000 ± 19 µg/mL
Sodium, Na	5 000 ± 18 µg/mL		

Density: 1.076 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
K	ICP Assay	3141a	140813
K	Gravimetric		See Sec. 4.2
Li	ICP Assay	3129a	100714
Li	Gravimetric		See Sec. 4.2
Mg	ICP Assay	3131a	140110
Mg	EDTA	928	928
Na	ICP Assay	3152a	120715
Na	Gravimetric		See Sec. 4.2
P	ICP Assay	3139a	060717
P	Acidimetric	84L	84L

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES ($\mu\text{g/mL}$)

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

August 12, 2020

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

11.2 Lot Expiration Date

- **August 12, 2024**

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

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

11.3 Period of Validity

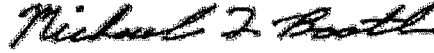
- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME210105AU
Standard Name: Au Secondary Stock
Date Prepared: 1/4/2021
Date Expires: 1/4/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: R2-AU695955
Balance ID:
Comments: Opened 1/4/2021; Expires 1/4/2021

Type: Secondary
BY: Ron Hunt
Status: Empty/Disposed

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Gold Single Analyte Custom Grade Soluti	13396	500	mL	1/4/2021

Final Volume:
500 mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

Energy Laboratories Inc

Standard LOG

Standard ID: ME210901 100 PPB STANDARD
 Standard Name: 100 ppb Standard
 Date Prepared: 6/10/2021
 Date Expires: 1/4/2022
 Department: ME
 Vendor: Inorganic Ventures
 Lot Number:
 Balance ID:
 Comments: Made Fresh Daily

Type: Secondary
 BY: Cindy Rohrer
 Status: Expired

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Hydrochloric Acid, 36.5-38.0% 000027	13784	0.25	mL	12/15
Nitric Acid, 69.0-70.0%,0000277202	13781	0.5	mL	1/14/
Milli-Q H2O	391	48.335	mL	6/1/2

Final Volume: 50 mL

<u>Stock Source</u>	Base Units	Amount Added
ME210511 MSCAL MSCAL 3C	ug/mL	0.05 mL
ME210610 MSCAL EL-MSCAL-5A	ug/mL	0.25 mL
ME210812 HgPrim Primary Hg Stock 2 PPM	ug/mL	0.05 mL
ME210726 MSCAL MSCAL 2B	ug/mL	0.05 mL

Analvtes **CAS** Conc: **ug/mL**

Energy Laboratories Inc

Standard LOG

Standard ID: ME210511 MSCAL 3C
Standard Name: MSCAL 3C
Date Prepared: 5/11/2021
Date Expires: 5/11/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: P2-MEB682620
Balance ID:
Comments: Opened 5/11/21; expires 5/11/22

Type: Primary
BY: Alyssa A. espinoza
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Multi Analyte Custom Grade Solution	13651	250	mL	5/11/2022

Final Volume:
250 mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: EL-MSCAL-3C
Lot Number: S2-MEB702844
Matrix: 3% (v/v) HNO₃
tr. HF
Value / Analyte(s): 400 µg/mL ea:
Silicon,
100 µg/mL ea:
Tin, Titanium,
Molybdenum, Antimony

ID #: 13651

Opened: _____

Multi Analyte Custom Grade Solution

Expires: 3/8/2025

Rec'd: 3/18/2021

Energx Laboratories Inc 1120 So 27th Street
Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Antimony, Sb	100.0 ± 0.8 µg/mL	Molybdenum, Mo	100.0 ± 0.6 µg/mL
Silicon, Si	400.1 ± 3.0 µg/mL	Tin, Sn	100.0 ± 0.6 µg/mL
Titanium, Ti	100.0 ± 0.7 µg/mL		

Density: 1.015 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Mo	ICP Assay	3134	130418
Sb	ICP Assay	3102a	140911
Si	ICP Assay	3150	130912
Sn	ICP Assay	3161a	140917
Ti	ICP Assay	3162a	130925

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

$$X_{\text{CRM/RM}} = (\bar{X}_a) (u_{\text{char } a})$$

\bar{X}_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES ($\mu\text{g/mL}$)

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800 669 6799; 540 585 3030, Fax: 540 585 3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 08, 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

- **March 08, 2025**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME210610 MSCAL-5A
Standard Name: EL-MSCAL-5A
Date Prepared: 6/10/2021
Date Expires: 6/10/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: P2-MEB687200
Balance ID:
Comments: Opened 6/10/21; Expires 6/10/22

Type: Primary
BY: Alyssa A. espinoza
Status: Empty/Disposed

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Multi Analyte Custom Grade Solution	13476	500	mL	6/10/2022

Final Volume:
500 mL

Stock Source

Base Units

Amount Added

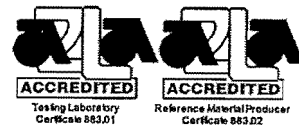
Analytes

CAS

Conc: **ug/mL**

1.0 ACCREDITATION / REGISTRATION

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


2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
 Catalog Number: EL-MSCAL-5A
 Lot Number: R2-MEB695692
 Matrix: 3% (v/v) HNO₃
 Value / Analyte(s):
 5 000 µg/mL ea:
 Calcium, Potassium,
 Magnesium, Sodium,
 500 µg/mL ea:
 Phosphorus, Iron,
 250 µg/mL ea:
 Lithium

ID #: 13476

 Opened: _____
 Multi Analyte Custom Grade Solution
Expires: 8/12/2024
 Rec'd: 1/15/2021
 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Calcium, Ca	5 000 ± 20 µg/mL	iron, Fe	500.0 ± 2.1 µg/mL
Lithium, Li	250.0 ± 1.1 µg/mL	Magnesium, Mg	5 000 ± 20 µg/mL
Phosphorus, P	500.1 ± 2.9 µg/mL	Potassium, K	5 000 ± 19 µg/mL
Sodium, Na	5 000 ± 18 µg/mL		

Density: 1.076 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
K	ICP Assay	3141a	140813
K	Gravimetric		See Sec. 4.2
Li	ICP Assay	3129a	100714
Li	Gravimetric		See Sec. 4.2
Mg	ICP Assay	3131a	140110
Mg	EDTA	928	928
Na	ICP Assay	3152a	120715
Na	Gravimetric		See Sec. 4.2
P	ICP Assay	3139a	060717
P	Acidimetric	84L	84L

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES ($\mu\text{g/mL}$)

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

August 12, 2020

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

11.2 Lot Expiration Date

- **August 12, 2024**

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

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

11.3 Period of Validity

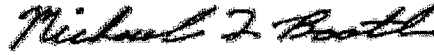
- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Spike LOG

Standard ID: ME210812 HGPRIMARY
 Standard Name: Primary Hg Stock 2 PPM
 Date Prepared: 8/12/2021
 Date Expires: 1/5/2022
 Department: ME
 Vendor: Inorganic Ventures
 Lot Number:
 Balance ID:
 Comments: Made with different HG stock than QCS

Type: Primary
 BY: Parker A. Pearsall
 Status: Expired

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Nitric Acid Instra Analyzed 0000267725	13706	0.5	mL	8/11/2025
Hydrochloric Acid, 36.5-38.0% 000027130	13503	0.25	mL	9/15/2025

Final Volume:
 25 mL

<u>Stock Source</u>		Base Units	Amount Added
ME210105HG	HG Stock	ug/mL	0.05 mL
ME210105AU	Au Stock	ug/mL	0.05 mL

<u>Analytes</u>	CAS	Conc:	ug/mL
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Energy Laboratories Inc

Standard LOG

Standard ID: ME210105AU
Standard Name: Au Secondary Stock
Date Prepared: 1/4/2021
Date Expires: 1/4/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: R2-AU695955
Balance ID:
Comments: Opened 1/4/2021; Expires 1/4/2021

Type: Secondary
BY: Ron Hunt
Status: Empty/Disposed

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Gold Single Analyte Custom Grade Soluti	13396	500	mL	1/4/2021

Final Volume:
500 mL

Stock Source

Base Units

Amount Added

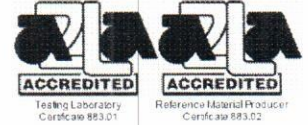
Analytes

CAS

Conc: **ug/mL**

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
 Catalog Number: CGAU1
 Lot Number: R2-AU695955
 Matrix: 10% (v/v) HCl
 Value / Analyte(s): 1 000 µg/mL ea:
 Gold
 Starting Material: H[AuCl₄]
 Starting Material Lot#: 2340
 Starting Material Purity: 99.9983%

ID #: 13396
 Opened: _____
 Gold Single Analyte Custom Grade Solution
Expires: 9/1/2024
 Rec'd: 1/4/2021
 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1001 ± 5 µg/mL
Density: 1.022 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1 **1002 ± 4 µg/mL**
 ICP Assay NIST SRM 3121 Lot Number: 991806

Assay Method #2 **1001 ± 5 µg/mL**
 Calculated NIST SRM Lot Number: See Sec. 4.2

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

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

Characterization of CRM/RM by Two or More Methods

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

$$X_{CRM/RM} = \sum(w_j) (X_j)$$

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

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

M Ag	0.029000	M Eu	<	0.000210	O Na	0.003300	M Se	<	0.014000	M Zn	0.000370	
M Al	<	0.001900	M Fe	0.002100	M Nb	<	0.000110	O Si	0.003300	M Zr	<	0.001700
M As	<	0.005700	M Ga	<	0.001100	M Nd	<	0.000110	M Sm	<	0.000110	
s Au	<		M Gd	<	0.000110	M Ni	<	0.002500	M Sn	<	0.001600	
M B	<	0.005000	M Ge	<	0.004300	M Os	<	0.000110	M Sr	<	0.000810	
M Ba	<	0.001300	M Hf	<	0.000310	O P	<	0.052000	M Ta	<	0.000110	
M Be	<	0.000610	M Hg	<	0.001200	M Pb	<	0.001900	M Tb	<	0.000110	
M Bi	<	0.002700	M Ho	<	0.000110	M Pd	0.003600	M Te	<	0.002600		
O Ca	0.001400	M In	0.000071	M Pr	<	0.000110	M Th	<	0.004100			
M Cd	<	0.000410	M Ir	<	0.000210	M Pt	0.008800	M Ti	<	0.003100		
M Ce	<	0.000210	O K	<	0.011000	M Rb	<	0.001500	M Tl	<	0.000110	
M Co	<	0.000210	M La	<	0.000110	M Re	<	0.000110	M Tm	<	0.000110	
O Cr	<	0.005200	O Li	0.000063	M Rh	<	0.001500	M U	<	0.000110		
M Cs	<	0.000810	M Lu	<	0.000110	M Ru	<	0.001700	O V	<	0.002700	
O Cu	0.001000	O Mg	0.000230	O S	<	0.052000	M W	<	0.003900			
M Dy	<	0.000110	O Mn	<	0.002100	M Sb	0.003200	M Y	<	0.000110		
M Er	<	0.000110	M Mo	<	0.001400	O Sc	<	0.001400	M Yb	<	0.000110	

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 - 196.97 +3 6 Au(Cl)63

Chemical Compatibility - Stable in HCl, and HNO₃, as the chloride complex. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels. 2-10 ppb Au is stable for #1 day maximum in 1% HNO₃ / LDPE container. 100 ppb is stable for #2 days maximum in 1% HNO₃ / LDPE container. 1-10,000 ppm solutions chemically stable for years in 10% HCl / LDPE container.

Au Containing Samples (Preparation and Solution) - Metal (Aqua Regia); Oxides (Soluble in HCl); Ores (Dissolve in HCl / HNO₃).

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

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 197 amu	5 ppt	N/A	181Ta16O
ICP-OES 208.209 nm	0.04/0.01 µg/mL	1	Ir, Re
ICP-OES 242.795 nm	0.02/0.003 µg/mL	1	Mn, Os, Th, Ta, Pt, Co, F
ICP-OES 267.595 nm	0.03/0.003 µg/mL	1	Nb, Ta, U, Cr, Th, Rh, Ru

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 01, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/WM 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/WM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **September 01, 2024**

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

- The lot expiration date reflects the period of time that the stability of a CRM/WM can be supported by long term stability studies conducted on properly stored and handled CRM/WMs. 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/WM 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/WM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME210105HG
Standard Name: HG Stock
Date Prepared: 1/4/2021
Date Expires: 1/5/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: R2-HG696409
Balance ID:
Comments:

Type: Primary
BY: Ron Hunt
Status: Expired

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Mercury Single Analyte Custom Grade Sol	13412	125	mL	9/15/2024

Final Volume:
125 mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

1.0 ACCREDITATION / REGISTRATION

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


2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
 Catalog Number: CGHG1
 Lot Number: R2-HG696409
 Matrix: 5% (v/v) HNO₃
 Value / Analyte(s): 1 000 µg/mL ea:
 Mercury
 Starting Material: Hg metal
 Starting Material Lot#: 1959
 Starting Material Purity: 99.9994%

ID #: 13412
 Opened:
 Mercury Single Analyte Custom Grade Solution
Expires: 9/15/2024
 Rec'd: 1/4/2021
 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1002 ± 3 µg/mL
Density: 1.026 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1	1004 ± 8 µg/mL ICP Assay NIST SRM 3133 Lot Number: 160921
Assay Method #2	1003 ± 3 µg/mL EDTA NIST SRM 928 Lot Number: 928
Assay Method #3	1001 ± 3 µg/mL Calculated NIST SRM Lot Number: See Sec. 4.2

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

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRMRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMRM 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	0.001159	M	Eu	<	0.000201	O	Na	0.000435	M	Se	<	0.015915	O	Zn	<	0.001510
O	Al	0.000090	O	Fe	0.000113	M	Nb	<	0.000201	O	Si	0.000525	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	0.000746	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	0.002007	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	0.000096	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	0.000971	M	Sc	<	0.000201	M	Yb	<	0.000201			

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

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 15, 2020

- 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 15, 2024**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0

NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME210726 MSCAL2B
Standard Name: MSCAL 2B
Date Prepared: 7/26/2021
Date Expires: 7/26/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: S2-MEB702845
Balance ID:
Comments: Opened 7/26/2021; Expires 7/26/2022

Type: Primary
BY: Alyssa A. espinoza
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Multi Analyte Custom Grade Solution	13652		mL	7/26/2022

Final Volume:
mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: EL-MSCAL-3C
Lot Number: S2-MEB702844
Matrix: 3% (v/v) HNO₃
tr. HF
Value / Analyte(s): 400 µg/mL ea:
Silicon,
100 µg/mL ea:
Tin, Titanium,
Molybdenum, Antimony

ID #: 13651

Opened: _____

Multi Analyte Custom Grade Solution

Expires: 3/8/2025

Rec'd: 3/18/2021

Energx Laboratories Inc 1120 So 27th Street
Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Antimony, Sb	100.0 ± 0.8 µg/mL	Molybdenum, Mo	100.0 ± 0.6 µg/mL
Silicon, Si	400.1 ± 3.0 µg/mL	Tin, Sn	100.0 ± 0.6 µg/mL
Titanium, Ti	100.0 ± 0.7 µg/mL		

Density: 1.015 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Mo	ICP Assay	3134	130418
Sb	ICP Assay	3102a	140911
Si	ICP Assay	3150	130912
Sn	ICP Assay	3161a	140917
Ti	ICP Assay	3162a	130925

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{TS} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

$$X_{\text{CRM/RM}} = (\bar{X}_a) (u_{\text{char } a})$$

\bar{X}_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{TS} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES ($\mu\text{g/mL}$)

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800 669 6799; 540 585 3030, Fax: 540 585 3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 08, 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

- **March 08, 2025**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME210511 MSCAL 3C
Standard Name: MSCAL 3C
Date Prepared: 5/11/2021
Date Expires: 5/11/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: P2-MEB682620
Balance ID:
Comments: Opened 5/11/21; expires 5/11/22

Type: Primary
BY: Alyssa A. espinoza
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Multi Analyte Custom Grade Solution	13651	250	mL	5/11/2022

Final Volume:
250 mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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1.0 ACCREDITATION / REGISTRATION

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2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: EL-MSCAL-3C
Lot Number: S2-MEB702844
Matrix: 3% (v/v) HNO₃
tr. HF
Value / Analyte(s): 400 µg/mL ea:
Silicon,
100 µg/mL ea:
Tin, Titanium,
Molybdenum, Antimony

ID #: 13651

Opened: _____

Multi Analyte Custom Grade Solution

Expires: 3/8/2025

Rec'd: 3/18/2021

Energx Laboratories Inc 1120 So 27th Street
Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Antimony, Sb	100.0 ± 0.8 µg/mL	Molybdenum, Mo	100.0 ± 0.6 µg/mL
Silicon, Si	400.1 ± 3.0 µg/mL	Tin, Sn	100.0 ± 0.6 µg/mL
Titanium, Ti	100.0 ± 0.7 µg/mL		

Density: 1.015 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Mo	ICP Assay	3134	130418
Sb	ICP Assay	3102a	140911
Si	ICP Assay	3150	130912
Sn	ICP Assay	3161a	140917
Ti	ICP Assay	3162a	130925

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

$$X_{\text{CRM/RM}} = (\bar{X}_a) (u_{\text{char } a})$$

\bar{X}_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES ($\mu\text{g/mL}$)

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800 669 6799; 540 585 3030, Fax: 540 585 3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 08, 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

- **March 08, 2025**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME210610 MSCAL-5A
Standard Name: EL-MSCAL-5A
Date Prepared: 6/10/2021
Date Expires: 6/10/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: P2-MEB687200
Balance ID:
Comments: Opened 6/10/21; Expires 6/10/22

Type: Primary
BY: Alyssa A. espinoza
Status: Empty/Disposed

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Multi Analyte Custom Grade Solution	13476	500	mL	6/10/2022

Final Volume:
500 mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

1.0 ACCREDITATION / REGISTRATION

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


2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
 Catalog Number: EL-MSCAL-5A
 Lot Number: R2-MEB695692
 Matrix: 3% (v/v) HNO₃
 Value / Analyte(s):
 5 000 µg/mL ea:
 Calcium, Potassium,
 Magnesium, Sodium,
 500 µg/mL ea:
 Phosphorus, Iron,
 250 µg/mL ea:
 Lithium

ID #: 13476

 Opened: _____
 Multi Analyte Custom Grade Solution
Expires: 8/12/2024
 Rec'd: 1/15/2021
 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Calcium, Ca	5 000 ± 20 µg/mL	iron, Fe	500.0 ± 2.1 µg/mL
Lithium, Li	250.0 ± 1.1 µg/mL	Magnesium, Mg	5 000 ± 20 µg/mL
Phosphorus, P	500.1 ± 2.9 µg/mL	Potassium, K	5 000 ± 19 µg/mL
Sodium, Na	5 000 ± 18 µg/mL		

Density: 1.076 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
K	ICP Assay	3141a	140813
K	Gravimetric		See Sec. 4.2
Li	ICP Assay	3129a	100714
Li	Gravimetric		See Sec. 4.2
Mg	ICP Assay	3131a	140110
Mg	EDTA	928	928
Na	ICP Assay	3152a	120715
Na	Gravimetric		See Sec. 4.2
P	ICP Assay	3139a	060717
P	Acidimetric	84L	84L

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:

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES ($\mu\text{g/mL}$)

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

August 12, 2020

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

11.2 Lot Expiration Date

- **August 12, 2024**

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

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

11.3 Period of Validity

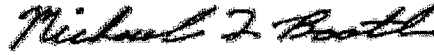
- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Spike LOG

Standard ID: ME210812 HGPRIMARY
Standard Name: Primary Hg Stock 2 PPM
Date Prepared: 8/12/2021
Date Expires: 1/5/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number:
Balance ID:
Comments: Made with different HG stock than QCS

Type: Primary
BY: Parker A. Pearsall
Status: Expired

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Nitric Acid Instra Analyzed 0000267725	13706	0.5	mL	8/11/2025
Hydrochloric Acid, 36.5-38.0% 000027130	13503	0.25	mL	9/15/2025

Final Volume:
25 mL

Stock Source

ME210105HG HG Stock
ME210105AU Au Stock

Base Units

ug/mL
ug/mL

Amount Added

0.05 mL
0.05 mL

Analytes

CAS

Conc: ug/mL

Energy Laboratories Inc

Standard LOG

Standard ID: ME210105AU
Standard Name: Au Secondary Stock
Date Prepared: 1/4/2021
Date Expires: 1/4/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: R2-AU695955
Balance ID:
Comments: Opened 1/4/2021; Expires 1/4/2021

Type: Secondary
BY: Ron Hunt
Status: Empty/Disposed

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Gold Single Analyte Custom Grade Soluti	13396	500	mL	1/4/2021

Final Volume:
500 mL

Stock Source

Base Units

Amount Added

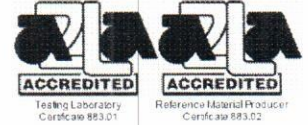
Analytes

CAS

Conc: **ug/mL**

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
 Catalog Number: CGAU1
 Lot Number: R2-AU695955
 Matrix: 10% (v/v) HCl
 Value / Analyte(s): 1 000 µg/mL ea:
 Gold
 Starting Material: H[AuCl₄]
 Starting Material Lot#: 2340
 Starting Material Purity: 99.9983%

ID #: 13396
 Opened: _____
 Gold Single Analyte Custom Grade Solution
Expires: 9/1/2024
 Rec'd: 1/4/2021
 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1001 ± 5 µg/mL
Density: 1.022 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1 **1002 ± 4 µg/mL**
 ICP Assay NIST SRM 3121 Lot Number: 991806

Assay Method #2 **1001 ± 5 µg/mL**
 Calculated NIST SRM Lot Number: See Sec. 4.2

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

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

Characterization of CRM/RM by Two or More Methods

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

$$X_{CRM/RM} = \sum(w_j)(X_j)$$

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

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

M Ag	0.029000	M Eu	<	0.000210	O Na	0.003300	M Se	<	0.014000	M Zn	0.000370	
M Al	<	0.001900	M Fe	0.002100	M Nb	<	0.000110	O Si	0.003300	M Zr	<	0.001700
M As	<	0.005700	M Ga	<	0.001100	M Nd	<	0.000110	M Sm	<	0.000110	
s Au	<		M Gd	<	0.000110	M Ni	<	0.002500	M Sn	<	0.001600	
M B	<	0.005000	M Ge	<	0.004300	M Os	<	0.000110	M Sr	<	0.000810	
M Ba	<	0.001300	M Hf	<	0.000310	O P	<	0.052000	M Ta	<	0.000110	
M Be	<	0.000610	M Hg	<	0.001200	M Pb	<	0.001900	M Tb	<	0.000110	
M Bi	<	0.002700	M Ho	<	0.000110	M Pd	0.003600	M Te	<	0.002600		
O Ca	0.001400	M In	0.000071	M Pr	<	0.000110	M Th	<	0.004100			
M Cd	<	0.000410	M Ir	<	0.000210	M Pt	0.008800	M Ti	<	0.003100		
M Ce	<	0.000210	O K	<	0.011000	M Rb	<	0.001500	M Tl	<	0.000110	
M Co	<	0.000210	M La	<	0.000110	M Re	<	0.000110	M Tm	<	0.000110	
O Cr	<	0.005200	O Li	0.000063	M Rh	<	0.001500	M U	<	0.000110		
M Cs	<	0.000810	M Lu	<	0.000110	M Ru	<	0.001700	O V	<	0.002700	
O Cu	0.001000	O Mg	0.000230	O S	<	0.052000	M W	<	0.003900			
M Dy	<	0.000110	O Mn	<	0.002100	M Sb	0.003200	M Y	<	0.000110		
M Er	<	0.000110	M Mo	<	0.001400	O Sc	<	0.001400	M Yb	<	0.000110	

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 - 196.97 +3 6 Au(Cl)63

Chemical Compatibility - Stable in HCl, and HNO₃, as the chloride complex. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels. 2-10 ppb Au is stable for #1 day maximum in 1% HNO₃ / LDPE container. 100 ppb is stable for #2 days maximum in 1% HNO₃ / LDPE container. 1-10,000 ppm solutions chemically stable for years in 10% HCl / LDPE container.

Au Containing Samples (Preparation and Solution) - Metal (Aqua Regia); Oxides (Soluble in HCl); Ores (Dissolve in HCl / HNO₃).

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

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 197 amu	5 ppt	N/A	181Ta16O
ICP-OES 208.209 nm	0.04/0.01 µg/mL	1	Ir, Re
ICP-OES 242.795 nm	0.02/0.003 µg/mL	1	Mn, Os, Th, Ta, Pt, Co, F
ICP-OES 267.595 nm	0.03/0.003 µg/mL	1	Nb, Ta, U, Cr, Th, Rh, Ru

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 01, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/WM 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/WM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **September 01, 2024**

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

- The lot expiration date reflects the period of time that the stability of a CRM/WM can be supported by long term stability studies conducted on properly stored and handled CRM/WMs. 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/WM 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/WM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME210105HG
Standard Name: HG Stock
Date Prepared: 1/4/2021
Date Expires: 1/5/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: R2-HG696409
Balance ID:
Comments:

Type: Primary
BY: Ron Hunt
Status: Expired

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Mercury Single Analyte Custom Grade Sol	13412	125	mL	9/15/2024

Final Volume:
125 mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

1.0 ACCREDITATION / REGISTRATION

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


2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
 Catalog Number: CGHG1
 Lot Number: R2-HG696409
 Matrix: 5% (v/v) HNO₃
 Value / Analyte(s): 1 000 µg/mL ea:
 Mercury
 Starting Material: Hg metal
 Starting Material Lot#: 1959
 Starting Material Purity: 99.9994%

ID #: 13412
 Opened:
 Mercury Single Analyte Custom Grade Solution
Expires: 9/15/2024
 Rec'd: 1/4/2021
 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1002 ± 3 µg/mL
Density: 1.026 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1	1004 ± 8 µg/mL ICP Assay NIST SRM 3133 Lot Number: 160921
Assay Method #2	1003 ± 3 µg/mL EDTA NIST SRM 928 Lot Number: 928
Assay Method #3	1001 ± 3 µg/mL Calculated NIST SRM Lot Number: See Sec. 4.2

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

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRMRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMRM 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	0.001159	M	Eu	<	0.000201	O	Na	0.000435	M	Se	<	0.015915	O	Zn	<	0.001510
O	Al	0.000090	O	Fe	0.000113	M	Nb	<	0.000201	O	Si	0.000525	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	0.000746	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	0.002007	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	0.000096	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	0.000971	M	Sc	<	0.000201	M	Yb	<	0.000201			

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

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 15, 2020

- 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 15, 2024**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME210726 MSCAL2B
Standard Name: MSCAL 2B
Date Prepared: 7/26/2021
Date Expires: 7/26/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: S2-MEB702845
Balance ID:
Comments: Opened 7/26/2021; Expires 7/26/2022

Type: Primary
BY: Alyssa A. espinoza
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Multi Analyte Custom Grade Solution	13652		mL	7/26/2022

Final Volume:
mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
 Catalog Number: EL-MSCAL-2B
 Lot Number: S2-MEB702845
 Matrix: 5% (v/v) HNO3
 Value / Analyte(s):
 100 µg/mL ea:
 Aluminum,
 Boron,
 Beryllium,
 Cobalt,
 Copper,
 Manganese,
 Lead,
 Strontium,
 Thallium,
 Vanadium,
 40 µg/mL ea:
 Silver

Arsenic,
Barium,
Cadmium,
Chromium,
Iron,
Nickel,
Selenium,
Thorium,
Uranium,
Zinc,

ID #: 13652

Opened: _____

Multi Analyte Custom Grade Solution

Expires: 3/8/2025

Rec'd: 3/18/2021

Energy Laboratories Inc 1120 So. 27th Street
Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Aluminum, Al	100.0 ± 0.4 µg/mL	Arsenic, As	100.0 ± 0.9 µg/mL
Barium, Ba	100.0 ± 0.5 µg/mL	Beryllium, Be	100.0 ± 0.7 µg/mL
Boron, B	99.9 ± 0.7 µg/mL	Cadmium, Cd	100.0 ± 0.5 µg/mL
Chromium, Cr	100.0 ± 0.8 µg/mL	Cobalt, Co	100.0 ± 0.6 µg/mL
Copper, Cu	100.0 ± 0.5 µg/mL	Iron, Fe	100.1 ± 0.4 µg/mL
Lead, Pb	100.0 ± 0.6 µg/mL	Manganese, Mn	100.0 ± 0.5 µg/mL
Nickel, Ni	100.0 ± 0.6 µg/mL	Selenium, Se	100.0 ± 0.7 µg/mL
Silver, Ag	39.99 ± 0.18 µg/mL	Strontium, Sr	100.0 ± 0.4 µg/mL
Thallium, Tl	100.0 ± 0.6 µg/mL	Thorium, Th	100.0 ± 0.5 µg/mL
Uranium, U	100.0 ± 0.5 µg/mL	Vanadium, V	100.0 ± 0.5 µg/mL
Zinc, Zn	100.0 ± 0.5 µg/mL		

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

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ag	ICP Assay	3151	160729
Ag	Volhard	999c	999c
Al	ICP Assay	3101a	140903
Al	EDTA	928	928
As	ICP Assay	3103a	100818
B	ICP Assay	3107	110830
Ba	ICP Assay	3104a	140909
Ba	Gravimetric		See Sec. 4.2
Be	ICP Assay	3105a	090514
Cd	ICP Assay	3108	130116
Cd	EDTA	928	928
Co	ICP Assay	3113	190630
Co	EDTA	928	928
Cr	ICP Assay	3112a	170630
Cu	ICP Assay	3114	121207
Cu	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
Fe	Calculated		See Sec. 4.2
Mn	ICP Assay	3132	050429
Mn	EDTA	928	928
Ni	ICP Assay	3136	120619
Ni	EDTA	928	928
Pb	ICP Assay	3128	101026
Pb	EDTA	928	928
Se	ICP Assay	3149	100901
Se	Calculated		See Sec. 4.2
Sr	EDTA	928	928
Sr	ICP Assay	Traceable to 3153a	K2-SR650985
Sr	Calculated		See Sec. 4.2
Th	EDTA	928	928
Th	Calculated		See Sec. 4.2
Tl	ICP Assay	3158	151215
U	ICP Assay	3164	080521
U	Calculated		See Sec. 4.2
V	ICP Assay	3165	160906
V	EDTA	928	928
Zn	ICP Assay	3168a	120629
Zn	EDTA	928	928

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Certified Abundance:

IV's Certified Abundance

<u>Isotope</u>	<u>Atom %</u>
Uranium 238U	99.8 ± 0.1
Uranium 235U	0.24 ± 0.05

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 08, 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

- **March 08, 2025**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME210901 10 PPB STANDARD
Standard Name: 10 ppb Standard
Date Prepared: 9/1/2021
Date Expires: 1/4/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number:
Balance ID:
Comments: Made fresh daily

Type: Secondary
BY: Cindy Rohrer
Status: Expired

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Nitric Acid, 69.0-70.0%,0000282671	14178	0.5	mL	4/11/
Milli-Q H2O	391	43.5	mL	6/1/2
Hydrochloric Acid Instra Analyzed 000	14028	0.25	mL	3/29/

Final Volume: 50 mL

Stock Source
ME210901 100 PP 100 ppb Standard

Base Units
ug/mL

Amount Added
5 mL

Analvtes

CAS

Conc: **ug/mL**

Energy Laboratories Inc

Standard LOG

Standard ID: ME210901 1 PPB STANDARD

Standard Name: 1 PPB STANDARD

Date Prepared: 9/1/2021

Date Expires: 1/4/2022

Department:

Vendor:

Lot Number:

Balance ID:

Comments: Made fresh daily

Type: Secondary

BY: Cindy Rohrer

Status: Expired

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Hydrochloric Acid Instra Analyzed 000	14028	0.25	mL	3/29/
Nitric Acid, 69.0-70.0%,0000277202	13781	0.5	mL	1/14/
Milli-Q H2O	391	39.25	mL	6/1/2

Final Volume: 50 mL

Stock Source

ME210901 10 PPB 10 ppb Standard

Base Units

ug/mL

Amount Added

10 mL

Analvtes

CAS

Conc:

ug/mL

Energy Laboratories Inc

Standard LOG

Standard ID: ME210901 0.5 PPB STANDARD
 Standard Name: 0.5 ppb Standard
 Date Prepared: 9/1/2021
 Date Expires: 1/4/2022
 Department: ME
 Vendor: Inorganic Ventures
 Lot Number:
 Balance ID:
 Comments: Made fresh daily

Type: Secondary
 BY: Cindy Rohrer
 Status: Expired

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Nitric Acid, 69.0-70.0%,0000282671	14178	0.5	mL	4/11/
Milli-Q H2O	391	46	mL	6/1/2
Hydrochloric Acid Instra Analyzed 000	14028	0.25	mL	3/29/

Final Volume: 50 mL

Stock Source
ME210901 1 PPB 1 PPB STANDARD

Base Units
ug/mL

Amount Added
25 mL

Analvtes

CAS

Conc: **ug/mL**

Energy Laboratories Inc

Standard LOG

Standard ID: ME210901 0.1 PPB STANDARD
Standard Name: 0.1 ppb Standard
Date Prepared: 9/1/2021
Date Expires: 1/4/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number:
Balance ID:
Comments: Made fresh daily

Type: Secondary
BY: Cindy Rohrer
Status: Expired

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Hydrochloric Acid Instra Analyzed 000	14028	0.25	mL	3/29/
Nitric Acid, 69.0-70.0%,0000282671	14178	0.5	mL	4/11/
Milli-Q H2O	391	48	mL	6/1/2

Final Volume: 50 mL

Stock Source
ME210901 0.5 PPB 0.5 ppb Standard

Base Units
ug/mL

Amount Added
10 mL

Analvtes

CAS

Conc: **ug/mL**

Energy Laboratories Inc

Standard LOG

Standard ID: ME210901 0.05 PPB STANDARD
 Standard Name: 0.05 ppb Standard
 Date Prepared: 9/1/2021
 Date Expires: 1/4/2022
 Department: ME
 Vendor: Inorganic Ventures
 Lot Number:
 Balance ID:
 Comments: Made fresh daily

Type: Secondary
 BY: Cindy Rohrer
 Status: Expired

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Nitric Acid, 69.0-70.0%,0000282671	14178	0.5	mL	4/11/
Milli-Q H2O	391	48	mL	6/1/2
Hydrochloric Acid Instra Analyzed 000	14028	0.5	mL	3/29/

Final Volume: 50 mL

Stock Source
ME210901 0.1 PPB 0.1 ppb Standard

Base Units
ug/mL

Amount Added
25 mL

Analvtes

CAS

Conc: **ug/mL**

Energy Laboratories Inc

Standard LOG

Standard ID: ME210901 0.025 PPB STANDARD
 Standard Name: 0.025 ppb Standard
 Date Prepared: 9/1/2021
 Date Expires: 1/4/2022
 Department: ME
 Vendor: Inorganic Ventures
 Lot Number:
 Balance ID:
 Comments: Made fresh daily

Type: Secondary
 BY: Cindy Rohrer
 Status: Expired

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Nitric Acid, 69.0-70.0%,0000282671	14178	0.5	mL	4/11/
Milli-Q H2O	391	48	mL	6/1/2
Hydrochloric Acid Instra Analyzed 000	14028	0.5	mL	3/29/

Final Volume: 50 mL

Stock Source
ME210901 0.05 PP 0.05 ppb Standard

Base Units
ug/mL

Amount Added
25 mL

Analvtes

CAS

Conc: **ug/mL**

Energy Laboratories Inc

Standard LOG

Standard ID: ME211206 ICV STANDARD
 Standard Name: ICV for ICPMS Standards
 Date Prepared: 12/6/2021
 Date Expires: 4/30/2022
 Department:
 Vendor:
 Lot Number:
 Balance ID:
 Comments: Made fresh daily

Type: Secondary
 BY: Stacy R. Hendricks
 Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Hydrochloric Acid Instra Analyzed 000	14028	1	mL	3/29/
Nitric Acid Instra Analyzed 000028856	14572	2	mL	6/28/
Milli-Q H2O	391		mL	6/1/2

Final Volume: 100 mL

<u>Stock Source</u>	Base Units	Amount Added
ME210211 U Seco U 2' QCS	ug/mL	0.05 mL
ME211206 Th QC Th QCS Stock	ug/mL	0.05 mL
ME210901 Hg Sec Secondary Hg Stock 2 PPM	ug/mL	0.05 mL
ME211124 EL-MSI EL-MSICV-2	ug/mL	0.05 mL
ME210817 ICV-1A EL-MSICV-1A	ug/mL	0.05 mL
ME210903 Ce, La Ce, La Secondary solution	ug/mL	0.05 mL

Analvtes **CAS** Conc: **mg/L**

Energy Laboratories Inc

Spike LOG

Standard ID: ME210211 U SECOND SOURCE
Standard Name: U 2' QCS
Date Prepared: 2/11/2021
Date Expires: 4/30/2022
Department: ME
Vendor:
Lot Number:
Balance ID:
Comments:

Type: Secondary
BY: Alyssa A. Olson
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Nitric Acid Instra Analyzed 0000264786	13061	0.25	mL	5/12/2025
Milli-Q H2O	391	22.25	mL	6/1/2100

Final Volume:
25 mL

Stock Source

ME200624A U Stock

Base Units

ug/mL

Amount Added

2.5 mL

Analytes

CAS

Conc: ug/mL

Energy Laboratories Inc

Standard LOG

Standard ID: ME200624A
Standard Name: U Stock
Date Prepared: 6/24/2020
Date Expires: 4/30/2022
Department: ME
Vendor: SCP Science
Lot Number: S200422002
Balance ID:
Comments:

Type: Primary
BY: Ron Hunt
Status: Empty/Disposed

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
PlasmaCal Standard Uranium	12767	500	mL	4/30/

Final Volume: 500 mL

Stock Source

Base Units

Amount Added

Analvtes

CAS

Conc: **ug/mL**

A Uranium

7440-61-1

1000

U

1.0 DESCRIPTION: **PlasmaCAL ICP/ICPMS Standard - Uranium 1000 µg/ml**
 Catalogue Number: 140-051-920/-921/-925
 Starting Material: Uranyl Nitrate 99.99%
 Lot Number: **S200422002**
 Matrix: 4% HNO₃ (See Section 3 for actual matrix)
 Expiration Date (End of month): **April 2022** (or 15 months after bottle is opened, whichever comes first)

2.0 CERTIFIED VALUES AND ASSOCIATED UNCERTAINTY:
 Certified Concentration: **1003 µg/ml +/- 4 µg/ml**
983 µg/g +/- 4 µg/g
 Method of analysis: Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES)
 Traceability: NIST Standard Reference Material 3164 Lot: **080521**

Note: The uncertainty of the certified value has been calculated from applicable uncertainty contributors (u) including uncertainty established during characterization of the material (u_{char}), the between bottle variation (u_{bb}), short-term stability (u_{sts}) and long-term stability (u_{lts}) according to the model $u_c = \sqrt{(u_{char}^2 + u_{bb}^2 + u_{sts}^2 + u_{lts}^2)}$. This combined uncertainty has been further multiplied by a coverage factor (k) of 2 to provide a 95% confidence interval.

3.0 REFERENCE VALUES:
 Density: **1.020 g/ml @ 21.7 °C**
 Actual Matrix: **4.0% (v/v) HNO₃**

ID #: 12767
 Opened: _____
 PlasmaCAL Standard Uranium
Expires: 4/30/2022
 Rec'd: 6/15/2020
 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

% abundance of stable isotopes : ²³⁸U : 99.79% ; ²³⁵U : 0.21%
 Note : The uranyl nitrate comes from a depleted source of uranium.

Trace Metal Impurities as tested by ICP-MS:

Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)
Ag	<0.0010	Fe	<0.0018	Nd	<0.0010	Sn	<0.0010
Al	0.0073	Ga	<0.0010	Ni	0.0038	Sr	<0.0025
As	<0.0010	Gd	<0.0010	Os	*	Ta	<0.0010
Au	<0.0010	Ge	<0.0010	P	<0.0026	Tb	<0.0010
B	<0.0015	Hf	<0.0010	Pb	<0.0010	Te	<0.0031
Ba	<0.0010	Hg	*	Pd	<0.0010	Th	0.0020
Be	<0.0010	Ho	<0.0010	Pr	<0.0010	Ti	<0.0012
Bi	<0.0010	In	<0.0010	Pt	<0.0010	Tl	<0.0011
Ca	0.0340	Ir	<0.0010	Rb	<0.0010	Tm	<0.0010
Cd	<0.0010	K	<0.0024	Re	<0.0010	U	N/A
Ce	<0.0010	La	*	Rh	<0.0010	V	<0.0010
Co	<0.0010	Li	<0.0010	Ru	<0.0010	W	<0.0020
Cr	<0.0010	Lu	<0.0010	S	<1.0000	Y	0.0049
Cs	<0.0010	Mg	<0.0010	Sb	<0.0010	Yb	<0.0010
Cu	<0.0010	Mn	<0.0010	Sc	<0.0010	Zn	<0.0010
Dy	<0.0010	Mo	<0.0010	Se	*	Zr	<0.0010
Er	<0.0010	Na	<0.0010	Si	<1.0000		
Eu	<0.0010	Nb	<0.0010	Sm	<0.0010		

4.0 APPROVAL AND DATE OF CERTIFICATION:
 Certification Approval: Daniel Boisvert, Chemist
 Certification Date: April 28, 2020

Daniel Boisvert

5.0 INTENDED USE / UTILISATION PRÉVUE:

- ICP Standards: For the calibration of, including but not limited to: ICP-AES, ICP-MS, FAAS, GFAA, XRF and DCP. / *Étalons ICP : Pour l'étalonnage d'instruments de mesure tels que: ICP-AES, ICP-MS, FAAS, GFAA, XRF et DCP.*
 - AA Standards: For the calibration of Flame (FAAS) and Graphite Furnace (GFAA) Atomic Absorption Spectrometers. / *Étalons AA : Pour l'étalonnage de spectromètres d'absorption atomique flamme (GFAA) et four au graphite (GFAA).*
 - Matrix Modifiers: For the optimization of analytical conditions to provide better Graphite Furnace Atomic Absorption (GFAA) instrument response and improved detection limits. / *Modificateur de matrice : Pour l'optimisation des conditions analytiques afin de fournir des meilleurs réponses instrumentales et limites de détection pour SAA four au graphite.*
 - pH Standards: For the calibrating pH meters or for other wet chemistry applications. / *Étalons pH : Pour étalonnage de pH mètres et autres applications de chimie humide.*
 - Conductivity Standards: For electrolytic conductivity measurement as a calibration standard. / *Étalons de conductivité : Comme étalon pour les mesures de conductivité électrolytiques.*
 - IC Standards: for calibration of, but not limited to IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS or other wet chemistry applications. / *Étalons IC : Pour étalonnage d'instruments tels que : IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS et autres applications de chimie humide.*
- For any inquiries, please contact **SCP SCIENCE**. / *Pour toute question, veuillez contacter SCP SCIENCE.*

6.0 INSTRUCTIONS FOR USE / INSTRUCTIONS D'UTILISATION:

Handling and Storage / Manutention et entreposage: Keep product tightly capped when not in use. The solution should be opened for a minimum amount of time necessary to dispense the amount required. Do not pipet or use directly from container. Do not return unused portions back to container. Store under normal laboratory conditions. Avoid exposure to excessive sources of heat and humidity or direct sunlight. / *Garder les contenants bien fermés lorsque non utilisés. Le contenant devrait être ouvert seulement pour le temps requis afin de prélever la quantité nécessaire. Ne pas pipetter ou utiliser directement du contenant. Ne pas retourner les portions non-utilisées dans le contenant. Conserver dans des conditions normales de laboratoire. Éviter l'exposition à des sources de chaleur et d'humidité excessives ou à l'exposition solaire directe.*

Stability / Stabilité: This Standard is guaranteed to be stable and accurate to within the specified uncertainty of measurement up to the unopened expiry date, if sealed, or up to the opened expiry date (when indicated), whichever comes first, provided the solution is kept tightly capped and stored under the indicated storage conditions. Purchasers will be notified of any significant changes resulting in re-certification or withdrawal of the product prior to the expiration date. / *La stabilité et l'exactitude de cet étalon sont garanties d'être à l'intérieur de l'incertitude de mesure, jusqu'à la date d'expiration de la bouteille non-ouverte, si scellée, ou jusqu'à la date d'expiration de la bouteille ouverte (si indiquée), en presumant que le contenant est maintenu fermé et gardé dans les conditions d'entreposage indiquées. Les acheteurs seront avisés dans le cas où il y aura des changements significatifs nécessitant une re-certification ou un rappel du produit avant la date d'expiration.*

7.0 HAZARDOUS INFORMATION / INFORMATION SUR LES RISQUES POTENTIELS:

Please refer to the associated Safety Data Sheet (SDS) for information regarding this product (available at www.SCPSCIENCE.com). / *SVP vous référer à la Fiche Signalétique applicable pour de l'information sur ce produit (Disponible à www.SCPSCIENCE.com).*

8.0 HOMOGENEITY / HOMOGÉNÉITÉ:

This solution has been blended according to an in-house procedure and its homogeneity is guaranteed to be fit for purpose when a sample size sufficient for the intended method of analysis is used. / *Cette solution a été préparée selon une procédure maison et nous assurons que sa homogénéité est approprié à l'emploi lorsqu'un échantillon suffisant pour la méthode d'analyse prévue est utilisé.*

9.0 TRACEABILITY / TRAÇABILITÉ:

This CRM (Certified Reference Material) is traceable to the NIST SRM (Standard Reference Material) indicated in section 2 through an unbroken chain of comparisons. In addition, balances used are regularly calibrated using weights which are traceable to NIST (National Institute of Standards and Technology) or NRC (National Research Council of Canada) standards. All conductivity meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable Thermometer and standards. All pH meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable thermometer and pH/MV simulator. / *Ce matériel de référence certifié est traçable au Matériel de Référence Standardisé de NIST indiqué à la section 2 par une chaîne de comparaison ininterrompue. De plus, les balances utilisées sont étalonnées régulièrement en utilisant des poids qui sont traçables au NIST (National Institute of Standards and Technology) ou au CRNC (Conseil National de Recherches Canada). Tout conductimètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et étalons traçables au NIST ou CNRC. Tout pH mètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et un simulateur pH/MV traçables au NIST ou au CNRC.*

10.0 PREPARATION / PRÉPARATION:

For the preparation of these solutions, 18 megohm/cm double deionized water, high-purity acids and glassware calibrated to ASTM Class A specifications are used. / *Une eau de 18 megohm/cm doublement déionisée, de l'acide de haute pureté, ainsi que de la verrerie étalonnée afin de satisfaire les spécifications Classe A de ASTM ont été utilisés pour la préparation de cet étalon.*

11.0 QUALITY SYSTEM CERTIFICATIONS / CERTIFICATIONS DE SYSTÈME QUALITÉ:

ISO 9001 Certification / Certification ISO 9001: This standard was produced in a facility which operates under a registered ISO 9001 Quality Management System. Please consult our web site for a copy of the most recent revision of our certificate of registration. / *Cet étalon a été fabriqué dans un laboratoire qui utilise un Système de Gestion de la Qualité enregistré à la norme ISO 9001. Veuillez consulter notre site web pour obtenir la version la plus récente de notre certificat d'enregistrement.*

ISO 17025 Accreditation / Accréditation ISO 17025: SCP SCIENCE (Corporate Headquarters) operates an ISO 17025 accredited laboratory. Please consult our web site for a copy of the most recent revision of our certificate and scope of accreditation. / *SCP SCIENCE (Siège social) est accréditée ISO 17025. Veuillez consulter notre site web afin d'obtenir la plus récente version de notre certificat d'accréditation ainsi que la portée de notre accréditation.*

ISO 17034 Accreditation / Accréditation ISO 17034 : SCP SCIENCE (Corporate Headquarters) is an ISO 17034 accredited Reference Material Producer. Please consult our website for a copy of our most recent certificate and scope of accreditation. / *SCP SCIENCE (Siège social) est un Fabricant de Matériaux de Référence Accrédité ISO 17034. Veuillez consulter notre site web afin d'obtenir la plus récente version de notre certificat d'accréditation ainsi que la portée de notre accréditation.*

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Marktobendorf
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Fax: +49 (0) 8342-89560-69

Energy Laboratories Inc

Spike LOG

Standard ID: ME211206 TH QCS STOCK
Standard Name: Th QCS Stock
Date Prepared: 12/6/2021
Date Expires: 10/25/2022
Department: ME
Vendor:
Lot Number:
Balance ID:
Comments:

Type: Secondary
BY: Stacy R. Hendricks
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Nitric Acid Instra Analyzed 000028856	14572	0.25	mL	6/28/
Milli-Q H2O	391	22.25	mL	6/1/2

Final Volume: 25 mL

Stock Source
ME 211025 Th Sec Th Secondary Stock

Base Units
ug/mL

Amount Added
2.5 mL

Analvtes

CAS

Conc: **ug/mL**

Energy Laboratories Inc

Standard LOG

Standard ID: ME 211025 TH SECONDARY STOCK
Standard Name: Th Secondary Stock
Date Prepared: 10/25/2021
Date Expires: 10/25/2022
Department: ME
Vendor: SCP Science
Lot Number: S190401026
Balance ID:
Comments: Opened 10/25/2021; Expires 10/25/2022

Type: Primary
BY: Stacy R. Hendricks
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Thorium Single Analyte Custom Grade	14318	125	mL	10/25

Final Volume: 500 mL

Stock Source

Base Units

Amount Added

Analvtes

CAS

Conc: **ug/mL**

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
Catalog Number: CGTH1
Lot Number: S2-TH706436
Matrix: 5% (v/v) HNO3
Value / Analyte(s): 1 000 µg/mL ea:
Thorium
Starting Material: TH(NO3)4*4H2O
Starting Material Lot#: 2250
Starting Material Purity: 99.9905%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1001 ± 4 µg/mL
Density: 1.026 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1	1001 ± 3 µg/mL EDTA NIST SRM 928 Lot Number: 928
Assay Method #2	1001 ± 6 µg/mL Calculated NIST SRM Lot Number: See Sec. 4.2

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

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

ID #: 14318
Opened:
Thorium Single Analyte Custom Grade Solution
Expires: 7/4/2025
Rec'd: 9/24/2021
Energy Laboratories Inc 1120 So. 27th Street
Billings MT 59107

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

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 ($\mu\text{g/mL}$)

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

M Ag <	0.000448	M Eu <	0.000224	O Na	0.064077	M Se <	0.005827	M Zn	0.003183
O Al	0.010962	M Fe	0.012392	M Nb <	0.003138	i Si <		M Zr <	0.010310
M As <	0.038776	M Ga <	0.004931	M Nd	0.004697	M Sm	0.000871		
M Au <	0.000224	M Gd	0.000300	M Ni <	0.006724	M Sn <	0.028242		
M B <	0.021293	M Ge <	0.008965	M Os <	0.000224	M Sr	0.002582		
M Ba	0.001317	M Hf <	0.000224	i P <		M Ta <	0.001344		
M Be <	0.000224	M Hg <	0.000448	M Pb	0.003287	M Tb <	0.001793		
M Bi <	0.001793	M Ho <	0.001344	M Pd <	0.000448	M Te <	0.010086		
O Ca	0.051969	M In	0.000134	M Pr	0.001202	s Th <			
M Cd <	0.001344	M Ir <	0.000224	M Pt <	0.000224	M Ti <	0.004258		
M Ce	0.015420	O K	0.028928	M Rb <	0.005155	M Tl <	0.000224		
M Co <	0.001344	M La	0.003577	M Re <	0.000224	M Tm <	0.000224		
M Cr <	0.015465	M Li <	0.000448	M Rh <	0.000224	M U	0.006564		
M Cs <	0.013896	M Lu <	0.000224	M Ru <	0.000224	M V <	0.001793		
M Cu	0.001472	O Mg	0.027914	i S <		M W <	0.000224		
M Dy	0.000197	M Mn	0.001814	M Sb <	0.004931	M Y	0.000860		
M Er <	0.002241	M Mo <	0.000896	M Sc <	0.000672	M Yb <	0.000224		

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 - 232.04 +4 8 Th(OH) 3+ and Th(OH)22+

Chemical Compatibility -Soluble in HCl, and HNO3. Avoid H3PO4, H2SO4 and HF although solubilities may not be a problem depending upon pH and matrix (For example: ThF4 is soluble in acids). Avoid neutral to basic media. Th4+ is stable with most metals and inorganic anions forming an insoluble carbonate, oxide, fluoride, oxalate, sulfate and phosphate in neutral to slightly acidic media.

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

Th Containing Samples (Preparation and Solution) -Metal (Soluble in Aqua Regia); Oxide (The heated oxide is not soluble in acids except hot conc. H2SO4); Ores (Na2O2 fusion at 480 ± 20EC for 7 minutes, cool and treat sintered mass with 50 mL cold water and stand until disintegrated. The mass is transferred to a beaker and acidified with HCl with 25 mL excess HCl added. Any residue is collected on a Whatman No. 42 filter, dried and ignited to 1000 EC in Pt0 crucible and the ash treated with H2SO4 / HF and fumed. If residue remains, then treat it by peroxide fusion as above.)

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 232 amu	1 ppt	N/A	
ICP-OES 274.716 nm	0.08 / 0.008 µg/mL	1	Ti, Ta, Fe, V
ICP-OES 283.231 nm	0.07 / 0.007 µg/mL	1	U, Mo, Ti, Fe, Cr
ICP-OES 283.730 nm	0.07 / 0.007 µg/mL	1	U, Zr

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

July 04, 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

- July 04, 2025

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Spike LOG

Standard ID: ME210901 HG SECOND SOURCE
Standard Name: Secondary Hg Stock 2 PPM
Date Prepared: 9/1/2021
Date Expires: 7/26/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number:
Balance ID:
Comments:

Type: Secondary
BY: Alyssa A. espinoza
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Nitric Acid, 69.0-70.0%,0000282671	14178	0.1	mL	4/11/
Hydrochloric Acid Instra Analyzed 000	14028	0.05	mL	3/29/

Final Volume: 50 mL

Stock Source
ME210726 Hg Secondary Source

Base Units
ug/mL

Amount Added
0.1 mL

Analvtes

CAS

Conc: **ug/mL**

Energy Laboratories Inc

Spike LOG

Standard ID: ME210726
Standard Name: Hg Secondary Source
Date Prepared: 7/26/2021
Date Expires: 7/26/2022
Department: _____
Vendor: _____
Lot Number: _____
Balance ID: _____
Comments: _____

Type: _____
BY: Jordan A. Gjerde
Status: New

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Mercury Single Analyte Custom Grade	13979	120	mL	7/26/

Final Volume: mL

Stock Source

Base Units

Amount Added

Analvtes

CAS

Conc: ug/mL

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
 Catalog Number: CGHG1
 Lot Number: R2-HG696409
 Matrix: 5% (v/v) HNO3
 Value / Analyte(s): 1 000 µg/mL ea:
 Mercury
 Starting Material: Hg metal
 Starting Material Lot#: 1959
 Starting Material Purity: 99.9994%

ID #: 13979
 Opened:
 Mercury Single Analyte Custom Grade Solution
Expires: 9/15/2024
 Rec'd: 6/23/2021
 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1002 ± 3 µg/mL
Density: 1.026 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1 **1004 ± 8 µg/mL**
 ICP Assay NIST SRM 3133 Lot Number: 160921

Assay Method #2 **1003 ± 3 µg/mL**
 EDTA NIST SRM 928 Lot Number: 928

Assay Method #3 **1001 ± 3 µg/mL**
 Calculated NIST SRM Lot Number: See Sec. 4.2

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

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

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

O Ag	0.001159	M	Eu <	0.000201	O Na	0.000435	M	Se <	0.015915	O Zn <	0.001510
O Al	0.000090	O	Fe	0.000113	M Nb <	0.000201	O	Si	0.000525	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	0.000746	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	0.002007	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	0.000096	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	0.000971	M Sc <	0.000201	M	Yb <	0.000201		

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

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 200.59 +2 4 Hg(OH)(aq) 1+
Chemical Compatibility - Stable in HNO₃. Avoid basic media forming insoluble carbonate. The sulfide, basic carbonate, oxalate, phosphate, arsenite, arsenate and iodide are insoluble in water.

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 15, 2020

- 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 15, 2024**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME211124 EL-MSICV-2
Standard Name: EL-MSICV-2
Date Prepared: 11/24/2021
Date Expires: 11/24/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number:
Balance ID:
Comments:

Type: Primary
BY: Amanda E. McDani
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Multi Analyte Custom Grade Solution	14023	500	mL	11/24

Final Volume: mL

Stock Source

Base Units

Amount Added

Analvtes

CAS

Conc: **ug/mL**

1.0 ACCREDITATION / REGISTRATION

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


2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
 Catalog Number: EL-MSICV-2
 Lot Number: R2-MEB696849
 Matrix: 3% (v/v) HNO₃
 tr. HF
 Value / Analyte(s):
 1 000 µg/mL ea:
 Silicon,
 100 µg/mL ea:
 Tin, Titanium,
 Molybdenum, Antimony

Second Source: Whenever possible, this solution was manufactured from a second set of concentrates in our manufacturing facility.

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Antimony, Sb	100.0 ± 0.6 µg/mL	Molybdenum, Mo	100.0 ± 0.5 µg/mL
Silicon, Si	1 000 ± 7 µg/mL	Tin, Sn	99.9 ± 0.4 µg/mL
Titanium, Ti	99.9 ± 0.6 µg/mL		

Density: 1.019 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Mo	ICP Assay	3134	130418
Sb	ICP Assay	3102a	140911
Si	ICP Assay	3150	130912
Sn	ICP Assay	3161a	070330
Sn	Calculated		See Sec. 4.2
Ti	ICP Assay	3162a	130925

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.

ID #: 14023

Opened: _____

Multi Analyte Custom Grade Solution

Expires: 9/14/2024

Rec'd: 7/7/2021

 Eneray Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{TS} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{TS} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES ($\mu\text{g/mL}$)

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 14, 2020

- 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 14, 2024**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME210817 ICV-1A
Standard Name: EL-MSICV-1A
Date Prepared: 8/17/2021
Date Expires: 8/17/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: R2-MEB688457
Balance ID:
Comments: Opened 8/17/2021; Expires 8/17/2022

Type: Primary
BY: Alyssa A. espinoza
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Multi Analyte Custom Grade Solution	13475	500	mL	8/17/

Final Volume: 500 mL

Stock Source

Base Units

Amount Added

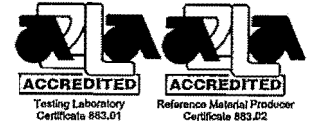
Analvtes

CAS

Conc: **ug/mL**

1.0 ACCREDITATION / REGISTRATION

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


2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution

Catalog Number: EL-MSICV-1A

Lot Number: R2-MEB688457

Matrix: 5% (v/v) HNO₃

Value / Analyte(s):

5 000 µg/mL ea:	Calcium,	Potassium,	Magnesium,
	Sodium,		
1 000 µg/mL ea:	Phosphorus,		
500 µg/mL ea:	Manganese,	Iron,	Aluminum,
100 µg/mL ea:	Arsenic,	Boron,	Barium,
	Cobalt,	Chromium,	Copper,
	Lithium,	Nickel,	Lead,
	Selenium,	Strontium,	Thallium,
	Vanadium,	Zinc,	
50 µg/mL ea:	Silver,	Cadmium,	Beryllium

ID #: 13475

Opened: _____

Multi Analyte Custom Grade Solution

Expires: 1/10/2024

Rec'd: 1/15/2021

 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

Second Source: Whenever possible, this solution was manufactured from a second set of concentrates in our manufacturing facility.

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Aluminum, Al	500.3 ± 1.8 µg/mL	Arsenic, As	100.0 ± 0.8 µg/mL
Barium, Ba	99.9 ± 0.4 µg/mL	Beryllium, Be	49.96 ± 0.33 µg/mL
Boron, B	100.0 ± 0.6 µg/mL	Cadmium, Cd	50.10 ± 0.22 µg/mL
Calcium, Ca	5 001 ± 20 µg/mL	Chromium, Cr	100.0 ± 0.6 µg/mL
Cobalt, Co	100.0 ± 0.5 µg/mL	Copper, Cu	100.1 ± 0.4 µg/mL
Iron, Fe	499.7 ± 2.1 µg/mL	Lead, Pb	100.1 ± 0.4 µg/mL
Lithium, Li	100.0 ± 0.4 µg/mL	Magnesium, Mg	5 000 ± 21 µg/mL
Manganese, Mn	499.8 ± 1.9 µg/mL	Nickel, Ni	100.1 ± 0.4 µg/mL
Phosphorus, P	1 000 ± 5 µg/mL	Potassium, K	5 000 ± 18 µg/mL
Selenium, Se	100.1 ± 0.8 µg/mL	Silver, Ag	50.02 ± 0.22 µg/mL
Sodium, Na	5 000 ± 18 µg/mL	Strontium, Sr	100.1 ± 0.4 µg/mL
Thallium, Tl	100.0 ± 0.7 µg/mL	Vanadium, V	99.9 ± 0.5 µg/mL
Zinc, Zn	100.0 ± 0.4 µg/mL		

Density: 1.098 g/mL (measured at 20 ± 4 °C)

Assay Information:

1.098 g/mL
 20 ± 4 °C

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ag	ICP Assay	3151	160729
Ag	Volhard	999c	999c
Al	ICP Assay	3101a	140903
Al	EDTA	928	928
As	ICP Assay	3103a	100818
B	ICP Assay	3107	110830
Ba	ICP Assay	3104a	140909
Ba	Gravimetric		See Sec. 4.2
Be	ICP Assay	3105a	090514
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
Cd	ICP Assay	3108	130116
Cd	EDTA	928	928
Co	EDTA	928	928
Co	ICP Assay	traceable to 3113	M2-CO661665
Cr	ICP Assay	3112a	170630
Cu	ICP Assay	3114	121207
Cu	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
K	ICP Assay	3141a	140813
K	Gravimetric		See Sec. 4.2
Li	ICP Assay	3129a	100714
Li	Gravimetric		See Sec. 4.2
Mg	ICP Assay	3131a	140110
Mg	EDTA	928	928
Mn	ICP Assay	3132	050429
Mn	EDTA	928	928
Na	ICP Assay	3152a	120715
Na	Gravimetric		See Sec. 4.2
Ni	ICP Assay	3136	120619
Ni	EDTA	928	928
P	ICP Assay	3139a	060717
P	Acidimetric	84L	84L
Pb	ICP Assay	3128	101026
Pb	EDTA	928	928
Se	ICP Assay	3149	100901
Sr	EDTA	928	928
Sr	ICP Assay	3153a	990906
Tl	ICP Assay	3158	993012
V	ICP Assay	3165	160906
V	EDTA	928	928
Zn	ICP Assay	3168a	120629
Zn	EDTA	928	928

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ls} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

$$X_{\text{CRM/RM}} = (X_n) (u_{\text{char } n})$$

X_n = mean of Assay Method n with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ls} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES ($\mu\text{g/mL}$)

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

- While stored in the sealed outer bag, transpiration of this CRM/RM is negligible. After opening the sealed outer 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 outer 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.

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 10, 2020

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

11.2 Lot Expiration Date

- **January 10, 2024**

- 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

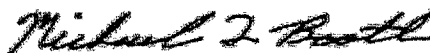
- Sealed outer Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control



Certifying Officer:

Paul Gaines
CEO, Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME210903 CE, LA SECONDARY
 Standard Name: Ce, La Secondary solution
 Date Prepared: 9/3/2021
 Date Expires: 5/25/2022
 Department: ME
 Vendor:
 Lot Number:
 Balance ID:
 Comments: Second Source Stock Solution

Type: Secondary
 BY: Parker A. Pearsall
 Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Nitric Acid Instra Analyzed 000020579	10902	0.5	mL	7/1/2
Milli-Q H2O	391	39.5	mL	6/1/2

Final Volume: 50 mL

Stock Source

ME210903 La Sec La Secondary Stock
 ME210525 Ce 2nd Ce Secondary Stock

Base Units

ug/mL
 ug/mL

Amount Added

5 mL
 5 mL

Analvtes

CAS

Conc: **ug/mL**

Energy Laboratories Inc

Standard LOG

Standard ID: ME210903 LA SECOND SOURCE

Standard Name: La Secondary Stock

Date Prepared: 9/3/2021

Date Expires: 9/3/2022

Department:

Vendor:

Lot Number:

Balance ID:

Type: Secondary

BY: Alyssa A. espinoza

Status: Empty/Disposed

Comments: Opened 9/3/2021; Expires 9/3/2022

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Lanthanum PlasmaCal Standard	14019	125	mL	9/3/22

Final Volume: mL

Stock Source

Base Units

Amount Added

Analvtes

CAS

Conc: ug/mL

La

1.0 DESCRIPTION:

PlasmaCAL ICP/ICPMS Standard - Lanthanum 1000 µg/ml
 Catalogue Number: 140-051-570/-571/-575
 Starting Material: Lanthanum(III) Oxide 99.99+%
 Lot Number: **S201029004**
 Matrix: 4% HNO₃ (See Section 3 for actual matrix)
 Expiration Date (End of month): **November 2022** (or 15 months after bottle is opened, whichever comes first)

2.0 CERTIFIED VALUES AND ASSOCIATED UNCERTAINTY:

Certified Concentration: **1005 µg/ml +/- 4 µg/ml**
985 µg/g +/- 4 µg/g
 Method of analysis: Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES)
 Traceability: NIST Standard Reference Material 3127a Lot: **151030**

Note: The uncertainty of the certified value has been calculated from applicable uncertainty contributors (u_i) including uncertainty established during characterization of the material (u_{char}), the between bottle variation (u_{bb}), short-term stability (u_{sts}) and long-term stability (u_{lts}) according to the model $u_c = \sqrt{(u_{char}^2 + u_{bb}^2 + u_{sts}^2 + u_{lts}^2)}$. This combined uncertainty has been further multiplied by a coverage factor (k) of 2 to provide a 95% confidence interval.

ID #: 14019

Opened: _____
 Lanthanum PlasmaCal Standard
Expires: 11/30/2022
 Rec'd: 7/6/2021
 Energv Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

3.0 REFERENCE VALUES:

Density: **1.020 g/ml @ 23.4 °C**
 Actual Matrix: **4.0% (v/v) HNO₃**

Trace Metal Impurities as tested by ICP-AES:

Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)
Ag	<0.0049	Fe	<0.0102	Nd	<0.1595	Sn	<0.0307
Al	<0.0280	Ga	<0.0260	Ni	<0.0139	Sr	<0.0004
As	<0.0525	Gd	<0.0685	Os	*	Ta	<0.0635
Au	<0.0085	Ge	<0.0548	P	<0.0104	Tb	<0.0146
B	<0.2535	Hf	<0.0339	Pb	<0.2460	Te	<0.4025
Ba	<0.0025	Hg	*	Pd	<0.1410	Th	<0.0471
Be	<0.0022	Ho	<0.0065	Pr	<0.0274	Ti	<0.0013
Bi	<0.0780	In	<0.0105	Pt	<0.0533	Tl	<0.5600
Ca	0.0164	Ir	<0.0243	Rb	*	Tm	<0.0105
Cd	<0.0048	K	<0.0128	Re	<0.0076	U	<0.2490
Ce	<0.0393	La	N/A	Rh	<0.0163	V	<0.0049
Co	<0.0224	Li	<0.0006	Ru	<0.0304	W	<0.0443
Cr	<0.0063	Lu	<0.0021	S	<0.0515	Y	<0.0033
Cs	*	Mg	<0.0045	Sb	<0.0197	Yb	<0.0057
Cu	<0.0040	Mn	<0.0018	Sc	<0.0055	Zn	<0.0045
Dy	<0.0043	Mo	<0.0229	Se	<0.0249	Zr	<0.0061
Er	<0.0070	Na	<0.0038	Si	<0.0455		
Eu	<0.0086	Nb	<0.0112	Sm	<0.1105		

*: Not tested

4.0 APPROVAL AND DATE OF CERTIFICATION:

Certification Approval: Daniel Boisvert, Chemist
 Certification Date: November 04, 2020

Daniel Boisvert

5.0 INTENDED USE / UTILISATION PRÉVUE:

- ICP Standards: For the calibration of, including but not limited to: ICP-AES, ICP-MS, FAAS, GFAA, XRF and DCP. / *Étalons ICP : Pour l'étalonnage d'instruments de mesure tels que: ICP-AES, ICP-MS, FAAS, GFAA, XRF et DCP.*
 - AA Standards: For the calibration of Flame (FAAS) and Graphite Furnace (GFAA) Atomic Absorption Spectrometers. / *Étalons AA : Pour l'étalonnage de spectromètres d'absorption atomique flamme (FAAS) et four au graphite (GFAA).*
 - Matrix Modifiers: For the optimization of analytical conditions to provide better Graphite Furnace Atomic Absorption (GFAA) instrument response and improved detection limits. / *Modificateur de matrice : Pour l'optimisation des conditions analytiques afin de fournir des meilleures réponses instrumentales et limites de détection pour SAA four au graphite.*
 - pH Standards: For the calibrating pH meters or for other wet chemistry applications. / *Étalons pH : Pour étalonnage de pH mètres et autres applications de chimie humide.*
 - Conductivity Standards: For electrolytic conductivity measurement as a calibration standard. / *Étalons de conductivité : Comme étalon pour les mesures de conductivité électrolytiques.*
 - IC Standards: for calibration of, but not limited to IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS or other wet chemistry applications. / *Étalons IC : Pour étalonnage d'instruments tels que : IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS et autres applications de chimie humide.*
- For any inquiries, please contact **SCP SCIENCE**. / *Pour toute question, veuillez contacter SCP SCIENCE.*

6.0 INSTRUCTIONS FOR USE / INSTRUCTIONS D'UTILISATION:

Handling and Storage / Manutention et entreposage: Keep product tightly capped when not in use. The solution should be opened for a minimum amount of time necessary to dispense the amount required. Do not pipet or use directly from container. Do not return unused portions back to container. Store under normal laboratory conditions. Avoid exposure to excessive sources of heat and humidity or direct sunlight. / *Garder les contenants bien fermés lorsque non utilisés. Le contenant devrait être ouvert seulement pour le temps requis afin de prélever la quantité nécessaire. Ne pas pipetter ou utiliser directement du contenant. Ne pas retourner les portions non-utilisées dans le contenant. Conserver dans des conditions normales de laboratoire. Éviter l'exposition à des sources de chaleur et d'humidité excessives ou à l'exposition solaire directe.*

Stability / Stabilité: This Standard is guaranteed to be stable and accurate to within the specified uncertainty of measurement up to the unopened expiry date, if sealed, or up to the opened expiry date (when indicated), whichever comes first, provided the solution is kept tightly capped and stored under the indicated storage conditions. Purchasers will be notified of any significant changes resulting in re-certification or withdrawal of the product prior to the expiration date. / *La stabilité et l'exactitude de cet étalon sont garanties d'être à l'intérieur de l'incertitude de mesure, jusqu'à la date d'expiration de la bouteille non-ouverte, si scellée, ou jusqu'à la date d'expiration de la bouteille ouverte (si indiquée), en présupmant que le contenant est maintenu fermé et gardé dans les conditions d'entreposage indiquées. Les acheteurs seront avisés dans le cas où il y aura des changements significatifs nécessitant une re-certification ou un rappel du produit avant la date d'expiration.*

7.0 HAZARDOUS INFORMATION / INFORMATION SUR LES RISQUES POTENTIELS:

Please refer to the associated Safety Data Sheet (SDS) for information regarding this product (available at www.SCPSCIENCE.com). / *SVP vous référer à la Fiche Signalétique applicable pour de l'information sur ce produit (Disponible à www.SCPSCIENCE.com).*

8.0 HOMOGENEITY / HOMOGÉNÉITÉ:

This solution has been blended according to an in-house procedure and its homogeneity is guaranteed to be fit for purpose when a sample size sufficient for the intended method of analysis is used. / *Cette solution a été préparée selon une procédure maison et nous assurons que sa homogénéité est approprié à l'emploi lorsqu'un échantillon suffisant pour la méthode d'analyse prévue est utilisé.*

9.0 TRACEABILITY / TRAÇABILITÉ:

This CRM (Certified Reference Material) is traceable to the NIST SRM (Standard Reference Material) indicated in section 2 through an unbroken chain of comparisons. In addition, balances used are regularly calibrated using weights which are traceable to NIST (National Institute of Standards and Technology) or NRC (National Research Council of Canada) standards. All conductivity meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable Thermometer and standards. All pH meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable thermometer and pH/MV simulator. / *Ce matériel de référence certifié est traçable au Matériel de Référence Standardisé de NIST indiqué à la section 2 par une chaîne de comparaison ininterrompue. De plus, les balances utilisées sont étalonnées régulièrement en utilisant des poids qui sont traçables au NIST (National Institute of Standards and Technology) ou au CRNC (Conseil National de Recherches Canada). Tout conductimètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et étalons traçables au NIST ou CNRC. Tout pH mètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et un simulateur pH/MV traçables au NIST ou au CNRC.*

10.0 PREPARATION / PRÉPARATION:

For the preparation of these solutions, 18 megohm/cm double deionized water, high-purity acids and glassware calibrated to ASTM Class A specifications are used. / *Une eau de 18 megohm/cm doublement déionisé, de l'acide de haute pureté, ainsi que de la verrerie étalonnée afin de satisfaire les spécifications Classe A de ASTM ont été utilisés pour la préparation de cet étalon.*

11.0 QUALITY SYSTEM CERTIFICATIONS / CERTIFICATIONS DE SYSTÈME QUALITÉ:

ISO 9001 Certification / Certification ISO 9001: This standard was produced in a facility which operates under a registered ISO 9001 Quality Management System. Please consult our web site for a copy of the most recent revision of our certificate of registration. / *Cet étalon a été fabriqué dans un laboratoire qui utilise un Système de Gestion de la Qualité enregistré à la norme ISO 9001. Veuillez consulter notre site web pour obtenir la version la plus récente de notre certificat d'enregistrement.*

ISO 17025 Accreditation / Accréditation ISO 17025: SCP SCIENCE (Corporate Headquarters) operates an ISO 17025 accredited laboratory. Please consult our web site for a copy of the most recent revision of our certificate and scope of accreditation. / *SCP SCIENCE (Siège social) est accréditée ISO 17025. Veuillez consulter notre site web afin d'obtenir la plus récente version de notre certificat d'accréditation ainsi que la portée de notre accréditation.*

ISO 17034 Accreditation / Accréditation ISO 17034 : SCP SCIENCE (Corporate Headquarters) is an ISO 17034 accredited Reference Material Producer. Please consult our website for a copy of our most recent certificate and scope of accreditation. / *SCP SCIENCE (Siège social) est un Fabricant de Matériaux de Référence Accrédité ISO 17034. Veuillez consulter notre site web afin d'obtenir la plus récente version de notre certificat d'accréditation ainsi que la portée de notre accréditation.*

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Marktoberdorf
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Fax: +49 (0) 8342-89560-69

Energy Laboratories Inc

Standard LOG

Standard ID: ME210525 CE 2ND SOURCE
Standard Name: Ce Secondary Stock
Date Prepared: 5/25/2021
Date Expires: 5/25/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: N2-CE682808
Balance ID:
Comments: opened 5/25/2021, expires 5/25/2022

Type: Primary
BY: Stacy R. Hendricks
Status: Empty/Disposed

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
ICP/ICPMS Standard Cerium	13642	125	mL	5/25/

Final Volume: 125 mL

Stock Source

Base Units

Amount Added

Analvtes

CAS

Conc: **ug/mL**

Ce

1.0 DESCRIPTION: *PlasmaCAL ICP/ICPMS Standard - Cerium 1000 µg/ml*
 Catalogue Number: 140-051-580/-581/-585
 Starting Material: Cerium(III) Nitrate Hexahydrate 99.99+%
 Lot Number: **S210208003**
 Matrix: 4% HNO₃ (See Section 3 for actual matrix)
 Expiration Date (End of month): **February 2023** (or 15 months after bottle is opened, whichever comes first)

2.0 CERTIFIED VALUES AND ASSOCIATED UNCERTAINTY:
 Certified Concentration: **1003 µg/ml +/- 4 µg/ml**
982 µg/g +/- 4 µg/g
 Method of analysis: Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES)
 Traceability: NIST Standard Reference Material 3110 Lot: **090504**

Note: The uncertainty of the certified value has been calculated from applicable uncertainty contributors (u_i) including uncertainty established during characterization of the material (u_{char}), the between bottle variation (u_{bb}), short-term stability (u_{sts}) and long-term stability (u_{lts}) according to the model $u_c = \sqrt{(u_{char}^2 + u_{bb}^2 + u_{sts}^2 + u_{lts}^2)}$. This combined uncertainty has been further multiplied by a coverage factor (k) of 2 to provide a 95% confidence interval.

3.0 REFERENCE VALUES:
 Density: **1.021 g/ml @ 22.5 °C**
 Actual Matrix: **4.0% (v/v) HNO₃**

Trace Metal Impurities as tested by ICP-MS:

ID #: 13642
 Opened: _____
 ICP/ICPMS Standard Cerium
Expires: 2/28/2023
 Rec'd: 3/16/2021
 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)
Ag	<0.0010	Fe	<0.0018	Nd	0.0102	Sn	<0.0010
Al	0.0148	Ga	0.0526	Ni	0.0064	Sr	<0.0025
As	<0.0010	Gd	<0.0010	Os	<0.0010	Ta	<0.0010
Au	<0.0010	Ge	<0.0010	P	<0.0132	Tb	<0.0010
B	<0.0015	Hf	<0.0010	Pb	<0.0010	Te	<0.0010
Ba	<0.0010	Hg	*	Pd	<0.0010	Th	<0.0010
Be	<0.0010	Ho	<0.0010	Pr	0.0235	Ti	<0.0012
Bi	<0.0010	In	<0.0010	Pt	<0.0010	Tl	<0.0011
Ca	0.0375	Ir	<0.0010	Rb	<0.0010	Tm	<0.0010
Cd	<0.0010	K	<0.0024	Re	<0.0010	U	<0.0010
Ce	N/A	La	<0.10	Rh	<0.0010	V	<0.0010
Co	<0.0010	Li	<0.0010	Ru	<0.0010	W	<0.0020
Cr	<0.0010	Lu	<0.0010	S	*	Y	<0.0010
Cs	<0.0010	Mg	<0.0010	Sb	<0.0010	Yb	<0.0010
Cu	0.0121	Mn	<0.0010	Sc	<0.0010	Zn	<0.0010
Dy	<0.0010	Mo	<0.0010	Se	<0.0010	Zr	<0.0010
Er	<0.0010	Na	<0.0010	Si	<0.10		
Eu	0.0035	Nb	<0.0010	Sm	<0.0010		

*: Not tested

4.0 APPROVAL AND DATE OF CERTIFICATION:
 Certification Approval: Yaling Sui, Chemist
 Certification Date: February 22, 2021

Yaling Sui

5.0 INTENDED USE / UTILISATION PRÉVUE:

- ICP Standards: For the calibration of, including but not limited to: ICP-AES, ICP-MS, FAAS, GFAA, XRF and DCP. / *Étalons ICP : Pour l'étalonnage d'instruments de mesure tels que: ICP-AES, ICP-MS, FAAS, GFAA, XRF et DCP.*
 - AA Standards: For the calibration of Flame (FAAS) and Graphite Furnace (GFAA) Atomic Absorption Spectrometers. / *Étalons AA : Pour l'étalonnage de spectromètres d'absorption atomique flamme (GFAA) et four au graphite (GFAA).*
 - Matrix Modifiers: For the optimization of analytical conditions to provide better Graphite Furnace Atomic Absorption (GFAA) instrument response and improved detection limits. / *Modificateur de matrice : Pour l'optimisation des conditions analytiques afin de fournir des meilleures réponses instrumentales et limites de détection pour SAA four au graphite.*
 - pH Standards: For the calibrating pH meters or for other wet chemistry applications. / *Étalons pH : Pour étalonnage de pH mètres et autres applications de chimie humide.*
 - Conductivity Standards: For electrolytic conductivity measurement as a calibration standard. / *Étalons de conductivité : Comme étalon pour les mesures de conductivité électrolytiques.*
 - IC Standards: for calibration of, but not limited to IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS or other wet chemistry applications. / *Étalons IC : Pour étalonnage d'instruments tels que : IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS et autres applications de chimie humide.*
- For any inquiries, please contact SCP SCIENCE. / *Pour toute question, veuillez contacter SCP SCIENCE.*

6.0 INSTRUCTIONS FOR USE / INSTRUCTIONS D'UTILISATION:

Handling and Storage / Manutention et entreposage: Keep product tightly capped when not in use. The solution should be opened for a minimum amount of time necessary to dispense the amount required. Do not pipet or use directly from container. Do not return unused portions back to container. Store under normal laboratory conditions. Avoid exposure to excessive sources of heat and humidity or direct sunlight. / *Garder les contenants bien fermés lorsque non utilisés. Le contenant devrait être ouvert seulement pour le temps requis afin de prélever la quantité nécessaire. Ne pas pipetter ou utiliser directement du contenant. Ne pas retourner les portions non-utilisées dans le contenant. Conserver dans des conditions normales de laboratoire. Éviter l'exposition à des sources de chaleur et d'humidité excessives ou à l'exposition solaire directe.*

Stability / Stabilité: This Standard is guaranteed to be stable and accurate to within the specified uncertainty of measurement up to the unopened expiry date, if sealed, or up to the opened expiry date (when indicated), whichever comes first, provided the solution is kept tightly capped and stored under the indicated storage conditions. Purchasers will be notified of any significant changes resulting in re-certification or withdrawal of the product prior to the expiration date. / *La stabilité et l'exactitude de cet étalon sont garanties d'être à l'intérieur de l'incertitude de mesure, jusqu'à la date d'expiration de la bouteille non-ouverte, si scellée, ou jusqu'à la date d'expiration de la bouteille ouverte (si indiquée), en présumant que le contenant est maintenu fermé et gardé dans les conditions d'entreposage indiquées. Les acheteurs seront avisés dans le cas où il y aura des changements significatifs nécessitant une re-certification ou un rappel du produit avant la date d'expiration.*

7.0 HAZARDOUS INFORMATION / INFORMATION SUR LES RISQUES POTENTIELS:

Please refer to the associated Safety Data Sheet (SDS) for information regarding this product (available at www.SCPSCIENCE.com). / *SVP vous référer à la Fiche Signalétique applicable pour de l'information sur ce produit (Disponible à www.SCPSCIENCE.com).*

8.0 HOMOGENEITY / HOMOGÉNÉITÉ:

This solution has been blended according to an in-house procedure and its homogeneity is guaranteed to be fit for purpose when a sample size sufficient for the intended method of analysis is used. / *Cette solution a été préparée selon une procédure maison et nous assurons que sa homogénéité est approprié à l'emploi lorsqu'un échantillon suffisant pour la méthode d'analyse prévue est utilisé.*

9.0 TRACEABILITY / TRAÇABILITÉ:

This CRM (Certified Reference Material) is traceable to the NIST SRM (Standard Reference Material) indicated in section 2 through an unbroken chain of comparisons. In addition, balances used are regularly calibrated using weights which are traceable to NIST (National Institute of Standards and Technology) or NRC (National Research Council of Canada) standards. All conductivity meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable Thermometer and standards. All pH meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable thermometer and pH/MV simulator. / *Ce matériel de référence certifié est traçable au Matériel de Référence Standardisé de NIST indiqué à la section 2 par une chaîne de comparaison ininterrompue. De plus, les balances utilisées sont étalonnées régulièrement en utilisant des poids qui sont traçables au NIST (National Institute of Standards and Technology) ou au CRNC (Conseil National de Recherches Canada). Tout conductimètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et étalons traçables au NIST ou CNRC. Tout pH mètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et un simulateur pH/MV traçables au NIST ou au CNRC.*

10.0 PREPARATION / PRÉPARATION:

For the preparation of these solutions, 18 meghom/cm double deionized water, high-purity acids and glassware calibrated to ASTM Class A specifications are used. / *Une eau de 18 meghom/cm doublement déionisée, de l'acide de haute pureté, ainsi que de la verrerie étalonnée afin de satisfaire les spécifications Classe A de ASTM ont été utilisés pour la préparation de cet étalon.*

11.0 QUALITY SYSTEM CERTIFICATIONS / CERTIFICATIONS DE SYSTÈME QUALITÉ:

ISO 9001 Certification / Certification ISO 9001: This standard was produced in a facility which operates under a registered ISO 9001 Quality Management System. Please consult our web site for a copy of the most recent revision of our certificate of registration. / *Cet étalon a été fabriqué dans un laboratoire qui utilise un Système de Gestion de la Qualité enregistré à la norme ISO 9001. Veuillez consulter notre site web pour obtenir la version la plus récente de notre certificat d'enregistrement.*

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Fax: +49 (0) 8342-89560-69

Energy Laboratories Inc

Standard LOG

Standard ID: ME210901 ICSA
Standard Name: ICSA
Date Prepared: 9/1/2021
Date Expires: 9/1/2022
Department: ME
Vendor:
Lot Number:
Balance ID:

Type: Secondary
BY: Cindy Rohrer
Status: Open

Comments: Made fresh every Monday, Wednesday, and Friday

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Nitric Acid, 69.0-70.0%,0000282671	14178	1	mL	4/11/
Milli-Q H2O	391	46.5	mL	6/1/2
Hydrochloric Acid Instra Analyzed 000	14028	0.5	mL	3/29/

Final Volume: 50 mL

Stock Source
ME210901 6020IC 6020ICS-8A

Base Units
ug/mL

Amount Added
2 mL

Analvtes

CAS

Conc: **mg/L**

Energy Laboratories Inc

Standard LOG

Standard ID: ME210901 6020ICS-8A
Standard Name: 6020ICS-8A
Date Prepared: 9/1/2021
Date Expires: 9/1/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: P2-MEB684490
Balance ID:
Comments: Opened on 9/01/2021; Expires on 9/01/2022.

Type: Primary
BY: Alyssa A. espinoza
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Multi Analyte Custom Grade Solution	13794	500	mL	9/1/2022

Final Volume:
500 mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **mg/L**

1.0 ACCREDITATION / REGISTRATION

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


2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
 Catalog Number: 6020ICS-8A
 Lot Number: R2-MEB693957
 Matrix: 1% (v/v) HNO₃
 Value / Analyte(s):
 18 000 µg/mL ea:
 Chloride,
 3 000 µg/mL ea:
 Calcium,
 2 500 µg/mL ea:
 Iron,
 2 000 µg/mL ea:
 Carbon,
 1 000 µg/mL ea:
 Aluminum,
 Sulfur,
 Magnesium,
 20 µg/mL ea:
 Molybdenum,

Sodium,

 Phosphorus,
 Potassium,

Titanium

ID #: 13794

Opened:

Multi Analyte Custom Grade Solution

Expires: 6/18/2024

Rec'd: 4/29/2021

 Eneray Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Aluminum, Al	1 001 ± 4 µg/mL	Calcium, Ca	3 003 ± 12 µg/mL
Carbon, C	2 002 ± 5 µg/mL	Chloride, Cl	18 020.0 ± 90.0 µg/mL
Iron, Fe	2 502 ± 10 µg/mL	Magnesium, Mg	1 001 ± 4 µg/mL
Molybdenum, Mo	20.02 ± 0.09 µg/mL	Phosphorus, P	1 001 ± 6 µg/mL
Potassium, K	1 001 ± 4 µg/mL	Sodium, Na	2 502 ± 9 µg/mL
Sulfur, S	1 001 ± 4 µg/mL	Titanium, Ti	20.02 ± 0.12 µg/mL

Density: 1.050 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Al	ICP Assay	3101a	140903
Al	EDTA	928	928
C	Acidimetric	84L	84L
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
K	ICP Assay	3141a	140813
K	Gravimetric		See Sec. 4.2
Mg	ICP Assay	3131a	140110
Mg	EDTA	928	928
Mo	ICP Assay	3134	130418
Mo	Calculated		See Sec. 4.2
Na	ICP Assay	3152a	120715
Na	Gravimetric		See Sec. 4.2
P	ICP Assay	3139a	060717
P	Acidimetric	84L	84L
S	Acidimetric	84L	84L
S	ICP Assay	traceable to 3154	M2-S657208
Ti	ICP Assay	3162a	130925
Ti	Calculated		See Sec. 4.2

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES ($\mu\text{g/mL}$)

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

M	Ag	<	0.000110	M	Eu	<	0.000067	s	Na	<		M	Se	<	0.003300	M	Zn	<	0.007900	
s	Al	<		s	Fe	<			M	Nb	<	0.000140	O	Si	<	0.011000	M	Zr	<	0.000770
O	As	<	0.021000	M	Ga	<	0.026000	M	Nd	<	0.000034	M	Sm	<	0.000034					
M	Au	<	0.000067	M	Gd	<	0.000067	O	Ni	<	0.002900	M	Sn	<	0.000210					
M	B	<	0.001200	M	Ge	<	0.002600	M	Os	<	0.000034	M	Sr	<	0.031000					
M	Ba	<	0.001400	M	Hf	<	0.000034	s	P	<		M	Ta	<	0.000340					
O	Be	<	0.000210	M	Hg	<	0.000140	M	Pb	<	0.000510	M	Tb	<	0.000034					
M	Bi	<	0.000210	M	Ho	<	0.000034	M	Pd	<	0.000110	M	Te	<	0.000670					
s	Ca	<		M	In	<	0.000067	M	Pr	<	0.000034	M	Th	<	0.000034					
O	Cd	<	0.002700	M	Ir	<	0.000034	M	Pt	<	0.000034	s	Ti	<						
M	Ce	<	0.000140	s	K	<		M	Rb	<	0.056000	M	Tl	<	0.000210					
M	Co	<	0.014000	M	La	<	0.000410	M	Re	<	0.000034	M	Tm	<	0.000034					
M	Cr	<	0.022000	O	Li	<	0.002500	M	Rh	<	0.000067	M	U	<	0.000034					
M	Cs	<	0.000970	M	Lu	<	0.000034	M	Ru	<	0.000340	M	V	<	0.000410					
M	Cu	<	0.009900	s	Mg	<		s	S	<		M	W	<	0.001800					
M	Dy	<	0.000034	M	Mn	<	0.005300	M	Sb	<	0.000640	M	Y	<	0.000034					
M	Er	<	0.000034	s	Mo	<		M	Sc	<	0.000540	M	Yb	<	0.000034					

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

June 18, 2020

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

11.2 Lot Expiration Date

- **June 18, 2024**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME210901 ICSAB
 Standard Name: ICSAB
 Date Prepared: 9/1/2021
 Date Expires: 9/1/2022
 Department: ME
 Vendor:
 Lot Number:
 Balance ID:
 Comments: Made fresh every Monday, Wednesday, and Friday

Type: Secondary
 BY: Cindy Rohrer
 Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Nitric Acid, 69.0-70.0%,0000282671	14178	1	mL	4/11/
Milli-Q H2O	391	46.45	mL	6/1/2
Hydrochloric Acid Instra Analyzed 000	14028	0.5	mL	3/29/

Final Volume: 50 mL

Stock Source

ME210901 6020IC 6020ICS-8A
 ME 210901 6020IC 6020ICS-9B

Base Units

ug/mL
 ug/mL

Amount Added

2 mL
 0.05 mL

Analvtes

CAS

Conc: **mg/L**

Energy Laboratories Inc

Standard LOG

Standard ID: ME 210901 6020ICS-9B
Standard Name: 6020ICS-9B
Date Prepared: 9/1/2021
Date Expires: 9/1/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: P2-MEB678862
Balance ID:
Comments: Opened 9/1/2021; Expires 9/1/2022

Type: Primary
BY: Alyssa A. espinoza
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Multi Analyte Custom Grade Solution	13478	125	mL	9/1/2022

Final Volume:
125 mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **mg/L**

1.0 ACCREDITATION / REGISTRATION

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


2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
 Catalog Number: 6020ICS-9B
 Lot Number: P2-MEB678862
 Matrix: 3% (v/v) HNO₃
 Value / Analyte(s): 20 µg/mL ea:
 Cobalt, Chromium, Copper,
 Manganese, Nickel, Vanadium,
 10 µg/mL ea:
 Zinc, Arsenic, Cadmium,
 Selenium,
 5 µg/mL ea:
 Silver

ID #: 13478
 Opened: _____
 Multi Analyte Custom Grade Solution
 Expires: 5/17/2023
 Rec'd: 1/15/2021
 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Arsenic, As	10.01 ± 0.05 µg/mL	Cadmium, Cd	10.01 ± 0.04 µg/mL
Chromium, Cr	20.02 ± 0.12 µg/mL	Cobalt, Co	20.01 ± 0.10 µg/mL
Copper, Cu	20.02 ± 0.08 µg/mL	Manganese, Mn	20.02 ± 0.09 µg/mL
Nickel, Ni	20.02 ± 0.09 µg/mL	Selenium, Se	10.01 ± 0.06 µg/mL
Silver, Ag	5.005 ± 0.022 µg/mL	Vanadium, V	20.02 ± 0.08 µg/mL
Zinc, Zn	10.01 ± 0.04 µg/mL		

Density: 1.015 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ag	ICP Assay	3151	160729
Ag	Volhard	999c	999c
As	ICP Assay	3103a	100818
As	Calculated		See Sec. 4.2
Cd	ICP Assay	3108	130116
Cd	EDTA	928	928
Co	EDTA	928	928
Co	ICP Assay	traceable to 3113	M2-CO661665
Cr	ICP Assay	3112a	170630
Cu	ICP Assay	3114	121207
Cu	EDTA	928	928
Mn	EDTA	928	928
Mn	ICP Assay	Traceable to 3132	N2-MN665236
Mn	Calculated		See Sec. 4.2
Ni	ICP Assay	3136	120619
Ni	EDTA	928	928
Se	ICP Assay	3149	100901
Se	Calculated		See Sec. 4.2
V	EDTA	928	928
V	ICP Assay	3165	992706
Zn	ICP Assay	3168a	120629
Zn	EDTA	928	928

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

May 17, 2019

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

11.2 Lot Expiration Date

- **May 17, 2023**

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

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

11.3 Period of Validity

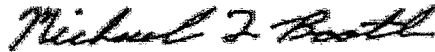
- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control



Certifying Officer:

Paul Gaines
CEO, Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME211006 SS1
 Standard Name: SS1 ICPMS Spiking Solution
 Date Prepared: 10/6/2021
 Date Expires: 1/5/2022
 Department: ME
 Vendor: Inorganic Ventures
 Lot Number:
 Balance ID:
 Comments:

Type: Tertiary
 BY: Jason P. Van Clea
 Status: Expired

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
Nitric Acid, 69.0-70.0%,0000277202	13781	0.8	mL	1/14/
Hydrochloric Acid, 36.5-38.0% 000027	13784	2	mL	12/15
Milli-Q H2O	391	28.8	mL	6/1/2

Final Volume: 40 mL

Stock Source

ME210812 HgPrim Primary Hg Stock 2 PPM
 ME210726 MSCAL MSCAL 2B
 ME210511 MSCAL MSCAL 3C

Base Units

ug/mL
 ug/mL
 ug/mL

Amount Added

2 mL
 2 mL
 2 mL

Analvtes

CAS

Conc: **ug/mL**

Energy Laboratories Inc

Spike LOG

Standard ID: ME210812 HGPRIMARY
Standard Name: Primary Hg Stock 2 PPM
Date Prepared: 8/12/2021
Date Expires: 1/5/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number:
Balance ID:
Type: Primary
BY: Parker A. Pearsall
Status: Expired
Comments: Made with different HG stock than QCS

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Nitric Acid Instra Analyzed 0000267725	13706	0.5	mL	8/11/2025
Hydrochloric Acid, 36.5-38.0% 000027130	13503	0.25	mL	9/15/2025

Final Volume:
25 mL

Stock Source

ME210105HG HG Stock
ME210105AU Au Stock

Base Units

ug/mL
ug/mL

Amount Added

0.05 mL
0.05 mL

Analytes

CAS

Conc: ug/mL

Energy Laboratories Inc

Standard LOG

Standard ID: ME210105AU
Standard Name: Au Secondary Stock
Date Prepared: 1/4/2021
Date Expires: 1/4/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: R2-AU695955
Balance ID:
Comments: Opened 1/4/2021; Expires 1/4/2021

Type: Secondary
BY: Ron Hunt
Status: Empty/Disposed

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Gold Single Analyte Custom Grade Soluti	13396	500	mL	1/4/2021

Final Volume:
500 mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
 Catalog Number: CGAU1
 Lot Number: R2-AU695955
 Matrix: 10% (v/v) HCl
 Value / Analyte(s): 1 000 µg/mL ea:
 Gold
 Starting Material: H[AuCl₄]
 Starting Material Lot#: 2340
 Starting Material Purity: 99.9983%

ID #: 13396
 Opened: _____
 Gold Single Analyte Custom Grade Solution
Expires: 9/1/2024
 Rec'd: 1/4/2021
 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1001 ± 5 µg/mL
Density: 1.022 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1 **1002 ± 4 µg/mL**
 ICP Assay NIST SRM 3121 Lot Number: 991806

Assay Method #2 **1001 ± 5 µg/mL**
 Calculated NIST SRM Lot Number: See Sec. 4.2

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

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

Characterization of CRM/RM by Two or More Methods

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

$$X_{CRM/RM} = \sum(w_j) (X_j)$$

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

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

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

M Ag	0.029000	M Eu	<	0.000210	O Na	0.003300	M Se	<	0.014000	M Zn	0.000370	
M Al	<	0.001900	M Fe	0.002100	M Nb	<	0.000110	O Si	0.003300	M Zr	<	0.001700
M As	<	0.005700	M Ga	<	0.001100	M Nd	<	0.000110	M Sm	<	0.000110	
s Au	<		M Gd	<	0.000110	M Ni	<	0.002500	M Sn	<	0.001600	
M B	<	0.005000	M Ge	<	0.004300	M Os	<	0.000110	M Sr	<	0.000810	
M Ba	<	0.001300	M Hf	<	0.000310	O P	<	0.052000	M Ta	<	0.000110	
M Be	<	0.000610	M Hg	<	0.001200	M Pb	<	0.001900	M Tb	<	0.000110	
M Bi	<	0.002700	M Ho	<	0.000110	M Pd	0.003600	M Te	<	0.002600		
O Ca	0.001400	M In	0.000071	M Pr	<	0.000110	M Th	<	0.004100			
M Cd	<	0.000410	M Ir	<	0.000210	M Pt	0.008800	M Ti	<	0.003100		
M Ce	<	0.000210	O K	<	0.011000	M Rb	<	0.001500	M Tl	<	0.000110	
M Co	<	0.000210	M La	<	0.000110	M Re	<	0.000110	M Tm	<	0.000110	
O Cr	<	0.005200	O Li	0.000063	M Rh	<	0.001500	M U	<	0.000110		
M Cs	<	0.000810	M Lu	<	0.000110	M Ru	<	0.001700	O V	<	0.002700	
O Cu	0.001000	O Mg	0.000230	O S	<	0.052000	M W	<	0.003900			
M Dy	<	0.000110	O Mn	<	0.002100	M Sb	0.003200	M Y	<	0.000110		
M Er	<	0.000110	M Mo	<	0.001400	O Sc	<	0.001400	M Yb	<	0.000110	

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 - 196.97 +3 6 Au(Cl)63

Chemical Compatibility - Stable in HCl, and HNO₃, as the chloride complex. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels. 2-10 ppb Au is stable for #1 day maximum in 1% HNO₃ / LDPE container. 100 ppb is stable for #2 days maximum in 1% HNO₃ / LDPE container. 1-10,000 ppm solutions chemically stable for years in 10% HCl / LDPE container.

Au Containing Samples (Preparation and Solution) - Metal (Aqua Regia); Oxides (Soluble in HCl); Ores (Dissolve in HCl / HNO₃).

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

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 197 amu	5 ppt	N/A	181Ta16O
ICP-OES 208.209 nm	0.04/0.01 µg/mL	1	Ir, Re
ICP-OES 242.795 nm	0.02/0.003 µg/mL	1	Mn, Os, Th, Ta, Pt, Co, F
ICP-OES 267.595 nm	0.03/0.003 µg/mL	1	Nb, Ta, U, Cr, Th, Rh, Ru

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 01, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/WM 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/WM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **September 01, 2024**

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

- The lot expiration date reflects the period of time that the stability of a CRM/WM can be supported by long term stability studies conducted on properly stored and handled CRM/WMs. 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/WM 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/WM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME210105HG
Standard Name: HG Stock
Date Prepared: 1/4/2021
Date Expires: 1/5/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: R2-HG696409
Balance ID:

Type: Primary
BY: Ron Hunt
Status: Expired

Comments:

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Mercury Single Analyte Custom Grade Sol	13412	125	mL	9/15/2024

Final Volume:
125 mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

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

X_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRMRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMRM 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	0.001159	M	Eu	<	0.000201	O	Na	0.000435	M	Se	<	0.015915	O	Zn	<	0.001510
O	Al	0.000090	O	Fe	0.000113	M	Nb	<	0.000201	O	Si	0.000525	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	0.000746	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	0.002007	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	0.000096	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	0.000971	M	Sc	<	0.000201	M	Yb	<	0.000201			

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

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 15, 2020

- 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 15, 2024**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME210726 MSCAL2B
Standard Name: MSCAL 2B
Date Prepared: 7/26/2021
Date Expires: 7/26/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: S2-MEB702845
Balance ID:
Comments: Opened 7/26/2021; Expires 7/26/2022

Type: Primary
BY: Alyssa A. espinoza
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Multi Analyte Custom Grade Solution	13652		mL	7/26/2022

Final Volume:
mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: EL-MSCAL-3C
Lot Number: S2-MEB702844
Matrix: 3% (v/v) HNO₃
tr. HF
Value / Analyte(s): 400 µg/mL ea:
Silicon,
100 µg/mL ea:
Tin, Titanium,
Molybdenum, Antimony

ID #: 13651

Opened: _____

Multi Analyte Custom Grade Solution

Expires: 3/8/2025

Rec'd: 3/18/2021

Energx Laboratories Inc 1120 So 27th Street
Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Antimony, Sb	100.0 ± 0.8 µg/mL	Molybdenum, Mo	100.0 ± 0.6 µg/mL
Silicon, Si	400.1 ± 3.0 µg/mL	Tin, Sn	100.0 ± 0.6 µg/mL
Titanium, Ti	100.0 ± 0.7 µg/mL		

Density: 1.015 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Mo	ICP Assay	3134	130418
Sb	ICP Assay	3102a	140911
Si	ICP Assay	3150	130912
Sn	ICP Assay	3161a	140917
Ti	ICP Assay	3162a	130925

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

Characterization of CRM/RM by Two or More Methods

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

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

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

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

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

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

$$X_{\text{CRM/RM}} = (\bar{X}_a) (u_{\text{char } a})$$

\bar{X}_a = mean of Assay Method A with

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

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

k = coverage factor = 2

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

u_{bb} = bottle to bottle homogeneity standard uncertainty

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

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

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

4.1 Thermometer Calibration

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

4.2 Balance Calibration

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

4.3 Glassware Calibration

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

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES ($\mu\text{g/mL}$)

N/A

6.0 INTENDED USE

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

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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

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

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

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

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

8.0 HAZARDOUS INFORMATION

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

9.0 HOMOGENEITY

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

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

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

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 08, 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

- **March 08, 2025**

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

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

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME210511 MSCAL 3C
Standard Name: MSCAL 3C
Date Prepared: 5/11/2021
Date Expires: 5/11/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: P2-MEB682620
Balance ID:
Comments: Opened 5/11/21; expires 5/11/22

Type: Primary
BY: Alyssa A. espinoza
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Multi Analyte Custom Grade Solution	13651	250	mL	5/11/2022

Final Volume:
250 mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

300 Technology Drive
 Christiansburg, VA 24073 USA
 inorganicventures.com

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

1.0 ACCREDITATION / REGISTRATION

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2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
 Catalog Number: EL-MSCAL-3C
 Lot Number: S2-MEB702844
 Matrix: 3% (v/v) HNO₃
 tr. HF
 Value / Analyte(s): 400 µg/mL ea:
 Silicon,
 100 µg/mL ea:
 Tin, Titanium,
 Molybdenum, Antimony

ID #: 13651

Opened: _____

Multi Analyte Custom Grade Solution

Expires: 3/8/2025

Rec'd: 3/18/2021

 Eneray Laboratories Inc 1120 So 27th Street
 Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Antimony, Sb	100.0 ± 0.8 µg/mL	Molybdenum, Mo	100.0 ± 0.6 µg/mL
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Density: 1.015 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
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$$w_i = (1/u_{\text{char } i}^2) / (\sum(1/(u_{\text{char } i}^2)))$$

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

k = coverage factor = 2

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

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- 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 ($\mu\text{g/mL}$)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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HF Note: This standard should not be prepared or stored in glass.

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- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 08, 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

- **March 08, 2025**

- The date after which this CRM/RM should not be used.

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11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

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12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Spike LOG

Standard ID: ME211117A INTERNAL STANDARD
 Standard Name Internal Standards 2 mg/L
 Date Prepared 11/17/2021
 Date Expires: 1/4/2022
 Department ME
 Vendor:
 Lot Number:
 Balance ID:
 Comments:

Type: Solution
 BY: Stacy R. Hendricks
 Status: Expired

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Hydrochloric Acid, 36.5-38.0% 000028182	13910	10	mL	3/29/2026
Nitric Acid, 69.0-70.0%,0000282671	14178	20	mL	4/11/2026

Final Volume:
1000 mL

Stock Source

ME210105AU Au Secondary Stock
 ME210420 Ge Sec Ge Secondary Standard
 ME210208 Sc Sec Sc Secondary Stock
 ME210208 Bi Seco Bismuth Secondary Stock
 ME210208 In Seco In Secondary Stock
 ME210212-TB TB Terbium primary source
 ME210212-HO HO Holmium primary source
 ME210212-LU LU Lutetium primary source

Base Units

ug/mL
 ug/mL
 ug/mL
 ug/mL
 ug/mL
 ug/mL
 ug/mL
 ug/mL

Amount Added

0.2 mL
 2 mL
 2 mL
 2 mL
 2 mL
 2 mL
 2 mL
 2 mL

Analytes

CAS

Conc: ug/mL

Energy Laboratories Inc

Standard LOG

Standard ID: ME210105AU
Standard Name: Au Secondary Stock
Date Prepared: 1/4/2021
Date Expires: 1/4/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: R2-AU695955
Balance ID:
Comments: Opened 1/4/2021; Expires 1/4/2021

Type: Secondary
BY: Ron Hunt
Status: Empty/Disposed

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Gold Single Analyte Custom Grade Soluti	13396	500	mL	1/4/2021

Final Volume:
500 mL

Stock Source

Base Units

Amount Added

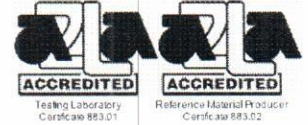
Analytes

CAS

Conc: **ug/mL**

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
 Catalog Number: CGAU1
 Lot Number: R2-AU695955
 Matrix: 10% (v/v) HCl
 Value / Analyte(s): 1 000 µg/mL ea:
 Gold
 Starting Material: H[AuCl₄]
 Starting Material Lot#: 2340
 Starting Material Purity: 99.9983%

ID #: 13396
 Opened: _____
 Gold Single Analyte Custom Grade Solution
Expires: 9/1/2024
 Rec'd: 1/4/2021
 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1001 ± 5 µg/mL
Density: 1.022 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1 **1002 ± 4 µg/mL**
 ICP Assay NIST SRM 3121 Lot Number: 991806

Assay Method #2 **1001 ± 5 µg/mL**
 Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$$X_{CRM/RM} = \sum(w_j) (X_j)$$

X_j = mean of Assay Method i with standard uncertainty $u_{char i}$
 w_i = the weighting factors for each method calculated using the inverse square of the variance:
 $w_i = (1/u_{char i})^2 / (\sum(1/(u_{char i})^2))$

$$CRM/RM \text{ Expanded Uncertainty } (\pm) = U_{CRM/RM} = k (u_{char}^2 + u_{bb}^2 + u_{Its}^2 + u_{ts}^2)^{1/2}$$

k = coverage factor = 2

$u_{char} = \{\sum((w_i)^2 (u_{char i})^2)\}^{1/2}$ where $u_{char i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{Its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$$X_{CRM/RM} = (X_a) (u_{char a})$$

X_a = mean of Assay Method A with

$u_{char a}$ = the standard uncertainty of characterization Method A

$$CRM/RM \text{ Expanded Uncertainty } (\pm) = U_{CRM/RM} = k (u_{char a}^2 + u_{bb}^2 + u_{Its}^2 + u_{ts}^2)^{1/2}$$

k = coverage factor = 2

$u_{char a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{Its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M Ag	0.029000	M Eu	<	0.000210	O Na	0.003300	M Se	<	0.014000	M Zn	0.000370	
M Al	<	0.001900	M Fe	0.002100	M Nb	<	0.000110	O Si	0.003300	M Zr	<	0.001700
M As	<	0.005700	M Ga	<	0.001100	M Nd	<	0.000110	M Sm	<	0.000110	
s Au	<		M Gd	<	0.000110	M Ni	<	0.002500	M Sn	<	0.001600	
M B	<	0.005000	M Ge	<	0.004300	M Os	<	0.000110	M Sr	<	0.000810	
M Ba	<	0.001300	M Hf	<	0.000310	O P	<	0.052000	M Ta	<	0.000110	
M Be	<	0.000610	M Hg	<	0.001200	M Pb	<	0.001900	M Tb	<	0.000110	
M Bi	<	0.002700	M Ho	<	0.000110	M Pd	0.003600	M Te	<	0.002600		
O Ca	0.001400	M In		0.000071	M Pr	<	0.000110	M Th	<	0.004100		
M Cd	<	0.000410	M Ir	<	0.000210	M Pt	0.008800	M Ti	<	0.003100		
M Ce	<	0.000210	O K	<	0.011000	M Rb	<	0.001500	M Tl	<	0.000110	
M Co	<	0.000210	M La	<	0.000110	M Re	<	0.000110	M Tm	<	0.000110	
O Cr	<	0.005200	O Li		0.000063	M Rh	<	0.001500	M U	<	0.000110	
M Cs	<	0.000810	M Lu	<	0.000110	M Ru	<	0.001700	O V	<	0.002700	
O Cu	0.001000	O Mg		0.000230	O S	<	0.052000	M W	<	0.003900		
M Dy	<	0.000110	O Mn	<	0.002100	M Sb	0.003200	M Y	<	0.000110		
M Er	<	0.000110	M Mo	<	0.001400	O Sc	<	0.001400	M Yb	<	0.000110	

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 - 196.97 +3 6 Au(Cl)63

Chemical Compatibility - Stable in HCl, and HNO₃, as the chloride complex. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels. 2-10 ppb Au is stable for #1 day maximum in 1% HNO₃ / LDPE container. 100 ppb is stable for #2 days maximum in 1% HNO₃ / LDPE container. 1-10,000 ppm solutions chemically stable for years in 10% HCl / LDPE container.

Au Containing Samples (Preparation and Solution) - Metal (Aqua Regia); Oxides (Soluble in HCl); Ores (Dissolve in HCl / HNO₃).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 197 amu	5 ppt	N/A	181Ta16O
ICP-OES 208.209 nm	0.04/0.01 µg/mL	1	Ir, Re
ICP-OES 242.795 nm	0.02/0.003 µg/mL	1	Mn, Os, Th, Ta, Pt, Co, F
ICP-OES 267.595 nm	0.03/0.003 µg/mL	1	Nb, Ta, U, Cr, Th, Rh, Ru

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 01, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/WM 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/WM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **September 01, 2024**

- The date after which this CRM/WM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/WM can be supported by long term stability studies conducted on properly stored and handled CRM/WMs. 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/WM 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/WM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Standard LOG

Standard ID: ME210420 GE SECONDARY STOCK
Standard Name: Ge Secondary Standard
Date Prepared: 4/20/2021
Date Expires: 4/20/2022
Department: ME
Vendor: SCP Science
Lot Number: S201204009
Balance ID:
Comments: Opened 4/20/2021; Expires 4/20/2022

Type: Primary
BY: Stacy R. Hendricks
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
ICP/ICPMS Standard Germanium	13639	125	mL	4/20/2022

Final Volume:
125 mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

Ge

1.0 DESCRIPTION: *PlasmaCAL ICP/ICPMS Standard - Germanium 1000 µg/ml*
 Catalogue Number: 140-050-320/-321/-325
 Starting Material: Ammonium Hexafluorogermanate(IV) 99.99+%
 Lot Number: **S201204009**
 Matrix: H₂O / tr. F⁻
 Expiration Date (End of month): **December 2022** (or 15 months after bottle is opened, whichever comes first)

2.0 CERTIFIED VALUES AND ASSOCIATED UNCERTAINTY:

Certified Concentration: **1002 µg/ml +/- 3 µg/ml**
1002 µg/g +/- 3 µg/g
 Method of analysis: Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES)
 Traceability: NIST Standard Reference Material 3120a Lot: **151115**

Note: The uncertainty of the certified value has been calculated from applicable uncertainty contributors (u_i) including uncertainty established during characterization of the material (u_{char}), the between bottle variation (u_{bb}), short-term stability (u_{sts}) and long-term stability (u_{lts}) according to the model $u_c = \sqrt{(u_{char}^2 + u_{bb}^2 + u_{sts}^2 + u_{lts}^2)}$. This combined uncertainty has been further multiplied by coverage factor (k) of 2 to provide a 95% confidence interval.

ID #: 13639

Opened: _____
 ICP/ICPMS Standard Germanium
Expires: 12/31/2022
 Rec'd: 3/16/2021
 Enerx Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

3.0 REFERENCE VALUES:

Density: **1.000 g/ml @ 22.7 °C**

Trace Metal Impurities as tested by ICP-MS:

Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)
Ag	<0.0010	Fe	<0.0018	Nd	<0.0010	Sn	<0.0010
Al	<0.0010	Ga	<0.0010	Ni	<0.0010	Sr	<0.0025
As	0.0097	Gd	<0.0010	Os	<0.0010	Ta	<0.0010
Au	<0.0010	Ge	N/A	P	<0.0026	Tb	<0.0010
B	<0.0015	Hf	<0.0010	Pb	<0.0010	Te	<0.0010
Ba	<0.0010	Hg	*	Pd	<0.0010	Th	<0.0010
Be	<0.0010	Ho	<0.0010	Pr	<0.0010	Ti	<0.0012
Bi	<0.0010	In	<0.0010	Pt	<0.0010	Tl	<0.0011
Ca	<0.0135	Ir	<0.0010	Rb	<0.0010	Tm	<0.0010
Cd	<0.0010	K	<0.0024	Re	<0.0010	U	<0.0010
Ce	<0.0010	La	<0.0010	Rh	<0.0010	V	<0.0010
Co	<0.0010	Li	<0.0010	Ru	<0.0010	W	<0.0020
Cr	<0.0010	Lu	<0.0010	S	*	Y	<0.0010
Cs	<0.0010	Mg	<0.0010	Sb	<0.0010	Yb	<0.0010
Cu	<0.0010	Mn	<0.0010	Sc	<0.0010	Zn	<0.0010
Dy	<0.0010	Mo	<0.0010	Se	<0.0010	Zr	<0.0010
Er	<0.0010	Na	<0.0025	Si	*		
Eu	<0.0010	Nb	<0.0010	Sm	<0.0010		

*: Not tested

4.0 APPROVAL AND DATE OF CERTIFICATION:

Certification Approval: Daniel Boisvert, Chemist
 Certification Date: December 16, 2020

Daniel Boisvert

5.0 INTENDED USE / UTILISATION PRÉVUE:

- ICP Standards: For the calibration of, including but not limited to: ICP-AES, ICP-MS, FAAS, GFAA, XRF and DCP. / *Étalons ICP : Pour l'étalonnage d'instruments de mesure tels que: ICP-AES, ICP-MS, FAAS, GFAA, XRF et DCP.*
 - AA Standards: For the calibration of Flame (FAAS) and Graphite Furnace (GFAA) Atomic Absorption Spectrometers. / *Étalons AA : Pour l'étalonnage de spectromètres d'absorption atomique flamme (FAAS) et four au graphite (GFAA).*
 - Matrix Modifiers: For the optimization of analytical conditions to provide better Graphite Furnace Atomic Absorption (GFAA) instrument response and improved detection limits. / *Modificateur de matrice : Pour l'optimisation des conditions analytiques afin de fournir des meilleures réponses instrumentales et limites de détection pour SAA four au graphite.*
 - pH Standards: For the calibrating pH meters or for other wet chemistry applications. / *Étalons pH : Pour étalonnage de pH mètres et autres applications de chimie humide.*
 - Conductivity Standards: For electrolytic conductivity measurement as a calibration standard. / *Étalons de conductivité : Comme étalon pour les mesures de conductivité électrolytiques.*
 - IC Standards: for calibration of, but not limited to IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS or other wet chemistry applications. / *Étalons IC : Pour étalonnage d'instruments tels que : IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS et autres applications de chimie humide.*
- For any inquiries, please contact **SCP SCIENCE**. / *Pour toute question, veuillez contacter SCP SCIENCE.*

6.0 INSTRUCTIONS FOR USE / INSTRUCTIONS D'UTILISATION:

Handling and Storage / Manutention et entreposage: Keep product tightly capped when not in use. The solution should be opened for a minimum amount of time necessary to dispense the amount required. Do not pipet or use directly from container. Do not return unused portions back to container. Store under normal laboratory conditions. Avoid exposure to excessive sources of heat and humidity or direct sunlight. / *Garder les contenants bien fermés lorsque non utilisés. Le contenant devrait être ouvert seulement pour le temps requis afin de prélever la quantité nécessaire. Ne pas pipetter ou utiliser directement du contenant. Ne pas retourner les portions non-utilisées dans le contenant. Conserver dans des conditions normales de laboratoire. Éviter l'exposition à des sources de chaleur et d'humidité excessives ou à l'exposition solaire directe.*

Stability / Stabilité: This Standard is guaranteed to be stable and accurate to within the specified uncertainty of measurement up to the unopened expiry date, if sealed, or up to the opened expiry date (when indicated), whichever comes first, provided the solution is kept tightly capped and stored under the indicated storage conditions. Purchasers will be notified of any significant changes resulting in re-certification or withdrawal of the product prior to the expiration date. / *La stabilité et l'exactitude de cet étalon sont garanties d'être à l'intérieur de l'incertitude de mesure, jusqu'à la date d'expiration de la bouteille non-ouverte, si scellée, ou jusqu'à la date d'expiration de la bouteille ouverte (si indiquée), en présumant que le contenant est maintenu fermé et gardé dans les conditions d'entreposage indiquées. Les acheteurs seront avisés dans le cas où il y aura des changements significatifs nécessitant une re-certification ou un rappel du produit avant la date d'expiration.*

7.0 HAZARDOUS INFORMATION / INFORMATION SUR LES RISQUES POTENTIELS:

Please refer to the associated Safety Data Sheet (SDS) for information regarding this product (available at www.SCPSCIENCE.com). / *SVP vous référer à la Fiche Signalétique applicable pour de l'information sur ce produit (Disponible à www.SCPSCIENCE.com).*

8.0 HOMOGENEITY / HOMOGÉNÉITÉ:

This solution has been blended according to an in-house procedure and its homogeneity is guaranteed to be fit for purpose when a sample size sufficient for the intended method of analysis is used. / *Cette solution a été préparée selon une procédure maison et nous assurons que sa homogénéité est appropriée à l'emploi lorsqu'un échantillon suffisant pour la méthode d'analyse prévue est utilisé.*

9.0 TRACEABILITY / TRAÇABILITÉ:

This CRM (Certified Reference Material) is traceable to the NIST SRM (Standard Reference Material) indicated in section 2 through an unbroken chain of comparisons. In addition, balances used are regularly calibrated using weights which are traceable to NIST (National Institute of Standards and Technology) or NRC (National Research Council of Canada) standards. All conductivity meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable thermometer and standards. All pH meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable thermometer and pH/MV simulator. / *Ce matériel de référence certifié est traçable au Matériel de Référence Standardisé de NIST indiqué à la section 2 par une chaîne de comparaison ininterrompue. De plus, les balances utilisées sont étalonnées régulièrement en utilisant des poids qui sont traçables au NIST (National Institute of Standards and Technology) ou au CRNC (Conseil National de Recherches Canada). Tout conductimètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et étalons traçables au NIST ou CNRC. Tout pH mètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et un simulateur pH/MV traçables au NIST ou au CNRC.*

10.0 PREPARATION / PRÉPARATION:

For the preparation of these solutions, 18 megohm/cm double deionized water, high-purity acids and glassware calibrated to ASTM Class A specifications are used. / *Une eau de 18 megohm/cm doublement déionisé, de l'acide de haute pureté, ainsi que de la verrerie étalonnée afin de satisfaire les spécifications Classe A de ASTM ont été utilisés pour la préparation de cet étalon.*

11.0 QUALITY SYSTEM CERTIFICATIONS / CERTIFICATIONS DE SYSTÈME QUALITÉ:

ISO 9001 Certification / Certification ISO 9001: This standard was produced in a facility which operates under a registered ISO 9001 Quality Management System. Please consult our web site for a copy of the most recent revision of our certificate of registration. / *Cet étalon a été fabriqué dans un laboratoire qui utilise un Système de Gestion de la Qualité enregistré à la norme ISO 9001. Veuillez consulter notre site web pour obtenir la version la plus récente de notre certificat d'enregistrement.*

ISO 17025 Accreditation / Accréditation ISO 17025: SCP SCIENCE (Corporate Headquarters) operates an ISO 17025 accredited laboratory. Please consult our web site for a copy of the most recent revision of our certificate and scope of accreditation. / *SCP SCIENCE (Siège social) est accréditée ISO 17025. Veuillez consulter notre site web afin d'obtenir la plus récente version de notre certificat d'accréditation ainsi que la portée de notre accréditation.*

ISO 17034 Accreditation / Accréditation ISO 17034 : SCP SCIENCE (Corporate Headquarters) is an ISO 17034 accredited Reference Material Producer. Please consult our website for a copy of our most recent certificate and scope of accreditation. / *SCP SCIENCE (Siège social) est un Fabricant de Matériaux de Référence Accrédité ISO 17034. Veuillez consulter notre site web afin d'obtenir la plus récente version de notre certificat d'accréditation ainsi que la portée de notre accréditation.*

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H9X 4B6 Canada
Phone: +1 (800) 361-6820
Fax: +1 (800) 253-5549

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3rd Party Distribution Center
348 Route 11, Champlain,
N.Y. 12919-4816
Phone: +1 (800) 361-6820
Fax: +1 (800) 253-5549

FRANCE
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SILIC 642, 91965
Villebon sur Yvette, France
Phone: +33 (0) 1 69 18 71 17
Fax: +33 (0) 1 60 92 05 67

GERMANY
Alte Marktobderdorfer Straße 14, 87616
Marktobderdorf
Phone: +49 (0) 8342-89560-61
Fax: +49 (0) 8342-89560-69

Energy Laboratories Inc

Spike LOG

Standard ID: ME210208 SC SECOND STOCK
Standard Name: Sc Secondary Stock
Date Prepared: 2/8/2021
Date Expires: 2/8/2022
Department: ME
Vendor: SCP Science
Lot Number: S200813011
Balance ID:
Comments: Opened 2/08/2021; Expires 2/08/2022

Type: Primary
BY: Parker A. Pearsall
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
PlasmaCal Standard Scandium	13520	125	mL	8/31/2022

Final Volume:
125 mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

Sc

1.0 DESCRIPTION: **PlasmaCAL ICP/ICPMS Standard - Scandium 1000 µg/ml**
 Catalogue Number: 140-051-210/-211/-215
 Starting Material: Scandium(III) Oxide 99.99+%
 Lot Number: **S200813011**
 Matrix: 4% HNO₃ (See Section 3 for actual matrix)
 Expiration Date (End of month): **August 2022** (or 15 months after bottle is opened, whichever comes first)

2.0 CERTIFIED VALUES AND ASSOCIATED UNCERTAINTY:
 Certified Concentration: **999 µg/ml +/- 5 µg/ml**
978 µg/g +/- 5 µg/g
 Method of analysis: Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES)
 Traceability: NIST Standard Reference Material 3148a Lot: **100701**

Note: The uncertainty of the certified value has been calculated from applicable uncertainty contributors (u_i) including uncertainty established during characterization of the material (u_{char}), the between bottle variation (u_{bb}), short-term stability (u_{sts}) and long-term stability (u_{lts}) according to the model $u_c = \sqrt{(u_{char}^2 + u_{bb}^2 + u_{sts}^2 + u_{lts}^2)}$. This combined uncertainty has been further multiplied by a coverage factor (k) of 2 to provide a 95% confidence interval.

3.0 REFERENCE VALUES:
 Density: **1.022 g/ml @ 22.5 °C**
 Actual Matrix: **4.0% (v/v) HNO₃**

ID #: 13520
 Opened: _____
 PlasmaCal Standard Scandium
Expires: 8/31/2022
 Rec'd: 1/26/2021
 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

Trace Metal Impurities as tested by ICP-AES:

Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)
Ag	<0.0244	Fe	<0.0102	Nd	<0.0319	Sn	<0.1535
Al	<0.0280	Ga	<0.0260	Ni	<0.0139	Sr	<0.0004
As	<0.0105	Gd	<0.0137	Os	*	Ta	<0.0635
Au	<0.0085	Ge	<0.0548	P	<0.0104	Tb	<0.0146
B	<0.0507	Hf	<0.0339	Pb	<0.0492	Te	<0.4025
Ba	<0.0005	Hg	*	Pd	<0.0282	Th	<0.0471
Be	<0.0022	Ho	<0.0065	Pr	<0.1370	Ti	<0.0013
Bi	<0.0156	In	<0.0105	Pt	<0.2665	Tl	<0.5600
Ca	0.0742	Ir	<0.0243	Rb	*	Tm	<0.0105
Cd	<0.0048	K	<0.0128	Re	<0.0076	U	<0.2490
Ce	<0.0393	La	<0.0173	Rh	<0.0163	V	<0.0049
Co	<0.0224	Li	<0.0028	Ru	<0.0304	W	<0.0443
Cr	<0.0063	Lu	<0.0021	S	<0.0515	Y	<0.0033
Cs	*	Mg	<0.0009	Sb	<0.0197	Yb	<0.0057
Cu	<0.0200	Mn	<0.0089	Sc	N/A	Zn	<0.0045
Dy	<0.0214	Mo	<0.0229	Se	<0.1245	Zr	0.1015
Er	<0.0349	Na	<0.0191	Si	<0.0091		
Eu	<0.0017	Nb	<0.0112	Sm	<0.1105		

*: Not tested

4.0 APPROVAL AND DATE OF CERTIFICATION:
 Certification Approval: Daniel Boisvert, Chemist
 Certification Date: August 20, 2020

Daniel Boisvert

5.0 INTENDED USE / UTILISATION PRÉVUE:

- ICP Standards: For the calibration of, including but not limited to: ICP-AES, ICP-MS, FAAS, GFAA, XRF and DCP. / *Étalons ICP : Pour l'étalonnage d'instruments de mesure tels que: ICP-AES, ICP-MS, FAAS, GFAA, XRF et DCP.*
 - AA Standards: For the calibration of Flame (FAAS) and Graphite Furnace (GFAA) Atomic Absorption Spectrometers. / *Étalons AA : Pour l'étalonnage de spectromètres d'absorption atomique flamme (GFAA) et four au graphite (GFAA).*
 - Matrix Modifiers: For the optimization of analytical conditions to provide better Graphite Furnace Atomic Absorption (GFAA) instrument response and improved detection limits. / *Modificateur de matrice : Pour l'optimisation des conditions analytiques afin de fournir des meilleures réponses instrumentales et limites de détection pour SAA four au graphite.*
 - pH Standards: For the calibrating pH meters or for other wet chemistry applications. / *Étalons pH : Pour étalonnage de pH mètres et autres applications de chimie humide.*
 - Conductivity Standards: For electrolytic conductivity measurement as a calibration standard. / *Étalons de conductivité : Comme étalon pour les mesures de conductivité électrolytiques.*
 - IC Standards: for calibration of, but not limited to IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS or other wet chemistry applications. / *Étalons IC : Pour étalonnage d'instruments tels que : IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS et autres applications de chimie humide.*
- For any inquiries, please contact **SCP SCIENCE**. / *Pour toute question, veuillez contacter SCP SCIENCE.*

6.0 INSTRUCTIONS FOR USE / INSTRUCTIONS D'UTILISATION:

Handling and Storage / Manutention et entreposage: Keep product tightly capped when not in use. The solution should be opened for a minimum amount of time necessary to dispense the amount required. Do not pipet or use directly from container. Do not return unused portions back to container. Store under normal laboratory conditions. Avoid exposure to excessive sources of heat and humidity or direct sunlight. / *Garder les contenants bien fermés lorsque non utilisés. Le contenant devrait être ouvert seulement pour le temps requis afin de prélever la quantité nécessaire. Ne pas pipetter ou utiliser directement du contenant. Ne pas retourner les portions non-utilisées dans le contenant. Conserver dans des conditions normales de laboratoire. Éviter l'exposition à des sources de chaleur et d'humidité excessives ou à l'exposition solaire directe.*

Stability / Stabilité: This Standard is guaranteed to be stable and accurate to within the specified uncertainty of measurement up to the unopened expiry date, if sealed, or up to the opened expiry date (when indicated), whichever comes first, provided the solution is kept tightly capped and stored under the indicated storage conditions. Purchasers will be notified of any significant changes resulting in re-certification or withdrawal of the product prior to the expiration date. / *La stabilité et l'exactitude de cet étalon sont garanties d'être à l'intérieur de l'incertitude de mesure, jusqu'à la date d'expiration de la bouteille non-ouverte, si scellée, ou jusqu'à la date d'expiration de la bouteille ouverte (si indiquée), en présupmant que le contenant est maintenu fermé et gardé dans les conditions d'entreposage indiquées. Les acheteurs seront avisés dans le cas où il y aura des changements significatifs nécessitant une re-certification ou un rappel du produit avant la date d'expiration.*

7.0 HAZARDOUS INFORMATION / INFORMATION SUR LES RISQUES POTENTIELS:

Please refer to the associated Safety Data Sheet (SDS) for information regarding this product (available at www.SCPSCIENCE.com). / *SVP vous référer à la Fiche Signalétique applicable pour de l'information sur ce produit (Disponible à www.SCPSCIENCE.com).*

8.0 HOMOGENEITY / HOMOGÉNÉITÉ:

This solution has been blended according to an in-house procedure and its homogeneity is guaranteed to be fit for purpose when a sample size sufficient for the intended method of analysis is used. / *Cette solution a été préparée selon une procédure maison et nous assurons que sa homogénéité est approprié à l'emploi lorsqu'un échantillon suffisant pour la méthode d'analyse prévue est utilisé.*

9.0 TRACEABILITY / TRAÇABILITÉ:

This CRM (Certified Reference Material) is traceable to the NIST SRM (Standard Reference Material) indicated in section 2 through an unbroken chain of comparisons. In addition, balances used are regularly calibrated using weights which are traceable to NIST (National Institute of Standards and Technology) or NRC (National Research Council of Canada) standards. All conductivity meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable Thermometer and standards. All pH meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable thermometer and pH/MV simulator. / *Ce matériel de référence certifié est traçable au Matériel de Référence Standardisé de NIST indiqué à la section 2 par une chaîne de comparaison ininterrompue. De plus, les balances utilisées sont étalonnées régulièrement en utilisant des poids qui sont traçables au NIST (National Institute of Standards and Technology) ou au CRNC (Conseil National de Recherches Canada). Tout conductimètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et étalons traçables au NIST ou CNRC. Tout pH mètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et un simulateur pH/MV traçables au NIST ou au CNRC.*

10.0 PREPARATION / PRÉPARATION:

For the preparation of these solutions, 18 megohm/cm double deionized water, high-purity acids and glassware calibrated to ASTM Class A specifications are used. / *Une eau de 18 megohm/cm doublement déionisée, de l'acide de haute pureté, ainsi que de la verrerie étalonnée afin de satisfaire les spécifications Classe A de ASTM ont été utilisés pour la préparation de cet étalon.*

11.0 QUALITY SYSTEM CERTIFICATIONS / CERTIFICATIONS DE SYSTÈME QUALITÉ:

ISO 9001 Certification / Certification ISO 9001: This standard was produced in a facility which operates under a registered ISO 9001 Quality Management System. Please consult our web site for a copy of the most recent revision of our certificate of registration. / *Cet étalon a été fabriqué dans un laboratoire qui utilise un Système de Gestion de la Qualité enregistré à la norme ISO 9001. Veuillez consulter notre site web pour obtenir la version la plus récente de notre certificat d'enregistrement.*

ISO 17025 Accreditation / Accréditation ISO 17025: SCP SCIENCE (Corporate Headquarters) operates an ISO 17025 accredited laboratory. Please consult our web site for a copy of the most recent revision of our certificate and scope of accreditation. / *SCP SCIENCE (Siège social) est accréditée ISO 17025. Veuillez consulter notre site web afin d'obtenir la plus récente version de notre certificat d'accréditation ainsi que la portée de notre accréditation.*

ISO 17034 Accreditation / Accréditation ISO 17034: SCP SCIENCE (Corporate Headquarters) is an ISO 17034 accredited Reference Material Producer. Please consult our website for a copy of our most recent certificate and scope of accreditation. / *SCP SCIENCE (Siège social) est un Fabricant de Matériaux de Référence Accrédité ISO 17034. Veuillez consulter notre site web afin d'obtenir la plus récente version de notre certificat d'accréditation ainsi que la portée de notre accréditation.*

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Fax: +1 (800) 253-5549

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Fax: +49 (0) 8342-89560-69

Energy Laboratories Inc

Spike LOG

Standard ID: ME210208 BI SECONDARY STOCK
Standard Name: Bismuth Secondary Stock
Date Prepared: 2/8/2021
Date Expires: 2/8/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: P2-BI687736
Balance ID:
Comments: Opened 02/08/2021; Expires 02/08/2022

Type: Primary
BY: Parker A. Pearsall
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Bismuth Single Analyte Custom Grade Sol	13448	125	mL	1/11/2024

Final Volume:
125 mL

Stock Source

Base Units

Amount Added

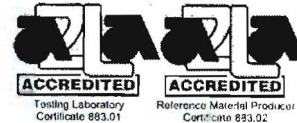
Analytes

CAS

Conc: **ug/mL**

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
 Catalog Number: CGBI1
 Lot Number: P2-BI687736
 Matrix: 5% (v/v) HNO3
 Value / Analyte(s): 1 000 µg/mL ea:
 Bismuth
 Starting Material: Bi METAL
 Starting Material Lot#: 1874
 Starting Material Purity: 99.9997%

ID #: 13448
 Opened: _____
 Bismuth Single Analyte Custom Grade Solution
Expires: 1/11/2024
 Rec'd: 1/7/2021
 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1002 ± 6 µg/mL
Density: 1.026 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1 **1002 ± 4 µg/mL**
 ICP Assay NIST SRM 3106 Lot Number: 180815

Assay Method #2 **1001 ± 6 µg/mL**
 Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$$X_{CRM/RM} = \sum(w_i)(X_i)$$

X_i = mean of Assay Method i with standard uncertainty $u_{char i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$$w_i = (1/u_{char i}^2) / (\sum(1/u_{char i}^2))$$

$$CRM/RM \text{ Expanded Uncertainty } (\pm) = U_{CRM/RM} = k (u_{char}^2 + u_{bb}^2 + u_{Its}^2 + u_{ts}^2)^{1/2}$$

k = coverage factor = 2

$u_{char} = [\sum(w_i)^2 (u_{char i}^2)]^{1/2}$ where $u_{char i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{Its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$$X_{CRM/RM} = (X_a) (u_{char a})$$

X_a = mean of Assay Method A with

$u_{char a}$ = the standard uncertainty of characterization Method A

$$CRM/RM \text{ Expanded Uncertainty } (\pm) = U_{CRM/RM} = k (u_{char a}^2 + u_{bb}^2 + u_{Its}^2 + u_{ts}^2)^{1/2}$$

k = coverage factor = 2

$u_{char a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{Its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

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	0.000158	M	Eu <	0.000430	O Na	0.000456	M	Se <	0.003000	M	Zn <	0.012000	
O Al <	0.014000	O	Fe	0.000096	M	Nb <	0.000430	O	Si	0.001852	M	Zr <	0.000860
M As <	0.000430	M	Ga <	0.000430	M	Nd <	0.000430	M	Sm <	0.000430			
M Au <	0.000430	M	Gd <	0.000430	M	Ni	0.000174	M	Sn <	0.003000			
O B	0.000349	M	Ge <	0.000860	M	Os <	0.200000	M	Sr <	0.000430			
M Ba <	0.000430	M	Hf <	0.000430	O	P <	0.059000	M	Ta <	0.000860			
O Be <	0.001200	M	Hg <	0.000860	O	Pb <	0.024000	M	Tb <	0.000430			
s Bi <		M	Ho <	0.000430	M	Pd <	0.000430	M	Te <	0.016000			
O Ca	0.000349	M	In <	0.000430	M	Pr <	0.000430	M	Th <	0.000430			
M Cd <	0.000430	M	Ir <	0.000430	M	Pt <	0.000430	M	Ti <	0.001300			
M Ce <	0.000430	O	K	0.000295	M	Rb <	0.000430	M	Tl <	0.000430			
M Co <	0.000430	M	La <	0.000430	M	Re <	0.000430	M	Tm <	0.000430			
O Cr <	0.002000	O	Li <	0.000120	M	Rh <	0.000430	M	U <	0.000430			
M Cs <	0.005200	M	Lu <	0.000430	M	Ru <	0.007700	M	V <	0.001800			
M Cu <	0.002600	O	Mg	0.000029	O	S <	0.059000	M	W <	0.000860			
M Dy <	0.000430	M	Mn <	0.000860	M	Sb <	0.014000	M	Y <	0.000430			
M Er <	0.000430	M	Mo <	0.000860	O	Sc <	0.000590	M	Yb <	0.000430			

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 - 208.98 +3 $6 \text{ Bi}(\text{O})(\text{H}_2\text{O})_{x+1}$

Chemical Compatibility - Stable in HCl, HNO₃, H₂SO₄ and HF. Avoid basic media forming insoluble hydroxide. Stable with most metals and inorganic anions in acidic media. Many salts that are insoluble in water are soluble in HCl, HNO₃ and HF. The major problem with Bi³⁺ is its tendency to hydrolyze at higher concentrations or in dilute acid. Nitric acid solutions should be 5% to hold the Bi in solution in the 100 to 10000 µg/mL concentration range.

Stability - 2-100 ppb levels stable for months in 1% HNO₃ / LDPE container. 1-10,000 ppm solutions chemically stable for years in 5 - 7% HNO₃ / LDPE container.

Bi Containing Samples (Preparation and Solution) - Metal (soluble in HNO₃); Oxides (Soluble in HNO₃); Alloys (Dissolve in conc. 4:1 HCl /HNO₃. Heating may be required.); Organic based (dry ash at 450EC and dissolve ash in HNO₃ or acid digestion with conc. hot sulfuric acid adding hydrogen peroxide dropwise and carefully until clear.)

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 209 amu	2 ppt	N/A	193Ir16O
ICP-OES 222.825 nm	0.1/0.02 µg/mL	1	Cr, Hf, Ce, Os
ICP-OES 223.061 nm	0.04/0.005 µg/mL	1	Th, Ir, Ti Cu
ICP-OES 306.772 nm	0.08/0.01 µg/mL	1	Th, U, Zr, Hf, Fe

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 11, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **January 11, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS


Certificate Approved By:

Michael Booth
Manager, Quality Control



Certifying Officer:

Paul Gaines
CEO, Senior Technical Director



Energy Laboratories Inc

Spike LOG

Standard ID: ME210208 IN SECONDARY STOCK
Standard Name: In Secondary Stock
Date Prepared: 2/8/2021
Date Expires: 2/8/2022
Department: ME
Vendor: SCP Science
Lot Number: S200212023
Balance ID:
Comments: Opened 02/08/2021; Expires 02/08/2022

Type: Primary
BY: Parker A. Pearsall
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Indium ICP ICPMS Standard	12886	125	mL	2/27/2022

Final Volume:
125 mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

In

1.0 DESCRIPTION: *PlasmaCAL ICP/ICPMS Standard - Indium 1000 µg/ml*
 Catalogue Number: 140-051-490/-491/-495
 Starting Material: In Metal 99.99+%
 Lot Number: **S200212023**
 Matrix: 4% HNO₃ (See Section 3 for actual matrix)
 Expiration Date (End of month): **February 2022** (or 15 months after bottle is opened, whichever comes first)

2.0 CERTIFIED VALUES AND ASSOCIATED UNCERTAINTY:
 Certified Concentration: **997 µg/ml +/- 4 µg/ml**
977 µg/g +/- 4 µg/g
 Method of analysis: Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES)
 Traceability: NIST Standard Reference Material 3124a Lot: **110516**

Note: The uncertainty of the certified value has been calculated from applicable uncertainty contributors (u_i) including uncertainty established during characterization of the material (u_{char}), the between bottle variation (u_{bb}), short-term stability (u_{sts}) and long-term stability (u_{lts}) according to the model $u_c = \sqrt{(u_{char}^2 + u_{bb}^2 + u_{sts}^2 + u_{lts}^2)}$. This combined uncertainty has been further multiplied by a coverage factor (k) of 2 to provide a 95% confidence interval.

3.0 REFERENCE VALUES:
 Density: **1.020 g/ml @ 22.6 °C**
 Actual Matrix: **4.0% (v/v) HNO₃**

ID #: 12886
 Opened: _____
 Indium ICP ICPMS Standard
Expires: 2/27/2022
 Rec'd: 7/27/2020
 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

Trace Metal Impurities as tested by ICP-MS:

Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)	Element	Conc. (ppm)
Ag	<0.0010	Fe	<0.0018	Nd	<0.0010	Sn	0.0079
Al	<0.0010	Ga	<0.0010	Ni	<0.0010	Sr	<0.0025
As	<0.0010	Gd	<0.0010	Os	<0.0010	Ta	<0.0010
Au	<0.0010	Ge	<0.0010	P	<0.0026	Tb	<0.0010
B	<0.0015	Hf	<0.0010	Pb	0.0013	Te	<0.0010
Ba	0.0063	Hg	<0.0010	Pd	<0.0010	Th	<0.0010
Be	<0.0010	Ho	<0.0010	Pr	<0.0010	Ti	<0.0012
Bi	<0.0010	In	N/A	Pt	<0.0010	Tl	<0.0011
Ca	0.0336	Ir	<0.0010	Rb	<0.0010	Tm	<0.0010
Cd	<0.0010	K	<0.0024	Re	<0.0010	U	<0.0010
Ce	<0.0010	La	<0.0010	Rh	<0.0010	V	<0.0010
Co	<0.0010	Li	<0.0010	Ru	<0.0010	W	<0.0020
Cr	<0.0010	Lu	<0.0010	S	<0.5000	Y	<0.0010
Cs	<0.0010	Mg	<0.0010	Sb	<0.0010	Yb	<0.0010
Cu	<0.0010	Mn	<0.0010	Sc	<0.0010	Zn	<0.0010
Dy	<0.0010	Mo	<0.0010	Se	<0.0010	Zr	<0.0010
Er	<0.0010	Na	0.0035	Si	<0.1000		
Eu	<0.0010	Nb	<0.0010	Sm	<0.0010		

*: Not tested

4.0 APPROVAL AND DATE OF CERTIFICATION:
 Certification Approval: Daniel Boisvert, Chemist
 Certification Date: February 19, 2020

Daniel Boisvert

5.0 INTENDED USE / UTILISATION PRÉVUE:

- ICP Standards: For the calibration of, including but not limited to: ICP-AES, ICP-MS, FAAS, GFAA, XRF and DCP. / *Étalons ICP : Pour l'étalonnage d'instruments de mesure tels que: ICP-AES, ICP-MS, FAAS, GFAA, XRF et DCP.*
 - AA Standards: For the calibration of Flame (FAAS) and Graphite Furnace (GFAA) Atomic Absorption Spectrometers. / *Étalons AA : Pour l'étalonnage de spectromètres d'absorption atomique flamme (GFAA) et four au graphite (GFAA).*
 - Matrix Modifiers: For the optimization of analytical conditions to provide better Graphite Furnace Atomic Absorption (GFAA) instrument response and improved detection limits. / *Modificateur de matrice : Pour l'optimisation des conditions analytiques afin de fournir des meilleures réponses instrumentales et limites de détection pour SAA four au graphite.*
 - pH Standards: For the calibrating pH meters or for other wet chemistry applications. / *Étalons pH : Pour étalonnage de pH mètres et autres applications de chimie humide.*
 - Conductivity Standards: For electrolytic conductivity measurement as a calibration standard. / *Étalons de conductivité : Comme étalon pour les mesures de conductivité électrolytiques.*
 - IC Standards: for calibration of, but not limited to IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS or other wet chemistry applications. / *Étalons IC : Pour étalonnage d'instruments tels que : IC, HPLC, TLC, ISE, IR, NMR, MS, UV/VIS et autres applications de chimie humide.*
- For any inquiries, please contact **SCP SCIENCE**. / *Pour toute question, veuillez contacter SCP SCIENCE.*

6.0 INSTRUCTIONS FOR USE / INSTRUCTIONS D'UTILISATION:

Handling and Storage / Manutention et entreposage: Keep product tightly capped when not in use. The solution should be opened for a minimum amount of time necessary to dispense the amount required. Do not pipet or use directly from container. Do not return unused portions back to container. Store under normal laboratory conditions. Avoid exposure to excessive sources of heat and humidity or direct sunlight. / *Garder les contenants bien fermés lorsqu'ils ne sont pas utilisés. Le contenant devrait être ouvert seulement pour le temps requis afin de prélever la quantité nécessaire. Ne pas pipetter ou utiliser directement du contenant. Ne pas retourner les portions non-utilisées dans le contenant. Conserver dans des conditions normales de laboratoire. Éviter l'exposition à des sources de chaleur et d'humidité excessives ou à l'exposition solaire directe.*

Stability / Stabilité: This Standard is guaranteed to be stable and accurate to within the specified uncertainty of measurement up to the unopened expiry date, if sealed, or up to the opened expiry date (when indicated), whichever comes first, provided the solution is kept tightly capped and stored under the indicated storage conditions. Purchasers will be notified of any significant changes resulting in re-certification or withdrawal of the product prior to the expiration date. / *La stabilité et l'exactitude de cet étalon sont garanties d'être à l'intérieur de l'incertitude de mesure, jusqu'à la date d'expiration de la bouteille non-ouverte, si scellée, ou jusqu'à la date d'expiration de la bouteille ouverte (si indiquée), en présumant que le contenant est maintenu fermé et gardé dans les conditions d'entreposage indiquées. Les acheteurs seront avisés dans le cas où il y aura des changements significatifs nécessitant une re-certification ou un rappel du produit avant la date d'expiration.*

7.0 HAZARDOUS INFORMATION / INFORMATION SUR LES RISQUES POTENTIELS:

Please refer to the associated Safety Data Sheet (SDS) for information regarding this product (available at www.SCPSCIENCE.com). / *SVP vous référer à la Fiche Signalétique applicable pour de l'information sur ce produit (Disponible à www.SCPSCIENCE.com).*

8.0 HOMOGENEITY / HOMOGÉNÉITÉ:

This solution has been blended according to an in-house procedure and its homogeneity is guaranteed to be fit for purpose when a sample size sufficient for the intended method of analysis is used. / *Cette solution a été préparée selon une procédure maison et nous assurons que sa homogénéité est appropriée à l'emploi lorsqu'un échantillon suffisant pour la méthode d'analyse prévue est utilisé.*

9.0 TRACEABILITY / TRAÇABILITÉ:

This CRM (Certified Reference Material) is traceable to the NIST SRM (Standard Reference Material) indicated in section 2 through an unbroken chain of comparisons. In addition, balances used are regularly calibrated using weights which are traceable to NIST (National Institute of Standards and Technology) or NRC (National Research Council of Canada) standards. All conductivity meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable thermometer and standards. All pH meters used to analyze this standard have been regularly calibrated using a NIST or NRC traceable thermometer and pH/MV simulator. / *Ce matériel de référence certifié est traçable au Matériel de Référence Standardisé de NIST indiqué à la section 2 par une chaîne de comparaison ininterrompue. De plus, les balances utilisées sont étalonnées régulièrement en utilisant des poids qui sont traçables au NIST (National Institute of Standards and Technology) ou au CRNC (Conseil National de Recherches Canada). Tout conductimètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et étalons traçables au NIST ou au CNRC. Tout pH mètre utilisé afin d'analyser cet étalon a été sujet à un étalonnage périodique utilisant des thermomètres et un simulateur pH/MV traçables au NIST ou au CNRC.*

10.0 PREPARATION / PRÉPARATION:

For the preparation of these solutions, 18 megohm/cm double deionized water, high-purity acids and glassware calibrated to ASTM Class A specifications are used. / *Une eau de 18 megohm/cm doublement déionisée, de l'acide de haute pureté, ainsi que de la verrerie étalonnée afin de satisfaire les spécifications Classe A de ASTM ont été utilisés pour la préparation de cet étalon.*

11.0 QUALITY SYSTEM CERTIFICATIONS / CERTIFICATIONS DE SYSTÈME QUALITÉ:

ISO 9001 Certification / Certification ISO 9001: This standard was produced in a facility which operates under a registered ISO 9001 Quality Management System. Please consult our web site for a copy of the most recent revision of our certificate of registration. / *Cet étalon a été fabriqué dans un laboratoire qui utilise un Système de Gestion de la Qualité enregistré à la norme ISO 9001. Veuillez consulter notre site web pour obtenir la version la plus récente de notre certificat d'enregistrement.*

ISO 17025 Accreditation / Accréditation ISO 17025: SCP SCIENCE (Corporate Headquarters) operates an ISO 17025 accredited laboratory. Please consult our web site for a copy of the most recent revision of our certificate and scope of accreditation. / *SCP SCIENCE (Siège social) est accréditée ISO 17025. Veuillez consulter notre site web afin d'obtenir la plus récente version de notre certificat d'accréditation ainsi que la portée de notre accréditation.*

ISO 17034 Accreditation / Accréditation ISO 17034: SCP SCIENCE (Corporate Headquarters) is an ISO 17034 accredited Reference Material Producer. Please consult our website for a copy of our most recent certificate and scope of accreditation. / *SCP SCIENCE (Siège social) est un Fabricant de Matériaux de Référence Accrédité ISO 17034. Veuillez consulter notre site web afin d'obtenir la plus récente version de notre certificat d'accréditation ainsi que la portée de notre accréditation.*

CORPORATE

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Marktberdorf
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Fax: +49 (0) 8342-69560-69

Energy Laboratories Inc

Spike LOG

Standard ID: ME210212-TB
Standard Name: TB Terbium primary source
Date Prepared: 2/12/2021
Date Expires: 2/12/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: R2-TB695079AA
Balance ID:
Comments: Opened 2/12/2021; Expires 2/12/2022

Type: Primary
BY: Alyssa A. Olson
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Terbium Single Analyte Atomic Absorption	13445	125	mL	2/12/2022

Final Volume:
125 mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Atomic Absorption Solution
Catalog Number: AATB1
Lot Number: R2-TB695079AA
Matrix: 5% (v/v) HNO₃
Value / Analyte(s): 1 000 µg/mL ea:
Terbium

ID #: 13445
Opened:
Terbium Single Analyte Atomic Absorption So
Expires: 8/19/2024
Rec'd: 1/7/2021
Enerav Laboratories Inc 1120 So. 27th Street
Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1000 ± 10 µg/mL
Density: 1.026 g/mL (measured at 20 ± 4 °C)

4.0 TRACEABILITY TO NIST

The concentration of this solution standard has been verified by Inductively Coupled Plasma Spectroscopy (ICP) and is traceable to NIST SRM 3157a.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL**7.1 Storage and Handling Recommendations**

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit www.inorganicventures.com/TCT

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 158.93 +3 6 to 9 or 10 for some compounds $Tb(OH)_x(H_2O)_y+3-x$

Chemical Compatibility -Soluble in HCl, H₂SO₄ and HNO₃. Avoid HF, H₃PO₄ and neutral to basic media. Stable with most metals and inorganic anions forming an insoluble carbonate, oxide, oxalate, and fluoride. Avoid mixing with elements / solutions containing moderate amounts of fluoride.

Stability - 2-100 ppb levels stable for months in 1% HNO₃ / LDPE container. 1-10,000 ppm solutions chemically stable for years in 2 - 5% HNO₃ / LDPE container.

Tb Containing Samples (Preparation and Solution) -Metal (Soluble in acids); Oxide (Dissolve by heating in H₂O/ HNO₃); Ores (Carbonate fusion in PtO followed by HCl dissolution); Organic Matrices (dry ash and dissolve in 1:1 H₂O / HCl or HNO₃).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 159 amu	1 ppt	N/A	
ICP-OES 350.917 nm	0.02 / 0.002 µg/mL	1	V, Th, Ce, Zr
ICP-OES 367.635 nm	0.06 / 0.006 µg/mL	1	Ta, Ce, Co, 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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

August 19, 2020

- The certification is valid within the measurement uncertainty specified provided the CRMWRM 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 CRMWRM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **August 19, 2024**

- The date after which this CRMWRM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRMWRM can be supported by long term stability studies conducted on properly stored and handled CRMWRMs. 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 CRMWRM 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 CRMWRM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Energy Laboratories Inc

Spike LOG

Standard ID: ME210212-HO
Standard Name: HO Holmium primary source
Date Prepared: 2/12/2021
Date Expires: 2/12/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: R2-HO691014
Balance ID:
Comments: Opened 2/12/2021; Expires 2/12/2022

Type: Primary
BY: Alyssa A. Olson
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Holmium Single Analyte Custom Grade S	13443	125	mL	2/12/2022

Final Volume:
mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Custom Grade Solution
 Catalog Number: CGHO1
 Lot Number: R2-HO691014
 Matrix: 5% (v/v) HNO3
 Value / Analyte(s): 1 000 µg/mL ea:
 Holmium
 Starting Material: Holmium Oxide
 Starting Material Lot#: 1890
 Starting Material Purity: 99.9947%

ID #: 13443
 Opened: _____
 Holmium Single Analyte Custom Grade Solution
Expires: 4/1/2024
 Rec'd: 1/7/2021
 Energy Laboratories Inc 1120 So. 27th Street
 Billings MT 59107

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 999 ± 3 µg/mL
Density: 1.026 g/mL (measured at 20 ± 4 °C)

Assay Information:

Assay Method #1	996 ± 6 µg/mL ICP Assay NIST SRM 3123a Lot Number: 090408
Assay Method #2	998 ± 3 µg/mL EDTA NIST SRM 928 Lot Number: 928
Assay Method #3	1000 ± 3 µg/mL Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$$X_{CRM/RM} = \sum(w_i)(X_i)$$

X_i = mean of Assay Method i with standard uncertainty $u_{char i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$$w_i = (1/u_{char i})^2 / (\sum(1/(u_{char i})^2))$$

$$CRM/RM \text{ Expanded Uncertainty } (\pm) = U_{CRM/RM} = k (u_{char}^2 + u_{bb}^2 + u_{lts}^2 + u_{ts}^2)^{1/2}$$

k = coverage factor = 2

$u_{char} = [\sum(w_i)^2 (u_{char i})^2]^{1/2}$ where $u_{char i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$$X_{CRM/RM} = (X_a) / (u_{char a})$$

X_a = mean of Assay Method A with

$u_{char a}$ = the standard uncertainty of characterization Method A

$$CRM/RM \text{ Expanded Uncertainty } (\pm) = U_{CRM/RM} = k (u_{char a}^2 + u_{bb}^2 + u_{lts}^2 + u_{ts}^2)^{1/2}$$

k = coverage factor = 2

$u_{char a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M Ag <	0.010000	M Eu	0.000377	M Na <	0.036000	M Se <	0.004400	M Zn <	0.071000
M Al <	0.020000	M Fe	0.002965	M Nb <	0.001200	i Si <		M Zr <	0.000400
M As <	0.011000	M Ga <	0.001600	M Nd	0.000183	M Sm	0.000700		
M Au <	0.006400	M Gd	0.000404	M Ni <	0.004800	M Sn <	0.002400		
M B <	0.091000	M Ge <	0.004000	M Os <	0.000400	M Sr <	0.002400		
M Ba <	0.002400	M Hf <	0.003200	i P <		i Ta <			
M Be <	0.003200	M Hg <	0.005600	M Pb <	0.057000	M Tb	0.000431		
M Bi <	0.005600	s Ho <		M Pd <	0.004400	M Te <	0.008000		
M Ca <	0.028000	M In <	0.001600	M Pr	0.000204	M Th <	0.001200		
M Cd <	0.000800	M Ir <	0.001600	M Pt <	0.000400	M Ti <	0.000800		
M Ce <	0.004800	O K	0.002965	M Rb <	0.002400	M Tl <	0.001600		
M Co <	0.001600	M La	0.000350	M Re <	0.000400	M Tm	0.000323		
M Cr <	0.005600	O Li <	0.001200	M Rh <	0.001600	M U <	0.000400		
M Cs	0.000485	M Lu	0.037737	M Ru <	0.000400	M V <	0.029000		
M Cu <	0.005600	O Mg <	0.003300	n S <		M W <	0.011000		
M Dy	0.009434	M Mn <	0.001200	M Sb <	0.002000	M Y	0.003504		
M Er	0.001671	M Mo <	0.011000	M Sc <	0.001200	M Yb	0.006199		

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 - 164.93 +3 6 to 9 or 10 for some compounds $\text{Ho}(\text{OH})_x(\text{H}_2\text{O})_{y+3-x}$

Chemical Compatibility - Soluble in HCl, H₂SO₄ and HNO₃. Avoid HF, H₃PO₄ and neutral to basic media. Stable with most metals and inorganic anions forming an insoluble carbonate, oxide, oxalate, and fluoride. Avoid mixing with elements / solutions containing moderate amounts of fluoride.

Stability - 2-100 ppb levels stable for months in 1% HNO₃ / LDPE container. 1-10,000 ppm solutions chemically stable for years in 2-5% HNO₃ / LDPE container.

Ho Containing Samples (Preparation and Solution) - Meta I (Soluble in acids); Oxide (Dissolved by heating in H₂O / HNO₃); Ores (Carbonate fusion in PtO followed by HCl dissolution); Organic Matrices (Dry ash and dissolve in 1:1 H₂O / HCl or HNO₃).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 165 amu	1 ppt	n/a	149 Sm 16O
ICP-OES 339.898 nm	0.02 / 0.002 µg/mL	1	Ce, Re
ICP-OES 345.600 nm	0.006 / 0.0001 µg/mL	1	U, Ti

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

April 01, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **April 01, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control



Certifying Officer:

Paul Gaines
CEO, Senior Technical Director



Energy Laboratories Inc

Spike LOG

Standard ID: ME210212-LU
Standard Name: LU Lutetium primary source
Date Prepared: 2/12/2021
Date Expires: 2/12/2022
Department: ME
Vendor: Inorganic Ventures
Lot Number: R2-LU689867RAA
Balance ID:
Comments: Opened 2/12/2021; Expires 2/12/2022

Type: Primary
BY: Alyssa A. Olson
Status: Open

Chemical / Solvent Used	BottleNo	Amt	Units	Expires
Lutetium Single Analyte Atomic Absorptio	13444	125	mL	3/1/2024

Final Volume:
125 mL

Stock Source

Base Units

Amount Added

Analytes

CAS

Conc: **ug/mL**

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Atomic Absorption Solution
Catalog Number: AALU1
Lot Number: R2-LU689867RAA
Matrix: 2% (v/v) HNO₃
Value / Analyte(s): 1 000 µg/mL ea:
Lutetium

ID #: 13444

Opened: _____

Lutetium Single Analyte Custom Grade Solution

Expires: 3/1/2024

Rec'd: 1/7/2021

Energy Laboratories Inc 1120 So. 27th Street
Billings MT 59107**3.0 CERTIFIED VALUES AND UNCERTAINTIES**

Certified Value: 1000 ± 10 µg/mL
Density: 1.011 g/mL (measured at 20 ± 4 °C)

4.0 TRACEABILITY TO NIST

The concentration of this solution standard has been verified by Inductively Coupled Plasma Spectroscopy (ICP) and is traceable to NIST SRM 3130a.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL**7.1 Storage and Handling Recommendations**

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit www.inorganicventures.com/TCT

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 174.97 +3 6 to 9 or 10 for some compounds $\text{Lu}(\text{OH})_x(\text{H}_2\text{O})_{y+3-x}$

Chemical Compatibility -Soluble in HCl, H₂SO₄ and HNO₃. Avoid HF, H₃PO₄ and neutral to basic media. Stable with most metals and inorganic anions forming an insoluble carbonate, oxide, oxalate, and fluoride. Avoid mixing with elements / solutions containing moderate amounts of fluoride.

Stability - 2-100 ppb levels stable for months in 1% HNO₃ / LDPE container. 1-10,000 ppm solutions chemically stable for years in 2-5% HNO₃ / LDPE container.

Lu Containing Samples (Preparation and Solution) -Metal (Soluble in acids); Oxide (Dissolved by heating in H₂O/ HNO₃); Ores (Carbonate fusion in Pt0 followed by HCl dissolution); Organic Matrices (Dry ash and dissolve in 1:1 H₂O / HCl or HNO₃).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 175 amu	1 ppt	n/a	159 Tb16O
ICP-OES 261.542 nm	0.001 / 0.0003 µg/mL	1	Th, Mo, V, W
ICP-OES 291.139 nm	0.006 / 0.0006 µg/mL	1	Cr, 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

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 01, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **March 01, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control



Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

