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Final Report
Activation Laboratories

Report Number: A21-20098

Report Date: 21/12/2021

Analyte Symbol	SiO2	Al2O3	Fe2O3(T)	MnO	MgO
Unit Symbol	%	%	%	%	%
Detection Limit	0.01	0.01	0.01	0.001	0.01
Analysis Method	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP
AA 202	38.83	13.17	7.07	0.126	5.27
AA 993	40.43	13.3	7.36	0.131	5.4
AA 994	38.78	12.77	7.46	0.13	5.46
AA 961	40.06	13.83	7.6	0.13	5.41
AA 1454	37.02	12.31	6.82	0.12	5.44
AA 1460	38.53	12.93	7.28	0.129	5.16
AA 1461	34.29	13.03	5.86	0.121	4.07
AA 1470	37.83	12.44	7.24	0.127	5.5
AA 1472	39.09	13.03	7.48	0.13	5.6
AA 1494	37.91	13.52	7.15	0.13	4.89
AA 1495	40.11	13	7.37	0.134	5.45
AA 1623	38.43	12.95	7.41	0.131	5.9
AA 2160	39.9	13.31	7.27	0.127	5.83
AA 3531	38.11	13.43	6.91	0.128	4.94
ALT-B	39.67	13.37	7.57	0.208	5.25
ALT-C	40.25	13.47	7.38	0.137	5.48
TA-14	37.5	12.74	7.07	0.131	5.34
CAS	45.3	17.54	7.02	0.166	2.83
DN-1	39.5	13.59	7.36	0.133	5.47
DN-2	41.13	14.75	7.39	0.14	5.03
DN-3	40.66	13.15	7.74	0.136	6.03
PC-UP	42.01	14.63	7.32	0.139	5.7
CC-1	41.28	16.35	6.31	0.156	2.77
CC-3	44.39	13.73	8.57	0.145	6.89

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Report Number: A21-20098

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Analyte Symbol	CaO	Na2O	K2O	TiO2	P2O5
Unit Symbol	%	%	%	%	%
Detection Limit	0.01	0.01	0.01	0.001	0.01
Analysis Method	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP
AA 202	16.06	0.32	4.09	0.764	0.65
AA 993	15.29	0.56	5.17	0.802	0.86
AA 994	15.75	1.37	4.57	0.791	0.51
AA 961	14.78	0.76	4.62	0.819	0.72
AA 1454	16.41	1.15	4.17	0.725	0.38
AA 1460	15.89	0.87	4.89	0.781	0.45
AA 1461	15.72	0.85	5.59	0.632	0.5
AA 1470	16.5	0.79	4.22	0.791	0.49
AA 1472	16.25	0.57	4.95	0.811	0.74
AA 1494	16.12	0.61	4.66	0.76	0.41
AA 1495	14.91	0.66	3.91	0.816	0.71
AA 1623	16.06	0.7	4.49	0.803	0.63
AA 2160	15.75	0.77	4.36	0.809	0.54
AA 3531	15.69	0.34	4.77	0.772	0.47
ALT-B	15.13	0.41	3.82	0.805	0.63
ALT-C	14.72	0.36	4.4	0.816	0.57
TA-14	16.56	0.7	3.81	0.766	0.43
CAS	7.32	2.58	7.15	0.669	0.4
DN-1	14.69	0.6	5.56	0.804	0.4
DN-2	13.28	0.36	5.45	0.793	0.41
DN-3	15.46	0.65	5.25	0.845	0.39
PC-UP	13.49	0.34	5.45	0.81	0.38
CC-1	9.72	1.56	6.57	0.596	0.4
CC-3	13.73	1.25	4.67	0.921	0.47

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Analyte Symbol	LOI	Total	Sc	Be	V
Unit Symbol	%	%	ppm	ppm	ppm
Detection Limit		0.01	1	1	5
Analysis Method	GRAV	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP
AA 202	11.99	98.34	21	8	229
AA 993	10.48	99.77	23	9	241
AA 994	12.35	99.94	23	8	246
AA 961	11.3	100	22	9	238
AA 1454	14.79	99.34	21	8	222
AA 1460	12.88	99.79	22	8	248
AA 1461	17.91	98.57	12	9	187
AA 1470	13.64	99.56	23	8	234
AA 1472	11.58	100.2	24	8	239
AA 1494	13.48	99.63	20	9	248
AA 1495	11.89	98.96	24	8	227
AA 1623	12.95	100.4	24	8	237
AA 2160	11.68	100.3	23	8	236
AA 3531	13.13	98.69	20	9	235
ALT-B	12.17	99.03	21	9	254
ALT-C	10.95	98.52	23	8	227
TA-14	13.46	98.51	21	8	209
CAS	7.65	98.62	9	17	185
DN-1	10.99	99.12	22	9	231
DN-2	11.17	99.9	20	10	215
DN-3	9.72	100	27	8	244
PC-UP	9.53	99.8	23	9	232
CC-1	13.42	99.13	8	15	161
CC-3	4.93	99.68	31	9	256

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Analyte Symbol	Ba	Sr	Y	Zr	Cr
Unit Symbol	ppm	ppm	ppm	ppm	ppm
Detection Limit	2	2	1	2	20
Analysis Method	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-MS
AA 202	1399	1831	23	272	50
AA 993	2275	1903	25	254	40
AA 994	1594	1749	25	289	40
AA 961	1587	1565	25	284	40
AA 1454	939	1929	21	265	40
AA 1460	1284	2567	25	287	40
AA 1461	2818	3517	21	248	20
AA 1470	1425	1633	24	284	50
AA 1472	1508	1778	25	283	40
AA 1494	2595	4078	22	275	40
AA 1495	2408	5166	24	282	50
AA 1623	1055	1605	24	284	50
AA 2160	1711	2230	23	285	50
AA 3531	2251	3358	23	280	40
ALT-B	2447	3433	25	286	50
ALT-C	4076	3023	24	285	50
TA-14	1369	2419	23	274	40
CAS	1407	1860	24	341	< 20
DN-1	1027	1860	25	302	40
DN-2	1101	2858	25	305	30
DN-3	860	1738	26	311	50
PC-UP	974	2431	25	306	40
CC-1	1219	1014	21	306	< 20
CC-3	861	1814	26	322	60

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Analyte Symbol	Co	Ni	Cu	Zn	Ga
Unit Symbol	ppm	ppm	ppm	ppm	ppm
Detection Limit	1	20	10	30	1
Analysis Method	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
AA 202	25	30	110	80	14
AA 993	24	30	130	60	14
AA 994	25	20	90	60	14
AA 961	26	30	110	70	14
AA 1454	22	40	80	50	13
AA 1460	25	30	90	60	14
AA 1461	19	20	100	60	13
AA 1470	26	30	90	70	14
AA 1472	25	30	90	60	14
AA 1494	24	20	160	540	15
AA 1495	26	30	100	80	12
AA 1623	25	30	80	70	14
AA 2160	26	30	100	80	14
AA 3531	24	20	100	60	14
ALT-B	28	30	110	130	15
ALT-C	27	30	170	80	15
TA-14	24	30	90	290	15
CAS	20	< 20	70	100	20
DN-1	26	30	90	80	14
DN-2	25	20	100	70	22
DN-3	27	30	90	80	14
PC-UP	26	30	90	60	14
CC-1	19	< 20	80	100	19
CC-3	31	30	90	60	14

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Analyte Symbol	Ge	As	Rb	Nb	Mo
Unit Symbol	ppm	ppm	ppm	ppm	ppm
Detection Limit	1	5	2	1	2
Analysis Method	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
AA 202	1	15	274	20	< 2
AA 993	1	24	403	20	< 2
AA 994	1	13	309	18	< 2
AA 961	1	17	308	19	< 2
AA 1454	1	11	275	14	< 2
AA 1460	1	14	260	20	< 2
AA 1461	< 1	17	259	22	< 2
AA 1470	1	14	311	19	< 2
AA 1472	1	15	415	18	< 2
AA 1494	< 1	15	222	20	< 2
AA 1495	1	23	230	17	< 2
AA 1623	< 1	12	327	19	< 2
AA 2160	1	15	310	19	< 2
AA 3531	1	14	285	21	< 2
ALT-B	1	40	225	20	< 2
ALT-C	1	11	307	20	< 2
TA-14	1	18	348	19	2
CAS	< 1	19	493	47	2
DN-1	1	23	434	21	< 2
DN-2	1	11	473	24	< 2
DN-3	1	14	395	20	< 2
PC-UP	1	9	512	23	< 2
CC-1	< 1	26	480	45	< 2
CC-3	1	10	548	19	< 2

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Analyte Symbol	Ag	In	Sn	Sb	Cs
Unit Symbol	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.5	0.2	1	0.5	0.5
Analysis Method	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
AA 202	< 0.5	< 0.2	5	1.5	13.3
AA 993	< 0.5	< 0.2	4	2.2	20
AA 994	< 0.5	< 0.2	5	1.1	14.2
AA 961	< 0.5	< 0.2	5	1.3	13.4
AA 1454	< 0.5	< 0.2	4	1.6	22
AA 1460	< 0.5	< 0.2	5	1.3	24.1
AA 1461	< 0.5	< 0.2	3	1.3	20
AA 1470	< 0.5	< 0.2	5	1.3	15.4
AA 1472	< 0.5	< 0.2	5	1.3	14.6
AA 1494	< 0.5	< 0.2	4	1.4	14.4
AA 1495	< 0.5	< 0.2	5	1	12
AA 1623	< 0.5	< 0.2	5	1.1	22.4
AA 2160	< 0.5	< 0.2	5	1.4	13.1
AA 3531	< 0.5	< 0.2	4	2.8	17.5
ALT-B	< 0.5	< 0.2	5	1.9	24.2
ALT-C	0.9	< 0.2	6	1.2	19
TA-14	< 0.5	< 0.2	5	1.9	20.7
CAS	< 0.5	< 0.2	4	0.9	28.7
DN-1	< 0.5	< 0.2	5	2	31
DN-2	< 0.5	< 0.2	5	1.2	38.9
DN-3	< 0.5	< 0.2	5	1.5	29.5
PC-UP	< 0.5	< 0.2	5	0.9	35.5
CC-1	< 0.5	< 0.2	4	1	29.1
CC-3	< 0.5	< 0.2	6	0.9	33.7

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Analyte Symbol	La	Ce	Pr	Nd	Sm
Unit Symbol	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.1	0.1	0.05	0.1	0.1
Analysis Method	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
AA 202	83.2	167	19.3	72.3	12.6
AA 993	84.7	171	19.9	75.5	13.1
AA 994	76.3	158	18.4	70.6	12.5
AA 961	84.4	168	19.9	75	13
AA 1454	68.5	135	15.6	61.6	10.8
AA 1460	78.1	160	19	72.7	12.9
AA 1461	90	169	18.4	65	10.6
AA 1470	76.7	160	18.8	72.8	13.1
AA 1472	75.4	156	18.4	70.7	12.6
AA 1494	79	159	18.2	68.6	11.9
AA 1495	74.5	155	18.5	72.3	12.7
AA 1623	73.8	152	17.8	68.1	12.4
AA 2160	78.7	161	18.9	71.7	12.9
AA 3531	84.4	168	19.1	70.9	12.4
ALT-B	86	174	20.5	76.5	12.9
ALT-C	81.3	168	19.6	75.3	13.3
TA-14	76.6	157	18.4	69.1	12.2
CAS	135	245	25.3	82.1	12.5
DN-1	84.2	169	19.7	73.5	12.7
DN-2	93.6	186	21.1	76.9	13
DN-3	77.7	164	19.9	77.3	13.7
PC-UP	85.3	175	20.5	76.1	13.6
CC-1	130	239	23.8	78	12
CC-3	76.8	163	19.8	78.2	14.1

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Analyte Symbol	Eu	Gd	Tb	Dy	Ho
Unit Symbol	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.05	0.1	0.1	0.1	0.1
Analysis Method	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
AA 202	2.54	8.6	1.1	5.4	0.9
AA 993	2.62	8.7	1.2	5.7	1
AA 994	2.54	8.6	1.1	5.4	0.9
AA 961	2.52	8.5	1.1	5.5	0.9
AA 1454	2.03	6.6	0.9	4.4	0.8
AA 1460	2.58	8.5	1.2	5.7	1
AA 1461	2.08	7.1	0.9	4.4	0.7
AA 1470	2.57	8.9	1.1	6	1
AA 1472	2.51	8.5	1	5.5	0.9
AA 1494	2.33	7.9	1	5.2	0.9
AA 1495	2.47	8.6	1.1	5.5	0.9
AA 1623	2.3	8.2	1	5.2	0.9
AA 2160	2.47	8.4	1.1	5.3	0.9
AA 3531	2.38	8.3	1	5.4	0.9
ALT-B	2.58	8.4	1.1	5.6	0.9
ALT-C	2.49	8.8	1.1	5.8	1
TA-14	2.43	8.2	1	5.3	0.9
CAS	2.32	8	1	5.1	0.9
DN-1	2.55	8.3	1.1	5.7	0.9
DN-2	2.58	8.7	1.1	5.6	0.9
DN-3	2.77	9.1	1.3	6	1
PC-UP	2.74	8.9	1.2	5.9	1
CC-1	2.29	7.6	1	4.8	0.8
CC-3	2.8	9.5	1.2	6.1	1

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Analyte Symbol	Er	Tm	Yb	Lu	Hf
Unit Symbol	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.1	0.05	0.1	0.01	0.2
Analysis Method	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
AA 202	2.3	0.28	1.7	0.28	7
AA 993	2.4	0.3	1.9	0.29	2.3
AA 994	2.3	0.3	1.8	0.28	7.3
AA 961	2.4	0.3	1.8	0.28	5.6
AA 1454	1.9	0.25	1.5	0.22	6.2
AA 1460	2.4	0.32	1.9	0.29	7.4
AA 1461	1.9	0.25	1.5	0.21	5.5
AA 1470	2.5	0.33	2.1	0.31	7.7
AA 1472	2.3	0.31	1.8	0.24	4.5
AA 1494	2.3	0.28	1.8	0.26	6.9
AA 1495	2.3	0.29	1.8	0.28	4.9
AA 1623	2.2	0.28	1.7	0.25	7.3
AA 2160	2.3	0.3	1.9	0.27	7.3
AA 3531	2.3	0.29	1.8	0.28	7.3
ALT-B	2.4	0.3	1.8	0.28	7.2
ALT-C	2.4	0.3	1.8	0.26	7.7
TA-14	2.3	0.3	1.8	0.26	7.2
CAS	2.2	0.28	1.8	0.25	7.2
DN-1	2.4	0.3	1.9	0.28	7.6
DN-2	2.4	0.3	1.9	0.27	7.5
DN-3	2.6	0.34	2	0.28	8.1
PC-UP	2.6	0.33	2	0.3	7.8
CC-1	2	0.25	1.5	0.23	6.4
CC-3	2.5	0.32	1.9	0.29	8.4

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Analyte Symbol	Ta	W	Tl	Pb	Bi
Unit Symbol	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.1	1	0.1	5	0.4
Analysis Method	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
AA 202	1	3	2.1	50	< 0.4
AA 993	0.9	4	2.9	60	0.4
AA 994	0.8	2	1.6	40	< 0.4
AA 961	0.9	3	2	66	0.5
AA 1454	0.7	2	2	37	< 0.4
AA 1460	2.5	3	2.6	66	0.4
AA 1461	0.9	3	1.5	59	0.5
AA 1470	1	3	1.8	46	< 0.4
AA 1472	0.9	3	2.1	51	0.4
AA 1494	0.9	2	2.2	67	< 0.4
AA 1495	0.8	2	1.6	63	0.4
AA 1623	1.3	2	1.9	45	< 0.4
AA 2160	0.9	2	1.8	55	< 0.4
AA 3531	1	2	1.9	119	0.4
ALT-B	14.8	24	3.1	83	0.5
ALT-C	2.1	2	2.4	121	0.4
TA-14	0.9	5	2.2	87	0.4
CAS	1.8	6	3.2	70	0.6
DN-1	0.9	2	4.1	47	0.5
DN-2	1	3	3	53	0.6
DN-3	0.9	2	2.5	38	< 0.4
PC-UP	1.1	8	3.3	40	< 0.4
CC-1	1.7	7	3.7	86	0.8
CC-3	0.9	3	2.7	38	0.5

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Analyte Symbol	Th	U
Unit Symbol	ppm	ppm
Detection Limit	0.1	0.1
Analysis Method	FUS-MS	FUS-MS
AA 202	31.6	6.9
AA 993	33	6.8
AA 994	29.4	6.2
AA 961	32.3	6.8
AA 1454	24.9	6.3
AA 1460	31.1	6.6
AA 1461	33.6	7.2
AA 1470	30	6.5
AA 1472	28.8	6.7
AA 1494	30.3	6.9
AA 1495	29.1	7.4
AA 1623	28.7	6.4
AA 2160	30.6	6.6
AA 3531	31.5	6.9
ALT-B	33.4	7.8
ALT-C	32.3	6.6
TA-14	29.3	7.9
CAS	57.7	10.1
DN-1	32.5	8.9
DN-2	35.8	6.3
DN-3	30.5	7.9
PC-UP	34.9	8.7
CC-1	55.8	4.7
CC-3	30.2	6.4