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Appendices

Appendix 1 – Samples

List of abbreviations

TS	Thin sections
PS	Polished Section
NS	Normal Section
MA	Microprobe analysis
WHR	Whole Rock Geochemistry
FIP	Fluid Inclusion paragenesis and classification
FIM	Fluid Inclusion Microthermometry
PIXE	Proton Induced X-ray Emission Spectrometry
LA-ICP-MS	Laser ablation ion coupled plasma mass spectrometry

Appendix 1.1- Sample List

No.	*JCU Ref No*	*Sample No*	*Field Sample No.*	*Location*	*Description*
1.	74550	JB 1	WPT 003	465288/7672646	Coarse grained spotty gabbro
2.	74551	JB 2	WPT 008	471646/7669442	Saxby granite
3.	74552	JB 3A	WPT 015	467656/7665156	Breccia
4.	74553	JB 3B	WPT 015	467656/7665156	Granite
5.	74554	JB 3C	WPT 015	467656/7665156	Hornfels within breccia
6.	74555	JB 3D	WPT 017	467330/7665022	Bedded calc silicate
7.	74556	JB 3E	WPT 017	467330/7665022	Albitized breccia
8.	74557	JB 4	WPT 020	466544/7664323	Mt. Angelay granite
9.	74558	JB 5A	WPT 038	463611/7657487	Granite breccia
10.	74559	JB 5B	WPT 038	463611/7657487	Syenodiorite
11.	74560	JB 6A	WPT 039	464129/7657938	Granite with mag-hydrothermal veins
12.	74561	JB 6B	WPT 039	464129/7657938	Granite with mag-hydrothermal veins
13.	74562	JB 6C	WPT 039	464129/7657938	Syenodiorite
14.	74563	JB 6D	WPT 138	464095/7658079	Pegmatite
15.	74564	JB 6E	WPT 138	464095/7658079	Syenodiorite
16.	74565	JB 7	WPT 040	463732/7657504	Pegmatite
17.	74566	JB 8A	WPT 042	462669/7657226	Microgabbro
18.	74567	JB 8B	WPT 042	462669/7657226	Syenodiorite
19.	74568	JB 9A	WPT 047	471062/7666340	Gabbro
20.	74569	JB 9B	WPT 047	471062/7666340	Mingled rock with granite and gabbro
21.	74570	JB 10	WPT 048	465906/7663362	Microgabbro
22.	74571	JB 11	WPT 049	465881/7663427	Syenodiorite
23.	74572	JB12A	WPT 050	465429/7672589	Microgabbro
24.	74573	JB12B	WPT 051	465474/7672582	Coarse grained gabbro
25.	74574	JB 13A	WPT 066	482840/7660662	Schist
26.	74575	JB13B	WPT 066	482840/7660662	Schist
27.	74576	JB 13C	WPT 066	482840/7660662	Psammitic schist
28.	74577	JB 13 D	WPT 066	482840/7660662	Aplite
29.	74578	JB 13E	WPT 067	483014/7660918	Psammitic schist
30.	74579	JB 13F	WPT 067	483014/7660918	Schist
31.	74580	JB 14	WPT 068	483426/7660928	Schist
32.	74581	JB 15	WPT 071	481682/7672654	Alkali granite
33.	74582	JB16A	WPT 113	463323/7674487	Granite
34.	74583	JB 16B	WPT 113	463323/7674487	Granite with calc- silicate zenolith
35.	74584	JB 16C	WPT 113	463323/7674487	Granite
36.	74585	JB 17	WPT 113	463323/7674487	Psammite
37.	74586	JB 18A	WPT 073	463017/7674586	Granite
38.	74587	JB 18B	WPT 073	463017/7674586	Bedded calc silicate
39.	74588	JB20A	WPT 074	462688/7674629	Calc silicate

No.	JCU Ref No	Sample No	Field Sample No.	Location	Description
40.	74589	JB 20B	WPT 074	462688/7674629	Granite
41.	74590	JB 21	WPT 075	462637/7674626	Granite
42.	74591	JB 22	WPT 076	462594/7674487	Granite with calc- silicate zenolith
43.	74592	JB 23A	WPT 077	462548/7674385	Breccia
44.	74593	JB 23B	WPT 077	462548/7674385	Granite from calc silicate contact
45.	74594	JB 24	WPT 078	462880/7673964	Granite from calc silicate contact
46.	74595	JB 25A	WPT 080	464642/7672758	Coarse grained gabbro
47.	74596	JB 25B	WPT 080	464642/7672758	Granite
48.	74597	JB 26	WPT 083	464518/7663095	Granite
49.	74598	JB 27	WPT 084	464298/7663447	Granite
50.	74599	JB 28	WPT 087	463272/7664010	Granite with calc- silicate zenolith
51.	74600	JB 29A	WPT 088	463236/7664100	Calc silicate
52.	74601	JB 29B	WPT 088	463236/7664100	Granite from calc silicate contact
53.	74602	JB 30	WPT 089	463223/7663957	Calc silicate
54.	74603	JB 31	WPT 090	463763/7664049	Medium grained gabbro
55.	74604	JB 32	WPT 091	463874/7664026	Schist
56.	74605	JB 33	WPT 094	463992/7672361	Granite
57.	74606	JB 34	WPT 095	464021/7672494	Schist
58.	74607	JB 35A	WPT 096	463967/7672607	Albitzed granite
59.	74608	JB 35B	WPT 096	463967/7672607	Albitzed granite
60.	74609	JB 35C	WPT 096	463967/7672607	Schist
61.	74610	JB 35D	WPT 096	463967/7672607	Calc silicate
62.	74611	JB 35E	WPT 096	463967/7672607	Pegmatite
63.	74612	JB 35F	WPT 130	464079/7672828	Coarse grained gabbro
64.	74613	JB 36	WPT 097	464138/7672779	Pegmatite
65.	74614	JB37A1	WPT 098	464222/7672850	Pegmatite
66.	74615	JB37A2	WPT 098	464222/7672850	Late actinolite and albite from pegmatite
67.	74616	JB 37B	WPT 098	464222/7672850	Mixed rock
68.	74617	JB 37C	WPT 098	464222/7672850	Mingled rock with granite and gabbro
69.	74618	JB 37D	WPT 098	464222/7672850	Mixed rock
70.	74619	JB 37E	WPT 098	464222/7672850	Mixed rock
71.	74620	JB 37F	WPT 098	464222/7672850	Mixed rock
72.	74621	JB 37G	WPT 098	464222/7672850	Mixed rock
73.	74622	JB 37H	WPT 098	464222/7672850	Mixed rock
74.	74623	JB 37I	WPT 098	464222/7672850	Mixed rock
75.	74624	JB 38	WPT 103	463014/7662888	Granite
76.	74625	JB 39	WPT 106	462700/7663147	Calc silicate
77.	74626	JB 40	WPT 107	462624/7663202	Syenodiorite
78.	74627	JB 41	WPT 108	462701/7663167	Calc silicate
79.	74628	JB 42	WPT 109	462774/7663052	Amphibolite
80.	74629	JB 43	WPT 110	462843/7663023	Psammite

No.	JCU Ref No	Sample No	Field Sample No.	Location	Description
81.	74630	JB 44	WPT 111	463889/7662888	Granite
82.	74631	JB 45A	WPT 125	459536/7688402	Schist
83.	74632	JB 45B	WPT 125	459536/7688402	Amphibolite
84.	74633	JB 45C	WPT 125	459536/7688402	Psammite
85.	74634	JB 46	WPT126	459456/7688103	Breccia
86.	74635	JB 47A	WPT 127	463918/7684535	Schist
87.	74636	JB 47B	WPT 127	463918/7684535	Psammite
88.	74637	JB 48	WPT 128	454258/7694158	Bedded calc silicate
89.	74638	JB 49	WPT 123	463084/7675231	Bedded calc silicate
90.	74639	JB 50A	WPT122	462935/7675193	Calc silicate
91.	74640	JB 50B	WPT122	462935/7675193	Granite
92.	74641	JB 51	WPT 120	462976/7675273	Granite
93.	74642	JB 52	WPT 119	463154/7675158	Granite
94.	74643	JB 53A	WPT 118	463137/7675053	Granite
95.	74644	JB 53B	WPT 118	463137/7675053	Amphibolite
96.	74645	JB 54	WPT 116	463142/7674794	Calc silicate
97.	74646	JB 55A	WPT 114	463353/7674678	Granite from calc silicate contact
98.	74647	JB 55B	WPT 114	463353/7674678	Granite
99.	74648	JB 56A	WPT 045	470476/7666720	Amphibolite
100.	74649	JB 56B	WPT 045	470476/7666720	Granite
101.	74650	JB 57	WPT 129	462836/7678390	Granite from calc silicate contact
102.	74651	JB 58	WPT 131	466064/7669992	Granite
103.	74652	JB 59	WPT 132	464345/7662676	Granite
104.	74653	JB 60A	WPT 133	463460/7657518	Medium grained gabbro
105.	74654	JB 60B	WPT 133	463460/7657518	Mingled rock with granite and gabbro
106.	74655	JB 60C	WPT 133	463460/7657518	Syenodiorite
107.	74656	JB 61	WPT 134	463257/7657529	Brain rock
108.	74657	JB 62A	WPT 135	463208/7657630	Granite with mag-hydrothermal veins
109.	74658	JB62B	WPT 135	463208/7657630	Syenodiorite
110.	74659	JB 63	WPT 136	463366/7658227	Medium grained gabbro
111.	74660	JB 64A	WPT 137	463057/7658070	Brain rock
112.	74661	JB 64B	WPT 137	463057/7658070	Syenodiorite with mag-hydrothermal veins
113.	74662	JB 65	WPT 139	463925/7657363	Syenodiorite
114.	74663	JB 66	WPT 140	461227/7653538	Mag- hydrothermal vein
115.	74664	JB 67	WPT 157	458432/7689083	Medium grained gabbro
116.	74665	JB 68	WPT 158	458325/7689071	Microgabbro
117.	74666	JB 69	WPT 159	458753/7689512	Gabbro from Corella breccia contact
118.	74667	JB 70	WPT 160	458702/7689563	Gabbro from Corella breccia contact
119.	74668	JB 71	WPT 161	459638/7687810	Gabbro from Corella breccia contact
120.	74669	JB 72	WPT 162	459664/7687849	Marble

No.	*JCU Ref No*	*Sample No*	*Field Sample No.*	*Location*	*Description*
121.	74670	JB 73	WPT 162	459664/7687849	Medium grained gabbro
122.	74671	JB 74	WPT 163	459685/7687914	Gabbro from Corella breccia contact
123.	74672	JB 75	WPT 165	459361/7688254	Pegmatite
124.	74673	JB 76	WPT 167	463431/7678332	Gabbro from Corella breccia contact
125.	74674	JB 77	WPT 171	464696/7677269	Granite
126.	74675	JB 78	WPT 172	464701/7677203	Granite
127.	74676	JB 79A	WPT 174	463658/7675164	Granite from mingled rock
128.	74677	JB 79 B	WPT 174	463658/7675164	Mingled rock with granite and gabbro
129.	74678	JB 79 C	WPT 174	463658/7675164	Granite from mingled rock
130.	74679	JB 79 D	WPT 174	463658/7675164	Gabbro from mingled rock
131.	74680	JB 79 E	WPT 174	463658/7675164	Mingled rock with granite and gabbro
132.	74681	JB 79 F	WPT 174	463658/7675164	Gabbro from mingled rock
133.	74682	JB 79 G	WPT 174	463658/7675164	Granite from mingled rock
134.	74683	JB 80	WPT 175	463799/7674852	Pegmatite
135.	74684	JB 81	WPT 176	464102/7674928	Granite
136.	74685	JB 82A	WPT 154	464056/7674782	Gabbro from mingled rock
137.	74686	JB 82 B	WPT 154	464056/7674782	Granite from mingled rock
138.	74687	JB 82 C	WPT 154	464056/7674782	Mixed rock
139.	74688	JB 83	WPT 153	464107/7674861	Quartz vein
140.	74689	JB 84	WPT 177	463667/7674814	Amphibolite
141.	74690	JB 85	WPT 178	464807/7672823	Mingled rock with strange textures
142.	74691	JB 86	WPT 146	464834/7672646	Coarse grained spotty gabbro
143.	74692	JB 87	WPT 156	464795/7672428	Coarse grained spotty gabbro
144.	74693	JB 88 A	WPT 142	465112/7672737	Medium grained spotty gabbro
145.	74694	JB 88 B	WPT 142	465112/7672737	Granite
146.	74695	JB 88 C	WPT 142	465112/7672737	Quartz vein
147.	74696	JB 88 D	WPT 142	465112/7672737	Aplite
148.	74697	JB 88 E	WPT 142	465112/7672737	Mingled rock
149.	74698	JB 89	WPT 148	465450/7672722	Fine grained spotty gabbro

Appendix 1.2- Sample List- Various analyses

No	*Samples*	*Sample prepared by*	*TS Type*	*MA*	*WHR*	*FIP*	*FIM*	*PIXE*	*LA-ICP-MS*
1	JB 1	JCU	PS	√	√				
2	JB 3D	JCU	PS						
3	JB 4	JCU	PS			√	√	√	√
4	JB 5A	JCU	PS						
5	JB 6B	JCU	PS						
6	JB 6C	CANADA	PS	√	√				
7	JB 6D	CANADA	PS			√	√	√	
8	JB 6E	CANADA	PS	√	√				
9	JB 7	JCU	PS			√	√		
10	JB 8B	JCU	PS	√	√				
11	JB 12B	JCU	PS	√	√				
12	JB 15	JCU	PS	√	√				
13	JB 25A	CANADA	PS	√	√				
14	JB 31	CANADA	PS						
15	JB 35A	JCU	PS	√	√				
16	JB 35B	JCU	PS						
17	JB 35C	JCU	PS						
18	JB 35D	JCU	PS						
19	JB 35E	JCU	PS			√	√		
20	JB 35F	CANADA	PS	√	√				
21	JB 36	CANADA	PS						
22	JB 37A1	CANADA	PS			√	√	√	
23	JB 37A2	JCU	PS						
24	JB 37B	CANADA	PS	√	√				
25	JB 37C/F	CANADA	PS	√	√	√	√	√	
26	JB 37C/M	CANADA	PS	√					
27	JB 37D	CANADA	PS	√	√				
28	JB 37E	CANADA	PS	√	√				
29	JB 37F	CANADA	PS	√	√				
30	JB 37G	CANADA	PS	√	√				
31	JB 37H	CANADA	PS	√	√				
32	JB 37I	CANADA	PS	√	√				
33	JB 39	JCU	PS						
34	JB 42	JCU	PS						
35	JB 45A	JCU	PS	√	√				
36	JB 45B	JCU	PS						
37	JB 47B	JCU	PS	√	√				
38	JB 48	JCU	PS						
39	JB 58	JCU	PS						
40	JB 59	JCU	PS			√	√		√
41	JB 60A	CANADA	PS	√	√				
42	JB 60B/F	CANADA	PS	√	√				

No	*Samples*	*Sample prepared by*	*TS Type*	*MA*	*WHR*	*FIP*	*FIM*	*PIXE*	*LA-ICP-MS*
43	JB 60B/M	CANADA	PS	√					
44	JB 60C	CANADA	PS	√	√				
45	JB 61	CANADA	PS			√	√	√	√
46	JB 62A	CANADA	PS						
47	JB 62B	CANADA	PS						
48	JB 63	CANADA	PS	√	√				
49	JB 64A	CANADA	PS			√	√	√	√
50	JB 64B	CANADA	PS	√	√				
51	JB 64B/Vein	CANADA	PS						
52	JB 67	JCU	NS	√	√				
53	JB 68	JCU	NS	√					
54	JB 75	CANADA	PS						
55	JB 76	JCU	NS	√					
56	JB 79B	CANADA	PS	√	√	√	√		
57	JB 79D	CANADA		√	√				
58	JB 79E	JCU	PS						
59	JB 81	CANADA, JCU	PS	√	√	√		√	
60	JB 82A	JCU	PS	√	√				
61	JB 82B	CANADA, JCU	PS	√	√	√	√	√	
62	JB 82C	JCU	PS	√	√				
63	JB 87	JCU	PS	√	√				
64	JB 88A	JCU	PS	√	√				
65	JB 88B	CANADA, JCU	PS	√	√	√	√		
66	JB 88C	CANADA	PS			√	√	√	√
67	JB 88D	CANADA	PS			√	√		
68	JB 88E	JCU	PS						
69	JB 89	JCU	PS	√	√				

Appendix 2- Mineral Abbreviations

List of abbreviations

Plag	Plagioclase	***Hbl***	Hornblende
Amp	Amphibole	***Cpx***	Clinopyroxene
Mt	Magnetite	***Apt***	Apatite
Qtz	Quartz	***Tit***	Titanite
Ab	Albite	***Act***	Actinolite
Bt	Biotite	***Chl***	Chlorite
Kfs	K feldspar		

Appendix 3- Whole rock geochemistry

Appendix 3.1- Major and trace elements in SIC and MAIC rocks

	JB 1	JB 25A	JB 35F	JB 15	JB 12B	JB 35A	JB 37B	JB 37C/F	JB 37C/M
SiO2	47.46	45.7	49.97	73.37	49.6	63.56	68.79	71.73	53.77
TiO2	1.41	2.04	1.43	0.31	1.35	0.85	0.53	0.23	1.2
Al2O3	15.26	15.67	15.81	13.62	16.09	16.28	14.75	15.15	15.94
Fe2O3	13.55	13.42	11.71	2.36	12.11	6.85	3.38	1.28	9.35
MnO	0.15	0.18	0.15	0.03	0.18	0.03	0.04	0.02	0.13
MgO	6.3	6.45	5.53	0.39	5.77	1.44	1.53	0.52	5.43
CaO	7.74	8.07	7.21	1.02	7.39	2.93	2.49	1.07	5.18
Na2O	3.67	4.05	3.33	4.13	3.52	5.59	7.62	5.82	6.22
K2O	2.42	1.72	2.62	4.35	2.12	1.86	0.45	4.08	1.07
P2O5	0.47	0.83	0.88	0.06	0.3	0.28	0.25	0.09	0.63
SO3	0.02	0.04	bd	0.01	0.02	0.01	0.01	bd	0.01
LOI	1.7	2.25	1.63	0.8	1.92	0.84	1.09	0.88	1.78
SUM	100.15	100.43	100.28	100.45	100.37	100.51	100.93	100.87	100.71
Sc	29	40	27	3	43	9	8	1	21
Ba	1028	703	1790	474	912	655	186	945	427
Ti	8525	11914	8805	1784	8337	4729	2791	1112	7186
V	310	287	253	19	269	70	64	20	220
Cr	133	108	85	21	114	22	45	10	81
Mn	1066	1255	1100	216	1376	163	291	166	1008
Co	61	53	44	37	44	31	31	27	39
Ni	88	52	58	2	66	8	8	1	31
Cu	100	77	43	43	74	19	33	50	4
Zn	99	98	62	bd	57	bd	bd	bd	44
Ga	20	20	21	20	19	24	18	15	24
Pb	28	26	21	16	29	9	bd	bd	10
Rb	86	55	89	252	77	96	15	80	24
Sr	721	537	910	68	503	361	168	128	240
Y	25	35	26	39	37	43	25	10	57
Zr	97	95	147	271	106	622	182	122	175
Nb	17	15	10	61	16	41	21	14	39
Th	2	1	12	88	6	28	19	23	24
U	2	1	4	32	2	5	2	bd	4
Ce	95.1	111	194	73.1	95.7	59.6	66.2	28.8	185
Dy	3.68	5.75	3.91	3.09	5.61	4.83	2.98	0.716	8.07
Er	2.03	3.02	2.15	2.18	3.07	2.94	1.72	0.415	4.8
Eu	1.5	2.27	1.91	0.422	1.81	0.841	1.05	0.631	2.31
Gd	4.98	8.03	5.83	3.03	6.59	5.21	3.93	1.03	10.5
Ho	0.735	1.16	0.77	0.679	1.13	1	0.603	0.143	1.65
La	49.3	53.7	110	35.3	49.9	31.1	32.9	16	81.9
Lu	0.317	0.392	0.336	0.437	0.438	0.465	0.293	0.0777	0.803
Nd	36	50.3	60.1	20.7	38	26.6	28	8.77	77.7
Pr	10.4	13.2	19.1	6.67	10.7	7.15	8.14	2.69	21.8
Sm	5.48	8.46	7.27	3.38	6.48	5.16	4.45	1.21	12.2
Tb	0.677	1.06	0.759	0.496	0.971	0.797	0.539	0.134	1.46
Tm	0.297	0.42	0.314	0.373	0.439	0.447	0.265	0.0683	0.733
Yb	2.01	2.74	2.11	2.76	2.97	3.12	1.82	0.475	5.12

	JB 37D	JB 37E	JB 37F	JB 37G	JB 37H	JB 37I	JB 8B	JB 6C	JB 6E
SiO2	51.03	49.63	49.1	50.19	49.79	51.23	60.53	59.25	56.46
TiO2	1.28	1.23	1.38	1.38	1.43	1.4	1.1	1.2	1.55
Al2O3	17.05	16.02	16.91	17.64	16.5	17.04	15.47	15.83	15.28
Fe2O3	10.61	11.4	10.98	11.32	11.06	10.26	8.07	8.38	10.48
MnO	0.19	0.14	0.16	0.14	0.19	0.1	0.09	0.1	0.13
MgO	4.89	5.31	5.04	4.61	4.51	4.44	1.8	1.81	2.92
CaO	6.17	7.17	6.87	5.58	6.98	6.46	4.12	4.37	5.75
Na2O	5.28	4.35	4.78	5.3	5.38	4.72	4.73	5.31	4.76
K2O	1.82	2.62	1.9	1.96	1.22	2.73	3.25	3.09	2.08
P2O5	0.59	0.6	0.6	0.63	0.77	0.83	0.34	0.4	0.61
SO3	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01
LOI	1.81	1.46	2.4	1.9	1.96	1.57	0.65	0.66	0.77
SUM	100.73	99.96	100.13	100.68	99.81	100.78	100.15	100.41	100.79
Sc	27	24	28	28	31	23	16	15	19
Ba	751	2755	1021	954	549	2145	1166	1008	815
Ti	7720	8031	8294	8239	8729	7640	5985	6516	8594
V	218	249	241	232	205	201	82	86	175
Cr	71	59	58	53	64	28	13	9	13
Mn	1314	1048	1121	1002	1301	624	620	703	907
Co	36	42	40	47	49	39	44	59	80
Ni	35	47	35	34	33	33	9	7	16
Cu	50	64	49	52	47	40	8	14	32
Zn	42	51	80	64	52	27	6	bd	14
Ga	21	18	19	20	21	22	22	24	21
Pb	20	20	24	24	20	18	15	16	16
Rb	66	112	64	71	39	98	95	100	60
Sr	627	912	457	679	647	708	232	253	294
Y	39	24	34	41	71	42	72	60	65
Zr	193	134	189	295	263	219	707	523	239
Nb	22	7	24	21	29	21	53	76	57
Th	4	10	5	6	8	11	24	51	33
U	bd	3	2	2	1	1	4	4	4
Ce	149	149	139	154	196	201	162	159	163
Dy	5.55	3.53	5.06	6.1	10.8	6.15	10.5	7.48	9.06
Er	3.09	1.92	2.85	3.43	5.8	3.33	5.8	4.82	5.06
Eu	2.14	1.98	1.99	2.17	2.82	2.36	2.17	2.09	2.07
Gd	7.43	5.5	6.85	8.09	13.8	8.72	12.9	9.09	11.3
Ho	1.12	0.708	1.03	1.21	2.15	1.23	2.12	1.59	1.83
La	73.6	77	72.9	78.8	91.7	99.8	71.1	77.2	78.6
Lu	0.473	0.34	0.436	0.52	0.763	0.502	0.902	0.906	0.757
Nd	56.1	53.2	51.2	57.7	84.9	71.3	70.7	58.1	68.5
Pr	16.4	16	15	16.7	23	21.5	18.8	17.3	18.8
Sm	8.38	6.89	7.54	8.67	14.6	10.1	13.5	9.47	12.1
Tb	1.03	0.7	0.929	1.1	1.94	1.19	1.85	1.3	1.62
Tm	0.444	0.289	0.41	0.485	0.793	0.484	0.849	0.785	0.736
Yb	3.03	2.05	2.77	3.32	5.13	3.29	5.72	5.56	4.95

	JB 63	JB 64B	JB 64B/Vein	JB 60A	JB 60B/F	JB 60B/M	JB 60C	JB 45A	JB 47B
SiO2	51.47	53.96	62.4	52.1	62.59	50.65	53.74	45.65	66.04
TiO2	1.63	1.55	0.41	1	0.78	1.04	1.41	1.16	0.71
Al2O3	15.3	15.94	12.05	14.71	15.91	13.55	15.63	26.64	14.83
Fe2O3	11.68	11.93	8.07	9.4	7.39	9.86	10.99	12.86	8.73
MnO	0.14	0.08	0.16	0.14	0.04	0.14	0.17	0.14	0.06
MgO	4.43	2.67	4.51	6.8	1.57	8.5	2.61	1.67	2.46
CaO	6.46	4.6	4.7	8.55	3.06	8.72	5.53	0.52	0.27
Na2O	3.98	7.38	6.38	3.63	4.48	3.31	6.06	0.69	0.42
K2O	2.87	0.68	0.19	2.23	3.16	2.94	2.26	7.68	4.83
P2O5	0.74	0.74	0.05	0.33	0.25	0.35	0.68	0.14	0.14
SO3	0.02	0.02	bd	0.03	0.01	0.02	0.02	0.01	0.01
LOI	1.05	1.21	0.86	1.34	1.16	1.46	0.86	3.01	1.64
SUM	99.77	100.75	99.77	100.26	100.39	100.54	99.97	100.19	100.14
Sc	23	19	26	23	6	27	21	27	16
Ba	965	287	63	2314	3123	3019	814	2316	1662
Ti	9610	8563	1987	7513	5658	7620	9009	8179	5210
V	218	176	151	235	114	220	195	203	118
Cr	64	37	34	423	31	664	23	166	173
Mn	1027	551	1277	1477	493	1519	1771	1360	608
Co	55	40	28	88	73	105	76	80	96
Ni	39	14	7	122	18	147	8	63	41
Cu	54	81	15	46	4	42	48	19	18
Zn	76	6	14	65	10	40	34	101	96
Ga	21	25	26	18	23	19	25	35	21
Pb	26	15	3	23	14	17	11	33	22
Rb	118	35	7	93	130	136	72	389	264
Sr	375	155	26	439	325	297	237	55	48
Y	36	66	26	30	39	55	60	59	23
Zr	275	444	116	210	552	183	446	281	159
Nb	44	69	38	17	22	26	36	33	28
Th	15	15	40	17	29	12	21	20	15
U	3	10	13	bd	bd	bd	bd	bd	bd
Ce	132	168	48.5	115	119	111	156	138	67.7
Dy	5.39	9.04	3.03	4.82	5.48	8.6	8.93	6.78	3.19
Er	2.99	5.35	2.13	2.62	3.03	4.91	4.88	5.16	2
Eu	1.77	2.33	0.514	1.78	1.66	1.92	2.15	1.83	0.887
Gd	7.16	10.9	3.27	6.69	7.18	9.81	11.1	8.68	4.45
Ho	1.08	1.85	0.663	0.951	1.1	1.74	1.78	1.57	0.664
La	65.3	77.7	22.7	57.5	62.1	52.6	68.7	68.9	32.9
Lu	0.459	0.891	0.651	0.392	0.449	0.76	0.71	1.03	0.332
Nd	49.8	70.5	18.1	46.1	45.6	51.8	65.2	57.6	27.5
Pr	14.5	20.2	5.32	13.1	13.1	13.6	17.8	16.2	7.68
Sm	7.84	11.8	3.21	7.58	7.67	10.2	11.5	9.94	4.99
Tb	0.993	1.6	0.497	0.912	1	1.47	1.6	1.21	0.603
Tm	0.439	0.805	0.365	0.383	0.425	0.732	0.701	0.856	0.308
Yb	3.03	5.58	3.05	2.68	2.83	5.06	4.6	6.36	2.11

	JB 67	JB 79B	JB 79D	JB 81	JB 82A	JB 82B	JB 82C	JB 87	JB 88A	JB 88B	JB 89
SiO2	48.76	73.17	54.39	70.85	53.94	67.89	54.79	48.57	48.75	75.45	50.23
TiO2	1.01	0.19	1.26	0.39	1.25	0.55	1.16	1.42	1.6	0.24	1.19
Al2O3	16.02	13.21	17.31	14.03	15.5	14.59	15.92	15.2	14.35	14.34	15.46
Fe2O3	12.26	1.65	9.41	2.95	10.51	4.93	10.09	12.91	12.63	1.01	12
MnO	0.19	0.02	0.13	0.03	0.12	0.04	0.12	0.1	0.12	0.01	0.16
MgO	6.62	0.26	3.92	0.42	3.99	1.02	3.7	6.11	5.75	0.29	7.54
CaO	10.71	0.78	4.97	1.47	6.3	2.61	5.96	7.61	7.49	0.62	8.96
Na2O	2.26	1.38	2.4	3.65	3.5	4.18	3.56	4.22	3.61	6.63	2.46
K2O	0.86	7.88	3.54	4.7	2.98	2.85	2.55	1.09	1.89	0.3	1
P2O5	0.07	0.15	0.95	0.09	0.57	0.14	0.54	0.36	0.91	0.05	0.1
SO3	bd	bd	bd	bd	bd	bd	bd	0.01	bd	bd	bd
LOI	1.16	0.72	1.67	0.64	1.14	0.74	1.3	2.23	2.37	0.55	0.58
SUM	99.91	99.39	99.95	99.19	99.8	99.51	99.69	99.83	99.47	99.46	99.68
Sc	37	2	18	1	21	4	19	29	26	3	35
Ba	122	773	1945	986	1229	887	1202	501	1187	87	302
Ti	6094	956	7742	1974	6847	2834	6466	8111	8981	1259	7309
V	292	7	206	37	189	61	185	294	269	15	257
Cr	80	27	19	16	69	15	47	141	84	22	308
Mn	1504	142	1011	147	979	282	944	760	830	51	1274
Co	89	49	52	60	61	51	53	72	51	46	80
Ni	85	3	29	4	37	6	35	73	59	1	116
Cu	156	18	8	12	44	3	47	62	51	16	75
Zn	52	bd	29	bd	20	bd	36	9	32	bd	57
Ga	17	13	21	18	22	21	22	20	19	20	18
Pb	21	34	26	9	20	13	22	18	19	5	18
Rb	43	124	155	128	114	101	77	39	63	10	47
Sr	189	326	1085	141	508	353	653	717	772	57	221
Y	16	34	37	38	39	34	34	25	33	29	26
Zr	44	131	229	254	334	344	238	88	81	186	97
Nb	10	13	17	32	30	27	27	10	12	31	12
Th	bd	28	29	58	21	72	22	10	10	88	6
U	bd	7	9	7	5	8	4	1	2	14	1

Appendix 3.2-Halogens in SIC and MAIC rocks

Sample No	***Cl***	***F***
JB 1	0.136	0.05
JB 25A	0.085	0.15
JB 35F	0.184	0.09
JB 15	0.044	0.17
JB 12B	0.186	0.06
JB 35A	0.088	0.11
JB 37C/F	0.029	0.02
JB 37C/M	0.078	0.00
JB 37D	0.090	0.00
JB 37F	0.086	0.00
JB 67	0.210	0.00
JB 81	0.028	0.00
JB 82A	0.067	0.00
JB 82B	0.046	0.00
JB 82C	0.090	0.00
JB 87	0.092	0.18
JB 8B	0.114	0.00
JB 6C	0.008	0.00
JB 6E	0.008	0.00
JB 63	0.197	0.00
JB 60B/F	0.079	0.00
JB 60B/M	0.107	0.00
JB 60C	0.120	0.00

Appendix 4- Microprobe analysis

Appendix 4.1-Hornblende analysis- Recalculations were made based on 23 Oxygens

Sample No.	*JB6C*	*JB6C*	*JB6C*	*JB6C*	*JB6C*	*JB6C*	*JB6C*	*JB6C*	*JB6C*	*JB6C*	*JB6C*	*JB6C*	*JB6C*	*JB6C*	*JB6C*	*JB6E*	*JB6E*	*JB6E*	*JB6E*	*JB6E*	*JB6E*	*JB6E*	*JB6E*	*JB6E*
Analysis No.	*A_4*	*B_1*	*C_1*	*C_2*	*C_3*	*D_1*	*D_2*	*D_3*	*E_1*	*E_2*	*E_3*	*F_1*	*F_2*	*G_1*	*G_2*	*A_3*	*A_4*	*A_5*	*A_6*	*B_1*	*B_2*	*B_3*	*C_1*	*C_2*
SiO2	45.29	44.58	44.70	44.59	45.36	44.86	45.27	44.95	45.23	44.49	44.44	44.75	44.14	44.60	44.70	43.94	44.31	44.46	44.72	44.49	44.11	43.46	44.12	44.10
TiO2	0.99	0.91	0.76	0.98	1.00	1.02	0.90	0.78	1.15	1.19	0.98	1.16	1.14	1.05	0.88	1.07	1.00	0.92	0.83	1.11	1.29	1.07	1.19	1.19
Al2O3	7.75	7.79	7.79	7.71	7.42	7.50	7.60	7.85	7.66	7.79	7.73	7.41	8.14	7.90	7.73	7.97	8.23	8.19	8.12	7.98	8.07	8.39	8.01	7.81
FeO	15.93	17.38	15.27	16.21	15.90	16.85	16.35	15.65	16.17	17.32	15.49	17.77	17.92	16.04	15.97	17.89	16.52	17.65	16.69	18.36	18.62	18.48	18.57	18.26
Na2O	2.54	2.36	2.39	2.42	2.50	2.59	2.36	2.37	2.53	2.46	2.41	2.47	2.55	2.37	2.25	1.95	2.00	2.04	1.99	2.04	1.99	2.06	1.91	2.06
CaO	11.49	11.38	11.49	11.50	11.40	11.40	11.53	11.34	11.23	11.29	11.24	11.24	11.41	11.57	11.64	11.48	11.54	11.33	11.65	11.15	11.30	11.37	11.50	11.07
MnO	0.21	0.27	0.27	0.27	0.21	0.20	0.23	0.32	0.23	0.27	0.28	0.29	0.26	0.27	0.28	0.27	0.23	0.28	0.24	0.26	0.32	0.19	0.23	0.28
MgO	12.40	11.08	12.59	11.72	12.14	11.34	12.02	12.54	11.63	11.10	12.20	10.84	10.87	11.92	11.62	10.64	11.42	10.78	11.52	10.29	10.27	10.14	10.27	9.98
K2O	1.19	1.28	1.21	1.18	1.10	1.18	1.13	1.35	1.13	1.17	1.21	1.16	1.20	1.26	1.20	1.31	1.23	1.18	1.26	1.18	1.22	1.28	1.17	1.17
Cl	0.38	0.48	0.37	0.41	0.38	0.42	0.42	0.59	0.41	0.35	0.40	0.42	0.45	0.41	0.43	0.70	0.59	0.54	0.70	0.47	0.61	0.76	0.50	0.45
F	0.62	0.60	0.92	0.76	0.78	0.81	0.79	0.92	0.75	0.83	0.79	0.52	0.72	0.80	0.82	0.39	0.53	0.42	0.44	0.32	0.35	0.30	0.27	0.27
Total	98.78	98.10	97.75	97.75	98.20	98.16	98.58	98.66	98.12	98.25	97.16	98.03	98.80	98.19	97.53	97.62	97.60	97.79	98.16	97.64	98.14	97.50	97.73	96.64
Si	6.74	6.74	6.73	6.75	6.80	6.78	6.78	6.72	6.80	6.72	6.73	6.78	6.66	6.71	6.78	6.69	6.70	6.72	6.72	6.74	6.68	6.64	6.70	6.76
Ti	0.11	0.10	0.09	0.11	0.11	0.12	0.10	0.09	0.13	0.14	0.11	0.13	0.13	0.12	0.10	0.12	0.11	0.10	0.09	0.13	0.15	0.12	0.14	0.14
Al	1.36	1.39	1.38	1.37	1.31	1.34	1.34	1.38	1.36	1.39	1.38	1.32	1.45	1.40	1.38	1.43	1.47	1.46	1.44	1.43	1.44	1.51	1.43	1.41
Fe3+	0.26	0.23	0.29	0.22	0.23	0.18	0.26	0.30	0.20	0.26	0.28	0.23	0.25	0.23	0.17	0.25	0.25	0.29	0.24	0.29	0.30	0.24	0.28	0.25
Fe2+	1.72	1.96	1.63	1.83	1.77	1.95	1.79	1.66	1.84	1.93	1.68	2.02	2.01	1.79	1.85	2.03	1.84	1.94	1.86	2.03	2.06	2.12	2.08	2.09
Na	0.73	0.69	0.70	0.71	0.73	0.76	0.68	0.69	0.74	0.72	0.71	0.73	0.75	0.69	0.66	0.58	0.59	0.60	0.58	0.60	0.58	0.61	0.56	0.61
Ca	1.83	1.84	1.85	1.86	1.83	1.85	1.85	1.82	1.81	1.83	1.82	1.82	1.84	1.87	1.89	1.87	1.87	1.84	1.88	1.81	1.83	1.86	1.87	1.82
Mn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.04	0.04	0.03	0.03	0.04	0.04	0.03	0.04	0.03	0.03	0.04	0.02	0.03	0.04
Mg	2.75	2.50	2.83	2.64	2.71	2.56	2.68	2.80	2.61	2.50	2.76	2.45	2.44	2.68	2.63	2.41	2.57	2.43	2.58	2.33	2.32	2.31	2.32	2.28
K	0.23	0.25	0.23	0.23	0.21	0.23	0.21	0.26	0.22	0.23	0.23	0.22	0.23	0.24	0.23	0.25	0.24	0.23	0.24	0.23	0.24	0.25	0.23	0.23
Cl	0.10	0.12	0.09	0.10	0.10	0.11	0.11	0.15	0.10	0.09	0.10	0.11	0.12	0.11	0.11	0.18	0.15	0.14	0.18	0.12	0.16	0.20	0.13	0.12
F	0.29	0.29	0.44	0.37	0.37	0.39	0.37	0.44	0.36	0.40	0.38	0.25	0.35	0.38	0.39	0.19	0.25	0.20	0.21	0.15	0.17	0.15	0.13	0.13

Sample No.	JB6E	JB6E	JB6E	JB6E	JB6E	JB6E	JB6E	JB6E	JB8B	JB8B	JB8B	JB8B	JB8B	JB8B	JB8B	JB8B	JB60C	JB60C	JB60C	JB60C	JB60C	JB60C	JB60C
Analysis No.	***D_7***	***D_8***	***D_9***	***D_14***	***D_11***	***E_3***	***E_4***	***E_5***	***A_1***	***B_1***	***C_1***	***C_2***	***C_3***	***D_1***	***D_3***	***E_1***	***A_4***	***B_1***	***B_2***	***B_3***	***B_4***	***B_7***	***C_1***
SiO2	44.42	44.91	44.22	44.31	44.31	43.71	43.09	43.96	44.37	44.16	43.92	43.87	44.63	44.92	44.93	45.18	44.55	44.34	43.89	43.37	43.76	44.52	43.67
TiO2	1.04	1.06	1.13	0.93	1.06	0.92	1.04	0.99	1.17	1.14	1.05	1.09	1.16	1.03	1.05	1.05	1.29	1.17	1.12	1.11	1.07	1.20	1.25
Al2O3	8.30	7.88	8.28	8.19	8.15	8.58	8.80	8.25	7.87	7.79	8.36	8.38	7.65	7.51	7.67	7.49	8.64	7.91	8.90	8.39	8.64	7.69	8.25
FeO	17.82	17.49	17.98	16.37	17.78	18.05	18.93	17.55	20.61	20.07	20.24	20.76	20.04	20.15	20.34	19.47	17.90	18.87	17.38	19.68	18.59	18.57	19.00
Na2O	2.06	1.99	2.03	1.99	1.90	1.90	2.05	2.00	2.11	2.01	2.08	2.08	2.02	1.90	1.91	1.83	2.10	2.27	2.12	2.22	2.25	2.11	2.19
CaO	11.47	11.73	11.39	11.66	11.56	11.69	11.56	11.71	11.00	11.16	11.34	11.34	11.34	11.42	11.36	11.26	11.56	11.28	11.58	11.32	11.59	11.49	11.45
MnO	0.27	0.21	0.21	0.28	0.22	0.26	0.22	0.19	0.29	0.28	0.21	0.27	0.27	0.27	0.22	0.22	0.23	0.25	0.25	0.28	0.31	0.31	0.22
MgO	11.07	11.10	10.67	11.58	11.06	10.42	9.91	10.98	9.01	9.28	8.98	8.93	9.62	9.47	9.57	9.46	10.50	10.09	10.88	9.68	10.26	10.20	9.71
K2O	1.25	1.03	1.14	1.20	1.26	1.41	1.47	1.29	1.22	1.19	1.24	1.27	1.21	1.16	1.21	1.12	1.29	1.16	1.34	1.37	1.27	1.20	1.22
Cl	0.58	0.56	0.51	0.63	0.76	0.97	0.87	0.71	0.45	0.43	0.43	0.47	0.42	0.39	0.40	0.38	0.56	0.50	0.59	0.68	0.58	0.49	0.57
F	0.29	0.37	0.28	0.38	0.22	0.27	0.27	0.36	0.30	0.23	0.44	0.49	0.35	0.51	0.28	0.34	0.26	0.30	0.35	0.28	0.43	0.27	0.24
Total	98.56	98.34	97.83	97.51	98.27	98.18	98.22	97.99	98.41	97.73	98.28	98.95	98.71	98.72	98.94	97.82	98.88	98.14	98.40	98.36	98.75	98.04	97.77
Si	6.66	6.75	6.68	6.69	6.67	6.63	6.57	6.66	6.74	6.74	6.70	6.66	6.75	6.80	6.77	6.86	6.67	6.72	6.61	6.61	6.61	6.75	6.67
Ti	0.12	0.12	0.13	0.11	0.12	0.11	0.12	0.11	0.13	0.13	0.12	0.12	0.13	0.12	0.12	0.12	0.14	0.13	0.13	0.13	0.12	0.14	0.14
Al	1.47	1.39	1.47	1.46	1.45	1.53	1.58	1.47	1.41	1.40	1.50	1.50	1.36	1.34	1.36	1.34	1.53	1.41	1.58	1.51	1.54	1.37	1.48
Fe3+	0.32	0.24	0.30	0.25	0.29	0.20	0.22	0.24	0.30	0.30	0.25	0.29	0.30	0.28	0.32	0.24	0.21	0.25	0.25	0.28	0.25	0.22	0.20
Fe2+	1.92	1.95	1.97	1.82	1.95	2.10	2.19	1.99	2.32	2.27	2.33	2.35	2.24	2.27	2.24	2.23	2.03	2.14	1.93	2.23	2.10	2.14	2.22
Na	0.60	0.58	0.59	0.58	0.55	0.56	0.61	0.59	0.62	0.59	0.61	0.61	0.59	0.56	0.56	0.54	0.61	0.67	0.62	0.66	0.66	0.62	0.65
Ca	1.84	1.89	1.84	1.89	1.86	1.90	1.89	1.90	1.79	1.83	1.85	1.85	1.84	1.85	1.83	1.83	1.86	1.83	1.87	1.85	1.88	1.87	1.87
Mn	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.02	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.03
Mg	2.48	2.49	2.40	2.61	2.48	2.36	2.25	2.48	2.04	2.11	2.04	2.02	2.17	2.14	2.15	2.14	2.34	2.28	2.44	2.20	2.31	2.31	2.21
K	0.24	0.20	0.22	0.23	0.24	0.27	0.29	0.25	0.24	0.23	0.24	0.25	0.23	0.22	0.23	0.22	0.25	0.22	0.26	0.27	0.24	0.23	0.24
Cl	0.15	0.14	0.13	0.16	0.19	0.25	0.23	0.18	0.12	0.11	0.11	0.12	0.11	0.10	0.10	0.10	0.14	0.13	0.15	0.18	0.15	0.13	0.15
F	0.14	0.18	0.13	0.18	0.10	0.13	0.13	0.17	0.14	0.11	0.21	0.24	0.17	0.24	0.13	0.17	0.13	0.15	0.17	0.13	0.21	0.13	0.11

Sample No.	JB60C	JB60C	JB60C	JB60C	JB60C	JB63	JB63	JB81	JB81	JB81	JB81	JB81	JB81	JB81	JB81	JB82B	JB82B	JB82B	JB82B	JB82B	JB82B	JB82B
Analysis No.	**C_2**	**C_3**	**D_1**	**D_2**	**D_3**	**B_1**	**C_1**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
SiO2	43.74	42.99	43.66	43.20	41.90	44.81	45.03	47.80	48.05	49.34	48.47	48.18	47.05	46.28	47.55	45.40	44.47	45.24	44.70	45.41	44.77	44.35
TiO2	1.11	1.13	1.09	1.01	0.86	2.11	1.97	0.30	0.33	0.57	0.85	0.51	0.48	0.68	0.47	1.11	1.19	0.82	0.98	1.12	0.90	0.91
Al2O3	8.42	8.95	8.27	8.86	9.67	8.35	8.06	6.66	6.49	5.72	6.37	6.40	7.04	7.55	6.92	8.44	8.88	8.61	8.60	8.52	8.42	8.62
FeO	18.85	19.21	19.35	19.38	20.52	18.52	18.35	15.82	16.22	15.33	16.20	15.56	17.16	16.79	16.29	18.10	18.37	18.25	17.84	18.36	18.27	18.07
Na2O	2.13	2.13	2.20	2.18	2.05	2.03	2.20	1.52	1.43	1.45	1.47	1.32	1.40	1.61	0.94	1.66	1.68	1.68	1.77	1.70	1.63	1.69
CaO	11.45	11.43	11.52	11.54	11.30	11.48	11.34	11.65	11.80	11.68	11.59	11.81	11.87	11.55	11.67	11.69	11.80	11.46	11.53	11.56	11.81	11.50
MnO	0.21	0.27	0.22	0.22	0.21	0.34	0.39	0.21	0.14	0.15	0.20	0.14	0.21	0.22	0.11	0.32	0.38	0.28	0.32	0.42	0.34	0.35
MgO	9.77	9.37	9.59	9.16	8.77	10.48	10.42	12.63	12.79	13.79	13.22	13.25	12.50	12.05	11.96	10.87	10.62	11.04	11.07	11.06	10.94	10.87
K2O	1.29	1.47	1.24	1.44	1.74	1.15	1.12	0.40	0.39	0.83	0.91	0.94	1.01	1.13	0.96	1.20	1.21	1.10	1.20	1.11	1.19	1.15
Cl	0.57	0.73	0.57	0.62	0.96	0.48	0.50	0.19	0.18	0.14	0.16	0.18	0.21	0.24	0.43	0.29	0.28	0.28	0.28	0.25	0.29	0.27
F	0.38	0.25	0.36	0.33	0.29	0.17	0.11	0.60	0.60	0.54	0.48	0.61	0.58	0.63	0.39	0.20	0.23	0.39	0.20	0.19	0.18	0.31
Total	97.91	97.93	98.07	97.94	98.28	99.92	99.49	97.78	98.42	99.54	99.92	98.89	99.51	98.73	97.69	99.30	99.12	99.15	98.49	99.72	98.74	98.08
Si	6.67	6.58	6.66	6.62	6.45	6.64	6.70	7.06	7.05	7.13	7.01	7.04	6.89	6.85	7.05	6.72	6.62	6.70	6.67	6.68	6.67	6.65
Ti	0.13	0.13	0.13	0.12	0.10	0.24	0.22	0.03	0.04	0.06	0.09	0.06	0.05	0.08	0.05	0.12	0.13	0.09	0.11	0.12	0.10	0.10
Al	1.51	1.61	1.49	1.60	1.75	1.46	1.41	1.16	1.12	0.97	1.09	1.10	1.21	1.32	1.21	1.47	1.56	1.50	1.51	1.48	1.48	1.52
Fe3+	0.21	0.20	0.21	0.16	0.27	0.28	0.24	0.39	0.44	0.40	0.44	0.38	0.52	0.40	0.33	0.35	0.38	0.45	0.41	0.44	0.44	0.46
Fe2+	2.19	2.26	2.26	2.33	2.37	2.02	2.04	1.56	1.55	1.46	1.52	1.52	1.58	1.68	1.69	1.89	1.90	1.81	1.82	1.82	1.84	1.81
Na	0.63	0.63	0.65	0.65	0.61	0.58	0.63	0.44	0.41	0.41	0.41	0.37	0.40	0.46	0.27	0.48	0.48	0.48	0.51	0.49	0.47	0.49
Ca	1.87	1.87	1.88	1.89	1.86	1.82	1.81	1.84	1.85	1.81	1.80	1.85	1.86	1.83	1.85	1.85	1.88	1.82	1.84	1.82	1.89	1.85
Mn	0.03	0.03	0.03	0.03	0.03	0.04	0.05	0.03	0.02	0.02	0.02	0.02	0.03	0.03	0.01	0.04	0.05	0.04	0.04	0.05	0.04	0.04
Mg	2.22	2.14	2.18	2.09	2.01	2.31	2.31	2.78	2.80	2.97	2.85	2.89	2.73	2.66	2.64	2.40	2.36	2.44	2.46	2.43	2.43	2.43
K	0.25	0.29	0.24	0.28	0.34	0.22	0.21	0.08	0.07	0.15	0.17	0.18	0.19	0.21	0.18	0.23	0.23	0.21	0.23	0.21	0.23	0.22
Cl	0.15	0.19	0.15	0.16	0.25	0.12	0.13	0.05	0.05	0.04	0.04	0.05	0.05	0.06	0.11	0.07	0.07	0.07	0.07	0.06	0.07	0.07
F	0.18	0.12	0.17	0.16	0.14	0.08	0.05	0.28	0.28	0.25	0.22	0.28	0.27	0.30	0.18	0.10	0.11	0.18	0.10	0.09	0.09	0.15

Sample No.	JB82B	JB82B	JB82A	JB82A	JB82A	JB82A	JB82A	JB82A	JB82A	JB82A	JB82A	JB82A	JB82A	JB82C	JB82C	JB82C	JB82C	JB82C	JB82C	JB82C	JB82C
Analysis No.	8	9	1	2	3	4	5	6	7	8	9	10	11	4	9	10	11	13	15	17	18
SiO2	45.09	44.78	45.80	47.01	45.36	48.46	45.88	45.38	45.50	45.20	45.03	45.02	45.09	46.29	45.56	43.51	45.47	46.78	43.05	46.42	45.47
TiO2	1.27	1.32	0.19	0.12	0.10	0.15	0.10	0.10	0.14	0.22	0.15	0.09	0.20	0.69	1.14	1.62	0.54	0.71	0.70	0.40	0.44
Al2O3	8.53	8.38	8.15	7.57	8.48	6.28	8.50	8.44	8.62	8.60	8.95	8.66	8.74	7.85	8.56	10.01	8.59	7.32	9.98	8.12	8.49
FeO	17.91	18.00	17.66	16.89	17.76	15.64	17.43	17.77	17.59	17.30	18.43	18.51	18.10	16.91	16.97	18.71	17.77	16.11	18.93	16.93	18.07
Na2O	1.77	1.59	1.54	1.42	1.34	1.24	1.48	1.50	1.55	1.66	1.53	1.56	1.64	1.34	1.70	1.95	1.65	1.58	1.83	1.48	1.40
CaO	11.64	11.64	11.78	11.90	11.97	11.81	11.93	11.87	11.74	11.54	11.83	11.81	11.71	11.63	11.40	11.47	11.59	11.52	11.67	11.98	11.82
MnO	0.31	0.33	0.15	0.16	0.20	0.15	0.11	0.14	0.15	0.21	0.17	0.19	0.11	0.26	0.36	0.36	0.32	0.38	0.34	0.37	0.33
MgO	10.86	10.98	11.42	11.92	10.83	12.90	11.36	11.10	11.13	10.70	10.58	10.73	10.62	11.69	11.26	9.90	11.07	12.17	9.91	11.68	11.13
K2O	1.19	1.19	1.06	0.88	1.13	0.72	1.03	1.08	1.10	1.17	1.13	1.10	1.19	0.96	1.05	1.38	0.48	0.92	1.35	0.94	1.09
Cl	0.25	0.27	0.23	0.22	0.37	0.15	0.28	0.27	0.28	0.28	0.33	0.29	0.29	0.28	0.35	0.41	0.37	0.24	0.46	0.33	0.39
F	0.28	0.18	0.31	0.18	0.40	0.27	0.34	0.28	0.29	0.30	0.26	0.14	0.28	0.13	0.27	0.28	0.11	0.19	0.22	0.17	0.18
Total	99.10	98.65	98.30	98.27	97.92	97.75	98.44	97.92	98.09	97.18	98.39	98.11	97.97	98.02	98.62	99.60	97.96	97.92	98.44	98.82	98.81
Si	6.70	6.67	6.81	6.94	6.80	7.13	6.81	6.78	6.79	6.82	6.73	6.73	6.77	6.86	6.75	6.48	6.76	6.92	6.49	6.84	6.74
Ti	0.14	0.15	0.02	0.01	0.01	0.02	0.01	0.01	0.02	0.03	0.02	0.01	0.02	0.08	0.13	0.18	0.06	0.08	0.08	0.04	0.05
Al	1.49	1.47	1.43	1.32	1.50	1.09	1.49	1.49	1.52	1.53	1.58	1.53	1.55	1.37	1.49	1.76	1.50	1.28	1.77	1.41	1.48
Fe3+	0.34	0.40	0.45	0.38	0.37	0.37	0.40	0.43	0.39	0.30	0.42	0.48	0.34	0.40	0.36	0.34	0.48	0.37	0.41	0.36	0.48
Fe2+	1.89	1.85	1.75	1.71	1.86	1.56	1.76	1.79	1.80	1.88	1.88	1.83	1.93	1.69	1.74	2.00	1.73	1.62	1.98	1.73	1.76
Na	0.51	0.46	0.44	0.41	0.39	0.35	0.43	0.43	0.45	0.49	0.44	0.45	0.48	0.39	0.49	0.56	0.48	0.45	0.53	0.42	0.40
Ca	1.85	1.86	1.88	1.88	1.92	1.86	1.90	1.90	1.88	1.86	1.89	1.89	1.88	1.85	1.81	1.83	1.84	1.83	1.88	1.89	1.88
Mn	0.04	0.04	0.02	0.02	0.03	0.02	0.01	0.02	0.02	0.03	0.02	0.02	0.01	0.03	0.05	0.05	0.04	0.05	0.04	0.05	0.04
Mg	2.40	2.44	2.53	2.62	2.42	2.83	2.51	2.47	2.47	2.41	2.36	2.39	2.38	2.58	2.49	2.20	2.45	2.68	2.23	2.57	2.46
K	0.23	0.23	0.20	0.17	0.22	0.13	0.19	0.21	0.21	0.23	0.21	0.21	0.23	0.18	0.20	0.26	0.09	0.17	0.26	0.18	0.21
Cl	0.06	0.07	0.06	0.06	0.09	0.04	0.07	0.07	0.07	0.07	0.08	0.07	0.07	0.07	0.09	0.10	0.09	0.06	0.12	0.08	0.10
F	0.13	0.08	0.15	0.09	0.19	0.12	0.16	0.13	0.14	0.14	0.12	0.07	0.13	0.06	0.13	0.13	0.05	0.09	0.11	0.08	0.09

Sample No.	*JB82C*	*JB82C*	*JB1*	*JB1*	*JB1*	*JB1*	*JB1*	*JB1*	*JB1*	*JB1*	*JB1*	*JB1*	*JB1*	*JB1*	*JB1*	*JB1*	*JB1*	*JB25A*	*JB25A*	*JB25A*	*JB25A*	*JB25A*
Analysis No.	*20*	*21*	*A_1*	*C_1*	*C_2*	*C_5*	*C_10*	*D_1*	*D_2*	*D_3*	*EE_1*	*EE_5*	*EE_7*	*C_7*	*C_9*	*C_11*	*EE_2*	*A_5*	*A_6*	*A_7*	*B_1*	*B_5*
SiO2	45.98	47.32	42.01	43.15	41.52	42.13	41.57	42.03	42.09	41.98	41.96	43.15	41.90	47.77	44.15	48.20	42.19	41.52	41.24	40.95	42.02	41.04
TiO2	0.42	0.40	3.05	2.18	2.45	2.45	2.84	2.94	3.11	3.20	2.87	2.12	2.90	1.01	1.84	0.99	2.30	2.32	3.58	2.95	2.78	2.89
Al2O3	8.22	7.41	10.84	9.91	10.91	10.83	10.87	10.90	10.83	10.97	10.80	9.62	10.57	6.48	9.63	6.90	11.03	10.77	10.93	11.18	10.22	11.04
FeO	17.54	16.51	14.33	14.14	15.27	14.99	14.47	13.38	13.77	13.53	14.53	14.74	13.72	12.98	13.91	11.76	14.18	14.41	14.52	14.54	13.67	14.57
Na2O	1.51	1.34	2.55	2.38	2.39	2.30	2.50	2.67	2.58	2.52	2.58	2.37	2.66	1.27	2.16	1.66	2.09	2.58	2.88	2.71	2.73	2.92
CaO	11.82	11.96	11.26	11.30	11.17	11.39	11.18	11.13	11.25	11.16	11.24	10.49	11.12	11.88	11.36	11.58	10.89	11.36	11.06	11.22	11.22	11.24
MnO	0.28	0.35	0.17	0.21	0.23	0.16	0.25	0.15	0.21	0.19	0.17	0.22	0.20	0.23	0.19	0.25	0.22	0.29	0.26	0.23	0.17	0.20
MgO	11.21	12.25	12.17	12.73	12.04	11.99	11.93	12.17	12.00	11.94	11.85	12.21	12.14	14.82	13.01	15.64	12.19	11.59	11.44	11.50	12.29	11.47
K2O	1.03	0.87	1.41	1.47	1.41	1.47	1.48	1.50	1.45	1.43	1.40	1.37	1.41	0.68	1.10	0.67	1.81	1.31	1.25	1.40	1.37	1.29
Cl	0.36	0.30	0.42	0.46	0.42	0.50	0.43	0.40	0.37	0.39	0.41	0.41	0.41	0.27	0.47	0.27	0.53	0.37	0.32	0.37	0.35	0.33
F	0.21	0.25	0.22	0.35	0.20	0.25	0.21	0.14	0.24	0.19	0.19	0.27	0.27	0.23	0.20	0.28	0.20	0.34	0.25	0.30	0.39	0.23
Total	98.58	98.96	98.43	98.28	98.01	98.45	97.73	97.41	97.90	97.50	97.99	96.97	97.30	97.62	98.03	98.21	97.63	96.86	97.73	97.35	97.20	97.22
Si	6.82	6.94	6.24	6.41	6.21	6.27	6.23	6.29	6.28	6.28	6.27	6.47	6.30	6.96	6.52	6.94	6.30	6.29	6.20	6.19	6.33	6.21
Ti	0.05	0.04	0.34	0.24	0.28	0.27	0.32	0.33	0.35	0.36	0.32	0.24	0.33	0.11	0.20	0.11	0.26	0.26	0.40	0.34	0.31	0.33
Al	1.44	1.28	1.90	1.73	1.92	1.90	1.92	1.92	1.91	1.93	1.90	1.70	1.87	1.11	1.68	1.17	1.94	1.92	1.94	1.99	1.81	1.97
Fe3+	0.35	0.38	0.28	0.31	0.43	0.32	0.30	0.19	0.20	0.19	0.25	0.41	0.22	0.45	0.35	0.45	0.37	0.23	0.22	0.24	0.21	0.21
Fe2+	1.83	1.64	1.50	1.45	1.48	1.54	1.52	1.48	1.52	1.50	1.56	1.43	1.50	1.13	1.37	0.97	1.40	1.59	1.61	1.60	1.51	1.63
Na	0.43	0.38	0.73	0.69	0.69	0.66	0.73	0.77	0.75	0.73	0.75	0.69	0.77	0.36	0.62	0.46	0.60	0.76	0.84	0.79	0.80	0.86
Ca	1.88	1.88	1.79	1.80	1.79	1.82	1.80	1.78	1.80	1.79	1.80	1.69	1.79	1.85	1.80	1.79	1.74	1.84	1.78	1.82	1.81	1.82
Mn	0.04	0.04	0.02	0.03	0.03	0.02	0.03	0.02	0.03	0.02	0.02	0.03	0.03	0.03	0.02	0.03	0.03	0.04	0.03	0.03	0.02	0.03
Mg	2.48	2.68	2.70	2.82	2.68	2.66	2.67	2.72	2.67	2.66	2.64	2.73	2.72	3.22	2.86	3.36	2.71	2.62	2.56	2.59	2.76	2.59
K	0.20	0.16	0.27	0.28	0.27	0.28	0.28	0.29	0.28	0.27	0.27	0.26	0.27	0.13	0.21	0.12	0.34	0.25	0.24	0.27	0.26	0.25
Cl	0.09	0.08	0.11	0.12	0.11	0.13	0.11	0.10	0.09	0.10	0.10	0.11	0.11	0.07	0.12	0.07	0.14	0.09	0.08	0.10	0.09	0.09
F	0.10	0.12	0.10	0.17	0.10	0.12	0.10	0.07	0.11	0.09	0.09	0.13	0.13	0.11	0.09	0.13	0.09	0.17	0.12	0.14	0.18	0.11

Sample No.	***JB25A***	***JB25A***	***JB25A***	***JB25A***	***JB25A***	***JB25A***	***JB25A***	***JB25A***	***JB25A***	***JB25A***	***JB25A***	***JB25A***	***JB25A***	***JB25A***	***JB25A***	***JB25A***	***JB25A***	***JB25A***	***JB25A***	***JB25A***
Analysis No.	***B_6***	***B_7***	***C_1***	***C_2***	***D_3***	***D_4***	***D_5***	***D_6***	***D_7***	***E***	***E_1***	***E_2***	***E_3***	***F_1***	***F_2***	***F_3***	***F_4***	***F_5***	***F_6***	***F_7***
SiO2	41.88	40.63	42.36	45.93	42.00	41.66	41.75	42.93	41.42	41.35	41.35	44.15	42.43	41.14	42.00	42.65	41.58	41.58	41.74	42.14
TiO2	2.16	2.86	2.26	1.62	2.79	2.60	2.45	2.16	3.24	3.06	2.56	2.25	2.49	2.74	1.70	1.59	2.99	3.20	2.57	2.08
Al2O3	10.26	10.96	9.98	7.66	10.56	10.60	10.75	10.00	10.99	10.60	10.58	8.84	10.09	11.12	11.04	10.11	10.98	10.57	10.86	10.66
FeO	13.97	15.25	14.45	12.61	13.88	14.98	14.38	13.81	14.39	14.18	14.35	13.14	14.11	14.25	14.14	14.72	14.53	14.15	13.91	13.79
Na2O	2.79	2.92	2.68	2.59	2.86	2.87	2.81	2.68	2.91	2.88	2.90	2.76	2.66	2.85	2.60	2.47	2.77	2.99	2.77	2.66
CaO	11.33	11.27	11.17	10.97	11.09	11.35	11.53	11.42	11.02	11.16	11.19	10.99	10.81	11.17	11.32	11.27	11.28	10.84	11.30	11.42
MnO	0.30	0.29	0.28	0.26	0.20	0.29	0.16	0.25	0.19	0.26	0.23	0.30	0.28	0.23	0.26	0.22	0.23	0.24	0.19	0.18
MgO	12.64	11.80	12.51	14.50	12.11	11.90	12.20	12.77	11.71	11.83	11.87	13.32	12.34	11.77	12.63	12.44	11.78	11.77	12.09	12.47
K2O	1.35	1.24	1.46	1.09	1.36	1.30	1.44	1.31	1.31	1.33	1.30	1.19	1.36	1.28	1.18	1.07	1.30	1.27	1.35	1.16
Cl	0.39	0.40	0.39	0.34	0.35	0.43	0.39	0.40	0.36	0.33	0.38	0.37	0.35	0.41	0.41	0.41	0.39	0.36	0.33	0.32
F	0.37	0.30	0.28	0.52	0.31	0.26	0.36	0.32	0.37	0.25	0.27	0.39	0.38	0.17	0.33	0.22	0.26	0.28	0.34	0.32
Total	97.45	97.92	97.82	98.09	97.51	98.24	98.21	98.05	97.90	97.23	96.98	97.68	97.31	97.13	97.60	97.17	98.09	97.25	97.45	97.20
Si	6.30	6.11	6.34	6.74	6.30	6.24	6.25	6.39	6.21	6.24	6.26	6.56	6.37	6.21	6.27	6.39	6.22	6.27	6.27	6.32
Ti	0.24	0.32	0.25	0.18	0.31	0.29	0.28	0.24	0.37	0.35	0.29	0.25	0.28	0.31	0.19	0.18	0.34	0.36	0.29	0.23
Al	1.82	1.94	1.76	1.33	1.87	1.87	1.90	1.75	1.94	1.89	1.89	1.55	1.78	1.98	1.94	1.79	1.94	1.88	1.92	1.88
Fe3+	0.30	0.38	0.33	0.35	0.22	0.27	0.23	0.26	0.24	0.22	0.24	0.27	0.33	0.25	0.40	0.40	0.24	0.23	0.23	0.29
Fe2+	1.45	1.54	1.48	1.19	1.52	1.60	1.57	1.46	1.57	1.57	1.58	1.36	1.44	1.55	1.36	1.45	1.57	1.56	1.51	1.44
Na	0.81	0.85	0.78	0.74	0.83	0.83	0.82	0.77	0.85	0.84	0.85	0.79	0.77	0.83	0.75	0.72	0.80	0.87	0.81	0.77
Ca	1.82	1.82	1.79	1.73	1.78	1.82	1.85	1.82	1.77	1.80	1.82	1.75	1.74	1.81	1.81	1.81	1.81	1.75	1.82	1.84
Mn	0.04	0.04	0.04	0.03	0.03	0.04	0.02	0.03	0.02	0.03	0.03	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.02	0.02
Mg	2.83	2.65	2.79	3.17	2.71	2.66	2.72	2.83	2.62	2.66	2.68	2.95	2.76	2.65	2.81	2.78	2.63	2.64	2.71	2.79
K	0.26	0.24	0.28	0.20	0.26	0.25	0.27	0.25	0.25	0.26	0.25	0.22	0.26	0.25	0.22	0.21	0.25	0.24	0.26	0.22
Cl	0.10	0.10	0.10	0.09	0.09	0.11	0.10	0.10	0.09	0.09	0.10	0.09	0.09	0.10	0.10	0.10	0.10	0.09	0.08	0.08
F	0.18	0.14	0.13	0.24	0.15	0.12	0.17	0.15	0.18	0.12	0.13	0.18	0.18	0.08	0.16	0.10	0.12	0.13	0.16	0.15

Sample No.	***JB12B***	***JB12B***	***JB12B***	***JB12B***	***JB12B***	***JB12B***	***JB35F***	***JB35F***	***JB35F***	***JB35F***	***JB35F***	***JB35F***	***JB35F***	***JB35F***	***JB35F***	***JB35F***	***JB35F***	***JB35F***	***JB35F***	***JB35F***
Analysis No.	***A_3***	***B_1***	***C_3***	***D_1***	***D_2***	***F_4***	***A_4***	***B_4***	***B_5***	***B_6***	***C_3***	***C_4***	***D_1***	***D_2***	***E_1***	***E_5***	***F_1***	***G_4***	***H_5***	***H_9***
SiO2	44.55	44.06	45.12	43.88	42.39	45.31	43.84	43.97	43.94	41.88	42.47	41.47	40.63	44.23	44.41	41.68	43.95	44.09	43.24	42.88
TiO2	0.75	1.71	0.97	1.68	1.69	0.81	1.09	1.84	1.69	1.28	1.30	1.76	1.29	1.47	1.28	1.29	1.69	1.70	1.58	1.41
Al2O3	9.00	9.36	8.41	9.45	10.52	8.15	9.00	8.98	8.99	10.19	8.88	9.47	10.92	8.81	8.87	10.44	8.52	8.77	8.76	9.09
FeO	15.71	15.09	14.82	14.94	15.26	15.03	16.91	15.41	15.50	16.99	15.44	15.76	18.37	15.76	15.49	17.47	14.86	15.02	15.36	15.32
Na2O	1.61	1.96	1.67	2.00	2.06	1.55	1.08	1.84	1.85	1.81	1.49	1.57	1.56	1.64	1.63	1.58	1.70	1.74	1.61	1.59
CaO	11.19	11.27	11.38	11.36	11.43	11.47	10.81	11.33	11.19	11.49	11.79	11.54	11.66	11.73	11.68	11.47	11.52	11.48	11.64	11.64
MnO	0.25	0.33	0.25	0.27	0.22	0.28	0.29	0.35	0.35	0.33	0.31	0.32	0.32	0.33	0.36	0.33	0.29	0.29	0.34	0.33
MgO	11.66	11.69	12.42	11.68	10.83	12.38	12.01	11.74	11.81	10.68	11.66	11.38	9.52	11.89	11.94	10.14	12.24	12.04	11.75	11.82
K2O	1.21	1.28	1.09	1.30	1.34	1.09	1.13	1.21	1.21	1.59	1.37	1.51	1.95	1.19	1.29	1.71	1.06	1.14	1.30	1.31
Cl	0.94	0.47	0.59	0.43	0.44	0.81	0.66	0.47	0.47	0.96	0.79	0.88	1.34	0.62	0.60	1.09	0.44	0.47	0.67	0.67
F	0.16	0.09	0.08	0.19	0.10	0.15	0.10	0.17	0.19	0.15	0.13	0.18	0.11	0.15	0.16	0.13	0.20	0.13	0.15	0.13
Total	97.04	97.31	96.80	97.18	96.28	97.04	96.92	97.32	97.19	97.35	95.63	95.84	97.67	97.81	97.71	97.33	96.47	96.86	96.41	96.20
Si	6.69	6.59	6.75	6.59	6.45	6.78	6.56	6.59	6.59	6.38	6.52	6.39	6.25	6.61	6.64	6.37	6.63	6.62	6.57	6.53
Ti	0.08	0.19	0.11	0.19	0.19	0.09	0.12	0.21	0.19	0.15	0.15	0.20	0.15	0.17	0.14	0.15	0.19	0.19	0.18	0.16
Al	1.59	1.65	1.48	1.67	1.89	1.44	1.59	1.59	1.59	1.83	1.61	1.72	1.98	1.55	1.56	1.88	1.51	1.55	1.57	1.63
Fe3+	0.32	0.27	0.33	0.24	0.20	0.31	0.65	0.31	0.36	0.30	0.30	0.32	0.24	0.31	0.30	0.29	0.33	0.31	0.28	0.32
Fe2+	1.65	1.62	1.52	1.63	1.74	1.58	1.47	1.62	1.59	1.86	1.68	1.71	2.12	1.66	1.64	1.95	1.54	1.58	1.67	1.63
Na	0.47	0.57	0.48	0.58	0.61	0.45	0.31	0.53	0.54	0.53	0.44	0.47	0.47	0.48	0.47	0.47	0.50	0.51	0.47	0.47
Ca	1.80	1.81	1.82	1.83	1.86	1.84	1.73	1.82	1.80	1.87	1.94	1.90	1.92	1.88	1.87	1.88	1.86	1.85	1.90	1.90
Mn	0.03	0.04	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.04
Mg	2.61	2.61	2.77	2.61	2.46	2.76	2.68	2.62	2.64	2.43	2.67	2.61	2.18	2.65	2.66	2.31	2.75	2.70	2.66	2.68
K	0.23	0.24	0.21	0.25	0.26	0.21	0.22	0.23	0.23	0.31	0.27	0.30	0.38	0.23	0.25	0.33	0.20	0.22	0.25	0.25
Cl	0.24	0.12	0.15	0.11	0.11	0.21	0.17	0.12	0.12	0.25	0.21	0.23	0.35	0.16	0.15	0.28	0.11	0.12	0.17	0.17
F	0.08	0.04	0.04	0.09	0.05	0.07	0.05	0.08	0.09	0.07	0.06	0.09	0.05	0.07	0.08	0.06	0.10	0.06	0.07	0.06

Sample No.	JB35F	JB35F	JB35F	JB35F	JB35F	JB35F	JB35F	JB35F	JB35F	JB35F	JB35F	JB35F	JB87	JB87	JB87	JB87	JB89	JB89	JB89	JB89	JB89	JB89
Analysis No.	H_17	H_18	A_5	B_3	B_7	B_12	E_2	G_3	H_4	H_6	H_11	H_16	1	2	3	4	1	2	3	4	5	6
SiO2	43.91	43.84	42.83	43.70	41.77	41.49	44.94	44.59	41.98	41.50	45.36	41.08	44.19	45.96	44.27	42.76	41.96	42.50	42.10	42.59	43.71	43.73
TiO2	1.33	1.64	1.32	1.36	1.23	1.38	1.26	1.52	1.30	1.12	0.98	1.28	1.35	1.17	1.76	1.17	3.36	0.70	0.72	0.46	2.10	2.22
Al2O3	8.36	8.93	10.12	9.21	10.21	10.01	7.98	8.59	10.40	9.72	9.01	10.32	9.54	8.87	9.56	10.88	10.80	10.79	11.43	10.99	9.92	10.22
FeO	15.04	15.39	16.48	15.75	17.11	16.82	16.27	15.48	17.81	16.81	15.73	17.22	12.99	12.82	13.41	14.21	18.01	17.13	17.16	17.27	16.83	17.25
Na2O	1.59	1.76	1.44	1.68	1.57	1.58	1.05	1.34	1.45	1.46	1.05	1.57	3.02	3.05	3.29	2.79	2.09	1.92	2.06	1.64	1.66	1.70
CaO	11.65	11.50	11.54	11.28	11.66	11.60	11.73	11.69	11.62	11.75	11.51	11.40	10.91	10.69	10.93	11.43	11.29	11.69	11.56	11.70	11.45	11.57
MnO	0.31	0.31	0.31	0.29	0.33	0.39	0.34	0.35	0.34	0.30	0.36	0.39	0.22	0.23	0.21	0.16	0.08	0.04	0.12	0.09	0.07	0.06
MgO	12.33	11.52	11.06	11.75	10.39	10.77	12.10	11.92	9.93	10.87	12.08	9.87	13.43	14.28	13.41	12.35	9.22	9.89	9.52	9.83	10.38	10.55
K2O	1.19	1.19	1.58	1.28	1.63	1.60	1.31	1.27	1.62	1.57	1.36	1.68	0.85	0.73	0.86	1.36	1.46	1.47	1.37	1.53	1.27	1.35
Cl	0.51	0.45	0.92	0.61	1.01	1.00	0.90	0.68	1.10	1.01	0.80	1.13	0.47	0.27	0.39	0.50	0.55	0.43	0.41	0.44	0.68	0.53
F	0.17	0.07	0.15	0.18	0.12	0.15	0.09	0.09	0.06	0.17	0.09	0.12	0.25	0.21	0.41	0.33	0.00	0.05	0.00	0.00	0.00	0.01
Total	96.38	96.59	97.75	97.09	97.03	96.78	97.98	97.53	97.61	96.27	98.32	96.05	97.23	98.29	98.50	97.94	98.82	96.60	96.45	96.54	98.06	99.19
Si	6.64	6.62	6.45	6.57	6.39	6.36	6.70	6.67	6.39	6.39	6.70	6.37	6.56	6.69	6.52	6.38	6.31	6.49	6.44	6.50	6.54	6.47
Ti	0.15	0.19	0.15	0.15	0.14	0.16	0.14	0.17	0.15	0.13	0.11	0.15	0.15	0.13	0.19	0.13	0.38	0.08	0.08	0.05	0.24	0.25
Al	1.49	1.59	1.80	1.63	1.84	1.81	1.40	1.51	1.87	1.76	1.57	1.89	1.67	1.52	1.66	1.91	1.91	1.94	2.06	1.98	1.75	1.78
Fe3+	0.34	0.26	0.33	0.38	0.27	0.33	0.37	0.30	0.27	0.37	0.40	0.25	0.32	0.42	0.30	0.26	0.16	0.21	0.21	0.26	0.21	0.27
Fe2+	1.56	1.68	1.74	1.60	1.92	1.83	1.66	1.64	2.00	1.79	1.54	1.99	1.30	1.14	1.35	1.52	2.11	1.98	1.98	1.94	1.90	1.86
Na	0.47	0.52	0.42	0.49	0.47	0.47	0.30	0.39	0.43	0.44	0.30	0.47	0.87	0.86	0.94	0.81	0.61	0.57	0.61	0.48	0.48	0.49
Ca	1.89	1.86	1.86	1.82	1.91	1.90	1.87	1.87	1.90	1.94	1.82	1.89	1.73	1.67	1.72	1.83	1.82	1.91	1.89	1.91	1.84	1.84
Mn	0.04	0.04	0.04	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.04	0.05	0.03	0.03	0.03	0.02	0.01	0.00	0.02	0.01	0.01	0.01
Mg	2.78	2.59	2.48	2.63	2.37	2.46	2.69	2.66	2.25	2.49	2.66	2.28	2.97	3.10	2.94	2.75	2.07	2.25	2.17	2.24	2.32	2.33
K	0.23	0.23	0.30	0.25	0.32	0.31	0.25	0.24	0.31	0.31	0.26	0.33	0.16	0.14	0.16	0.26	0.28	0.29	0.27	0.30	0.24	0.25
Cl	0.13	0.12	0.24	0.16	0.26	0.26	0.23	0.17	0.29	0.27	0.20	0.30	0.12	0.07	0.10	0.13	0.14	0.11	0.11	0.11	0.17	0.13
F	0.08	0.03	0.07	0.09	0.06	0.07	0.04	0.04	0.03	0.08	0.04	0.06	0.12	0.10	0.19	0.16	0.00	0.02	0.00	0.00	0.00	0.00

Sample No.	***JB89***	***JB89***	***JB37B***	***JB37B***	***JB37B***	***JB37B***	***JB37B***	***JB37B***	***JB37C***	***JB37C***	***JB37C***	***JB37D***	***JB37D***	***JB37D***	***JB37D***	***JB37D***	***JB37D***	***JB37D***	***JB37D***	***JB37D***	***JB37D***
Analysis No.	***8***	***9***	***A_1***	***B_4***	***G_5***	***G_6***	***G_9***	***G_10***	***D_1***	***D_3***	***F_1***	***B_1***	***C1***	***E1***	***F1***	***F2***	***F3***	***F4***	***F5***	***F6***	***F7***
SiO2	42.37	42.35	45.94	45.94	44.51	45.83	45.51	45.51	45.88	45.26	46.79	42.13	43.88	45.07	44.73	40.24	44.42	41.91	44.16	39.89	44.20
TiO2	3.25	3.64	0.73	1.10	1.24	1.33	0.92	1.31	1.19	1.21	1.06	1.76	1.48	1.35	1.23	1.31	1.41	1.34	1.78	1.91	1.78
Al2O3	11.21	10.94	8.08	8.08	8.69	8.46	8.19	8.29	7.73	8.07	7.42	9.69	9.36	8.43	8.61	10.75	8.92	10.41	9.08	11.46	9.03
FeO	17.33	16.75	14.39	14.48	15.40	13.91	16.62	14.32	13.64	14.22	13.81	16.88	14.84	14.33	13.92	18.58	14.18	16.90	14.37	18.99	15.54
Na2O	1.99	2.01	2.10	1.99	1.92	2.05	1.74	2.27	1.73	1.82	1.52	1.98	2.24	2.06	2.00	2.05	2.25	2.12	2.19	2.15	2.26
CaO	10.84	11.29	11.14	10.95	11.66	11.03	11.34	11.11	11.22	11.45	11.39	10.90	11.13	11.16	11.32	10.83	11.22	11.29	11.35	11.01	11.22
MnO	0.12	0.07	0.14	0.16	0.17	0.13	0.14	0.15	0.13	0.22	0.14	0.16	0.21	0.20	0.20	0.29	0.15	0.27	0.15	0.15	0.20
MgO	9.70	9.66	13.78	13.40	12.58	13.67	12.39	13.39	13.38	13.29	13.95	10.62	12.05	12.82	13.29	9.42	12.77	10.34	12.74	9.49	12.27
K2O	1.43	1.42	1.11	1.15	1.27	1.24	1.15	1.20	1.16	1.29	1.15	1.87	1.32	1.16	1.20	1.94	1.26	1.73	1.31	1.95	1.34
Cl	0.45	0.41	0.27	0.33	0.47	0.41	0.47	0.36	0.45	0.49	0.41	0.96	0.53	0.45	0.55	1.11	0.46	1.01	0.57	1.09	0.72
F	0.02	0.09	0.67	0.70	0.57	0.82	0.45	0.73	0.53	0.52	0.53	0.32	0.38	0.38	0.31	0.14	0.35	0.43	0.42	0.20	0.36
Total	98.71	98.63	98.34	98.28	98.49	98.89	98.91	98.64	97.04	97.84	98.16	97.27	97.42	97.43	97.36	96.66	97.39	97.75	98.11	98.28	98.91
Si	6.32	6.34	6.75	6.76	6.61	6.71	6.71	6.70	6.83	6.72	6.86	6.43	6.58	6.71	6.65	6.25	6.63	6.39	6.56	6.10	6.55
Ti	0.36	0.41	0.08	0.12	0.14	0.15	0.10	0.15	0.13	0.13	0.12	0.20	0.17	0.15	0.14	0.15	0.16	0.15	0.20	0.22	0.20
Al	1.97	1.93	1.40	1.40	1.52	1.46	1.42	1.44	1.36	1.41	1.28	1.74	1.65	1.48	1.51	1.97	1.57	1.87	1.59	2.07	1.58
Fe3+	0.29	0.13	0.48	0.45	0.35	0.42	0.46	0.38	0.33	0.35	0.41	0.27	0.28	0.33	0.36	0.34	0.30	0.21	0.29	0.37	0.31
Fe2+	1.87	1.97	1.29	1.33	1.57	1.29	1.59	1.38	1.37	1.42	1.28	1.89	1.58	1.46	1.37	2.07	1.47	1.95	1.50	2.06	1.62
Na	0.58	0.58	0.60	0.57	0.55	0.58	0.50	0.65	0.50	0.52	0.43	0.59	0.65	0.59	0.58	0.62	0.65	0.63	0.63	0.64	0.65
Ca	1.73	1.81	1.75	1.73	1.86	1.73	1.79	1.75	1.79	1.82	1.79	1.78	1.79	1.78	1.80	1.80	1.79	1.84	1.81	1.80	1.78
Mn	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.03	0.03	0.03	0.04	0.02	0.03	0.02	0.02	0.03
Mg	2.16	2.16	3.02	2.94	2.79	2.98	2.73	2.94	2.97	2.94	3.05	2.42	2.69	2.84	2.95	2.18	2.84	2.35	2.82	2.16	2.71
K	0.27	0.27	0.21	0.22	0.24	0.23	0.22	0.23	0.22	0.24	0.21	0.36	0.25	0.22	0.23	0.38	0.24	0.34	0.25	0.38	0.25
Cl	0.11	0.10	0.07	0.08	0.12	0.10	0.12	0.09	0.11	0.12	0.10	0.25	0.14	0.11	0.14	0.29	0.12	0.26	0.14	0.28	0.18
F	0.01	0.04	0.32	0.33	0.27	0.39	0.21	0.34	0.25	0.25	0.25	0.16	0.18	0.18	0.14	0.07	0.16	0.21	0.20	0.10	0.17

Sample No.	*JB37D*	*JB37D*	*JB37D*	*JB37D*	*JB37D*	*JB37D*	*JB37E*	*JB37E*	*JB37E*	*JB37F*	*JB37F*	*JB37F*	*JB37F*	*JB37F*	*JB37F*	*JB37F*	*JB37F*	*JB37F*	*JB37F*	*JB37F*	*JB37F*
Analysis No.	*F8*	*G1*	*G2*	*G3*	*G4*	*G5*	*J_5*	*E1*	*H_10*	*A_6*	*A_15*	*A_17*	*B_1*	*C_1*	*C_15*	*C_16*	*D_1*	*D_8*	*D_12*	*E_4*	*A_5*
SiO2	39.53	44.37	44.37	41.54	40.89	45.59	43.42	49.25	41.60	42.26	42.65	42.76	42.93	42.23	42.21	42.76	42.46	41.71	43.05	44.11	43.11
TiO2	1.85	1.40	1.82	1.66	1.58	1.46	0.85	0.05	0.61	2.04	1.61	1.80	2.16	2.13	2.23	1.84	2.14	2.05	2.01	1.90	2.05
Al2O3	11.96	8.60	8.92	10.32	11.10	8.00	9.30	5.52	10.32	10.17	10.07	9.87	9.55	10.04	10.00	9.55	9.76	10.37	9.52	8.78	9.26
FeO	18.66	15.87	15.10	16.06	17.26	14.54	14.81	13.23	18.18	15.54	15.37	15.79	15.08	15.39	15.22	14.60	15.00	15.84	14.83	14.29	15.51
Na2O	2.20	1.76	2.14	2.08	2.20	1.97	1.94	1.30	1.73	2.26	2.24	1.96	2.34	2.27	2.43	2.27	2.38	2.28	2.13	2.35	1.95
CaO	11.27	11.39	11.31	11.34	11.32	11.37	11.56	11.61	12.01	11.49	11.47	11.54	11.41	11.40	11.38	11.53	11.44	11.48	11.45	11.35	12.01
MnO	0.23	0.19	0.24	0.20	0.24	0.21	0.18	0.12	0.26	0.05	0.02	0.10	0.04	0.06	0.08	0.05	0.07	0.05	0.07	0.10	0.12
MgO	9.58	11.81	12.24	10.87	10.17	12.79	11.96	15.03	9.93	11.67	11.77	11.55	11.95	11.59	11.85	12.38	11.68	11.48	11.87	12.71	11.33
K2O	2.03	1.42	1.30	1.75	1.98	1.13	1.64	0.65	1.68	1.34	1.37	1.40	1.27	1.36	1.32	1.30	1.33	1.36	1.38	1.23	1.32
Cl	1.35	0.58	0.64	0.94	1.38	0.56	0.70	0.35	1.08	0.63	0.63	0.73	0.51	0.57	0.50	0.64	0.58	0.65	0.54	0.46	0.57
F	0.23	0.26	0.24	0.43	0.35	0.33	0.43	0.39	0.23	0.24	0.33	0.24	0.24	0.24	0.18	0.27	0.31	0.28	0.25	0.26	0.27
Total	98.89	97.66	98.33	97.18	98.47	97.96	96.79	97.50	97.64	97.70	97.52	97.73	97.49	97.28	97.41	97.18	97.15	97.55	97.10	97.54	97.49
Si	6.03	6.65	6.59	6.35	6.23	6.76	6.59	7.18	6.38	6.36	6.42	6.43	6.45	6.27	6.36	6.44	6.43	6.31	6.49	6.59	6.52
Ti	0.21	0.16	0.20	0.19	0.18	0.16	0.10	0.00	0.07	0.23	0.18	0.20	0.24	0.24	0.25	0.21	0.24	0.23	0.23	0.21	0.23
Al	2.15	1.52	1.56	1.86	1.99	1.40	1.66	0.95	1.87	1.80	1.79	1.75	1.69	2.00	1.78	1.70	1.74	1.85	1.69	1.55	1.65
Fe3+	0.30	0.30	0.27	0.22	0.18	0.27	0.21	0.44	0.24	0.27	0.27	0.27	0.24	0.32	0.28	0.26	0.19	0.29	0.22	0.25	0.12
Fe2+	2.08	1.69	1.61	1.84	2.02	1.53	1.67	1.18	2.10	1.68	1.67	1.71	1.65	1.59	1.64	1.58	1.70	1.71	1.65	1.53	1.84
Na	0.65	0.51	0.62	0.62	0.65	0.57	0.57	0.37	0.51	0.66	0.65	0.57	0.68	0.65	0.71	0.66	0.70	0.67	0.62	0.68	0.57
Ca	1.84	1.83	1.80	1.86	1.85	1.81	1.88	1.81	1.97	1.85	1.85	1.86	1.84	1.81	1.84	1.86	1.86	1.86	1.85	1.82	1.95
Mn	0.03	0.02	0.03	0.03	0.03	0.03	0.02	0.02	0.03	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.18	2.64	2.71	2.48	2.31	2.83	2.71	3.27	2.27	2.62	2.64	2.59	2.68	2.57	2.66	2.78	2.64	2.59	2.67	2.83	2.55
K	0.40	0.27	0.25	0.34	0.39	0.21	0.32	0.12	0.33	0.26	0.26	0.27	0.24	0.26	0.25	0.25	0.26	0.26	0.27	0.23	0.25
Cl	0.35	0.15	0.16	0.24	0.36	0.14	0.18	0.09	0.28	0.16	0.16	0.19	0.13	0.14	0.13	0.16	0.15	0.17	0.14	0.12	0.15
F	0.11	0.13	0.12	0.21	0.17	0.16	0.21	0.18	0.11	0.12	0.16	0.11	0.11	0.11	0.09	0.13	0.15	0.13	0.12	0.12	0.13

Sample No.	JB37F	JB37F	JB37F	JB37F	JB37F	JB37F	JB37F	JB37F	JB37F	JB37G	JB37G	JB37G	JB37G	JB37H	JB37I	JB37I	JB37I	JB37I	JB67	JB67	JB67
Analysis No.	A_7	A_14	B_4	B_5	C_14	D_2	D_10	D_11	E_5	A_6	B_1	C_10	C_14	F_4	B_2	D_1	D_2	D_3	1	2	3
SiO2	41.86	42.38	41.29	41.86	41.87	42.04	40.85	41.51	50.42	33.49	42.67	41.85	43.13	43.41	44.53	43.66	44.16	44.18	47.59	44.47	47.36
TiO2	2.08	1.77	1.97	1.66	1.44	2.08	1.26	1.58	0.85	0.05	2.19	1.58	1.50	2.05	1.70	2.37	2.10	2.08	0.16	0.16	1.27
Al2O3	10.27	10.02	10.59	10.78	9.71	10.11	10.55	10.42	4.20	18.14	9.32	9.97	9.34	9.63	8.89	9.21	9.17	9.02	6.61	8.94	6.55
FeO	15.74	15.81	15.46	15.60	15.33	15.53	17.20	16.58	12.93	18.16	13.83	14.90	14.38	15.33	13.92	13.32	14.18	13.98	19.83	21.87	19.86
Na2O	2.26	2.15	2.04	1.96	1.89	1.94	1.75	1.82	0.93	0.03	2.33	2.26	1.94	2.35	2.33	2.63	2.69	2.35	1.56	2.00	1.58
CaO	11.46	11.51	11.52	11.64	11.62	11.22	11.38	11.52	12.20	11.49	11.18	11.19	11.24	11.40	11.29	11.25	11.32	11.30	10.35	11.03	11.08
MnO	0.08	0.08	0.08	0.06	0.10	0.06	0.04	0.06	0.04	0.09	0.06	0.04	0.07	0.26	0.15	0.11	0.18	0.13	0.19	0.10	0.10
MgO	11.43	11.65	11.11	11.09	12.20	11.62	11.33	10.87	14.94	8.47	12.49	11.77	12.48	11.92	12.82	12.51	12.65	12.75	10.88	8.96	10.60
K2O	1.33	1.35	1.56	1.69	1.19	1.42	1.62	1.66	0.55	0.03	1.28	1.32	1.27	1.45	1.05	1.13	1.11	1.13	0.31	0.43	0.42
Cl	0.70	0.65	0.72	0.75	0.62	0.71	0.80	0.75	0.34	0.01	0.44	0.52	0.34	0.66	0.56	0.43	0.43	0.44	0.51	1.46	0.55
F	0.20	0.27	0.27	0.15	0.26	0.15	0.23	0.31	0.07	0.07	0.51	0.43	0.40	0.19	0.41	0.38	0.48	0.56	0.00	0.10	0.00
Total	97.41	97.64	96.61	97.24	96.23	96.87	97.02	97.08	97.47	90.03	96.30	95.83	96.09	98.65	97.65	97.00	98.47	97.92	97.99	99.53	99.37
Si	6.33	6.39	6.31	6.35	6.37	6.36	6.21	6.33	7.34	5.28	6.47	6.41	6.53	6.46	6.63	6.56	6.55	6.57	7.05	6.67	6.97
Ti	0.24	0.20	0.23	0.19	0.16	0.24	0.14	0.18	0.09	0.01	0.25	0.18	0.17	0.23	0.19	0.27	0.23	0.23	0.02	0.02	0.14
Al	1.83	1.78	1.91	1.93	1.74	1.80	1.89	1.87	0.72	3.37	1.67	1.80	1.67	1.69	1.56	1.63	1.60	1.58	1.15	1.58	1.14
Fe3+	0.27	0.30	0.22	0.20	0.47	0.34	0.61	0.30	0.24	2.05	0.26	0.31	0.38	0.24	0.25	0.14	0.22	0.25	0.58	0.43	0.44
Fe2+	1.72	1.69	1.75	1.77	1.47	1.62	1.57	1.81	1.34	0.35	1.49	1.60	1.44	1.67	1.48	1.54	1.54	1.48	1.87	2.31	2.01
Na	0.66	0.63	0.60	0.58	0.56	0.57	0.52	0.54	0.26	0.01	0.69	0.67	0.57	0.68	0.67	0.77	0.77	0.68	0.45	0.58	0.45
Ca	1.86	1.86	1.89	1.89	1.89	1.82	1.85	1.88	1.90	1.94	1.82	1.84	1.82	1.82	1.80	1.81	1.80	1.80	1.64	1.77	1.75
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.02	0.01	0.02	0.02	0.02	0.01	0.01
Mg	2.58	2.62	2.53	2.51	2.77	2.62	2.57	2.47	3.24	1.99	2.82	2.69	2.82	2.65	2.84	2.80	2.80	2.83	2.40	2.00	2.33
K	0.26	0.26	0.30	0.33	0.23	0.27	0.31	0.32	0.10	0.01	0.25	0.26	0.25	0.28	0.20	0.22	0.21	0.22	0.06	0.08	0.08
Cl	0.18	0.17	0.19	0.19	0.16	0.18	0.21	0.19	0.08	0.00	0.11	0.14	0.09	0.17	0.14	0.11	0.11	0.11	0.13	0.37	0.14
F	0.10	0.13	0.13	0.07	0.13	0.07	0.11	0.15	0.03	0.04	0.25	0.21	0.19	0.09	0.19	0.18	0.23	0.27	0.00	0.05	0.00

Sample No.	JB67	JB67	JB67	JB67	JB68	JB68	JB68	JB68	JB76	JB76	JB76	JB76	JB76
Analysis No.	4	5	6	7	1	2	3	4	1	2	3	4	5
SiO2	48.28	48.14	47.82	48.10	42.19	38.68	41.15	41.48	43.88	43.80	43.32	43.54	43.30
TiO2	0.63	0.94	0.77	0.42	0.26	0.22	0.18	0.28	2.10	2.10	2.08	1.84	1.82
Al2O3	6.63	6.15	6.35	6.47	12.66	13.18	12.04	14.40	9.56	9.46	9.56	9.57	9.47
FeO	20.05	19.98	20.06	20.22	20.07	22.13	21.34	19.47	16.14	16.15	16.33	17.21	15.89
Na2O	1.56	1.44	1.53	1.46	2.51	2.43	2.10	2.65	2.67	2.31	2.67	2.19	2.55
CaO	10.28	10.30	10.55	10.22	10.98	11.20	11.10	10.81	11.17	11.19	11.22	11.26	11.30
MnO	0.27	0.18	0.16	0.17	0.16	0.11	0.18	0.28	0.10	0.12	0.13	0.13	0.14
MgO	11.11	11.34	11.19	11.60	8.66	6.23	7.69	8.19	11.73	11.46	11.55	11.44	11.61
K2O	0.28	0.37	0.31	0.27	0.34	1.15	0.84	0.36	1.01	1.29	1.16	1.40	1.05
Cl	0.48	0.42	0.44	0.43	1.62	2.87	2.38	1.19	1.01	1.05	1.06	1.28	0.98
F	0.00	0.01	0.00	0.05	0.00	0.00	0.02	0.00	0.15	0.19	0.20	0.14	0.19
Total	99.56	99.26	99.18	99.41	99.45	98.21	99.01	99.10	99.52	99.13	99.28	99.99	98.30
Si	7.04	7.05	7.01	7.02	6.30	6.07	6.28	6.18	6.48	6.51	6.44	6.44	6.48
Ti	0.07	0.10	0.08	0.05	0.03	0.03	0.02	0.03	0.23	0.23	0.23	0.20	0.20
Al	1.14	1.06	1.10	1.11	2.23	2.44	2.17	2.53	1.66	1.66	1.68	1.67	1.67
Fe3+	0.55	0.53	0.58	0.61	0.38	0.04	0.25	0.42	0.23	0.21	0.22	0.29	0.21
Fe2+	1.89	1.92	1.87	1.86	2.12	2.86	2.48	2.00	1.76	1.80	1.82	1.84	1.78
Na	0.44	0.41	0.43	0.41	0.73	0.74	0.62	0.77	0.76	0.67	0.77	0.63	0.74
Ca	1.61	1.62	1.66	1.60	1.76	1.88	1.82	1.73	1.77	1.78	1.79	1.78	1.81
Mn	0.03	0.02	0.02	0.02	0.02	0.01	0.02	0.04	0.01	0.02	0.02	0.02	0.02
Mg	2.41	2.47	2.44	2.52	1.93	1.46	1.75	1.82	2.58	2.54	2.56	2.52	2.59
K	0.05	0.07	0.06	0.05	0.06	0.23	0.16	0.07	0.19	0.24	0.22	0.26	0.20
Cl	0.12	0.11	0.11	0.11	0.41	0.76	0.62	0.30	0.25	0.27	0.27	0.32	0.25
F	0.00	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.07	0.09	0.09	0.06	0.09

Appendix 4.2-Biotite analysis- Recalculations were made based on 11 Oxygens

Sample No.	*JB6E*	*JB6E*	*JB6E*	*JB6E*	*JB6E*	*JB6E*	*JB6E*	*JB6E*	*JB6E*	*JB6E*	*JB6E*	*JB8B*	*JB8B*	*JB60A*	*JB60A*	*JB60A*	*JB60A*	*JB60A*	*JB60A*	*JB60A*	*JB60A*	*JB60A*
Analysis No.	*A_1*	*A_2*	*A_7*	*D_1*	*D_2*	*D_3*	*D_4*	*D_5*	*D_6*	*E_1*	*E_2*	*D_2*	*E_2*	*A_1*	*A_2*	*A_3*	*A_4*	*A_5*	*A_6*	*A_9*	*A_18*	*B_1*
SiO2	37.10	37.06	37.77	37.57	37.51	37.54	37.86	37.48	37.43	37.24	37.27	37.41	38.19	38.03	37.75	37.45	37.86	37.90	37.71	37.90	38.09	37.19
TiO2	1.95	2.17	2.03	2.40	2.43	2.44	2.40	2.64	2.52	2.18	2.40	1.71	1.73	3.26	3.19	2.94	3.22	3.31	3.04	2.95	2.97	3.15
Al2O3	13.17	12.94	13.07	12.89	12.90	12.97	13.02	13.18	12.96	13.05	13.06	12.62	12.93	12.90	13.11	12.98	13.14	13.18	13.06	13.18	13.01	13.18
FeO	18.90	18.22	18.43	18.33	18.78	18.79	18.61	18.39	18.59	19.07	18.49	18.75	18.69	17.26	17.33	17.51	17.74	17.16	17.99	17.33	17.10	18.03
Na2O	0.17	0.08	0.17	0.15	0.14	0.14	0.14	0.15	0.16	0.09	0.11	0.12	0.11	0.18	0.16	0.13	0.17	0.18	0.16	0.13	0.15	0.11
CaO	0.08	0.02	0.07	0.06	0.02	0.03	0.03	0.03	0.02	0.01	0.01	0.03	0.04	0.02	0.00	0.00	0.02	0.02	0.00	0.01	0.03	0.00
MnO	0.08	0.15	0.12	0.11	0.16	0.11	0.13	0.09	0.11	0.12	0.15	0.06	0.18	0.12	0.08	0.10	0.18	0.10	0.09	0.05	0.11	0.06
MgO	13.14	12.97	13.02	13.02	12.84	13.05	13.15	13.11	13.02	12.77	13.22	12.60	13.61	13.40	13.43	13.39	13.29	13.16	13.24	12.93	13.27	12.96
K2O	8.90	10.08	9.09	9.73	9.82	9.85	10.00	9.69	9.85	10.03	9.80	9.73	9.77	9.83	9.79	9.84	9.41	9.54	9.91	9.27	9.49	9.71
Cl	0.83	0.86	0.99	0.91	0.88	0.86	0.88	0.78	0.84	0.87	0.81	0.54	0.57	0.78	0.80	0.81	0.81	0.87	0.81	0.84	0.84	0.89
F	0.75	0.69	0.74	0.57	0.72	0.77	0.78	0.64	0.62	0.77	0.60	1.08	1.18	0.48	0.40	0.39	0.37	0.55	0.40	0.47	0.26	0.39
Total	95.07	95.24	95.49	95.74	96.20	96.55	97.00	96.19	96.12	96.20	95.92	94.65	97.00	96.26	96.04	95.54	96.21	95.97	96.41	95.07	95.33	95.68
Si	2.86	2.87	2.90	2.88	2.87	2.87	2.87	2.86	2.86	2.86	2.86	2.92	2.90	2.88	2.86	2.86	2.86	2.87	2.86	2.89	2.89	2.84
Ti	0.11	0.13	0.12	0.14	0.14	0.14	0.14	0.15	0.15	0.13	0.14	0.10	0.10	0.19	0.18	0.17	0.18	0.19	0.17	0.17	0.17	0.18
Al4+	1.14	1.13	1.10	1.12	1.13	1.13	1.13	1.14	1.14	1.14	1.14	1.08	1.10	1.12	1.14	1.14	1.14	1.13	1.14	1.11	1.11	1.16
Al6+	0.06	0.05	0.08	0.04	0.04	0.03	0.04	0.04	0.03	0.04	0.03	0.08	0.06	0.03	0.03	0.03	0.03	0.05	0.03	0.08	0.06	0.03
Fe2+	1.22	1.18	1.18	1.17	1.20	1.20	1.18	1.17	1.19	1.23	1.18	1.22	1.19	1.09	1.10	1.12	1.12	1.09	1.14	1.11	1.09	1.15
Na	0.03	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.03	0.02	0.02	0.03	0.03	0.02	0.02	0.02	0.02
Ca	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.00
Mg	1.51	1.50	1.49	1.49	1.47	1.48	1.49	1.49	1.48	1.46	1.51	1.47	1.54	1.51	1.52	1.52	1.50	1.49	1.50	1.47	1.50	1.48
K	0.88	0.99	0.89	0.95	0.96	0.96	0.97	0.94	0.96	0.98	0.96	0.97	0.95	0.95	0.95	0.96	0.91	0.92	0.96	0.90	0.92	0.95
Cl	0.11	0.11	0.13	0.12	0.11	0.11	0.11	0.10	0.11	0.11	0.11	0.07	0.07	0.10	0.10	0.11	0.10	0.11	0.10	0.11	0.11	0.12
F	0.18	0.17	0.18	0.14	0.17	0.18	0.19	0.16	0.15	0.19	0.14	0.27	0.28	0.11	0.10	0.09	0.09	0.13	0.10	0.11	0.06	0.09
log a(HCl)/a(HF)	-0.11	-0.07	-0.06	-0.02	-0.08	-0.10	-0.10	-0.08	-0.06	-0.11	-0.05	-0.38	-0.36	0.00	0.04	0.04	0.05	-0.01	0.03	0.00	0.11	0.05

Sample No.	JB60A	JB60A	JB60A	JB60A	JB60A	JB60A	JB60A	JB60A	JB60A	JB60A	JB60A	JB60A	JB60A	JB60A	JB60A	JB60A	JB60B	JB60B	JB60B	JB60B
Analysis No.	B_2	B_6	B_7	B_12	C_1	C_2	C_3	C_4	C_5	C_7	C_8	C_9	C_13	D_4	D_7	D_11	A_1	A_2	A_3	A_7
SiO2	38.02	37.83	37.87	37.89	36.91	37.95	38.55	37.53	38.25	37.92	37.76	37.76	36.82	38.22	38.00	37.94	38.42	38.40	38.21	38.19
TiO2	3.08	2.99	3.18	3.37	3.20	2.79	2.88	2.84	2.89	2.64	2.99	2.78	3.18	2.91	2.58	2.67	2.50	2.65	2.58	2.57
Al2O3	12.96	13.09	12.98	12.82	13.28	12.96	13.09	12.96	13.14	13.04	13.19	12.92	13.13	13.12	12.96	13.08	13.11	13.09	12.93	13.11
FeO	18.30	18.05	18.25	17.67	18.30	17.37	17.74	17.92	17.78	17.60	17.50	17.99	18.36	16.92	17.29	17.13	16.68	16.39	15.88	16.38
Na2O	0.14	0.16	0.11	0.18	0.14	0.15	0.19	0.15	0.14	0.11	0.13	0.13	0.14	0.12	0.15	0.15	0.19	0.18	0.16	0.20
CaO	0.00	0.01	0.00	0.02	0.00	0.01	0.01	0.02	0.03	0.00	0.00	0.01	0.00	0.01	0.00	0.03	0.00	0.01	0.01	0.00
MnO	0.09	0.11	0.06	0.08	0.10	0.12	0.13	0.11	0.13	0.14	0.09	0.10	0.13	0.07	0.08	0.10	0.10	0.13	0.08	0.10
MgO	13.39	13.36	13.02	13.29	12.70	13.49	13.74	13.51	13.87	13.68	13.69	13.50	12.68	13.50	13.73	13.59	14.92	14.99	14.74	14.74
K2O	9.72	9.83	9.89	8.75	9.27	9.61	9.42	9.75	9.48	9.90	9.97	9.84	9.26	9.32	9.50	9.64	9.46	9.80	9.38	9.46
Cl	0.80	0.88	0.85	0.84	1.05	0.90	0.87	0.92	0.86	0.90	0.91	0.90	1.01	0.83	0.86	0.87	0.66	0.63	0.63	0.64
F	0.37	0.44	0.41	0.42	0.48	0.47	0.40	0.33	0.44	0.43	0.54	0.36	0.42	0.29	0.29	0.29	0.52	0.50	0.46	0.56
Total	96.86	96.74	96.62	95.32	95.43	95.83	97.03	96.04	97.02	96.36	96.77	96.30	95.13	95.30	95.43	95.48	96.55	96.77	95.07	95.95
Si	2.87	2.86	2.87	2.88	2.83	2.88	2.89	2.85	2.87	2.87	2.85	2.87	2.83	2.90	2.89	2.88	2.88	2.87	2.90	2.88
Ti	0.17	0.17	0.18	0.19	0.18	0.16	0.16	0.16	0.16	0.15	0.17	0.16	0.18	0.17	0.15	0.15	0.14	0.15	0.15	0.15
Al4+	1.13	1.14	1.13	1.12	1.17	1.12	1.11	1.15	1.13	1.13	1.15	1.13	1.17	1.10	1.11	1.12	1.12	1.13	1.10	1.12
Al6+	0.02	0.02	0.02	0.03	0.03	0.04	0.04	0.02	0.03	0.03	0.02	0.02	0.03	0.07	0.05	0.05	0.04	0.03	0.05	0.04
Fe2+	1.15	1.14	1.16	1.12	1.17	1.10	1.11	1.14	1.11	1.11	1.10	1.14	1.18	1.07	1.10	1.09	1.04	1.03	1.01	1.03
Na	0.02	0.02	0.02	0.03	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.02	0.03
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Mg	1.50	1.51	1.47	1.51	1.45	1.53	1.53	1.53	1.55	1.54	1.54	1.53	1.46	1.53	1.56	1.54	1.67	1.67	1.67	1.66
K	0.93	0.95	0.95	0.85	0.91	0.93	0.90	0.95	0.91	0.96	0.96	0.95	0.91	0.90	0.92	0.93	0.90	0.94	0.91	0.91
Cl	0.10	0.11	0.11	0.11	0.14	0.12	0.11	0.12	0.11	0.12	0.12	0.12	0.13	0.11	0.11	0.11	0.08	0.08	0.08	0.08
F	0.09	0.10	0.10	0.10	0.12	0.11	0.09	0.08	0.10	0.10	0.13	0.09	0.10	0.07	0.07	0.07	0.12	0.12	0.11	0.13
log a(HCl)/a(HF)	0.04	0.03	0.03	0.03	0.04	0.03	0.05	0.09	0.03	0.04	0.01	0.07	0.05	0.09	0.10	0.10	-0.03	-0.02	-0.01	-0.05

Sample No.	JB60B	JB60B	JB60B	JB60B	JB60B	JB60B	JB60B	JB60B	JB60B	JB60B	JB60B	JB60B	JB60B	JB60B	JB60B	JB63	JB1	JB1	JB1	JB1	JB1
Analysis No.	B_1	B_2	C_1	C_2	C_3	C_4	C_6	C_7	D_1	D_2	D_3	D_4	D_5	D_7	D_8	B_5	A_2	A_3	C_4	EE_4	F_2
SiO2	38.16	38.14	38.25	38.13	38.33	38.32	38.90	38.11	38.00	38.14	38.57	38.22	38.27	38.37	38.69	37.72	38.18	38.57	37.87	38.21	36.93
TiO2	2.36	2.39	2.36	2.32	2.34	2.42	2.47	2.28	2.85	2.47	2.58	2.46	2.39	2.38	2.54	3.77	3.54	3.37	3.53	3.55	3.72
Al2O3	13.03	13.10	13.13	13.04	13.02	13.14	13.22	13.01	13.06	13.03	13.02	13.16	13.15	13.05	13.24	13.30	13.47	13.55	13.54	13.45	13.24
FeO	16.33	16.06	16.36	16.43	16.57	16.34	16.47	16.51	15.74	16.31	16.12	16.13	16.06	16.11	16.16	17.94	14.01	12.73	14.14	12.92	15.04
Na2O	0.19	0.16	0.14	0.14	0.17	0.24	0.21	0.19	0.14	0.16	0.18	0.15	0.15	0.16	0.16	0.13	0.19	0.15	0.11	0.10	0.21
CaO	0.00	0.01	0.00	0.00	0.00	0.02	0.02	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.01	0.01	0.00	0.01	0.06	0.00
MnO	0.13	0.08	0.09	0.16	0.08	0.09	0.15	0.10	0.09	0.16	0.09	0.10	0.12	0.12	0.16	0.18	0.08	0.05	0.07	0.04	0.14
MgO	14.82	15.03	14.80	15.12	14.86	14.81	14.88	14.80	14.27	14.87	15.15	14.74	14.86	14.80	14.31	13.40	16.25	17.19	16.05	16.41	14.64
K2O	9.74	10.00	10.09	9.99	10.14	9.78	9.41	9.12	9.82	9.56	9.73	10.00	9.82	9.74	9.42	9.67	9.77	9.80	9.99	9.70	9.55
Cl	0.66	0.65	0.62	0.63	0.63	0.64	0.63	0.61	0.61	0.59	0.59	0.62	0.62	0.62	0.58	0.82	0.51	0.47	0.48	0.40	0.54
F	0.49	0.48	0.46	0.48	0.42	0.51	0.54	0.55	0.51	0.56	0.53	0.51	0.47	0.41	0.50	0.29	0.42	0.57	0.57	0.61	0.52
Total	95.92	96.10	96.29	96.44	96.57	96.31	96.90	95.33	95.09	95.85	96.56	96.09	95.91	95.76	95.81	97.23	96.43	96.47	96.37	95.45	94.53
Si	2.88	2.87	2.88	2.87	2.88	2.88	2.90	2.89	2.89	2.88	2.89	2.88	2.88	2.89	2.91	2.83	2.83	2.84	2.82	2.85	2.82
Ti	0.13	0.14	0.13	0.13	0.13	0.14	0.14	0.13	0.16	0.14	0.15	0.14	0.14	0.13	0.14	0.21	0.20	0.19	0.20	0.20	0.21
Al4+	1.12	1.13	1.12	1.13	1.12	1.12	1.10	1.11	1.11	1.12	1.11	1.12	1.12	1.11	1.09	1.17	1.17	1.16	1.18	1.15	1.18
Al6+	0.04	0.04	0.04	0.02	0.03	0.04	0.06	0.05	0.06	0.04	0.03	0.05	0.05	0.05	0.08	0.00	0.01	0.02	0.01	0.03	0.01
Fe2+	1.03	1.01	1.03	1.03	1.04	1.03	1.03	1.05	1.00	1.03	1.01	1.02	1.01	1.02	1.02	1.12	0.87	0.78	0.88	0.81	0.96
Na	0.03	0.02	0.02	0.02	0.02	0.04	0.03	0.03	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.03
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.01
Mg	1.67	1.69	1.66	1.70	1.66	1.66	1.65	1.67	1.62	1.67	1.69	1.66	1.67	1.66	1.60	1.50	1.80	1.89	1.78	1.82	1.67
K	0.94	0.96	0.97	0.96	0.97	0.94	0.89	0.88	0.95	0.92	0.93	0.96	0.94	0.94	0.90	0.92	0.92	0.92	0.95	0.92	0.93
Cl	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.08	0.08	0.08	0.07	0.10	0.06	0.06	0.06	0.05	0.07
F	0.12	0.11	0.11	0.11	0.10	0.12	0.13	0.13	0.12	0.13	0.12	0.12	0.11	0.10	0.12	0.07	0.10	0.13	0.14	0.14	0.12
log a(HCl)/a(HF)	-0.01	-0.01	-0.01	-0.02	0.00	-0.04	-0.05	-0.06	-0.04	-0.06	-0.05	-0.03	-0.02	0.01	-0.06	0.09	0.01	-0.05	-0.08	-0.12	-0.05

Sample No.	JB35F	JB35F	JB35F	JB35F	JB35F	JB35F	JB35F	JB35F	JB35F	JB35F	JB35F	JB12B	JB12B	JB12B	JB12B	JB12B	JB12B	JB12B	JB12B	JB88A
Analysis No.	A_1	A_3	B_1	B_9	B_10	C_1	C_2	H_1	H_2	H_8	H_13	A_1	C_1	C_2	E_1	E_2	E_3	F_1	F_3	1
SiO2	36.58	36.99	36.91	36.53	36.34	36.57	36.67	36.71	35.70	36.70	36.08	38.14	36.27	37.36	36.77	36.90	36.30	37.92	37.44	38.94
TiO2	3.96	4.04	3.95	3.91	3.70	4.06	4.23	4.04	3.86	4.02	3.81	3.22	2.94	2.62	3.03	2.83	2.94	2.86	2.90	2.12
Al2O3	13.42	13.79	13.66	13.63	13.50	13.39	13.54	13.36	13.43	13.67	13.02	13.08	13.54	13.66	13.53	13.59	13.36	13.75	13.59	13.22
FeO	17.02	16.41	16.76	15.84	16.05	15.87	15.62	16.75	17.57	16.67	16.74	17.34	17.77	17.62	17.97	17.77	17.90	17.24	17.40	14.90
Na2O	0.10	0.08	0.06	0.11	0.10	0.06	0.07	0.07	0.09	0.07	0.10	0.13	0.08	0.11	0.13	0.10	0.13	0.13	0.10	0.16
CaO	0.01	0.00	0.00	0.04	0.03	0.03	0.00	0.01	0.01	0.03	0.02	0.03	0.48	0.02	0.04	0.03	0.01	0.02	0.02	0.02
MnO	0.12	0.16	0.12	0.18	0.17	0.11	0.16	0.18	0.12	0.12	0.10	0.15	0.15	0.12	0.14	0.15	0.18	0.13	0.17	0.01
MgO	13.27	13.54	13.56	13.40	13.35	13.90	13.64	13.17	12.70	13.26	12.82	13.48	13.58	13.24	12.60	12.85	12.56	13.40	13.25	15.38
K2O	9.87	10.04	10.00	9.73	9.63	9.71	9.96	9.61	9.34	9.67	9.45	9.88	8.52	9.45	9.51	9.46	9.19	9.61	9.76	9.58
Cl	0.74	0.77	0.73	0.75	0.75	0.70	0.73	0.74	0.86	0.78	0.81	0.84	0.74	0.81	0.92	0.85	0.91	0.85	0.90	0.56
F	0.38	0.43	0.39	0.41	0.38	0.51	0.36	0.26	0.26	0.25	0.41	0.31	0.32	0.29	0.20	0.26	0.28	0.29	0.36	0.83
Total	95.46	96.25	96.14	94.53	94.00	94.91	94.99	94.91	93.93	95.24	93.36	96.61	94.38	95.29	94.85	94.79	93.76	96.21	95.88	95.72
Si	2.79	2.79	2.79	2.80	2.81	2.80	2.80	2.81	2.78	2.80	2.82	2.87	2.79	2.85	2.83	2.84	2.83	2.86	2.84	2.92
Ti	0.23	0.23	0.22	0.23	0.21	0.23	0.24	0.23	0.23	0.23	0.22	0.18	0.17	0.15	0.18	0.16	0.17	0.16	0.17	0.12
Al4+	1.21	1.21	1.21	1.20	1.19	1.20	1.20	1.19	1.22	1.20	1.18	1.13	1.21	1.15	1.17	1.16	1.17	1.14	1.16	1.08
Al6+	0.00	0.02	0.01	0.03	0.03	0.00	0.01	0.01	0.01	0.02	0.01	0.03	0.02	0.08	0.06	0.07	0.05	0.08	0.06	0.09
Fe2+	1.09	1.04	1.06	1.02	1.04	1.01	1.00	1.07	1.14	1.06	1.09	1.09	1.14	1.12	1.16	1.14	1.17	1.09	1.11	0.93
Na	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.02	0.01	0.02	0.02	0.01	0.02
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
Mg	1.51	1.52	1.53	1.53	1.54	1.58	1.55	1.50	1.47	1.51	1.49	1.51	1.56	1.51	1.45	1.47	1.46	1.51	1.50	1.72
K	0.96	0.97	0.97	0.95	0.95	0.95	0.97	0.94	0.93	0.94	0.94	0.95	0.84	0.92	0.93	0.93	0.91	0.92	0.95	0.92
Cl	0.10	0.10	0.09	0.10	0.10	0.09	0.09	0.10	0.11	0.10	0.11	0.11	0.10	0.10	0.12	0.11	0.12	0.11	0.12	0.07
F	0.09	0.10	0.09	0.10	0.09	0.12	0.09	0.06	0.06	0.06	0.10	0.07	0.08	0.07	0.05	0.06	0.07	0.07	0.09	0.20
log a(HCl)/a(HF)	0.04	0.02	0.03	0.03	0.04	-0.01	0.05	0.09	0.11	0.11	0.03	0.08	0.06	0.08	0.15	0.10	0.10	0.09	0.07	-0.16

Sample No.	***JB88A***	***JB88A***	***JB89***	***JB15***	***JB15***	***JB15***	***JB15***	***JB15***	***JB15***	***JB15***	***JB15***	***JB15***	***JB15***	***JB15***	***JB35A***	***JB35A***	***JB35A***	***JB35A***	***JB35A***	***JB35A***	***JB35A***
Analysis No.	***2***	***3***	***1***	***A_1***	***B_1***	***C_1***	***C_2***	***D_1***	***D_2***	***E_1***	***E_2***	***E_3***	***F_1***	***F_2***	***A_1***	***A_2***	***A_3***	***A_4***	***B_1***	***B_2***	***C_1***
SiO2	38.04	38.63	37.14	34.10	35.14	35.36	35.24	35.76	35.39	35.86	35.60	35.11	35.03	35.20	37.85	37.66	37.61	37.67	37.53	38.01	37.88
TiO2	2.47	2.42	1.03	1.68	1.70	1.65	1.54	1.81	1.60	1.82	1.61	1.82	2.00	1.76	3.42	2.92	3.30	3.40	3.14	2.94	2.94
Al2O3	13.16	12.93	13.66	16.33	15.89	16.03	16.56	15.33	15.66	15.39	15.91	16.05	15.53	15.58	14.20	14.09	14.12	14.32	14.40	14.89	14.39
FeO	15.23	15.25	18.86	27.93	29.96	28.28	29.09	28.47	28.90	27.19	28.77	28.80	29.26	28.59	17.98	17.97	17.77	18.11	18.29	17.68	17.67
Na2O	0.16	0.14	0.06	0.07	0.05	0.04	0.07	0.13	0.09	0.08	0.04	0.08	0.07	0.15	0.14	0.10	0.07	0.09	0.11	0.13	0.11
CaO	0.01	0.03	0.02	0.07	0.00	0.00	0.04	0.04	0.02	0.00	0.01	0.03	0.02	0.08	0.00	0.01	0.00	0.01	0.00	0.01	0.00
MnO	0.05	0.02	0.04	0.26	0.32	0.27	0.27	0.36	0.24	0.40	0.35	0.34	0.30	0.29	0.11	0.09	0.03	0.13	0.11	0.13	0.07
MgO	14.37	14.97	11.89	3.74	3.85	3.56	3.60	4.02	4.04	4.06	3.79	3.65	3.58	3.69	12.59	13.17	12.34	12.19	12.24	12.14	12.73
K2O	9.47	9.38	9.89	8.11	8.91	9.56	9.08	9.42	9.55	9.67	9.69	9.69	9.49	9.48	9.90	9.77	9.93	9.82	9.85	9.82	10.12
Cl	0.62	0.57	0.52	0.43	0.51	0.51	0.48	0.48	0.48	0.49	0.50	0.50	0.48	0.47	0.72	0.67	0.73	0.72	0.63	0.83	0.67
F	0.73	0.72	0.19	0.05	0.06	0.06	0.04	0.15	0.12	0.44	0.41	0.04	0.15	0.17	0.81	0.80	0.84	0.80	0.74	0.70	0.78
Total	94.30	95.07	93.29	92.78	96.39	95.32	96.01	95.96	96.08	95.39	96.68	96.11	95.91	95.45	97.71	97.23	96.75	97.25	97.03	97.28	97.35
Si	2.91	2.92	2.91	2.79	2.80	2.83	2.80	2.85	2.82	2.87	2.83	2.80	2.81	2.83	2.83	2.83	2.84	2.83	2.83	2.85	2.84
Ti	0.14	0.14	0.06	0.10	0.10	0.10	0.09	0.11	0.10	0.11	0.10	0.11	0.12	0.11	0.19	0.17	0.19	0.19	0.18	0.17	0.17
Al4+	1.09	1.08	1.09	1.21	1.20	1.17	1.20	1.15	1.18	1.13	1.17	1.20	1.19	1.17	1.17	1.17	1.16	1.17	1.17	1.15	1.16
Al6+	0.09	0.07	0.17	0.36	0.29	0.35	0.35	0.29	0.30	0.32	0.32	0.31	0.28	0.30	0.09	0.08	0.10	0.10	0.11	0.16	0.12
Fe2+	0.97	0.96	1.24	1.91	1.99	1.89	1.93	1.90	1.93	1.82	1.91	1.92	1.96	1.92	1.13	1.13	1.12	1.14	1.15	1.11	1.11
Na	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.02
Ca	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.00	0.00	0.00	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.00	0.01	0.01	0.01	0.00
Mg	1.64	1.69	1.39	0.46	0.46	0.43	0.43	0.48	0.48	0.48	0.45	0.43	0.43	0.44	1.41	1.48	1.39	1.37	1.38	1.36	1.42
K	0.92	0.90	0.99	0.85	0.90	0.98	0.92	0.96	0.97	0.99	0.98	0.99	0.97	0.97	0.95	0.94	0.96	0.94	0.95	0.94	0.97
Cl	0.08	0.07	0.07	0.06	0.07	0.07	0.06	0.06	0.06	0.07	0.07	0.07	0.06	0.06	0.09	0.08	0.09	0.09	0.08	0.11	0.09
F	0.18	0.17	0.05	0.01	0.01	0.01	0.01	0.04	0.03	0.11	0.10	0.01	0.04	0.04	0.19	0.19	0.20	0.19	0.18	0.17	0.18
log a(HCl)/a(HF)	-0.12	-0.13	0.04	0.04	0.05	0.06	0.11	-0.14	-0.08	-0.58	-0.55	0.09	-0.16	-0.20	-0.17	-0.17	-0.18	-0.17	-0.20	-0.11	-0.18

Sample No.	***JB35A***	***JB35A***	***JB35A***	***JB35A***	***JB35A***	***JB35A***	***JB35A***	***JB35A***	***JB35A***	***JB35A***	***JB35A***	***JB35A***	***JB35A***	***JB35A***	***JB35A***	***JB35A***	***JB35A***	***JB35A***	***JB35A***	***JB82B***
Analysis No.	***C_2***	***D_1***	***D_2***	***D_3***	***D_4***	***D_5***	***E_1***	***F_1***	***G_1***	***G_6***	***H_1***	***H_2***	***H_3***	***H_4***	***H_5***	***I_1***	***I_2***	***I_3***	***I_12***	***1***
SiO2	37.36	37.40	33.66	37.64	37.84	37.88	37.61	37.54	37.50	37.76	37.79	37.55	37.56	37.80	38.06	37.72	36.96	37.75	37.93	37.92
TiO2	3.16	3.07	2.74	3.06	3.03	3.06	3.09	3.35	3.35	3.47	3.09	3.37	2.75	3.03	3.16	3.49	3.22	2.87	3.27	2.14
Al2O3	14.14	14.16	13.46	15.34	14.52	14.60	14.17	14.36	14.24	14.26	14.29	14.70	14.42	14.97	14.74	14.06	14.30	14.34	14.27	13.95
FeO	18.60	18.72	15.51	17.07	17.73	17.44	17.54	18.62	18.19	18.54	18.42	17.25	17.51	17.65	17.67	17.80	17.13	17.69	17.73	18.37
Na2O	0.10	0.07	0.05	0.08	0.05	0.03	0.07	0.07	0.10	0.09	0.09	0.06	0.07	0.11	0.08	0.13	0.09	0.08	0.16	0.07
CaO	0.00	0.01	3.92	0.26	0.00	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.03	0.01	0.03	0.00	0.02
MnO	0.13	0.10	0.26	0.15	0.09	0.06	0.07	0.06	0.05	0.09	0.08	0.07	0.11	0.10	0.06	0.15	0.04	0.06	0.11	0.18
MgO	12.27	12.39	10.42	12.02	12.48	12.24	12.45	12.09	12.35	12.12	12.65	12.09	12.47	11.71	11.99	11.81	12.08	12.62	12.22	13.14
K2O	9.81	10.03	7.77	9.98	10.02	9.83	10.00	9.96	9.70	9.87	9.81	9.89	10.00	9.97	9.86	9.71	9.84	9.99	9.93	9.53
Cl	0.68	0.75	0.50	0.58	0.62	0.53	0.70	0.76	0.75	0.77	0.80	0.75	0.72	0.77	0.76	0.69	0.72	0.73	0.74	0.39
F	0.70	0.80	0.21	0.46	0.77	0.81	0.68	0.67	0.68	0.65	0.87	0.90	0.87	0.74	0.76	0.64	0.82	0.87	0.63	0.56
Total	96.95	97.50	88.51	96.63	97.15	96.49	96.38	97.48	96.92	97.62	97.91	96.65	96.48	96.84	97.14	96.23	95.21	97.03	96.98	96.28
Si	2.83	2.82	2.77	2.83	2.84	2.86	2.85	2.82	2.83	2.83	2.83	2.84	2.85	2.85	2.85	2.86	2.84	2.85	2.85	2.87
Ti	0.18	0.17	0.17	0.17	0.17	0.17	0.18	0.19	0.19	0.20	0.17	0.19	0.16	0.17	0.18	0.20	0.19	0.16	0.18	0.12
Al4+	1.17	1.18	1.23	1.17	1.16	1.14	1.15	1.18	1.17	1.17	1.17	1.16	1.15	1.15	1.15	1.14	1.16	1.15	1.15	1.13
Al6+	0.09	0.08	0.08	0.18	0.13	0.16	0.11	0.10	0.10	0.09	0.09	0.14	0.13	0.18	0.16	0.12	0.13	0.12	0.12	0.11
Fe2+	1.18	1.18	1.07	1.07	1.11	1.10	1.11	1.17	1.15	1.16	1.15	1.09	1.11	1.11	1.11	1.13	1.10	1.12	1.12	1.16
Na	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.01	0.01	0.02	0.01
Ca	0.00	0.00	0.35	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.01	0.01	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.01	0.01
Mg	1.38	1.39	1.28	1.35	1.40	1.38	1.41	1.36	1.39	1.36	1.41	1.36	1.41	1.31	1.34	1.33	1.38	1.42	1.37	1.48
K	0.95	0.97	0.82	0.96	0.96	0.95	0.97	0.96	0.93	0.94	0.94	0.95	0.97	0.96	0.94	0.94	0.96	0.96	0.95	0.92
Cl	0.09	0.10	0.07	0.07	0.08	0.07	0.09	0.10	0.10	0.10	0.10	0.10	0.09	0.10	0.10	0.09	0.09	0.09	0.09	0.05
F	0.17	0.19	0.05	0.11	0.18	0.19	0.16	0.16	0.16	0.15	0.21	0.22	0.21	0.18	0.18	0.15	0.20	0.21	0.15	0.14
log a(HCl)/a(HF)	-0.16	-0.17	0.04	-0.09	-0.21	-0.28	-0.13	-0.12	-0.12	-0.11	-0.16	-0.20	-0.19	-0.15	-0.16	-0.14	-0.18	-0.18	-0.11	-0.24

Sample No.	JB82B	JB82B	JB82B	JB82B	JB82A	JB82A	JB82A	JB82A	JB82A	JB82A	JB82C	JB82C	JB82C	JB82C	JB82C	JB82C	JB37C	JB37D	JB37D	JB37D
Analysis No.	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**6**	**1**	**5**	**12**	**16**	**19**	**19**	**E_1**	**A_1**	**A_2**	**A_3**
SiO2	37.91	38.24	38.42	38.19	38.19	38.02	38.05	38.54	37.87	38.72	38.38	37.85	38.32	38.59	38.34	38.83	38.40	37.11	37.07	36.61
TiO2	2.09	2.75	1.88	1.89	0.59	0.60	0.67	0.51	0.53	0.56	1.24	0.83	1.34	1.09	1.02	1.40	3.34	3.03	2.67	2.65
Al2O3	13.76	13.73	14.02	14.12	13.78	13.54	13.92	13.90	13.70	14.12	14.41	14.22	14.18	14.25	13.78	15.13	12.72	13.40	13.46	13.51
FeO	19.35	19.09	18.97	18.45	18.41	17.99	18.20	18.09	18.81	17.24	19.66	18.36	18.64	18.12	18.37	18.17	15.22	16.04	16.58	16.44
Na2O	0.10	0.10	0.06	0.05	0.09	0.08	0.09	0.06	0.05	0.07	0.04	0.10	0.06	0.09	0.11	0.07	0.08	0.11	0.14	0.08
CaO	0.00	0.00	0.00	0.00	0.09	0.07	0.02	0.01	0.00	0.00	0.03	0.11	0.04	0.01	1.07	0.14	0.03	0.00	0.02	0.01
MnO	0.22	0.20	0.22	0.21	0.10	0.06	0.12	0.14	0.11	0.11	0.25	0.29	0.22	0.20	0.21	0.27	0.10	0.11	0.11	0.12
MgO	12.77	12.63	12.90	13.56	12.58	12.94	12.87	13.35	13.11	13.14	12.08	13.59	12.69	13.07	11.78	11.71	15.61	13.74	14.17	14.14
K2O	10.13	9.89	9.83	9.88	9.73	9.87	9.89	9.72	10.16	10.01	9.68	9.52	9.85	9.72	7.00	9.62	9.12	9.47	9.15	9.34
Cl	0.39	0.39	0.37	0.35	0.32	0.33	0.33	0.33	0.33	0.34	0.54	0.54	0.55	0.54	0.36	0.54	0.51	0.35	0.40	0.35
F	0.61	0.59	0.63	0.69	0.56	0.56	0.80	0.81	0.86	0.65	0.52	0.42	0.33	0.50	0.20	0.35	1.15	0.84	0.62	0.79
Total	97.33	97.61	97.30	97.40	94.43	94.06	94.95	95.47	95.53	94.96	96.84	95.81	96.21	96.18	92.23	96.23	96.29	94.21	94.38	94.04
Si	2.86	2.87	2.89	2.86	2.95	2.95	2.93	2.94	2.91	2.96	2.90	2.88	2.90	2.92	2.98	2.92	2.88	2.86	2.84	2.83
Ti	0.12	0.16	0.11	0.11	0.03	0.03	0.04	0.03	0.03	0.03	0.07	0.05	0.08	0.06	0.06	0.08	0.19	0.18	0.15	0.15
Al4+	1.14	1.13	1.11	1.14	1.05	1.05	1.07	1.06	1.09	1.04	1.10	1.12	1.10	1.08	1.02	1.08	1.12	1.14	1.16	1.17
Al6+	0.09	0.08	0.13	0.11	0.20	0.18	0.19	0.19	0.16	0.23	0.19	0.15	0.17	0.19	0.24	0.26	0.00	0.07	0.06	0.06
Fe2+	1.22	1.20	1.19	1.16	1.19	1.17	1.17	1.15	1.21	1.10	1.24	1.17	1.18	1.14	1.19	1.14	0.95	1.03	1.06	1.06
Na	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.02	0.01
Ca	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.09	0.01	0.00	0.00	0.00	0.00
Mn	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01
Mg	1.44	1.41	1.45	1.52	1.45	1.49	1.48	1.52	1.50	1.50	1.36	1.54	1.43	1.47	1.36	1.31	1.74	1.58	1.62	1.63
K	0.98	0.95	0.94	0.95	0.96	0.98	0.97	0.95	1.00	0.97	0.93	0.92	0.95	0.94	0.69	0.92	0.87	0.93	0.90	0.92
Cl	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.07	0.07	0.07	0.07	0.05	0.07	0.07	0.05	0.05	0.05
F	0.15	0.14	0.15	0.16	0.14	0.14	0.19	0.20	0.21	0.16	0.13	0.10	0.08	0.12	0.05	0.08	0.27	0.21	0.15	0.19
log a(HCl)/a(HF)	-0.29	-0.27	-0.32	-0.35	-0.35	-0.31	-0.48	-0.47	-0.53	-0.37	-0.17	-0.08	-0.04	-0.13	-0.04	-0.07	-0.37	-0.21	-0.34	-0.34

Sample No.	JB37D	JB37D	JB37D	JB37D	JB37D	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E
Analysis No.	D_1	E_1	F_1C	E_1	G_1	F_1	G_1	H_4	H_19	H_20	H_29	H_30	H_36	H_39	I_4	I_15	J_1	J_9	J_17	J_24	J_38
SiO2	37.23	37.53	37.17	37.04	38.21	37.49	37.80	37.60	37.48	37.98	37.55	37.44	37.43	36.88	37.34	37.29	36.63	38.38	37.04	37.52	37.34
TiO2	3.49	3.06	3.36	2.75	3.46	2.09	1.79	2.00	1.93	2.05	1.97	1.89	1.85	2.23	2.22	1.92	1.91	2.21	2.26	1.89	1.91
Al2O3	13.55	13.69	13.43	13.50	13.60	13.22	13.38	13.03	13.37	13.27	13.24	13.40	13.19	13.38	13.22	13.20	13.25	13.45	13.16	13.71	13.44
FeO	16.09	15.37	16.54	16.25	15.59	16.81	16.91	17.02	17.30	16.97	16.53	17.55	17.13	17.10	16.35	16.93	17.57	16.54	17.05	17.14	16.51
Na2O	0.09	0.06	0.09	0.09	0.10	0.05	0.11	0.04	0.09	0.08	0.10	0.09	0.09	0.06	0.10	0.06	0.12	0.17	0.11	0.10	0.11
CaO	0.01	0.00	0.00	0.00	0.02	0.01	0.04	0.00	0.00	0.00	0.05	0.02	0.00	0.04	0.00	0.05	0.02	0.10	0.05	0.08	0.10
MnO	0.11	0.05	0.09	0.10	0.11	0.19	0.15	0.14	0.12	0.13	0.14	0.19	0.14	0.11	0.18	0.17	0.20	0.18	0.13	0.21	0.14
MgO	13.92	14.18	14.00	14.63	15.04	13.73	14.22	13.93	14.19	14.13	13.89	13.60	13.92	13.57	13.88	13.81	13.81	13.21	13.23	13.73	13.53
K2O	9.64	9.76	9.88	9.78	9.45	9.92	9.25	9.88	9.76	9.83	9.43	9.63	9.81	9.95	9.83	9.89	8.76	9.50	9.67	9.20	9.33
Cl	0.32	0.35	0.34	0.36	0.31	0.59	0.61	0.59	0.54	0.58	0.63	0.62	0.63	0.57	0.60	0.61	0.51	0.47	0.58	0.49	0.54
F	0.71	0.76	0.72	0.71	0.78	0.71	0.63	0.71	0.76	0.65	0.83	0.80	0.66	0.65	0.71	0.60	0.56	0.56	0.49	0.49	0.51
Total	95.16	94.81	95.62	95.21	96.67	94.81	94.89	94.95	95.53	95.66	94.35	95.22	94.86	94.54	94.43	94.52	93.35	94.77	93.76	94.55	93.47
Si	2.83	2.86	2.83	2.83	2.85	2.88	2.89	2.89	2.86	2.89	2.89	2.87	2.88	2.85	2.88	2.88	2.85	2.93	2.88	2.87	2.89
Ti	0.20	0.18	0.19	0.16	0.19	0.12	0.10	0.12	0.11	0.12	0.11	0.11	0.11	0.13	0.13	0.11	0.11	0.13	0.13	0.11	0.11
Al4+	1.17	1.14	1.17	1.17	1.15	1.12	1.11	1.11	1.14	1.11	1.11	1.13	1.12	1.15	1.12	1.12	1.15	1.07	1.12	1.13	1.11
Al6+	0.05	0.09	0.03	0.04	0.04	0.08	0.09	0.07	0.07	0.08	0.09	0.09	0.07	0.07	0.08	0.08	0.07	0.13	0.08	0.11	0.12
Fe2+	1.02	0.98	1.05	1.04	0.97	1.08	1.08	1.09	1.11	1.08	1.06	1.13	1.10	1.11	1.05	1.09	1.14	1.05	1.11	1.10	1.07
Na	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01
Mn	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	1.58	1.61	1.59	1.66	1.67	1.57	1.62	1.60	1.62	1.60	1.60	1.56	1.60	1.56	1.59	1.59	1.60	1.50	1.53	1.57	1.56
K	0.94	0.95	0.96	0.95	0.90	0.97	0.90	0.97	0.95	0.95	0.93	0.94	0.96	0.98	0.97	0.97	0.87	0.92	0.96	0.90	0.92
Cl	0.04	0.04	0.04	0.05	0.04	0.08	0.08	0.08	0.07	0.07	0.08	0.08	0.08	0.07	0.08	0.08	0.07	0.06	0.08	0.06	0.07
F	0.17	0.18	0.17	0.17	0.18	0.17	0.15	0.17	0.18	0.16	0.20	0.19	0.16	0.16	0.17	0.15	0.14	0.14	0.12	0.12	0.12
log a(HCl)/a(HF)	-0.31	-0.31	-0.27	-0.34	-0.26	-0.15	-0.11	-0.15	-0.19	-0.13	-0.17	-0.18	-0.12	-0.14	-0.14	-0.10	-0.13	-0.16	-0.08	-0.11	-0.09

Sample No.	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37H	JB37H	JB37H	JB37H	JB37H
Analysis No.	***K_19***	***K_25***	***K_31***	***B1_7***	***B1_9***	***B1_12***	***B1_18***	***B1_21***	***C1_4***	***D1_5***	***D1_11***	***D1_18***	***E1_1***	***E1_5***	***E1_11***	***B_2***	***E_1***	***F_1***	***F_2***	***F_3***
SiO2	37.28	37.01	37.09	37.76	37.64	37.73	37.48	37.97	38.10	38.82	38.66	38.45	38.24	38.67	38.44	37.08	37.43	37.69	37.62	38.57
TiO2	1.69	1.80	1.41	1.26	1.40	3.53	3.81	1.55	1.43	1.09	1.04	1.27	0.85	0.71	0.86	2.83	4.72	4.20	4.15	4.33
Al2O3	13.32	13.31	13.29	13.22	13.06	13.09	13.16	13.31	13.11	13.08	12.94	13.01	13.31	13.09	12.75	13.24	13.29	13.36	13.58	13.14
FeO	17.22	17.42	17.13	16.44	16.32	16.42	16.38	16.68	17.13	15.99	15.55	16.67	16.07	16.16	16.31	15.86	15.62	15.54	15.39	15.70
Na2O	0.06	0.11	0.09	0.14	0.09	0.06	0.17	0.13	0.09	0.10	0.10	0.09	0.06	0.06	0.07	0.15	0.12	0.09	0.08	0.13
CaO	0.02	0.05	0.02	0.05	0.03	0.03	0.08	0.06	0.00	0.00	0.05	0.03	0.04	0.05	0.01	0.03	0.00	0.00	0.01	0.02
MnO	0.16	0.18	0.16	0.15	0.10	0.16	0.11	0.11	0.15	0.12	0.08	0.09	0.13	0.07	0.05	0.05	0.10	0.09	0.09	0.13
MgO	13.45	12.90	13.23	14.76	14.16	14.41	14.14	14.27	14.32	15.28	15.25	14.67	14.94	15.29	14.87	14.76	14.86	14.98	14.79	14.96
K2O	9.89	9.39	9.49	9.34	9.97	9.95	9.33	9.68	9.80	10.02	9.91	9.85	9.68	9.94	9.95	9.61	9.80	9.80	9.44	9.39
Cl	0.57	0.56	0.51	0.42	0.38	0.44	0.53	0.42	0.44	0.54	0.54	0.52	0.47	0.43	0.53	0.45	0.49	0.39	0.46	0.44
F	0.80	0.58	0.43	0.71	0.73	0.72	0.74	0.76	0.74	0.82	0.81	0.85	0.70	0.78	0.76	0.83	0.81	0.75	0.73	0.73
Total	94.46	93.32	92.85	94.26	93.89	96.54	95.92	94.92	95.32	95.86	94.93	95.50	94.49	95.24	94.59	94.89	97.24	96.89	96.34	97.54
Si	2.89	2.89	2.90	2.90	2.91	2.84	2.83	2.90	2.91	2.93	2.94	2.93	2.93	2.94	2.95	2.84	2.79	2.81	2.82	2.85
Ti	0.10	0.11	0.08	0.07	0.08	0.20	0.22	0.09	0.08	0.06	0.06	0.07	0.05	0.04	0.05	0.16	0.26	0.24	0.23	0.24
Al4+	1.11	1.11	1.10	1.10	1.09	1.16	1.17	1.10	1.09	1.07	1.06	1.07	1.07	1.06	1.05	1.16	1.21	1.19	1.18	1.15
Al6+	0.10	0.12	0.13	0.10	0.10	0.00	0.01	0.10	0.09	0.10	0.10	0.09	0.13	0.11	0.10	0.03	-0.04	-0.01	0.01	-0.01
Fe2+	1.11	1.14	1.12	1.06	1.06	1.03	1.04	1.07	1.09	1.01	0.99	1.06	1.03	1.03	1.05	1.01	0.97	0.97	0.96	0.97
Na	0.01	0.02	0.01	0.02	0.01	0.01	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.02
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01
Mg	1.55	1.50	1.54	1.69	1.63	1.62	1.59	1.63	1.63	1.72	1.73	1.66	1.70	1.73	1.70	1.68	1.65	1.67	1.65	1.65
K	0.98	0.94	0.95	0.92	0.98	0.96	0.90	0.94	0.95	0.97	0.96	0.96	0.94	0.96	0.97	0.94	0.93	0.93	0.90	0.88
Cl	0.07	0.07	0.07	0.05	0.05	0.06	0.07	0.05	0.06	0.07	0.07	0.07	0.06	0.06	0.07	0.06	0.06	0.05	0.06	0.06
F	0.20	0.14	0.11	0.17	0.18	0.17	0.18	0.18	0.18	0.20	0.20	0.20	0.17	0.19	0.18	0.20	0.19	0.18	0.17	0.17
log a(HCl)/a(HF)	-0.21	-0.14	-0.09	-0.23	-0.29	-0.21	-0.17	-0.27	-0.25	-0.18	-0.18	-0.22	-0.19	-0.25	-0.18	-0.24	-0.18	-0.23	-0.18	-0.19

Appendix 4.3-Apatite analysis- Recalculations were made based on 25 Oxygens

Sample	JB6C	JB6C	JB6C	JB6C	JB6C	JB6C	JB6C	JB6C	JB6C	JB6C	JB6C	JB6C	JB6C	JB6C	JB6C	JB6C	JB6C	JB6C	JB6C	JB6C	JB6C
Analysis	1	2	3	2L1	2L2	2L3	2L4	2L5	3C	3R	4C1	4C2	4LC1	4L1	4L2	4L3	4L4	4L5	4R	6C	6L1
SiO2	0.36	0.73	0.18	0.06	0.51	0.73	1.25	0.93	0.37	1.73	1.03	0.44	1.47	1.08	1.02	1.29	0.29	1.08	0.26	0.34	0.96
FeO	1.08	0.23	0.30	0.36	0.41	0.59	0.70	0.94	0.86	1.09	0.24	0.21	0.11	0.26	0.26	0.20	0.17	0.21	0.29	0.26	0.47
Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CaO	54.24	53.90	55.08	55.19	55.00	54.77	53.62	54.31	54.49	54.72	51.79	54.77	52.99	53.64	53.88	53.25	54.80	53.56	55.18	55.33	54.46
P2O5	38.14	38.08	39.03	39.26	37.90	37.37	37.77	38.16	38.48	37.05	36.07	38.58	35.94	36.81	37.81	37.59	38.01	37.49	38.50	39.57	38.99
As2O5	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.01	0.00	0.02	0.00
MnO	0.01	0.03	0.03	0.03	0.09	0.05	0.07	0.08	0.05	0.05	0.07	0.01	0.02	0.01	0.02	0.08	0.04	0.00	0.01	0.02	0.00
Ce2O3	0.42	0.88	0.34	0.39	0.56	1.02	1.52	0.97	0.50	0.42	1.04	0.92	1.95	1.32	1.25	1.46	0.55	1.60	0.21	0.48	0.98
SO3	0.05	0.02	0.01	0.04	0.00	0.00	0.02	0.01	0.01	0.01	0.03	0.01	0.02	0.03	0.01	0.01	0.02	0.01	0.03	0.00	0.00
SrO	0.04	0.06	0.03	0.06	0.01	0.00	0.01	0.01	0.00	0.02	0.03	0.00	0.02	0.00	0.02	0.05	0.03	0.00	0.00	0.03	0.00
Cl	0.21	0.23	0.14	0.15	0.19	0.19	0.26	0.17	0.11	0.07	0.34	0.29	0.32	0.24	0.23	0.32	0.24	0.30	0.17	0.17	0.17
F	4.09	5.41	5.87	5.58	5.03	4.67	5.33	4.92	6.56	4.43	6.01	4.49	4.58	4.42	4.36	4.13	4.38	4.23	4.74	5.34	4.99
Total	96.86	97.25	98.51	98.74	97.55	97.38	98.22	98.40	98.66	97.69	94.03	97.77	95.42	95.90	96.97	96.57	96.64	96.64	97.35	99.28	98.87
No.	64.00	66.00	67.00	68.00	69.00	70.00	71.00	72.00	74.00	75.00	76.00	77.00	78.00	79.00	80.00	81.00	82.00	83.00	84.00	86.00	87.00
Si	0.07	0.14	0.03	0.01	0.10	0.14	0.24	0.18	0.07	0.33	0.20	0.08	0.29	0.21	0.20	0.25	0.06	0.21	0.05	0.06	0.18
Fe	0.22	0.05	0.06	0.07	0.08	0.12	0.14	0.19	0.17	0.22	0.05	0.04	0.02	0.05	0.05	0.04	0.04	0.04	0.06	0.05	0.09
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	8.74	8.57	8.62	8.63	8.78	8.81	8.47	8.58	8.49	8.74	8.50	8.73	8.72	8.76	8.66	8.60	8.85	8.67	8.80	8.60	8.52
P	6.22	6.13	6.18	6.21	6.13	6.09	6.04	6.10	6.07	5.99	5.99	6.22	5.99	6.08	6.15	6.15	6.22	6.14	6.22	6.23	6.17
As	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Ce	0.03	0.06	0.02	0.03	0.04	0.07	0.11	0.07	0.03	0.03	0.07	0.06	0.14	0.09	0.09	0.10	0.04	0.11	0.01	0.03	0.07
S	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Cl	0.07	0.07	0.05	0.05	0.06	0.06	0.08	0.05	0.04	0.02	0.11	0.09	0.11	0.08	0.07	0.11	0.08	0.10	0.06	0.05	0.05
F	2.49	3.25	3.47	3.30	3.04	2.84	3.18	2.94	3.86	2.67	3.73	2.71	2.85	2.73	2.65	2.52	2.67	2.59	2.86	3.14	2.95

Sample	JB6C	JB6C	JB6C	JB8B	JB8B	JB8B	JB8B	JB8B	JB8B	JB8B	JB8B	JB8B	JB8B	JB8B	JB8B	JB60C	JB60C	JB60C	JB60C	JB60C	JB60C	JB60C
Analysis	**6R**	**7**	**8**	**C1**	**L1**	**L2**	**L3**	**L4**	**2C**	**2L**	**2L**	**3L**	**3**	**4**	**L1**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
SiO2	5.26	0.32	0.27	0.30	1.40	0.95	1.02	5.15	0.28	0.71	0.28	1.15	0.29	0.33	0.67	0.24	0.24	0.31	0.28	0.34	0.26	0.24
FeO	1.60	0.23	0.07	0.14	0.13	0.17	0.18	6.49	0.30	0.25	0.37	0.85	0.32	0.32	0.14	0.14	0.21	0.09	0.09	0.00	0.07	0.14
Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
CaO	50.93	55.68	54.83	55.60	53.55	54.56	54.38	43.37	55.78	54.62	55.38	50.24	55.59	55.57	54.95	52.57	53.49	52.47	51.82	51.58	52.05	52.34
P2O5	33.11	39.45	40.16	38.17	36.04	36.74	36.39	29.40	37.74	37.42	36.47	34.12	36.46	36.99	37.67	37.21	38.96	38.69	37.41	36.45	37.08	37.98
As2O5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MnO	0.00	0.03	0.00	0.04	0.07	0.02	0.02	0.07	0.04	0.04	0.09	0.01	0.02	0.06	0.05	0.06	0.08	0.05	0.08	0.05	0.02	0.05
Ce2O3	0.00	0.31	0.46	0.40	1.30	0.78	0.93	0.00	0.22	0.54	0.35	0.39	0.38	0.23	0.70	0.43	0.29	0.41	0.39	0.42	0.42	0.17
SO3	0.05	0.00	0.04	0.07	0.01	0.01	0.01	0.02	0.00	0.00	0.01	0.01	0.02	0.01	0.08	0.00	0.01	0.01	0.01	0.01	0.00	0.01
SrO	0.00	0.03	0.01	0.06	0.00	0.03	0.02	0.00	0.03	0.02	0.03	0.03	0.03	0.00	0.04	0.02	0.00	0.01	0.00	0.02	0.03	0.04
Cl	0.06	0.20	0.20	0.21	0.25	0.23	0.19	0.03	0.15	0.19	0.17	0.20	0.23	0.22	0.25	0.53	0.24	0.63	0.54	0.66	0.59	0.54
F	4.72	4.85	4.20	4.06	3.90	4.10	4.27	1.89	4.27	5.43	4.92	4.39	3.98	3.94	3.95	3.99	4.67	3.84	3.74	3.97	3.82	4.13
Total	93.74	99.01	98.43	97.29	94.95	95.80	95.57	85.63	96.99	96.88	95.95	89.51	95.58	95.94	96.77	93.40	96.17	94.75	92.65	91.69	92.59	93.78
No.	88.00	89.00	119.00	13.00	14.00	15.00	16.00	17.00	19.00	20.00	21.00	22.00	23.00	24.00	30.00	90.00	91.00	92.00	93.00	94.00	95.00	96.00
Si	1.03	0.06	0.05	0.06	0.28	0.19	0.20	1.13	0.05	0.14	0.06	0.24	0.06	0.07	0.13	0.05	0.05	0.06	0.06	0.07	0.05	0.05
Fe	0.34	0.05	0.01	0.03	0.03	0.04	0.04	1.52	0.06	0.05	0.08	0.19	0.07	0.07	0.03	0.03	0.04	0.02	0.02	0.00	0.01	0.03
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	8.35	8.71	8.60	8.95	8.88	8.94	8.94	7.93	9.02	8.75	9.08	8.75	9.20	9.13	8.90	8.76	8.57	8.55	8.68	8.75	8.75	8.62
P	5.50	6.25	6.38	6.22	6.05	6.10	6.06	5.44	6.18	6.07	6.05	6.02	6.11	6.15	6.18	6.28	6.32	6.38	6.34	6.26	6.31	6.34
As	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01
Ce	0.00	0.02	0.03	0.03	0.09	0.06	0.07	0.00	0.02	0.04	0.03	0.03	0.03	0.02	0.05	0.03	0.02	0.03	0.03	0.03	0.03	0.01
S	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cl	0.02	0.06	0.06	0.07	0.08	0.08	0.06	0.01	0.05	0.06	0.06	0.07	0.08	0.07	0.08	0.18	0.08	0.21	0.18	0.23	0.20	0.18
F	2.93	2.87	2.49	2.47	2.45	2.54	2.65	1.31	2.61	3.29	3.05	2.89	2.49	2.44	2.42	2.51	2.83	2.37	2.37	2.55	2.42	2.57

Sample No.	JB82C	JB82C	JB82C	JB82C	JB82C	JB82C	JB82C	JB1	JB1	JB1	JB1	JB1	JB1	JB1	JB1	JB25A	JB25A	JB25A	JB25A	JB25A	JB25A	JB25A
Analysis No.	1	1D	2	2R	3	3L	4	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7
SiO2	0.11	0.49	0.30	0.34	0.31	0.57	0.30	0.17	0.25	0.11	0.12	0.26	0.23	0.26	0.23	0.24	0.13	0.18	0.32	0.36	0.37	0.36
FeO	0.15	0.28	0.10	0.37	0.25	0.37	0.25	0.16	0.16	0.14	0.12	0.12	0.15	0.06	0.05	0.05	0.05	0.05	0.11	0.10	0.14	0.04
Na2O	0.00	0.00	0.12	0.00	0.12	0.00	0.11	0.12	0.17	0.09	0.05	0.16	0.08	0.15	0.10	0.13	0.03	0.08	0.26	0.30	0.25	0.26
CaO	57.14	55.53	55.70	56.25	55.77	55.38	56.66	54.85	54.51	54.93	54.88	54.40	54.80	54.49	54.48	55.89	55.37	55.57	54.75	54.62	54.82	55.29
P2O5	41.01	40.56	39.33	40.29	40.22	38.55	39.39	38.15	37.20	38.05	37.26	37.34	37.61	37.72	37.20	39.46	40.74	39.99	38.28	38.91	38.65	38.76
As2O5	0.00	0.00	0.00	0.00	0.01	0.00	0.03	0.02	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00
MnO	0.06	0.04	0.10	0.04	0.02	0.07	0.07	0.07	0.13	0.09	0.01	0.10	0.10	0.12	0.10	0.08	0.11	0.06	0.04	0.07	0.06	0.04
Ce2O3	0.10	0.28	0.07	0.33	0.10	0.57	0.19	0.55	0.70	0.60	0.45	0.62	0.60	0.68	0.67	0.25	0.60	0.48	0.40	0.46	0.36	0.52
SO3	0.11	0.18	0.87	0.18	0.92	0.24	0.57	0.12	0.24	0.03	0.07	0.24	0.12	0.24	0.08	0.29	0.09	0.13	0.62	0.65	0.63	0.54
SrO	0.05	0.05	0.09	0.04	0.05	0.05	0.05	0.13	0.18	0.18	0.13	0.20	0.14	0.15	0.14	0.15	0.08	0.16	0.14	0.14	0.13	0.14
Cl	0.19	0.24	0.52	0.34	0.31	0.37	0.25	2.25	2.30	2.15	2.17	2.27	2.06	2.18	2.34	0.76	0.99	0.97	0.91	0.87	0.94	0.91
F	3.74	4.76	3.85	3.97	3.84	3.62	3.66	2.41	2.22	2.25	2.36	2.23	2.29	2.18	2.22	3.64	3.31	3.40	3.22	3.23	3.24	3.32
Total	101.04	100.34	99.30	100.39	100.23	98.19	99.93	97.48	96.63	97.18	96.15	96.46	96.76	96.79	96.13	99.24	99.87	99.41	97.48	98.15	98.03	98.56
No.	45.00	46.00	47.00	48.00	49.00	50.00	51.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	104.00	105.00	106.00	107.00	108.00	109.00	110.00
Si	0.02	0.09	0.06	0.06	0.06	0.11	0.06	0.03	0.05	0.02	0.02	0.05	0.04	0.05	0.05	0.05	0.02	0.03	0.06	0.07	0.07	0.07
Fe	0.03	0.05	0.02	0.07	0.05	0.08	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.01
Na	0.00	0.00	0.02	0.00	0.02	0.00	0.02	0.02	0.03	0.01	0.01	0.02	0.01	0.02	0.02	0.02	0.00	0.01	0.04	0.05	0.04	0.04
Ca	8.78	8.51	8.70	8.70	8.58	8.83	8.85	8.92	9.00	8.99	9.09	8.97	9.01	8.94	9.04	8.79	8.62	8.72	8.79	8.68	8.74	8.78
P	6.38	6.29	6.22	6.31	6.27	6.22	6.23	6.28	6.21	6.30	6.25	6.24	6.26	6.27	6.25	6.28	6.42	6.36	6.23	6.26	6.24	6.23
As	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.01	0.01	0.02	0.01	0.00	0.01	0.01	0.01	0.02	0.01	0.00	0.02	0.02	0.02	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01
Ce	0.01	0.02	0.01	0.02	0.01	0.04	0.01	0.04	0.05	0.04	0.03	0.04	0.04	0.05	0.05	0.02	0.04	0.03	0.03	0.03	0.02	0.04
S	0.02	0.02	0.12	0.02	0.13	0.03	0.08	0.02	0.04	0.00	0.01	0.04	0.02	0.04	0.01	0.04	0.01	0.02	0.09	0.09	0.09	0.08
Sr	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.01	0.02
Cl	0.06	0.07	0.16	0.10	0.10	0.12	0.08	0.74	0.77	0.71	0.73	0.76	0.69	0.72	0.79	0.24	0.31	0.31	0.30	0.28	0.30	0.29
F	2.17	2.76	2.27	2.32	2.23	2.18	2.16	1.48	1.39	1.39	1.48	1.39	1.43	1.35	1.39	2.16	1.95	2.02	1.95	1.94	1.95	1.99

Sample No.	JB25A	JB35F	JB35F	JB35F	JB35F	JB35F	JB35F	JB35F	JB87	JB87	JB87	JB87	JB88A	JB88A	JB88A	JB88A	JB88A	JB88A	JB88A	JB88A	JB88A
Analysis No.	8	1	2	3	4	5	6	7	1	2	3	4	1	1L	1D	2	2D	2L	3	3D	3L
SiO2	0.30	0.27	0.17	0.49	0.39	0.11	0.54	0.38	0.18	0.29	0.20	0.22	0.23	0.15	28.03	0.29	0.38	0.31	0.23	1.60	0.26
FeO	0.06	0.06	0.06	0.10	0.15	0.08	0.08	0.01	0.10	0.22	0.13	0.13	0.13	0.12	3.25	0.36	0.18	0.26	0.12	0.46	0.21
Na2O	0.16	0.00	0.00	0.05	0.17	0.01	0.00	0.17	0.10	0.00	0.14	0.18	0.06	0.03	0.35	0.22	0.04	0.24	0.13	0.03	0.15
CaO	55.34	56.31	56.58	54.79	54.57	55.02	54.59	55.13	54.75	56.14	54.55	54.50	55.67	56.53	40.47	54.51	40.07	54.71	55.91	31.18	55.14
P2O5	38.67	40.16	40.20	38.68	38.77	38.78	38.56	38.42	37.32	38.44	38.06	37.12	40.74	41.80	22.89	39.72	30.56	40.47	41.23	23.90	40.82
As2O5	0.04	0.02	0.01	0.00	0.00	0.03	0.00	0.03	0.00	0.01	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MnO	0.07	0.04	0.00	0.13	0.22	0.08	0.17	0.09	0.07	0.02	0.09	0.07	0.05	0.04	0.14	0.07	0.07	0.12	0.08	0.07	0.05
Ce2O3	0.44	0.10	0.22	0.65	0.40	0.43	0.68	0.15	0.79	0.49	0.78	0.63	0.62	0.32	0.32	0.68	0.47	0.72	0.59	0.40	0.76
SO3	0.54	0.19	0.09	0.43	0.82	0.09	0.30	0.74	0.03	0.05	0.03	0.16	0.06	0.05	0.02	0.47	0.48	0.33	0.03	0.10	0.09
SrO	0.16	0.07	0.03	0.12	0.10	0.11	0.12	0.11	0.20	0.01	0.15	0.15	0.15	0.15	0.00	0.14	0.10	0.08	0.11	0.04	0.12
Cl	0.83	0.43	0.15	2.45	3.14	2.77	2.35	1.92	2.26	0.22	1.82	2.31	1.51	0.93	0.70	1.86	1.61	1.74	1.23	1.37	1.24
F	3.47	3.40	3.58	2.12	1.89	2.09	2.23	2.63	2.05	3.88	2.40	2.18	2.57	3.50	1.41	2.72	2.21	2.72	3.36	0.83	3.45
Total	98.43	99.52	99.54	98.55	99.11	98.07	98.15	98.21	96.48	98.07	96.92	96.20	100.39	101.93	96.82	99.48	74.86	100.16	101.33	59.31	100.55
No.	111.00	97.00	98.00	99.00	100.00	101.00	102.00	103.00	26.00	27.00	28.00	29.00	35.00	36.00	37.00	38.00	39.00	40.00	41.00	42.00	43.00
Si	0.06	0.05	0.03	0.09	0.07	0.02	0.10	0.07	0.04	0.06	0.04	0.04	0.04	0.03	5.02	0.05	0.09	0.06	0.04	0.50	0.05
Fe	0.01	0.01	0.01	0.02	0.03	0.02	0.02	0.00	0.02	0.04	0.03	0.03	0.02	0.02	0.62	0.07	0.05	0.05	0.02	0.15	0.04
Na	0.02	0.00	0.00	0.01	0.03	0.00	0.00	0.03	0.02	0.00	0.02	0.03	0.01	0.00	0.05	0.03	0.01	0.04	0.02	0.01	0.02
Ca	8.80	8.81	8.85	8.78	8.68	8.88	8.78	8.81	9.08	8.98	8.93	9.04	8.68	8.60	6.06	8.57	8.26	8.52	8.59	8.13	8.53
P	6.22	6.36	6.37	6.27	6.24	6.34	6.28	6.22	6.26	6.23	6.31	6.23	6.43	6.44	3.47	6.32	6.38	6.38	6.41	6.31	6.39
As	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.01	0.01	0.00	0.02	0.03	0.01	0.03	0.01	0.01	0.00	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.02	0.01
Ce	0.03	0.01	0.02	0.05	0.03	0.03	0.05	0.01	0.06	0.03	0.06	0.05	0.04	0.02	0.02	0.05	0.04	0.05	0.04	0.05	0.05
S	0.08	0.03	0.01	0.06	0.12	0.01	0.04	0.11	0.00	0.01	0.00	0.02	0.01	0.01	0.00	0.07	0.09	0.05	0.00	0.02	0.01
Sr	0.02	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.00	0.02	0.02	0.02	0.02	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Cl	0.27	0.14	0.05	0.79	1.01	0.91	0.77	0.62	0.76	0.07	0.60	0.78	0.48	0.29	0.21	0.59	0.67	0.55	0.38	0.72	0.39
F	2.09	2.01	2.12	1.28	1.14	1.27	1.35	1.59	1.29	2.35	1.49	1.36	1.52	2.01	0.80	1.62	1.72	1.60	1.95	0.82	2.02

Sample No.	JB88A	JB37D	JB37D	JB37D	JB37D	JB37D	JB37D	JB37F	JB37F	JB37F	JB37F	JB37F	JB37F	JB37I	JB37I	JB37I	JB37I	JB37I	JB37I	JB37I
Analysis No.	**3D**	**1**	**2**	**2L**	**3**	**4**	**5**	**1**	**2**	**3**	**3L**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
SiO2	0.63	0.49	0.39	0.40	2.87	0.71	0.57	0.39	0.33	0.32	0.35	0.42	0.38	0.13	0.33	0.44	0.33	0.29	0.28	0.37
FeO	0.13	0.08	0.02	0.02	0.10	0.13	0.41	0.11	0.09	0.08	0.06	0.15	0.08	0.05	0.00	0.01	0.02	0.02	0.06	0.10
Na2O	0.01	0.22	0.02	0.03	0.57	0.20	0.13	0.13	0.06	0.07	0.03	0.12	0.15	0.00	0.00	0.00	0.00	0.00	0.03	0.00
CaO	55.56	54.91	56.69	56.25	53.00	54.79	56.01	55.60	55.70	55.51	56.30	55.59	54.73	55.92	55.50	55.50	55.85	55.44	55.37	55.22
P2O5	40.97	38.97	39.86	39.29	36.36	37.43	39.47	39.47	39.29	38.89	38.94	38.66	38.11	40.07	39.88	39.59	39.45	40.14	40.49	38.86
As2O5	0.00	0.00	0.06	0.01	0.00	0.01	0.01	0.00	0.03	0.00	0.01	0.00	0.06	0.00	0.00	0.00	0.01	0.00	0.01	0.01
MnO	0.09	0.04	0.00	0.01	0.02	0.03	0.03	0.05	0.04	0.06	0.06	0.01	0.05	0.00	0.00	0.01	0.00	0.00	0.03	0.03
Ce2O3	0.38	0.74	0.52	0.61	0.82	0.63	0.36	0.72	0.60	0.72	0.62	0.26	0.60	0.19	0.30	0.45	0.49	0.28	0.30	0.44
SO3	0.00	0.48	0.16	0.13	0.29	0.67	0.50	0.22	0.13	0.13	0.18	0.51	0.47	0.02	0.31	0.10	0.15	0.06	0.32	0.24
SrO	0.12	0.10	0.06	0.05	0.05	0.06	0.11	0.09	0.07	0.12	0.10	0.12	0.08	0.06	0.03	0.04	0.04	0.10	0.06	0.07
Cl	0.90	0.66	0.14	0.14	0.56	0.57	0.31	1.10	0.93	1.17	0.87	0.46	1.43	0.10	0.15	0.13	0.27	0.21	0.37	0.13
F	3.86	3.82	4.53	3.92	3.54	3.71	4.11	3.35	3.23	3.45	4.08	3.77	3.09	4.32	4.02	4.34	3.67	4.08	3.55	3.98
Total	100.84	98.75	100.51	99.18	96.54	97.25	100.22	99.57	98.94	98.80	99.67	98.38	97.61	99.02	98.78	98.75	98.67	98.85	99.28	97.75
No.	44.00	52.00	53.00	54.00	55.00	56.00	57.00	58.00	59.00	60.00	61.00	62.00	63.00	112.00	113.00	114.00	115.00	116.00	117.00	118.00
Si	0.12	0.09	0.07	0.08	0.55	0.14	0.11	0.07	0.06	0.06	0.07	0.08	0.07	0.02	0.06	0.08	0.06	0.05	0.05	0.07
Fe	0.03	0.02	0.00	0.00	0.02	0.03	0.08	0.02	0.02	0.02	0.01	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.01	0.02
Na	0.00	0.03	0.00	0.00	0.09	0.03	0.02	0.02	0.01	0.01	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	8.52	8.66	8.77	8.86	8.55	8.82	8.68	8.74	8.83	8.83	8.85	8.81	8.81	8.75	8.69	8.71	8.83	8.68	8.63	8.79
P	6.36	6.22	6.24	6.27	5.94	6.10	6.20	6.28	6.30	6.26	6.20	6.21	6.21	6.35	6.32	6.29	6.31	6.36	6.39	6.27
As	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Ce	0.03	0.05	0.04	0.04	0.06	0.04	0.02	0.05	0.04	0.05	0.04	0.02	0.04	0.01	0.02	0.03	0.03	0.02	0.02	0.03
S	0.00	0.07	0.02	0.02	0.04	0.10	0.07	0.03	0.02	0.02	0.02	0.07	0.07	0.00	0.04	0.01	0.02	0.01	0.05	0.03
Sr	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.01
Cl	0.28	0.21	0.04	0.04	0.18	0.19	0.10	0.35	0.30	0.38	0.28	0.15	0.47	0.03	0.05	0.04	0.09	0.07	0.12	0.04
F	2.24	2.28	2.65	2.34	2.16	2.26	2.41	1.99	1.94	2.07	2.43	2.26	1.88	2.55	2.38	2.58	2.19	2.41	2.09	2.39

Appendix 4.4- Plagioclase analysis- Recalculations were made based on 32 Oxygens

Sample No.	JB6C	JB6C	JB60C	JB60C	JB60C	JB60C	JB60C	JB60C	JB63	JB81	JB81	JB82B	JB82B	JB82B	JB88B	JB88B	JB37C	JB35A	JB35A	JB35A
Analysis No.	D_5	F_5	A_3	A_6	A_7	B_5	B_8	D_5	A_5	6	8	1	2	3	4	7	D_2	B_3	E_3	E_4
SiO2	66.27	65.92	73.76	74.16	73.96	74.26	73.26	73.90	61.15	66.91	69.72	66.90	65.16	74.32	70.71	73.84	70.33	63.45	64.03	63.59
TiO2	0.09	0.02	0.00	0.01	0.00	0.03	0.03	0.00	0.05	0.00	0.04	0.03	0.09	0.00	0.07	0.03	0.00	0.00	1.19	0.00
Al2O3	22.97	23.28	20.86	20.80	20.70	21.12	20.79	20.79	25.73	22.70	22.45	22.50	22.76	20.58	19.89	20.36	23.22	23.05	21.90	22.64
FeO	0.07	0.10	0.02	0.05	0.00	0.10	0.05	0.01	0.09	0.08	0.20	0.09	0.11	0.02	0.90	0.07	0.26	0.06	0.35	0.05
Na2O	9.28	8.74	10.83	10.63	10.20	8.13	9.13	9.29	7.55	10.02	10.56	10.02	9.70	11.27	12.63	11.78	7.62	9.30	9.29	9.43
CaO	3.94	4.39	0.53	0.10	0.07	0.14	0.21	0.14	7.16	3.44	2.54	3.41	3.94	0.04	0.35	0.34	2.88	4.44	3.58	4.19
MnO	0.00	0.00	0.02	0.00	0.00	0.02	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.05	0.02
MgO	0.00	0.00	0.02	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.12	0.01
K2O	0.21	0.33	0.03	0.05	0.04	0.21	0.08	0.03	0.26	0.10	0.13	0.14	0.25	0.38	0.15	0.10	0.09	0.26	0.18	0.27
Cl	0.00	0.01	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.01	2.12	0.05	0.00	0.00	0.01	0.01
F	0.00	0.00	0.00	0.04	0.02	0.04	0.00	0.00	0.00	0.05	0.06	0.00	0.00	0.01	0.06	0.07	0.01	0.00	0.00	0.05
Total	102.83	102.79	106.08	105.84	105.00	104.06	103.58	104.16	102.01	103.30	105.71	103.10	102.03	106.63	106.90	106.66	104.41	100.57	100.71	100.26
Si	11.36	11.31	12.07	12.13	12.17	12.24	12.18	12.21	10.69	11.42	11.60	11.44	11.30	12.12	11.79	12.08	11.69	11.18	11.25	11.24
Ti	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.16	0.00
Al	4.64	4.71	4.02	4.01	4.01	4.10	4.07	4.05	5.30	4.57	4.40	4.53	4.65	3.95	3.91	3.92	4.55	4.79	4.54	4.71
Fe2+	0.01	0.01	0.00	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.03	0.01	0.02	0.00	0.13	0.01	0.04	0.01	0.05	0.01
Na	3.08	2.91	3.44	3.37	3.25	2.60	2.94	2.97	2.56	3.32	3.40	3.32	3.26	3.56	4.08	3.73	2.46	3.18	3.17	3.23
Ca	0.72	0.81	0.09	0.02	0.01	0.02	0.04	0.02	1.34	0.63	0.45	0.62	0.73	0.01	0.06	0.06	0.51	0.84	0.67	0.79
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00
K	0.05	0.07	0.01	0.01	0.01	0.04	0.02	0.01	0.06	0.02	0.03	0.03	0.06	0.08	0.03	0.02	0.02	0.06	0.04	0.06
Cl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.01	0.00	0.00	0.00	0.00
F	0.00	0.00	0.00	0.02	0.01	0.02	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.03	0.04	0.01	0.00	0.00	0.03

Sample No.	*JB35A*	*JB35A*	*JB35A*	*JB35A*	*JB35A*	*JB35A*	*JB35A*	*JB82A*	*JB82C*	*JB82C*	*JB82C*	*JB1*	*JB1*	*JB1*	*JB37B*	*JB37B*	*JB37B*	*JB37B*	*JB37B*	*JB37D*
Analysis No.	***F_3***	***F_4***	***G_5***	***H_6***	***I_8***	***I_10***	***I_11***	***4***	***2***	***5***	***23***	***A_7***	***A_8***	***C_13***	***A_3***	***D_5***	***F_7***	***F_8***	***F_9***	***F_1***
SiO2	62.56	64.85	67.92	65.72	64.08	66.10	63.67	65.40	66.43	63.22	73.02	60.81	56.37	59.81	73.87	74.35	70.44	71.57	75.01	73.72
TiO2	0.04	0.01	0.16	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	1.27	0.00	0.05	0.00	0.03	0.04	0.00	0.04
Al2O3	21.44	22.23	20.81	21.86	22.76	22.15	22.73	22.59	23.63	24.52	21.53	24.28	18.91	25.41	20.96	20.76	18.77	17.35	21.04	21.15
FeO	1.34	0.11	1.22	0.09	0.01	0.15	0.04	0.12	0.08	0.09	0.01	0.07	4.80	0.03	0.24	0.27	2.72	2.68	0.34	0.32
Na2O	9.48	9.86	8.62	10.00	9.48	10.05	9.38	9.46	8.16	8.73	11.16	8.30	7.44	7.75	8.17	10.95	6.89	6.83	10.89	5.39
CaO	3.01	3.51	1.50	3.04	4.28	3.37	4.29	4.05	4.62	5.66	0.78	5.84	1.88	7.01	0.18	0.04	1.35	2.22	0.06	0.49
MnO	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.03	0.07	0.00	0.00
MgO	0.77	0.00	0.54	0.01	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.00	4.96	0.01	0.11	0.00	2.54	2.31	0.02	0.01
K2O	0.16	0.22	0.52	0.22	0.10	0.15	0.14	0.16	0.10	0.16	0.58	0.10	3.35	0.14	0.04	0.01	0.04	0.06	0.01	0.10
Cl	0.02	0.00	0.04	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.01	0.00	0.00	0.03
F	0.00	0.00	0.05	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.12	0.05	0.03	0.00	0.00	0.01	0.00	0.00
Total	98.85	100.80	101.37	100.94	100.80	102.01	100.25	101.79	103.05	102.38	107.09	99.42	99.31	100.22	103.66	106.38	102.82	103.14	107.38	101.24
Si	11.25	11.37	11.75	11.48	11.25	11.43	11.24	11.35	11.33	10.97	11.91	10.87	10.55	10.65	12.22	12.12	11.97	12.14	12.11	12.35
Ti	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Al	4.54	4.59	4.24	4.50	4.71	4.52	4.73	4.62	4.75	5.01	4.14	5.12	4.17	5.33	4.09	3.99	3.76	3.47	4.00	4.18
Fe2+	0.20	0.02	0.18	0.01	0.00	0.02	0.01	0.02	0.01	0.01	0.00	0.01	0.75	0.00	0.03	0.04	0.39	0.38	0.05	0.04
Na	3.31	3.35	2.89	3.39	3.23	3.37	3.21	3.18	2.70	2.94	3.53	2.88	2.70	2.68	2.62	3.46	2.27	2.25	3.41	1.75
Ca	0.58	0.66	0.28	0.57	0.80	0.62	0.81	0.75	0.84	1.05	0.14	1.12	0.38	1.34	0.03	0.01	0.25	0.40	0.01	0.09
Mn	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Mg	0.21	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.38	0.00	0.03	0.00	0.64	0.58	0.00	0.00
K	0.04	0.05	0.11	0.05	0.02	0.03	0.03	0.04	0.02	0.04	0.12	0.02	0.80	0.03	0.01	0.00	0.01	0.01	0.00	0.02
Cl	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.01
F	0.00	0.00	0.03	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.03	0.02	0.00	0.00	0.01	0.00	0.00

Sample No.	JB37D	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37F	JB37F	JB37F	JB37F	JB37F
Analysis No.	F_2	F_5	F_6	F_7	F_8	F_9	G_6	G_8	H_5	H_6	H_8	H_24	H_25	H_42	H_43	A_1	A_2	A_4	B_6	B_7
SiO2	64.62	55.96	66.36	59.46	65.56	64.10	60.53	65.46	59.48	66.45	66.42	65.59	65.77	65.52	64.54	67.01	70.36	64.62	71.75	71.26
TiO2	0.01	0.07	0.00	0.54	0.00	0.01	0.04	0.01	0.41	0.03	0.00	0.00	0.01	0.02	0.00	0.06	1.12	0.25	0.00	0.00
Al2O3	23.96	7.70	24.60	20.09	24.44	23.88	16.36	24.24	21.42	24.49	23.84	24.35	23.06	24.04	22.19	24.21	20.10	19.27	21.39	21.25
FeO	0.04	6.47	0.23	5.33	0.26	0.26	2.62	0.39	4.79	0.26	0.22	0.05	0.31	0.15	0.48	0.13	0.92	2.56	0.11	0.28
Na2O	8.59	3.19	7.66	4.22	8.17	8.70	6.77	8.15	5.76	7.44	9.03	8.62	5.76	8.24	5.12	6.61	9.25	5.87	9.22	7.92
CaO	4.88	15.32	4.77	1.80	4.84	4.89	9.93	4.66	3.11	4.76	4.08	4.37	2.98	4.71	5.71	1.33	0.92	3.64	0.86	0.79
MnO	0.00	0.10	0.05	0.06	0.00	0.04	0.05	0.00	0.04	0.02	0.03	0.03	0.01	0.02	0.03	0.00	0.00	0.00	0.00	0.02
MgO	0.00	10.14	0.02	4.35	0.00	0.04	3.93	0.07	3.97	0.03	0.03	0.01	0.13	0.09	0.89	0.02	0.64	2.21	0.02	0.04
K2O	0.20	0.27	0.17	3.12	0.15	0.14	0.18	0.21	2.83	0.19	0.14	0.13	2.00	0.19	0.21	1.67	0.03	0.68	0.07	0.57
Cl	0.01	0.01	0.00	0.12	0.00	0.00	0.00	0.00	0.14	0.00	0.03	0.00	0.03	0.01	0.02	0.01	0.00	0.09	0.01	0.01
F	0.00	0.04	0.00	0.19	0.00	0.00	0.00	0.03	0.27	0.03	0.04	0.08	0.01	0.00	0.00	0.00	0.04	0.05	0.00	0.00
Total	102.30	99.27	103.87	99.28	103.42	102.06	100.41	103.22	102.21	103.71	103.85	103.22	100.07	102.99	99.18	101.04	103.39	99.24	103.43	102.14
Si	11.16	10.79	11.23	10.91	11.17	11.12	11.04	11.19	10.68	11.25	11.28	11.20	11.51	11.21	11.39	11.53	11.87	11.54	12.00	12.05
Ti	0.00	0.01	0.00	0.07	0.00	0.00	0.01	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.03	0.00	0.00
Al	4.88	1.75	4.91	4.35	4.91	4.88	3.52	4.88	4.53	4.89	4.77	4.90	4.76	4.85	4.62	4.91	4.00	4.05	4.22	4.23
Fe2+	0.01	1.04	0.03	0.82	0.04	0.04	0.40	0.06	0.72	0.04	0.03	0.01	0.05	0.02	0.07	0.02	0.13	0.38	0.02	0.04
Na	2.88	1.19	2.51	1.50	2.70	2.93	2.39	2.70	2.00	2.44	2.97	2.85	1.95	2.73	1.75	2.21	3.03	2.03	2.99	2.60
Ca	0.90	3.17	0.86	0.35	0.88	0.91	1.94	0.85	0.60	0.86	0.74	0.80	0.56	0.86	1.08	0.25	0.17	0.70	0.15	0.14
Mn	0.00	0.02	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	2.92	0.01	1.19	0.00	0.01	1.07	0.02	1.06	0.01	0.01	0.00	0.03	0.02	0.23	0.00	0.16	0.59	0.00	0.01
K	0.04	0.07	0.04	0.73	0.03	0.03	0.04	0.04	0.65	0.04	0.03	0.03	0.45	0.04	0.05	0.37	0.01	0.15	0.01	0.12
Cl	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.04	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.03	0.00	0.00
F	0.00	0.03	0.00	0.11	0.00	0.00	0.00	0.02	0.15	0.02	0.02	0.04	0.01	0.00	0.00	0.00	0.02	0.03	0.00	0.00

Sample No.	*JB12B*	*JB37H*	*JB67*	*JB67*	*JB67*	*JB68*	*JB68*	*JB68*	*JB68*	*JB76*	*JB76*	*JB76*	*JB76*	*JB88A*	*JB89*	*JB89*	*JB89*	*JB89*	*JB89*
Analysis No.	*F_2*	*A_3*	*1*	*2*	*3*	*1*	*2*	*3*	*4*	*1*	*2*	*3*	*4*	*1*	*1*	*2*	*3*	*4*	*9*
SiO2	43.90	66.92	54.39	54.66	52.63	54.15	53.85	55.19	52.41	65.64	64.85	67.03	72.77	71.66	62.41	57.87	59.55	61.84	55.14
TiO2	0.10	0.00	0.02	0.01	0.10	0.13	0.07	0.02	0.03	0.00	0.00	0.05	0.00	0.02	0.02	0.04	0.03	0.05	0.06
Al2O3	22.08	23.45	28.66	28.74	29.69	29.28	29.53	28.55	30.49	24.62	27.96	24.50	23.88	21.21	24.27	27.03	25.41	24.08	28.90
FeO	2.64	0.08	0.22	0.37	0.45	0.36	0.52	0.12	0.25	0.14	0.81	0.17	0.15	0.16	0.11	0.15	0.04	0.12	0.21
Na2O	0.04	7.65	5.07	5.30	4.13	4.87	4.98	5.71	4.18	7.29	5.17	8.31	3.37	11.43	8.29	6.61	7.52	8.20	5.36
CaO	26.28	4.06	11.75	11.89	13.14	12.25	11.88	11.06	13.39	5.48	0.52	4.92	0.84	1.29	5.92	9.29	7.28	6.17	11.14
MnO	0.01	0.02	0.00	0.00	0.02	0.00	0.00	0.03	0.00	0.02	0.01	0.02	0.00	0.02	0.01	0.00	0.00	0.00	0.02
MgO	0.02	0.01	0.03	0.02	0.02	0.03	0.02	0.01	0.05	0.01	0.18	0.01	0.14	0.00	0.01	0.00	0.00	0.01	0.00
K2O	0.02	0.15	0.03	0.10	0.08	0.08	0.03	0.02	0.07	0.11	3.70	0.41	0.94	0.21	0.35	0.19	0.28	0.45	0.11
Cl	0.02	0.00	0.00	0.09	0.00	0.14	0.01	0.03	0.02	0.00	0.01	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
F	0.00	0.00	0.03	0.06	0.00	0.00	0.00	0.03	0.00	0.00	0.05	0.00	0.00	0.00	0.10	0.00	0.01	0.05	0.03
Total	95.11	102.34	100.20	101.23	100.26	101.29	100.89	100.77	100.89	103.31	103.27	105.44	102.09	106.01	101.49	101.19	100.13	100.97	100.97
Si	8.92	11.44	9.82	9.80	9.54	9.70	9.68	9.90	9.45	11.18	11.04	11.22	12.07	11.84	10.95	10.28	10.62	10.92	9.87
Ti	0.02	0.00	0.00	0.00	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.01
Al	5.29	4.72	6.10	6.07	6.35	6.18	6.25	6.03	6.48	4.94	5.61	4.83	4.67	4.13	5.02	5.66	5.34	5.01	6.09
Fe2+	0.45	0.01	0.03	0.06	0.07	0.05	0.08	0.02	0.04	0.02	0.12	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.03
Na	0.02	2.53	1.77	1.84	1.45	1.69	1.74	1.99	1.46	2.41	1.71	2.70	1.08	3.66	2.82	2.28	2.60	2.81	1.86
Ca	5.72	0.74	2.27	2.28	2.55	2.35	2.29	2.12	2.59	1.00	0.10	0.88	0.15	0.23	1.11	1.77	1.39	1.17	2.14
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.00	0.05	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
K	0.01	0.03	0.01	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.80	0.09	0.20	0.04	0.08	0.04	0.06	0.10	0.02
Cl	0.01	0.00	0.00	0.03	0.00	0.04	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F	0.00	0.00	0.02	0.03	0.00	0.00	0.00	0.02	0.00	0.00	0.03	0.00	0.00	0.00	0.06	0.00	0.01	0.03	0.02

Appendix 4.5-Clinopyroxene analysis- Recalculations were made based on 6 Oxygens

Sample No.	***JB60A***	***JB60A***	***JB60A***	***JB60A***	***JB60A***	***JB60A***	***JB60A***	***JB60A***	***JB60A***	***JB60A***	***JB60A***	***JB60A***	***JB60A***	***JB60A***	***JB60A***	***JB60A***	***JB60A***	***JB60A***	***JB60A***	***JB60A***
Analysis No.	***A_7***	***A_8***	***A_11***	***A_15***	***A_16***	***A_17***	***B_3***	***B_4***	***B_5***	***B_8***	***B_9***	***B_10***	***B_11***	***C_10***	***C_11***	***C_14***	***C_15***	***C_16***	***D_1***	***D_2***
SiO2	53.73	53.70	53.91	54.10	54.18	53.95	53.74	54.53	54.29	54.10	53.75	54.22	53.60	53.84	52.18	53.89	53.65	53.61	53.62	54.20
TiO2	0.11	0.04	0.04	0.15	0.04	0.07	0.08	0.02	0.06	0.13	0.23	0.12	0.07	0.10	0.41	0.09	0.09	0.11	0.14	0.04
Al2O3	0.86	0.80	0.83	0.80	0.67	0.65	0.93	0.59	0.45	0.87	0.89	0.89	0.89	0.81	2.48	0.89	0.84	0.90	1.04	0.69
FeO	9.00	8.49	8.44	8.17	8.36	8.15	8.42	8.01	8.14	7.94	8.97	8.75	8.41	8.08	10.70	8.47	8.61	7.91	7.99	7.82
Na2O	0.51	0.50	0.54	0.53	0.49	0.37	0.54	0.45	0.37	0.49	0.48	0.53	0.51	0.54	0.33	0.51	0.36	0.56	0.61	0.51
CaO	21.75	22.23	22.45	22.48	22.95	23.03	22.71	23.50	23.50	21.60	21.45	22.79	22.92	22.71	19.00	22.55	23.06	23.13	22.68	23.44
MnO	0.36	0.36	0.28	0.30	0.25	0.25	0.30	0.24	0.29	0.26	0.27	0.28	0.27	0.40	0.28	0.30	0.31	0.31	0.36	0.34
MgO	14.20	14.22	14.15	14.43	14.11	14.13	13.73	14.03	14.15	14.77	14.36	13.92	13.93	13.90	14.39	13.88	14.02	13.76	13.91	13.94
K2O	0.01	0.01	0.06	0.01	0.07	0.27	0.02	0.05	0.09	0.01	0.01	0.04	0.07	0.00	0.15	0.05	0.27	0.00	0.04	0.09
Cl	0.00	0.02	0.00	0.00	0.00	0.02	0.00	0.01	0.01	0.04	0.00	0.00	0.00	0.00	0.04	0.01	0.02	0.00	0.01	0.01
F	0.02	0.00	0.03	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00
Total	100.55	100.37	100.73	100.97	101.12	100.87	100.48	101.45	101.35	100.22	100.41	101.56	100.67	100.38	99.96	100.65	101.23	100.31	100.42	101.09
Si	1.99	1.99	1.99	1.99	1.99	1.99	1.99	2.00	2.00	2.00	1.99	1.99	1.99	1.99	1.95	1.99	1.98	1.99	1.99	2.00
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Al	0.04	0.04	0.04	0.03	0.03	0.03	0.04	0.03	0.02	0.04	0.04	0.04	0.04	0.04	0.11	0.04	0.04	0.04	0.05	0.03
Fe2+	0.28	0.26	0.26	0.25	0.26	0.25	0.26	0.25	0.25	0.25	0.28	0.27	0.26	0.25	0.33	0.26	0.27	0.25	0.25	0.24
Na	0.04	0.04	0.04	0.04	0.04	0.03	0.04	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.02	0.04	0.03	0.04	0.04	0.04
Ca	0.86	0.88	0.89	0.89	0.91	0.91	0.90	0.92	0.93	0.85	0.85	0.90	0.91	0.90	0.76	0.89	0.91	0.92	0.90	0.92
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	0.78	0.79	0.78	0.79	0.77	0.78	0.76	0.77	0.78	0.81	0.79	0.76	0.77	0.77	0.80	0.77	0.77	0.76	0.77	0.77
K	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
Cl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sample No.	***JB60A***	***JB60A***	***JB60A***	***JB60A***	***JB60B***	***JB60B***	***JB60B***	***JB60B***	***JB60B***	***JB60B***	***JB1***	***JB1***	***JB1***	***JB1***	***JB1***	***JB1***	***JB1***	***JB1***	***JB25A***	***JB37B***
Analysis No.	***D_5***	***D_6***	***D_8***	***D_9***	***A_4***	***A_5***	***A_6***	***C_5***	***D_6***	***D_10***	***A_5***	***A_6***	***B_1***	***B_2***	***B_3***	***C_3***	***EE_6***	***F_3***	***B_3***	***D_6***
SiO2	53.86	52.44	53.63	53.53	53.14	52.58	44.31	53.75	53.70	53.50	55.74	52.88	53.15	53.04	52.52	53.45	52.60	53.22	51.96	53.41
TiO2	0.03	0.30	0.10	0.12	0.05	1.15	3.52	0.03	0.05	0.01	0.04	0.16	0.14	0.07	0.12	0.08	0.26	0.10	0.32	0.07
Al2O3	0.88	1.90	0.91	1.09	1.09	1.48	7.06	0.79	0.65	0.83	0.66	1.48	1.33	1.07	1.34	0.65	1.37	1.24	1.61	1.01
FeO	8.24	8.62	8.32	8.49	7.71	7.86	11.95	7.86	8.41	7.46	6.86	9.27	7.44	8.51	8.68	7.46	9.91	7.74	7.09	9.07
Na2O	0.53	0.42	0.54	0.47	0.61	0.69	0.29	0.62	0.54	0.60	0.57	0.59	0.71	0.45	0.72	0.76	0.55	0.93	1.06	1.27
CaO	23.02	21.12	22.86	22.42	23.07	22.34	12.84	23.35	23.86	23.59	22.48	21.67	22.33	22.29	21.94	22.91	20.50	22.26	22.36	21.54
MnO	0.32	0.32	0.31	0.37	0.38	0.21	0.18	0.32	0.27	0.26	0.33	0.29	0.29	0.34	0.39	0.33	0.39	0.34	0.34	0.18
MgO	13.86	14.00	13.90	14.09	13.93	13.39	13.57	14.00	13.48	13.93	14.15	14.06	14.08	14.31	13.83	14.39	13.31	14.11	13.99	13.08
K2O	0.06	1.09	0.05	0.35	0.01	0.43	3.35	0.01	0.00	0.01	0.10	0.01	0.01	0.01	0.00	0.00	0.01	0.00	0.02	0.06
Cl	0.01	0.09	0.00	0.02	0.00	0.03	0.22	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
F	0.00	0.03	0.00	0.00	0.00	0.05	0.41	0.00	0.00	0.04	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.06	0.01
Total	100.82	100.33	100.61	100.94	100.00	100.22	97.70	100.72	100.96	100.23	100.94	100.42	99.48	100.10	99.55	100.04	98.92	99.94	98.81	99.70
Si	1.99	1.96	1.99	1.98	1.98	1.96	1.74	1.99	1.99	1.99	2.03	1.97	1.98	1.97	1.97	1.99	1.99	1.98	1.96	2.00
Ti	0.00	0.01	0.00	0.00	0.00	0.03	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00
Al	0.04	0.08	0.04	0.05	0.05	0.07	0.33	0.03	0.03	0.04	0.03	0.06	0.06	0.05	0.06	0.03	0.06	0.05	0.07	0.04
Fe2+	0.25	0.27	0.26	0.26	0.24	0.24	0.39	0.24	0.26	0.23	0.21	0.29	0.23	0.26	0.27	0.23	0.31	0.24	0.22	0.28
Na	0.04	0.03	0.04	0.03	0.04	0.05	0.02	0.04	0.04	0.04	0.04	0.04	0.05	0.03	0.05	0.05	0.04	0.07	0.08	0.09
Ca	0.91	0.84	0.91	0.89	0.92	0.89	0.54	0.92	0.95	0.94	0.88	0.86	0.89	0.89	0.88	0.91	0.83	0.89	0.90	0.86
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	0.76	0.78	0.77	0.78	0.77	0.74	0.79	0.77	0.74	0.77	0.77	0.78	0.78	0.79	0.77	0.80	0.75	0.78	0.79	0.73
K	0.00	0.05	0.00	0.02	0.00	0.02	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cl	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00

Sample No.	*JB37B*	*JB37B*	*JB37D*	*JB37D*	*JB37D*	*JB37E*	*JB37E*	*JB37E*	*JB37E*	*JB37E*	*JB37E*	*JB37E*	*JB37E*	*JB37E*	*JB37E*	*JB37E*	*JB37E*	*JB37E*	*JB37E*	*JB37E*
Analysis No.	*F_6*	*F_12*	*F_1*	*F_2*	*G_1*	*F_4*	*G_4*	*G_5*	*H_1*	*H_2*	*H_7*	*H_22*	*H_23*	*H_33*	*H_34*	*H_35*	*H_37*	*H_38*	*H_44*	*I_1*
SiO2	54.11	53.94	53.58	53.38	52.87	52.26	52.83	53.06	53.06	53.01	53.34	52.62	52.38	52.89	53.20	50.75	52.95	51.41	52.62	52.87
TiO2	0.05	0.00	0.05	0.05	0.18	0.06	0.10	0.06	0.18	0.11	0.07	0.08	0.12	0.07	0.03	0.54	0.07	0.26	0.05	0.00
Al2O3	0.83	0.61	0.55	0.67	1.13	1.41	1.17	1.32	1.25	1.17	1.21	1.36	1.41	1.31	0.94	2.16	0.93	2.38	1.29	0.85
FeO	8.79	7.73	7.95	8.21	8.32	8.72	8.81	7.96	8.51	8.45	7.57	8.30	8.53	8.42	7.05	7.75	8.09	9.19	8.62	8.39
Na2O	1.15	1.00	0.53	0.67	0.69	0.87	0.71	0.76	0.86	0.71	0.72	0.87	0.94	1.05	0.70	0.59	0.64	0.74	1.09	0.65
CaO	21.80	22.92	22.99	22.12	22.82	22.51	22.84	22.96	22.72	22.50	23.14	22.80	22.37	22.16	23.06	21.15	23.25	19.86	22.16	23.19
MnO	0.21	0.17	0.29	0.25	0.34	0.33	0.30	0.25	0.37	0.32	0.31	0.27	0.30	0.36	0.23	0.25	0.25	0.23	0.30	0.22
MgO	13.17	13.15	13.84	13.78	13.55	13.23	13.07	13.00	13.32	13.34	13.21	13.13	13.09	13.14	13.51	13.68	13.36	13.02	13.04	13.19
K2O	0.02	0.00	0.00	0.04	0.03	0.00	0.02	0.02	0.02	0.07	0.00	0.09	0.00	0.01	0.09	0.80	0.08	1.27	0.00	0.02
Cl	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.05	0.01	0.08	0.00	0.00
F	0.00	0.05	0.04	0.00	0.05	0.02	0.00	0.00	0.00	0.04	0.00	0.01	0.02	0.05	0.00	0.10	0.01	0.09	0.00	0.00
Total	100.12	99.58	99.82	99.17	100.00	99.42	99.86	99.38	100.29	99.73	99.58	99.52	99.17	99.46	98.82	97.82	99.63	98.53	99.17	99.39
Si	2.01	2.01	2.00	2.00	1.98	1.97	1.98	1.99	1.98	1.98	1.99	1.98	1.97	1.98	2.00	1.94	1.98	1.96	1.98	1.99
Ti	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.00
Al	0.04	0.03	0.02	0.03	0.05	0.06	0.05	0.06	0.05	0.05	0.05	0.06	0.06	0.06	0.04	0.10	0.04	0.11	0.06	0.04
Fe2+	0.27	0.24	0.25	0.26	0.26	0.27	0.28	0.25	0.27	0.26	0.24	0.26	0.27	0.26	0.22	0.25	0.25	0.29	0.27	0.26
Na	0.08	0.07	0.04	0.05	0.05	0.06	0.05	0.05	0.06	0.05	0.05	0.06	0.07	0.08	0.05	0.04	0.05	0.05	0.08	0.05
Ca	0.87	0.92	0.92	0.89	0.91	0.91	0.92	0.92	0.91	0.90	0.93	0.92	0.90	0.89	0.93	0.87	0.93	0.81	0.89	0.93
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	0.73	0.73	0.77	0.77	0.75	0.74	0.73	0.73	0.74	0.74	0.74	0.73	0.74	0.74	0.76	0.78	0.75	0.74	0.73	0.74
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.06	0.00	0.00
Cl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
F	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00

Sample No.	***JB37E***	***JB37E***	***JB37E***	***JB37E***	***JB37E***	***JB37E***	***JB37E***	***JB37E***	***JB37E***	***JB37E***	***JB37E***	***JB37E***	***JB37E***	***JB37E***	***JB37E***	***JB37E***	***JB37E***	***JB37E***	***JB37E***	***JB37E***
Analysis No.	***I_2***	***I_9***	***I_10***	***I_13***	***I_14***	***I_18***	***I_19***	***J_2***	***J_3***	***J_4***	***J_10***	***J_11***	***J_12***	***J_13***	***J_15***	***J_16***	***J_20***	***J_23***	***J_27***	***J_28***
SiO2	53.32	52.57	53.14	52.48	52.60	52.89	50.57	52.48	52.66	52.42	52.78	52.88	52.68	52.67	52.45	53.32	53.15	52.88	53.47	53.24
TiO2	0.04	0.09	0.09	0.12	0.09	0.09	0.20	0.00	0.06	0.08	0.10	0.15	0.14	0.10	0.06	0.07	0.09	0.08	0.10	0.10
Al2O3	0.86	1.41	0.89	1.49	1.18	1.08	2.76	1.00	0.95	1.29	1.17	1.22	1.52	1.21	1.14	1.03	0.99	1.28	1.05	1.14
FeO	7.70	8.40	7.53	8.45	8.54	7.66	11.44	7.89	7.90	8.75	8.50	8.29	8.93	8.57	8.02	8.05	7.56	8.42	8.40	8.60
Na2O	0.77	0.87	0.69	0.88	0.78	0.75	0.88	0.71	0.66	0.75	0.66	0.70	0.81	0.80	0.75	0.64	0.74	0.73	0.68	0.71
CaO	23.16	22.87	23.16	22.65	22.63	23.20	18.69	23.10	22.95	22.87	22.65	23.11	22.70	22.92	22.45	23.03	23.24	22.95	22.76	22.80
MnO	0.28	0.25	0.26	0.30	0.28	0.19	0.25	0.23	0.30	0.34	0.26	0.27	0.26	0.28	0.25	0.32	0.19	0.24	0.28	0.32
MgO	13.71	13.12	13.51	13.10	13.40	13.46	12.98	13.75	13.52	12.99	13.19	13.16	12.91	13.16	13.47	13.61	13.47	13.11	13.20	13.08
K2O	0.05	0.01	0.07	0.06	0.02	0.01	0.77	0.06	0.04	0.00	0.06	0.02	0.00	0.01	0.08	0.07	0.03	0.00	0.07	0.04
Cl	0.00	0.00	0.00	0.01	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.00
F	0.00	0.04	0.00	0.01	0.05	0.00	0.11	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Total	99.88	99.64	99.35	99.54	99.56	99.32	98.71	99.23	99.03	99.49	99.41	99.80	99.96	99.73	98.68	100.16	99.45	99.69	100.01	100.02
Si	1.99	1.97	1.99	1.97	1.98	1.98	1.93	1.97	1.98	1.97	1.98	1.98	1.97	1.98	1.98	1.98	1.99	1.98	1.99	1.99
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	0.04	0.06	0.04	0.07	0.05	0.05	0.12	0.04	0.04	0.06	0.05	0.05	0.07	0.05	0.05	0.05	0.04	0.06	0.05	0.05
Fe2+	0.24	0.26	0.24	0.27	0.27	0.24	0.37	0.25	0.25	0.28	0.27	0.26	0.28	0.27	0.25	0.25	0.24	0.26	0.26	0.27
Na	0.06	0.06	0.05	0.06	0.06	0.05	0.07	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05
Ca	0.93	0.92	0.93	0.91	0.91	0.93	0.77	0.93	0.93	0.92	0.91	0.93	0.91	0.92	0.91	0.92	0.93	0.92	0.91	0.91
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	0.76	0.73	0.75	0.73	0.75	0.75	0.74	0.77	0.76	0.73	0.74	0.73	0.72	0.74	0.76	0.76	0.75	0.73	0.73	0.73
K	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sample No.	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E
Analysis No.	J_29	J_39	J_40	J_41	J_42	J_43	J_44	J_46	J_53	K_1	K_2	K_3	K_4	K_6	K_8	K_12	K_13	K_16	K_20	K_21
SiO2	53.05	52.89	52.68	52.83	53.07	52.95	52.61	53.13	52.83	52.85	52.96	51.92	53.22	53.07	52.99	52.94	52.45	52.67	48.54	52.74
TiO2	0.10	0.05	0.07	0.08	0.07	0.14	0.17	0.07	0.09	0.12	0.10	0.61	0.04	0.07	0.08	0.11	0.16	0.13	1.21	0.07
Al2O3	1.14	0.91	1.14	1.32	1.26	1.40	1.32	1.01	1.14	1.46	1.16	1.77	0.97	1.24	1.24	1.29	1.46	1.30	3.56	1.36
FeO	8.05	8.23	7.98	8.83	8.35	8.84	8.38	7.85	8.31	8.82	8.27	8.32	8.15	8.54	8.37	8.61	8.51	8.58	9.96	8.64
Na2O	0.72	0.70	0.66	0.74	0.74	0.76	0.72	0.71	0.76	0.77	0.70	0.69	0.73	0.80	0.75	0.72	0.71	0.71	0.68	0.83
CaO	23.21	23.01	22.68	22.65	22.79	22.74	22.51	23.29	22.76	22.53	22.87	21.89	22.96	22.86	22.73	23.13	22.21	23.21	20.04	22.61
MnO	0.22	0.26	0.25	0.26	0.29	0.22	0.29	0.24	0.32	0.25	0.30	0.24	0.23	0.24	0.26	0.19	0.25	0.30	0.24	0.28
MgO	13.13	13.50	13.17	13.08	13.19	13.21	13.21	13.55	13.30	13.26	13.08	12.68	13.33	13.23	12.96	13.06	13.20	13.17	12.29	13.35
K2O	0.01	0.06	0.03	0.00	0.02	0.05	0.18	0.02	0.01	0.01	0.12	0.44	0.06	0.01	0.01	0.14	0.38	0.00	0.24	0.06
Cl	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.02	0.01	0.02	0.00
F	0.00	0.05	0.04	0.01	0.06	0.00	0.00	0.04	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.01	0.00	0.04	0.12	0.00
Total	99.64	99.67	98.70	99.82	99.84	100.32	99.40	99.92	99.52	100.08	99.56	98.60	99.70	100.07	99.40	100.20	99.34	100.11	96.91	99.94
Si	1.99	1.98	1.99	1.98	1.98	1.97	1.98	1.98	1.98	1.97	1.99	1.97	1.99	1.98	1.99	1.98	1.97	1.97	1.89	1.97
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00
Al	0.05	0.04	0.05	0.06	0.06	0.06	0.06	0.04	0.05	0.06	0.05	0.08	0.04	0.05	0.05	0.06	0.06	0.06	0.16	0.06
Fe2+	0.25	0.26	0.25	0.28	0.26	0.28	0.26	0.24	0.26	0.28	0.26	0.26	0.25	0.27	0.26	0.27	0.27	0.27	0.32	0.27
Na	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.05	0.05	0.05	0.06	0.05	0.05	0.05	0.05	0.05	0.06
Ca	0.93	0.92	0.92	0.91	0.91	0.91	0.91	0.93	0.91	0.90	0.92	0.89	0.92	0.91	0.91	0.93	0.90	0.93	0.83	0.91
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	0.73	0.75	0.74	0.73	0.74	0.73	0.74	0.75	0.74	0.74	0.73	0.72	0.74	0.74	0.72	0.73	0.74	0.73	0.71	0.74
K	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00	0.01	0.02	0.00	0.01	0.00
Cl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00

Sample No.	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37E	JB37F	JB37F	JB37F	JB12B	JB35F	JB37H	JB37H	JB37H	JB67
Analysis No.	***K_22***	***K_26***	***K_27***	***K_28***	***B1_1***	***B1_26***	***B1_27***	***B1_29***	***D1_15***	***D1_24***	***C_17***	***D_9***	***F_1***	***A_2***	***D_3***	***A_4***	***E_2***	***F_5***	***1***
SiO2	52.69	52.72	52.60	52.43	53.63	53.95	53.92	53.77	51.47	53.17	52.47	52.54	52.07	54.23	52.88	50.98	53.49	53.80	51.33
TiO2	0.10	0.11	0.01	0.10	0.00	0.00	0.08	0.01	0.06	0.06	0.18	0.17	0.21	0.10	0.09	0.05	0.14	0.00	0.22
Al2O3	1.25	1.27	1.03	1.38	0.40	0.38	0.41	0.45	1.17	0.85	1.05	1.01	1.25	0.42	1.02	2.76	0.95	0.53	2.98
FeO	8.82	8.00	7.82	8.67	7.53	7.53	7.59	7.32	12.07	8.88	8.03	7.72	7.58	8.33	8.24	10.91	9.19	7.17	10.50
Na2O	0.93	0.87	0.72	0.86	0.58	0.66	0.66	0.65	0.90	1.01	0.81	0.83	0.84	0.38	0.57	0.82	0.88	0.87	0.36
CaO	22.30	22.56	23.13	22.14	23.63	23.11	23.13	23.30	18.62	21.91	22.77	23.06	22.56	23.08	23.14	19.38	21.58	24.01	19.54
MnO	0.32	0.16	0.21	0.28	0.21	0.20	0.23	0.22	0.14	0.30	0.08	0.09	0.10	0.42	0.39	0.21	0.34	0.38	0.16
MgO	13.40	13.33	13.33	13.20	13.86	13.70	14.12	14.14	11.24	13.18	13.56	13.58	13.54	13.97	13.51	13.88	13.51	14.56	14.86
K2O	0.00	0.20	0.04	0.01	0.00	0.00	0.01	0.01	0.35	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.01
Cl	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
F	0.00	0.00	0.00	0.01	0.00	0.02	0.05	0.00	0.61	0.00	0.00	0.01	0.05	0.00	0.00	0.00	0.00	0.01	0.02
Total	99.81	99.23	98.89	99.08	99.85	99.56	100.20	99.87	96.66	99.37	98.95	99.01	98.20	100.93	99.85	99.00	100.08	101.33	100.00
Si	1.97	1.98	1.98	1.98	2.00	2.01	2.00	2.00	2.02	2.00	1.98	1.98	1.97	2.00	1.98	1.93	1.99	1.98	1.92
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
Al	0.06	0.06	0.05	0.06	0.02	0.02	0.02	0.02	0.05	0.04	0.05	0.04	0.06	0.02	0.05	0.12	0.04	0.02	0.13
Fe2+	0.28	0.25	0.25	0.27	0.23	0.23	0.24	0.23	0.40	0.28	0.25	0.24	0.24	0.26	0.26	0.35	0.29	0.22	0.33
Na	0.07	0.06	0.05	0.06	0.04	0.05	0.05	0.05	0.07	0.07	0.06	0.06	0.06	0.03	0.04	0.06	0.06	0.06	0.03
Ca	0.90	0.91	0.93	0.89	0.94	0.92	0.92	0.93	0.78	0.88	0.92	0.93	0.92	0.91	0.93	0.79	0.86	0.95	0.78
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Mg	0.75	0.75	0.75	0.74	0.77	0.76	0.78	0.78	0.66	0.74	0.76	0.76	0.77	0.77	0.75	0.78	0.75	0.80	0.83
K	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.08	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00

Sample No.	***JB67***	***JB67***	***JB67***	***JB68***	***JB68***	***JB68***	***JB76***	***JB76***	***JB76***	***JB76***	***JB76***	***JB76***	***JB88A***	***JB88A***	***JB88A***	***JB89***	***JB89***	***JB89***	***JB89***
Analysis No.	***2***	***2***	***3***	***1***	***2***	***3***	***1***	***2***	***3***	***4***	***5***	***6***	***1***	***2***	***3***	***5***	***8***	***11***	***12***
SiO2	51.44	52.41	52.10	54.33	52.41	52.02	53.65	54.10	54.27	53.74	54.36	53.72	53.59	54.60	54.28	53.68	53.94	51.59	51.61
TiO2	0.15	0.20	0.60	0.31	0.67	0.57	0.12	0.11	0.04	0.00	0.04	0.03	0.03	0.06	0.02	0.06	0.02	0.59	0.26
Al2O3	2.18	2.21	2.55	2.83	2.47	2.56	1.13	0.92	0.99	1.03	0.61	1.08	1.19	1.08	0.60	0.80	0.60	3.09	1.04
FeO	11.78	10.87	10.19	11.13	9.06	10.80	9.44	9.70	8.86	8.99	8.87	9.59	9.68	9.06	10.66	10.05	8.85	8.87	11.87
Na2O	0.58	0.37	0.34	0.38	0.33	0.35	0.73	0.72	0.71	0.76	0.61	0.73	0.58	0.87	0.99	0.32	0.38	0.57	0.40
CaO	17.69	18.94	19.55	12.34	19.90	18.55	22.10	21.73	22.50	22.26	22.64	22.15	21.53	22.46	21.85	22.86	23.08	22.48	21.92
MnO	0.23	0.16	0.15	0.17	0.20	0.19	0.18	0.17	0.17	0.19	0.19	0.18	0.42	0.29	0.32	0.16	0.13	0.14	0.14
MgO	15.15	15.50	15.12	16.61	15.82	15.41	13.68	13.57	13.96	13.75	13.89	13.49	14.25	13.64	12.82	13.09	13.73	12.79	12.41
K2O	0.02	0.00	0.01	0.05	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.02
Cl	0.50	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
F	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.10	0.10	0.00
Total	99.72	100.67	100.61	98.24	100.86	100.45	101.05	101.07	101.50	100.73	101.21	101.00	101.27	102.06	101.54	101.02	100.85	100.24	99.67
Si	1.93	1.94	1.93	2.01	1.93	1.93	1.98	2.00	1.99	1.99	2.00	1.99	1.98	1.99	2.01	1.99	2.00	1.93	1.96
Ti	0.00	0.01	0.02	0.01	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01
Al	0.10	0.10	0.11	0.12	0.11	0.11	0.05	0.04	0.04	0.05	0.03	0.05	0.05	0.05	0.03	0.04	0.03	0.14	0.05
Fe2+	0.37	0.34	0.32	0.34	0.28	0.33	0.29	0.30	0.27	0.28	0.27	0.30	0.30	0.28	0.33	0.31	0.27	0.28	0.38
Na	0.04	0.03	0.02	0.03	0.02	0.02	0.05	0.05	0.05	0.05	0.04	0.05	0.04	0.06	0.07	0.02	0.03	0.04	0.03
Ca	0.71	0.75	0.78	0.49	0.78	0.74	0.88	0.86	0.88	0.88	0.89	0.88	0.85	0.88	0.87	0.91	0.92	0.90	0.89
Mn	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Mg	0.85	0.86	0.83	0.92	0.87	0.85	0.75	0.75	0.76	0.76	0.76	0.74	0.78	0.74	0.71	0.72	0.76	0.71	0.70
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cl	0.03	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00

Appendix 5- Fluid inclusions

Appendix 5.1- Fluid inclusion microthermometry

List of abbreviations

TmCO₂	Final melting temperature of CO_2
ThCO₂	Homogenization temperature of CO_2 (L → V)
Tfm	Temperature of first melting/ Eutectic temperature
Tm	Final melting temperature of ice
Thm	Temperature of hydrohalite melting
TmCla	Temperature of clathrate melting
ThV	Homogenization temperature of vapour phase
ThS	Homogenization temperature of solid phase
Th	Final homogenization temperature
NaCl	NaCl content calculated using Calcicbrine (Naden, 1996).
CaCl₂	$CaCl_2$ content calculated using Calcicbrine (Naden, 1996)
Dh	Bulk density
Sal (NaCl+CaCl₂) eqv	Salinity calculated from final ice melting temperature and halite dissolution temperature (halite-bearing fluid inclusions or from final ice melting temperature and hydrohalite melting (two phase fluid inclusions) temperature using the software Calcicbrine (Naden, 1996)

Appendix 5.1a- Thermometric data on Type 1a fluid inclusions

No.	*Sample No.*	*Inclusion No.*	*Phases*	*Origin*	*TmCO2*	*ThCO2*	*Mode*	*Th*	*Dh (g/cc)*
1	JB 4	JB 4_1	L (CO2)	P	-58	18.2	V→L	18.2	0.79
2	JB 4	JB 4_2	L (CO2)	P	-58	16.7	V→L	16.7	0.81
3	JB 4	JB 4_3	L (CO2)	P	-58	3.9	V→L	3.9	0.90
4	JB 4	JB 4_4	L (CO2)	PS	-56.8	11.2	V→L	11.2	0.85
5	JB 4	JB 4_5	L(CO2)	PS	-57.5	8.1	V→L	8.1	0.87
6	JB 59	JB 59_1	L (CO2)	P	-54.7	-10.5	V→L	-10.5	0.99
7	JB 59	JB 59_2	L (CO2)	PS	-56.2	12.4	V→L	12.4	0.84
8	JB 59	JB 59_3	L (CO2)	PS	-56.1	18.1	V→L	18.1	0.79
9	JB 59	JB 59_4	L (CO2)	PS	-55.8	17.3	V→L	17.3	0.80
10	JB 59	JB 59_5	L (CO2)	PS	-55.3	12.8	V→L	12.8	0.84
11	JB 61	JB 61_1	L (CO2)	P	-56.6	22.4	V→L	22.4	0.75
12	JB 61	JB 61_2	L (CO2)	PS	-56.3	30.1	V→L	30.1	0.59
13	JB 61	JB 61_3	L (CO2)	PS	-56.2	30.1	V→L	30.1	0.59
14	JB 64A	JB 64A_1	L (CO2)	PS	-57.9	26.8	V→L	26.8	0.68
15	JB 64A	JB 64A_2	L (CO2)	PS	-57.9	28	V→L	28	0.66
16	JB 64A	JB 64A_3	L (CO2)	PS	-57.9	26.6	V→L	26.6	0.68
17	JB 64A	JB 64A_4	L (CO2)	PS	-56.7	26.7	V→L	26.7	0.68
18	JB 64A	JB 64A_5	L (CO2)	PS	-56.2	27.2	V→L	27.2	0.67
19	JB 64A	JB 64A_6	L (CO2)	PS	-57.1	27.7	V→L	27.7	0.66
20	JB 64A	JB 64A_7	L (CO2)	P	-57.3	22.8	V→L	22.8	0.74
21	JB 88C	JB 88C_1	L (CO2)	P	-53.7	20.9	V→L	20.9	0.76
22	JB 88C	JB 88C_2	L (CO2)	P	-54.6	28.1	V→L	28.1	0.65
23	JB 88C	JB 88C_3	L (CO2)	P	-55.4	9.1	V→L	9.1	0.87
24	JB 88C	JB 88C_4	L (CO2)	P	-55.9	28.7	V→L	28.7	0.64
25	JB 88C	JB 88C_5	L (CO2)	P	-54.7	27.6	V→L	27.6	0.66
26	JB 88D	JB 88D_1	L (CO2)	P	-54.2	29	V→L	29	0.63
27	JB 88D	JB 88D_2	L (CO2)	P	-55	28.6	V→L	28.6	0.64
28	JB 88D	JB 88D_3	L (CO2)	P	-54.2	15	V→L	15	0.82
29	JB 88D	JB 88D_4	L (CO2)	P	-52.8	15.4	V→L	15.4	0.82
30	JB 6D	JB 6D_1	L (CO2)	P	-57.4	17.1	V→L	17.1	0.80
31	JB 6D	JB 6D_2	L (CO2)	P	-57.5	18.9	V→L	18.9	0.78
32	JB 6D	JB 6D_3	L (CO2)	P	-57.7	15.2	V→L	15.2	0.82
33	JB 6D	JB 6D_4	L (CO2)	P	-57.9	20.1	V→L	20.1	0.77
34	JB 6D	JB 6D_5	L (CO2)	P	-58.8	22	V→L	22	0.75
35	JB 6D	JB 6D_6	L (CO2)	PS	-58	13.3	V→L	13.3	0.84
36	JB 6D	JB 6D_7	L (CO2)	PS	-58	13.8	V→L	13.8	0.83
37	JB 7	JB 7_1	L (CO2)	P	-55.2	20.2	V→L	20.2	0.77
38	JB 7	JB 7_2	L (CO2)	P	-55.2	2.5	V→L	2.5	0.91
39	JB 37A1	JB 37A1_1	L (CO2)	P	-54.2	22	V→L	22	0.75
40	JB 37A1	JB 37A1_2	L (CO2)	P	-54.3	22.7	V→L	22.7	0.74

Appendix 5.1b- Thermometric data on Type 1b & 1c fluid inclusions

No.	*Sample No.*	*Inclusion No.*	*Phases*	*Origin*	*Tm CO2*	*Tfm*	*Thm*	*TmCla*	*Th CO2*	*Mode*	*ThS*	*Th*
1	JB 64A	JB 64A_8	L (CO2-Aq)	PS	-55.9	-51.3			27.6	V→L		256.7
2	JB 64A	JB 64A_9	L (CO2-Aq)	PS	-55.7				27.1	V→L		
3	JB 64A	JB 64A_10	L (CO2-Aq)	PS	-56.4				26.9	V→L		
4	JB 64A	JB 64A_11	L (CO2-Aq)+S	PS	-57.8	-36.2	-8.7		28	V→L	235.6	
5	JB 64A	JB 64A_12	L (CO2-Aq)+S	P	-57.6		-3.6	-8.2	27.9	V→L		
6	JB 64A	JB 64A_13	L (CO2-Aq)+S	PS	-56.3	-52.5	8.3		29.2	V→L		
7	JB 64A	JB 64A_14	L (CO2-Aq)+S	PS	-54.7		2.5	-12.3	27.1	V→L		

Appendix 5.1c- Thermometric data on Type 2b fluid inclusions

No.	Sample	Inclusion No.	Phases	Origin	Tfm	Tm	Thm	ThV	Th	Mode	Sal (NaCl+ CaCl2 eqv.)(wt%)	NaCl (wt%)	CaCl2 (wt%)	NaCl/(NaCl +CaCl2)	Dh (g/cc)
1	JB 4	JB 4_LS1	L+V	S	-69.5	-26.2		142.5	142.5	V→L	28.39	16.74	11.66	0.59	1.13
2	JB 4	JB 4_LS2	L+V	S	-54.6	-21.5		161.8	161.8	V→L	25.96	25.08	0.87	0.97	1.10
3	JB 4	JB 4_LS3	L+V	S	-52.7	-31.5		164.2	164.2	V→L	29.17	10.70	18.48	0.37	1.14
4	JB 4	JB 4_LS4	L+V	S	-31.7	-14.4		182.4	182.4	V→L	18.13	18.13			1.01
5	JB 4	JB 4_LS5	L+V	S	-31.4	-14.3		184.3	184.3	V→L	18.04	18.04			1.01
6	JB 4	JB 4_LS6	L+V	S	-30.7	-11.2		180.3	180.3	V→L	15.17	15.17			0.99
7	JB 4	JB 4_LS7	L+V	S	-31.5	-7		182.3	182.3	V→L	10.49	10.49			0.96
8	JB 4	JB 4_LS8	L+V	S	-48	-15.9		167.7	167.7	V→L	19.37	19.37			1.03
9	JB 4	JB 4_LS9	L+V	S	-49.2	-21.1		150.1	150.1	V→L	23.11	23.11			1.09
10	JB 4	JB 4_LS10	L+V	S	-14.1	-9.5		143.7	143.7	V→L	13.40	13.40			1.01
11	JB 4	JB 4_LS11	L+V	S	-20.9	-6.1		154.6	154.6	V→L	9.34	9.34			0.98
12	JB 4	JB 4_LS12	L+V	S	-13	-8.3		146.4	146.4	V→L	12.05	12.05			1.00
13	JB 4	JB 4_LS13	L+V	S	-21.4	-6.5		182.4	182.4	V→L	9.86	9.86			0.96
14	JB 4	JB 4_LS14	L+V	S	-27.8	-8.9		177.5	177.5	V→L	12.73	12.73			0.98
15	JB 4	JB 4_LS15	L+V	S	-35.3	-6.3		181.1	181.1	V→L	9.60	9.60			0.96
16	JB 4	JB 4_LS16	L+V	S	-35.1	-6.3		185.1	185.1	V→L	9.60	9.60			0.95
17	JB 59	JB 59_LS1	L+V	S	-72.3	-25.3		107.5	107.5	V→L	28.02	17.97	10.05	0.64	1.16
18	JB 59	JB 59_LS2	L+V	S	-73.6	-25.5		140.4	140.4	V→L	28.09	17.65	10.44	0.63	1.13
19	JB 59	JB 59_LS3	L+V	S	-71.3	-25		140.7	140.7	V→L	27.90	18.45	9.45	0.66	1.13
20	JB 59	JB 59_LS4	L+V	S	-58.6	-22.8		158.7	158.7	V→L	26.48	22.20	4.28	0.84	1.10

No.	Sample	Inclusion No.	Phases	Origin	Tfm	Tm	Thm	ThV	Th	Mode	Sal (NaCl+ CaCl2 eqv.)(wt%)	NaCl (wt%)	CaCl2 (wt%)	NaCl/(NaCl +CaCl2)	Dh (g/cc)
21	JB 59	JB 59_LS5	L+V	S	-25.4	-2.5		267.6	267.6	V→L	4.18	4.18			0.81
22	JB 59	JB 59_LS6	L+V	S	-28.5	-6.8		258.3	258.3	V→L	10.24	10.24			0.89
23	JB 61	JB 61_LS1	L+V	S	-64.2	-23.6	2.4	168	168	V→L	27.02	20.73	6.29	0.77	1.10
24	JB 61	JB 61_LS2	L+V	S	-29.8	-2.3		323.4	323.4	V→L	3.87	3.87			0.70
25	JB 61	JB 61_LS3	L+V	S	-30	-1		288.5	288.5	V→L	1.74	1.74			0.74
26	JB 61	JB 61_LS4	L+V	S	-36.9	-11.7		150.7	150.7	V→L	15.67	15.67			1.02
27	JB 61	JB 61_LS5	L+V	S	-36.3	-9		153.8	153.8	V→L	12.85	12.85			1.00
28	JB 64A	JB 64A_LS1	L+V	S	-25.7	-2.4		311.5	311.5	V→L	4.03	4.03			0.73
29	JB 64A	JB 64A_LS2	L+V	S	-63.9	-22.5	8.5	167.2	167.2	V→L	26.13	22.62	3.52	0.87	1.09
30	JB 88B	JB 88B_LS1	L+V	S	-23	-2.7		185	185	V→L	4.49	4.49			0.92
31	JB 88B	JB 88B_LS2	L+V	S	-63.8	-16.5		131.8	131.8	V→L	19.84	19.84			1.07
32	JB 88B	JB 88B_LS3	L+V	S	-60.5	-14.6		173.1	173.1	V→L	18.30	18.30			1.02
33	JB 88C	JB 88C_LS1	L+V	S	-72.4	-38.9		139.1	139.1	V→L	30.88	6.39	24.49	0.21	1.19
34	JB 88C	JB 88C_LS2	L+V	S	-48.3	-13.3		160	160	V→L	17.17	17.17			1.02
35	JB 88C	JB 88C_LS3	L+V	S	-27.4	-3		241.7	241.7	V→L	4.96	4.96			0.86
36	JB 88C	JB 88C_LS4	L+V	S	-30.6	-1.7		196.8	196.8	V→L	2.90	2.90			0.89
37	JB 88C	JB 88C_LS5	L+V	S	-27.9	-1.9		224.5	224.5	V→L	3.23	3.23			0.86
38	JB 88C	JB 88C_LS6	L+V	S	-27.2	-1.8		210.9	210.9	V→L	3.06	3.06			0.88
39	JB 88D	JB 88D_LS1	L+V	S	-53.8	-21.9		146.1	146.1	V→L	25.91	23.96	1.95	0.92	1.12
40	JB 88D	JB 88D_LS2	L+V	S	-20.6	-1.6		209.2	209.2	V→L	2.74	2.74			0.88
41	JB 88D	JB 88D_LS3	L+V	S	-23.1	-1.9		190	190	V→L	3.23	3.23			0.90

No.	Sample	Inclusion No.	Phases	Origin	Tfm	Tm	Thm	ThV	Th	Mode	Sal (NaCl+ CaCl2 eqv.)(wt%)	NaCl (wt%)	CaCl2 (wt%)	NaCl/(NaCl +CaCl2)	Dh (g/cc)
42	JB 82B	JB 82B_LS1	L+V	S	-67.3	-24.4		158.4	158.4	V→L	27.54	19.37	8.17	0.70	1.11
43	JB 82B	JB 82B_LS2	L+V	S	-65.3	-26.1		145.8	145.8	V→L	28.38	16.90	11.48	0.60	1.13
44	JB 82B	JB 82B_LS3	L+V	S	-64.2	-23.6		137.1	137.1	V→L	27.02	20.73	6.29	0.77	1.13
45	JB 37C	JB 37C_LS1	L+V	S	-65	-21.6		143	143	V→L	25.93	24.78	1.14	0.96	1.13
46	JB 37C	JB 37C_LS2	L+V	S	-44.5	-18.1		187.8	187.8	V→L	21.04	21.04			1.03
47	JB 37C	JB 37C_LS3	L+V	S	-44.7	-16.1		186.9	186.9	V→L	19.53	19.53			1.02
48	JB 37C	JB 37C_LS4	L+V	S	-54.4	-11.4		222.6	222.6	V→L	15.37	15.37			0.96
49	JB 6D	JB 6D_LS1	L+V	S	-64	-22.1		167.6	167.6	V→L	25.95	23.47	2.47	0.90	1.09
50	JB 6D	JB 6D_LS2	L+V	S	-68	-23.9	4.3	172.9	172.9	V→L	27.22	20.20	7.02	0.74	1.10
51	JB 6D	JB 6D_LS3	L+V	S	-65.7	-21.5		192.1	192.1	V→L	25.96	25.08	0.87	0.97	1.07
52	JB 6D	JB 6D_LS4	L+V	S	-7.9	-2.3		192.1	192.1	V→L	3.87	3.87			0.91
53	JB 6D	JB 6D_LS5	L+V	S	-8.3	-0.8		189.2	189.2	V→L	1.40	1.40			0.89
54	JB 7	JB 7_LS1	L+V	S	-50.6	-23		117.8	117.8	V→L	26.61	21.82	4.79	0.82	1.15
55	JB 7	JB 7_LS2	L+V	S	-33.3	-1.2		201.4	201.4	V→L	2.07	2.07			0.88
56	JB 7	JB 7_LS3	L+V	S	-47.4	-6.4		128.7	128.7	V→L	9.73	9.73			0.99
57	JB 7	JB 7_LS4	L+V	S	-47.3	-17.4		123.7	123.7	V→L	20.52	20.52			1.08
58	JB 7	JB 7_LS5	L+V	S	-44.1	-5.3		134.2	134.2	V→L	8.28	8.28			0.98
59	JB 79B	JB 79B_LS1	L+V	S	-50.8	-10.8		201.8	201.8	V→L	14.77	14.77			0.97
60	JB 79B	JB 79B_LS2	L+V	S	-25.8	-4.4		172.3	172.3	V→L	7.02	7.02			0.95
61	JB 37A1	JB 37A1_LS1	L+V	S	-70.2	-29.3		153.6	153.6	V→L	28.87	12.93	15.94	0.45	1.14
62	JB 37A1	JB 37A1_LS2	L+V	S	-70.1	-29.5		153.6	153.6	V→L	28.88	12.70	16.19	0.44	1.14

No.	***Sample***	***Inclusion No.***	***Phases***	***Origin***	***Tfm***	***Tm***	***Thm***	***ThV***	***Th***	***Mode***	***Sal (NaCl+ CaCl2 eqv.)(wt%)***	***NaCl (wt%)***	***CaCl2 (wt%)***	***NaCl/(NaCl +CaCl2)***	***Dh (g/cc)***
63	JB 37A1	JB 37A1_LS3	L+V	S	-70.1	-28.6		158.5	158.5	V→L	28.84	13.78	15.06	0.48	1.13
64	JB 37A1	JB 37A1_LS4	L+V	S	-52.6	-21.8		167.8	167.8	V→L	25.90	24.22	1.68	0.94	1.09
65	JB 37A1	JB 37A1_LS5	L+V	S	-53.2	-22.2		161.3	161.3	V→L	25.98	23.24	2.74	0.89	1.10
66	JB 37A1	JB 37A1_LS6	L+V	S	-49.5	-19.5		140.3	140.3	V→L	20.85		20.85		1.12
67	JB 35E	JB 35E_LS1	L+V	S	-72.9	-25.6		152.8	152.8	V→L	28.12	17.50	10.62	0.62	1.12
68	JB 35E	JB 35E_LS2	L+V	S	-28.5	-4.4		309.1	309.1	V→L	7.02	7.02			0.78
69	JB 35E	JB 35E_LS3	L+V	S	-25.3	-4.7		296	296	V→L	7.45	7.45			0.80

Appendix 5.1d- Thermometric data on Type 3b fluid inclusions

No.	*Sample*	*Inclusion No.*	*Phases*	*Origin*	*Tfm*	*Tm*	*Thm*	*ThV*	ThS	Th	Mode	*Sal (NaCl+ CaCl2 eqv.) (wt%)*	*NaCl (wt%)*	*CaCl2 (wt%)*	*NaCl/ (NaCl +CaCl2)*	*Dh (g/cc)*
1	JB 4	JB 4_HS1	L+V+S	S	-70.2	-32		148.8	201.9	201.9	S→L	37.33	21.28	16.05	0.57	1.17
2	JB 4	JB 4_HS2	L+V+S	S	-68.5	-27.3	17.6	160.2	182.7	182.7	S→L	34.74	22.35	12.39	0.64	1.16
3	JB 4	JB 4_HS3	L+V+S	S	-53.5	-25.2	11.5	211.3	153.4	211.3	S→L	32.16	22.16	10.00	0.69	1.11
4	JB 4	JB 4_HS4	L+V+S	S	-72.1	-32.9		159.6	198.3	198.3	S→L	37.40	20.55	16.85	0.55	1.17
5	JB 4	JB 4_HS5	L+V+S	S	-72.6	-27.5	6.7	153.9	200.8	200.8	S→L	35.73	23.54	12.19	0.66	1.15
6	JB 4	JB 4_HS6	L+V+S	S	-34.5	-12.8		136.6	145.3	145.3	S→L	16.71	16.71			1.03
7	JB 4	JB 4_HS7	L+V+S	S	-46.6	-19.1	1.9	181.4	179.1	181.4	S→L	21.75	21.75			1.04
8	JB 59	JB 59_HS1	L+V+S	S	-70.2	-32.9	11.6	144.4	232.6	232.6	S→L	39.31	23.77	15.54	0.60	1.16
9	JB 59	JB 59_HS2	L+V+S	S	-70.1	-33.8	10.7	144.6	219.2	219.2	S→L	38.78	22.10	16.69	0.57	1.17
10	JB 59	JB 59_HS3	L+V+S	S	-71.6	-33.3		148.7	202.8	202.8	S→L	37.73	20.73	17.00	0.55	1.17
11	JB 59	JB 59_HS4	L+V+S	S	-69.1	-29.3	12.7	150	205.7	205.7	S→L	36.67	22.93	13.74	0.63	1.16
12	JB 59	JB 59_HS5	L+V+S	S	-67.7	-33.1	29.3		222.4	222.4	S→L	38.76	22.67	16.09	0.58	1.17
13	JB 61	JB 61_HS1	L+V+S	S	-66	-33.8		148.8	318.6	318.6	S→L	44.96	32.74	12.22	0.73	1.09
14	JB 61	JB 61_HS2	L+V+S	S	-68.6	-33.7		148.4	316.4	316.4	S→L	44.79	32.51	12.29	0.73	1.09
15	JB 64A	JB 64A_HS1	L+V+S	S	-66	-24.2	12.1	162.6	320.1	320.1	S→L	41.59	36.24	5.34	0.87	1.01
16	JB 64A	JB 64A_HS2	L+V+S	S	-69	-23.8	12.7	161.7	324.5	324.5	S→L	41.64	36.95	4.68	0.89	0.99
17	JB 88B	JB 88B_HS1	L+V+S	S	-72.2	-36.6		167.2	244.6	244.6	S→L	40.91	23.79	17.12	0.58	1.17
18	JB 88C	JB 88C_HS1	L+V+S	S	-73	-21.9	24.7	158.9	182.6	182.6	S→L	30.08	27.96	2.12	0.93	1.12
19	JB 88C	JB 88C_HS2	L+V+S	S	-86.9	-23.1	15.1	161.6	183.4	183.4	S→L	31.47	26.24	5.24	0.83	1.13
20	JB 88D	JB 88D_HS1	L+V+S	S	-71.5	-24.2		144.6	198.4	198.4	S→L	33.43	25.94	7.49	0.78	1.13

No.	*Sample*	*Inclusion No.*	*Phases*	*Origin*	*Tfm*	*Tm*	*Thm*	*ThV*	ThS	Th	Mode	*Sal (NaCl+ CaCl2 eqv.) (wt%)*	*NaCl (wt%)*	*CaCl2 (wt%)*	*NaCl/ (NaCl +CaCl2)*	*Dh (g/cc)*
21	JB 79B	JB 79B_HS1	L+V+S	S	-58.1	-23.1	14.2	119.1	200.5	200.5	S→L	32.31	27.22	5.09	0.84	1.12
22	JB 79B	JB 79B_HS2	L+V+S	S	-64.2	-23.6		126.6	198.8	198.8	S→L	32.82	26.58	6.24	0.81	1.12
23	JB 79B	JB 79B_HS3	L+V+S	S	-44.7	-15		186.7	184.1	186.7	S→L	18.63	18.63			1.01
24	JB 79B	JB 79B_HS4	L+V+S	S	-45.7	-15.3		148.3	156.3	156.3	S→L	18.88	18.88			1.04
25	JB 79B	JB 79B_HS5	L+V+S	S	-46.1	-16.4		155.9	175.6	175.6	S→L	19.76	19.76			1.03
26	JB 79B	JB 79B_HS6	L+V+S	S	-64.6	-22.8		149.1	264.1	264.1	S→L	35.96	32.17	3.79	0.89	1.06
27	JB 79B	JB 79B_HS7	L+V+S	S	-72.4	-23.2		181.4	190.4	190.4	S→L	31.96	26.55	5.41	0.83	1.13
28	JB 82B	JB 82B_HS1	L+V+S	S	-44.1	-15		130.4	158.6	158.6	S→L	18.63	18.63			1.04
29	JB 82B	JB 82B_HS2	L+V+S	S	-40	-15.4		140.1	126.6	140.1	S→L	18.96	18.96			1.05
30	JB 82B	JB 82B_HS3	L+V+S	S	-42.8	-16.7		140.3	126.8	140.3	S→L	19.99	19.99			1.06
31	JB 82B	JB 82B_HS4	L+V+S	S	-64.2	-21.9		128.4	161.6	161.6	S→L	29.08	26.89	2.19	0.92	1.14
32	JB 82B	JB 82B_HS5	L+V+S	S	-69.5	-25.3		150.4	243.8	243.8	S→L	36.98	28.43	8.55	0.77	1.11
33	JB 6D	JB 6D_HS1	L+V+S	S	-73.7	-36.5		157	235.6	235.6	S→L	40.27	22.69	17.58	0.56	1.17
34	JB 6D	JB 6D_HS2	L+V+S	S	-72.2	-27	6.6	152.4	205	205.0	S→L	35.74	24.19	11.55	0.68	1.15
35	JB 6D	JB 6D_HS3	L+V+S	S	-71.4	-26.1	5.5	165.3	189.6	189.6	S→L	34.49	23.72	10.77	0.69	1.15
36	JB 6D	JB 6D_HS4	L+V+S	S	-71.6	-26.4	6.2	158.3	211.2	211.2	S→L	35.74	25.03	10.72	0.70	1.14
37	JB 6D	JB 6D_HS5	L+V+S	S	-62.8	-28.2		162.4	209.3	209.3	S→L	36.53	23.90	12.63	0.65	1.15
38	JB 6D	JB 6D_HS6	L+V+S	S	-67.7	-35.5		154.8	204.6	204.6	S→L	38.29	19.85	18.45	0.52	1.18
39	JB 6D	JB 6D_HS7	L+V+S	S	-72	-32.9		160.7	198.9	198.9	S→L	37.40	20.55	16.85	0.55	1.17
40	JB 6D	JB 6D_HS8	L+V+S	S	-71	-33.3		157.8	220.8	220.8	S→L	38.80	22.56	16.24	0.58	1.17
41	JB 6D	JB 6D_HS9	L+V+S	S	-60.4	-30	10.4	164.2	193.6	193.6	S→L	36.23	21.51	14.71	0.59	1.16
42	JB 6D	JB 6D_HS10	L+V+S	S	-75.3	-31.8		159	230.1	230.1	S→L	38.92	24.10	14.82	0.62	1.16

No.	*Sample*	*Inclusion No.*	*Phases*	*Origin*	*Tfm*	*Tm*	*Thm*	*ThV*	**ThS**	**Th**	**Mode**	*Sal (NaCl+ CaCl2 eqv.) (wt%)*	*NaCl (wt%)*	*CaCl2 (wt%)*	*NaCl/ (NaCl +CaCl2)*	*Dh (g/cc)*
43	JB 6D	JB 6D_HS11	L+V+S	S	-68.1	-25.7	7.3	162.8	202.7	202.7	S→L	34.89	24.93	9.96	0.71	1.14
44	JB 7	JB 7_HS1	L+V+S	S	-71.6	-35.2		134.3	254.3	254.3	S→L	41.18	25.20	15.98	0.61	1.16
45	JB 7	JB 7_HS2	L+V+S	S	-71	-31.7		160.9	234.7	234.7	S→L	39.14	24.55	14.59	0.63	1.15
46	JB 7	JB 7_HS3	L+V+S	S	-53.5	-27.1	16	123.9	196.6	196.6	S→L	35.35	23.49	11.86	0.66	1.15
47	JB 7	JB 7_HS4	L+V+S	S	-46.2	-25.5	13.9	128.4	184.2	184.2	S→L	33.86	23.87	9.99	0.71	1.15
48	JB 7	JB 7_HS5	L+V+S	S	-75.8	-30.9	8.9	120	203.2	203.2	S→L	37.04	21.90	15.15	0.59	1.16
49	JB 7	JB 7_HS6	L+V+S	S	-62.3	-25.4		132.6	162.1	162.1	S→L	32.66	22.44	10.22	0.69	1.16
50	JB 7	JB 7_HS7	L+V+S	S	-57.8	-26.4		135.4	183.6	183.6	S→L	34.38	23.11	11.28	0.67	1.15
51	JB 37A1	JB 37A1_HS1	L+V+S	S	-72.9	-41		154.6	263.2	263.2	S→L	42.55	24.76	17.79	0.58	1.17
52	JB 37A1	JB 37A1_HS2	L+V+S	S	-70.2	-38.5		153.5	270.7	270.7	S→L	42.73	26.12	16.61	0.61	1.16
53	JB 37A1	JB 37A1_HS3	L+V+S	S	-45.3	-22.9	9.3	141.4	176.8	176.8	S→L	30.84	26.04	4.81	0.84	1.13
54	JB 37A1	JB 37A1_HS4	L+V+S	S	-66.1	-22.2	7.2	130.2	168.7	168.7	S→L	29.65	26.63	3.01	0.90	1.13
55	JB 37A1	JB 37A1_HS5	L+V+S	S	-70.6	-25.1		138.8	202.5	202.5	S→L	34.43	25.38	9.05	0.74	1.13
56	JB 37A1	JB 37A1_HS6	L+V+S	S	62.8	-25	8.8	140.2	208	208.0	S→L	34.62	25.82	8.80	0.75	1.13
57	JB 37A1	JB 37A1_HS7	L+V+S	S	-62.6	-22.6	12.6	140.6	189.8	189.8	S→L	31.19	27.24	3.95	0.87	1.12

Appendix 5.1e- Thermometric data on Type 4 fluid inclusions

No.	***Sample No***	***FLINC No***	***Phases***	***Origin***	***Tfm***	***Tm***	***Thm***	***ThV***	***ThS1***	***ThS2***	***ThS3***	***Th***	***Sal (NaCl+ CaCl2 eqv.)(wt%)***	***NaCl (wt%)***	***CaCl2 (wt%)***	***NaCl/ (NaCl +CaCl2)***	***Dh (g/cc)***
1	JB 61	JB 61_MS1	L+V+3S	P	-69.7	-27.7	8.8	165.8	119.6	153.2	262.8	262.8	39.39	28.70	10.70	0.73	1.12
2	JB 61	JB 61_MS2	L+V+3S	P	-53.2	-21.9	12.5	151.4	169.3	181.3	190.3	384.3	46.14	45.09	1.05	0.98	0.77
3	JB 61	JB 61_MS3	L+V+3S	P	-72	-26.3	9.1	166.7	156.4	178.9	269.1	269.1	39.15	29.96	9.20	0.77	1.10
4	JB 61	JB 61_MS4	L+V+3S	P?	-73.5	-25.5		141.5	170.3	189.2	194.7	317.6	42.25	35.25	7.00	0.83	1.03
5	JB 61	JB 61_MS5	L+V+2S	P	-72.9	-38.9		155.7	310.8	404.5		404.5	52.22	43.75	8.48	0.84	0.82
6	JB 61	JB 61_MS6	L+V+3S	P	-81.5	-53.2	21.4	149.8	389.2	-	-	-					
7	JB 61	JB 61_MS7	L+V+3S	P?	-72.9	-28.2	-	-	-	-	-	-					
8	JB 61	JB 61_MS8	L+V+2S	P	-69.2	-29.6	-	-	-	-		-					
9	JB 61	JB 61_MS9	L+V+3S	P	-72.1	-19.4	-	-	-	-	-	-					
10	JB 61	JB 61_MS10	L+V+2S	P	-66.4	-34.8	-	-	-	-		-					
11	JB 61	JB 61_MS11	L+V+2S	P?	-76.3	-28	-	-	-	-		-					
12	JB 61	JB 61_MS12	L+V+5S	P?	-49	-	-	-	-	-	-	-					
13	JB 61	JB 61_MS13	L+V+3S	P	-62.9	-28.8		118.3	310.6	-	-	-					
14	JB 61	JB 61_MS14	L+V+3S	P	-69.2	-24.1		133.1	180.5	455	-	-					
15	JB 61	JB 61_MS15	L+V+2S	P	-70.2	-32.3		136.9	304.1	-		-					
16	JB 61	JB 61_MS16	L+V+2S	P	-	-		170.2		344.6		344.6					
17	JB 61	JB 61_MS17	L+V+3S	P	-71.6	-37.8	9.8	158.5	231.4	-	-	-					
18	JB 61	JB 61_MS18	L+V+3S	P	-61.7	-21.2		-	-	-	-	-					
19	JB 61	JB 61_MS19	L+V+3S	P	-51.5	-22.9	6.2	275.6	188.6	234.1	-	-					
20	JB 61	JB 61_MS20	L+V+4S	P	-58.7	-24.4		140.2	149.2	255.7	-	-					

No.	***Sample No***	***FLINC No***	***Phases***	***Origin***	***Tfm***	***Tm***	***Thm***	***ThV***	***ThS1***	***ThS2***	***ThS3***	***Th***	***Sal (NaCl+ CaCl2 eqv.)(wt%)***	***NaCl (wt%)***	***CaCl2 (wt%)***	***NaCl/ (NaCl +CaCl2)***	***Dh (g/cc)***
21	JB 61	JB 61_MS21	L+V+4S	P	-67.6	-28.9	10.3	146.8	278.7	410.4	-	-					
22	JB 61	JB 61_MS22	L+V+2S	P	-68.3	-24	6.9	144.4	109.3	184.2		184.2	32.46	25.18	7.28	0.78	1.14
23	JB 64A	JB 64A_MS1	L+V+2S	P	-72.1	-28.7		142.8	292.8	479.4		479.4	58.69	57.02	1.67	0.97	0.14
24	JB 64A	JB 64A_MS2	L+V+2S	PS	-70.3	-27.6		160	144.6	360.6		360.6	46.59	39.39	7.20	0.85	0.95
25	JB 64A	JB 64A_MS3	L+V+2S	P	-73.9	-34.5		138.1	394.8	495		495.0	60.73	59.86	0.87	0.99	0.07
26	JB 64A	JB 64A_MS4	L+V+2S	P?	-65.8	-28.3		124.3	207.2	354.7		354.7	46.30	38.47	7.83	0.83	0.97
27	JB 64A	JB 64A_MS5	L+V+2S	P	-50.9	-24.6		125	210.7	342.6		342.6	43.76	38.43	5.33	0.88	0.96
28	JB 64A	JB 64A_MS6	L+V+4S	P	-72.4	-24.9	12.1	161.4	155.6	-	-	-					
29	JB 64A	JB 64A_MS7	L+V+2S	P	-72.6	-38.8		169.2	-			-					
30	JB 64A	JB 64A_MS8	L+V+3S	P	-77.2	-37.3		175.6	-		-	-					
31	JB 64A	JB 64A_MS9	L+V+2S	P	-84	-44.4		158.6	310.2	-		-					
32	JB 64A	JB 64A_MS10	L+V+2S	P	-88.1	-53.9	3.6	150.8	347.4	-		-					
33	JB 64A	JB 64A_MS11	L+V+2S	P	-87.1	-53.5		151.9	353	-		-					
34	JB 64A	JB 64A_MS12	L+V+2S	P	-88	-53.1		144.1	427.9	-		-					
35	JB 64A	JB 64A_MS13	L+V+2S	P	-82.9	-50.5	14.4	155.8	315.8	-		-					
36	JB 64A	JB 64A_MS14	L+V+3S	P	-68.5	-35.7		-	-	-	-	-					

No.	***Sample No***	***FLINC No***	***Phases***	***Origin***	***Tfm***	***Tm***	***Thm***	***ThV***	***ThS1***	***ThS2***	***ThS3***	***Th***	***Sal (NaCl+ CaCl2 eqv.)(wt%)***	***NaCl (wt%)***	***CaCl2 (wt%)***	***NaCl/ (NaCl +CaCl2)***	***Dh (g/cc)***
37	JB 64A	JB 64A_MS15	L+V+2S	P	-72.4	-38.8		-	-	-		-					
38	JB 64A	JB 64A_MS16	L+V+3S	P	-57.5	-21.8		296.5	-	-	-	-					
39	JB 64A	JB 64A_MS17	L+V+3S	P	-73.1	-34.9		162.4	-	-	-	-					
40	JB 64A	JB 64A_MS18	L+V+2S	P	-	-4.3		143.3	-	-		-					
41	JB 64A	JB 64A_MS19	L+V+3S	P	-49.7	-12		127.2	286.1	-	-	-					
42	JB 64A	JB 64A_MS20	L+V+2S	P?	-	-0.2		270.3	-	-		-					
43	JB 64A	JB 64A_MS21	L+V+2S	P	-	-	29.3	215.3	-	-		-					

Appendix 5.2- PIXE results

Sample No	Inclusion Type	Inclusion No	Cl	K	Ca	Mn	Fe	Cu	Zn	Br	Rb	Sr	Ba	Pb L	Ti
JB 61	Type 4	JB 61_PX_MS1	259891	39885	45297	5951	45333	5397	1292	<500	<568	722	<14511	780	1675
		Uncertainty	6743	1947	1396	255	783	200	119	174	200	171	6185	254	176
		Det. Limits	3064	875	567	232	212	265	255	500	568	391	14511	489	367
JB 61	Type 4	JB 61_PX_MS2	365698	23523	71452	8318	23199	289	3092	<390	<454	1476	8203	<521	2452
		Uncertainty	7805	1258	1801	231	449	95	152	140	207	203	2928	266	130
		Det. Limits	1157	448	314	165	158	222	222	390	454	284	6724	521	212
JB 61	Type 4	JB 61_PX_MS3	deep	332680	326783	37269	26228	<133	1286	<162	<268	<139	<3437	<285	3348
		Uncertainty	deep	9664	6273	456	333	66	82	72	101	58	1500	148	136
		Det. Limits	deep	2182	759	104	100	133	135	162	268	139	3437	285	207
JB 61	Type 4	JB 61_PX_MS4	343696	40245	33528	2089	62652	8136	842	338	1352	520	<3321	3806	353
		Uncertainty	7419	1358	833	122	709	139	74	79	190	86	1450	401	71
		Det. Limits	1249	344	211	83	85	148	150	205	253	168	3321	314	115
JB 61	Type 4	JB 61_PX_MS5	598711	61109	207560	25404	6159	381	2240	603	<660	1770	8280	<492	1075
		Uncertainty	12786	2605	3603	691	226	99	153	180	284	271	3076	234	174
		Det. Limits	2198	642	436	194	179	237	226	418	660	335	6738	492	268
JB 64A	Type 4	JB 64A_PX_MS1	deep	23743	43541	5973	5722	126	657	<197	<117	392	<4617	<130	1392
		Uncertainty	deep	2227	1500	174	125	35	37	73	45	57	1970	64	142
		Det. Limits	deep	3131	1033	100	80	77	70	197	117	113	4617	130	286
JB 64A	Type 4	JB 64A_PX_MS2	243179	45196	56039	2548	3844	74	763	281	399	1160	<2064	<141	490
		Uncertainty	3029	1059	877	80	141	27	46	48	95	131	899	70	51
		Det. Limits	579	209	136	54	48	59	60	99	202	96	2064	141	76

Sample No	Inclusion Type	Inclusion No	Cl	K	Ca	Mn	Fe	Cu	Zn	Br	Rb	Sr	Ba	Pb L	Ti
JB 64A	Type 4	JB 64A_PX_MS3	599631	120349	34504	6631	2313	<143	10590	346	<406	8750	15727	1421	5427
		Uncertainty	11350	3424	1309	123	74	63	258	124	174	446	2722	232	413
		Det. Limits	2057	554	337	123	116	143	144	294	406	272	5141	389	189
JB 64A	Type 4	JB 64A_PX_MS4	370195	29790	55148	14064	57128	<176	4065	440	<408	4957	7964	1761	1715
		Uncertainty	7512	1219	1314	334	777	72	119	107	195	291	2902	307	134
		Det. Limits	1642	422	276	120	118	176	171	259	408	261	6673	355	168
JB 64A	Type 4	JB 64A_PX_MS5	739547	86900	92942	8420	1975	<116	6390	515	<345	7338	10627	720	3266
		Uncertainty	13847	3012	2320	190	90	53	270	109	171	671	2159	173	243
		Det. Limits	1715	452	290	106	93	116	112	262	345	233	3887	301	165
JB 61	Type 1c	JB61_PX_CB1	262645	9118	22705	698	810	1237	689	<141	<154	476	<2802	147	412
		Uncertainty	4899	416	460	33	48	83	43	50	56	77	1196	62	63
		Det. Limits	574	192	131	60	53	65	62	141	154	90	2802	131	87
JB 61	Type 1c	JB61_PX_CB2	308942	28800	11529	364	12038	4595	329	<243	<177	<157	<6437	862	973
		Uncertainty	8854	1359	473	70	240	123	50	92	69	63	2745	153	110
		Det. Limits	4733	749	390	100	86	108	105	243	177	157	6437	221	195
JB 4	Type 3b	JB 4_PX_HS1	283646	38042	26572	1447	1399	281	697	<444	<494	1811	<11264	<497	1612
		Uncertainty	6085	1225	811	116	102	91	112	148	173	258	4824	236	195
		Det. Limits	1280	499	358	194	176	221	209	444	494	311	11264	497	270
JB 4	Type 3b	JB 4_PX_HS2	381313	12056	11599	476	661	102	312	<197	<172	798	<5318	<198	877
		Uncertainty	7534	600	334	51	51	37	46	68	64	114	2271	91	119
		Det. Limits	2296	458	287	93	79	93	87	197	172	137	5318	198	162
JB 82B	Type 3b	JB 82B_PX_HS3	deep	32866	54462	541	285	<96	550	<267	<154	1452	<5341	281	4003
		Uncertainty	deep	4634	2170	62	47	38	52	105	62	120	2281	96	206

Sample No	Inclusion Type	Inclusion No	Cl	K	Ca	Mn	Fe	Cu	Zn	Br	Rb	Sr	Ba	Pb L	Ti
		Det. Limits	deep	3748	1253	122	95	96	88	267	154	138	5341	180	362
JB 61	Type 3b	JB 61_PX_HS4	239428	13297	6415	89	79	<70	280	<196	<151	<111	<4509	<165	325
		Uncertainty	5086	390	225	36	29	28	40	70	51	45	1926	70	60
		Det. Limits	1250	326	214	71	60	70	65	196	151	111	4509	165	125
JB 64A	Type 3b	JB 64A_PX_HS5	211071	24138	11828	298	1891	170	1210	<431	<291	<225	<8797	<293	1654
		Uncertainty	4729	873	433	78	113	62	103	145	107	91	3758	134	155
		Det. Limits	1381	482	355	148	127	151	142	431	291	225	8797	293	237
JB 6D	Type 3b	JB 6D_PX_HS6	36266	7018	1759	55	313	41	129	<96	<76	<52	<2044	<70	315
		Uncertainty	801	207	95	17	24	15	18	33	27	21	874	30	37
		Det. Limits	296	123	83	34	29	35	33	96	76	52	2044	70	54
JB 6D	Type 3b	JB 6D_PX_HS7	542809	39507	100478	2532	430	<107	979	302	<283	1547	<2422	<200	265
		Uncertainty	6770	1117	1491	79	82	42	73	73	114	185	1059	89	92
		Det. Limits	823	269	187	92	83	107	100	153	283	144	2422	200	119
JB 37A1	Type 3b	JB 37A1_PX_HS8	55988	39973	10342	49	144	<35	99	138	<93	87	<1703	<65	1567
		Uncertainty	1455	1149	389	19	19	15	15	47	34	25	728	32	58
		Det. Limits	2403	360	184	39	33	35	33	101	93	51	1703	65	84
JB 37A1	Type 3b	JB 37A1_PX_HS9	203299	8843	13623	100	331	<61	118	<175	<115	190	<2977	<140	1763
		Uncertainty	4239	396	390	29	30	25	24	60	44	44	1272	59	70
		Det. Limits	1003	270	172	60	51	61	58	175	115	92	2977	140	104
JB 4	Type 2b	JB 4_PX_LS1	6244	10142	1403	121	891	323	145	<187	<123	<115	<4581	<161	1109
		Uncertainty	493	333	133	37	44	36	37	63	43	44	1958	67	66
		Det. Limits	1052	295	193	76	65	82	78	187	123	115	4581	161	126
JB 4	Type 2b	JB 4_PX_LS2	82041	2812	15419	92	878	131	128	726	<177	200	<4211	<130	621

Sample No	Inclusion Type	Inclusion No	Cl	K	Ca	Mn	Fe	Cu	Zn	Br	Rb	Sr	Ba	Pb L	Ti
		Uncertainty	1759	191	325	31	56	28	31	125	66	53	1796	85	54
		Det. Limits	362	153	116	65	57	69	64	176	177	124	4211	130	86
JB 4	Type 2b	JB 4_PX_LS3	58775	2531	5688	123	365	86	340	<198	<140	229	<4704	<191	639
		Uncertainty	1324	161	158	32	34	30	40	67	50	77	2007	91	68
		Det. Limits	232	130	106	67	59	74	71	198	140	127	4704	191	93
JB 81	Type 2b	JB 81_PX_LS4	45922	4192	21808	194	222	<109	363	<330	<246	498	<5772	<225	2003
		Uncertainty	991	285	562	51	52	43	56	117	92	105	2466	109	101
		Det. Limits	674	290	218	104	90	109	103	330	246	178	5772	225	163
JB 82B	Type 2b	JB 81_PX_LS5	2698	2022	6898	<120	259	<125	231	<331	<285	412	<11691	<214	1004
		Uncertainty	432	272	208	59	52	50	50	112	102	119	4994	131	96
		Det. Limits	935	351	258	120	104	125	117	331	285	288	11691	214	189
JB 6D	Type 2b	JB 6D_PX_LS6	125067	11626	7148	<71	95	100	211	<158	<121	<115	<4760	<126	538
		Uncertainty	2944	531	267	34	29	29	27	56	43	46	2034	60	79
		Det. Limits	3655	538	288	71	59	67	63	158	121	115	4760	126	143
JB 37C	Type 2b	JB 37C_PX_LS7	68798	13017	844	<197	344	<209	744	<533	<417	<452	<17244	<469	6207
		Uncertainty	1570	477	180	94	99	89	96	181	151	170	7367	220	156
		Det. Limits	889	467	360	197	171	209	196	533	417	452	17244	469	289
JB 37A1	Type 2b	JB 37A1_PX_LS8	39849	2327	8487	62	93	<49	117	<139	<89	<85	<3164	<90	1465
		Uncertainty	1429	332	217	25	21	20	23	60	31	32	1352	41	55
		Det. Limits	2381	375	203	52	44	49	46	139	89	85	3164	90	104
JB 64A	Type 2b	JB 64A_PX_LS9	247387	5790	15655	403	233	<118	472	<343	<252	<188	<7320	<224	558
		Uncertainty	5611	324	360	61	49	48	73	118	85	83	3132	99	113
		Det. Limits	1213	361	256	112	97	118	113	343	252	188	7320	224	177

Sample No	Inclusion Type	Inclusion No	Cl	K	Ca	Mn	Fe	Cu	Zn	Br	Rb	Sr	Ba	Pb L	Ti
JB 64A	Type 2b	JB 64A_PX_LS10	149666	7284	11618	283	1248	102	422	<276	<177	132	<4914	<219	806
		Uncertainty	3363	322	298	52	70	39	47	99	63	58	2099	109	97
		Det. Limits	1004	315	228	94	82	99	94	276	177	128	4914	219	153
JB 88C	Type 2b	JB 88C_PX_LS11	66010	1889	5759	<38	60	43	80	<112	<74	<59	<2184	<70	359
		Uncertainty	1469	129	155	18	16	16	16	43	25	22	933	36	37
		Det. Limits	481	154	102	38	33	39	36	112	74	59	2184	70	65
JB 88C	Type 2b	JB 88C_PX_LS12	352197	15226	47483	374	1641	181	702	1468	<316	1147	<8130	<267	1719
		Uncertainty	8475	1191	1173	78	88	57	66	250	134	145	3472	134	173
		Det. Limits	5549	948	536	149	126	142	132	403	316	227	8130	267	283

Appendix 5.3- LA- ICP- MS results

Sample No.	Inclusion type	Inclusion No.	Na	K	Ca	Mn	Fe	Cu	Zn	Rb	Sr	Mo	Ba	Pb	Bi	Li
JB 61	Type 4	JB 61_ICP_MS1	127025	80881	<287465	<3587	<257862	15215	100374	<251	928	<288	413	518	14	<1171
JB 61	Type 4	JB 61_ICP_MS2	112569	18168	69724	4457	23004	896	1260	192	1724	<20	846	680	3	<83
JB 61	Type 4	JB 61_ICP_MS3	144680	21554	<10383	1668	<9803	625	528	445	1064	13	2462	78	1	<62
JB 61	Type 4	JB 61_ICP_MS4	72283	103393	<93150	13040	<70652	<1954	<1277	2755	3348	<78	7877	578	22	<404
JB 61	Type 4	JB 61_ICP_MS5	53180	272040	<21356	20377	51851	<504	696	1772	797	<15	3118	109	13	<99
JB 61	Type 4	JB 61_ICP_MS6	113790	40713	<91711	13793	<98842	<2526	2499	184	1533	<92	3642	325	<2	<431
JB 61	Type 4	JB 61_ICP_MS7	86438	55432	<123531	5862	741586	2710	1930	827	1470	<131	3461	180	8	<563
JB 61	Type 4	JB 61_ICP_MS8	133608	35700	19023	1173	26247	6535	500	205	269	<11	742	31	<0.3	<62
JB 61	Type 4	JB 61_ICP_MS9	165921	21129	41958	590	77491	7112	<874	134	178	<27	469	57	2	<128
JB 61	Type 4	JB 61_ICP_MS10	145099	35994	69952	1223	<41299	<1250	3953	208	7650	<59	3084	441	<2	454
JB 64A	Type 4	JB 64A_ICP_MS1	74157	18197	140231	<950	<61581	<1774	1980	131	9380	<86	3130	146	1	602
JB 64A	Type 4	JB 64A_ICP_MS2	69836	33401	137696	<771	<38591	<1300	5069	198	8133	<60	2983	299	2	493
JB 64A	Type 4	JB 64A_ICP_MS3	75556	40327	122424	<898	<49030	<1346	7702	271	8356	<66	2001	766	5	<335
JB 64A	Type 4	JB 64A_ICP_MS4	5371	22715	263415	50842	74728	<271	1719	499	1675	<10	3387	79	8	52
JB 64A	Type 4	JB 64A_ICP_MS5	142316	30237	6798	590	23209	<63	<94	224	95	4	672	10	0	<12
JB 64A	Type 4	JB 64A_ICP_MS6	137997	30077	14837	1297	73024	9469	241	271	258	<6	829	14	1	28

Sample No.	Inclusion type	Inclusion No.	Na	K	Ca	Mn	Fe	Cu	Zn	Rb	Sr	Mo	Ba	Pb	Bi	Li
JB 64A	Type 4	JB 64A_ICP_MS7	114110	26504	61155	10832	<30955	<581	5414	232	790	<31	1536	101	<0.5	<112
JB 64A	Type 4	JB 64A_ICP_MS8	85011	39414	105693	14694	14919	<40090	<1433	401	1221	<10	2921	<891	<2	80
JB 64A	Type 4	JB 64A_ICP_MS9	78577	31038	<155401	<2128	<229158	<3304	18029	<161	1782	176	107	336	6	<729
JB 64A	Type 4	JB 64A_ICP_MS10	150424	18488	<8158	510	<11002	<191	<207	112	75	<9	210	30	<0.4	<36
JB 4	Type 3b	JB 4_ICP_HS1	109958	13635	77640	3072	<44248	3675	2055	216	6166	<21	1083	2858	43	<146
JB 4	Type 3b	JB 4_ICP_HS2	97164	57855	70680	5374	<55768	22032	10409	518	11452	<38	1949	1889	<0.6	<210
JB 59	Type 3b	JB 59_ICP_HS1	146899	7556	<27292	789	<34574	<679	870	104	875	<25	389	99	<0.6	152
JB 59	Type 3b	JB 59_ICP_HS2	111048	23255	<70325	2642	<88857	<1565	1694	285	3156	<72	1325	237	<2	944
JB 59	Type 3b	JB 59_ICP_HS3	112830	24516	<80469	8575	<109741	<2099	1810	350	11437	<85	9892	960	<2	<363
JB 61	Type 3b	JB 61_ICP_HS1	57049	20258	170222	9166	<46936	<769	4294	176	867	30	1130	122	17	<153
JB 61	Type 3b	JB 61_ICP_HS2	122612	45742	32298	<221	<20671	549	2888	157	545	<17	908	86	<0.5	<80
JB 61	Type 3b	JB 61_ICP_HS3	120323	34155	44480	<648	<59883	<1043	<806	149	518	<51	864	6525	<1	<233
JB 61	Type 3b	JB 61_ICP_HS4	124630	35953	35333	1047	<9169	<136	<133	151	716	<11	1874	<416	<1	119
JB 61	Type 3b	JB 61_ICP_HS5	154442	7775	<68348	<334	<36272	<763	<582	<31	250	<25	114	<4	<2	<141
JB 61	Type 3b	JB 61_ICP_HS6	127098	35089	31398	285	<30232	867	896	152	512	<23	824	85	<0.6	<91
JB 64A	Type 3b	JB 64A_ICP_HS1	79285	29566	122987	<316	<38828	<740	4522	131	359	<25	613	9	1	250
JB 88C	Type 3b	JB 88C_ICP_HS1	58099	14922	99739	298	<11082	<357	867	115	6912	<16	1888	217	1	<90
JB 88C	Type 3b	JB 88C_ICP_HS2	47240	12372	121433	163	<6597	<242	429	94	3483	<24	964	80	0	91