

Supplementary Table 1. Mineral compositions in weight percent

Sample name	Mineral	SiO ₂	Al ₂ O ₃	FeO	MgO	CaO	MnO	TiO ₂
JAB15D	Biotite	35.95	18.17	19.93	9.3	0.03	0.27	2.35
	Garnet	37.31	20.81	28.2	2.23	1.47	10.01	0
	Plagioclase	63.22	23.12	0.14	-	4.28	-	-
	Muscovite	46.5	33.81	1.6	0.97	0	0.02	0.69
JAB18A	Biotite	36.51	19.18	18.98	10.14	0.01	0.17	1.19
	Garnet	38.05	21.36	31.03	3.17	1.85	5.53	-
	Plagioclase	60.38	25.03	0.03	-	6.61	-	-
	Muscovite	46.09	34.4	1.6	0.79	0.03	0.02	0.45
JAB21B	Biotite	35.71	19.05	22.43	7.48	0	0.22	2.17
	Garnet	37.53	21.02	29.29	2.12	1.51	9.48	-
	Plagioclase	61.83	24.42	0.05	-	5.52	-	-
	Muscovite	46.36	35.03	1.78	0.65	0	0.02	0.71
JAB146A1	Biotite	37.64	17.33	18.96	10.53	0.02	0	1.43
	Garnet	38.33	21.48	30.37	2.6	8.16	0.2	0.1
	Plagioclase	63.02	23.01	0.27	-	4.29	-	-
	Muscovite	48.42	31.5	2.02	1.88	0	0.02	0.54
JAB152A3	Biotite	36.7	17.2	21.99	8.78	0.03	0.12	1.57
	Garnet	37.93	21.13	28.73	0.84	8.99	3.05	0.17
	Plagioclase	65.74	21.77	0.01	-	2.49	-	-
	Muscovite	47.74	31.55	2.56	1.58	0	0.02	0.36
JAB156A1	Biotite	35.89	18.29	21.52	8.51	0.01	0.14	2.26
	Garnet	37.25	21.03	31.82	2.17	1.53	5.96	-
	Plagioclase	63.66	23.13	0.07	-	4.09	-	-
	Muscovite	46.39	35.22	1.41	0.63	0.02	0.01	0.45
JAB159A	Biotite	37.22	17.72	18.07	11.38	0.02	0	1.49
	Garnet	37.5	21.3	30	2.5	7.6	0	0.08
	Plagioclase	63.65	22.61	0.03	-	3.95	-	-
	Muscovite	48.82	31.42	1.93	2	0.02	0	0.47
JAB160A	Biotite	37.23	17.78	17.41	11.8	0	0.05	1.54
	Garnet	38.09	21.34	29.7	2.34	8.15	0.79	0.06
	Plagioclase	63.61	22.39	0.11	-	3.67	-	-
	Muscovite	48	32.28	1.65	1.62	0.01	0.01	0.51
JAB161A	Biotite	35.87	17.82	21.82	8.99	0	0.05	1.74
	Garnet	37.43	21.15	35.52	2.71	2.06	1.73	0
	Plagioclase	62.79	23.52	0.08	-	4.65	-	-
	Muscovite	46.42	34.74	2.28	0.67	0	0.01	0.37
JAB162A	Biotite	36.08	18.42	20.15	10.1	0.01	0.03	1.7
	Garnet	37.67	20.87	33.82	2.8	2.66	1.81	0
	Plagioclase	61.58	24.23	0.04	-	5.64	-	-
	Muscovite	46.55	34.69	1.84	0.69	0	0.01	0.47
JAB164A	Biotite	35.99	17.62	22.46	8.45	0	0.1	2.31
	Garnet	37.12	20.94	32.07	2.29	3.77	2.96	0
	Plagioclase	61.92	23.9	0.09	-	5.26	-	-
	Muscovite	46.36	34.55	1.73	0.83	0.01	0.02	0.69
JAB235A1	Biotite	36.16	17.45	21.41	9.22	0.03	0.06	1.68

	Garnet	37.75	20.97	31.01	1.66	4.48	3.98	0
	Plagioclase	61.68	24.2	0.13	-	5.7	-	-
	Muscovite	46.99	33.85	1.97	0.95	0	0.04	0.34
JAB240D1	Biotite	36.79	19.13	18.66	11.01	0.03	0.05	1.51
	Garnet	37.87	20.94	33.04	2.81	5.13	0.51	0.03
	Plagioclase	59.83	25.45	0.13	-	6.92	-	-
	Muscovite	45.88	35.64	0.97	0.61	0.01	0	0.4
JAB242A	Biotite	36.35	18.56	19.27	10.23	0.01	0.07	1.92
	Garnet	37.58	20.92	32.35	2.65	1.97	4.26	0.03
	Plagioclase	64.08	22.51	0.07	-	3.55	-	-
	Muscovite	45.34	35.08	1.14	0.67	0	0.01	0.64
JAB245A	Biotite	36.57	18.72	18.38	10.57	0	0.02	1.82
	Garnet	38	21.25	34.09	3.34	2.45	1.34	0.09
	Plagioclase	60.2	25.15	0.12	-	5.91	-	-
	Muscovite	47.19	34.26	1.5	0.9	0.35	0	0.73
JAB253A	Biotite	35.82	18.61	22.34	8.08	0.03	0.12	1.49
	Garnet	37.19	20.94	28.82	1.09	3.51	7.93	0
	Plagioclase	63.08	23.11	0.11	-	4.26	-	-
	Muscovite	47.4	33.42	2.07	1.03	0.01	0.02	0.35
JAB255A	Biotite	36.04	18.18	20.12	10.59	0.01	0.03	1.44
	Garnet	37.91	21.18	35.58	2.96	2.66	0.2	0.03
	Plagioclase	61.48	24.61	0.17	-	5.7	-	-
	Muscovite	47.21	35.19	1.12	0.85	0.02	0	0.29
JAB257A	Biotite	36.5	17.91	20.03	10.18	0	0.05	1.61
	Garnet	37.75	20.97	33.15	2.12	5.38	0.77	0
	Plagioclase	63.62	23	0.15	-	4.04	-	-
	Muscovite	47.01	34.36	1.3	0.99	0.01	0.01	0.33
	Ilmenite	0.03	0.02	48.09	0.33	0.09	0.27	50.8
	Rutile	0.23	0.38	0.62	0	0.07	0.08	98.56
JAB258D	Biotite	36.15	18.78	20.32	9.17	0.02	0.03	2.41
	Garnet	38.33	21.28	34.95	3.04	1.99	1.41	0.04
	Plagioclase	61.09	24.75	0.03	-	6.01	-	-
	Muscovite	46.77	34.47	1.74	0.72	0	0.02	0.99
JAB261B1	Biotite	35.58	18.52	20.73	9.33	0.01	0.02	2.19
	Garnet	37.24	20.82	35.15	3.23	1.77	1.62	0.05
	Plagioclase	62.09	23.98	0.04	-	5.22	-	-
	Muscovite	45.83	34.09	2.07	0.73	0	0	0.15
JAB262A1	Biotite	35.83	18.4	20.27	9.01	0.02	0.03	2.57
	Garnet	37.46	21.02	33.97	3.1	2	1.67	0.03
	Plagioclase	61.55	24.51	0.06	-	5.71	-	-
	Muscovite	46.2	34.13	1.85	0.7	0.01	0	0.95
JAB264A2	Biotite	35.97	18.57	20.52	9.35	0	0	2.29
	Garnet	37.61	21.47	35.62	3.06	1.8	0.86	0
	Plagioclase	61.59	24.34	0.02	-	5.69	-	-
	Muscovite	46.41	34.77	1.25	0.71	0.01	0.04	0.96
JAB268A	Biotite	35.72	17.83	22.35	8.3	0	0.21	2.5
	Garnet	37.19	20.92	27.53	1.83	2.61	9.74	0.01
	Plagioclase	60.03	25.46	0.11	-	6.76	-	-
	Muscovite	46.09	33.64	2.44	0.78	0	0.01	0.67
JAB269B	Biotite	35.57	18.49	22.5	8.27	0	0.08	1.97
	Garnet	37.64	21.04	33.78	2.51	1.28	3.91	0.01

	Plagioclase	62.17	24.15	0.13 -		5.32 -	-	
	Muscovite	46.73	34.6	1.77	0.73	0.03	0.02	0.44
JAB277D1	Biotite	35.76	18.94	22.45	8.21	0.03	0.14	1.38
	Garnet	37.44	20.8	32.84	2	2.01	5.41	0.1
	Plagioclase	60.05	25.19	0.28 -		6.59 -	-	
	Muscovite	47.87	34.54	2.16	0.43	0.01	0.01	0.13

Background corrections for Mg, Al, Si, Ca, Fe, and Mn in garnet, rutile, and ilmenite were done using M whereas a LOP correction was used for Ti. In plagioclase, Na, Al, Si, K, and Ca were corrected for backg and Fe was corrected using LOP. For muscovite, Al, Si, and K analyses used MAN corrections while F, N and Fe used LOP corrections. Background corrections for biotite are the same as those for muscovite e correction is used for Fe in biotite.

K2O	Na2O	F	Total
9.14	0.11	0.13	95.38
-	-	-	100.03
0.11	8.86	-	99.73
9.58	0.79	0.1	94.06
9.24	0.22	0.13	95.77
-	-	-	100.99
0.08	7.6	-	99.73
9.62	0.85	0.12	93.97
8.92	0.22	0.05	96.25
-	-	-	100.95
0.12	8.31	-	100.25
9.84	0.73	0.15	95.27
8.66	0.12	0.32	95.01
-	-	-	101.24
0.08	8.75	-	99.42
9.56	0.89	0.14	94.97
8.11	0.13	0.47	95.1
-	-	-	100.84
0.13	10.05	-	100.19
9.58	0.65	0.08	94.12
9.12	0.11	0.21	96.06
-	-	-	99.76
0.09	8.93	-	99.97
9.28	0.99	0.08	94.48
8.6	0.13	0.39	95.02
-	-	-	98.98
0.07	9.04	-	99.35
9.31	0.91	0.12	95
8.46	0.14	0.63	95.04
-	-	-	100.47
0.05	9.16	-	98.99
9.05	1.06	0.12	94.31
9.27	0.14	0.13	95.83
-	-	-	100.6
0.09	8.65	-	99.78
9.26	1.28	0.11	95.14
8.84	0.32	0.21	95.86
-	-	-	99.63
0.07	8.16	-	99.72
9.01	1.39	0.09	94.74
9.17	0.1	0.06	96.26
-	-	-	99.15
0.1	8.34	-	99.61
9.7	0.83	0.11	94.83
8.78	0.08	0.21	95.08

-	-	-	99.85
0.09	8.2	-	100
9.19	1.15	0.17	94.65
8.09	0.14	0.2	95.61
-	-	-	100.33
0.06	7.35	-	99.74
8.68	1.56	0.02	93.77
8.74	0.17	0.07	95.39
-	-	-	99.76
0.07	9.08	-	99.36
8.7	1.33	0	92.91
8.96	0.13	0.08	95.25
-	-	-	100.56
0.48	7.56	-	99.42
8.83	1.11	0.05	94.92
8.62	0.17	0.34	95.62
-	-	-	99.48
0.08	8.88	-	99.52
9.5	0.87	0.16	94.83
8.69	0.05	0.35	95.5
-	-	-	100.52
0.09	8.06	-	100.11
8.62	1.69	0.05	95.04
8.67	0.14	0.31	95.4
-	-	-	100.14
0.07	8.85	-	99.73
9.04	1.33	0.06	94.44
-	-	-	99.63
-	-	-	99.94
8.98	0.27	0.13	96.26
-	-	-	101.04
0.08	8	-	99.96
9.56	0.92	0.08	95.27
8.64	0.26	0.16	95.44
-	-	-	99.88
0.08	8.41	-	99.82
9.38	1.05	0.04	93.34
9.01	0.24	0.23	95.61
-	-	-	99.25
0.08	8.01	-	99.92
9.62	0.88	0.1	94.44
8.57	0.24	0.13	95.64
-	-	-	100.42
0.08	8.21	-	99.93
9.47	1.07	0.04	94.73
9.28	0.06	0.13	96.38
-	-	-	99.83
0.1	7.21	-	99.67
9.93	0.64	0.06	94.26
9.04	0.13	0.02	96.07
-	-	-	100.17

	0.09	8.33 -		100.19
	9.14	1.08	0.07	94.61
	8.75	0.37	0.02	96.05
-	-	-		100.6
	0.15	7.44 -		99.7
	8.66	1.5	0.02	95.33

AN corrections,
round using MAN
lg, Na, Ca, Ti, Mn,
except the MAN