Table A1. Chemical composition of samples collected by Kieffer et al. (2004) and igneous certified reference materials (CRMs) used in this study and their CIPW norm calculations (Kelsey, 1965; Johannsen, 1921).

	Sample	Igneous type	Altitude (m)	Chemical composition (wt. %)										Mineralogy calculated from CIPW norms (wt. %)				
				Al_2O_3	CaO	Fe_2O_3	K_2O	MgO	MnO	Na_2O	P_2O_5	SiO_2	TiO_2	Crystalline Fe oxide	Quartz	Pyroxene	Feldspars	Olivine
Certified Reference Material (CRMs)	**AGV-1**	Andesite	na	17.15	4.94	6.77	2.92	1.53	0.09	4.26	0.49	58.84	1.05	4.3	12.7	4.2	77.8	0
	BCR-1	Basalt	na	13.64	6.95	13.41	1.69	3.48	0.18	3.27	0.36	54.11	2.24	5.7	9.3	21.5	62.7	0
	BE-N	Basalt	na	10.07	13.87	12.84	1.39	13.15	0.2	3.18	1.05	38.2	2.61	8.4	0	30.1	38.2	16.1
	BHVO-1	Basalt	na	13.8	11.4	12.23	0.52	7.23	0.168	2.26	0.27	49.94	2.71	5.7	2.7	35.9	55	0
	BIR-1	Basalt	na	15.35	13.24	11.26	0.03	9.68	0.171	1.75	0.05	47.77	0.96	3.0	0	32.2	55.5	9.3
	BR	Basalt	na	10.2	13.8	12.88	1.4	13.28	0.2	3.05	1.04	38.2	2.6	8.6	0	30	38.5	16
	JB-1	Basalt	na	14.53	9.29	8.97	1.43	7.73	0.16	2.79	0.26	52.17	1.34	3.6	1.3	32.2	62.4	0
	RGM-1	Rhyolite	na	13.72	1.15	1.86	4.3	0.28	0.04	4.07	0.05	73.45	0.267	0.7	30.2	1.6	67.1	0
Data from Kieffer et al. 2004	**240**	trachyandesite	3875	15.40	3.33	9.25	3.09	1.09	0.22	5.68	58.20	1.10	3.77	3.8	2.0	0	16.6	73.7
	245	basalt	3845	16.50	8.07	13.50	1.28	3.47	0.25	4.39	47.60	2.31	6.84	6.8	0	0	12.5	63.4
	246	basalt	3880	17.30	8.84	13.80	0.87	5.53	0.18	3.44	47.00	2.29	6.35	6.4	0	0	10.3	62.7
	249	basalt	3560	14.70	9.16	15.50	1.30	4.42	0.24	3.50	46.90	2.84	7.64	7.6	0	0	18.5	56.1
	250	basalt	3470	16.10	8.78	14.00	1.34	4.04	0.23	3.59	48.00	2.24	6.28	6.3	0	0	14.3	61.6
	251	basalt	2845	17.70	12.20	11.40	0.58	7.25	0.17	2.02	45.10	1.45	4.40	4.4	0	0	17.5	57.5

254	basalt	2680	15.60	10.60	14.70	1.00	5.25	0.23	2.99	45.90	2.29	6.48	6.5	0	0	20.1	55.1
126	basalt	1800	15.30	10.10	12.40	0.53	5.47	0.17	2.60	49.70	1.90	5.41	5.4	1.1	0	36.6	53.6
127	basalt	1810	15.90	9.84	12.20	0.52	5.14	0.17	2.99	50.10	1.88	5.34	5.3	0.2	0	35.1	56.8
128	basalt	1830	15.90	7.02	11.50	0.40	4.45	0.06	2.66	49.80	1.93	5.34	5.3	6.5	0	25.5	55.1
129	basalt	1830	14.60	10.40	12.70	0.27	5.73	0.19	2.84	50.60	2.03	5.7	5.7	1.2	0	39.1	51.9
130	basalt	1840	13.60	8.82	14.20	0.52	4.70	0.21	3.24	50.90	2.35	6.52	6.5	2.0	0	36.8	51.5
131	basalt	1870	14.00	9.47	13.50	0.46	5.01	0.20	2.96	50.20	2.13	6.01	6.0	1.7	0	37.3	51.3
132	basalt	1880	13.90	9.39	13.70	0.51	5.04	0.20	2.98	51.00	2.18	5.28	5.3	2.3	0	37.6	51.3
137	basalt	2090	13.60	8.87	14.70	0.80	5.07	0.22	2.91	51.20	2.36	6.61	6.6	2.0	0	38.4	51.0
138	trachybasalt	2090	15.50	10.43	13.10	0.18	6.00	0.18	2.40	46.40	1.89	5.49	5.5	0	0	31.5	52.4
139	trachyte	2200	15.60	4.31	7.80	4.07	0	0	3.44	61.10	1.33	4.52	4.5	14.9	0	8.8	68.3
141	trachybasalt	2310	14.20	7.04	13.20	2.07	2.75	0.17	3.21	49.20	2.63	7.38	7.4	1.8	0	25.6	57.6
142	trachybasalt	2310	18.50	7.79	10.20	1.53	2.52	0.12	3.86	50.30	1.91	5.49	5.5	0	0	17.9	70.3
143	basalt	2330	15.90	10.16	11.70	0.44	5.14	0.16	2.87	49.50	1.74	5.42	5.4	0.6	0	34.2	56.1
144	basalt	2345	15.20	9.07	12.10	0.64	4.96	0.14	2.95	50.60	2.10	5.74	5.7	2.3	0	33.2	55.1
145	basalt	2350	15.00	9.77	12.30	0.50	4.50	0.15	2.82	48.00	1.96	5.5	5.5	0.6	0	33.9	53.6
147	basalt	2360	16.10	9.35	11.30	0.58	5.19	0.13	2.99	49.80	1.68	4.83	4.8	0.5	0	33.0	57.5
148	basalt	2370	16.50	9.37	11.20	0.55	5.35	0.13	3.01	49.90	1.63	4.72	4.7	0.1	0	32.9	58.6
151	basalt	2450	16.70	6.96	14.80	0.98	5.33	0.16	3.44	45.90	2.81	7.49	7.5	0	0	8.3	62.1
152	basalt	2470	15.50	9.85	10.60	0.54	5.21	0.14	2.82	50.90	1.68	4.73	4.7	2.7	0	33.5	55.1

153	basalt	2480	15.60	9.52	10.50	0.64	5.42	0.17	2.88	51.80	1.69	4.73	4.7	3.0	0	33.4	55.9
154	basalt	2490	15.40	10.90	11.80	0.23	5.76	0.16	2.62	48.80	1.92	5.36	5.4	0.1	0	37.7	53.1
157	basalt	2530	14.80	11.00	12.00	0.21	6.17	0.14	2.40	48.20	1.90	5.35	5.4	0.1	0	39.5	50.5
158	basalt	2540	15.70	10.30	12.30	0.31	5.79	0.18	2.81	49.10	1.94	5.46	5.5	0	0	34.8	54.9
159	basalt	2560	16.10	10.80	10.60	0.24	5.57	0.12	2.59	48.10	1.63	4.64	4.6	0.0	0	35.0	54.9
160	basalt	2570	15.50	10.70	10.90	0.42	3.70	0.15	2.69	46.20	1.89	5.17	5.2	0.3	0	31.2	54.2
161	basalt	2580	15.80	10.10	10.50	0.48	4.68	0.14	2.85	48.50	1.91	5.15	5.2	1.0	0	31.7	55.9
164	basalt	2610	17.20	11.00	10.00	0.21	6.14	0.13	2.66	48.90	1.43	4.17	4.2	0	0	31.8	58.1
165	basalt	2630	14.80	10.26	13.30	0.39	5.19	0.15	2.94	48.60	2.40	6.49	6.5	0	0	34.5	53.2