DR2009130 Supplementary information 2

Analytical Procedure

All melt inclusions analysed were naturally quenched to glass and none were re homogenized. Post-entrapment crystallisation of olivine on the inclusion walls was accounted for by assuming olivine–liquid equilibrium and a K_d^{Fe-Mg} $[(FeO/MgO)_{olivine}/(FeO/MgO)_{melt})]$ of 0.30 (Danyushevsky et al., 2000). Post-entrapment crystallisation corrections were small, typically requiring < 10% olivine addition to the melt.

Major elements and volatiles (S, Cl and F) were measured by electron microprobe using a Cameca SX100 at the University of Cambridge, Department of Earth Sciences. All samples were thoroughly cleaned and carbon coated prior to analyses. Quantitative determinations of the elements were made using the wavelength dispersive system with TAP, PET and LIF crystals. All analyses were conducted using an accelerating voltage of 15 kV. A beam current of 100nA for olivine and 10nA for glass was used, with counting times of at least 10 seconds on the peak and half those counting times on the background. Calibration was based on mineral standards: orthoclase, jadeite, periclase, wolastonite and corundum.

The concentrations of volatile elements (CO_2, H_2O) and selected trace elements (Li, Ti, Sr Y, Zr, Nb, Ba, La, Ce) were measured on a Cameca IMS 4f at the University of Edinburgh. The samples were thoroughly cleaned in methanol and water baths previous to being gold coated for the Ion probe. For all analyses, a 15 keV primary beam of O- ions was used to generate secondary ions, which were then accelerated to 4500 eV, with an offset of -75 eV (+/- 20eV) to reduce transfer of molecular ions into the secondary column. A primary beam current of 5 nA was used throughout, with a nonrastered, tear-drop shaped beam covering an area <20μm on single spots well within the margins of the melt inclusion.

The following trace elements were analysed by counting for 3s in each cycle of a 6 cycle run: ^{26}Mg, ^{30}Si, ^{42}Ca, ^{47}Ti, ^{88}Sr, ^{89}Y, ^{90}Zr, ^{93}Nb, ^{138}Ba, ^{139}La, ^{140}Ce. These counts were normalised to 30Si. Concentrations of Si in each melt inclusion had already been measured using the electron probe, and these Si values (mean 48 wt% SiO_2 were used to calculate absolute elemental concentrations in the melt inclusions. All trace elements were calibrated against NIST SRM610 glass. Analyses of standards indicate the accuracy is within 0.3-1.5% relative for all elements analysed. Precision is always <4% relative based on repetitive measurements.

Volatiles were measured separately to trace elements, using the same beam conditions and the same hole as that made by the trace elements. The following were measured for 3s in each cycle of a 10 cycle run: ^{1}H, ^{11}B, ^{12}C $^{+24}Mg^{2+}$, ^{19}F, $^{25}Mg^{2+}$, $^{28}Si^{2+}$, ^{30}Si and ^{35}Cl. These counts were normalised to ^{30}Si. The first 3 cycles of each analysis were disregarded and the final 7 used to process the data. H was calibrated against Sission 51 (rhyolite), analyses of standards indicate the accuracy is 4% relative for all elements analysed. Precision is always 8% relative based on repetitive measurements. C was calibrated against RB480 (rhyolite) as well as CY82293 (MORB), analyses of standards indicate the accuracy is 7.4% relative for all elements analysed. Precision is always 6% relative based on repetitive measurements.

A subset of inclusions were analysed using a UP213 Nd:YAG laser ablation system interfaced to a Perkin-Elmer Elan DRC II ICP-MS at the University of Cambridge, Department of Earth Sciences for Cu. Helium was used as the ablation gas. A 60 µm diameter laser beam and a laser repetition rate of 10 Hz and laser power of ~1 mJ (10 J cm-1) was used for the entire study. The spot size was chosen as a compromise between signal intensity and the size of the melt inclusions of interest in the samples.

For data processing and calculation of concentrations, Glitter Software (GEMOC, Australia) was used to process the raw data files containing the signal intensity vs time data (the output from the Elan software). Cu was calibrated against NIST SRM610 glass. In addition, several analyses of the USGS standards BIR-1, BCR-2, BHVO-2 and were conducted during the course of the study to verify calibration accuracy. Analyses of standards indicate the accuracy is 3% relative for all elements analysed. Precision is always 6-8% relative based on repetitive measurements.

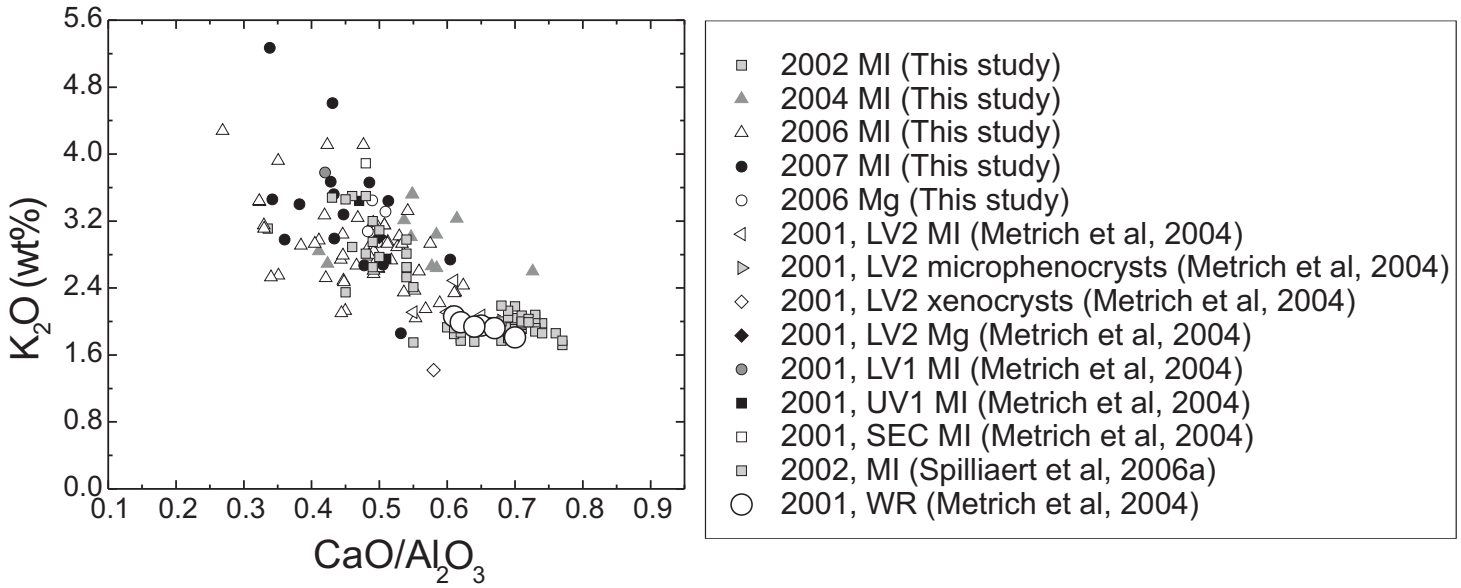
5.6
4.8
4.0
3.2
2.4
1.6
0.8
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
K2O (wt%)
CaO/Al2O3
2002 MI (This study)
2004 MI (This study)
2006 MI (This study)
2007 MI (This study)
2006 Mg (This study)
2001, LV2 MI (Metrich et al, 2004)
2001, LV2 microphenocrysts (Metrich et al, 2004)
2001, LV2 xenocrysts (Metrich et al, 2004)
2001, LV2 Mg (Metrich et al, 2004)
2001, LV1 MI (Metrich et al, 2004)
2001, UV1 MI (Metrich et al, 2004)
2001, SEC MI (Metrich et al, 2004)
2002, MI (Spilliaert et al, 2006a)
2001, WR (Metrich et al, 2004)

Table 1: Compositions of melt inclusions and matrix glass

	2001-Mi[d]							2002-MI	2004-MI			
	ET0101-1L	ET0102-1L	ET0103-1L	ET0104-1L	ET0105-1L	ET0106-1L	ET0107-1L	ET0201-4S	ET0401-1F	ET0402-1F	ET0403-1F	ET0404-1F
SiO_2 (wt%)	46.86	50.48	50.87	50.45	48.73	47.70	50.10	50.72	47.98	47.92	47.96	50.48
TiO_2	1.56	1.75	1.77	1.79	1.78	1.72	1.68	1.36	2.17	1.96	2.17	1.18
Al_2O_3	13.70	16.27	16.00	16.03	15.49	14.93	16.88	14.20	14.43	15.92	14.43	15.17
FeO	12.06	10.17	10.13	10.37	10.38	11.47	9.90	11.46	12.65	11.52	12.64	11.82
MnO	0.14	0.19	0.17	0.22	0.24	0.22	0.22	0.23	0.25	0.20	0.25	0.19
MgO	8.86	4.51	4.31	4.35	6.01	6.60	3.48	5.36	4.70	4.26	4.69	4.61
CaO	8.72	7.05	7.03	5.51	7.26	7.70	7.20	4.76	7.92	8.54	7.91	6.23
Na_2O	4.38	4.93	5.58	5.78	5.65	5.56	5.51	4.83	5.31	5.48	5.31	6.18
K_2O	2.22	3.11	3.19	4.12	2.85	2.99	3.44	3.11	3.52	3.21	3.52	2.84
F	0.12	0.18	0.16	0.22	0.18	0.15	0.15	0.11	0.21	0.16	0.21	0.16
Cl	0.18	0.19	0.19	0.24	0.19	0.19	0.20	0.23	0.19	0.17	0.19	0.28
S	0.08	0.04	0.04	0.05	0.06	0.06	0.08	0.01	0.03	0.04	0.03	0.04
H_2O	0.77	0.55	0.00	0.41	0.74	0.29	0.67	2.73	0.18	0.21	0.22	0.34
CO_2 (ppm)	59	81	181	33	103	129	81	491	1075	299	755	225
Cu	-	-	-	-	-	-	-	-	92	151	257	220
Zr	255	331	316	327	279	294	301	373	308	318	391	351
Nb	62	79	75	80	66	68	74	89	71	72	85	80
La	70	93	95	102	90	95	92	125	91	97	117	107
Mg #	0.57	0.44	0.43	0.43	0.51	0.51	0.39	0.45	0.40	0.40	0.40	0.41
Fo%[a]	81	72	72	73	78	78	69	72	70	70	70	70
% PEC[b]	18	6	5	7	10	11	6	5	5	4	5	7
SCSS[c]	1439	1123	-	1094	1220	1291	1076	803	1198	1129	1232	1174

	2004-MI									2006-MI		
	ET0405-1F	ET0406-1F	ET0407-1F	ET0408-1F	ET0409-1F	ET0410-1F	ET0411-1F	ET0412-1F	ET0413-1F	ET0601-3F	ET0602-2L	ET0603-2L
SiO_2 (wt%)	48.73	47.63	46.57	47.48	46.90	46.90	51.54	47.61	44.13	48.09	51.37	54.85
TiO_2	1.73	1.94	1.68	1.92	1.75	1.75	1.52	2.40	1.85	1.74	2.02	1.38
Al_2O_3	14.63	15.75	13.67	15.42	15.05	15.05	14.90	14.49	15.80	15.84	14.97	17.20
FeO	12.36	11.86	12.60	12.35	11.94	11.94	11.13	12.09	11.23	11.26	10.20	8.04
MnO	0.18	0.18	0.16	0.23	0.18	0.18	0.19	0.20	0.14	0.24	0.18	0.24
MgO	4.81	4.76	9.82	5.08	7.04	7.04	4.38	4.35	8.56	5.36	3.92	3.08
CaO	7.07	9.20	7.99	8.43	8.69	8.69	6.31	8.90	11.47	8.04	7.67	5.67
Na_2O	5.48	4.75	4.12	5.19	5.12	5.12	6.02	5.50	3.12	5.31	5.65	5.50
K_2O	2.77	3.04	2.64	3.01	2.66	2.66	2.69	3.23	2.60	3.15	2.95	3.15
F	0.14	0.17	0.16	0.13	0.15	0.15	0.12	0.20	0.15	0.13	0.14	0.12
Cl	0.23	0.16	0.14	0.18	0.17	0.17	0.29	0.22	0.16	0.18	0.23	0.20
S	0.02	0.04	0.04	0.05	0.08	0.08	0.02	0.04	0.25	0.09	0.01	0.01
H_2O	1.36	0.18	0.14	-	-	-	0.25	0.28	0.55	0.23	0.71	1.20
CO_2 (ppm)	359	362	168	-	-	-	67	113	97	18	1008	165
Cu	98	309	412	241	642	420	-	-	-	306	113	103
Zr	371	299	397	-	-	-	336	405	325	281	377	322
Nb	92	66	89	-	-	-	79	104	85	63	100	94
La	111	91	113	-	-	-	101	160	107	83	122	97
Mg #	0.41	0.42	0.58	0.42	0.51	0.51	0.41	0.39	0.58	0.46	0.41	0.41
Fo%[a]	70	71	71	71	78	78	70	70	82	74	70	70
% PEC[b]	6	3	16	6	13	13	6	4	10	7	6	2
SCSS[c]	1163	1145	1413	-	-	-	1093	1247	1445	1167	1140	903

	2006-MI											
	ET0604-2B	ET0605-3F	ET0606-3F	ET0607-5L	ET0608-5L	ET0609-5L	ET0610-4S	ET0611-12L	ET0612-12L	ET0613-12L	ET0614-12L	ET0615-12L
SiO_2 (wt%)	54.21	52.02	47.52	50.69	49.63	48.45	50.18	50.05	51.24	51.27	50.27	47.66
TiO_2	0.52	1.79	1.62	1.77	1.80	2.07	1.86	1.25	1.23	2.03	1.51	1.65
Al_2O_3	15.94	15.34	14.58	14.40	13.46	14.98	14.76	18.47	18.05	17.08	15.37	13.72
FeO	12.87	10.46	11.01	10.81	12.59	11.41	10.62	9.21	8.54	8.34	10.83	14.97
MnO	0.24	0.22	0.15	0.22	0.18	0.20	0.23	0.18	0.20	0.14	0.22	0.17
MgO	7.32	4.70	8.21	4.52	7.42	5.70	5.02	4.20	3.52	3.30	4.24	6.09
CaO	2.39	6.30	8.05	8.18	6.68	6.34	6.88	7.10	5.83	5.99	7.82	6.17
Na_2O	5.10	5.23	5.14	5.29	4.49	5.60	5.39	4.81	5.93	5.68	5.42	5.34
K_2O	1.14	2.97	2.37	2.15	2.74	4.11	2.67	2.91	3.43	3.92	2.94	2.13
F	0.13	0.11	0.12	0.17	0.14	0.21	0.13	0.23	0.30	0.19	0.13	0.15
Cl	0.06	0.19	0.17	0.26	0.28	0.23	0.25	0.25	0.26	0.19	0.30	0.22
S	0.01	0.02	0.12	0.08	0.01	0.04	0.03	0.06	0.03	0.01	0.04	0.05
H_2O	-	-	0.67	1.07	0.10	0.18	1.48	0.99	1.22	1.07	0.58	1.40
CO_2 (ppm)	-	-	84	1524	280	196	122	1576	1054	171	19	2187
Cu	112	122	82	77	242	175	155	-	-	-	-	-
Zr	-	-	225	316	484	290	308	281	275	368	311	297
Nb	-	-	52	81	124	69	77	63	62	88	79	77
La	-	-	67	104	147	92	85	83	84	104	103	88
Mg #	0.50	0.44	0.57	0.43	0.51	0.47	0.46	0.45	0.42	0.41	0.41	0.42
Fo%[a]	74	72	82	71	77	76	74	72	72	72	70	70
% PEC[b]	9	4	16	7	15	10	4	8	6	5	8	12
SCSS[c]	-	-	1365	1161	1171	1143	1066	1026	945	958	1180	1283

	2006-MI											
	ET0616-12L	ET0617-6S	ET0618-6S	ET0619-6S	ET0620-6S	ET0621-6S	ET0622-6S	ET0623-2L	ET0624-2L	ET0625-2L	ET0626-2L	ET0627-6S
SiO_2 (wt%)	51.28	50.30	50.47	48.19	51.04	50.10	50.32	54.14	51.03	51.44	48.14	48.51
TiO_2	1.23	1.54	1.38	1.73	1.56	1.09	1.37	1.36	2.01	1.63	1.11	1.86
Al_2O_3	18.06	14.42	15.90	15.55	14.63	14.63	15.75	16.97	14.88	15.10	14.84	14.69
FeO	8.54	11.28	10.28	11.71	11.45	11.50	10.37	7.94	10.09	9.62	12.82	12.65
MnO	0.20	0.20	0.22	0.22	0.21	0.26	0.21	0.23	0.18	0.17	0.24	0.24
MgO	3.52	4.83	4.16	4.57	4.91	4.88	4.44	3.07	3.86	3.62	5.44	6.34
CaO	5.83	7.09	7.11	7.75	7.19	6.13	7.05	5.60	7.62	7.50	9.08	6.51
Na_2O	5.93	5.08	5.24	4.97	5.15	5.10	5.19	5.42	5.62	5.68	4.06	5.27
K_2O	3.44	2.57	2.49	2.63	2.61	3.27	2.47	3.11	2.93	3.14	2.35	2.74
F	0.30	0.11	0.12	0.14	0.11	0.15	0.12	0.12	0.15	0.15	0.17	0.15
Cl	0.26	0.26	0.28	0.21	0.26	0.38	0.28	0.21	0.24	0.26	0.17	0.25
S	0.03	0.05	0.07	0.07	0.05	0.08	0.07	0.01	0.01	0.03	0.07	0.06
H_2O	1.14	1.76	1.87	1.86	0.30	1.79	1.98	1.28	0.70	0.98	1.31	0.35
CO_2 (ppm)	620	813	1153	956	773	604	973	40	867	183	86	833
Cu	-	-	-	-	-	-	-	-	-	-	-	-
Zr	277	336	296	300	294	449	439	343	371	342	320	299
Nb	60	80	70	61	65	102	105	100	98	89	78	75
La	86	99	86	77	79	144	137	103	120	113	97	90
Mg #	0.42	0.43	0.42	0.41	0.43	0.43	0.43	0.41	0.41	0.40	0.43	0.47
Fo%[a]	72	71	70	70	71	71	71	70	70	70	70	75
% PEC[b]	6	4	2	2	4	4	3	2	5	6	4	8
SCSS[c]	952	1024	952	1010	1174	1022	935	897	1136	1076	1222	1328

	2006-MI											
	ET0628-6S	ET0629-3F	ET0630-3F	ET0631-4S	ET0632-4S	ET0633-4S	ET0634-4S	ET0635-4S	ET0636-4S	ET0637-4S	ET0638-4S	ET0639-3F
SiO_2 (wt%)	49.74	49.01	49.53	48.34	49.45	51.22	48.21	49.42	49.00	50.52	49.43	48.09
TiO_2	1.69	2.17	1.70	1.80	1.74	1.44	1.70	1.63	1.78	1.26	1.19	1.74
Al_2O_3	16.57	16.22	14.16	13.64	15.76	14.76	15.28	14.49	15.92	14.15	13.97	15.84
FeO	10.00	8.78	11.59	13.04	10.73	10.55	11.31	12.33	10.81	11.21	12.10	11.26
MnO	0.23	0.14	0.24	0.19	0.21	0.18	0.20	0.21	0.20	0.18	0.24	0.24
MgO	4.94	5.63	5.03	8.30	6.11	4.20	6.29	5.11	4.27	4.71	5.35	5.36
CaO	7.39	7.87	7.59	6.71	7.64	6.91	7.91	8.09	8.42	7.49	8.53	8.04
Na_2O	5.14	4.62	5.27	4.22	4.66	5.21	5.00	5.00	5.16	4.80	4.28	5.31
K_2O	3.04	2.90	2.35	2.84	2.80	3.24	2.73	2.60	2.90	3.02	2.34	3.15
F	0.15	0.14	0.17	0.14	0.16	0.17	0.18	0.14	0.19	0.15	0.17	0.14
Cl	0.20	0.21	0.30	0.14	0.19	0.18	0.20	0.17	0.20	0.14	0.23	0.19
S	0.06	0.07	0.06	0.00	0.06	0.02	0.04	0.03	0.04	0.05	0.09	0.10
H_2O	0.43	1.70	1.75	0.14	0.12	1.35	0.62	0.21	0.74	1.88	1.75	0.23
CO_2 (ppm)	1954	543	668	296	154	23	27	989	332	1020	821	18
Cu	-	-	-	-	-	-	-	-	-	-	-	-
Zr	301	286	271	283	329	320	282	267	286	260	250	281
Nb	64	63	66	62	70	79	61	58	61	64	48	63
La	82	81	84	82	87	100	82	71	77	78	71	83
Mg #	0.47	0.53	0.44	0.53	0.50	0.41	0.50	0.42	0.41	0.43	0.44	0.46
Fo%[a]	75	79	71	78	77	70	77	70	70	70	70	74
% PEC[b]	4	7	7	13	8	6	10	6	4	5	5	7
SCSS[c]	1123	943	1037	1309	1042	1073	1298	1207	1185	988	1066	1167

	2006-MI											
	ET0640-3F	ET0641-3F	ET0642-3F	ET0643-3F	ET0645-5L	ET0646-2L	ET0647-2L	ET0648-2L	ET0649-2L	ET0650-2L	ET0651-2L	ET0652-2L
SiO_2 (wt%)	51.07	50.57	51.79	51.29	46.51	50.74	50.62	49.30	50.78	49.66	49.82	52.42
TiO_2	1.70	1.73	1.22	1.46	1.64	1.58	1.22	1.63	1.37	1.35	1.73	1.92
Al_2O_3	16.81	16.91	14.42	14.45	14.59	15.85	15.77	14.81	16.34	17.60	16.39	15.46
FeO	9.43	9.90	11.50	10.97	12.17	9.79	10.38	11.59	10.25	9.75	9.72	9.44
MnO	0.15	0.21	0.24	0.21	0.18	0.17	0.20	0.19	0.19	0.15	0.16	0.22
MgO	4.61	4.82	4.96	4.56	7.31	4.21	4.71	5.34	4.68	4.36	3.48	3.64
CaO	5.90	5.75	6.40	7.09	8.39	7.90	8.30	8.20	6.88	4.73	7.81	6.26
Na_2O	5.62	5.68	5.37	4.67	5.37	5.65	4.80	5.32	5.42	7.04	5.73	5.85
K_2O	2.55	2.53	2.10	3.18	2.93	2.64	2.89	2.04	2.52	4.28	4.11	2.93
F	0.15	0.13	0.14	0.16	0.15	0.23	0.20	0.14	0.19	0.19	0.30	0.21
Cl	0.39	0.36	0.38	0.14	0.21	0.30	0.30	0.36	0.26	0.24	0.20	0.28
S	0.09	0.07	0.12	0.02	0.08	0.09	0.05	0.13	0.10	0.05	0.01	0.05
H_2O	1.26	1.00	1.22	1.13	0.19	0.57	0.12	0.83	0.86	0.26	0.14	0.90
CO_2 (ppm)	49	66	238	74	120	325	68	530	217	130	9	3834
Cu	-	-	-	-	-	-	-	-	-	-	-	-
Zr	317	318	298	328	265	344	325	308	267	274	327	370
Nb	88	84	70	80	58	94	82	76	70	80	76	105
La	116	104	69	97	78	103	98	96	90	96	92	118
Mg #	0.47	0.46	0.43	0.43	0.52	0.43	0.45	0.45	0.45	0.44	0.39	0.41
Fo%[a]	74	74	70	70	79	72	-15	73	73	76	70	70
% PEC[b]	6	7	7	5	14	8	10	11	9	8	4	6
SCSS[c]	1024	1082	1157	1146	1320	1118	964	1262	1125	985	921	1051

2006-MI	2007-MI

	ET0653-2L	ET0654-4F	ET0655-4F	ET0656-4F	ET0657-4S	ET0701-2F	ET0702-2F	ET0703-3F	ET0704-2F	ET0705-2F	ET0706-S1	ET0707-4F
SiO_2 (wt%)	49.57	50.90	47.99	47.82	48.32	49.49	48.63	49.79	49.21	50.93	47.64	50.12
TiO_2	1.08	1.55	1.87	1.27	1.73	1.98	2.26	1.96	2.27	1.91	1.27	1.59
Al_2O_3	15.73	14.57	15.50	15.69	15.80	15.62	18.52	16.77	14.95	16.11	18.49	15.34
FeO	10.78	11.14	11.23	11.52	10.95	11.27	9.05	9.92	11.33	9.92	10.08	10.32
MnO	0.20	0.22	0.19	0.22	0.17	0.19	0.18	0.20	0.23	0.24	0.13	0.19
MgO	4.94	4.62	5.35	6.64	5.07	4.08	4.22	3.77	3.85	3.19	6.34	5.36
CaO	9.81	6.50	8.40	9.24	8.43	7.58	6.67	7.18	6.44	5.45	9.83	7.75
Na_2O	3.92	5.15	5.22	3.52	5.13	5.00	6.21	5.52	6.02	5.74	3.84	4.55
K_2O	2.43	2.79	3.32	2.22	2.93	3.66	2.98	3.67	4.61	5.27	1.86	2.68
F	0.20	0.18	0.21	0.14	0.16	0.16	0.17	0.16	0.26	0.19	0.15	0.14
Cl	0.21	0.26	0.20	0.17	0.19	0.17	0.38	0.18	0.25	0.21	0.09	0.17
S	0.12	0.07	0.07	0.15	0.07	0.01	0.07	0.02	0.02	0.01	0.07	0.05
H_2O	0.89	1.28	0.13	1.23	0.73	0.14	0.15	0.15	-	-	-	1.08
CO_2 (ppm)	837	706	56	85	57	3	195	124	-	-	-	655
Cu	-	-	-	-	-	297	270	133	278	211	156	-
Zr	213	373	280	205	250	339	385	347	-	-	-	306
Nb	44	98	63	39	57	78	113	82	-	-	-	75
La	59	117	85	52	73	94	127	104	-	-	-	84
Mg #	0.45	0.42	0.46	0.51	0.45	0.39	0.45	0.40	0.38	0.36	0.53	0.48
Fo%[a]	71	70	75	75	74	69	75	71	70	69	77	74
% PEC[b]	11	6	8	9	5	4	3	6	6	2	10	10
SCSS[c]	1201	1122	1080	1209	1226	1015	885	921	-	-	-	1146

	2007-MI							
	ET0708-4F	ET0709-4F	ET0710-4F	ET0711-4F	ET0712-2F	ET0713-2F	ET0714-3F	ET0715-3F
SiO_2 (wt%)	51.32	51.58	50.99	50.21	50.35	48.81	52.20	51.10
TiO_2	1.71	1.90	1.59	1.54	1.66	1.97	1.38	1.38
Al_2O_3	17.52	17.20	16.16	17.09	15.95	15.10	15.90	15.09
FeO	7.27	7.93	10.55	9.16	10.74	12.26	9.30	9.78
MnO	0.13	0.12	0.19	0.19	0.21	0.21	0.19	0.15
MgO	3.40	3.86	4.73	3.64	3.85	4.55	3.52	4.06
CaO	5.99	6.57	7.72	7.41	6.90	7.75	7.11	9.12
Na_2O	6.62	6.20	4.44	6.04	5.54	4.77	5.55	5.08
K_2O	3.46	3.40	2.67	2.99	3.52	3.44	3.28	2.74
F	0.18	0.21	0.21	0.18	0.17	0.18	0.17	0.18
Cl	0.46	0.21	0.19	0.29	0.21	0.19	0.25	0.18
S	0.10	0.06	0.07	0.04	0.02	0.00	0.01	0.01
H_2O	0.98	0.00	0.07	0.33	0.29	0.15	0.36	0.47
CO_2 (ppm)	199	883	149	670	276	4	52	792
Cu	-	-	-	-	-	-	-	-
Zr	472	366	305	412	325	333	350	377
Nb	135	109	76	116	82	78	95	107
La	163	131	109	150	97	99	112	121
Mg #	0.45	0.46	0.44	0.41	0.39	0.40	0.40	0.43
Fo%[a]	76	76	71	71	69	69	69	70
% PEC[b]	5	6	8	3	5	7	6	8
SCSS[c]	911	-	847	996	1072	1104	1009	1132

	2006-Mg[e]				
	ET06MG1-2S	ET06MG2-2S	ET06MG3-2S	ET06MG4-4S	ET06MG5-4S
SiO_2 (wt%)	48.62	49.98	49.98	50.34	49.02
TiO_2	2.13	1.64	1.64	1.94	2.12
Al_2O_3	15.33	16.45	16.45	16.73	15.29
FeO	10.01	9.48	9.48	9.52	10.24
MnO	0.23	0.13	0.13	0.19	0.24
MgO	3.53	3.06	3.06	3.08	3.51
CaO	7.50	8.17	8.17	8.08	7.78
Na_2O	5.05	5.08	5.08	4.98	4.97
K_2O	3.45	2.94	2.94	3.08	3.31
F	0.16	0.12	0.12	0.15	0.15
Cl	0.18	0.14	0.14	0.15	0.19
S	0.00	0.00	0.00	0.01	0.00
H_2O	0.10	0.10	0.10	0.14	0.12
CO_2 (ppm)	18	7	7	21	14
Cu	109	160	64	155	124
Zr	161	254	112	234	207
Nb	53	79	31	79	65
La	84	87	87	88	86
Mg #	0.39	0.37	0.37	0.37	0.38
Fo%[a]	-	-	-	-	-
% PEC[b]	-	-	-	-	-
SCSS[c]	899	837	837	872	1098

Table 3: Whole rock data

	Whole rock by XRF				
	ET042F	ET0612L	ET063F	ET064S	ET069L
Cu	144	139	127	129	124
Nb	47.9	48.8	51.2	49.6	51.1

Table 2: Dates and descriptions of samples collected

Sample No	Date erupted	Date collecte	Description	Latitude	Longitude
ET07 - 4F	April/may 07	3/5/07	Lava	37.743139	15.007861
ET07 - 3F	April/may 07	3/5/07	Lava	37.743139	15.007861
ET07 - 2F	April/may 07	3/5/07	Lava	37.743417	15.007233
ET07 - 1S	April/may 07	3/5/07	Scoria	37.743417	15.007233
ET06 - 2B	Jul-06	20/7/06	Bomb	37.738322	15.005641
ET06 - 4S	Jul-06	19/7/06	Scoria	37.738322	15.005641
ET06 - 6S	Jul-06	20/7/06	Scoria	37.738322	15.005641
ET06 - 2F	Jul-06	19/7/06	Lava	37.745118	15.005664
ET06 - 3F	Jul-06	20/7/06	Lava	37.745046	15.005789
ET06 - 4F	Jul-06	20/7/06	Lava	37.743253	15.005653
ET06 - 2L	Jul-06	23/7/06	Lava	37.744740	15.006186
ET06 - 5L	Jul-06	20/7/06	Lava	37.744740	15.006186
ET06 - 12L	Jul-06	23/7/06	Lava	37.742774	15.013042
ET04 - 1F	2004	19/7/06	Lava	37.739827	15.013177
ET02 - 4S	2002	20/7/06	Scoria	37.734113	15.001124
ET01 - 1L	2001	20/7/06	Lava	37.702075	15.003408

[a] Forsterite content of olivine hosts - Fo=[100*Mg/(Fe+Mg)]

[b] % melt inclusions corrected for post entrapment crystallisation

[c] The sulphur concentration (ppm) in the melt at sulphide saturation. Predicted using the model of Liu et al., (2007)

1 sigma error on ln(SCSS) is estimated at +/- 5% relative, (Liu et al., 2008)

[d] Melt inclusion

[e] Matrix glass

Details of analytical conditions can be found in supplementary information B.