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Composition and temperature of komatiite melts from Gorgona Island constrained from olivine-hosted melt inclusions

Vadim S. Kamenetsky, Andrey A. Gurenko, Andrew C. Kerr

Analytical Methods

Electron microprobe

Major elements in minerals and glasses were analyzed using the JEOL Superprobe JXA-8200 electron microprobe (Max Planck Institute for Chemistry, Mainz, Germany). We applied 15 kV accelerating voltage, 12 nA electron beam current and defocused to 5 µm size beam for analyses of host matrix glasses and olivine-hosted glass inclusions. The 20 kV and 20 nA primary beam was applied for analyses of olivine and spinel. Peak counting times on major elements were 60 s and 30 s of background. Standard built-in ZAF correction routine was used. Sulfur and chlorine were analysed at the same analytical conditions as other major elements in glasses. At these conditions, the detection limit for S was around 200–250 ppm. A set of reference materials (i.e. natural and synthetic oxides, minerals and glasses; Micro-Analysis Consultants Ltd, Cambridgeshire, UK) and the Smithsonian Institution standard set for electron microprobe analysis (Jarosewich et al., 1980) were used for routine calibration and instrument stability monitoring. Typical analytical uncertainties (2RSD = 2σ relative standard deviation) are 1.5–3.0% for SiO_2, Al_2O_3, FeO, MgO, CaO, TiO_2; 4-6% for Na_2O, 10% for K_2O, 15% for P_2O_5, and 30% for MnO. As a monitor sample for S and Cl measurements, we also used the USNM 111240/52 VG-2 basaltic glass (recommended values of 0.134–0.137 wt% S; (Dixon et al., 1991; Thordarson et al., 1996); 0.030 wt% Cl, N. Metrich, personal communication, 2003). The concentrations of 0.140 ± 0.023 wt% S and 0.029 ± 0.007 wt% Cl (±2σ SD = 2-sigma standard deviation, N = 37) were obtained during this study.

Ion microprobe

Glass inclusions were analyzed for H_2O, B, Cl and trace elements (REE, Nb, Th, Sr, Y, Zr, V and Cr) using the Cameca IMS 3f instrument at the MPI in Mainz. For H_2O, B and Cl analyses, conditions were similar to those described by (Chaussidon and Libourel, 1993; Sobolev and Chaussidon, 1996), with 12.5 kV accelerating voltage for the $^{16}O^-$ primary beam, 4.5 kV secondary accelerating voltage, –80 V offset and $M/\Delta M$ ≈300. The energy slit was centered and opened to 25 V. A 150 µm contrast aperture and a 750 µm field aperture were used. Analyses were performed in three blocks of 6 cycles over the masses ^{1}H, ^{11}B, ^{30}Si, ^{35}Cl and ^{47}Ti, counted during 4 s, 6 s, 2 s, 6 s and 2 s, respectively. Titanium was monitored to detect and, if necessary, correct for overlap with host minerals in the case of small (<40 µm) inclusions. A set of natural and synthetic glasses with water concentrations ranging from 0.1 to 2.1 wt.% H_2O and 14 to 1920 ppm B was used for calibration. The

olivine host grains were repeatedly analyzed throughout each session to monitor the H_2O background level, and inclusion analyses were started when H_2O concentration measured on olivine was equivalent to, or lower than, 0.03 wt%. The external precision, assessed from multiple measurements of reference glasses, was better than 10 rel%.
The analysis of trace elements employed similar instrument settings as for H_2O, except that a larger field aperture (1800 µm) was used. Each analysis consisted of 5 sequential scans of the masses ^{16}O, ^{30}Si, ^{35}Cl, ^{39}K, ^{44}Ca, ^{47}Ti, ^{51}V, ^{52}Cr, ^{88}Sr, ^{89}Y, ^{90}Zr, ^{93}Nb, then the REE masses from 133 to 180 and finally mass ^{232}Th. The remaining oxide interferences, e.g., light rare earth element (LREE) oxides interfering with heavy rare earth elements (HREE) were corrected by peak deconvolution (Fahey et al., 1987; Zinner and Crozaz, 1986). Relative sensitivity factors were determined from analyses of basaltic reference glasses (Jochum et al., 2000). Instrument drift was controlled and correction applied using daily replicate analyses of KL2-G reference glass. The obtained analytical error was better than 10% relative for all elements except Gd, Tm, Lu, Hf and Th whose uncertainties range between 11 and 30% relative.

Laser ablation ICP-MS
Trace element concentrations in the selected large (>40 µm) melt inclusions were analyzed with the single collector sector-field ICP-MS Element 2 equipped with the New Wave Research UP213 Nd-YAG (213 nm) laser at Max Planck Institute for Chemistry (Mainz, Germany). Analyses were performed in an Ar atmosphere by ablating 40 µm-diameter spots at a rate of 5 shots/sec using laser power of ~12 J/cm^2. The instrument was optimized for sensitivity on mid- to high-mass isotopes (in the range 80-240 a.m.u.) and for minimal molecular oxide species (i.e., $^{232}Th^{16}O/^{232}Th < 0.2\%$) and doubly-charges ion species (i.e., $^{140}Ce^{++}/^{140}Ce^{+} < 0.3\%$) production. The analysis time for each sample was 50-90 seconds, comprising a 30 second measurement of background (laser off) and a 20-60 second analysis (depending on inclusion’s thickness) with laser on. Instrument calibration and stability monitoring was performed by ablating the NIST612 and KL2-G glass standards. Data reduction was undertaken according to standard methods ((Longerich et al., 1996) using the NIST612 glass (Pearce et al., 1997) as a primary reference material and KL2-G (Jochum et al., 2000) as the internal standard. The intensity of peacks were normalized to ^{43}Ca (Ca analysed by EMPA) The KL2-G reference glass (Jochum et al., 2000) glass was repeatedly analysed throughout analytical sessions and was used as a secondary reference material.

Table DR1. Compositions of studied komatiites from Gorgona Island, Columbia

Sample	GOR94-3	GOR94-4	GOR94-17	GOR94-28	GOR94-44
Type	cumulate	cumulate	cumulate	joint top	cumulate
SiO_2	45.06	44.88	47.80	44.38	45.53
TiO_2	0.49	0.49	0.55	0.53	0.57
Al_2O_3	8.07	8.15	9.15	8.89	9.59
Fe_2O_3	11.56	11.68	11.82	11.72	11.81
MnO	0.17	0.17	0.17	0.17	0.18
MgO	28.61	28.12	23.36	25.36	24.74
CaO	6.56	6.82	7.46	7.42	8.02
Na_2O	0.31	0.33	0.51	0.51	0.51
K_2O	0.05	0.02	0.01	0.03	0.02
P_2O_5	0.04	0.04	0.04	0.04	0.04
Total	100.90	100.69	100.87	99.05	101.02
LOI	3.69	3.32	2.36	1.98	2.43
Ba, ppm	3.170	1.718	1.831	2.467	2.048
Co, ppm	85.6	90.4	88.4	87.3	84.4
Cr, ppm					
Cu, ppm	91	90	95	91	96
Ga, ppm	10	9	10	10	10
Nb, ppm	0.33	0.52	0.51	0.42	0.40
Ni, ppm	1018	1228	935	1082	1050
Rb, ppm	0.87	0.60	0.65	0.80	0.64
Sc, ppm	32	29	34	32	33
Sr, ppm	36	30	37	38	37
Th, ppm	0.04	0.05	0.06	0.04	0.04
V, ppm	186	163	190	180	186
Y, ppm	10	10	11	11	11
Zn, ppm	70	66	69	68	67
Zr, ppm	21	20	22	21	22
La, ppm	0.60	0.56	0.61	0.57	0.57
Ce, ppm	1.96	1.83	2.03	1.91	1.93
Pr, ppm	0.42	0.37	0.42	0.40	0.40
Nd, ppm	2.58	2.22	2.57	2.44	2.50
Sm, ppm	1.11	0.97	1.13	1.07	1.10
Eu, ppm	0.52	0.45	0.52	0.50	0.51
Gd, ppm	1.77	1.52	1.79	1.72	1.76
Tb, ppm	0.34	0.29	0.34	0.32	0.33
Dy, ppm	2.11	1.83	2.14	2.05	2.09
Ho, ppm	0.44	0.38	0.45	0.43	0.43
Er, ppm	1.20	1.05	1.21	1.16	1.19
Tm, ppm	0.18	0.16	0.18	0.17	0.18
Yb, ppm	1.06	0.94	1.08	1.04	1.05

Lu, ppm	0.16	0.14	0.16	0.15	0.16
Hf, ppm	0.69	0.63	0.72	0.69	0.69
Th, ppm	0.04	0.05	0.06	0.04	0.04
U, ppm	0.01	0.01	0.01	0.01	0.01

Table DR2. Representative compositions of homogenised melt inclusions and their host olivine

Grain No	m1 94-28-1	m1 94-28-3mi1	m1 94-28-9	m2 94-17-11	m2 94-17-13	m3 94-4-20	m3 94-4-21	m3 94-44-24	m3 94-44-27	m1 94-28-2	m1 94-28-8a	m2 94-17-16	m4 94-3_30a	m4 94-3-32
Host olivine														
SiO_2	40.35	40.66	40.40	40.80	40.74	40.34	40.28	40.68	40.69	41.34	40.22	40.42	40.84	41.02
FeO	9.21	8.90	8.95	9.72	9.54	9.37	9.03	8.65	8.88	9.02	8.97	10.08	8.48	9.18
MnO	0.15	0.15	0.14	0.17	0.13	0.14	0.16	0.12	0.14	0.15	0.14	0.17	0.12	0.15
MgO	49.01	49.48	48.91	49.06	49.19	48.81	48.88	49.45	49.44	50.02	48.56	48.36	49.99	49.71
CaO	0.32	0.32	0.32	0.33	0.33	0.32	0.32	0.32	0.31	0.33	0.32	0.34	0.31	0.34
NiO	0.43	0.44	0.43	0.40	0.41	0.42	0.44	0.44	0.44	0.44	0.44	0.40	0.44	0.45
Cr_2O_3	0.11	0.12	0.14	0.10	0.12	0.12	0.11	0.12	0.11	0.13	0.14	0.11	0.12	0.13
Total	99.56	100.07	99.29	100.57	100.46	99.52	99.21	99.78	100.00	101.43	98.79	99.87	100.31	100.98
Fo, mol%	90.5	90.8	90.7	90.0	90.2	90.3	90.6	91.1	90.9	90.8	90.6	89.5	91.3	90.6
Heated Melt Inclusions														
SiO_2	49.42	48.55	48.37	48.61	48.14	49.02	49.16	48.94	49.08	47.98	48.84	49.11	48.25	48.43
TiO_2	0.95	0.86	0.87	0.87	0.86	0.85	0.87	0.87	0.85	0.88	0.88	0.84	0.85	0.85
Al_2O_3	17.17	16.12	15.79	15.68	15.60	15.58	15.91	15.27	15.50	16.11	16.01	15.46	15.90	15.85
FeO	7.15	8.37	8.90	6.62	7.11	6.48	6.23	6.57	6.56	7.94	8.40	7.57	6.14	6.91
MnO	0.11	0.18	0.13	0.12	0.15	0.09	0.09	0.08	0.11	0.16	0.14	0.15	0.13	0.13
MgO	8.39	9.92	10.06	10.39	10.76	11.03	10.76	10.31	10.43	9.73	9.66	10.95	11.70	11.45
CaO	15.00	14.07	14.13	14.36	13.88	13.89	14.17	14.07	13.95	14.62	14.37	13.79	13.64	13.75
Na_2O	2.12	1.98	1.85	1.79	1.93	1.80	1.85	1.79	1.79	1.96	1.88	1.84	1.92	1.95
K_2O	0.039	0.039	0.040	0.034	0.034	0.035	0.044	0.041	0.039	0.037	0.038	0.032	0.044	0.030
P_2O_5	0.070	0.062	0.056	0.044	0.052	0.058	0.061	0.051	0.046	0.061	0.057	0.054	0.046	0.054
S	0.071	0.073	0.076	0.052	0.056	0.056	0.056	0.052	0.059	0.077	0.072	0.064	0.052	0.068
Cl	0.029	0.030	0.029	0.026	0.025	0.029	0.025	0.026	0.026	0.028	0.031	0.022	0.023	0.025
Total	100.52	100.24	100.31	98.62	98.60	98.92	99.22	98.08	98.44	99.58	100.39	99.88	98.69	99.49

H2O wt%			0.18	0.73	0.44	1.03	0.59					0.64	0.44	0.27
Cl, ppm	285	300	272	236	254	296	277	263	257	280	313	273	205	184
B, ppm	*0.61*	2.02	0.95	1.10	1.07	1.09	1.10	1.48	0.88	1.63	0.81	0.93	1.03	1.01
K, ppm		321	288	246	265	299	308	343	327	307	313	290	334	270
Ti, ppm		5333	5395	5120	5198	5357	5266	5022	5130	5413	5313	5097	5081	5369
V, ppm			435	369	388	453	412					397	405	406
Cr, ppm			401	751	444	736	579					484	686	706
Sr, ppm		83.3	82.3	75.2	75.0	82.2	80.2	78.1	73.7	86.4	86.8	75.0	77.0	79.2
Y, ppm		19.9	19.4	18.4	18.7	18.6	19.6	19.5	18.3	22.0	21.5	19.4	19.8	19.6
Zr, ppm		40.9	40.4	36.5	37.0	38.2	39.2	37.1	35.9	42.3	41.3	35.7	37.9	39.1
Nb, ppm		0.53	0.44	0.60		0.48	0.51		0.57	0.53	0.50	0.48	0.49	0.52
Ba, ppm		4.0	3.9	4.0	4.3	4.5	4.3	4.4	3.4	3.3	3.5	3.4	3.7	4.3
La, ppm		0.79	0.73	0.77	0.77	0.69	0.71	0.77	0.59	0.81	0.77	0.61	0.77	0.77
Ce, ppm		2.72	2.94	2.81	2.47	2.65	2.87	2.54	2.38	2.82	2.70	2.80	2.71	2.70
Pr, ppm		0.50	0.70	0.57	0.60	0.64	0.56	0.52		0.67	0.51	0.55	0.59	0.55
Nd, ppm		3.61	3.61	3.84	3.72	3.46	3.46	3.89	3.45	3.81	3.43	3.50	3.52	3.40
Sm, ppm		1.44	1.88	1.68	1.62	1.89	1.80	1.62	1.60	2.18	2.34	1.64	1.92	1.68
Eu, ppm		1.03	0.83	0.84	0.72	0.80	0.85	0.62	0.82	0.96	0.78	0.69	0.63	0.71
Gd, ppm		2.93	2.76	2.55	2.61	2.74	2.77	2.95	3.85	3.44	2.98	2.41	2.46	3.15
Tb, ppm		0.59	0.56	0.52	0.51	0.51	0.56	0.49	0.44	0.64	0.54	0.56	0.51	0.59
Dy, ppm		3.64	3.29	3.89	3.28	3.67	3.71	4.47	3.30	3.96	4.09	3.47	3.33	3.52
Ho, ppm		0.75	0.78	0.62	0.63	0.74	0.74	0.65		0.81	0.91	0.75	0.67	0.66
Er, ppm		2.05	2.20	2.01	1.89	2.08	1.98	1.85	2.00	2.64	2.09	2.61	2.00	2.16
Tm, ppm		0.29	0.29	0.25	0.30	0.30	0.25	0.38	0.28	0.34	0.32	0.33	0.25	0.24
Yb, ppm		2.88	1.94	2.10	1.72	1.83	1.92	1.79	1.79	2.29	1.80	2.40	1.83	1.98
Lu, ppm		0.28	0.30	0.26	0.23	0.31	0.35	0.22	0.28	0.31	0.30	0.32	0.26	0.28
Hf, ppm		1.63	1.24	0.98	1.28	0.84	1.02	1.31	1.27	1.44	1.16	0.93	1.43	1.22
Pb, ppm		0.20	0.12		0.59	0.11			0.05	0.10	0.09	0.36	0.40	0.16
Th, ppm		0.03	0.03	0.02	0.04	0.02	0.01		0.02	0.03	0.02			0.02

Table DR3. Calculated* compositions and temperatures of the Gorgona komatiite melts

SAMP_NO	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	Cr_2O_3	T_calc	Fo_host
m1 94-28_1	46.67	0.73	13.22	1.38	9.56	0.11	15.02	11.59	1.63	0.03	0.05	n.d.	1352	90.47
m1 94-28_2	46.25	0.71	13.00	1.38	9.56	0.15	15.45	11.84	1.58	0.03	0.05	n.d.	1362	90.81
m1 94-28_3a	46.53	0.69	12.98	1.38	9.57	0.17	15.65	11.37	1.59	0.03	0.05	n.d.	1365	90.83
m1 94-28_3b	46.42	0.67	12.54	1.38	9.56	0.11	16.37	11.42	1.45	0.03	0.05	n.d.	1378	91.23
m1 94-28_4a	46.52	0.66	12.41	1.38	9.56	0.14	16.78	10.96	1.52	0.02	0.05	n.d.	1386	91.4
m1 94-28_6	46.58	0.71	12.94	1.38	9.56	0.14	15.36	11.71	1.54	0.03	0.05	n.d.	1358	90.68
m1 94-28_7	46.21	0.69	13.06	1.38	9.56	0.14	15.83	11.43	1.62	0.02	0.06	n.d.	1370	91
m1 94-28_8a	46.74	0.71	12.93	1.38	9.56	0.14	15.31	11.64	1.52	0.03	0.05	n.d.	1357	90.61
m1 94-28_9a	46.58	0.72	12.99	1.38	9.56	0.13	15.39	11.66	1.52	0.03	0.05	n.d.	1359	90.69
m2 94-17_10	47.07	0.71	13.15	1.38	9.56	0.12	14.51	11.90	1.53	0.03	0.05	n.d.	1339	90.07
m2 94-17_11	47.12	0.73	13.11	1.38	9.56	0.12	14.40	12.04	1.50	0.03	0.03	n.d.	1337	90
m2 94-17_12	47.47	0.71	13.04	1.38	9.56	0.12	14.38	11.71	1.57	0.03	0.03	n.d.	1337	89.92
m2 94-17_13	46.89	0.73	13.22	1.38	9.56	0.15	14.59	11.79	1.64	0.03	0.04	n.d.	1343	90.18
m2 94-17_14	46.82	0.74	13.37	1.38	9.56	0.13	14.09	12.23	1.61	0.03	0.04	n.d.	1332	89.88
m2 94-17_15	47.36	0.74	13.63	1.38	9.56	0.14	13.27	12.19	1.65	0.04	0.04	n.d.	1314	89.18
m2 94-17_16	47.45	0.73	13.35	1.38	9.56	0.15	13.80	11.93	1.59	0.03	0.04	n.d.	1325	89.53
m2 94-17_17	47.57	0.73	13.37	1.38	9.57	0.10	13.66	11.93	1.61	0.03	0.04	n.d.	1322	89.41
m2 94-17_18	47.34	0.72	13.43	1.38	9.56	0.13	13.94	11.80	1.62	0.03	0.05	n.d.	1328	89.64
m2 94-17_18b	47.51	0.73	13.68	1.38	9.56	0.13	13.14	12.14	1.65	0.04	0.05	n.d.	1311	89.04
m3 94-4_19	47.02	0.67	12.73	1.38	9.56	0.12	15.84	11.10	1.51	0.03	0.04	n.d.	1367	90.83
m3 94-4_20	47.28	0.71	12.93	1.38	9.56	0.10	14.92	11.56	1.49	0.03	0.05	n.d.	1347	90.27
m3 94-4_21	47.04	0.70	12.79	1.38	9.56	0.10	15.43	11.43	1.49	0.03	0.05	n.d.	1358	90.61
m3 94-4_22	47.17	0.68	12.71	1.38	9.56	0.12	15.53	11.32	1.46	0.03	0.04	n.d.	1359	90.63
m3 94-4_23	47.39	0.67	12.40	1.38	9.56	0.13	15.69	11.28	1.43	0.02	0.05	n.d.	1362	90.68
m3 94-44_24	47.20	0.69	12.09	1.38	9.56	0.09	16.30	11.19	1.42	0.03	0.04	n.d.	1375	91.06
m3 94-44_25	47.53	0.70	12.55	1.38	9.56	0.10	15.26	11.38	1.47	0.03	0.04	n.d.	1354	90.43
m3 94-44_26	47.20	0.68	12.60	1.38	9.56	0.11	15.71	11.13	1.54	0.03	0.05	n.d.	1365	90.74
m3 94-44_27	47.25	0.68	12.38	1.38	9.56	0.11	15.95	11.19	1.43	0.03	0.04	n.d.	1368	90.85
m4 94-3_28	47.05	0.72	13.23	1.38	9.56	0.11	14.84	11.42	1.61	0.03	0.04	n.d.	1348	90.27
m4 94-3_29	46.85	0.68	12.95	1.38	9.56	0.10	15.95	10.92	1.54	0.02	0.05	n.d.	1369	90.9
m4 94-3_30	46.43	0.68	12.70	1.38	9.56	0.13	16.57	10.94	1.53	0.03	0.04	n.d.	1383	91.31
m4 94-3_31	46.50	0.69	12.84	1.38	9.56	0.11	16.25	11.08	1.52	0.02	0.05	n.d.	1376	91.13
m4 94-3_32	46.65	0.71	13.16	1.38	9.56	0.13	15.28	11.45	1.62	0.03	0.04	n.d.	1358	90.61
m4 94-3_33	46.84	0.68	12.64	1.38	9.56	0.11	16.25	10.94	1.54	0.02	0.04	n.d.	1376	91.08
m4 94-3_34	46.52	0.67	12.90	1.38	9.56	0.14	16.09	11.14	1.53	0.02	0.04	n.d.	1373	91.05
m4 94-3_345	46.57	0.67	12.81	1.38	9.56	0.11	16.64	10.66	1.52	0.03	0.06	n.d.	1383	91.29

m4 94-28_36	46.58	0.72	13.17	1.38	9.56	0.14	15.04	11.77	1.57	0.03	0.05	n.d.	1352	90.49
94-44 -gr1	46.73	0.68	12.32	1.38	9.56	0.11	16.39	11.25	1.28	0.02	0.07	0.22	1374	91.11
94-44-gr2	46.85	0.68	12.57	1.38	9.56	0.15	15.87	11.34	1.32	0.03	0.06	0.20	1364	90.82
94-44-gr3	46.44	0.64	12.21	1.38	9.56	0.16	17.06	11.02	1.26	0.02	0.06	0.20	1387	91.48
94-44-gr4	46.91	0.66	12.33	1.38	9.56	0.09	15.66	11.94	1.29	0.03	0.03	0.12	1361	90.77
94-44-gr5	46.54	0.64	12.26	1.38	9.56	0.10	17.07	10.98	1.30	0.02	0.04	0.11	1388	91.49
94-28-gr6	46.48	0.71	13.28	1.38	9.56	0.15	14.71	12.15	1.40	0.02	0.03	0.14	1342	90.27
94-28-gr7a	46.47	0.69	12.93	1.38	9.56	0.19	15.71	11.44	1.47	0.04	0.04	0.08	1364	90.85
94-28-gr8	46.44	0.66	12.83	1.38	9.56	0.17	16.28	11.10	1.44	0.02	0.04	0.08	1375	91.13
94-28-gr9a	46.44	0.67	12.80	1.38	9.56	0.15	15.93	11.49	1.40	0.02	0.06	0.08	1367	90.96
94-28-gr9b	46.26	0.71	12.75	1.38	9.56	0.16	15.84	11.78	1.36	0.03	0.06	0.09	1366	90.96
94-28-gr10	46.97	0.68	12.94	1.38	9.57	0.15	15.49	11.20	1.45	0.03	0.06	0.09	1358	90.6
94-28-gr11a	46.45	0.68	12.67	1.38	9.56	0.15	16.46	11.02	1.44	0.02	0.07	0.10	1378	91.21
94-28-gr11b	46.65	0.68	12.49	1.38	9.56	0.10	16.49	10.99	1.47	0.02	0.06	0.10	1379	91.21
94-28-gr12	46.88	0.64	12.65	1.38	9.56	0.14	16.24	10.90	1.43	0.02	0.07	0.10	1372	91.01
94-28-gr13	46.75	0.73	13.16	1.38	9.56	0.10	15.39	11.28	1.51	0.03	0.05	0.06	1357	90.61
Grg1 1-1	46.21	0.70	13.11	1.38	9.56	0.14	15.97	11.25	1.50	0.02	0.04	0.12	1370	91.02
Grg1 2-1	46.37	0.71	13.41	1.38	9.57	0.10	15.18	11.53	1.57	0.02	0.04	0.14	1354	90.57
Grg1 3-1	46.47	0.67	13.07	1.38	9.56	0.10	15.54	11.53	1.48	0.02	0.03	0.14	1361	90.76
Grg1 5-1	46.35	0.65	12.98	1.38	9.56	0.12	16.13	11.16	1.47	0.02	0.05	0.12	1372	91.07
Grg1 6-1	46.72	0.67	13.18	1.38	9.56	0.14	14.97	11.65	1.51	0.03	0.08	0.12	1348	90.37
Grg1 7-1	46.17	0.69	12.86	1.38	9.56	0.13	16.38	11.19	1.45	0.04	0.02	0.14	1378	91.24
Grg1 8a-1	46.23	0.71	12.98	1.38	9.56	0.12	15.84	11.53	1.45	0.02	0.06	0.13	1367	90.96
Grg1 8b-2	45.75	0.66	13.09	1.38	9.56	0.11	16.59	11.24	1.40	0.02	0.05	0.15	1381	91.39
Grg2 1-1	46.44	0.68	13.06	1.38	9.56	0.10	15.43	11.65	1.50	0.03	0.07	0.11	1359	90.71
Grg2 2-1	46.37	0.68	12.91	1.38	9.56	0.13	16.12	11.22	1.41	0.02	0.04	0.15	1371	91.05
Grg2 3-1	46.29	0.72	13.20	1.38	9.56	0.10	15.50	11.59	1.46	0.03	0.04	0.13	1360	90.76
Grg2 4-1	46.59	0.70	13.05	1.38	9.56	0.15	15.33	11.55	1.49	0.03	0.06	0.12	1356	90.61
Grg2 5-1	46.51	0.68	13.16	1.38	9.56	0.11	15.23	11.70	1.48	0.04	0.05	0.12	1354	90.58
Grg2 7-1	46.42	0.67	12.74	1.38	9.56	0.11	16.20	11.24	1.46	0.02	0.08	0.13	1373	91.1
Grg2 8-1	46.57	0.68	12.88	1.38	9.56	0.13	15.91	11.21	1.47	0.02	0.06	0.13	1367	90.92
Grg3 1-1	46.70	0.73	13.39	1.38	9.56	0.12	14.54	11.87	1.53	0.03	0.04	0.11	1340	90.13
Grg3 4-1	46.34	0.65	13.04	1.38	9.56	0.13	15.93	11.35	1.43	0.03	0.05	0.13	1367	90.96
Grg3 5-1	46.46	0.66	13.12	1.38	9.56	0.13	15.39	11.65	1.48	0.03	0.03	0.12	1358	90.68

* Calculation, using the model by Ford et al. (1983) and PETROLOG software by L. Danyushevsky (2001), was based on the compositions of heated melt inclusions (see Table DR2), corrected for "Fe-loss", their host olivine and melt's FeO = 10.8 and Fe^{2+}/Fe^{3+} = 7.7)
The total FeO in the melt was assumed to be equal to the average FeO in the whole rocks.
The degree of Fe oxidation in the melt was calculated using Fe2+/Fe3+ of Cr-spinel and empirical model of Maurel and Maurel (1982).

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