Table 8
Major (wt.%) and trace element (ppm) composition of the Belaya Zima rocks.

Rock type	Melteigites			Ijolites			Alkaline syenites			Calcite and calcite–dolomite carbonatites								Ankerite carbonatites		
Sample no.	2309/109-114	01/151	2092-761-763 M	2092-761-763 I	2095-226-231	520-95-99	C1-135-144	C1-131-135	2095-325	c411/25-34	c-257	2096-257	BZOl	2050-119-121	2099-75-80	2350	2098-679-685	2099-297-300	2098-679	2098
Major elements (wt.%)																				
SiO_2	33.40	27.90	35.30	37.20	38.60	40.50	49.30	54.40	48.80	2.90	5.20	11.20	1.16	0.80	10.50	4.96	1.12	0.20	0.18	0.50
TiO_2	3.99	6.30	5.49	2.79	3.55	2.53	0.25	0.30	1.64	0.06	0.45	0.85	0.21	0.02	0.29	0.46	0.02	0.02	0.02	0.02
Al_2O_3	7.00	6.50	7.60	13.20	16.20	14.60	18.20	18.00	18.40	0.30	1.20	1.80	0.10	0.10	3.40	0.30	0.10	0.10	0.10	0.10
Fe_2O_3	2.99	10.41	7.02	6.28	7.08	–	1.97	1.86	2.40	1.41	1.19	3.21	4.31	0.14	0.85	9.88	0.26	0.90	1.02	0.34
FeO	9.32	9.91	6.88	4.70	3.82	–	2.73	1.37	4.28	1.97	2.28	3.62	2.46	0.92	2.28	6.32	7.08	10.16	8.89	8.84
MnO	0.44	0.44	0.21	0.18	0.21	0.23	0.12	0.12	0.50	0.62	0.26	0.28	0.33	0.57	0.24	0.74	1.69	2.41	2.45	2.23
MgO	7.44	8.20	8.15	4.52	3.32	4.80	1.25	1.17	1.73	2.72	2.29	3.44	1.83	2.37	7.46	6.24	15.15	12.48	14.06	12.88
CaO	19.10	20.75	22.65	18.00	15.37	-	5.60	3.63	3.57	48.54	48.52	42.73	49.40	51.58	39.22	37.34	30.26	27.33	28.28	27.49
Na_2O	1.44	1.41	0.98	5.72	6.41	2.62	7.79	5.87	5.10	0.04	0.28	0.41	0.35	0.12	0.31	0.23	0.07	0.07	0.11	0.06
K_2O	3.46	0.52	1.15	2.83	2.84	2.17	7.47	8.97	8.16	0.38	0.60	0.86	0.08	0.12	2.80	0.25	0.01	0.01	0.01	0.01
P_2O_5	0.96	1.32	2.60	2.35	0.84	1.28	0.19	0.10	0.21	1.47	2.20	3.00	4.30	1.90	1.10	6.00	3.10	1.90	0.83	3.90
LOI	9.97	5.96	1.50	1.72	1.52	3.86	4.90	3.83	4.65	37.76	35.18	28.17	32.45	40.42	30.87	24.62	40.83	39.10	40.48	38.40
Total	99.51	99.62	99.53	99.49	99.76	99.33	99.77	99.52	99.44	98.17	99.65	99.57	96.98	99.04	99.32	97.34	99.67	94.66	96.43	94.75
CO_2	7.70	4.84	0.44	0.88	0.66	0.55	3.74	1.54	2.86	37.62	34.43	27.72	32.01	40.15	28.16	23.76	40.04	39.82	39.50	37.95
S	0.33	0.34	0.24	1.14	0.62	–	–	0.20	0.11	–	0.38	0.23	0.16	–	–	–	0.21	0.62	–	–
F	0.19	0.10	0.32	0.09	0.11	0.05	0.01	1.40	0.63	0.20	0.29	0.31	0.45	0.22	0.39	0.39	0.34	0.08	0.07	0.14
Trace elements (ppm)																				
Li	13.02	2.55	1.22	4.35	9.35	–	1.31	1.89	–	0.50	–	–	–	–	–	–	–	–	–	–
Be	4.23	1.59	1.42	1.57	2.44	1.02	4.20	5.95	4.06	0.13	0.77	1.82	0.27	0.32	3.62	0.27	0.69	0.95	0.78	0.42
Sc	14.74	12.83	15.02	4.49	12.23	42.10	0.78	1.24	1.42	1.45	0.85	2.76	2.64	4.86	5.48	6.65	7.56	10.18	8.50	8.25
V	325	241	286	241	557.82	418	112	138	508	21.46	104	154	81.98	9.49	37.89	174	37.58	22.67	23.41	25.83
Cr	3.96	1.29	4.62	4.73	8.02	62.00	5.29	10.44	0.92	1.10	1.71	1.43	0.83	2.07	1.20	1.09	13.82	2.98	2.21	17.80
Co	19.34	35.76	26.94	32.84	37.55	51.70	1.89	2.80	16.71	3.28	9.63	16.18	3.99	4.73	6.30	8.03	6.36	8.18	6.79	4.95
Ni	2.41	3.76	6.92	5.93	15.66	21.11	3.83	4.82	0.90	5.09	11.52	10.85	10.31	15.18	8.29	7.23	10.41	6.70	5.00	7.05
Cu	49.36	100.12	45.90	120.38	131.00	22.61	4.93	7.50	5.46	2.43	8.59	18.75	1.67	4.91	7.51	5.15	2.02	4.17	3.52	2.87
Zn	129	109	81.95	66.70	60.69	146	34	65	281	8.93	46.06	77.02	39.91	13.66	53.99	120	71.83	122.32	100.68	57.37
Ga	17.50	18.35	15.73	17.71	27.46	–	25.46	37.33	–	2.23	–	–	–	–	–	–	–	–	–	–

Ge	1.15	1.28	1.49	1.26	2.22	–	0.47	0.77	–	0.13	–	–	–	–	–	–	–	–	–	–
Rb	112	9.38	24.33	22.08	29.92	42.31	116.99	157.92	34.12	21.07	49.88	44.34	2.46	5.88	127	26.66	0.96	1.40	0.83	1.51
Sr	982	669	379	443	321	248	289	354	466	2682	6424	5370	7082	8677	6236	5226	7298	4135	3800	3394
Y	28.52	34.92	35.45	48.50	70.41	33.03	4.22	4.15	5.43	35.33	71.36	70.31	80.84	74.94	80.42	80.95	31.48	39.52	31.05	29.68
Zr	492	757	576	667	986	125	270	381	17.51	107	596	231	751	370	2083	370	885	14.72	23.20	2.64
Nb	622	547	126	38.11	78.94	17.81	188	223	505	242	252	111	15,660	2502	5865	5429	1237	60.10	52.12	96.31
Mo	0.48	1.08	0.32	0.43	0.61	0.77	1.74	1.52	0.89	0	1	0	0	1	1	0	7	38.73	30.98	12.57
Ag	16.18	9.66	2.21	0.86	3.46	–	2.90	7.96	–	7	–	–	–	–	–	–	–	–	–	–
Cd	0.27	0.18	0.08	0.19	0.13	0.03	0.32	0.05	0.02	1	0	0	1	0	0	0	0	0.08	0.04	0.06
Sn	4.87	4.80	6.24	3.60	4.65	–	2.15	1.30	–	0	–	–	–	–	–	–	–	–	–	–
Sb	0.25	0.06	0.02	0.06	0.09	–	0.14	0.08	–	0	–	–	–	–	–	–	–	–	–	–
Cs	2.60	0.28	0.33	0.33	0.27	5.58	0.88	0.84	5.92	0	1	1	0	0	2	0	0	0.02	0.03	0.04
Ba	667	235	192	37.29	39.46	486	1509	1631	1357	335	790	551	359	718	1924	344	74	197	177	107
La	87.69	221.62	80.15	38.44	16.42	21.72	20.18	12.88	82.97	158	245	255	374	265	204	365	594	14,504	9969	14,127
Ce	201	550	161	67.51	35.00	50.94	38.28	26.17	137	306	523	558	1535	595	535	1069	1194	27,674	19,200	22,248
Pr	25.04	67.12	19.53	7.95	4.50	6.83	4.12	2.73	12.68	34	52	58	110	57	58	93	107	2603	1667	1811
Nd	97.06	254.01	79.94	33.67	21.91	30.39	14.60	9.91	39.28	116	192	220	380	198	226	335	354	6002	4753	5219
Sm	17.74	39.44	18.52	9.03	7.18	7.39	2.47	1.55	3.81	17.47	33.89	40.49	65.92	33.73	45.38	60.13	49.98	381	308	388
Eu	4.86	9.73	5.44	2.99	2.92	2.18	0.56	0.72	0.82	4.87	10.41	11.97	17.90	10.25	13.65	16.37	12.11	63.82	52.61	70.00
Gd	10.08	16.21	14.06	9.35	10.01	1.18	1.17	1.80	0.31	6.79	3.63	4.06	5.54	3.61	4.72	5.34	3.40	19.54	15.36	18.91
Tb	1.42	2.20	1.91	1.48	1.52	7.50	0.20	0.16	2.34	1.20	26.92	31.79	35.69	25.72	33.61	41.29	30.25	160	125	165
Dy	8.16	12.05	10.64	8.89	9.18	7.09	1.17	0.77	1.18	7.28	17.08	18.14	23.51	17.17	22.99	23.07	10.37	60.04	15.87	21.74
Ho	1.29	1.81	1.71	1.66	1.83	1.42	0.21	0.14	0.20	1.27	3.03	3.04	3.68	3.10	3.96	3.68	1.43	2.64	1.94	2.19
Er	3.10	3.87	3.92	4.80	4.98	3.63	0.56	0.36	0.52	3.33	7.38	6.89	8.12	7.95	9.39	8.11	2.94	5.15	3.91	3.58
Tm	0.37	0.41	0.39	0.60	0.67	0.53	0.09	0.05	0.07	0.44	0.95	0.83	1.01	1.10	1.22	0.99	0.37	0.51	0.43	0.39
Yb	2.19	2.24	2.24	3.66	4.19	2.99	0.67	0.45	0.44	2.78	5.53	4.59	5.73	7.10	7.14	5.51	2.25	3.10	2.57	2.26
Lu	0.31	0.27	0.27	0.49	0.57	0.40	0.13	0.08	0.06	0.37	0.77	0.61	0.72	1.04	0.97	0.71	0.30	0.40	0.37	0.32
Hf	13.41	14.24	19.65	12.12	13.64	3.54	10.90	4.11	0.21	0.15	0.59	1.97	7.08	0.76	14.04	5.15	0.24	0.56	0.70	0.27
Ta	26.39	37.99	7.65	1.88	2.96	0.97	10.17	6.45	11.92	7.96	6.34	2.90	8.22	2.61	327	61.93	6.76	0.42	0.17	0.33
W	1.54	0.49	0.15	0.23	1.01	0.30	0.84	10.29	0.18	0.05	0.59	0.28	0.25	0.13	0.67	0.25	2.59	0.39	0.33	1.27
Tl	0.30	0.02	0.03	0.05	0.06	0.28	0.18	0.13	0.33	0.10	0.07	0.10	0.01	0.01	0.25	0.02	0.00	0.00	0.01	0.00
Pb	1.40	2.36	0.92	0.77	1.46	3.77	2.59	4.34	2.72	2.46	18.01	4.48	14.51	11.56	17.11	18.65	5.79	20.21	15.18	17.96
Bi	0.00	0.02	0.01	0.01	0.01	–	0.03	0.09	–	0.07	–	–	–	–	–	–	–	–	–	–
Th	7.01	21.18	4.00	1.19	1.10	2.88	4.95	2.68	3.39	1.42	12.19	20.95	134	42.42	211	251	17.23	213	114	86.27
U	1.48	10.60	1.70	0.71	0.81	0.51	10.94	19.36	22.87	32.39	1.78	4.54	1.52	0.71	186	2.32	4.90	0.33	0.28	0.43