

## Kimberlite geochemistry

Sample	W10-51 <sup>a</sup>	W10-11 <sup>a</sup>	W10-12 <sup>a</sup>	W10-22 <sup>a</sup>	W10-52 <sup>a</sup>	wjl5-7b <sup>b</sup>
SiO <sub>2</sub>	39.84	35.19	34.66	31.82	34.35	31.25
TiO <sub>2</sub>	1.48	2.15	2.37	1.75	2.04	2.09
Al <sub>2</sub> O <sub>3</sub>	3.18	4.48	4.29	3.41	4.21	4.32
TFe <sub>2</sub> O <sub>3</sub>	10.8	14.85	15.82	15.72	13.86	12.8
MnO	0.14	0.19	0.2	0.21	0.18	0.2
MgO	15.63	16.52	18.78	21.52	20.82	16.69
CaO	19.51	13.13	11.09	14.35	12.55	18.93
Na <sub>2</sub> O	1.47	1.09	1.01	0.1	1.06	1.32
K <sub>2</sub> O	0.42	0.69	0.73	1.09	0.69	1.26
P <sub>2</sub> O <sub>5</sub>	0.97	2.09	1.98	1.95	1.82	2.65
LOI	6.68	8.82	8.24	7.18	8.81	7.87
Total	100.12	99.2	99.17	99.1	100.39	99.38
TFeO	9.71	13.36	14.23	14.14	12.47	11.52
Mg#	0.74	0.69	0.7	0.73	0.75	0.72
La	130.2	306.1	328.5	203.5	187.2	212
Ce	257	601.8	667.7	441.2	355.6	449.4
Pr	33.68	70.74	80.74	56.65	52.58	59.22
Nd	139	282.9	321.1	190.3	207.8	228.9
Sm	29.3	49.04	45.13	29.76	31.36	39.64
Eu	9.13	18.12	18.73	11.46	11.86	11.14
Gd	27.65	48.92	38.53	31.59	31.68	32.41
Tb	3.64	4.69	5.23	3.5	3.62	3.97
Dy	16.96	21.03	26.19	16.99	15.45	17.53
Ho	3.41	4.47	5.11	3.26	3.176	2.77
Er	9.1	10.4	11.64	8.15	8.041	5.97
Tm	1.06	1.29	1.26	0.921	0.936	0.65
Yb	4.09	5.34	4.49	3.56	4.05	3.32

Lu	0.462	0.575	0.593	0.392	0.425	0.42
Y	64.62	83.22	94.11	70.82	71.74	62.83
Sr	1191	1134	1413	1143	1705	1676
Rb	8.92	14.18	44.71	26.22	1.92	30.05
Zr	543.8	438.2	500.1	401	538.6	412.5
Nb	101.6	149.1	178.6	143.1	157	123.6
Ba	782.9	3733	4545	2050	902.5	3523
Hf	7.68	7.99	9	6.04	8.37	9.08
Ta	3.88	5.52	6.17	4.32	5.8	7.28
Pb	n.d.	n.d.	n.d.	n.d.	n.d.	21.42
Th	16.88	50.91	55.23	33.81	23.79	23.57
U	3.55	9.32	8.76	6.47	7.29	7.68
(La/Yb) <sub>N</sub>	30.21	57.06	59.36	55.63	47.2	54.1

Total Fe<sub>2</sub>O<sub>3</sub> as TFe<sub>2</sub>O<sub>3</sub>; TFeO= 0.8998×TFe<sub>2</sub>O<sub>3</sub>. Mg<sup>#</sup>=molar Mg/(Mg+TFe<sup>2+</sup>). n.d.=not detected. N=chondrite normalized; Data are from [Jiang et al. \(2004\)<sup>a</sup>](#) and [Li et al. \(2010\)<sup>b</sup>](#), respectively.

## Syenite geochemistry

	05BH-2 <sup>a</sup>	05BH-3 <sup>a</sup>	05BH-5 <sup>a</sup>	XH-4 <sup>b</sup>	XH-9 <sup>b</sup>	XH-12 <sup>b</sup>	XH-14 <sup>b</sup>	XH-16 <sup>b</sup>	XH-34 <sup>b</sup>	XH-35 <sup>b</sup>	XH-36 <sup>b</sup>	XH-37 <sup>b</sup>	04XJ-73 <sup>c</sup>	04XJ-75 <sup>c</sup>	04XJ-77 <sup>c</sup>	04XJ-79 <sup>c</sup>	04XJ-82 <sup>c</sup>	04XJ-84 <sup>c</sup>	04XJ-86 <sup>c</sup>	04XJ-88 <sup>c</sup>	XHZ-1b <sup>d</sup>	XHZ-3-1 <sup>d</sup>	XHZ-4 <sup>d</sup>	XHZ-5A <sup>d</sup>	XHZ-6 <sup>d</sup>	XHZ-1A <sup>d</sup>	XHZ-9 <sup>d</sup>	XHZ-10 <sup>d</sup>
SiO <sub>2</sub>	68.70	68.48	67.87	63.75	60.89	61.24	61.52	60.32	63.86	61.03	69.07	67.33	64.15	67.29	65.28	65.14	62.98	65.48	65.42	65.14	60.90	62.02	61.82	61.48	62.02	58.59	62.89	60.02
TiO <sub>2</sub>	0.08	0.11	0.34	0.49	0.67	0.74	0.74	0.96	0.51	0.83	0.29	0.27	0.70	0.40	0.54	0.56	0.77	0.47	0.52	0.54	0.91	0.89	0.96	1.02	0.83	1.42	0.64	1.17
Al <sub>2</sub> O <sub>3</sub>	17.10	17.11	14.49	16.90	18.41	17.69	16.84	16.81	17.01	17.10	13.85	15.47	16.85	16.79	17.13	16.90	18.22	17.61	17.03	17.28	16.29	16.71	16.40	16.47	16.69	16.98	18.97	17.90
Fe <sub>2</sub> O <sub>3</sub> <sup>III</sup>	2.05	2.05	5.13	3.24	3.64	3.95	4.72	5.19	3.60	4.94	3.97	2.62	4.35	3.32	3.41	3.81	3.65	2.85	3.35	3.36	7.01	6.65	7.25	7.28	6.28	6.91	2.90	5.42
CaO	0.28	0.08	0.77	1.72	2.98	2.84	2.71	3.18	1.56	3.03	0.74	1.17	2.02	0.54	1.46	1.64	2.78	1.47	1.51	1.88	2.73	2.58	2.73	2.72	2.49	4.11	2.30	3.81
MgO	0.01	0.01	0.16	0.41	0.85	0.79	1.36	1.41	0.41	0.85	0.00	0.00	0.67	0.08	0.38	0.43	0.69	0.30	0.37	0.39	0.83	0.66	0.69	0.72	0.62	2.01	0.73	1.56
K <sub>2</sub> O	5.71	5.66	4.79	5.21	3.78	3.70	3.57	3.59	4.47	3.53	4.78	5.81	4.40	5.80	5.21	5.02	4.26	5.39	5.44	4.84	3.52	3.52	3.56	3.51	3.63	3.56	4.07	3.47
Na <sub>2</sub> O	6.08	6.30	5.41	6.58	6.78	6.88	6.38	6.48	6.98	6.58	5.89	5.61	6.08	5.15	5.82	5.74	5.82	5.83	5.70	5.80	6.86	6.05	5.66	5.82	6.27	5.21	6.61	5.54
MnO	0.01	0.10	0.17	0.11	0.10	0.10	0.14	0.14	0.10	0.14	0.14	0.15	0.15	0.04	0.12	0.11	0.09	0.08	0.11	0.12	0.23	0.21	0.23	0.24	0.21	0.14	0.05	0.09
P <sub>2</sub> O <sub>5</sub>	0.01	0.02	0.03	0.10	0.18	0.22	0.27	0.36	0.13	0.31	0.00	0.00	0.19	0.06	0.11	0.11	0.18	0.08	0.09	0.09	0.22	0.19	0.21	0.22	0.19	0.44	0.11	0.34
LOI	0.39	0.33	0.46	1.23	1.23	1.11	0.77	0.67	0.67	0.80	0.69	1.06	0.60	0.85	0.94	0.99	1.48	0.95	1.11	1.35	0.21	0.24	0.21	0.23	0.50	0.34	0.64	0.40
Total	100.42	100.25	99.64	99.97	99.69	99.46	99.26	99.38	99.48	99.40	99.61	99.77	99.72	99.84	99.65	99.65	99.61	99.74	99.72	99.62	99.71	99.73	99.72	99.71	99.72	99.69	99.91	99.72

Data are from Zhang *et al.* (2008)<sup>a</sup>, Yang *et al.* (1996)<sup>b</sup>, Sun *et al.* (2008)<sup>c</sup> and Wei & Xu (2011)<sup>d</sup>.

## Granite pluton geochemistry

	Halajun 1 pluton							Halajun 2 pluton							
sample	08KT02-1	08KT02-2	08KT02-3	08KT02-4	08KT02-5	08KT02-6	08KT02-7	08KT03-1	08KT03-2	08KT03-3	08KT03-4	08KT03-5	08KT03-6	08KT03-7	08KT03-8
Major elements (%)															
SiO <sub>2</sub>	71.86	71.7	73.22	74.24	72.89	72.7	75.23	77.67	77.88	77.81	76.76	77.99	77.24	78.22	77.02
Al <sub>2</sub> O <sub>3</sub>	14.6	14.7	14.44	13.36	13.16	13.94	12.02	12.07	12.09	12.04	12.17	12.18	12.01	12	12.42
CaO	1.2	1.14	1	0.96	0.89	1.01	1.15	0.53	0.59	0.52	0.57	0.47	0.52	0.49	0.53
Fe <sub>2</sub> O <sub>3</sub>	1.91	1.74	1.47	1.76	1.62	1.75	2.73	0.42	0.26	0.4	1.15	0.49	0.77	0.21	0.7
K <sub>2</sub> O	5.3	5.72	5.35	5.19	5.25	5.83	4.56	4.85	4.72	4.88	4.83	4.59	4.86	4.7	5
MgO	0.15	0.14	0.15	0.15	0.15	0.15	0.18	0.05	0.05	0.08	0.07	0.08	0.05	0.07	0.07
MnO	0.03	0.03	0.03	0.03	0.03	0.03	0.05	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01
Na <sub>2</sub> O	4.33	4.15	3.73	3.64	3.44	3.86	3.4	3.73	3.79	3.6	3.76	3.5	3.7	3.61	3.58
P <sub>2</sub> O <sub>5</sub>	0.02	0.02	0.02	0.03	0.02	0.02	0.04	0.01	0	0	0	0	0	0.01	0
TiO <sub>2</sub>	0.19	0.17	0.16	0.19	0.17	0.17	0.28	0.04	0.04	0.05	0.06	0.05	0.05	0.03	0.04
LOI	0.15	0.21	0.21	0.24	2.2	0.29	0.2	0.42	0.38	0.43	0.43	0.46	0.58	0.48	0.45
Σ	99.74	99.73	99.76	99.79	99.82	99.75	99.83	99.81	99.81	99.81	99.81	99.84	99.8	99.82	99.81
Trace elements (ppm)															
La	48.11	86.2	96.2	108	42.6	52.4	78.4	56	64.7	61.7	65.5	53.1	64.9	49.6	59
Ce	103.7	176	194	211	102	108	174	115	137	130	141	113	140	104	127
Pr	13.57	21.2	22.8	24.5	11.8	13.5	22.2	14.1	16.7	15.7	17.6	14.1	16.9	13.3	15.5
Nd	54.6	77.1	80.8	85.7	45.4	52.5	85.4	48.9	58.5	54.9	64.3	50.4	60.6	48.2	55.3
Sm	11.3	13.3	13	14.3	9.17	11.8	16.7	10.3	12.5	11.7	15.4	11.2	13.2	10.9	12.2
Eu	1.52	1.68	1.63	1.49	1.32	1.34	1.27	0.04	0.04	0.05	0.05	0.04	0.05	0.04	0.05
Gd	10.6	11.3	10.9	12.3	8.63	11.5	15	9.78	12.7	11.4	15.4	10.6	12.8	10.8	12.5
Tb	1.81	1.78	1.64	1.94	1.52	2.11	2.592	1.89	2.42	2.19	3.09	2.04	2.48	2.09	2.41
Dy	10.14	9.76	8.64	10.4	8.72	12.1	14.4	11.5	14.2	12.8	18.8	12	14.5	12.3	14.4

Ho	1.88	1.84	1.59	1.99	1.68	2.27	2.78	2.31	2.86	2.49	3.81	2.41	2.94	2.44	2.82
Er	5.19	4.91	4.35	5.62	4.81	6.08	7.72	7.18	8.38	7.4	11.5	7.15	8.75	7.22	8.34
Tm	0.78	0.75	0.65	0.89	0.75	0.95	1.19	1.27	1.38	1.23	1.89	1.24	1.49	1.2	1.38
Yb	4.86	4.59	4.13	5.54	4.78	5.81	7.5	8.82	8.93	7.78	11.9	8.04	9.88	7.94	8.85
Lu	0.74	0.71	0.65	0.87	0.75	0.99	1.17	1.4	1.38	1.19	1.83	1.28	1.5	1.26	1.38
Rb	170	190	183	177	197	207	151	447	441	412	456	416	456	443	470
Ga	31.1	30.1	28	29.3	27.2	28.7	25.9	29.5	30.1	27.9	30	28.4	29.71	29.2	29.5
V	2.98	2.43	3.16	4.27	3.01	2.33	4.39	2.45	1.97	3.11	1.35	1.72	1.74	1.6	1.86
Cr	0.05	0.03	0.64	0.45	0.12	0.09	0.05	0.15	0.74	0.62	1.49	0.63	0.11	4.17	0.29
Ni	1.21	0.73	1.64	0.82	0.89	0.18	0.73	0.54	0.22	0.01	1.21	1.55	1.66	4.75	1.37
Sr	88.7	97.8	93.5	87.6	77.9	80.4	75.9	6.23	8.59	7.31	7.34	7.49	5.15	7.84	6.29
Ba	460	551	546	484	465	466	364	9.91	10.5	10.8	9.53	12.2	8.22	9.63	10.8
Th	17.6	20.6	20.3	26.6	17.1	12.8	27.4	41.1	41.7	40.1	53.9	41.8	44	45	42.9
U	2.83	2.35	2.44	3.98	3.46	5.64	3.8	5.9	9.32	7.32	7.62	9.94	7.79	9.34	5.97
Ta	3.04	3.17	2.93	4.07	3.81	4.51	4.71	6.99	9.17	7.81	8.34	9.74	8.76	8.85	7.67
Nb	44.7	44.2	40.7	52.6	50.2	59.1	69.3	82.4	115	97.5	143	116	105	108	92.1
Zr	367	183	243	314	266	172	367	234	164	176	202	206	210	178	172
Hf	10.6	5.61	7.22	9.81	8.1	5.5	11.9	13.1	9.51	9	11.1	11.3	12	10.3	9.16
Y	52.8	50.5	45.2	56.4	48.6	61.9	76.7	77.9	91.2	77.4	121	73.9	91.5	78.4	90.7

Zhang et al. (2010)

	Guerlale pluton													
sample	09GL01	09GL02	09GL05	09GL06	09GL07	09GL08	09GL09	09GL10	09GL12	09GL13	09GL15	09GL16	09GL17	09GL18
Major elements (%)														
SiO <sub>2</sub>	77.77	73.49	75.25	65.97	76.75	76.46	74.07	75.82	73.66	73.85	74.3	74.05	74.11	73.81
Al <sub>2</sub> O <sub>3</sub>	11.55	13.35	12.61	16.8	11.94	12.41	12.8	12.22	12.71	12.82	12.83	12.82	12.73	12.6
CaO	0.25	0.86	0.64	1.08	0.46	0.17	0.66	0.52	0.73	1	0.83	0.93	0.68	0.94
Fe <sub>2</sub> O <sub>3</sub>	1.2	1.85	1.63	3.29	1.36	0.99	1.8	1.4	1.96	2.19	1.76	1.86	1.97	2.14
K <sub>2</sub> O	4.43	5.44	5.3	5.45	4.84	5.1	5.63	5.17	5.43	4.94	5.24	5.2	5.49	5.17

MgO	0.07	0.26	0.21	0.17	0.1	0.14	0.25	0.1	0.28	0.25	0.31	0.29	0.32	0.27
MnO	0.01	0.03	0.02	0.08	0.01	0.02	0.02	0.02	0.03	0.02	0.05	0.02	0.05	0.02
Na <sub>2</sub> O	3.35	3.4	3.11	5.88	3.34	3.4	3.32	3.51	3.21	3.17	3.41	3.38	3.2	3.4
P <sub>2</sub> O <sub>5</sub>	0.03	0.05	0.04	0.06	0.04	0.02	0.06	0.04	0.032	0.031	0.028	0.028	0.029	0.029
TiO <sub>2</sub>	0.11	0.24	0.2	0.23	0.12	0.1	0.24	0.12	0.2	0.2	0.2	0.19	0.19	0.19
LOI	0.64	0.41	0.38	0.38	0.43	0.61	0.53	0.47	1.57	1.31	0.86	1.04	1.05	1.24
Total	99.39	99.38	99.38	99.37	99.39	99.42	99.37	99.38	99.812	99.781	99.818	99.808	99.819	99.809
Trace elements (ppm)														
Sc	0.864	1.998	1.65	0.327	2.369	1.028	1.845	1.276	0.36	0.68	0.63	1.25	0.98	1.55
V	6.208	9.858	6.576	4.727	5.943	4.171	7.94	3.707	7.28	6.21	6.56	6.92	8.14	7.33
Cr	1.471	2.463	2.119	4.85	2.548	1.571	3.347	3.011	0.51	0.07	0.3	0.91	0.65	2.69
Co	16.66	19.68	23.59	23.9	19.04	17.45	20.77	19.45	2.08	0.63	1.99	1.25	1.13	1.14
Ni	1.198	1.537	1.562	4.593	1.145	1.01	1.522	1.413	2.44	0.03	0.44	0.13	1.37	1.01
Cu	1.781	4.406	7.456	1.397	1.906	3.11	2.366	3.462	3.86	2.93	2.79	2.12	2.82	3.51
Zn	36.48	45.67	32.78	33.77	67.34	54.62	38.82	59.38	43.56	36.79	73.85	69.42	86.35	35.04
Ga	25.28	20.14	18.59	28.34	27.81	27.86	18.86	29.56	22.78	24.62	23.19	23.39	24.54	23.99
Ge	1.94	1.761	1.745	2.073	1.607	2.1	1.586	1.95	1.89	2.23	2.19	1.99	2.13	2.39
Rb	188.2	283	300.3	319.9	130.3	253.6	287.4	263.4	371	367.7	339.5	350.5	382.9	379.4
Sr	24.02	72.8	40.89	22.49	56.92	23.55	61.49	26.78	50.04	45.57	49.4	50.18	53.48	39.54
Y	46.78	31.67	27.14	45.88	28.11	54.52	29.07	54.26	48	49.76	46.31	42.93	48.38	49.17
Zr	156.9	259.7	195.6	122.9	613.8	186.7	321.4	186.6	248	227.2	244.9	205.5	242.2	249.1
Nb	42.41	34.74	42.32	41.26	66.7	46.74	37.97	46.53	42.38	45.43	45.17	48.1	48.93	49.41
Cs	4.301	9.378	6.148	4.1	2.566	5.69	9.19	5.862	8.56	8.56	12.1	11.78	12.59	5.29
Ba	94.26	322.2	195.4	87.83	529.3	81.33	262	95.19	3368	338	339.6	317.4	344.2	296.9
La	57.27	66.29	51.93	60.24	65.1	68.61	49.14	77.47	58.39	139.2	70.14	102.6	77.61	79.45
Ce	112	118	93.13	123.8	114.1	137.8	86	155.1	103	263.6	123.3	179	138	139.5
Pr	12.95	12.02	9.51	14.1	12.34	15.67	9.112	17.56	11.13	26.94	13.37	18.92	14.74	15.2
Nd	44	37.53	29.52	48.05	39.91	53.09	29.43	60.82	37.79	82.52	42.98	55.74	47.83	47.44
Sm	8.405	5.926	4.572	9.239	6.062	9.998	5.017	11.24	8.06	11.96	7.69	8.41	8.31	8.13

Eu	0.289	0.496	0.345	0.247	1.031	0.264	0.393	0.315	0.57	0.7	0.59	0.61	0.62	0.54
Gd	7.963	5.295	4.157	8.494	5.522	9.348	4.874	10.38	8.1	9.25	7.2	7.01	7.59	7.38
Tb	1.472	0.886	0.734	1.534	0.875	1.692	0.828	1.842	1.45	1.47	1.24	1.19	1.33	1.35
Dy	9.046	5.314	4.493	9.117	5.371	10.15	5.024	10.53	8.9	8.63	7.76	7.26	8.25	8.38
Ho	1.787	1.086	0.972	1.8	1.096	2.012	1.064	2.014	1.92	1.82	1.69	1.62	1.8	1.9
Er	5.012	3.296	2.977	5.024	3.118	5.557	3.264	5.657	5.72	5.36	5.17	4.76	5.37	5.7
Tm	0.72	0.519	0.472	0.767	0.485	0.807	0.517	0.796	0.94	0.86	0.84	0.76	0.91	0.92
Yb	4.725	3.781	3.457	4.959	3.338	5.13	3.636	5.195	6.28	5.71	5.64	4.94	6.1	5.89
Lu	0.676	0.537	0.516	0.685	0.535	0.729	0.533	0.729	0.98	0.91	0.88	0.77	0.93	0.95
Hf	6.519	8.128	6.503	5.707	10.26	7.476	8.994	7.729	7.96	7.24	8	6.48	8.01	8.04
Ta	3.652	3.47	4.48	5.315	4.182	4.149	3.81	4.245	5.68	5.77	5.61	5.88	6.11	5.98
Pb	13.07	24.79	25.73	18.67	12.23	16.19	22.24	17.97	13.53	20.8	28.19	27.81	40.72	20.53
Th	26.34	39.54	41.59	19.98	14.37	27	46.27	27.89	50.28	47.41	52.93	50.74	51.25	54.4
U	3.659	4.501	6.239	4.408	1.534	3.304	4.999	3.182	5.46	4.9	8.18	7.1	6.34	6.16

	Kezile pluton												
sample	09KZ01	09KZ02	09KZ03	09KZ04	09KZ05	09KZ06	09KZ07	09KZ08	09KZ09	09KZ10	09KZ11	09KZ12	09KZ13
Major elements (%)													
SiO <sub>2</sub>	74.82	72.69	76.34	71.6	70.14	74.77	74.27	73.44	76.45	73	73.57	73.03	75.95
Al <sub>2</sub> O <sub>3</sub>	12.55	13.8	12.13	13.55	13.91	12.63	12.91	13.12	12.03	13.18	13.29	13.5	12.22
CaO	0.82	1.1	0.63	1.41	1.55	0.72	0.78	0.64	0.64	0.91	1	0.93	0.65
Fe <sub>2</sub> O <sub>3</sub>	1.91	2.31	1.43	3.05	2.99	1.87	1.87	1.92	1.38	2.14	1.54	1.95	1.03
K <sub>2</sub> O	5.26	5.22	5.08	5.13	5.11	5.36	5.5	5.79	5.13	5.51	5.49	5.64	5.55
MgO	0.24	0.35	0.17	0.49	0.58	0.26	0.28	0.27	0.17	0.34	0.29	0.31	0.2
MnO	0.03	0.03	0.02	0.06	0.05	0.02	0.02	0.01	0.01	0.03	0.02	0.03	0.02
Na <sub>2</sub> O	3.51	3.64	3.33	3.54	3.77	3.41	3.4	3.61	3.32	3.6	3.65	3.59	3.41
P <sub>2</sub> O <sub>5</sub>	0.03	0.05	0.02	0.08	0.08	0.03	0.03	0.04	0.02	0.04	0.04	0.04	0.01
TiO <sub>2</sub>	0.22	0.28	0.15	0.36	0.38	0.21	0.22	0.23	0.14	0.24	0.26	0.25	0.13
LOI	0.49	0.39	0.54	0.6	1.23	0.54	0.57	0.8	0.55	0.77	0.67	0.52	0.68

Total	99.88	99.86	99.84	99.87	99.79	99.82	99.85	99.87	99.84	99.76	99.82	99.79	99.85
Trace elements (ppm)													
Sc	1.4	1.25	0.82	3.49	3.48	1.18	0.89	1.61	0.06	1.67	1.51	2.05	0.77
V	6.16	11.92	7.45	17.23	20.76	4.5	6.36	7.18	2.33	5.46	7.9	10.46	4.87
Cr	2.26	1.51	5.69	3.25	5.32	0.26	1.84	2.67	1.04	3	2.04	1.25	2.05
Co	1.69	2.46	1.65	3.96	3.38	1.57	1.54	0.54	0.78	1.33	0.64	1.89	0.58
Ni	4.37	1.43	3.4	2.56	3.2	0.2	1.23	1.35	0.32	0.09	0.35	0.57	0.54
Cu	2.72	2.79	2.53	5.38	3.65	2	2.89	3.02	1.14	2.85	4.38	2.01	2.42
Zn	36.4	42.68	36.32	77.94	58.46	33.75	39.79	21.76	26.26	92.7	37.65	44.88	35.92
Ga	19.9	21.04	19.75	22.1	21.16	20.62	20.66	19.98	19.32	22.26	20.72	19.65	18.56
Ge	1.84	1.96	1.94	1.87	1.66	2.04	1.89	1.82	1.93	1.96	1.91	1.75	1.88
Rb	308.9	283	347.7	256.2	279.5	303.7	319.3	287.4	299.9	295.6	256.6	280.4	303.8
Sr	43.94	97.75	24.3	101	99.24	36.93	54.84	62.22	32	54.59	55.02	87.09	34.16
Y	35.55	36.15	33.7	34.25	29.92	29.83	33.9	31.49	32.22	33.35	34.42	30.21	31.75
Zr	298	275.7	193.5	289.6	314.6	254.8	254.6	310.8	206.3	291.5	297.7	302.8	136.9
Nb	46.13	37.31	39.89	30.3	31.78	43.79	41.1	42.49	46.43	45.82	41.02	37.46	37.12
Cs	15.68	9.4	13.14	19.48	15.67	9.23	9.77	3.12	7.98	5.26	4.81	7.74	5.3
Ba	170.6	340.4	80.82	404.3	421.8	164.5	243.7	338.2	87.15	367.1	348.3	358	121.4
La	66.81	63.3	82.47	62.43	60.94	100	62.88	57.98	55.58	71.27	69.89	52.24	48.63
Ce	117.9	109.7	136.1	112.3	107.1	166.3	109	99.09	98.16	124	121.1	93.42	85.26
Pr	12.54	11.88	13.97	12.74	11.9	17.16	11.49	10.61	9.96	12.94	13.27	10.24	9.06
Nd	39.56	38.95	39.8	41.86	38.08	50.58	35.73	33.72	30.82	40.76	42.34	32.47	29.03
Sm	6.68	6.69	6	7.43	6.44	6.58	6.07	5.86	5.16	6.79	6.95	5.75	5.46
Eu	0.35	0.54	0.23	0.87	0.75	0.36	0.41	0.38	0.18	0.5	0.53	0.53	0.26
Gd	5.7	6.22	5.04	6.89	5.68	4.98	5.57	5.27	4.68	6.02	5.94	5.01	5.14
Tb	1.02	1.02	0.89	1.09	0.95	0.81	0.95	0.91	0.85	1.01	1	0.88	0.93
Dy	6.16	6.39	5.56	6.52	5.36	4.83	5.7	5.61	5.67	6.17	5.93	5.27	5.44
Ho	1.39	1.39	1.25	1.38	1.2	1.07	1.24	1.27	1.22	1.32	1.29	1.16	1.17
Er	4.04	4.03	3.86	3.98	3.42	3.19	3.82	3.85	3.73	3.99	3.83	3.34	3.42



Tm	0.68	0.66	0.65	0.61	0.55	0.52	0.63	0.64	0.67	0.63	0.61	0.54	0.55
Yb	4.48	4.39	4.44	4.04	3.35	3.71	4.3	4.21	4.78	4.31	3.99	3.59	3.8
Lu	0.7	0.65	0.71	0.63	0.55	0.58	0.67	0.67	0.73	0.69	0.63	0.57	0.58
Hf	8.92	8.18	7.33	8.44	8.52	8.11	7.75	8.79	7.38	8.8	8.83	9.32	5.27
Ta	5.11	4.16	5.09	3.17	2.95	4.57	4.95	4.26	6.49	4.93	4.5	3.62	6.45
Pb	25.75	22.4	25.69	49.33	24.05	18.52	20.11	6.08	20.83	16.75	30.04	22.86	22.49
Th	54.17	41.59	61.22	38.63	35.38	54.44	49.99	44.83	56.91	43.33	36.22	46.55	43.93
U	7.06	6.45	12.69	5.4	4.73	9.54	10.26	7.34	10.63	8.81	7.24	8.28	7.14

	Halajun pluton III					Halajun pluton IV			
sample	2010HLJII I-1	2010HLJII I-2	2010HLJII I-3	2010HLJII I-4	2010HLJII I-5	2010HLJI V-1	2010HLJI V-3	2010HLJI V-3	2010HLJI V-4
Major elements (%)									
SiO <sub>2</sub>	62.25	62.69	60.29	61.22	62.37	73.8	73.75	73.76	73.66
Al <sub>2</sub> O <sub>3</sub>	15.71	15.67	15.37	17.68	15.82	12.7	12.75	12.77	12.7
CaO	2.41	1.63	2.6	1.34	2.35	0.87	0.85	0.94	0.52
Fe <sub>2</sub> O <sub>3</sub>	5.72	5.95	7.52	3.68	5.35	1.85	1.91	1.59	2.52
K <sub>2</sub> O	5.28	6.94	6.18	9.45	7.07	5.41	5.39	5.33	5.48
MgO	1.01	0.84	1.2	0.53	0.92	0.24	0.24	0.28	0.35
MnO	0.12	0.07	0.14	0.03	0.09	0.09	0.02	0.01	0.01
Na <sub>2</sub> O	4.71	3.68	3.75	3.78	3.6	3.29	3.34	3.15	3.08
P <sub>2</sub> O <sub>5</sub>	0.1	0.11	0.13	0.029	0.11	0.028	0.031	0.031	0.032
TiO <sub>2</sub>	0.44	0.45	0.68	0.08	0.46	0.19	0.19	0.2	0.2
LOI	2.07	1.79	1.91	2	1.68	1.4	1.35	1.72	1.24
Total	99.82	99.82	99.77	99.82	99.82	99.87	99.82	99.78	99.79
Trace elements (ppm)									
Sc	3.1	4.58	4.8	2.8	4.32	1.077	0.887	1.341	0.53
V	31.81	2751.6	4045.6	539.5	2776.1	8.507	7.702	7.664	6.751
Cr	14.12	33.85	45.56	26.15	33.13	0.147	2.275	6.278	0.546

Co	3.16	16.24	19.58	7.24	18.82	3.28	1.114	1.601	1.848
Ni	9.32	571.2	1135.3	265.8	704.8	0.103	1.138	3.903	0.822
Cu	5.12	19.15	4.92	5	4.9	3.18	12.13	3.805	5.569
Zn	81.89	11.24	6.2	9.27	5.37	28.53	31.15	31.9	40.18
Ga	31.16	28.84	9.79	34.79	5.9	22.82	21.54	23.73	22.16
Ge	2.3	979.9	108.7	104.9	89.67	1.895	1.774	2.077	2.068
Rb	258.4	29.48	33.18	25.85	29.96	384.6	365.6	369.7	369.8
Sr	118.2	2.42	2.68	1.23	2.31	62.74	42.69	44.8	45.38
Y	48.94	305.6	305.3	411.8	329.1	38.22	30.28	42.66	40.02
Zr	640.4	130.2	124.4	145.4	146.2	240.7	217.3	256.6	245.5
Nb	92.15	45.25	52.49	43.63	47.02	42.86	40.03	51.63	44.65
Cs	5.35	629.3	610.9	840.5	651.1	9.725	5.256	5.712	6.49
Ba	469.6	87.37	114.4	40.77	84.97	348.5	315	311.8	334.6
La	129.7	3.31	6.14	3.85	5.78	20.95	26.1	34.25	31.05
Ce	230.7	513	471.2	623.1	531.2	38.99	44.56	62.71	55.66
Pr	25.13	125.9	118.4	101.4	106.3	4.322	4.823	6.916	5.999
Nd	84.86	225	215.5	177	195.5	15.98	15.86	23.93	21.24
Sm	13.9	23.67	24.41	19.54	21.97	3.848	3.09	5.11	4.693
Eu	1.05	77.06	83.98	64.32	75.73	0.416	0.339	0.431	0.47
Gd	12.26	12.79	14.36	10.81	13.84	4.349	3.175	5.236	5.115
Tb	1.88	0.98	1.23	0.66	1.07	0.877	0.605	0.969	0.952
Dy	10.72	11.21	13.08	9.95	12.31	6.084	4.514	6.748	6.48
Ho	2.13	1.8	2.06	1.63	1.89	1.377	1.101	1.515	1.525
Er	5.76	9.72	11.28	9.41	10.5	4.58	3.683	4.868	4.582
Tm	0.83	1.97	2.29	1.92	2.16	0.757	0.657	0.878	0.79
Yb	5.15	5.26	5.99	5.29	5.77	5.283	4.485	5.945	5.346
Lu	0.81	0.73	0.87	0.76	0.79	0.833	0.7	0.924	0.848
Hf	13.6	4.81	5.32	4.78	4.93	7.504	7.241	8.753	7.938
Ta	6.53	0.76	0.82	0.78	0.79	5.586	4.844	7.46	5.882
Pb	19.36	12.61	12.11	18.31	13.43	13.06	12.1	11.58	18.78

Th	28.66	5.78	6.96	4.99	6.04	49.03	31.79	47.24	47.83
U	5.67	328.4	29.97	119.7	26.42	4.835	5.119	4.761	4.979

	Halajun pluton V								
sample	09HLJV-1	09HLJV-2	09HLJV-3	09HLJV-4	09HLJV-5	09HLJV-6	09HLJV-7	09HLJV-8	09HLJV-9
Major elements (%)									
SiO <sub>2</sub>	76.38	75.72	76.56	76.25	76.08	76.31	75.47	75.96	76.09
Al <sub>2</sub> O <sub>3</sub>	12.35	12.3	12.1	12.12	12.23	12.16	12.28	12.24	12.11
CaO	0.76	0.66	0.6	0.64	0.67	0.77	0.67	0.65	0.66
Fe <sub>2</sub> O <sub>3</sub>	0.63	1.75	1.27	1.41	1.38	1.15	1.54	1.42	1.38
K <sub>2</sub> O	5.17	4.65	4.59	4.8	4.8	4.85	4.89	4.91	4.98
MgO	0.1	0.06	0.05	0.05	0.06	0.05	0.05	0.05	0.05
MnO	0.01	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.02
Na <sub>2</sub> O	3.05	3.53	3.5	3.42	3.43	3.28	3.42	3.4	3.28
P <sub>2</sub> O <sub>5</sub>	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02
TiO <sub>2</sub>	0.08	0.09	0.07	0.08	0.08	0.08	0.07	0.07	0.07
LOI	0.87	0.64	0.63	0.58	0.64	0.72	0.97	0.66	0.74
Total	99.4	99.42	99.43	99.39	99.39	99.4	99.4	99.4	99.39
Trace elements (ppm)									
Sc	1.272	1.786	1.106	1.199	1.328	1.614	1.074	1.356	1.426
V	4.492	3.598	3.06	2.876	2.775	2.588	2.424	4.655	3.428
Cr	0.706	2.218	1.49	2.081	1.683	1.805	1.42	2.195	2.667
Co	27.7	27.87	33.67	33.54	30.42	30.88	39.79	39.93	38.31
Ni	1.344	1.388	1.72	1.615	1.589	1.715	1.978	1.876	1.811
Cu	1.568	0.815	0.878	0.585	0.741	1.027	1.179	0.575	0.755
Zn	25.59	28.4	21.98	26.1	26.81	28.81	26.78	21.73	24.94
Ga	34.26	35.45	33.9	34.91	36.88	37.23	34.55	37.74	37.38
Ge	2.682	3.117	2.866	2.885	3.181	2.964	2.835	3.581	3.453

Rb	443.9	465.3	413.4	469.2	494.7	497.4	445.5	584	570.8
Sr	15.64	8.868	11.41	6.304	9.215	8.695	9.659	4.898	6.731
Y	112.9	134.2	108.7	124.3	129	135.2	118.1	155.3	119.4
Zr	233.6	236.6	221.2	215.9	207.5	239.6	198.9	213.6	206.1
Nb	148.4	152.3	177.6	153.1	173.6	183.7	167.8	205.9	183.1
Cs	7.628	13.44	7.079	18.26	19.36	7.797	7.845	18.76	23.61
Ba	38.11	16.07	27.53	16.48	31.09	10.98	23.21	8.375	11.76
La	97.55	141.9	159.8	123.4	112.9	139.5	133.6	105.5	141
Ce	186.1	272.9	307.8	253.3	226.8	258.3	245.3	217.1	254.1
Pr	19.25	28.07	30.51	25.26	25.18	25.15	24.37	24.72	24.49
Nd	62.88	92.9	101.6	81.02	81.32	80.95	79.05	80.08	76.8
Sm	12.14	18.64	20.22	15.36	16.02	15.95	15.41	15.99	14.57
Eu	0.166	0.147	0.192	0.162	0.171	0.123	0.163	0.108	0.123
Gd	12.41	18.68	17.77	15.13	15.99	15.8	15.14	16.2	15.21
Tb	2.579	3.676	3.301	3.064	3.101	3.137	3.053	3.337	3.036
Dy	17.84	23.23	20.14	19.92	20.55	20.7	19.73	22	19.52
Ho	3.918	4.848	3.987	4.289	4.412	4.381	4.107	4.78	4.073
Er	12.07	14.2	11.3	13.07	13.37	13.31	12.37	14.91	12.18
Tm	1.986	2.164	1.767	2.019	2.101	2.167	1.901	2.452	2.001
Yb	13.65	14.46	11.7	13.79	13.88	15.25	12.74	16.88	13.39
Lu	1.983	2.073	1.701	1.985	1.974	2.198	1.817	2.458	1.986
Hf	11.52	11.71	10.79	10.93	10.17	12.65	9.654	11.86	11.24
Ta	10.83	11.09	14.17	17.27	16.96	19.45	17.85	22.27	15.38
Pb	14.69	9.552	16.82	14.6	15.07	18.59	15.29	11.47	11.89
Th	47.11	50.92	44.87	51.28	54.72	50.55	47.69	61.35	49.77
U	15.85	5.329	15.59	7.135	7.215	7.656	11.61	7.522	4.594

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	Kezi'ertuo pluton												
sample	TM-YT-7	TM-YT-8	TM-YT-10	TM-YT-11	TM-YT-14	TM-YT-16	YT-HH-1	YT-HH-2	YT-HH-4	YT-HH-	YT-HH-	YT-HH-	YT-HH-

										5	6	7	8
Major elements (%)													
SiO2	77.32	76.46	75.71	74.64	75.26	75.48	72.19	71.01	74.22	74.98	72.75	72.96	67.67
TiO2	0.06	0.07	0.08	0.09	0.09	0.08	0.24	0.24	0.18	0.18	0.03	0.25	0.43
Al2O3	11.67	12.06	12.57	11.81	11.76	12.34	13.5	14.12	12.88	12.73	13.52	13.15	13.93
Fe2O3T	0.32	0.57	0.46	0.44	2.02	0.76	2.52	2.56	1.85	1.94	2.08	2.62	4.2
MnO	0	0	0	0	0	0	0	0	0	0.03	0.04	0.04	0.08
MgO	0.04	0.06	0.06	0.05	0.02	0.03	0.16	0.15	0.11	0.12	0.13	0.18	0.35
CaO	0.1	0.94	1.08	2.6	0.64	1.22	1.06	1.15	0.97	0.97	1	1.08	1.38
Na2O	2.59	3.26	3.19	2.34	3.35	2.93	3.68	3.86	3.5	3.29	3.61	3.5	3.55
K2O	6.37	5	5.47	5.74	5.26	5.92	5.96	5.96	5.74	5.36	5.89	5.63	6.99
P2O5	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.029	0.031	0.001	0.083
LOI	0.79	1.18	0.99	1.69	0.67	1.16	0.37	0.36	0.31	0.34	0.43	0.46	0.39
Total	99.26	99.61	99.62	99.41	99.08	99.93	99.67	99.41	99.76	99.98	99.51	99.87	99.04
A/CNK	1.03	0.97	0.96	0.8	0.95	0.92	0.94	0.95	0.94	0.98	0.96	0.95	0.88
K2O + Na2O	8.96	8.26	8.66	8.08	8.61	8.85	9.63	9.81	9.24	8.65	9.5	9.13	10.54
AR	7.36	4.49	4.47	3.55	5.55	4.76	4.9	4.6	5	4.43	4.78	4.58	5.42
Trace elements (ppm)													
Sc	0.12	0.74	0.75	1.22	0.36	0.45	0.68	0.52	0.56	0.34	0.49	0.7	2.14
Ga	29.27	34.4	34.12	38.29	33.23	32.62	26.94	28.01	25.77	25.42	26.47	26.28	27.11
Rb	314.3	374.5	345.6	362.5	418.2	325.4	157.2	154.9	145.8	147.6	156.2	150	162.1
Ba	109.9	38.78	89.66	134.4	16.96	104.5	517.5	487.3	441.3	443.6	605.7	499.2	541.8
Th	4.46	50.61	43.19	51.78	37.42	57.08	1.76	2.2	3.35	14.92	2.91	8.81	8.5
U	10.79	7.13	6.99	9.97	5.49	13.1	2.36	2.12	2.16	2.31	3.43	1.84	3.35
Nb	62.22	122.9	87.48	135.9	101.4	127.9	40.26	37.28	32.79	29.2	34.35	43.02	53.01
Ta	3.71	3.03	3.52	6.72	2.33	3.82	1.71	0.82	1.72	0.94	0.89	1.89	3.14
La	3.22	113.3	95.69	118.1	64.47	31.44	8.12	4.43	4.1	37.2	4.86	35.77	23.2
Ce	15.96	236.7	180.9	235.6	171.4	78.46	28.76	47.76	50.19	138.8	38.95	111.8	84.86

Pr	0.56	23.03	18.79	29.74	13.13	7.81	2.29	1.2	1.01	8.13	1.77	7.75	5.55
Sr	22.8	13.63	23.72	28.74	19.31	28.83	53.37	36.9	46.42	83.91	83.1	82.43	74.87
Nd	1.76	76.52	64.7	116.8	42.45	31.62	9.74	5.14	4.95	30.37	8.56	30.81	22.4
Zr	202.7	255.9	245.1	243.4	183.9	315.5	338.3	348.7	256.1	285.2	271.1	355.3	541.2
Hf	12.17	13.49	12.31	12.17	9.84	15.39	10.13	10.26	7.77	8.67	8.29	10.47	14.97
Sm	0.32	13.23	11.77	24.23	7.41	8.15	2.17	1.22	0.95	5.32	2.38	6.04	4.96
Eu	0.03	0.12	0.14	0.23	0.08	0.2	0.49	0.3	0.28	0.85	0.66	1	0.89
Gd	0.39	13.43	11.49	26.53	7.81	9.76	2.37	1.59	1.3	5.71	2.96	6.65	5.79
Tb	0.08	2.23	1.8	4.81	1.26	1.96	0.4	0.27	0.21	0.81	0.53	1.03	0.99
Dy	0.64	13.86	11.52	30.41	7.54	13.22	2.36	1.68	1.36	4.54	3.32	5.98	6.06
Y	3.93	75.63	67.96	200.8	40.45	69.61	11.04	9	6.93	22.6	15.1	31.09	33.97
Ho	0.16	2.95	2.59	6.43	1.54	2.86	0.48	0.35	0.28	0.9	0.67	1.2	1.26
Er	0.56	9.23	8.54	19.65	4.52	8.79	1.37	1.05	0.86	2.5	1.9	3.43	3.67
Tm	0.11	1.66	1.59	3.52	0.75	1.49	0.22	0.17	0.14	0.4	0.31	0.54	0.61
Yb	0.82	11.07	10.79	23.75	4.78	9.41	1.46	1.15	0.95	2.49	1.94	3.49	4.11
Lu	0.12	1.59	1.55	3.41	0.67	1.29	0.22	0.17	0.14	0.37	0.28	0.53	0.63
Ti	349.55	445.35	490.35	559.43	560.19	496.45	1433.7	1418.4	1052.4	1098.1	201.32	1487.1	2559.3
P	4.36	4.36	4.36	4.36	4.36	4.36	4.36	4.36	4.36	126.11	135.35	4.36	360.26

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