Appendix 1: Chemical compositions, C.I.P.W norms and geochemical parameters of the volcano-plutonic rocks of the Abu Khurug ring complex, south Eastern Desert, Egypt.

Rock suite	Mafics															
Rock type	Syenogabbro						Essexite						Essexite xenoliths			
Sample no.	EG1	EG5	EG7	EG9	EG10	EG12	G2	G3	G4	G5	G6	G7	XS1	XS2	XS3	XS4
Major oxides (%)																
SiO_2	48.2	49.65	48.95	49.79	51.3	51.09	58.12	56.15	57.78	58.66	56.22	56.45	56.06	55.29	55.51	52.26
TiO_2	1.18	1.21	1.06	1.21	1.18	1.02	0.18	0.11	0.15	0.18	0.09	0.09	0.18	0.14	0.13	0.18
Al_2O_3	21.76	22.71	21.92	23.03	23.59	23.13	19.43	19.73	18.79	19.2	20.12	19.93	19.83	20.8	21.03	20.68
Fe_2O_3	7.73	7.38	7.15	6.72	4.85	5.77	4.95	5.02	5.93	4.94	5.02	5.06	5.24	4.5	4.21	4.68
MnO	0.12	0.11	0.11	0.1	0.08	0.09	0.14	0.15	0.18	0.14	0.16	0.16	0.13	0.11	0.11	0.11
MgO	2.8	2.36	2.67	2.17	0.89	1.92	0.23	0.1	0.2	0.22	0.1	0.22	0.45	0.45	0.51	0.44
CaO	9.11	9.06	9	9.36	9.53	9.23	1.06	0.73	0.95	1	0.68	1.06	1.93	1.84	1.84	1.71
Na_2O	5.08	4.79	5.21	5.03	5.7	5.07	8.69	10.87	9.29	8.58	10.13	8.99	7.43	7.72	7.34	7.52
K_2O	0.9	0.84	0.83	0.69	0.32	0.62	5.76	4.94	5.29	5.53	4.86	4.77	5.18	4.84	4.84	5.11
P_2O_5	0.25	0.41	0.24	0.25	0.23	0.31	0.05	0.04	0.06	0.05	0.04	0.04	0.09	0.07	0.08	0.1
Cr_2O_5	0.014	0.014	0.013	0.012	0.013	0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
LOI	2.6	1.2	2.6	1.4	2.1	1.5	1.2	1.9	1.1	1.3	2.3	2.9	3.4	4.1	4.3	4.1
CO_2	0.27	0.06	0.27	0.12	0.11	0.08	0.03	0.1	0.04	0.04	0.12	0.1	0.1	0.18	0.13	0.1
SO_4	0.03	0.11	<0.02	0.02	0.03	0.05	<0.02	<0.02	<0.02	<0.02	0.18	0.07	<0.02	<0.02	<0.02	<0.02
Total	100.044	99.904	100.023	99.902	99.923	99.89	99.84	99.84	99.76	99.84	100.02	99.84	100.02	100.04	100.03	96.99
Trace elements (PPm)																
As	2	<0.5	2	<0.5	<0.5	<0.5	2.4	13	6	2	6	4	<0.5	<0.5	<0.5	0.6
Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.1
Au (PPb)	<0.5	<0.5	2.3	1.7	1.6	0.6	1	<0.5	<0.5	1	0.8	<0.5	<0.5	<0.5	<0.5	<0.5
Ba	260	328	268	292	324	333	47	13	21	37	14	29	165	123	178	185
Be	<1	<1	<1	<1	1	<1	4	7	6	4	7	8	2	2	2	2
Bi	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cd	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.6	0.2	0.1	0.6	0.5	<0.1	0.1	0.1	<0.1
Co	17	16	17	12	7	11	1	0.5	1	1	0.6	0.4	1	1	1	1
Cs	0.8	0.3	0.8	0.3	0.3	0.2	0.8	1.2	0.5	0.8	1.1	1.1	5.3	5.7	6.2	5.5
Cu	3	4	3	3	3	2	2	4	2	2	5	3	2	2	2	2
Ga	22	23	22	23	24	23	33	40	38	33	42	41	31	32	30	31
Hf	2	2	2	3	3	2	18	28	30	18	29	30	11	10	9	8
Hg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ni	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Nb	18	16	16	21	16	20	120	206	143	137	204	203	52	53	51	50
Mo	0.3	0.4	0.2	0.5	0.5	0.7	2	18	4	4	22	19	0.4	0.5	0.4	0.5
Pb	0.8	0.5	0.7	0.6	0.4	0.5	2	6	5	3	10	8	1	2	1	1
Rb	17	16	16	13	5	11	165	142	136	164	144	137	103	93	95	103
Sb	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	<0.1	0.3	0.3	<0.1	<0.1	<0.1	<0.1
Sc	7	7	7	6	6	6	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Se	<0.5	<0.5	<0.5	0.7	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sn	<1	<1	<1	<1	<1	<1	5	11	11	6	11	12	4	4	3	3
Sr	983	1123	1051	1119	1220	1143	38	13	28	26	25	129	189	162	166	196
Ta	1	1	1	1	1	1	7	13	8	8	12	12	3	3	3	3
Tl	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.2	0.1	0.1	0.3	0.3	<0.1	<0.1	<0.1	<0.1
Th	1	1	1	2	1	1	16	26	23	15	28	28	5	5	5	4
U	0.2	0.3	0.2	0.2	0.3	0.3	4	7	8	4	7	7	1	1	1	1
V	66	75	64	51	61	44	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8
W	<0.5	1	<0.5	<0.5	0.5	<0.5	<0.5	4	<0.5	<0.5	6	8	<0.5	<0.5	<0.5	<0.5
Y	13	17	14	14	13	15	28	72	41	30	79	91	19	18	18	17
Zn	24	20	22	22	14	17	56	104	36	53	94	76	38	39	35	41
Zr	91	92	83	95	105	93	762	1241	1327	820	1259	1278	421	400	374	329
REE (PPm)																
La	16.9	22.3	16.7	18.2	17.1	20.7	82.2	144.5	106.4	84.1	152.3	131.6	43	40.3	41.6	39.8
Ce	35.4	47.5	36.6	38.6	35.7	42.8	164.7	260.5	209.1	170.3	257.1	232.4	90.7	84.4	85.3	82.9
Pr	4.85	6.44	4.8	5.06	4.59	5.67	17.89	26.87	22.38	18.19	27.07	25.24	11.06	10	10.27	9.93
Nd	19.8	28.1	20.6	21.3	18.8	24.6	60.3	92.8	77.7	63.7	93.2	90.3	40	37.3	38.2	37.3
Sm	3.72	5.2	3.94	3.89	3.43	4.47	10.19	16.08	12.52	10.47	15.95	16.13	7.12	6.36	6.58	6.38
Eu	2.31	2.62	2.4	2.46	2.63	2.63	0.58	0.98	0.69	0.61	1.05	1.03	0.72	0.57	0.64	0.7
Gd	3.55	4.86	3.58	3.68	3.14	4.06	7.91	14.01	9.57	8.34	14.57	14.57	5.28	4.8	4.9	4.85
Tb	0.55	0.71	0.54	0.55	0.48	0.59	1.24	2.31	1.5	1.3	2.46	2.6	0.79	0.73	0.74	0.73
Dy	2.59	3.29	2.63	2.7	2.27	2.91	6.58	13.18	8.14	6.71	13.81	14.55	4.09	3.91	3.88	3.69
Ho	0.47	0.58	0.46	0.46	0.41	0.49	1.05	2.27	1.36	1.08	2.5	2.68	0.68	0.64	0.66	0.6
Er	1.12	1.42	1.16	1.19	1.03	1.16	2.71	6.28	3.98	2.88	6.42	6.66	1.94	1.88	1.88	1.78
Tm	0.18	0.22	0.17	0.17	0.15	0.17	0.42	0.91	0.64	0.45	0.96	0.99	0.32	0.3	0.29	0.28
Yb	0.95	1.05	0.94	0.93	0.81	0.99	3.01	5.34	4.54	3.06	5.48	5.66	2.4	2.13	2.03	1.97
Lu	0.16	0.16	0.15	0.15	0.11	0.14	0.5	0.75	0.71	0.51	0.79	0.81	0.42	0.37	0.36	0.34
C.I.P.W norm																
Q	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Or	5.32	4.96	4.91	4.08	1.89	3.66	34.04	29.2	31.27	32.98	28.73	28.19	30.62	28.61	28.61	30.2
Ab	42.67	40.53	43.77	42.56	48.23	42.9	59.98	25.7	34.33	60.78	33.16	42.48	57.14	39.73	41.48	32.04
An	33.92	37.99	34.04	38.23	37.85	38.53	---	---	---	---	---	---	5.47	7.53	7.78	7.2
Ne	0.17	---	0.17	---	---	---	4.28	26.16	17.81	3.75	23.45	18.14	3.1	13.86	11.17	17.11
Ac	---	---	---	---	---	---	4.97	14.52	10.04	4.31	8.16	0.09	---	---	---	---
Di	3.35	0.09	3.54	1.55	2.68	1.19	1.24	0.72	1.07	1.18	0.54	1.18	2.16	---	---	---
Wo	---	---	---	---	---	---	1.29	0.77	1.12	1.16	0.69	1.19	---	---	---	---
Hy	---	---	---	---	---	---	---	---	---	---	---	---	0.08	---	---	---
Ol	3.8	4.09	---	3.28	0.68	2.96	---	---	---	---	---	---	---	0.79	0.89	0.77
C	---	---	---	---	---	---	---	---	---	---	---	---	---	0.1	0.87	0.14
Ns	---	---	---	---	---	---	---	0.35	---	---	---	---	---	---	---	---
Mt	---	---	---	---	---	---	---	---	0.15		0.26	0.26	---	---	---	---
Hm	7.73	7.38	7.15	6.72	4.85	5.77	3.23	---	2.35	3.45	2.02	4.85	5.24	4.5	4.21	4.68
Il	0.26	0.23	0.24	0.21	0.17	0.19	0.3	0.21	0.28	0.3	0.17	0.17	0.28	0.23	0.23	0.23
Tn	---	1.19	---	---	---	2.14	---	---	---	---	---	---	---	---	---	---
Pf	1.78	1.02	1.59	1.87	1.85	0.08	0.04	---	---	0.04	---	---	0.06	---	---	---
Ru	---	---	---	---	---	---	---	---	---	---	---	---	---	0.02	0.01	0.06
Ap	0.59	0.97	0.57	0.59	0.54	0.73	0.12	0.09	0.14	0.12	0.09	0.09	0.21	0.17	0.19	0.24
Z	---	---	0.02	---	---	---	---	---	---	---	---	---	---	---	---	---
Cc	0.61	0.14	0.62	0.27	0.25	0.18	0.07	0.23	0.09	0.09	0.27	0.23	0.23	0.41	0.3	0.23
Ma	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Geochemical Parameters																
A/NK	2.33	2.58	2.31	2.55	2.43	2.57	0.95	0.85	0.89	0.95	0.92	1	1.11	1.16	1.21	1.16
NK/A (A.I.)	0.43	0.39	0.43	0.39	0.41	0.39	1.05	1.18	1.12	1.05	1.09	1.00	0.90	0.86	0.83	0.86
A/CNK	0.84	0.9	0.85	0.88	0.87	0.9	0.87	0.8	0.83	0.87	0.87	0.91	0.93	0.98	1.02	0.98
Fe_2O_3/MgO	2.76	3.13	2.68	3.10	5.45	3.01	21.52	50.20	29.65	22.45	50.20	23.00	11.64	10.00	8.25	10.64
Na_2O/K_2O	5.64	5.70	6.28	7.29	17.81	8.18	1.51	2.20	1.76	1.55	2.08	1.88	1.43	1.60	1.52	1.47
$Na_2O + K_2O$	5.98	5.63	6.04	5.72	6.02	5.69	14.45	15.81	14.58	14.11	14.99	13.76	12.61	12.56	12.18	12.63
Al_2O_3/TiO_2	18.44	18.77	20.68	19.03	19.99	22.68	107.94	179.36	125.27	106.67	223.56	221.44	110.17	148.57	161.77	114.89
CaO/TiO_2	7.72	7.49	8.49	7.74	8.08	9.05	5.89	6.64	6.33	5.56	7.56	11.78	10.72	13.14	14.15	9.50
R1	972	1193	1010	1169	1166	1286	-689	-1402	-839	-560	-1116	-676	-251	-306	-149	-506
R2	1540	1532	1525	1561	1527	1537	506	470	480	495	472	515	618	627	635	610
Ac+Di+Wo+Hy	3.35	0.09	2.01	1.55	2.68	1.19	7.5	16.01	12.23	6.65	9.39	2.46	2.24	---	---	---
K/Rb	439	436	431	441	531	468	290	289	323	280	280	289	417	432	423	412
Rb/Sr	0.02	0.01	0.02	0.01	0.01	0.01	4.34	10.92	4.86	6.31	5.76	1.06	0.54	0.57	0.57	0.53
Rb/Ba	0.07	0.05	0.06	0.04	0.02	0.03	3.51	10.92	6.48	4.43	10.29	4.72	0.62	0.76	0.53	0.56
Zr/Hf	45.50	46	41.50	31.67	35	46.50	42.33	44.32	44.23	45.56	43.41	42.60	38.27	40	41.56	41.13
Zr/Y	7	5.41	5.93	6.79	8.08	6.20	27.21	17.24	32.37	27.33	15.94	14.04	22.16	22.22	20.78	19.35
Rb/Nb	0.94	1	1	0.62	0.31	0.55	1.38	0.69	0.95	1.20	0.71	0.67	1.98	1.75	1.86	2.06
Nb/Y	1.38	0.94	1.14	1.5	1.23	1.33	4.29	2.86	3.49	4.57	2.58	2.23	2.74	2.94	2.83	2.94
Y/Nb	0.72	1.03	0.88	0.67	0.81	0.75	0.23	0.35	0.29	0.22	0.39	0.45	0.37	0.34	0.35	0.34
10000Ga/Al	1.91	1.91	1.90	1.89	1.92	1.88	3.21	3.83	3.82	3.25	3.95	3.89	2.95	2.91	2.70	2.83
Ti/Y	544.16	426.7	453.91	518.14	544.16	407.66	38.54	9.16	21.93	35.97	6.83	5.93	56.79	46.63	43.3	63.48
Ce/Nb	7	5.41	5.93	6.79	8.08	6.20	27.21	17.24	32.37	27.33	15.94	14.04	22.16	22.22	20.78	19.35
Nb/Ta	18	16	16	21	16	20	17.14	15.85	17.88	17.13	17.00	16.92	17.33	17.67	17	16.67
Yb/Ta	0.95	1.05	0.94	0.93	0.81	0.99	0.43	0.41	0.57	0.38	0.46	0.47	0.80	0.71	0.68	0.66
Th/U	5	3.33	5	10	3.33	3.33	4	3.71	2.88	3.75	4	4	5	5	5	4
ΣREE	92.55	124.45	94.67	99.34	90.65	111.38	359.28	586.78	459.23	371.70	593.66	545.22	208.52	193.69	197.33	191.25
$(La/Yb)_n$	11.90	14.20	11.80	13.09	14.12	13.98	18.26	18.09	15.67	18.38	18.58	15.55	11.98	12.65	13.70	13.51
(La/Sm)n	2.80	2.65	2.62	2.89	3.08	2.86	4.98	5.54	5.24	4.96	5.89	5.03	3.73	3.91	3.90	3.85
(Gd/Yb)n	2.98	3.69	3.04	3.15	3.09	3.27	2.09	2.09	1.68	2.17	2.12	2.05	1.75	1.80	1.92	1.96
Eu/Eu*	1.95	1.60	1.97	2.00	2.46	1.90	0.20	0.20	0.19	0.20	0.21	0.21	0.36	0.32	0.35	0.39

Rock suite	Intermediate														
Rock type	Phonolite						Trachyte		Nepheline syenite						
Sample no.	R1	R3	R5	R7	R9	R10	T1	T2	S6	S7	S8	S12	S13	S16	S19
Major oxides (%)															
SiO_2	57.51	57.64	58.02	58.32	57.6	57.76	67.96	68.45	57.93	58.2	59.2	58.84	58.32	57.67	57.81
TiO_2	0.32	0.36	0.35	0.35	0.31	0.31	0.53	0.52	0.14	0.18	0.11	0.31	0.26	0.24	0.14
Al_2O_3	18.79	18.96	18.99	18.83	18.79	18.66	13.3	13.24	19.24	17.98	18.75	18.39	17.96	19.23	19.88
Fe_2O_3	5.03	5.38	5.17	5.15	4.99	4.84	6.25	6.22	4.77	5.94	4.78	5.65	5.55	5.13	4.29
MnO	0.14	0.14	0.14	0.14	0.14	0.13	0.11	0.11	0.13	0.16	0.12	0.15	0.14	0.12	0.11
MgO	0.39	0.55	0.43	0.47	0.41	0.36	0.09	0.09	0.17	0.21	0.19	0.36	0.33	0.33	0.22
CaO	1.61	1.71	1.54	1.56	1.49	1.52	0.27	0.27	1.13	1.15	1.09	1.23	1.68	1.36	1.08
Na_2O	8.2	7.88	8.22	7.94	7.95	8.28	5.37	5.2	7.96	7.96	7.6	6.6	6.42	6.86	7.68
K_2O	5.04	4.71	4.94	4.93	5.21	5.22	4.62	4.45	5.42	5.48	5.52	5.47	5.43	5.51	5.09
P_2O_5	0.1	0.12	0.12	0.13	0.1	0.1	0.03	0.04	0.02	0.02	0.02	0.05	0.07	0.05	0.04
Cr_2O_5	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
LOI	2.6	2.3	1.8	1.9	2.8	2.6	1.3	1.2	3	2.5	2.5	2.8	3.6	3.3	3.6
CO_2	0.05	0.05	0.03	0.03	0.04	0.03	0.03	0.03	0.12	0.09	0.1	0.14	0.26	0.22	0.16
SO_4	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	0.04	0.03	0.02	0.02	<0.02	0.07	<0.02	0.02
Total	99.78	99.8	99.75	99.75	99.83	99.81	99.9	99.86	100.06	99.89	100	99.99	100.09	100.02	100.12
Trace elements (PPm)															
As	6	8	6	6	6	6	<0.5	<0.5	1	1	0.7	1	1	1	0.6
Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Au (PPb)	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7
Ba	164	172	171	181	161	177	158	170	16	17	17	23	29	30	13
Be	7	7	7	7	7	6	7	7	4	5	4	5	5	5	4
Bi	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	1.1	1.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Cd	0.4	0.2	0.2	0.3	0.4	0.4	0.2	0.2	0.3	0.2	0.1	0.3	0.3	0.4	0.2
Co	3	3	3	3	2	2	0.5	0.5	1	1	1	1	1	1	1
Cs	1.5	1.1	1.4	1.2	1.5	1.5	0.1	0.2	1	1.1	1	0.9	1	1.1	1.2
Cu	5	4	4	3	4	4	1	1	2	3	2	2	2	2	1
Ga	30	31	30	31	30	31	39	40	33	35	34	33	33	33	31
Hf	23	23	23	22	24	22	22	23	15	20	16	16	19	16	13
Hg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ni	34	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Nb	159	163	167	164	167	162	178	187	132	185	130	162	177	158	107
Mo	7	2	6	5	7	8	1	1	4	4	4	4	3	2	2
Pb	10	7	10	10	10	10	9	9	5	7	5	6	7	7	5
Rb	121	110	109	108	130	121	90	92	121	124	118	117	119	115	113
Sb	0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Sc	<1	1	1	1	1	1	1	1	<1	<1	<1	<1	<1	<1	<1
Se	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sn	8	8	8	8	8	8	6	7	5	6	6	6	6	5	5
Sr	155	198	149	161	173	159	16	17	26	24	28	89	39	39	17
Ta	10	10	11	10	11	11	10	11	7	10	7	9	10	9	6
Tl	0.1	0.3	0.3	0.2	0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Th	23	21	23	23	23	23	8	8	11	15	11	13	16	13	9
U	7	6	7	6	6	6	1	1	3	5	4	4	5	4	3
V	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8
W	3	0.8	1	0.7	3	2	<0.5	<0.5	2	3	2	2	2	1	1
Y	42	40	43	41	43	42	57	59	29	40	30	41	49	41	30
Zn	99	86	96	89	100	100	119	117	94	109	80	116	131	119	75
Zr	1063	1079	1092	1076	1094	1067	935	983	653	919	648	730	862	720	546
REE (PPm)															
La	82.2	82.3	82.8	81.6	81.9	80.3	46.4	48.2	63.2	83.3	64	70.2	88.3	73.8	52.6
Ce	152.3	153.4	155.2	153.3	154.9	150.6	112.3	117.5	124.6	166	129.1	136.3	173.8	146.4	104.3
Pr	15.89	16.07	16.44	16.16	16.28	15.82	12.12	12.79	14.01	18.35	14.59	15.23	19.34	16.24	11.69
Nd	52.6	54.7	55.9	53.8	55.6	54.1	47.9	49.6	49.3	63	52	52.4	68.1	57.3	41.6
Sm	9.21	9.31	9.54	9.39	9.32	9.04	9.05	9.57	9.01	11.84	9.56	9.89	12.41	10.43	7.33
Eu	1.07	1.09	1.1	1.15	1.07	1.08	1.64	1.76	0.7	0.9	0.76	0.91	0.96	0.85	0.61
Gd	7.75	7.82	7.83	7.93	7.96	7.74	8.09	8.58	6.99	9.2	7.22	8.21	10.27	8.68	6.06
Tb	1.31	1.3	1.34	1.31	1.32	1.29	1.48	1.57	1.11	1.48	1.13	1.4	1.68	1.45	1
Dy	7.63	7.65	7.89	7.59	7.75	7.73	9.77	10.29	5.9	7.96	5.92	7.88	9.53	8.12	5.74
Ho	1.37	1.34	1.39	1.34	1.43	1.42	1.97	2.05	1.03	1.37	1.03	1.41	1.66	1.44	1.06
Er	4.14	3.89	4.16	3.98	4.17	4.09	6.07	6.42	2.94	4.06	3.02	4.01	4.73	3.98	3.01
Tm	0.64	0.61	0.64	0.62	0.64	0.63	0.92	0.96	0.49	0.65	0.48	0.58	0.7	0.6	0.45
Yb	3.92	3.93	4.04	3.95	4.09	3.99	5.53	5.8	3.23	4.4	3.25	3.65	4.26	3.69	2.9
Lu	0.56	0.56	0.58	0.56	0.58	0.57	0.78	0.82	0.51	0.68	0.52	0.52	0.58	0.52	0.44
C.I.P.W norm															
Q	---	---	---	---	---	---	19.33	21	---	---	---	---	---	---	---
Or	29.79	27.84	29.2	29.14	30.79	30.85	27.31	26.3	32.03	32.39	32.63	32.33	32.09	32.57	30.08
Ab	62.65	62	63.85	62.51	61.71	60.84	42.69	43.33	44.32	41.82	47.76	54.56	53.13	45.53	46.93
An	---	2.46	0.34	1.19	0.21	---	---	---	0.77	---	0.75	4.4	4.16	5.03	4.09
Ne	3.22	2.53	3.09	2.53	3.01	3.3	---	---	12.47	10.92	8.96	0.69	0.64	6.79	9.78
Ac	0.69	---	---	---	---	2.76	2.42	0.59	---	4.73	---	---	---	---	---
Di	2.09	2.95	2.31	2.52	2.2	1.93	---	---	0.91	1.13	1.02	---	1.34	---	---
Wo	1.57	0.18	1.45	0.67	1.22	1.52	---	---	1.16	1.49	1.08	---	---	---	---
Hy	---	---	---	---	---	---	0.22	0.22	---	---	---	---	---	---	---
Ol	---	---	---	---	---	---	---	---	---	---	---	0.63	0.14	0.58	0.38
C	---	---	---	---	---	---	---	---	---	---	---	---	---	0.14	0.24
Ns	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Mt	---	---	---	---	---	---	---	---	0.02	---	0.07	---	---	---	---
Hm	4.79	5.38	5.17	5.15	4.99	3.89	5.42	6.02	4.76	4.31	4.73	5.65	5.55	5.13	4.29
Il	0.3	0.3	0.3	0.3	0.3	0.28	0.23	0.23	0.26	0.34	0.21	0.32	0.3	0.26	0.23
Tn	---	---	---	---	---	0.24	0.67	0.63	---	---	---	---	---	---	---
Pf	0.28	0.34	0.33	0.33	0.26	0.28	---	---	---	---	---	0.24	0.17	---	---
Ru	---	---	---	---	---	---	0.13	0.14	---	---	---	---	---	0.1	0.02
Ap	0.24	0.28	---	0.31	0.24	---	0.07	0.09	0.05	0.05	0.05	0.12	0.17	0.12	0.09
Z	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cc	0.11	0.11	0.07	0.07	0.09	0.07	0.07	0.07	0.27	0.2	0.23	0.32	0.59	0.5	0.36
Ma	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Geochemical Parameters															
A/NK	0.99	1.05	1.01	1.02	1	0.97	0.96	0.99	1.01	0.95	1.01	1.1	1.09	1.11	1.1
NK/A (A.I.)	1.01	0.95	0.99	0.98	1.00	1.03	1.04	1.01	0.99	1.05	0.99	0.91	0.92	0.90	0.91
A/CNK	0.86	0.9	0.89	0.89	0.88	0.85	0.93	0.96	0.92	0.85	0.92	0.97	0.92	0.98	0.99
Fe_2O_3/MgO	12.90	9.78	12.02	10.96	12.17	13.44	69.44	69.11	28.06	28.29	25.16	15.69	16.82	15.55	19.50
Na_2O/K_2O	1.63	1.67	1.66	1.61	1.53	1.59	1.16	1.17	1.47	1.45	1.38	1.21	1.18	1.25	1.51
$Na_2O + K_2O$	13.24	12.59	13.16	12.87	13.16	13.50	9.99	9.65	13.38	13.44	13.12	12.07	11.85	12.37	12.77
Al_2O_3/TiO_2	58.72	52.67	54.26	53.80	60.61	60.19	25.09	25.46	137.43	99.89	170.45	59.32	69.08	80.13	142.00
CaO/TiO_2	5.03	4.75	4.40	4.46	4.81	4.90	0.51	0.52	8.07	6.39	9.91	3.97	6.46	5.67	7.71
R1	-393	-204	-347	-225	-337	-442	1369	1503	-358	-384	-169	147	190	-17	-178
R2	560	582	559	560	548	547	294	293	507	486	494	510	548	539	516
Ac+Di+Wo+Hy	4.35	3.13	3.76	3.19	3.42	6.21	2.64	0.81	2.07	7.35	2.1	---	1.34	---	---
K/Rb	346	355	376	379	333	358	426	401	372	367	388	388	379	398	374
Rb/Sr	0.78	0.56	0.73	0.67	0.75	0.76	5.63	5.41	4.65	5.17	4.21	1.31	3.05	2.95	6.65
Rb/Ba	0.74	0.64	0.64	0.60	0.81	0.68	0.57	0.54	7.56	7.29	6.94	5.09	4.10	3.83	8.69
Zr/Hf	46.22	46.91	47.48	48.91	45.58	48.50	42.50	42.74	43.53	45.95	40.50	45.63	45.37	45	42
Zr/Y	25.31	26.98	25.40	26.24	25.44	25.40	16.40	16.66	22.52	22.98	21.60	17.80	17.59	17.56	18.20
Rb/Nb	0.76	0.67	0.65	0.66	0.78	0.75	0.51	0.49	0.92	0.67	0.91	0.72	0.67	0.73	1.06
Nb/Y	3.79	4.08	3.88	4	3.88	3.86	3.12	3.17	4.55	4.63	4.33	3.95	3.61	3.85	3.57
Y/Nb	0.26	0.25	0.26	0.25	0.26	0.26	0.32	0.32	0.22	0.22	0.23	0.25	0.28	0.26	0.28
10000Ga/Al	3.02	3.09	2.99	3.11	3.02	3.14	5.54	5.71	3.24	3.68	3.43	3.39	3.47	3.24	2.95
Ti/Y	45.68	53.96	48.8	51.18	43.22	44.25	55.74	52..84	28.94	26.98	21.98	45.33	31.81	35.09	27.98
Ce/Nb	25.31	26.98	25.40	26.24	25.44	25.40	16.40	16.66	22.52	22.98	21.60	17.80	17.59	17.56	18.20
Nb/Ta	15.90	16.30	15.18	16.40	15.18	14.73	17.80	17	18.86	18.50	18.57	18.00	17.70	17.56	17.83
Yb/Ta	0.39	0.39	0.37	0.40	0.37	0.36	0.55	0.53	0.46	0.44	0.46	0.41	0.43	0.41	0.48
Th/U	3.29	3.50	3.29	3.83	3.83	3.83	8	8	3.67	3.00	2.75	3.25	3.20	3.25	3
ΣREE	340.59	343.97	348.85	342.68	347.01	338.40	264.02	275.91	283.02	373.19	292.58	312.59	396.32	333.50	238.79
$(La/Yb)_n$	14.02	14.00	13.70	13.81	13.39	13.46	5.61	5.56	13.08	12.66	13.17	12.86	13.86	13.37	12.13
(La/Sm)n	5.51	5.45	5.36	5.36	5.42	5.48	3.16	3.11	4.33	4.34	4.13	4.38	4.39	4.37	4.43
(Gd/Yb)n	1.58	1.59	1.54	1.60	1.55	1.55	1.17	1.18	1.72	1.67	1.77	1.79	1.92	1.88	1.67
Eu/Eu*	0.39	0.39	0.39	0.41	0.38	0.40	0.59	0.60	0.27	0.27	0.28	0.31	0.26	0.27	0.28

Rock suite	Intermediate																		
Rock type	Alkali syenite									Quartz syenite				Pegmatites			Ferruginous alteration zones		
														Qz-bearing		Ne-bearing			
Sample no.	S5	S9	S10	S11	S14	S15	S17	S18	S20	S1	S2	S3	S4	P1	P3	P5	HS1	HS3	HS5
Major oxides (%)																			
SiO_2	57.58	59.16	60.07	57.03	57.87	58.61	57.31	57.75	58.68	62.71	62.8	61.98	63.98	57.95	58.33	53	62.54	54.3	62.21
TiO_2	0.19	0.3	0.21	0.32	0.28	0.26	0.29	0.16	0.16	0.21	0.32	0.3	0.32	1.38	0.7	0.56	0.38	0.39	0.42
Al_2O_3	18.29	18.29	18.1	18.2	17.79	18.18	18	19.76	18.75	16.68	16.06	16.22	18.56	10.67	12.15	20.62	13.88	9.35	10.97
Fe_2O_3	6.08	5.23	4.89	6.17	5.86	5.54	6.41	4.74	4.86	5.15	5.43	5.94	2.75	14.67	11.67	8.22	8.05	25.45	12.12
MnO	0.16	0.14	0.13	0.2	0.15	0.13	0.16	0.12	0.12	0.12	0.19	0.15	0.06	0.2	0.24	0.14	0.65	0.19	1.36
MgO	0.23	0.3	0.26	0.38	0.34	0.33	0.34	0.21	0.22	0.14	0.1	0.15	0.09	0.18	0.15	0.68	0.12	0.03	0.05
CaO	1.25	0.87	1.12	1.2	1.75	1.48	1.61	0.99	1.1	0.65	1.11	1.46	0.33	0.64	0.66	0.95	0.75	0.19	0.7
Na_2O	8	7.37	7.14	7.81	6.49	6.44	6.76	7.86	7.59	7.72	7.64	7.7	7.09	9.14	9.32	5.27	6	5.3	6.48
K_2O	5.49	5.72	5.65	5.11	5.58	5.33	5.63	5.07	5.43	4.99	4.87	4.66	5.8	3.03	2.4	6.06	4.41	0.05	0.07
P_2O_5	0.02	0.05	0.06	0.03	0.05	0.07	0.07	0.03	0.03	0.02	0.03	0.04	0.03	0.04	0.1	0.04	0.18	0.17	0.13
Cr_2O_5	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
LOI	2.5	2.4	2.2	3.3	3.7	3.5	3.2	3.2	3	1.5	1.3	1.3	1	1.7	3	4.3	2	3.2	2.7
CO_2	0.09	0.13	0.2	0.16	0.28	0.24	0.27	0.14	0.14	0.03	0.1	0.14	0.03	0.06	0.12	0.21	0.1	0.08	0.1
SO_4	0.04	<0.02	<0.02	<0.02	0.05	<0.02	<0.02	<0.02	0.02	0.03	<0.02	<0.02	0.02	0.05	<0.02	<0.02	0.11	0.05	0.12
Total	99.92	99.96	100.03	99.91	100.19	100.11	100.05	100.03	100.1	99.95	99.95	100.04	100.06	99.71	98.84	100.05	99.17	98.75	97.43
Trace elements (PPm)																			
As	1	1	2	2	1	1	1	0.6	0.6	1	19	1	<0.5	3	3	2	2	3	3
Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3
Au (PPb)	1	<0.5	<0.5	<0.5	1.9	<0.5	<0.5	<0.5	<0.5	2	0.7	0.6	0.5	<0.5	<0.5	0.7	0.9	0.5	3.3
Ba	18	9	11	9	27	31	26	10	13	226	281	314	149	59	100	46	33	25	28
Be	5	5	5	7	5	5	6	4	4	4	5	4	1	5	8	6	6	7	5
Bi	<0.1	<0.1	0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
Cd	0.2	0.2	0.2	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.2	0.2	<0.1	0.2	0.2	0.2	0.3	3	15
Co	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	0.5	1
Cs	0.9	1	0.9	1.3	0.9	1	0.9	1.2	0.9	0.3	0.3	0.4	0.4	0.4	0.1	2.5	0.2	0.1	<0.1
Cu	3	3	3	4	2	2	2	2	1	1	3	1	1	4	2	5	2	1	11
Ga	34	33	32	33	34	33	36	32	32	50	50	49	36	45	78	37	75	109	119
Hf	19	18	19	25	18	18	19	14	15	10	16	13	4	139	209	17	73	80	48
Hg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.04
Ni	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Nb	168	151	129	219	187	182	186	105	115	61	122	73	47	1811	2703	169	1952	5333	7504
Mo	3	5	4	6	3	3	3	2	2	2	2	2	1	1	2	6	6	7	11
Pb	6	4	5	9	8	8	6	6	4	3	5	3	2	13	8	3	5	18	1095
Rb	125	119	116	120	122	117	123	111	116	97	95	96	55	50	33	191	190	2	2
Sb	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	0.3
Sc	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	1	<1
Se	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7
Sn	6	6	7	9	6	6	6	5	5	4	5	4	2	52	36	3	27	25	15
Sr	24	95	77	119	39	41	41	15	16	25	44	48	26	51	121	56	87	242	197
Ta	9	9	7	12	10	10	10	6	6	3	9	5	3	122	188	7	96	319	296
Tl	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Th	13	13	13	17	15	15	16	8	9	7	15	8	4	67	109	10	101	1564	1310
U	4	4	3	5	5	4	5	3	3	3	4	3	1	70	94	3	40	156	198
V	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8
W	3	3	2	3	2	2	2	1	1	2	2	1	1	4	8	1	4	13	26
Y	38	47	47	50	47	49	49	30	33	30	72	32	13	150	457	27	195	349	205
Zn	100	98	83	151	143	126	138	76	85	53	103	59	35	145	37	136	181	751	2544
Zr	857	798	810	1153	855	851	925	584	617	416	765	514	175	6785	15351	496	3665	5984	3345
REE (PPm)																			
La	76.6	66.7	68.2	85.2	84.6	88.5	92.8	51.7	57.8	45.8	89.1	47.1	23	299.9	1090.5	44.6	434.8	1208.6	1207.1
Ce	149.8	128.4	131.3	164.4	166.1	174.7	182	101.7	114.8	80.1	160.3	98	40.7	534	2931	88.1	843.3	2389.2	2178.1
Pr	16.73	14.42	14.79	18.09	18.58	19.61	20.27	11.37	12.91	11.08	19.63	11.83	4.9	56.08	219.91	9.99	85.34	242.79	204.17
Nd	58.9	49	51.9	61.5	64.9	69.5	73	41.1	46.3	42.2	73.6	43.8	17.7	187.9	794	34.5	292.7	831	635.8
Sm	10.86	9.73	10.25	11.47	12.11	12.68	12.77	6.96	7.81	8.16	14.46	8.89	3.5	29.53	140.29	6.31	48.23	133.09	84.32
Eu	0.84	1.13	1.19	1.16	0.96	1	1	0.6	0.67	1.31	2.27	1.54	1.19	4.16	17.39	0.65	3.38	7.57	4.83
Gd	8.56	8.66	9.25	9.16	10.13	10.44	10.47	5.78	6.41	6.88	13.17	7.36	3.01	27.91	112.52	5.23	42.14	96.09	56.81
Tb	1.38	1.6	1.69	1.54	1.65	1.71	1.73	0.97	1.07	1.16	2.25	1.22	0.53	4.93	16.11	0.94	6.76	12.39	7.85
Dy	7.42	9.21	9.34	8.93	9.24	9.72	9.82	5.59	6.3	6.16	13.43	6.63	2.72	27.74	90.64	5.25	37.54	63.67	38.56
Ho	1.36	1.66	1.62	1.71	1.67	1.67	1.71	1.06	1.13	1.15	2.57	1.24	0.5	4.92	15.9	0.96	6.41	10.43	6.07
Er	3.96	4.67	4.34	4.98	4.61	4.82	4.85	3.09	3.26	3.07	7.35	3.42	1.31	12.97	44.36	2.73	16.17	27.18	15.12
Tm	0.65	0.67	0.61	0.77	0.69	0.69	0.71	0.46	0.49	0.52	1.07	0.55	0.21	1.95	6.52	0.42	2.25	3.96	2.13
Yb	4.13	4.15	3.78	4.98	4.19	4.21	4.38	2.93	3.14	3.2	6.08	3.38	1.07	12.31	39.03	2.51	12.99	23.3	12.32
Lu	0.65	0.59	0.56	0.71	0.6	0.59	0.62	0.45	0.48	0.56	0.88	0.57	0.18	1.84	4.9	0.35	1.66	2.96	1.49
C.I.P.W norm																			
Q	---	---	---	---	---	---	---	---	---	0.58	0.58	0.57	0.64	1.38	1.12	---	11.07	23.28	23.61
Or	32.45	33.81	33.39	30.2	32.98	31.5	33.28	29.97	32.09	29.49	28.78	27.54	34.3	17.91	14.19	35.82	26.07	0.3	0.41
Ab	57.78	58.81	58.08	60.23	53.02	53.73	54.22	61.55	60.03	57.83	55.5	57.49	59.53	38.02	49.14	38.68	46.85	44.84	54.83
An	---	---	0.66	---	2.94	4.96	2.15	3.67	1.06	0.62	---	---	1.3	---	---	3.12	---	---	0.65
Ne	3.11	1.86	1.26	2.68	1.02	0.41	1.61	2.68	2.27	---	---	---	---	---	---	3.2	---	---	---
Ac	3.67	0.1	---	0.8	---	---	---	---	---	6.45	8.08	6.74	---	34.63	26.18	---	3.45	---	---
Di	1.24	1.61	1.4	2.04	1.83	0.01	1.83	0.06	1.18	0.75	0.54	0.81	---		0.29	---	0.64	---	0.27
Wo	1.62	0.25	0.51	0.75	0.38	---	0.39	0.35	0.71	0.44	1.51	1.92	---	---	---	---	0.45	---	0.42
Hy	---	---	---	---	---	---	---	---	---	---	---	---	0.22	0.45	0.24	---	---	---	---
Ol	---	---	---	---	---	0.57	---	---	---	---	---	---	---	---	---	1.19	---	---	---
C	---	---	---	---	---	---	---	---	---	---	---	---	0.14	---	---	4.25	---	0.58	---
Ns	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Mt	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1.02	---	3.21
Hm	4.81	5.19	4.89	5.89	5.86	5.54	6.41	4.74	4.86	2.15	2.22	3.6	2.75	2.7	2.62	8.22	6.15	25.45	9.9
Il	0.34	0.3	0.28	0.43	0.32	0.28	0.34	0.26	0.26	0.26	0.4	0.32	0.13	0.43	0.51	0.3	0.72	0.4	0.79
Tn	---	---	---	---	---	---	---	---	---	0.18	0.26	0.32	---	1.79	1.05	---	---	---	---
Pf	0.02	0.24	0.11	0.16	0.19	0.19	0.19	0.04	0.04	---	---	---	---	---	---	---	---	---	---
Ru	---	---	---	---	---	---	---	---	---	---	---	---	0.25	0.43	---	0.4	---	0.18	---
Ap	0.05	0.12	0.14	0.07	0.12	0.17	0.17	0.07	0.07	0.05	0.07	0.09	0.07	0.09	0.24	0.09	0.43	0.4	0.31
Z	---	---	---	---	---	---	---	---	---	---	---	---	0.04	---	---	---	---	---	---
Cc	0.2	0.3	0.45	0.36	0.64	0.55	0.61	0.32	0.32	0.07	0.23	0.32	0.07	0.14	0.27	0.48	0.23	---	0.23
Ma	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	95.75	---	0.06	---
Geochemical Parameters																			
A/NK	0.96	1	1.01	0.99	1.06	1.11	1.05	1.18	1.02	1.01	0.99	0.92	1.14	0.58	0.68	1.35	0.95	1.07	1.02
NK/A (A.I.)	1.04	1.00	0.99	1.01	0.94	0.90	0.95	0.85	0.98	0.99	1.01	1.09	0.88	1.72	1.47	0.74	1.05	0.93	0.98
A/CNK	0.86	0.92	0.91	0.89	0.89	0.95	0.89	1.06	0.92	0.95	0.88	0.8	1.10	0.55	0.64	1.22	0.87	1.03	0.91
Fe_2O_3/MgO	26.43	17.43	18.81	16.24	17.24	16.79	18.85	22.57	22.09	43.93	64.30	19.60	30.56	81.50	77.80	12.09	67.08	848.33	242.40
Na_2O/K_2O	1.46	1.29	1.26	1.53	1.16	1.21	1.20	1.55	1.40	1.35	1.36	1.65	1.05	3.02	3.88	0.87	1.36	1.06	92.57
$Na_2O + K_2O$	13.49	13.09	12.79	12.92	12.07	11.77	12.39	12.93	13.02	11.71	11.51	12.36	11.89	12.17	11.72	11.33	10.41	5.35	6.55
Al_2O_3/TiO_2	96.26	60.97	86.19	56.88	63.54	69.92	62.07	123.50	117.19	79.43	50.19	54.07	58.00	7.73	17.36	36.82	36.53	23.97	26.12
CaO/TiO_2	6.58	2.90	5.33	3.75	6.25	5.69	5.55	6.19	6.88	3.10	3.47	4.87	1.03	0.46	0.94	1.70	1.97	0.49	1.67
R1	-446	-152	17	-332	92	226	-67	-253	-182	464	517	356	666	-496	-296	22	792	1074	1511
R2	504	467	488	504	553	531	542	504	496	404	439	482	404	287	316	540	358	205	293
Ac+Di+Wo+Hy	6.53	1.96	1.91	3.59	2.21	0.01	2.22	0.41	1.89	1.19	2.65	9.47	0.22	35.08	26.71	---	4.54	---	0.69
K/Rb	365	399	404	353	380	378	380	379	389	427	425	403	875	503	604	263	193	208	291
Rb/Sr	5.21	1.25	1.51	1.01	3.13	2.85	3	7.40	7.25	3.88	2.16	2	2.12	0.98	0.27	3.41	2.18	0.01	0.01
Rb/Ba	6.94	13.22	10.55	13.33	4.52	3.77	4.73	11.10	8.92	0.43	0.34	0.31	0.37	0.85	0.33	4.15	5.76	0.08	0.07
Zr/Hf	45.11	44.33	42.63	46.12	47.50	47.28	48.68	41.71	41.13	41.60	47.81	39.54	43.75	48.81	73.45	29.18	50.21	74.80	69.69
Zr/Y	22.55	16.98	17.23	23.06	18.19	17.37	18.88	19.47	18.70	13.87	10.63	16.06	13.46	45.23	33.59	18.37	18.79	17.15	16.32
Rb/Nb	0.74	0.79	0.90	0.55	0.65	0.64	0.66	1.06	1.01	1.59	0.78	1.32	1.17	0.03	0.01	1.13	0.10	0	0
Nb/Y	4.42	3.21	2.74	4.38	3.98	3.71	3.8	3.5	3.48	2.03	1.69	2.28	3.62	12.07	5.91	6.26	10.01	15.28	36.6
Y/Nb	0.23	0.31	0.36	0.23	0.25	0.27	0.26	0.29	0.29	0.49	0.59	0.44	0.28	0.08	0.17	0.16	0.10	0.07	0.03
10000Ga/Al	3.51	3.41	3.34	3.43	3.61	3.43	3.78	3.06	3.23	5.67	5.88	5.71	3.67	7.97	12.13	3.39	10.21	22.03	20.50
Ti/Y	29.98	38.27	26.79	38.37	35.71	31.81	35.48	31.97	29.07	41.97	26.64	56.2	147.57	55.15	9.18	124.34	11.68	6.7	12.28
Ce/Nb	22.55	16.98	17.23	23.06	18.19	17.37	18.88	19.47	18.70	13.87	10.63	16.06	13.46	45.23	33.59	18.37	18.79	17.15	16.32
Nb/Ta	18.67	16.78	18.43	18.25	18.70	18.20	18.60	17.50	19.17	20.33	13.56	14.60	15.67	14.84	14.38	24.14	20.33	16.72	25.35
Yb/Ta	0.46	0.46	0.54	0.42	0.42	0.42	0.44	0.49	0.52	1.07	0.68	0.68	0.36	0.10	0.21	0.36	0.14	0.07	0.04
Th/U	3.25	3.25	4.33	3.40	3	3.75	3.20	2.67	3	2.33	3.75	2.67	4	0.96	1.16	3.33	2.53	10.03	6.62
ΣREE	341.84	300.59	308.82	374.60	380.03	399.84	416.13	233.76	262.57	211.35	406.16	235.53	100.52	1206.14	5523.07	202.54	1833.67	5052.23	4454.67
$(La/Yb)_n$	12.40	10.75	12.06	11.44	13.50	14.06	14.17	11.80	12.31	9.57	9.80	9.32	14.37	16.29	18.68	11.88	22.38	34.69	65.52
(La/Sm)n	4.35	4.23	4.11	4.58	4.31	4.31	4.48	4.58	4.57	3.46	3.80	3.27	4.05	6.27	4.80	4.36	5.56	5.60	8.83
(Gd/Yb)n	1.65	1.66	1.95	1.47	1.93	1.98	1.91	1.57	1.63	1.71	1.73	1.74	2.24	1.81	2.30	1.66	2.59	3.29	3.68
Eu/Eu*	0.27	0.38	0.38	0.35	0.27	0.27	0.27	0.29	0.29	0.54	0.51	0.59	1.13	0.45	0.43	0.35	0.23	0.21	0.21