

	Al2O3	SiO2	TiO2	Fe2O3	MnO	MgO	CaO	Na2O	K2O	P2O5	Al	Ba	Cr
	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(ppm)	(ppm)	(ppm)
Al2O3 (wt %)	1												
SiO2 (wt %)	0.61	1											
TiO2 (wt %)	0.98	0.581	1										
Fe2O3 (wt %)	-0.09	-0.43	-0.08	1									
MnO (wt %)	-0.66	-0.89	-0.64	0.505	1								
MgO (wt %)	-0.55	-0.79	-0.54	0.583	0.87	1							
CaO (wt %)	-0.71	-0.93	-0.69	0.219	0.84	0.623	1						
Na2O (wt %)	0.62	0.268	0.63	-0.11	-0.38	-0.36	-0.31	1					
K2O (wt %)	0.99	0.624	0.98	-0.1	-0.68	-0.55	-0.73	0.563	1				
P2O5 (wt %)	0.01	-0.1	0	-0.12	0.03	-0.04	0.12	0.099	0.01	1			
Al (ppm)	0.01	-0.1	0	-0.12	0.03	-0.04	0.12	0.099	0.01	1	1		
Ba (ppm)	0.29	0.147	0.27	0.029	-0.15	-0.04	-0.24	0.273	0.3	-0.03	-0.03	1	
Cr (ppm)	0.5	0.441	0.47	-0.25	-0.52	-0.43	-0.5	0.21	0.54	0.06	0.063	0.1	1
S (ppm)	-0.13	-0.41	-0.11	0.41	0.21	0.324	0.26	0.254	-0.14	0.03	0.028	0.12	-0.14
Sc (ppm)	0.79	0.53	0.76	0.039	-0.52	-0.45	-0.61	0.473	0.78	-0.02	-0.02	0.26	0.415
Sr (ppm)	-0.56	-0.85	-0.52	0.313	0.8	0.602	0.88	-0.19	-0.58	0.2	0.203	-0.09	-0.44
Zn (ppm)	0.05	0.105	0.05	-0.12	-0.11	-0.08	-0.09	0.156	0.05	-0.02	-0.02	0.29	0.027
Zr (ppm)	0.92	0.484	0.94	-0.06	-0.57	-0.47	-0.61	0.729	0.9	0.03	0.025	0.27	0.447
Be (ppm)	0.77	0.32	0.73	0.065	-0.43	-0.28	-0.5	0.488	0.77	0.1	0.103	0.28	0.661
V (ppm)	0.34	0.194	0.32	-0.21	-0.28	-0.19	-0.22	0.346	0.35	0.05	0.048	0.21	0.252
Co (ppm)	0.5	0.14	0.48	0.267	-0.2	-0.19	-0.26	0.517	0.47	-0.02	-0.02	0.22	0.248
Ni (ppm)	0.39	0.119	0.35	0.031	-0.2	-0.13	-0.21	0.313	0.38	0.06	0.059	0.22	0.407
Cu (ppm)	0.54	0.367	0.5	-0.02	-0.44	-0.36	-0.45	0.336	0.55	0.08	0.077	0.2	0.599
Ga (ppm)	0.97	0.566	0.95	-0.1	-0.66	-0.53	-0.7	0.569	0.97	0.06	0.056	0.29	0.63
Rb (ppm)	0.97	0.595	0.96	-0.09	-0.67	-0.54	-0.72	0.503	0.99	0.02	0.015	0.29	0.575
Y (ppm)	0.09	-0.12	0.1	0.066	0.09	-0	0.13	0.13	0.07	0.87	0.87	0.01	-0.11
Nb (ppm)	0.96	0.586	0.98	-0.08	-0.66	-0.56	-0.71	0.592	0.96	0.01	0.005	0.26	0.505
Mo (ppm)	0.23	0.07	0.21	0.008	-0.17	-0.11	-0.11	0.229	0.22	-0.04	-0.04	0.07	-0.14
Sn (ppm)	0.68	0.527	0.7	-0.1	-0.47	-0.46	-0.55	0.243	0.68	-0.05	-0.05	0.15	0.251
Cs (ppm)	0.87	0.557	0.86	-0.1	-0.62	-0.52	-0.66	0.22	0.9	-0.02	-0.02	0.2	0.511
La (ppm)	0.72	0.243	0.73	0.069	-0.32	-0.34	-0.33	0.459	0.69	0.42	0.42	0.15	0.243
Ce (ppm)	0.69	0.296	0.7	0.035	-0.34	-0.34	-0.37	0.394	0.67	0.49	0.492	0.13	0.162
Pr (ppm)	0.54	0.214	0.54	0.012	-0.25	-0.28	-0.26	0.33	0.52	0.67	0.668	0.1	0.098
Nd (ppm)	0.4	0.133	0.4	0.017	-0.16	-0.21	-0.16	0.258	0.38	0.75	0.75	0.07	0.015
Sm (ppm)	0.21	0.017	0.2	0.037	-0.03	-0.08	-0.04	0.192	0.18	0.79	0.792	0.05	-0.09
Eu (ppm)	0.11	-0.08	0.1	0.067	0.07	-0.01	0.07	0.107	0.08	0.83	0.827	0.07	-0.12
Gd (ppm)	0.2	-0.01	0.19	0.048	-0.01	-0.07	-0.01	0.181	0.17	0.82	0.823	0.04	-0.08
Tb (ppm)	0.16	-0.03	0.16	0.044	0.01	-0.05	0.02	0.163	0.14	0.83	0.825	0.04	-0.1
Dy (ppm)	0.18	-0.02	0.18	0.055	0.01	-0.05	0.01	0.172	0.15	0.82	0.822	0.04	-0.1

Ho (ppm)	0.21	-0.01	0.21	0.065	-0	-0.07	-0.01	0.193	0.18	0.83	0.829	0.05	-0.06
Er (ppm)	0.28	0.011	0.29	0.077	-0.04	-0.09	-0.04	0.26	0.25	0.8	0.797	0.11	-0.01
Tm (ppm)	0.4	0.045	0.41	0.118	-0.09	-0.14	-0.11	0.386	0.37	0.68	0.681	0.15	0.113
Yb (ppm)	0.5	0.106	0.5	0.119	-0.16	-0.19	-0.2	0.474	0.47	0.56	0.562	0.2	0.232
Lu (ppm)	0.51	0.109	0.51	0.103	-0.19	-0.21	-0.21	0.52	0.49	0.48	0.478	0.22	0.312
Hf (ppm)	0.93	0.501	0.95	-0.08	-0.59	-0.49	-0.62	0.729	0.91	0.02	0.023	0.27	0.455
Ta (ppm)	0.97	0.572	0.98	-0.09	-0.65	-0.54	-0.7	0.656	0.96	0.04	0.035	0.27	0.498
W (ppm)	0.16	0.212	0.18	-0.1	-0.24	-0.15	-0.23	-0.14	0.2	-0.05	-0.05	-0.03	0.039
Tl (ppm)	0.58	0.326	0.59	-0	-0.4	-0.31	-0.38	0.367	0.58	-0.08	-0.08	0.19	0.039
Pb (ppm)	0.42	0.428	0.44	0.039	-0.32	-0.39	-0.4	0.015	0.43	-0.11	-0.11	0.02	0.247
Th (ppm)	0.9	0.522	0.9	-0.03	-0.59	-0.5	-0.63	0.631	0.89	0.19	0.191	0.32	0.368
U (ppm)	0.38	0.172	0.35	-0.03	-0.27	-0.23	-0.21	0.191	0.38	0.32	0.32	0.12	-0.08

	S	Sc	Sr	Zn	Zr	Be	V	Co	Ni	Cu	Ga	Rb	Y
	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
S (ppm)	1												
Sc (ppm)	-0.1	1											
Sr (ppm)	0.35	-0.44	1										
Zn (ppm)	0.06	-0.02	-0.08	1									
Zr (ppm)	-0	0.68	-0.45	0.057	1								
Be (ppm)	0.05	0.61	-0.42	-0.01	0.71	1							
V (ppm)	0.07	0.24	-0.2	0.254	0.34	0.39	1						
Co (ppm)	0.15	0.44	-0.23	-0.1	0.5	0.66	0.09	1					
Ni (ppm)	0.06	0.33	-0.21	0.042	0.33	0.66	0.48	0.66	1				
Cu (ppm)	-0	0.53	-0.35	0.189	0.5	0.69	0.48	0.43	0.57	1			
Ga (ppm)	-0.1	0.76	-0.55	0.073	0.89	0.86	0.36	0.51	0.46	0.61	1		
Rb (ppm)	-0.1	0.76	-0.57	0.026	0.89	0.81	0.35	0.48	0.41	0.59	0.98	1	
Y (ppm)	0.03	0.11	0.24	-0.04	0.09	0.09	-0	0.08	0.09	-0.01	0.1	0.06	1
Nb (ppm)	-0.1	0.75	-0.54	0.036	0.93	0.76	0.29	0.5	0.38	0.53	0.95	0.96	0.1
Mo (ppm)	0.21	0.19	-0.15	0.016	0.2	0.19	0.28	0.29	0.4	0.14	0.19	0.22	0
Sn (ppm)	-0.5	0.54	-0.46	0.057	0.64	0.38	-0	0.26	0.15	0.27	0.64	0.67	0.11
Cs (ppm)	-0.2	0.66	-0.53	-0.03	0.73	0.69	0.26	0.33	0.33	0.49	0.88	0.93	0.04
La (ppm)	-0	0.64	-0.1	-0.04	0.69	0.54	0.09	0.39	0.22	0.32	0.7	0.7	0.61
Ce (ppm)	-0.1	0.59	-0.17	-0.04	0.65	0.48	0.04	0.33	0.18	0.23	0.66	0.66	0.7
Pr (ppm)	-0.1	0.47	-0.08	-0.04	0.5	0.38	0.04	0.25	0.16	0.18	0.52	0.51	0.85
Nd (ppm)	-0.1	0.35	-0.02	-0.04	0.36	0.29	0.01	0.19	0.13	0.11	0.39	0.37	0.91
Sm (ppm)	-0	0.19	0.06	-0.03	0.19	0.19	0.02	0.15	0.14	0.05	0.2	0.17	0.93
Eu (ppm)	-0	0.11	0.16	-0.03	0.09	0.13	-0	0.11	0.13	0.01	0.11	0.08	0.95
Gd (ppm)	-0	0.18	0.1	-0.04	0.18	0.18	0	0.14	0.14	0.04	0.19	0.16	0.96
Tb (ppm)	-0	0.16	0.12	-0.02	0.15	0.14	-0	0.12	0.12	0.02	0.16	0.13	0.96
Dy (ppm)	-0	0.18	0.13	-0.04	0.16	0.14	-0	0.12	0.11	0.01	0.17	0.14	0.97

Ho (ppm)	-0	0.22	0.14	-0.03	0.2	0.17	-0	0.13	0.13	0.06	0.2	0.17	0.98
Er (ppm)	0.03	0.3	0.13	-0.04	0.28	0.24	0.02	0.18	0.15	0.12	0.28	0.25	0.97
Tm (ppm)	0.08	0.44	0.1	-0.01	0.43	0.37	0.1	0.28	0.23	0.26	0.41	0.37	0.87
Yb (ppm)	0.11	0.57	0.04	-0.02	0.54	0.47	0.17	0.35	0.29	0.37	0.51	0.47	0.74
Lu (ppm)	0.16	0.59	0.04	-0.04	0.57	0.52	0.2	0.39	0.33	0.44	0.54	0.5	0.63
Hf (ppm)	-0	0.68	-0.48	0.066	1	0.72	0.34	0.51	0.33	0.5	0.9	0.9	0.09
Ta (ppm)	-0.1	0.74	-0.54	0.062	0.96	0.77	0.33	0.52	0.38	0.53	0.95	0.95	0.12
W (ppm)	-0.2	0.1	-0.13	-0.03	0.08	0	-0.1	-0.1	-0.2	-0.02	0.15	0.23	-0
Tl (ppm)	0.03	0.44	-0.33	0.046	0.52	0.43	0.43	0.46	0.59	0.28	0.54	0.56	0.08
Pb (ppm)	-0.6	0.44	-0.31	-0.08	0.38	0.22	-0.2	0.24	0.1	0.25	0.39	0.44	0.02
Th (ppm)	-0.1	0.74	-0.48	0.025	0.88	0.71	0.32	0.53	0.38	0.51	0.88	0.88	0.28
U (ppm)	0.13	0.29	-0.16	0.019	0.28	0.28	0.27	0.21	0.33	0.15	0.36	0.38	0.44

	Nb	Mo	Sn	Cs	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy
	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
Nb (ppm)	1												
Mo (ppm)	0.18	1											
Sn (ppm)	0.73	0.04	1										
Cs (ppm)	0.87	0.2	0.67	1									
La (ppm)	0.73	0.11	0.59	0.65	1								
Ce (ppm)	0.7	0.13	0.61	0.63	0.95	1							
Pr (ppm)	0.55	0.09	0.48	0.48	0.88	0.96	1						
Nd (ppm)	0.4	0.08	0.36	0.34	0.78	0.9	0.98	1					
Sm (ppm)	0.2	0.06	0.17	0.13	0.59	0.74	0.88	0.95	1				
Eu (ppm)	0.1	0.03	0.11	0.06	0.53	0.68	0.83	0.92	0.98	1			
Gd (ppm)	0.19	0.05	0.16	0.12	0.61	0.75	0.89	0.96	0.99	0.98	1		
Tb (ppm)	0.16	0.04	0.15	0.09	0.59	0.73	0.87	0.95	0.99	0.99	1	1	
Dy (ppm)	0.18	0.03	0.18	0.1	0.62	0.75	0.89	0.95	0.98	0.98	0.99	0.99	1
Ho (ppm)	0.22	0.03	0.21	0.14	0.67	0.77	0.9	0.95	0.96	0.96	0.98	0.98	0.99
Er (ppm)	0.29	0.03	0.26	0.19	0.74	0.81	0.92	0.95	0.92	0.92	0.94	0.94	0.96
Tm (ppm)	0.43	0.02	0.32	0.27	0.82	0.82	0.88	0.87	0.8	0.78	0.83	0.82	0.86
Yb (ppm)	0.52	0.05	0.36	0.34	0.84	0.8	0.82	0.77	0.68	0.65	0.7	0.69	0.73
Lu (ppm)	0.54	0.03	0.33	0.34	0.81	0.72	0.72	0.66	0.56	0.53	0.59	0.57	0.61
Hf (ppm)	0.94	0.21	0.65	0.74	0.69	0.65	0.5	0.36	0.19	0.09	0.18	0.15	0.16
Ta (ppm)	0.99	0.19	0.7	0.83	0.74	0.7	0.55	0.41	0.22	0.12	0.21	0.18	0.2
W (ppm)	0.19	-0.1	0.19	0.31	0.14	0.11	0.09	0.03	-0.06	-0.08	-0.06	-0.07	-0.06
Tl (ppm)	0.56	0.62	0.4	0.55	0.4	0.42	0.33	0.26	0.17	0.1	0.15	0.14	0.15
Pb (ppm)	0.5	-0.1	0.81	0.49	0.41	0.4	0.3	0.2	0.03	-0	0.03	0.02	0.06
Th (ppm)	0.91	0.21	0.66	0.75	0.75	0.76	0.67	0.56	0.41	0.32	0.39	0.37	0.38
U (ppm)	0.33	0.61	0.17	0.42	0.44	0.51	0.53	0.54	0.51	0.47	0.49	0.49	0.48

	Ho	Er	Tm	Yb	Lu	Hf	Ta	W	Tl	Pb	Th	U
	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
Ho (ppm)	1											
Er (ppm)	0.99	1										
Tm (ppm)	0.9	0.95	1									
Yb (ppm)	0.79	0.86	0.96	1								
Lu (ppm)	0.68	0.77	0.9	0.97	1							
Hf (ppm)	0.2	0.27	0.42	0.52	0.55	1						
Ta (ppm)	0.23	0.31	0.45	0.54	0.57	0.96	1					
W (ppm)	-0.03	-0.03	-0	-0.03	-0	0.08	0.18	1				
Tl (ppm)	0.15	0.17	0.21	0.25	0.23	0.52	0.55	0.04	1			
Pb (ppm)	0.1	0.13	0.19	0.24	0.23	0.39	0.45	0.2	0.24	1		
Th (ppm)	0.4	0.46	0.55	0.61	0.61	0.88	0.92	0.13	0.54	0.44	1	
U (ppm)	0.47	0.46	0.4	0.35	0.28	0.28	0.32	0.08	0.59	-0.08	0.41	1