

	SiO2	Al2O3	Fe2O3	MgO	CaO	Na2O	K2O	TiO2	P2O5	MnO	Sc	Ba	Co	Cs	
	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(ppm)	(ppm)	(ppm)	(ppm)	
SiO2	(wt %)	1													
Al2O3	(wt %)	-0.53	1												
Fe2O3	(wt %)	-0.53	0.863	1											
MgO	(wt %)	-0.66	-0.27	-0.2	1										
CaO	(wt %)	-0.44	-0.52	-0.41	0.96	1									
Na2O	(wt %)	-0.27	0.56	0.335	-0.21	-0.36	1								
K2O	(wt %)	-0.52	0.987	0.816	-0.25	-0.51	0.63	1							
TiO2	(wt %)	-0.37	0.899	0.702	-0.36	-0.57	0.72	0.92	1						
P2O5	(wt %)	0.58	-0.15	0.05	-0.55	-0.4	-0.55	-0.2	-0.2	1					
MnO	(wt %)	-0.55	-0.34	-0.28	0.93	0.94	-0.38	-0.4	-0.4	-0.3	1				
Sc	(ppm)	-0.5	0.965	0.885	-0.29	-0.52	0.52	0.94	0.88	-0.1	-0.3	1			
Ba	(ppm)	-0.4	0.854	0.602	-0.29	-0.52	0.82	0.89	0.87	-0.4	-0.4	0.77	1		
Co	(ppm)	-0.43	0.927	0.893	-0.33	-0.54	0.36	0.88	0.8	0.09	-0.3	0.93	0.72	1	
Cs	(ppm)	-0.48	0.962	0.891	-0.3	-0.54	0.39	0.92	0.81	-0	-0.4	0.93	0.75	0.94	1
Ga	(ppm)	-0.48	0.979	0.874	-0.31	-0.55	0.44	0.94	0.85	-0	-0.3	0.94	0.79	0.95	0.99
Hf	(ppm)	0.56	-0.28	-0.35	-0.38	-0.27	-0.05	-0.3	0.05	0.2	-0.3	-0.3	-0.2	-0.3	-0.3
Nb	(ppm)	-0.35	0.858	0.673	-0.35	-0.55	0.75	0.88	0.99	-0.2	-0.4	0.83	0.85	0.76	0.76
Rb	(ppm)	-0.5	0.99	0.877	-0.3	-0.54	0.48	0.97	0.86	-0.1	-0.4	0.95	0.82	0.94	0.99
Sr	(ppm)	-0.32	0.914	0.731	-0.43	-0.64	0.53	0.89	0.88	-0	-0.4	0.86	0.83	0.87	0.89
Ta	(ppm)	-0.27	0.712	0.51	-0.32	-0.5	0.64	0.73	0.82	-0.3	-0.4	0.69	0.73	0.62	0.64
Th	(ppm)	-0.07	0.764	0.677	-0.61	-0.76	0.52	0.74	0.87	0.12	-0.6	0.78	0.68	0.75	0.75
U	(ppm)	0.14	0.549	0.56	-0.67	-0.75	0.38	0.52	0.69	0.32	-0.7	0.61	0.45	0.61	0.55
Zr	(ppm)	0.57	-0.31	-0.37	-0.37	-0.25	-0.07	-0.3	0.03	0.22	-0.3	-0.3	-0.2	-0.3	-0.3
Y	(ppm)	0.24	0.487	0.489	-0.72	-0.76	0.26	0.45	0.66	0.39	-0.7	0.55	0.38	0.55	0.51
La	(ppm)	-0.01	0.786	0.741	-0.7	-0.83	0.35	0.74	0.8	0.33	-0.7	0.8	0.63	0.82	0.82
Ce	(ppm)	0.06	0.725	0.713	-0.72	-0.84	0.34	0.68	0.77	0.37	-0.7	0.76	0.56	0.77	0.76
Pr	(ppm)	0.01	0.742	0.7	-0.68	-0.81	0.32	0.69	0.78	0.32	-0.7	0.77	0.58	0.78	0.78
Nd	(ppm)	0.06	0.715	0.705	-0.71	-0.83	0.29	0.67	0.74	0.37	-0.7	0.76	0.54	0.77	0.76
Sm	(ppm)	0.11	0.635	0.655	-0.71	-0.8	0.28	0.59	0.7	0.38	-0.7	0.69	0.46	0.71	0.67
Eu	(ppm)	0.08	0.676	0.728	-0.71	-0.8	0.23	0.63	0.68	0.45	-0.7	0.74	0.47	0.76	0.72
Gd	(ppm)	0.2	0.565	0.577	-0.75	-0.81	0.21	0.52	0.65	0.47	-0.7	0.63	0.4	0.65	0.6
Tb	(ppm)	0.23	0.533	0.548	-0.76	-0.82	0.32	0.5	0.67	0.4	-0.8	0.6	0.42	0.6	0.55
Dy	(ppm)	0.21	0.496	0.502	-0.7	-0.76	0.29	0.47	0.66	0.37	-0.7	0.57	0.38	0.56	0.51
Ho	(ppm)	0.21	0.513	0.478	-0.71	-0.77	0.43	0.5	0.72	0.28	-0.7	0.57	0.45	0.53	0.5
Er	(ppm)	0.17	0.536	0.473	-0.68	-0.75	0.41	0.52	0.74	0.24	-0.7	0.58	0.47	0.55	0.53
Tm	(ppm)	0.18	0.498	0.388	-0.65	-0.72	0.49	0.5	0.75	0.14	-0.7	0.53	0.49	0.48	0.45
Yb	(ppm)	0.17	0.482	0.354	-0.63	-0.69	0.48	0.48	0.76	0.12	-0.6	0.52	0.5	0.47	0.43
Lu	(ppm)	0.18	0.452	0.355	-0.61	-0.68	0.5	0.46	0.73	0.11	-0.7	0.49	0.46	0.43	0.4
Mo	(ppm)	0.25	0.101	0.325	-0.46	-0.44	0.2	0.08	0.18	0.26	-0.5	0.21	0.08	0.24	0.14

Cu	(ppm)	-0.19	0.744	0.831	-0.49	-0.64	0.42	0.72	0.7	0.1	-0.6	0.79	0.56	0.78	0.75
Pb	(ppm)	0.04	0.292	0.258	-0.41	-0.46	0.52	0.26	0.37	-0	-0.4	0.32	0.5	0.28	0.28
Zn	(ppm)	-0.28	0.392	0.482	-0.09	-0.17	0.39	0.39	0.43	-0.1	-0.2	0.49	0.35	0.4	0.31
Ni	(ppm)	-0.5	0.942	0.923	-0.27	-0.5	0.43	0.91	0.81	-0	-0.3	0.93	0.75	0.97	0.93
V	(ppm)	-0.45	0.963	0.91	-0.35	-0.58	0.41	0.92	0.83	0.03	-0.4	0.96	0.75	0.96	0.99
Cr	(ppm)	-0.36	0.939	0.882	-0.43	-0.64	0.43	0.9	0.86	0.07	-0.5	0.93	0.75	0.93	0.95
W	(ppm)	-0.02	0.16	0.11	-0.22	-0.25	0.45	0.14	0.27	-0.2	-0.3	0.19	0.37	0.13	0.11
Sn	(ppm)	-0.35	0.89	0.838	-0.37	-0.57	0.4	0.85	0.77	0.14	-0.4	0.87	0.69	0.92	0.88
S	(ppm)	-0.24	0.786	0.911	-0.47	-0.63	0.39	0.75	0.72	0.23	-0.5	0.82	0.56	0.84	0.81
Tl	(ppm)	0.34	0.128	0.556	-0.48	-0.46	0.06	0.09	0.16	0.42	-0.5	0.25	-0	0.36	0.28

		Ga	Hf	Nb	Rb	Sr	Ta	Th	U	Zr	Y	La	Ce	Pr	Nd
	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
Ga	(ppm)	1													
Hf	(ppm)	-0.3	1												
Nb	(ppm)	0.81	0.07	1											
Rb	(ppm)	0.99	-0.3	0.81	1										
Sr	(ppm)	0.92	-0.1	0.85	0.91	1									
Ta	(ppm)	0.67	0.1	0.8	0.69	0.69	1								
Th	(ppm)	0.77	0.29	0.87	0.77	0.81	0.74	1							
U	(ppm)	0.56	0.37	0.71	0.55	0.6	0.58	0.86	1						
Zr	(ppm)	-0.3	0.99	0.05	-0.3	-0.09	0.08	0.26	0.35	1					
Y	(ppm)	0.52	0.5	0.66	0.5	0.58	0.51	0.86	0.89	0.48	1				
La	(ppm)	0.83	0.17	0.78	0.81	0.84	0.64	0.94	0.85	0.15	0.86	1			
Ce	(ppm)	0.76	0.23	0.75	0.75	0.78	0.61	0.93	0.9	0.21	0.9	0.98	1		
Pr	(ppm)	0.79	0.23	0.76	0.77	0.82	0.61	0.92	0.86	0.21	0.89	0.98	0.97	1	
Nd	(ppm)	0.76	0.22	0.72	0.75	0.76	0.6	0.92	0.87	0.2	0.89	0.97	0.98	0.98	1
Sm	(ppm)	0.68	0.3	0.69	0.66	0.69	0.55	0.89	0.9	0.28	0.9	0.94	0.97	0.96	0.98
Eu	(ppm)	0.72	0.16	0.66	0.71	0.71	0.52	0.86	0.85	0.14	0.88	0.94	0.97	0.95	0.97
Gd	(ppm)	0.61	0.35	0.64	0.59	0.64	0.5	0.87	0.88	0.34	0.93	0.92	0.95	0.95	0.96
Tb	(ppm)	0.56	0.42	0.68	0.55	0.61	0.54	0.89	0.92	0.4	0.96	0.9	0.94	0.92	0.94
Dy	(ppm)	0.52	0.46	0.67	0.5	0.56	0.55	0.87	0.91	0.44	0.95	0.86	0.91	0.88	0.9
Ho	(ppm)	0.52	0.48	0.73	0.51	0.6	0.57	0.89	0.9	0.46	0.93	0.85	0.89	0.87	0.88
Er	(ppm)	0.55	0.52	0.75	0.54	0.63	0.64	0.92	0.91	0.5	0.93	0.86	0.89	0.88	0.88
Tm	(ppm)	0.49	0.58	0.77	0.49	0.6	0.65	0.89	0.88	0.55	0.9	0.8	0.83	0.82	0.81
Yb	(ppm)	0.47	0.56	0.78	0.46	0.59	0.65	0.87	0.84	0.54	0.89	0.77	0.79	0.79	0.78
Lu	(ppm)	0.44	0.61	0.76	0.44	0.55	0.62	0.85	0.87	0.58	0.87	0.74	0.78	0.76	0.75
Mo	(ppm)	0.09	0.14	0.19	0.11	0.09	0.14	0.37	0.56	0.13	0.5	0.37	0.45	0.36	0.42
Cu	(ppm)	0.74	-0.1	0.67	0.75	0.65	0.6	0.72	0.68	-0.2	0.63	0.76	0.76	0.73	0.76
Pb	(ppm)	0.27	0.13	0.39	0.28	0.39	0.31	0.46	0.45	0.12	0.4	0.4	0.42	0.43	0.41
Zn	(ppm)	0.33	-0.1	0.44	0.34	0.28	0.31	0.39	0.34	-0.1	0.37	0.32	0.36	0.35	0.36

Ni	(ppm)	0.94	-0.3	0.76	0.94	0.85	0.61	0.72	0.58	-0.3	0.5	0.78	0.74	0.74	0.72
V	(ppm)	0.98	-0.3	0.78	0.98	0.89	0.66	0.78	0.6	-0.3	0.56	0.84	0.79	0.8	0.79
Cr	(ppm)	0.96	-0.1	0.82	0.95	0.91	0.68	0.84	0.68	-0.1	0.65	0.89	0.85	0.86	0.84
W	(ppm)	0.11	0.12	0.29	0.13	0.26	0.22	0.26	0.27	0.12	0.25	0.19	0.22	0.25	0.19
Sn	(ppm)	0.9	-0.3	0.74	0.89	0.83	0.55	0.71	0.58	-0.3	0.52	0.79	0.75	0.73	0.74
S	(ppm)	0.79	-0.1	0.71	0.79	0.71	0.51	0.78	0.77	-0.2	0.67	0.84	0.85	0.79	0.81
Tl	(ppm)	0.18	0.19	0.2	0.19	0.15	0.1	0.43	0.65	0.18	0.55	0.54	0.6	0.51	0.56

		Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Mo	Cu	Pb	Zn
	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
Sm	(ppm)	1													
Eu	(ppm)	0.96	1												
Gd	(ppm)	0.97	0.96	1											
Tb	(ppm)	0.97	0.93	0.97	1										
Dy	(ppm)	0.93	0.9	0.95	0.97	1									
Ho	(ppm)	0.91	0.84	0.91	0.95	0.94	1								
Er	(ppm)	0.89	0.84	0.9	0.94	0.94	0.95	1							
Tm	(ppm)	0.83	0.75	0.83	0.9	0.9	0.94	0.96	1						
Yb	(ppm)	0.79	0.72	0.8	0.88	0.88	0.91	0.94	0.96	1					
Lu	(ppm)	0.78	0.69	0.78	0.86	0.86	0.93	0.93	0.97	0.96	1				
Mo	(ppm)	0.46	0.45	0.45	0.52	0.49	0.46	0.42	0.4	0.39	0.42	1			
Cu	(ppm)	0.73	0.76	0.67	0.68	0.65	0.63	0.61	0.57	0.53	0.55	0.53	1		
Pb	(ppm)	0.4	0.36	0.4	0.44	0.39	0.44	0.42	0.44	0.42	0.43	0.48	0.37	1	
Zn	(ppm)	0.38	0.37	0.36	0.38	0.36	0.4	0.37	0.37	0.34	0.37	0.33	0.52	0.41	1
Ni	(ppm)	0.66	0.71	0.59	0.54	0.51	0.49	0.5	0.45	0.42	0.41	0.28	0.81	0.32	0.45
V	(ppm)	0.71	0.76	0.65	0.61	0.56	0.54	0.56	0.49	0.48	0.45	0.24	0.81	0.33	0.38
Cr	(ppm)	0.78	0.81	0.72	0.69	0.64	0.64	0.65	0.6	0.58	0.56	0.27	0.83	0.39	0.38
W	(ppm)	0.2	0.16	0.21	0.25	0.24	0.29	0.28	0.33	0.34	0.34	0.34	0.23	0.87	0.42
Sn	(ppm)	0.66	0.73	0.62	0.57	0.53	0.53	0.51	0.45	0.44	0.42	0.22	0.74	0.25	0.35
S	(ppm)	0.8	0.85	0.74	0.73	0.69	0.68	0.65	0.58	0.53	0.55	0.52	0.88	0.35	0.47
Tl	(ppm)	0.58	0.64	0.55	0.59	0.56	0.5	0.46	0.42	0.38	0.41	0.87	0.57	0.26	0.17

		Ni	V	Cr	W	Sn	S	Tl
	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
Ni	(ppm)	1						
V	(ppm)	0.96	1					
Cr	(ppm)	0.94	0.97	1				
W	(ppm)	0.18	0.17	0.21	1			

Sn	(ppm)	0.91	0.91	0.88	0.13	1		
S	(ppm)	0.86	0.85	0.86	0.17	0.83	1	
Tl	(ppm)	0.35	0.38	0.39	0.09	0.33	0.72	1