

Supplement

Table S1. Results of whole-rock major (wt.%) and trace element (10^{-6}) compositions for the DS1 and DS2 samples from Pohnpei Island

Element	Sample		Element	Sample	
	DS1	DS2		DS1	DS2
SiO ₂	42.02	41.98	Th	3.15	5.82
TiO ₂	3.71	3.72	U	0.96	1.64
Al ₂ O ₃	11.95	11.93	Nb	39.40	68.80
Fe ₂ O ₃	15.38	15.38	Ta	2.46	4.29
MnO	0.18	0.18	La	30.00	52.60
MgO	11.54	11.56	Ce	64.90	110.00
CaO	11.26	11.24	Pb	1.72	2.99
Na ₂ O	2.42	2.43	Pr	8.23	13.20
K ₂ O	0.94	0.91	Sr	602.00	949.00
P ₂ O ₅	0.51	0.52	Nd	35.00	53.20
Loss On	0.18	0.23	Sm	7.78	10.70
Sum	100.09	100.07	Zr	268.00	427.00
>Mg#	60.00	60.00	Hf	6.25	8.97
Li	5.33	8.16	Eu	2.52	3.36
Be	1.39	2.41	Gd	7.43	9.58
Sc	29.60	12.10	Tb	1.05	1.34
V	343.00	203.00	Dy	5.34	7.00
Cr	500.00	80.50	Y	25.20	34.50
Co	76.70	36.70	Ho	0.93	1.26
Ni	272.00	51.40	Er	2.19	3.09
Cu	51.10	34.60	Tm	0.29	0.42
Zn	118.00	127.00	Yb	1.60	2.40
Ga	20.90	25.00	Lu	0.22	0.34
Cs	0.25	0.53	W	9.73	51.10
Rb	18.10	42.60	Mo	1.71	3.08
Ba	329.00	573.00	Sn	1.88	2.23

Table S2. Results of in situ EPMA major element (wt.%) analyses of olivines in the basalts from Pohnpei Island

Element	SiO ₂	TiO ₂	Al ₂ O ₃	FeO	MnO	MgO	CaO	Cr ₂ O ₃	NiO	Total	Fo
DS1-1-1core	38.81	0.027	0.035	19.13	0.26	40.61	0.24	0.028	0.110	99.27	79
DS1-1-1rim	37.85	0.040	0.023	25.58	0.51	35.52	0.37	0.017	0.067	100.00	71
DS1-1-2core	39.59	0.019	0.037	14.58	0.19	43.88	0.24	0.035	0.230	98.83	84
DS1-1-2rim	37.93	0.049	0.023	25.35	0.50	35.82	0.39	0.022	0.074	100.18	72
DS1-1-3core	38.97	0.024	0.037	19.82	0.24	40.49	0.26	0.014	0.120	99.99	78
DS1-1-3rim	37.97	0.032	0.023	24.63	0.45	36.34	0.35	0.016	0.081	99.93	72
DS1-1-4core	39.02	0.029	0.034	19.53	0.27	40.67	0.22	0.016	0.110	99.92	79
DS1-1-4rim	38.09	0.037	0.026	24.57	0.45	36.74	0.32	0.022	0.075	100.36	73
DS1-1-5core	39.70	0.017	0.041	14.71	0.19	44.15	0.24	0.039	0.220	99.31	84
DS1-1-5rim	38.32	0.040	0.023	24.20	0.45	37.15	0.34	0.014	0.094	100.66	73
DS1-1-6core	39.46	0.033	0.049	15.77	0.20	43.39	0.25	0.085	0.200	99.46	83
DS1-1-6rim	38.24	0.049	0.030	23.77	0.42	37.45	0.29	0.024	0.104	100.40	74
DS1-1-7core	39.48	0.029	0.039	15.01	0.20	43.46	0.26	0.031	0.240	98.52	84
DS1-1-7rim	37.85	0.035	0.023	24.49	0.44	36.56	0.34	0.017	0.105	99.86	73
DS1-1-8	38.77	0.017	0.039	19.92	0.27	40.12	0.22	0.022	0.110	99.40	78
DS1-1-9	38.87	0.028	0.035	19.38	0.27	40.51	0.24	0.006	0.120	99.37	79
DS1-1-10	39.16	0.019	0.033	16.57	0.21	42.31	0.28	0.035	0.200	98.64	82
DS1-1-11	39.55	0.015	0.037	15.38	0.20	43.73	0.23	0.097	0.250	99.26	84
DS1-1-12	39.07	0.022	0.035	19.41	0.26	40.88	0.25	0.027	0.110	99.98	79
DS1-1-13	39.05	0.027	0.040	19.55	0.27	41.34	0.25	0.022	0.130	100.71	79
DS1-1-14	38.57	0.017	0.035	19.90	0.28	40.48	0.24	0.038	0.120	99.71	78
DS1-1-15	38.61	0.032	0.036	20.16	0.29	40.17	0.25	0.018	0.100	99.69	78
DS1-1-16	38.66	0.028	0.040	19.64	0.26	40.31	0.26	0.011	0.120	99.36	79
DS1-1-17	38.57	0.031	0.038	20.08	0.25	40.11	0.27	0.027	0.080	99.48	78
DS1-1-18	38.85	0.023	0.032	20.81	0.26	39.94	0.26	0.045	0.090	100.33	77
DS1-1-19	38.92	0.028	0.038	19.84	0.28	40.52	0.25	0.011	0.100	100.01	78
DS1-1-20	38.83	0.022	0.039	19.62	0.29	40.33	0.23	0.007	0.100	99.39	79
DS1-1-21	39.48	0.029	0.039	15.01	0.20	43.46	0.26	0.031	0.240	98.52	84
DS1-1-22	39.62	0.025	0.046	15.28	0.19	43.72	0.26	0.039	0.250	99.20	84
DS1-1-23	39.31	0.028	0.039	15.04	0.19	43.48	0.26	0.034	0.250	98.40	84
DS1-1-24	38.65	0.032	0.036	19.72	0.27	40.16	0.27	0.022	0.130	99.19	78
DS1-2-1	38.93	0.019	0.042	19.36	0.27	41.58	0.25	0.005	0.100	100.58	79
DS1-2-2	38.83	0.024	0.036	20.00	0.25	40.84	0.25	0.001	0.090	100.34	78
DS1-2-3	39.75	0.023	0.039	15.12	0.20	45.05	0.26	0.025	0.180	100.65	84
DS1-2-4	38.61	0.025	0.041	20.00	0.25	40.60	0.25	0.002	0.100	99.90	78
DS1-2-5	38.75	0.026	0.041	19.60	0.26	40.80	0.25	-	0.080	99.84	79
DS1-2-6	38.91	0.025	0.040	19.24	0.27	41.59	0.25	-	0.100	100.45	79
DS1-2-7	39.54	0.029	0.044	14.49	0.19	45.05	0.26	0.036	0.240	99.89	85

to be continued

Continued from Table S2

Element	SiO ₂	TiO ₂	Al ₂ O ₃	FeO	MnO	MgO	CaO	Cr ₂ O ₃	NiO	Total	Fo
DS1-2-8	38.89	0.027	0.030	18.71	0.26	41.64	0.26	0.003	0.130	99.97	80
DS1-2-9	38.88	0.020	0.028	19.48	0.25	40.83	0.25	-	0.140	99.89	79
DS1-2-10	38.39	0.022	0.033	20.46	0.31	40.07	0.25	-	0.070	99.61	78
DS1-2-11	39.17	0.029	0.038	20.60	0.29	40.39	0.26	0.004	0.130	100.80	78
DS1-2-12	38.47	0.028	0.033	19.83	0.27	39.88	0.26	0.007	0.130	98.79	78
DS1-2-13	38.30	0.029	0.031	20.33	0.25	39.68	0.26	0.004	0.120	98.91	78
DS1-2-14	38.34	0.028	0.034	20.16	0.26	39.72	0.24	0.007	0.110	98.82	78
DS1-2-15	39.00	0.024	0.034	15.37	0.20	42.92	0.26	0.023	0.220	97.85	83
DS1-2-16	39.24	0.014	0.045	14.54	0.19	43.63	0.25	0.040	0.290	97.97	84
DS1-2-17	38.20	0.029	0.036	20.38	0.28	39.66	0.26	0.020	0.110	98.90	78
DS1-2-18	38.35	0.022	0.039	20.17	0.25	39.83	0.26	0.005	0.150	98.95	78
DS1-2-19	38.34	0.025	0.034	20.30	0.28	39.92	0.25	0.015	0.110	99.18	78
DS1-2-20	38.93	0.020	0.071	20.12	0.29	40.24	0.25	-	0.100	99.95	78
DS2-1-1	38.32	0.028	0.03	21.73	0.38	39.19	0.21	0.009	0.068	99.97	76
DS2-1-2	38.81	0.024	0.04	20.90	0.32	40.03	0.24	0.014	0.129	100.52	77
DS2-1-3	38.84	0.028	0.03	20.81	0.32	39.93	0.22	0.010	0.060	100.27	77
DS2-1-4	38.48	0.029	0.04	19.94	0.29	40.70	0.25	0.107	0.120	99.97	78
DS2-2-1	38.29	0.031	0.04	20.11	0.29	39.66	0.24	0.010	0.117	98.69	78
DS2-2-2	38.27	0.038	0.04	20.59	0.29	39.89	0.22	0.046	0.103	99.42	78
DS2-2-3	38.27	0.028	0.03	20.76	0.32	39.30	0.21	0.001	0.063	98.95	77
DS2-2-4	38.32	0.028	0.03	21.73	0.38	39.19	0.21	0.009	0.068	99.97	76
DS2-2-5	38.81	0.024	0.04	20.90	0.32	40.03	0.24	0.014	0.129	100.52	77
DS2-2-6	38.84	0.028	0.03	20.81	0.32	39.93	0.22	0.010	0.060	100.27	77
DS2-2-7	38.48	0.029	0.04	19.94	0.29	40.70	0.25	0.107	0.120	99.97	78
DS2-2-8	38.93	0.027	0.04	20.04	0.32	40.16	0.22	0.029	0.051	99.79	78
DS2-2-9	38.77	0.020	0.04	20.54	0.31	39.96	0.24	0.11	0.120	100.02	78

Note: “-” indicate below detection limit.

Table S3. Results of *in situ* LA-ICP-MS major and trace element analyses of olivines in the basalts from Pohnphei Island

Sample	SiO ₂	TiO ₂	Al ₂ O ₃	FeO	MnO	MgO	CaO	Na ₂ O	P ₂ O ₅	Total	Fo	Li	B	Sc	V	Cr	Co	Ni	Cu	Zn	Ca	Ce	Rb	Sr	Y	Zr	Nb
DS1-1-1core	37.6	0.024	0.031	18.8	0.28	42.4	0.23	0.0068	0.019	99.30	80.000	1.64	0.960	4.01	4.86	20.6	190	978	0.86	154	0.24	0.83	0.0480	0.0120	0.160	0.047	0.0012
DS1-1-1rim	37.2	0.029	0.026	22.6	0.42	38.6	0.27	0.0085	0.032	99.22	75.000	3.39	1.100	3.73	5.19	4.18	185	746	0.32	210	0.21	0.96	0.0000	0.0320	0.450	0.095	0.0000
DS1-1-2core	37.5	0.025	0.036	18.9	0.28	42.4	0.20	0.0070	0.024	99.30	80.000	2.61	0.300	4.03	5.57	19.9	191	966	1.26	150	0.20	0.53	0.0000	0.0084	0.130	0.070	0.0036
DS1-1-2rim	36.9	0.033	0.029	23.4	0.46	38.0	0.33	0.0099	0.032	99.20	74.000	3.88	1.090	3.54	6.71	25.9	184	708	0.69	217	0.22	1.51	0.0000	0.0910	0.700	0.120	0.0047
DS1-1-3core	37.5	0.028	0.032	19.0	0.28	42.1	0.26	0.0075	0.034	99.31	80.000	2.56	0.029	4.17	5.30	7.08	188	849	1.08	147	0.16	1.34	0.0000	0.0039	0.140	0.063	0.0000
DS1-1-3rim	36.7	0.028	0.026	22.4	0.42	39.3	0.31	0.0081	0.022	99.23	76.000	3.27	0.000	3.84	5.54	8.73	182	737	0.34	200	0.26	1.36	0.0360	0.0190	0.610	0.100	0.0022
DS1-1-4core	37.1	0.029	0.036	18.8	0.27	42.7	0.26	0.0074	0.029	99.30	80.000	2.36	0.000	3.82	6.02	11.3	191	966	1.25	144	0.18	1.36	0.0000	0.0120	0.130	0.078	0.0000
DS1-1-4rim	36.5	0.031	0.027	23.1	0.44	38.8	0.29	0.0088	0.022	99.21	75.000	3.73	0.230	3.80	5.41	4.91	185	753	0.12	205	0.13	1.13	0.0360	0.0190	0.570	0.084	0.0000
DS1-1-5core	37.4	0.030	0.036	19.2	0.26	42.1	0.27	0.0076	0.024	99.33	80.000	2.12	0.160	3.97	5.52	11.6	190	706	1.23	146	0.21	0.39	0.0000	0.0110	0.081	0.047	0.0011
DS1-1-5rim	36.1	0.028	0.022	24.2	0.47	38.0	0.38	0.0098	0.025	99.18	74.000	3.47	0.000	3.29	4.77	16.1	183	714	0.82	208	0.29	1.23	0.0000	0.0420	0.720	0.120	0.0000
DS1-1-6core	36.9	0.025	0.031	20.3	0.27	41.5	0.20	0.0071	0.017	99.28	79.000	1.88	0.470	4.11	5.85	17.2	201	806	1.16	156	0.19	1.29	0.0520	0.0079	0.140	0.050	0.0022
DS1-1-6rim	36.8	0.029	0.033	19.3	0.28	42.7	0.21	0.0064	0.017	99.30	80.000	2.01	0.360	3.95	5.57	13.2	192	918	1.57	144	0.16	0.58	0.0110	0.0000	0.150	0.036	0.0000
DS1-1-7core	36.1	0.031	0.023	23.8	0.45	38.4	0.33	0.0091	0.023	99.19	74.000	3.73	0.940	3.80	5.50	4.55	179	701	0.46	200	0.13	0.00	0.0000	0.0300	0.530	0.086	0.0000
DS1-1-7rim	37.8	0.015	0.035	16.3	0.22	44.5	0.18	0.0128	0.095	99.16	83.000	5.06	0.470	3.01	5.13	25.7	169	2392	2.01	164	0.23	0.57	0.0430	0.0084	0.140	0.080	0.0012
DS1-1-8core	36.8	0.025	0.028	21.8	0.39	39.8	0.28	0.0100	0.043	99.18	76.000	4.26	0.790	3.57	5.03	72.4	177	1163	0.36	204	0.25	1.03	0.0027	0.0200	0.510	0.110	0.0023
DS1-1-8rim	37.2	0.024	0.030	19.7	0.25	41.8	0.29	0.0079	0.020	99.29	79.000	2.33	0.530	4.03	5.09	6.64	201	886	0.98	144	0.18	0.87	0.0480	0.0240	0.130	0.040	0.0023
DS1-1-9core	36.3	0.034	0.027	24.0	0.44	38.0	0.36	0.0087	0.028	99.19	74.000	3.00	0.290	3.96	6.15	4.00	183	710	0.32	210	0.26	1.20	0.0560	0.0000	0.650	0.097	0.0022
DS1-1-10core	37.5	0.019	0.035	15.3	0.20	45.9	0.29	0.0091	0.022	99.28	84.000	2.26	1.020	4.67	5.55	15.2	177	1779	2.06	125	0.22	0.65	0.0000	0.0240	0.085	0.061	0.0011
DS1-1-10rim	36.8	0.021	0.031	20.4	0.35	41.2	0.27	0.0094	0.023	99.16	78.000	3.03	0.630	3.91	5.12	14.7	175	1537	1.34	186	0.26	0.26	0.0000	0.0000	0.380	0.069	0.0033
DS1-1-11	37.3	0.029	0.034	19.0	0.28	42.4	0.23	0.0064	0.021	99.29	80.000	1.96	0.640	3.86	5.23	15.0	191	1008	0.95	152	0.35	0.72	0.0000	0.0120	0.150	0.091	0.0000
DS1-2-1	37.7	0.024	0.032	19.2	0.27	41.8	0.25	0.0079	0.023	99.30	80.000	2.54	0.340	3.89	4.98	17.5	187	947	1.21	149	0.11	1.38	0.0069	0.0120	0.140	0.040	0.0012
DS1-2-2	37.2	0.028	0.034	19.5	0.25	42.0	0.26	0.0074	0.025	99.30	79.000	1.71	0.270	3.99	5.57	13.1	197	820	0.82	139	0.22	1.29	0.0000	0.0230	0.130	0.074	0.0000
DS1-2-3core	38.0	0.023	0.034	15.5	0.20	45.2	0.26	0.0091	0.034	99.28	84.000	2.04	0.460	4.67	5.26	15.4	183	1727	2.17	114	0.22	1.17	0.0150	0.0037	0.130	0.053	0.0000
DS1-2-3rim	37.5	0.016	0.028	21.4	0.36	39.6	0.26	0.0095	0.029	99.18	77.000	3.36	0.480	3.70	5.34	93.7	179	1265	0.56	199	0.31	1.52	0.0000	0.0120	0.400	0.075	0.0011
DS1-2-4	37.4	0.025	0.034	20.4	0.25	40.9	0.25	0.0083	0.029	99.26	78.000	2.10	0.190	4.55	6.23	10.2	209	924	1.39	159	0.26	1.10	0.0260	0.0080	0.120	0.044	0.0011
DS1-2-10	37.4	0.026	0.033	19.6	0.26	41.7	0.24	0.0081	0.021	99.30	79.000	2.46	0.930	3.70	5.38	13.9	197	832	1.18	134	0.17	0.25	0.0160	0.0078	0.120	0.060	0.0000
DS1-2-5	38.1	0.027	0.032	19.8	0.27	40.8	0.28	0.0075	0.022	99.31	79.000	2.34	0.490	3.80	4.87	6.17	190	731	1.68	153	0.20	0.70	0.0000	0.0120	0.130	0.071	0.8100
DS1-2-6core	38.2	0.023	0.031	19.4	0.27	41.1	0.25	0.0069	0.020	99.28	79.000	1.93	0.550	4.14	5.08	14.5	196	1036	1.05	149	0.13	1.24	0.0000	0.0280	0.140	0.054	0.0011
DS1-2-6rim	37.1	0.033	0.023	24.2	0.47	36.9	0.36	0.0097	0.029	99.18	73.000	3.70	0.470	3.32	4.98	3.18	183	707	0.44	219	0.22	0.83	0.0000	0.0160	0.680	0.120	0.0000
DS1-2-7	38.1	0.024	0.035	14.5	0.20	46.1	0.27	0.0100	0.025	99.26	85.000	1.66	0.000	4.46	4.90	21.7	176	2033	3.13	113	0.16	1.22	0.0000	0.0000	0.037	0.030	0.0000
DS1-2-8	37.8	0.027	0.036	19.4	0.28	41.4	0.24	0.0082	0.035	99.27	79.000	1.97	0.054	4.62	5.45	27.8	188	1099	1.39	169	0.18	1.26	0.0480	0.0000	0.130	0.064	0.0000
DS1-2-9	36.8	0.024	0.038	19.8	0.250	42.0	0.26	0.0083	0.041	99.25	79.000	2.05	0.25	4.11	6.03	19.1	210	1168	1.29	138	0.19	2.05	0.1100	0.0042	0.120	0.052	0.0012
DS1-2-13-1	36.1	0.024	0.024	24.4	0.43	38.2	0.31	0.0099	0.023	99.52	73.619	3.52	0.510	3.36	5.36	23.2	186	852	0.40	211	0.29	1.31	0.0000	0.0150	0.590	0.110	0.0000
DS1-2-13-2	36.9	0.029	0.033	20.7	0.29	41.1	0.23	0.0067	0.023	99.24	78.021	2.25	0.530	4.82	6.31	14.4	200	992	1.10	175	0.19	1.49	0.0180	0.0042	0.180	0.066	0.0000
DS1-2-13-3	36.8	0.028	0.036	19.7	0.25	42.2	0.23	0.0073	0.018	99.26	79.217	1.84	0.330	4.97	6.17	10.0	210	1113	1.16	141	0.13	1.26	0.0000	0.0043	0.110	0.058	0.0000
DS1-2-13-4	36.7	0.023	0.034	19.6	0.25	42.3	0.26	0.0086	0.044	99.26	79.359	2.06	0.310	4.22	5.58	14.5	209	1141	1.46	137	0.20	2.11	0.0000	0.0130	0.097	0.042	0.0024
DS1-2-13-5	37.1	0.021	0.034	19.7	0.25	41.9	0.24	0.0089	0.041	99.26	79.138	1.59	0.031	4.16	5.31	15.8	206	1145	1.43	139	0.22	1.52	0.0000	0.0084	0.089	0.040	0.0000
DS1-2-13-6	36.8	0.024	0.038	19.8	0.25	42.0	0.26	0.0083	0.041	99.25	79.059	2.05	0.250	4.11	6.03	19.1	210	1168	1.29	138	0.19	2.05	0.1100	0.0042	0.120	0.052	0.0012

to be continued

Continued form Table S3

Sample	SiO ₂	TiO ₂	Al ₂ O ₃	FeO	MnO	MgO	CaO	Na ₂ O	P ₂ O ₅	Total	Pb	Sc	V	Cr	Co	Ni	Cu	Zn	Ga	Ce	Rb	Sr	Y	Zr	Nb		
DS1-2-13-7	36.6	0.024	0.037	19.7	0.25	42.3	0.27	0.0075	0.037	99.250	79.271	2.02	0.670	4.15	5.91	18.6	209	1.204	1.31	139	0.25	1.6000	0.0000	0.0084	0.12	0.048	0.0000
DS1-2-13-8	36.7	0.024	0.035	20.1	0.25	41.9	0.25	0.0083	0.031	99.240	78.827	2.22	0.059	3.83	5.57	18.1	211	1.156	1.14	142	0.23	1.9100	0.0000	0.0042	0.13	0.062	0.0000
DS1-2-13-9	36.6	0.022	0.031	20.2	0.25	41.9	0.21	0.0082	0.038	99.250	78.690	2.15	0.000	4.08	5.51	12.1	205	1.086	1.63	153	0.26	0.5900	0.0230	0.0041	0.13	0.045	0.0012
DS1-2-13-10	36.7	0.029	0.027	22.4	0.36	39.4	0.29	0.0083	0.024	99.190	75.799	3.10	0.430	3.95	5.10	10.6	190	1.000	0.75	185	0.25	1.2500	0.0000	0.0290	0.41	0.110	0.0000
DS1-2-13-11	36.2	0.024	0.023	24.1	0.44	38.0	0.32	0.0100	0.025	99.160	73.710	3.56	0.500	3.39	5.38	23.4	187	858	0.41	209	0.28	1.3300	0.0000	0.0170	0.58	0.120	0.0000
DS2-1-1	36.9	0.029	0.028	20.9	0.37	40.9	0.19	0.0059	0.028	99.296	78.000	3.10	0.000	2.69	4.05	4.65	172	538	1.29	209	0.25	0.3500	0.0035	0.0036	0.17	0.094	0.0010
DS2-1-2	37.0	0.019	0.029	20.1	0.32	41.6	0.22	0.0074	0.021	99.270	79.000	2.13	0.660	3.10	3.67	58.8	161	920	0.57	174	0.21	0.7400	0.0000	0.0000	0.12	0.064	0.0000
DS2-1-3	37.0	0.029	0.030	20.2	0.32	41.5	0.21	0.0068	0.027	99.331	79.000	2.09	0.940	3.08	4.32	3.64	168	469	0.42	164	0.17	1.3900	0.0000	0.0150	0.14	0.062	0.0011
DS2-1-4	37.1	0.027	0.034	19.6	0.29	42.0	0.24	0.0075	0.018	99.294	79.000	2.12	0.130	3.68	4.93	12.9	182	890	1.25	148	0.16	0.0380	0.0000	0.0000	0.14	0.050	0.0012
DS2-1-5	36.7	0.027	0.025	21.2	0.40	40.6	0.23	0.0069	0.021	99.287	77.000	4.90	1.450	2.52	3.82	3.81	168	528	1.18	224	0.18	0.5700	0.0000	0.0350	0.018	0.200	0.0700
DS2-2-1	37.4	0.028	0.029	20.3	0.33	41.0	0.23	0.0067	0.033	99.327	78.000	4.76	1.800	2.72	4.06	0.87	161	436	2.26	189	0.20	0.0000	0.0210	0.1500	0.14	0.078	0.0000
DS2-2-2	36.8	0.027	0.031	19.8	0.29	42.1	0.22	0.0068	0.020	99.300	79.000	2.57	0.370	3.40	5.07	10.4	175	791	0.97	148	0.093	1.0100	0.0000	0.0036	0.12	0.061	0.0010
S7-1-1	35.3	0.036	0.029	26.6	0.43	36.3	0.42	0.0081	0.022	99.097	71.000	5.02	0.000	5.50	10.6	16.0	178	798	0.37	238	0.33	0.8000	0.0000	0.0230	0.50	0.150	0.0011
S7-1-2	36.4	0.016	0.030	23.5	0.35	38.5	0.26	0.0091	0.036	99.121	75.000	4.22	0.120	4.69	7.85	11.4	181	1206	1.30	208	0.17	0.7900	0.0000	0.0300	0.32	0.054	0.0011
S7-1-3	35.8	0.025	0.019	28.0	0.49	34.3	0.37	0.0084	0.023	99.065	69.000	5.40	0.000	4.44	7.11	26.8	175	711	0.14	261	0.25	1.2300	0.0300	0.0490	0.68	0.110	0.0011
S7-1-4	35.7	0.035	0.028	26.3	0.43	36.2	0.41	0.0074	0.023	99.102	71.000	3.71	0.000	5.16	10.7	17.5	179	824	0.50	240	0.31	0.6400	0.0070	0.0280	0.43	0.120	0.0011
S7-1-5	35.8	0.026	0.024	25.5	0.40	37.0	0.32	0.0091	0.032	99.112	72.000	5.56	0.660	4.94	7.63	65.4	182	880	0.47	223	0.21	0.9700	0.0290	0.0470	0.36	0.160	0.0011
S7-2-1	36.1	0.024	0.023	27.6	0.47	34.4	0.40	0.0092	0.049	99.070	69.000	6.25	1.520	5.10	8.00	22.3	175	753	0.25	272	0.30	1.4600	0.0750	0.0480	0.52	0.120	0.0000
S7-2-2	38.0	0.017	0.035	23.6	0.37	36.7	0.27	0.0084	0.036	99.110	73.000	3.61	1.240	5.28	9.68	86.5	191	1268	2.49	217	0.33	0.8900	0.0190	0.0530	0.33	0.140	0.0065
S7-2-3	37.4	0.019	0.030	25.3	0.44	35.5	0.37	0.0100	0.046	99.120	71.000	6.86	0.420	5.71	10.1	32.3	185	852	0.56	256	0.34	0.6900	0.0000	0.0280	0.54	0.095	0.0000
S7-2-4	38.0	0.025	0.023	24.1	0.40	36.2	0.36	0.0085	0.035	99.151	73.000	4.98	1.230	5.28	9.43	25.4	188	893	0.51	229	0.23	0.9900	0.0450	0.0130	0.43	0.110	0.0024
S7-2-5	37.3	0.031	0.025	25.1	0.43	35.8	0.35	0.0075	0.026	99.135	72.000	4.60	0.210	4.89	10.4	10.9	184	811	0.36	244	0.22	1.1400	0.0990	0.0200	0.38	0.086	0.0000
S7-2-6	37.7	0.018	0.029	24.3	0.41	36.3	0.34	0.0090	0.0380	99.151	73.000	5.68	0.500	5.32	9.00	33.9	186	840	0.29	244	0.33	0.7600	0.0210	0.0000	0.43	0.086	0.0000
S7-2-7	37.1	0.025	0.029	23.8	0.40	37.5	0.25	0.0083	0.021	99.172	74.000	3.23	0.000	5.78	8.35	18.0	188	840	0.38	217	0.30	0.3700	0.0000	0.0670	0.35	0.150	0.0034
S7-2-8	36.7	0.027	0.025	26.1	0.43	35.4	0.38	0.0082	0.029	99.106	71.000	4.27	1.530	5.24	9.05	19.2	182	819	0.43	248	0.26	1.3400	0.0660	0.0087	0.48	0.130	0.0012
S8-1-1	36.1	0.023	0.028	24.6	0.39	37.6	0.37	0.0088	0.035	99.135	73.000	3.16	0.360	5.66	7.66	67.4	184	914	1.04	213	0.23	0.2700	0.0000	0.2100	0.40	0.120	0.0021
S8-1-2	36.3	0.038	0.031	24.4	0.40	37.6	0.39	0.0071	0.022	99.147	73.000	2.36	0.560	6.15	10.5	30.1	186	889	0.77	216	0.24	0.6500	0.0400	0.0150	0.41	0.077	0.0011
S8-1-3	36.6	0.022	0.031	24.1	0.39	37.7	0.33	0.0093	0.040	99.144	74.000	2.55	0.430	5.29	9.48	42.3	187	966	1.29	211	0.24	0.6000	0.0120	0.0340	0.40	0.130	0.0000
S8-1-4	35.7	0.020	0.021	24.6	0.40	38.0	0.36	0.0110	0.077	99.133	73.000	4.89	0.000	5.61	10.0	30.0	191	956	2.55	206	0.28	0.9000	0.0040	0.0370	0.36	0.110	0.0000
S8-1-5	36.1	0.025	0.021	25.3	0.42	36.8	0.40	0.0082	0.023	99.127	72.000	3.15	0.800	5.14	8.60	18.3	186	847	0.79	223	0.16	0.4100	0.0000	0.0150	0.38	0.092	0.0000
S8-2-1	36.5	0.035	0.035	25.4	0.39	36.4	0.35	0.0074	0.018	99.117	72.000	2.61	0.200	6.41	10.7	37.2	188	894	0.56	221	0.36	1.4100	0.0350	0.0250	0.40	0.120	0.0024
S8-2-2	36.2	0.024	0.024	26.7	0.42	35.3	0.42	0.0097	0.032	99.096	70.000	4.76	0.700	5.67	8.58	15.5	180	790	0.40	241	0.30	0.8200	0.0000	0.0370	0.45	0.094	0.0000
S8-2-3	36.3	0.022	0.029	25.4	0.39	36.6	0.38	0.0100	0.040	99.119	72.000	3.50	0.730	6.21	9.18	26.1	189	888	2.00	219	0.31	0.6300	0.0000	0.0370	0.35	0.190	0.0012
S8-2-4	36.5	0.027	0.029	25.8	0.39	36.0	0.40	0.0087	0.035	99.112	71.000	3.47	0.570	6.07	9.28	24.0	189	863	1.06	221	0.29	0.9700	0.0000	0.0330	0.44	0.100	0.0012
S8-2-5	36.6	0.030	0.023	26.3	0.41	35.3	0.39	0.0100	0.031	99.097	71.000	4.02	0.570	5.58	8.24	40.1	186	851	0.57	225	0.23	1.1700	0.0000	0.0290	0.54	0.099	0.0000
S8-2-6	36.8	0.029	0.026	25.9	0.41	35.5	0.45	0.0097	0.023	99.100	71.000	2.51	0.000	5.37	8.31	47.9	193	883	0.44	231	0.31	0.9600	0.0048	0.0250	0.50	0.120	0.0012
S8-2-7	37.0	0.019	0.029	25.3	0.39	36.1	0.34	0.0089	0.026	99.107	72.000	3.06	0.660	5.45	9.33	36.2	190	993	1.62	226	0.11	0.8200	0.0000	0.0200	0.41	0.100	0.0000
S8-2-8	37.5	0.026	0.030	24.7	0.39	36.1	0.32	0.0087	0.025	99.122	72.000	2.17	0.540	5.64	10.1	44.2	193	991	1.46	219	0.23	0.9200	0.0330	0.0370	0.32	0.110	0.0012

to be continued

Continued from Table S3

Sample	SiO ₂	TiO ₂	Al ₂ O ₃	FeO	MnO	MgO	CaO	Na ₂ O	P ₂ O ₅	Total	Fo	Li	B	Sc	V	Cr	Co	Ni	Cu	Zn	Ga	Ge	Rb	Sr	Y	Zr	Nb	
S8-2-9	36.8	0.029	0.024	25.3	0.39	36.2	0.40	0.0093	0.026	99.120	72	3.31	0.460	5.56	9.50	31.5	191	893	0.076	221	0.13	0.63	0.034	0.029	0.41	0.097	0.000	0.000
S8-2-10	36.2	0.026	0.020	26.5	0.42	35.4	0.46	0.0086	0.025	99.095	70	4.02	0.770	5.33	8.04	13.9	184	815	0.710	246	0.23	0.95	0.000	0.000	0.41	0.110	0.000	0.000
S8-2-11	36.6	0.024	0.026	25.3	0.40	36.4	0.39	0.0092	0.029	99.124	72	3.22	0.063	5.27	9.56	20.5	187	882	1.210	218	0.19	1.06	0.000	0.037	0.35	0.130	0.001	0.002
S8-3-1	37.4	0.021	0.023	24.6	0.38	36.5	0.23	0.0071	0.014	99.136	73	2.24	0.370	5.12	7.33	21.9	194	944	1.040	219	0.16	0.98	0.021	0.023	0.33	0.160	0.001	0.001
S8-3-2	37.2	0.036	0.032	24.3	0.40	36.8	0.37	0.0110	0.056	99.144	73	3.59	0.560	5.44	8.33	28.9	195	920	1.320	220	0.23	1.14	0.000	0.025	0.40	0.120	0.000	0.000
S8-3-3	37.0	0.023	0.026	25.3	0.43	35.8	0.44	0.0110	0.043	99.114	72	4.43	0.079	5.75	7.58	50.9	189	885	0.470	244	0.14	0.69	0.056	0.023	0.46	0.120	0.000	0.004
S8-3-4	37.4	0.022	0.029	23.9	0.38	37.1	0.28	0.0086	0.029	99.154	73	2.56	0.900	5.61	9.36	27.6	188	931	1.710	211	0.18	1.10	0.018	0.008	0.33	0.100	0.004	0.004
S8-3-5	36.7	0.022	0.031	24.5	0.39	37.1	0.35	0.0099	0.049	99.139	73	4.63	0.220	5.82	10.0	24.8	189	924	1.850	213	0.26	0.91	0.062	0.003	0.33	0.093	0.005	0.006
Samples	Mo	Sn	Sb	Cs	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Ta	Hf	W	Bi	Pb	Th	U		
DS1-1-1core	0.017	1.150	0.063	0.013	0.000	0.000	0.002	0.001	0.000	0.011	0.000	0.011	0.000	0.024	0.002	0.025	0.007	0.041	0.013	0.002	0.000	0.000	0.000	0.000	0.003	0.000	0.001	0.002
DS1-1-1rim	0.016	0.690	0.087	0.000	0.000	0.002	0.006	0.001	0.000	0.000	0.000	0.000	0.000	0.047	0.020	0.063	0.006	0.040	0.017	0.000	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000
DS1-1-2core	0.000	0.400	0.015	0.024	0.000	0.000	0.002	0.001	0.000	0.011	0.003	0.000	0.000	0.000	0.002	0.021	0.001	0.025	0.012	0.002	0.002	0.000	0.000	0.001	0.001	0.000	0.000	0.000
DS1-1-2rim	0.017	1.210	0.000	0.002	0.000	0.004	0.002	0.003	0.015	0.033	0.010	0.064	0.005	0.060	0.019	0.064	0.020	0.210	0.024	0.010	0.000	0.000	0.000	0.008	0.001	0.000	0.000	0.000
DS1-1-3core	0.047	2.400	0.000	0.000	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.022	0.005	0.009	0.006	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.001
DS1-1-3rim	0.000	0.990	0.069	0.000	0.020	0.000	0.004	0.001	0.027	0.000	0.003	0.030	0.005	0.051	0.019	0.091	0.016	0.130	0.027	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000
DS1-1-4core	0.016	0.660	0.019	0.007	0.020	0.000	0.002	0.000	0.000	0.000	0.000	0.010	0.009	0.022	0.006	0.021	0.002	0.046	0.025	0.000	0.000	0.004	0.000	0.000	0.000	0.003	0.000	0.000
DS1-1-4rim	0.000	1.170	0.000	0.000	0.000	0.000	0.004	0.001	0.000	0.010	0.003	0.020	0.003	0.078	0.019	0.092	0.014	0.099	0.017	0.000	0.001	0.000	0.004	0.001	0.000	0.000	0.000	0.000
DS1-1-5core	0.031	1.320	0.024	0.017	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.009	0.004	0.017	0.000	0.016	0.002	0.046	0.024	0.031	0.000	0.000	0.000	0.001	0.005	0.000	0.000	0.000
DS1-1-5rim	0.031	0.680	0.000	0.000	0.000	0.008	0.017	0.003	0.013	0.000	0.013	0.019	0.013	0.077	0.019	0.091	0.015	0.130	0.031	0.000	0.001	0.000	0.000	0.001	0.052	0.001	0.000	0.000
DS1-1-6core	0.016	0.790	0.130	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.003	0.000	0.000	0.017	0.000	0.014	0.005	0.039	0.006	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000
DS1-1-7core	0.031	0.490	0.120	0.000	0.000	0.000	0.000	0.000	0.013	0.010	0.003	0.000	0.002	0.022	0.003	0.014	0.003	0.023	0.006	0.000	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000
DS1-1-7rim	0.000	1.100	0.000	0.002	0.000	0.000	0.041	0.001	0.000	0.010	0.000	0.019	0.007	0.043	0.025	0.064	0.015	0.140	0.024	0.000	0.003	0.000	0.000	0.001	0.005	0.000	0.000	0.000
DS1-1-8core	0.050	0.000	0.023	0.016	0.000	0.000	0.000	0.000	0.015	0.011	0.003	0.032	0.007	0.180	0.002	0.130	0.001	0.400	0.001	0.000	0.008	0.000	0.000	0.003	0.003	0.000	0.000	0.000
DS1-1-8rim	0.033	1.030	0.068	0.007	0.000	0.004	0.004	0.005	0.014	0.000	0.003	0.021	0.000	0.088	0.013	0.045	0.018	0.150	0.017	0.002	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000
DS1-1-9core	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.003	0.010	0.003	0.010	0.002	0.230	0.005	0.024	0.004	0.040	0.003	0.008	0.007	0.000	0.000	0.010	0.005	0.000	0.000	0.000
DS1-1-9rim	0.016	0.009	0.061	0.004	0.000	0.002	0.011	0.001	0.000	0.000	0.003	0.031	0.008	0.057	0.017	0.110	0.016	0.160	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.000
DS1-1-10core	0.016	0.560	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.011	0.000	0.000	0.000	0.012	0.000	0.016	0.005	0.024	0.005	0.000	0.003	0.000	0.000	0.004	0.002	0.000	0.000	0.000
DS1-1-10rim	0.000	0.600	0.000	0.017	0.000	0.000	0.002	0.001	0.000	0.000	0.003	0.000	0.006	0.028	0.025	0.045	0.012	0.047	0.017	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DS1-1-1-11	0.000	1.150	0.061	0.000	0.000	0.000	0.000	0.000	0.014	0.000	0.000	0.010	0.002	0.030	0.003	0.034	0.002	0.160	0.012	0.003	0.003	0.000	0.000	0.001	0.002	0.000	0.000	0.000
DS1-2-1	0.000	0.860	0.000	0.000	0.021	0.000	0.000	0.000	0.000	0.011	0.006	0.000	0.004	0.000	0.005	0.020	0.005	0.040	0.013	0.008	0.005	0.000	0.012	0.003	0.005	0.000	0.000	0.000
DS1-2-2	0.000	1.510	0.000	0.023	0.000	0.000	0.004	0.000	0.000	0.000	0.006	0.000	0.000	0.032	0.005	0.019	0.002	0.150	0.008	0.005	0.003	0.000	0.003	0.006	0.018	0.000	0.000	0.000
DS1-2-3core	0.000	1.420	0.065	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.000	0.051	0.000	0.016	0.000	0.072	0.001	0.003	0.000	0.004	0.000	0.004	0.002	0.000	0.000	0.000
DS1-2-3rim	0.000	1.300	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.038	0.009	0.110	0.019	0.040	0.008	0.030	0.010	0.001	0.001	0.000	0.000	0.004	0.011	0.008	0.000	0.000
DS1-2-4	0.033	0.710	0.047	0.002	0.000	0.000	0.002	0.000	0.000	0.000	0.003	0.000	0.002	0.110	0.002	0.180	0.002	0.071	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DS1-2-10	0.000	0.980	0.000	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.006	0.015	0.003	0.007	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
DS1-2-5	0.000	1.160	0.041	0.000	0.020	0.002	0.004	0.000	0.000	0.000	0.006	0.000	0.001	0.000	0.004	0.021	0.004	0.032	0.002	0.000	0.000	0.004	0.000	0.004	0.006	0.013	0.000	0.000
DS1-2-6core	0.000	1.070	0.047	0.000	0.021	0.000	0.000	0.001	0.014	0.000	0.000	0.000	0.001	0.000	0.004	0.012	0.002	0.024	0.001	0.002	0.006	0.000	0.000	0.004	0.011	0.000	0.000	0.000
DS1-2-6rim	0.000	1.760	0.000	0.000	0.000	0.002																						

Continued form Table S3

Samples	Mo	Sn	Sb	Cs	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	W	Pb	Th	U	
DS1-2-7	0.000	0.660	0.0390	0.0130	0.021	0.000	0.000	0.000	0.000	0.000	0.0033	0.0100	0.0000	0.0000	0.0053	0.0160	0.0000	0.0240	0.0048	0.0020	0.0004	0.0000	0.0000	0.0057	0.0000	0.0000
DS1-2-8	0.033	0.480	0.0000	0.0000	0.000	0.000	0.000	0.0018	0.000	0.010	0.0033	0.0000	0.0029	0.0110	0.0040	0.0250	0.0080	0.0400	0.0060	0.0020	0.0000	0.0000	0.0069	0.0056	0.0000	0.0006
DS1-2-9	0.000	1.250	0.0000	0.0000	0.000	0.000	0.000	0.0000	0.000	0.000	0.0000	0.0000	0.0000	0.0000	0.0057	0.0054	0.0160	0.0027	0.0081	0.0037	0.0000	0.0000	0.0023	0.0232	0.0000	0.0000
DS1-2-13-1	0.000	1.350	0.0000	0.0000	0.000	0.000	0.0044	0.0017	0.013	0.000	0.0065	0.0390	0.0130	0.0810	0.0170	0.0890	0.0140	0.1400	0.0250	0.0110	0.0000	0.0000	0.0000	0.0172	0.0000	0.0007
DS1-2-13-2	0.018	0.990	0.0000	0.0160	0.000	0.000	0.0000	0.0000	0.015	0.000	0.0035	0.0210	0.0015	0.0000	0.0070	0.0830	0.0099	0.0330	0.0110	0.0000	0.0005	0.0000	0.0000	0.0149	0.0007	0.0000
DS1-2-13-3	0.000	1.040	0.0050	0.0081	0.000	0.0046	0.0000	0.0000	0.000	0.000	0.0000	0.0110	0.0060	0.0058	0.0028	0.0210	0.0028	0.0330	0.0050	0.0000	0.0000	0.0000	0.0075	0.0090	0.0000	0.0000
DS1-2-13-4	0.000	0.700	0.0060	0.0025	0.000	0.0046	0.0000	0.0000	0.000	0.0110	0.0000	0.0210	0.0059	0.0170	0.0042	0.0160	0.0070	0.0410	0.0050	0.0042	0.0000	0.0046	0.0000	0.0058	0.0000	0.0013
DS1-2-13-5	0.000	0.730	0.0035	0.0000	0.000	0.0000	0.0000	0.0000	0.000	0.0000	0.0000	0.0000	0.0030	0.0110	0.0041	0.0160	0.0014	0.0330	0.0037	0.0000	0.0000	0.0000	0.0050	0.0147	0.0000	0.0000
DS1-2-13-6	0.000	1.250	0.0000	0.0000	0.000	0.0000	0.0000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0057	0.0054	0.0160	0.0027	0.0081	0.0037	0.0000	0.0000	0.0023	0.0232	0.0000	0.0000
DS1-2-13-7	0.017	0.570	0.0040	0.0000	0.000	0.0000	0.0023	0.0000	0.000	0.0110	0.0000	0.0100	0.0029	0.0110	0.0027	0.0200	0.0041	0.0081	0.0110	0.0021	0.0000	0.0000	0.0026	0.0060	0.0000	0.0006
DS1-2-13-8	0.000	1.100	0.0180	0.0000	0.000	0.0000	0.0000	0.0000	0.000	0.0000	0.0034	0.0200	0.0014	0.0056	0.0040	0.0120	0.0041	0.0480	0.0049	0.0061	0.0000	0.0000	0.0072	0.0058	0.0000	0.0006
DS1-2-13-9	0.017	1.070	0.0000	0.0078	0.000	0.0000	0.0000	0.0000	0.000	0.0000	0.0000	0.0310	0.0073	0.0400	0.0190	0.0630	0.0095	0.1200	0.0150	0.0020	0.0008	0.0000	0.0280	0.0170	0.0021	0.0000
DS1-2-13-10	0.000	0.850	0.0040	0.0000	0.000	0.0000	0.0067	0.0019	0.000	0.0000	0.0068	0.0410	0.0120	0.0840	0.0180	0.1200	0.0160	0.1600	0.0270	0.0100	0.0000	0.0000	0.0000	0.0172	0.0000	0.0006
DS1-2-13-11	0.000	1.360	0.0000	0.0000	0.000	0.0000	0.0000	0.0018	0.014	0.0000	0.0068	0.0410	0.0120	0.0840	0.0180	0.1200	0.0160	0.1600	0.0270	0.0100	0.0000	0.0000	0.0000	0.0172	0.0000	0.0006
DS2-1-1	0.000	0.270	0.0020	0.0000	0.000	0.0000	0.0100	0.0000	0.000	0.0000	0.0000	0.0000	0.0013	0.0049	0.0039	0.0200	0.0059	0.0580	0.0058	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000
DS2-1-2	0.046	0.590	0.0048	0.0071	0.000	0.0000	0.0000	0.0016	0.000	0.0210	0.0000	0.0000	0.0040	0.0250	0.0013	0.0240	0.0012	0.0150	0.0082	0.0000	0.0018	0.0000	0.0024	0.0157	0.0000	0.0006
DS2-1-3	0.000	0.580	0.0030	0.0000	0.000	0.0000	0.0000	0.0000	0.000	0.0110	0.0000	0.0000	0.0014	0.0150	0.0081	0.0110	0.0000	0.0006	0.0072	0.0056	0.0000	0.0000	0.0000	0.0054	0.0000	0.0018
DS2-1-4	0.017	0.560	0.0030	0.0021	0.020	0.0000	0.0000	0.0018	0.000	0.0000	0.0000	0.0000	0.0029	0.0270	0.0100	0.0140	0.0079	0.0160	0.0064	0.0060	0.0024	0.0000	0.0000	0.0000	0.0000	0.0000
DS2-1-5	0.000	0.077	0.3300	0.0000	0.000	0.0000	0.0000	0.0041	0.000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0040	0.0600	0.0040	0.0036	0.0029	0.0082	0.0057	0.0000	0.0000	0.0130	0.0160	0.0013
DS2-2-1	0.016	1.340	0.1700	0.0000	0.000	0.0000	0.0000	0.0017	0.000	0.0000	0.0000	0.0000	0.0015	0.0110	0.0068	0.0310	0.0051	0.0320	0.0051	0.0059	0.0000	0.0045	0.0000	0.0141	0.0013	0.0000
DS2-2-2	0.044	0.370	0.0230	0.0000	0.000	0.0000	0.0000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0100	0.0000	0.0000	0.0290	0.0120	0.0018	0.0000	0.0000	0.0000	0.0155	0.0000	0.0006
S7-1-1	0.015	0.520	0.0000	0.0019	0.000	0.0000	0.0000	0.0017	0.000	0.0100	0.0000	0.0190	0.0039	0.0700	0.0200	0.0650	0.0110	0.0660	0.0220	0.0000	0.0000	0.0042	0.0000	0.0000	0.0000	0.0006
S7-1-2	0.000	0.900	0.0000	0.0000	0.000	0.0000	0.0063	0.0000	0.000	0.0000	0.0031	0.0094	0.0014	0.0410	0.0041	0.0300	0.0086	0.0450	0.0120	0.0056	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S7-1-3	0.016	0.640	0.0078	0.0020	0.000	0.0000	0.0000	0.0044	0.000	0.0110	0.0092	0.0000	0.0054	0.0500	0.0290	0.1100	0.0240	0.1800	0.0380	0.0056	0.0000	0.0000	0.0100	0.0000	0.0000	0.0000
S7-1-4	0.032	0.240	0.0400	0.0000	0.000	0.0000	0.0000	0.0000	0.000	0.0110	0.0033	0.0510	0.0015	0.0520	0.0180	0.0650	0.0150	0.1400	0.0340	0.0058	0.0000	0.0000	0.0000	0.0057	0.0000	0.0006
S7-1-5	0.000	0.750	0.0000	0.0000	0.000	0.0000	0.0086	0.0000	0.000	0.0110	0.0000	0.0510	0.0083	0.0510	0.0230	0.0430	0.0066	0.1000	0.0140	0.0000	0.0011	0.0000	0.0000	0.0057	0.0000	0.0006
S7-2-1	0.070	0.920	0.0000	0.0000	0.000	0.0000	0.0024	0.0000	0.000	0.0250	0.0035	0.0430	0.0057	0.0480	0.0150	0.0800	0.0110	0.1500	0.0220	0.0000	0.0000	0.0000	0.0000	0.0122	0.0014	0.0000
S7-2-2	0.000	0.980	0.0570	0.0050	0.020	0.0021	0.0150	0.0017	0.000	0.0220	0.0062	0.0095	0.0025	0.0590	0.0200	0.0380	0.0072	0.0690	0.0130	0.0076	0.0000	0.0000	0.0046	0.0027	0.0013	0.0000
S7-2-3	0.016	1.150	0.0160	0.0000	0.000	0.0000	0.0045	0.0018	0.000	0.0000	0.0067	0.0400	0.0070	0.0510	0.0200	0.0930	0.0150	0.0900	0.0140	0.0022	0.0000	0.0082	0.0000	0.0000	0.0007	0.0000
S7-2-4	0.000	0.460	0.0000	0.0000	0.000	0.0000	0.0046	0.0000	0.000	0.0370	0.0034	0.0210	0.0028	0.1200	0.0130	0.0400	0.0080	0.1200	0.0140	0.0021	0.0000	0.0000	0.0000	0.0061	0.0000	0.0000
S7-2-5	0.032	1.250	0.0000	0.0100	0.000	0.0000	0.0000	0.0000	0.000	0.0000	0.0033	0.0200	0.0067	0.0560	0.0180	0.0550	0.0160	0.1300	0.0230	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S7-2-6	0.016	0.380	0.0091	0.0051	0.000	0.0000	0.0022	0.0018	0.029	0.0120	0.0000	0.0500	0.0014	0.0460	0.0170	0.0800	0.0210	0.1000	0.0260	0.0040	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S7-2-7	0.047	1.030	0.0000	0.0077	0.040	0.0000	0.0065	0.0000	0.000	0.0460	0.0000	0.0390	0.0040	0.0280	0.0096	0.0510	0.0350	0.0240	0.0150	0.0039	0.0000	0.0000	0.0000	0.0085	0.0000	0.0006
S7-2-8	0.000	1.140	0.0081	0.0000	0.000	0.0000	0.0069	0.0000	0.000	0.0000	0.0034	0.0310	0.0140	0.0460	0.0160	0.0710	0.0140	0.0970	0.0220	0.0000	0.0000	0.0000	0.0025	0.0000	0.0000	0.0000
S8-1-1	0.032	0.190	0.0280	0.0074	0.000	0.0000	0.0020	0.0000	0.000	0.0210	0.0061	0.0093	0.0053	0.0250	0.0160	0.0610	0.0096	0.0740	0.0094	0.0037	0.0000	0.0037	0.0051	0.0000	0.0019	0.0023
S8-1-2	0.046	0.430	0.0000	0.0000	0.000	0.0020	0.0020	0.0017	0.000	0.0310	0.0030	0.0093	0.0027	0.0250	0.0180	0.0390	0.0072	0.1000	0.0250	0.0037	0.0000	0.0000	0.0000	0.0079	0.0000	0.0012
S8-1-3	0.031	0.420	0.0000	0.0028	0.000	0.0000	0.0000	0.0000	0.013	0.0110	0.0120	0.0094	0.0000	0.0300	0.0094	0.0300	0.0000	0.1000	0.0000	0.0000	0.0000	0.0000	0.0052	0.0026	0.0007	0.0000
S8-1-4	0.015	0.400	0.0170	0.0095	0.019	0.0000	0.0020	0.0000	0.000	0.0000	0.0030	0.0370	0.0078	0.0440	0.0210	0.0720	0.0140	0.1100	0.0200	0.0054	0.0000	0.0000	0.0000	0.0000	0.0006	0.0000

to be continued

Continued form Table S3

Samples	Mo	Sr	Sb	Cs	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	W	Pb	Bi	Th	U	
S8-1-5	0.016	0.7700	0.0110	0.0000	0.0000	0.0000	0.0000	0.0017	0.054	0.0210	0.0093	0.0000	0.0040	0.0810	0.0130	0.0470	0.0110	0.1000	0.0130	0.0000	0.0000	0.0000	0.0000	0.0250	0.0000	0.0007	0.0006
S8-2-1	0.018	0.3000	0.0840	0.0000	0.0000	0.0000	0.0023	0.0000	0.045	0.0000	0.0110	0.0320	0.0046	0.0520	0.0210	0.0600	0.0120	0.1200	0.0230	0.0040	0.0000	0.0000	0.0000	0.0100	0.0030	0.0014	0.0006
S8-2-2	0.052	0.7400	0.0570	0.0100	0.0000	0.0000	0.0023	0.0000	0.000	0.0000	0.0034	0.0000	0.0061	0.0460	0.0170	0.0590	0.0180	0.1500	0.0180	0.0039	0.0000	0.0000	0.0000	0.0017	0.0002	0.0000	0.0000
S8-2-3	0.017	1.6000	0.0350	0.0004	0.0000	0.0000	0.0000	0.0018	0.000	0.0000	0.0000	0.0210	0.0076	0.0460	0.0099	0.0590	0.0091	0.0970	0.0067	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0086	0.0000
S8-2-4	0.018	0.2000	0.0780	0.0000	0.0000	0.0000	0.0000	0.0055	0.000	0.0000	0.0000	0.0110	0.0077	0.0580	0.0210	0.0690	0.0160	0.1500	0.0200	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S8-2-5	0.018	0.6100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	0.0110	0.0000	0.0210	0.0015	0.0580	0.0071	0.0790	0.0093	0.1600	0.0210	0.0040	0.0000	0.0130	0.0052	0.0029	0.0000	0.0000	0.0000
S8-2-6	0.017	0.3200	0.0180	0.0000	0.0000	0.0000	0.0110	0.0000	0.015	0.0210	0.0035	0.0000	0.0015	0.0570	0.0130	0.0470	0.0092	0.1100	0.0170	0.0000	0.0000	0.0000	0.0000	0.0068	0.0029	0.0007	0.0000
S8-2-7	0.017	1.5100	0.0330	0.0000	0.0000	0.0000	0.0000	0.0000	0.015	0.0100	0.0034	0.0100	0.0044	0.0390	0.0160	0.0340	0.0100	0.1200	0.0170	0.0000	0.0000	0.0000	0.0000	0.0082	0.0000	0.0007	0.0006
S8-2-8	0.000	0.2300	0.0000	0.0000	0.0000	0.0023	0.0000	0.0000	0.000	0.0000	0.0035	0.0420	0.0015	0.0350	0.0029	0.0770	0.0052	0.0640	0.0180	0.0039	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S8-2-9	0.035	0.6200	0.0000	0.0000	0.0000	0.0000	0.0120	0.0000	0.030	0.0000	0.0035	0.0740	0.0016	0.0290	0.0170	0.0580	0.0130	0.0730	0.0240	0.0020	0.0000	0.0042	0.0034	0.0058	0.0007	0.0000	0.0000
S8-2-10	0.071	1.5800	0.0150	0.0200	0.0000	0.0023	0.0023	0.0000	0.000	0.0000	0.0035	0.0210	0.0046	0.0760	0.0170	0.0540	0.0180	0.1300	0.0240	0.0021	0.0000	0.0000	0.0000	0.0000	0.0029	0.0000	0.0000
S8-2-11	0.018	1.5400	0.0760	0.0000	0.0000	0.0000	0.0069	0.0000	0.015	0.0000	0.0000	0.0420	0.0046	0.0630	0.0099	0.0120	0.0079	0.0890	0.0280	0.0020	0.0000	0.0084	0.0000	0.0000	0.0000	0.0000	0.0000
S8-3-1	0.033	1.4000	0.0000	0.0110	0.0000	0.0000	0.0043	0.0000	0.014	0.0100	0.0000	0.0000	0.0086	0.0220	0.0066	0.0400	0.0098	0.0980	0.0490	0.0018	0.0000	0.0040	0.0000	0.0000	0.0000	0.0000	0.0000
S8-3-2	0.053	0.6700	0.110	0.0000	0.0000	0.0000	0.0000	0.0000	0.015	0.0000	0.0000	0.0110	0.0046	0.0360	0.0085	0.0210	0.0054	0.0410	0.0250	0.0040	0.0000	0.0000	0.0056	0.0000	0.0000	0.0000	0.0006
S8-3-3	0.000	0.5600	0.0300	0.0000	0.0000	0.0062	0.0021	0.0016	0.000	0.0099	0.0095	0.0097	0.0028	0.0800	0.0150	0.0740	0.0160	0.1200	0.0160	0.0018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S8-3-4	0.035	0.6400	0.0710	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	0.0110	0.0100	0.0530	0.0046	0.0350	0.0130	0.0430	0.0130	0.0820	0.0130	0.0060	0.0000	0.0000	0.0000	0.0000	0.0029	0.0007	0.0000
S8-3-5	0.016	1.3400	0.0018	0.0048	0.0000	0.0000	0.0000	0.0017	0.000	0.0100	0.0065	0.0099	0.0043	0.0320	0.0150	0.0460	0.0086	0.0910	0.0160	0.0019	0.0007	0.0000	0.0000	0.0000	0.0055	0.0000	0.0000

Table S4. Results of *in situ* LA-ICP-MS major and trace element analyses and the recommended reference value of the standards GSE-1G, BCR-2G, BHVO-2G, and BIR-1G glasses

Data	Sample	SiO ₂	TiO ₂	Al ₂ O ₃	FeO	MnO	MgO	CaO	Na ₂ O	K ₂ O	P ₂ O ₅	Li	B	Sc	V	Cr	Co	Ni	Cu	Zn	Ga	Ge	Rb	Sr	Y	Zr	Nb
Measured data	BIR-1G	48.20	0.95	15.10	10.90	0.18	9.47	12.8	1.61	0.022	0.030	3.09	0.730	40.9	319	385.0	47.9	169.0	111.0	77.7	15.1	0.73	0.21	101.2	13.1	13.1	0.45
Measured data	BIR-1G	48.50	0.97	15.40	10.35	0.18	9.77	12.4	1.64	0.022	0.029	3.05	0.049	40.7	317	388.0	50.8	171.0	111.0	74.9	14.3	2.01	0.20	100.6	13.0	12.8	0.44
Measured data	BIR-1G	47.40	0.96	15.40	10.30	0.18	9.38	13.7	1.87	0.021	0.037	3.31	0.750	44.0	323	406.0	52.3	176.0	122.0	71.6	15.2	1.28	0.32	109.0	14.9	14.2	0.48
Measured data	BIR-1G	47.50	0.93	15.70	10.30	0.18	9.74	12.9	1.88	0.022	0.037	3.06	1.250	44.0	322	383.0	52.7	172.0	120.0	74.9	15.5	1.47	0.21	108.0	15.1	14.0	0.55
Measured data	BIR-1G	47.40	0.98	15.50	10.50	0.18	9.51	13.3	1.87	0.021	0.035	3.01	1.500	44.4	326	395.0	52.0	171.0	125.0	70.3	15.5	1.07	0.24	109.0	15.3	14.6	0.47
Measured data	BIR-1G	47.30	0.97	15.60	10.50	0.18	9.68	13.0	1.91	0.021	0.036	3.29	0.950	44.0	325	398.0	52.4	178.0	126.0	72.3	16.4	1.16	0.19	110.0	15.1	14.4	0.54
Measured data	BIR-1G	48.50	0.96	15.10	9.93	0.18	9.34	13.3	1.88	0.022	0.040	2.80	1.140	44.2	321	389.0	52.4	178.0	126.0	71.0	15.4	0.75	0.22	106.0	14.3	13.9	0.50
Measured data	BIR-1G	47.30	0.92	15.50	10.80	0.18	9.51	13.0	1.89	0.021	0.030	3.10	1.660	42.6	315	410.0	52.8	179.0	125.0	71.2	15.2	1.60	0.18	108.0	14.5	13.9	0.54
Measured data	BIR-1G	47.50	0.94	15.50	10.60	0.18	9.46	13.0	1.89	0.022	0.041	3.07	0.570	44.0	323	399.0	52.6	178.0	125.0	72.4	16.1	1.37	0.20	107.0	15.1	14.1	0.51
Measured data	BIR-1G	47.90	0.94	15.20	10.10	0.18	9.46	13.5	1.88	0.021	0.040	2.73	0.710	44.1	321	390.0	52.8	176.0	125.0	70.9	15.0	0.75	0.19	108.0	14.7	14.0	0.53
Measured data	BIR-1G	47.90	0.95	15.20	10.40	0.18	9.60	13.0	1.86	0.021	0.044	2.86	2.580	43.1	314	385.0	53.0	173.0	127.0	73.0	16.2	1.33	0.26	107.0	15.0	13.5	0.50
Measured data	BIR-1G	47.60	0.95	15.40	10.40	0.18	9.51	13.1	1.90	0.022	0.028	3.20	2.300	44.4	321	421.0	52.7	179.0	127.0	73.0	16.2	1.33	0.26	107.0	15.0	13.5	0.50
Measured data	average	47.80	0.95	15.40	10.40	0.18	9.54	13.1	1.84	0.022	0.036	3.05	1.100	43.4	321	396.0	52.1	175.0	122.0	72.7	15.4	1.19	0.22	107.0	14.6	13.8	0.50
Reference data	BIR-1G	47.50	0.90	15.50	10.40	0.19	9.40	13.3	1.85	0.022	0.027	3.00	43.0	326	392.0	52.0	178.0	119.0	119.0	78.0	15.0	1.20	0.20	109.0	14.3	14.0	0.52
Measured data	BCR-2G	54.50	2.32	13.50	13.40	0.20	3.63	6.82	2.83	1.803	0.330	8.10	3.310	32.9	414	15.6	35.1	11.6	15.3	145.0	21.0	1.05	43.7	327.0	31.1	173.0	10.79
Measured data	BCR-2G	55.40	2.31	13.50	12.50	0.21	3.62	6.75	2.92	1.793	0.370	8.87	4.710	31.5	413	17.5	35.7	11.9	15.9	139.0	20.3	1.67	44.4	314.0	30.9	168.0	10.65
Measured data	BCR-2G	54.40	2.37	13.50	12.80	0.21	3.42	7.19	3.33	1.784	0.360	9.93	6.200	34.3	426	15.5	38.1	12.5	18.0	133.0	22.9	1.65	47.3	345.0	35.6	187.0	12.70
Measured data	BCR-2G	54.40	2.24	13.60	12.60	0.20	3.48	7.22	3.31	1.823	0.390	8.79	5.810	33.1	414	14.1	37.4	12.5	16.2	128.0	22.9	2.02	45.7	338.0	34.6	185.0	12.70

to be continued

Continued from Table S4

Data	Sample	SiO ₂	TiO ₂	Al ₂ O ₃	FeO	MnO	MgO	CaO	Na ₂ O	K ₂ O	P ₂ O ₅	Li	B	Sc	V	Cr	Co	Ni	Cu	Zn	Ga	Ge	Rb	Sr	Y	Zr	Nb
Measured data	BCR-2G	54.60	2.31	13.50	12.50	0.20	3.45	7.28	3.32	1.797	0.370	8.80	5.74	33.5	42.1	17.7	36.9	13.5	17.4	133.0	22.8	2.90	47.80	349.0	35.5	187.0	12.80
Measured data	BCR-2G	54.40	2.29	13.70	12.60	0.21	3.56	7.16	3.34	1.825	0.380	8.77	6.30	34.0	42.1	16.5	37.4	13.4	17.3	134.0	23.3	1.99	46.70	342.0	34.7	188.0	12.70
Measured data	BCR-2G	54.10	2.35	13.80	12.30	0.21	3.61	7.40	3.37	1.807	0.370	9.04	6.44	33.9	42.2	15.9	37.3	12.5	18.1	138.0	23.2	2.42	47.10	350.0	35.5	190.0	12.80
Measured data	BCR-2G	53.20	2.26	13.90	13.20	0.21	3.61	7.49	3.30	1.789	0.370	8.85	5.46	34.5	42.3	15.3	36.5	11.9	16.6	136.0	23.4	2.43	46.70	351.0	36.3	188.0	12.80
Measured data	BCR-2G	54.00	2.30	13.80	12.80	0.21	3.59	7.10	3.32	1.825	0.380	9.17	5.80	32.9	42.4	15.4	37.5	12.1	17.1	134.0	22.8	1.00	46.30	347.0	35.4	188.0	12.70
Measured data	BCR-2G	54.10	2.31	13.70	12.50	0.21	3.57	7.42	3.32	1.794	0.360	9.20	6.13	34.4	42.5	14.9	37.3	10.2	16.4	131.0	22.6	1.96	47.10	349.0	35.8	188.0	12.90
Measured data	BCR-2G	53.50	2.35	13.90	13.00	0.21	3.56	7.27	3.37	1.786	0.380	9.46	5.63	34.3	42.6	16.5	38.0	13.5	16.9	138.0	22.3	2.45	47.90	352.0	36.6	191.0	12.90
Measured data	BCR-2G	53.80	2.30	14.00	12.50	0.21	3.58	7.41	3.33	1.827	0.370	8.55	6.24	34.1	42.9	15.4	37.4	13.6	16.8	135.0	23.5	1.13	46.00	345.0	35.6	187.0	12.70
Measured data	average	54.20	2.31	13.70	12.70	0.21	3.56	7.21	3.25	1.804	0.370	8.96	5.65	33.6	42.2	15.9	37.0	12.4	16.8	135.0	22.6	1.89	46.40	343.0	34.8	185.0	12.40
Reference data	BCR-2G	54.40	2.35	13.40	12.40	0.20	3.56	7.06	3.23	1.795	0.370	9.00	6.00	33.0	42.5	17.0	38.0	13.0	21.0	125.0	23.0	1.50	47.00	342.0	35.0	184.0	12.50
Measured data	BHVO-2G	50.60	2.79	13.40	11.70	0.17	7.19	10.80	1.99	0.515	0.260	4.07	3.00	30.1	31.3	288.0	41.4	123.0	118.0	108.0	19.6	2.23	8.78	375.0	22.6	153.0	15.00
Measured data	BHVO-2G	50.10	2.72	13.7	11.4	0.18	7.35	11.2	2.02	0.519	0.27	4.30	4.77	30.8	31.1	285	43.1	121	122	112	18.9	2.12	8.22	374	21.6	153.0	15.20
Measured data	BHVO-2G	49.70	2.83	13.5	11.4	0.18	7.06	11.6	2.34	0.507	0.27	4.28	3.79	31.1	32.2	303	44.6	123	132	107	22.5	1.62	9.98	400	25.5	172.0	18.40
Measured data	BHVO-2G	50.10	2.69	13.6	11.3	0.18	7.25	11.2	2.31	0.521	0.30	3.81	4.43	32.6	31.8	290	43.8	122	130	101	21.4	1.08	9.65	404	25.7	169.0	18.40
Measured data	BHVO-2G	49.90	2.76	13.4	11.4	0.18	6.96	11.7	2.30	0.514	0.28	4.45	3.75	32.4	32.4	302	46.2	122	132	103	22.0	2.49	9.33	400	25.5	169.0	18.40
Measured data	BHVO-2G	50.10	2.72	13.6	11.1	0.18	7.17	11.4	2.33	0.506	0.29	4.58	5.38	30.8	30.9	281	43.7	122	126	104	20.8	0.88	9.03	396	25.4	169.0	18.40
Measured data	BHVO-2G	50.40	2.77	13.7	10.7	0.18	7.19	11.4	2.29	0.500	0.28	4.33	3.55	33.2	31.9	292	45.0	118	126	101	21.9	2.12	8.65	392	24.9	166.0	18.10
Measured data	BHVO-2G	49.60	2.71	13.5	11.7	0.17	7.22	11.4	2.29	0.495	0.28	4.66	3.99	30.9	32.3	298	45.0	120	129	100	21.4	1.01	8.97	394	25.5	166.0	18.20
Measured data	BHVO-2G	49.40	2.75	13.8	11.5	0.18	7.13	11.5	2.32	0.501	0.30	4.46	2.46	32.5	31.8	301	46.0	120	132	103	22.5	2.16	9.63	400	25.1	169.0	18.40
Measured data	BHVO-2G	50.40	2.75	13.5	11.0	0.18	7.19	11.4	2.30	0.497	0.27	4.30	3.44	31.2	31.4	295	42.9	122	124	103	21.1	2.23	9.03	391	24.5	166.0	18.00
Measured data	BHVO-2G	50.00	2.76	13.5	11.4	0.18	7.16	11.4	2.28	0.490	0.27	4.83	5.21	31.6	31.4	295	44.0	118	128	102	21.3	2.16	8.91	399	25.2	168.0	18.50
Measured data	BHVO-2G	50.20	2.69	13.5	10.9	0.17	7.04	11.8	2.29	0.495	0.28	4.01	3.52	31.9	31.9	286	44.0	124	127	99.1	22.1	1.78	8.74	391	24.2	165.0	17.90
Measured data	average	50.10	2.74	13.6	11.3	0.18	7.16	11.4	2.26	0.505	0.28	4.34	3.94	31.6	31.7	293	44.2	121	127	103.5	21.3	1.82	9.08	393	24.6	165.0	17.70
Reference data	BHVO-2G	49.30	2.72	13.6	11.3	0.17	7.13	11.4	2.40	0.514	0.29	4.40	33.0	30.8	293	44.0	116	127	102	22.0	1.60	9.20	396	26.0	170.0	18.30	
Measured data	GSE-1G	53.49	0.07	13.20	13.40	0.08	3.52	6.89	3.48	2.645	0.030	389.00	320.00	486.0	412	368.0	355.0	415.0	354.0	426.0	474.0	320.00	330.00	424.0	390.0	382.0	375.00
Measured data	GSE-1G	54.19	0.08	13.20	12.60	0.07	3.48	6.88	3.60	2.694	0.030	404.00	340.00	482.0	408	372.0	357.0	415.0	365.0	434.0	477.0	334.00	338.00	424.0	369.0	377.0	381.00
Measured data	GSE-1G	54.49	0.07	13.30	12.40	0.07	3.36	7.01	3.60	2.631	0.030	408.00	332.00	478.0	397	358.0	351.0	404.0	353.0	419.0	471.0	330.00	345.00	420.0	373.0	376.0	372.00
Measured data	GSE-1G	54.52	0.07	13.10	12.40	0.07	3.41	6.98	3.55	2.710	0.020	400.00	343.00	478.0	403	364.0	352.0	416.0	359.0	434.0	464.0	335.00	335.00	418.0	372.0	374.0	375.00
Measured data	GSE-1G	54.55	0.07	13.40	12.30	0.08	3.48	6.76	3.60	2.678	0.020	415.00	347.00	481.0	407	364.0	359.0	407.0	354.0	423.0	472.0	328.00	341.00	426.0	378.0	381.0	376.00
Measured data	GSE-1G	53.44	0.07	13.40	12.84	0.08	3.59	7.10	3.61	2.695	0.030	406.00	347.00	491.0	414	381.0	365.0	421.0	364.0	433.0	470.0	326.00	345.00	426.0	381.0	381.0	379.00
Measured data	GSE-1G	53.04	0.07	13.38	12.43	0.07	3.44	7.42	4.11	2.604	0.030	414.00	501.00	514.0	412	390.0	371.0	430.0	392.0	408.0	541.0	345.00	368.00	454.0	440.0	425.0	458.00
Measured data	GSE-1G	52.75	0.08	13.11	12.86	0.08	3.39	7.36	4.15	2.743	0.020	427.00	529.00	524.0	417	384.0	381.0	434.0	391.0	415.0	542.0	358.00	364.00	457.0	434.0	418.0	463.00
Measured data	GSE-1G	52.48	0.07	13.18	13.03	0.08	3.42	7.41	4.15	2.744	0.020	414.00	510.00	513.0	410	371.0	381.0	420.0	386.0	406.0	537.0	351.00	361.00	450.0	436.0	415.0	457.00
Measured data	GSE-1G	52.75	0.07	13.21	12.83	0.08	3.34	7.49	4.08	2.731	0.010	424.00	508.00	517.0	413	376.0	378.0	427.0	388.0	414.0	531.0	337.00	354.00	444.0	425.0	415.0	460.00
Measured data	GSE-1G	53.05	0.07	13.45	12.19	0.08	3.43	7.44	4.17	2.762	0.010	422.00	513.00	526.0	412	380.0	373.0	423.0	388.0	396.0	523.0	349.00	368.00	453.0	429.0	414.0	457.00
Measured data	GSE-1G	53.16	0.07	13.45	12.55	0.07	3.47	7.07	4.09	2.708	0.020	412.00	495.00	515.0	410	357.0	363.0	419.0	377.0	396.0	512.0	340.00	350.00	442.0	429.0	409.0	450.00
Measured data	GSE-1G	53.20	0.07	13.20	12.40	0.08	3.40	7.36	4.10	2.730	0.020	415.00	455.00	518.0	422	381.0	373.0	428.0	389.0	403.0	524.0	434.00	364.00	451.0	439.0	419.0	454.00
Measured data	GSE-1G	52.80	0.07	13.30	12.80	0.08	3.41	7.35	4.15	2.680	0.020	411.00	467.00	513.0	413	374.0	381.0	443.0	388.0	409.0	528.0	443.00	360.00	461.0	429.0	416.0	454.00

to be continued

Continued form Table S4

Data	Sample	SiO ₂	TiO ₂	Al ₂ O ₃	FeO	MnO	MgO	CaO	Na ₂ O	K ₂ O	P ₂ O ₅	Li	B	Sc	V	Cr	Co	Ni	Cu	Zn	Ga	Ce	Rb	Sr	Y	Zr	Nb
Measured data	GSE-1G	53.30	0.07	13.30	12.30	0.08	3.39	7.30	4.11	2.726	0.030	405.00	454.00	516.0	415	384.0	368.0	423.0	385.0	396.0	522.0	434.00	356.00	455.0	434.0	417.0	457.00
Measured data	GSE-1G	52.60	0.07	13.50	12.50	0.08	3.57	7.30	4.17	2.745	0.030	413.00	462.00	529.0	421	385.0	375.0	439.0	386.0	403.0	527.0	441.00	354.00	450.0	436.0	423.0	464.00
Measured data	GSE-1G	52.80	0.08	13.30	13.00	0.08	3.54	6.98	4.07	2.673	0.020	411.00	452.00	510.0	413	396.0	376.0	430.0	393.0	410.0	534.0	440.00	362.00	460.0	431.0	418.0	458.00
Measured data	GSE-1G	53.00	0.07	13.50	12.20	0.08	3.48	7.27	4.10	2.776	0.020	408.00	466.00	526.0	416	386.0	382.0	431.0	388.0	396.0	529.0	445.00	362.00	454.0	441.0	426.0	460.00
Measured data	GSE-1G	53.30	0.07	13.00	12.60	0.08	3.47	7.31	4.11	2.705	0.020	406.00	463.00	514.0	404	396.0	376.0	414.0	388.0	396.0	530.0	440.00	364.00	457.0	429.0	419.0	456.00
Measured data	GSE-1G	53.30	0.08	13.20	12.30	0.08	3.52	7.38	4.05	2.665	0.030	431.00	464.00	532.0	421	398.0	373.0	418.0	387.0	399.0	520.0	365.00	359.00	449.0	432.0	415.0	459.00
Measured data	GSE-1G	53.10	0.08	13.20	12.30	0.08	3.54	7.56	4.01	2.635	0.020	432.00	455.00	517.0	421	390.0	373.0	432.0	379.0	406.0	520.0	372.00	357.00	463.0	435.0	410.0	459.00
Measured data	GSE-1G	52.80	0.07	13.40	12.50	0.08	3.56	7.35	4.05	2.692	0.020	432.00	462.00	522.0	420	375.0	377.0	429.0	388.0	402.0	518.0	375.00	367.00	468.0	441.0	421.0	461.00
Measured data	GSE-1G	52.80	0.07	13.50	12.70	0.08	3.55	7.32	4.00	2.651	0.020	434.00	475.00	507.0	411	386.0	377.0	434.0	383.0	407.0	516.0	372.00	356.00	455.0	436.0	417.0	466.00
Measured data	GSE-1G	52.60	0.07	13.40	12.90	0.08	3.52	7.33	4.04	2.675	0.020	440.00	458.00	508.0	414	385.0	375.0	428.0	388.0	398.0	509.0	363.00	355.00	459.0	431.0	413.0	460.00
Measured data	GSE-1G	52.20	0.07	13.50	13.00	0.08	3.56	7.49	4.06	2.648	0.020	439.00	466.00	513.0	410	401.0	373.0	433.0	386.0	402.0	513.0	371.00	356.00	460.0	440.0	414.0	458.00
Measured data	GSE-1G	51.80	0.07	13.60	13.30	0.08	3.59	7.48	4.05	2.650	0.020	433.00	458.00	513.0	419	395.0	378.0	444.0	383.0	406.0	530.0	368.00	357.00	459.0	441.0	416.0	462.00
Measured data	GSE-1G	52.30	0.07	13.50	12.90	0.08	3.56	7.24	4.13	2.716	0.020	415.00	428.00	530.0	418	385.0	376.0	434.0	383.0	399.0	518.0	291.00	358.00	456.0	433.0	419.0	463.00
Measured data	GSE-1G	52.60	0.07	13.60	12.60	0.08	3.56	7.24	4.10	2.707	0.020	429.00	440.00	522.0	419	380.0	371.0	429.0	378.0	402.0	512.0	285.00	358.00	456.0	427.0	414.0	461.00
Measured data	GSE-1G	52.90	0.07	13.30	12.50	0.08	3.49	7.43	4.05	2.722	0.020	406.00	423.00	519.0	412	377.0	376.0	418.0	377.0	401.0	508.0	289.00	360.00	450.0	425.0	415.0	462.00
Measured data	GSE-1G	52.80	0.07	13.40	12.60	0.08	3.50	7.38	4.07	2.739	0.020	408.00	422.00	524.0	418	398.0	373.0	437.0	384.0	401.0	514.0	286.00	360.00	463.0	435.0	423.0	455.00
Measured data	GSE-1G	52.90	0.07	13.40	12.60	0.08	3.58	7.24	4.06	2.698	0.020	406.00	418.00	517.0	412	377.0	380.0	422.0	383.0	398.0	511.0	284.00	361.00	463.0	436.0	418.0	466.00
Measured data	GSE-1G	53.00	0.07	13.40	12.40	0.08	3.52	7.29	4.10	2.687	0.020	410.00	425.00	521.0	419	381.0	383.0	424.0	381.0	395.0	513.0	286.00	357.00	457.0	428.0	413.0	456.00
Measured data	GSE-1G	51.50	0.07	13.90	13.20	0.08	3.62	7.40	4.13	2.650	0.030	417.00	465.00	538.0	421	395.0	386.0	438.0	394.0	413.0	531.0	374.00	371.00	463.0	443.0	423.0	469.00
Measured data	GSE-1G	52.90	0.07	13.40	12.60	0.08	3.49	7.35	4.07	2.610	0.020	417.00	461.00	523.0	412	392.0	379.0	430.0	387.0	406.0	519.0	363.00	359.00	454.0	431.0	414.0	451.00
Measured data	GSE-1G	53.00	0.07	13.50	12.30	0.08	3.53	7.35	4.12	2.703	0.040	404.00	457.00	526.0	417	390.0	374.0	431.0	379.0	397.0	522.0	353.00	348.00	449.0	424.0	408.0	444.00
Measured data	GSE-1G	53.00	0.07	13.40	12.60	0.08	3.49	7.27	4.00	2.692	0.020	416.00	442.00	513.0	414	382.0	373.0	426.0	381.0	407.0	514.0	358.00	356.00	450.0	424.0	410.0	444.00
Reference data	GSE-1G	53.70	0.08	13.00	12.70	0.08	3.48	7.42	3.91	2.650	0.020	430.00	330.00	530.0	440	400.0	380.0	440.0	380.0	460.0	490.0	320.00	356.00	447.0	410.0	410.0	420.00
Data	Sample	Mo	Sn	Sb	Cs	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	W	Bi	Pb	Th	U
Measured data	BIR-1G	0.0000	0.69	0.30	0.0150	5.11	0.57	1.68	0.25	1.77	0.88	0.43	1.74	0.31	2.15	0.48	1.49	0.22	1.49	0.16	0.52	0.021	0.0163	0.0000	3.17	0.019	0.018
Measured data	BIR-1G	0.0000	1.40	0.64	0.0000	6.19	0.55	1.64	0.28	2.14	1.04	0.45	1.72	0.35	2.37	0.50	1.49	0.21	1.55	0.24	0.50	0.026	0.0000	0.0057	3.29	0.028	0.018
Measured data	BIR-1G	0.1600	1.29	0.67	0.0340	6.02	0.56	2.03	0.41	2.48	1.05	0.60	1.92	0.35	2.58	0.50	1.66	0.26	1.67	0.20	0.54	0.042	0.0054	0.0000	3.75	0.028	0.006
Measured data	BIR-1G	0.0220	1.38	0.64	0.0210	7.25	0.62	1.87	0.36	2.28	1.26	0.66	1.75	0.33	2.37	0.58	1.68	0.24	1.83	0.22	0.58	0.037	0.0052	0.0040	3.36	0.023	0.019
Measured data	BIR-1G	0.0200	0.94	0.58	0.0000	7.30	0.61	1.90	0.44	2.58	1.04	0.54	1.76	0.37	2.79	0.54	1.71	0.22	1.40	0.23	0.58	0.040	0.0323	0.0023	3.70	0.033	0.024
Measured data	BIR-1G	0.0840	2.05	0.51	0.0036	6.72	0.57	1.96	0.39	1.78	0.93	0.50	1.74	0.36	2.32	0.59	1.66	0.22	1.76	0.26	0.64	0.034	0.0167	0.0147	3.78	0.035	0.011
Measured data	BIR-1G	0.0440	2.86	0.79	0.0380	6.45	0.55	1.85	0.33	2.02	1.07	0.51	1.55	0.30	2.49	0.54	1.48	0.26	1.58	0.22	0.51	0.032	0.0181	0.0000	3.70	0.032	0.000
Measured data	BIR-1G	0.0220	0.88	0.80	0.0160	5.84	0.57	1.70	0.36	2.22	0.94	0.54	1.71	0.34	2.27	0.58	1.77	0.25	1.86	0.24	0.60	0.037	0.0062	0.0197	3.48	0.027	0.019
Measured data	BIR-1G	0.0240	2.44	0.37	0.0340	6.71	0.60	1.91	0.42	2.35	1.20	0.58	1.55	0.34	2.70	0.55	1.77	0.24	1.66	0.20	0.56	0.027	0.0056	0.0093	3.63	0.022	0.026
Measured data	BIR-1G	0.0230	1.56	0.88	0.0077	6.61	0.58	1.94	0.40	2.47	1.11	0.54	1.99	0.35	2.57	0.59	1.61	0.24	1.64	0.29	0.52	0.042	0.0109	0.0147	3.35	0.033	0.014
Measured data	BIR-1G	0.0980	2.37	0.62	0.0000	6.13	0.52	1.89	0.36	2.86	1.06	0.50	1.70	0.30	2.40	0.50	1.68	0.22	1.69	0.24	0.56	0.035	0.0111	0.0115	3.68	0.020	0.016
Measured data	BIR-1G	0.0830	1.69	0.74	0.0120	6.43	0.53	1.82	0.38	2.58	1.50	0.60	1.49	0.37	2.60	0.55	1.69	0.25	1.52	0.23	0.52	0.032	0.0118	0.0624	3.50	0.029	0.024
Measured data	average	0.0480	1.63	0.63	0.0150	6.40	0.57	1.85	0.37	2.29	1.09	0.54	1.72	0.34	2.47	0.54	1.64	0.23	1.64	0.23	0.55	0.034	0.0116	0.0120	3.53	0.027	0.016
Reference data	BIR-1G	0.0750	2.30	0.56	0.0070	6.50	0.61	1.89	0.37	2.37	1.09	0.52	1.85	0.35	2.55	0.56	1.70	0.24	1.64	0.25	0.57	0.036	#VALUE!	0.0090	0.030	0.023	0.023

to be continued

Continued from Table S4

Data	Sample	Mo	Sn	Sb	Cs	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	W	Bi	Pb	Th	U
Measured data	BCR-2G	257.000	0	1.72	0.51	1.110	654.00	23.30	49.20	5.94	26.20	6.02	1.79	6.41	0.96	5.81	1.14	3.33	0.48	3.18	4.42	0.670	0.560	0.0620	9.67	5.440	1.630
Measured data	BCR-2G	253.000	0	1.43	0.34	0.970	630.00	23.00	47.90	5.95	27.20	5.56	1.71	6.18	1.02	5.52	1.14	3.42	0.45	3.50	4.51	0.620	0.590	0.0540	10.39	5.360	1.560
Measured data	BCR-2G	274.000	0	4.86	0.37	1.190	690.00	25.20	53.70	6.85	28.50	6.61	1.99	6.88	1.07	6.47	1.29	3.90	0.55	3.28	5.02	0.810	0.480	0.0470	11.19	6.030	1.750
Measured data	BCR-2G	265.000	0	3.93	0.34	1.120	676.00	24.20	52.90	6.83	29.20	6.78	1.96	6.63	1.08	6.34	1.30	3.60	0.51	3.18	4.64	0.800	0.500	0.0590	10.98	5.850	1.660
Measured data	BCR-2G	269.000	0	4.98	0.42	1.160	677.00	24.60	53.10	6.77	28.50	7.09	1.88	7.28	1.02	6.55	1.38	3.85	0.59	3.37	4.99	0.780	0.550	0.0450	10.66	5.970	1.640
Measured data	BCR-2G	270.000	0	4.01	0.34	1.220	695.00	25.20	54.40	6.94	29.20	6.68	2.25	6.71	0.97	6.51	1.29	3.81	0.53	3.56	4.47	0.790	0.490	0.0770	11.14	5.940	1.730
Measured data	BCR-2G	269.000	0	4.02	0.40	1.240	692.00	25.30	53.80	7.11	28.90	6.79	1.97	7.19	1.07	6.55	1.29	3.83	0.53	3.67	4.79	0.780	0.490	0.0510	10.82	5.900	1.620
Measured data	BCR-2G	262.000	0	4.51	0.36	1.230	673.00	25.10	54.50	6.62	29.10	6.79	2.12	6.55	1.15	6.74	1.26	3.68	0.51	3.42	4.88	0.790	0.450	0.0380	11.00	5.900	1.740
Measured data	BCR-2G	268.000	0	3.60	0.34	1.240	680.00	25.10	52.90	6.87	30.60	6.75	2.03	6.56	1.07	6.74	1.34	3.96	0.54	3.43	4.85	0.780	0.540	0.0450	11.07	5.890	1.650
Measured data	BCR-2G	269.000	0	3.98	0.51	1.150	687.00	25.20	54.50	6.81	29.00	6.67	2.17	7.59	1.07	6.57	1.26	3.97	0.56	3.34	5.03	0.790	0.430	0.0420	11.06	5.970	1.700
Measured data	BCR-2G	270.000	0	3.50	0.19	1.220	690.00	25.80	54.20	6.84	29.50	7.45	1.99	6.88	1.09	6.73	1.35	3.76	0.57	3.70	4.94	0.810	0.510	0.0680	11.30	5.970	1.670
Measured data	BCR-2G	262.000	0	3.02	0.42	1.070	673.00	24.90	53.70	6.91	29.30	6.63	2.00	7.50	1.03	6.42	1.35	3.54	0.51	2.87	4.83	0.810	0.470	0.1500	10.68	5.890	1.690
Measured data	average	266.000	0	3.63	0.38	1.160	676.00	24.70	52.90	6.70	28.80	6.65	1.99	6.86	1.05	6.41	1.28	3.72	0.53	3.38	4.81	0.770	0.510	0.0600	10.83	5.840	1.670
Reference data	BCR-2G	270.000	0	2.60	0.35	1.160	683.00	24.70	53.30	6.70	28.90	6.59	1.97	6.71	1.02	6.44	1.27	3.70	0.51	3.39	4.84	0.780	0.500	0.0500	10.83	5.900	1.690
Measured data	BHVO-2G	3.670	0	1.73	0.29	0.090	129.00	14.50	33.60	4.66	22.20	5.19	1.95	5.34	0.76	5.18	0.87	2.28	0.28	1.82	3.68	0.970	0.210	0.0130	1.48	1.120	0.420
Measured data	BHVO-2G	4.090	0	1.37	0.21	0.100	124.00	13.80	34.00	4.61	23.10	5.14	1.86	5.87	0.88	4.86	0.86	2.37	0.32	1.53	4.01	0.950	0.200	0.0260	1.62	1.120	0.450
Measured data	BHVO-2G	4.720	0	4.17	0.24	0.130	134.00	15.30	37.80	5.51	24.80	5.95	1.99	6.07	0.92	5.81	0.99	2.60	0.31	2.07	4.33	1.160	0.220	0.0170	1.79	1.230	0.430
Measured data	BHVO-2G	4.440	0	3.46	0.23	0.0810	132.00	15.60	38.30	5.08	24.80	6.12	2.01	6.37	0.88	5.18	1.01	2.57	0.34	2.09	4.48	1.120	0.260	0.0160	1.85	1.190	0.430
Measured data	BHVO-2G	4.250	0	4.76	0.34	0.110	132.00	15.20	38.10	5.23	25.40	5.96	2.04	5.64	0.96	5.22	1.04	2.64	0.36	2.07	4.16	1.140	0.200	0.0250	1.61	1.170	0.450
Measured data	BHVO-2G	4.350	0	3.40	0.27	0.0670	129.00	15.40	37.40	5.29	25.10	6.17	2.03	6.70	0.92	5.36	0.85	2.37	0.30	2.06	4.44	1.190	0.240	0.0430	1.99	1.210	0.410
Measured data	BHVO-2G	4.250	0	3.72	0.17	0.0390	129.00	14.50	36.60	5.28	23.80	5.94	1.95	6.51	0.87	5.32	0.97	2.52	0.29	1.89	4.43	1.190	0.230	0.0190	1.85	1.190	0.400
Measured data	BHVO-2G	4.860	0	3.75	0.20	0.0980	121.00	15.10	37.20	5.20	25.70	6.16	2.07	6.13	0.91	5.31	0.98	2.72	0.36	1.78	4.28	1.120	0.300	0.0140	1.80	1.150	0.400
Measured data	BHVO-2G	3.800	0	3.27	0.24	0.100	131.00	15.40	38.50	5.47	24.70	6.03	2.01	6.04	0.93	4.81	0.96	2.32	0.27	2.10	4.42	1.160	0.270	0.0400	1.86	1.200	0.410
Measured data	BHVO-2G	3.690	0	1.93	0.39	0.0580	126.00	14.50	36.40	5.00	23.10	5.93	1.89	6.06	0.86	5.34	0.95	2.45	0.35	1.95	4.18	1.160	0.240	0.0130	1.90	1.170	0.430
Measured data	BHVO-2G	3.830	0	3.43	0.24	0.130	126.00	14.80	37.70	5.37	23.90	5.69	2.16	6.34	0.97	5.24	1.00	2.73	0.34	2.33	4.57	1.150	0.290	0.0130	1.80	1.200	0.420
Measured data	BHVO-2G	4.190	0	2.04	0.41	0.090	128.00	14.70	36.50	5.06	23.80	5.66	1.92	5.93	0.87	5.26	0.93	2.55	0.31	2.12	4.12	1.130	0.200	0.0020	1.73	1.120	0.380
Measured data	BHVO-2G	4.180	0	3.09	0.27	0.0910	128.00	14.90	36.80	5.15	24.20	5.83	1.99	6.08	0.89	5.24	0.95	2.51	0.32	1.98	4.26	1.120	0.240	0.0200	1.77	1.170	0.420
Reference data	BHVO-2G	3.800	0	2.60	0.30	0.100	131.00	15.20	37.60	5.35	24.50	6.10	2.07	6.16	0.92	5.28	0.98	2.56	0.34	2.01	4.32	1.150	0.230	0.0100	1.220	1.220	0.400
Measured data	GSE-1G	360.000	0	278.00	390.00	283.000	398.00	366.00	382.00	418.00	414.00	438.00	373.00	455.00	441.00	476.00	460.00	544.00	463.00	478.00	480.00	365.000	390.000	0.284000	0.336000	343.000	378.000
Measured data	GSE-1G	363.000	0	278.00	401.00	288.000	403.00	369.00	384.00	432.00	430.00	455.00	390.00	459.00	449.00	483.00	470.00	550.00	464.00	473.00	482.00	363.000	364.000	0.302000	0.357000	347.000	389.000
Measured data	GSE-1G	346.000	0	273.00	387.00	285.000	399.00	369.00	375.00	416.00	408.00	447.00	372.00	450.00	443.00	486.00	459.00	548.00	461.00	476.00	467.00	364.000	361.000	0.286000	0.346000	349.000	381.000
Measured data	GSE-1G	359.000	0	270.00	381.00	279.000	395.00	363.00	377.00	417.00	418.00	451.00	374.00	466.00	449.00	479.00	464.00	544.00	460.00	481.00	486.00	371.000	387.000	0.301000	0.354000	348.000	385.000
Measured data	GSE-1G	365.000	0	280.00	396.00	284.000	395.00	360.00	382.00	419.00	421.00	456.00	386.00	463.00	460.00	495.00	475.00	556.00	466.00	489.00	486.00	370.000	368.000	0.299000	0.358000	352.000	391.000
Measured data	GSE-1G	360.000	0	277.00	392.00	282.000	402.00	362.00	378.00	419.00	416.00	452.00	379.00	455.00	449.00	488.00	466.00	548.00	466.00	481.00	488.00	372.000	371.000	0.296000	0.350000	349.000	387.000
Measured data	GSE-1G	404.000	0	671.00	474.00	291.000	421.00	396.00	427.00	476.00	475.00	478.00	436.00	524.00	540.00	550.00	534.00	628.00	534.00	533.00	547.00	405.000	452.000	0.362000	0.394000	386.000	423.000
Measured data	GSE-1G	405.000	0	679.00	478.00	293.000	449.00	407.00	437.00	491.00	485.00	490.00	444.00	528.00	546.00	549.00	536.00	635.00	533.00	533.00	552.00	455.000	455.000	0.372000	0.401000	393.000	433.000
Measured data	GSE-1G	403.000	0	668.00	465.00	287.000	424.00	394.00	429.00	478.00	472.00	473.00	439.00	511.00	539.00	537.00	528.00	628.00	527.00	530.00	546.00	449.000	449.000	0.366000	0.395000	387.000	424.000
Measured data	GSE-1G	403.000	0	663.00	468.00	291.000	429.00	398.00	428.00	476.00	466.00	478.00	436.00	505.00	538.00	534.00	518.00	628.00	525.00	520.00	537.00	449.000	449.000	0.370000	0.391000	385.000	425.000

to be continued

Continued form Table S4

Data	Sample	Mo	Sn	Sb	Cs	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	W	Bi	Pb	Th	U	
Measured data	GSE-1G	391.000	0.648	459	287.000	0.425	0.386	424.00	466.00	450.00	465.00	428.00	509.00	531.00	535.00	514.00	600.00	523.00	517.00	529.00	395.00	450.00	388.000	0.356	0.000	0.389	0.00	418.000
Measured data	GSE-1G	389.000	0.644	452	286.000	0.426	0.384	414.00	462.00	447.00	474.00	424.00	500.00	523.00	532.00	511.00	614.00	527.00	512.00	539.00	392.00	444.00	388.000	0.356	0.000	0.385	0.00	409.000
Measured data	GSE-1G	384.000	0.724	393	301.000	0.416	0.392	415.00	484.00	440.00	471.00	427.00	503.00	514.00	536.00	508.00	624.00	552.00	531.00	510.00	418.00	461.00	421.000	0.508	0.000	0.388	0.00	400.000
Measured data	GSE-1G	392.000	0.712	400	305.000	0.433	0.400	419.00	485.00	454.00	479.00	429.00	492.00	512.00	531.00	499.00	612.00	548.00	522.00	500.00	410.00	460.00	429.000	0.510	0.000	0.395	0.00	413.000
Measured data	GSE-1G	387.000	0.698	401	296.000	0.426	0.393	415.00	485.00	451.00	471.00	429.00	503.00	520.00	542.00	511.00	615.00	551.00	531.00	506.00	417.00	466.00	420.000	0.515	0.000	0.395	0.00	406.000
Measured data	GSE-1G	392.000	0.715	402	305.000	0.437	0.399	427.00	488.00	461.00	480.00	433.00	507.00	517.00	533.00	509.00	614.00	550.00	529.00	501.00	419.00	466.00	423.000	0.517	0.000	0.396	0.00	414.000
Measured data	GSE-1G	390.000	0.705	409	299.000	0.421	0.393	422.00	486.00	451.00	471.00	435.00	500.00	515.00	530.00	501.00	581.00	547.00	518.00	498.00	406.00	452.00	416.000	0.506	0.000	0.383	0.00	407.000
Measured data	GSE-1G	401.000	0.732	409	309.000	0.424	0.400	420.00	491.00	452.00	480.00	433.00	514.00	523.00	546.00	518.00	630.00	556.00	544.00	519.00	424.00	472.00	434.000	0.516	0.000	0.399	0.00	409.000
Measured data	GSE-1G	391.000	0.718	412	305.000	0.425	0.393	418.00	482.00	450.00	488.00	427.00	496.00	520.00	534.00	510.00	607.00	550.00	524.00	506.00	416.00	461.00	423.000	0.512	0.000	0.388	0.00	403.000
Measured data	GSE-1G	379.000	0.596	584	309.000	0.417	0.388	414.00	470.00	449.00	472.00	420.00	511.00	496.00	538.00	494.00	600.00	539.00	505.00	511.00	391.00	429.00	410.000	0.302	0.000	0.384	0.00	390.000
Measured data	GSE-1G	387.000	0.608	613	315.000	0.434	0.397	430.00	480.00	462.00	494.00	438.00	513.00	507.00	549.00	506.00	616.00	550.00	522.00	524.00	401.00	437.00	421.000	0.314	0.000	0.394	0.00	401.000
Measured data	GSE-1G	396.000	0.615	599	315.000	0.436	0.395	430.00	489.00	464.00	486.00	435.00	529.00	512.00	556.00	506.00	628.00	558.00	520.00	526.00	401.00	440.00	421.000	0.313	0.000	0.396	0.00	406.000
Measured data	GSE-1G	387.000	0.613	603	315.000	0.433	0.395	428.00	487.00	452.00	491.00	429.00	517.00	506.00	554.00	502.00	604.00	548.00	527.00	521.00	400.00	440.00	426.000	0.312	0.000	0.393	0.00	401.000
Measured data	GSE-1G	382.000	0.604	599	309.000	0.435	0.394	428.00	488.00	457.00	491.00	427.00	518.00	508.00	555.00	505.00	614.00	545.00	523.00	522.00	397.00	435.00	422.000	0.312	0.000	0.392	0.00	400.000
Measured data	GSE-1G	377.000	0.605	600	310.000	0.425	0.390	424.00	479.00	447.00	486.00	431.00	512.00	507.00	554.00	499.00	604.00	547.00	514.00	521.00	399.00	433.00	422.000	0.309	0.000	0.393	0.00	400.000
Measured data	GSE-1G	377.000	0.608	597	302.000	0.426	0.398	430.00	486.00	457.00	489.00	434.00	522.00	508.00	564.00	503.00	613.00	547.00	516.00	520.00	396.00	437.00	420.000	0.303	0.000	0.381	0.00	405.000
Measured data	GSE-1G	395.000	0.532	511	313.000	0.432	0.399	433.00	487.00	463.00	527.00	421.00	502.00	522.00	522.00	547.00	611.00	530.00	526.00	536.00	408.00	445.00	376.000	0.569	0.000	0.378	0.00	412.000
Measured data	GSE-1G	391.000	0.530	499	319.000	0.438	0.392	426.00	477.00	455.00	506.00	417.00	494.00	515.00	508.00	535.00	604.00	521.00	504.00	525.00	407.00	441.00	375.000	0.586	0.000	0.391	0.00	418.000
Measured data	GSE-1G	385.000	0.538	513	318.000	0.424	0.395	426.00	481.00	456.00	511.00	413.00	492.00	512.00	508.00	541.00	614.00	530.00	523.00	529.00	404.00	442.00	375.000	0.584	0.000	0.391	0.00	411.000
Measured data	GSE-1G	390.000	0.523	497	319.000	0.424	0.388	420.00	476.00	461.00	509.00	413.00	486.00	506.00	503.00	529.00	603.00	519.00	515.00	521.00	401.00	434.00	376.000	0.574	0.000	0.382	0.00	408.000
Measured data	GSE-1G	396.000	0.537	506	322.000	0.427	0.393	425.00	479.00	464.00	516.00	417.00	507.00	512.00	522.00	545.00	619.00	529.00	525.00	530.00	404.00	443.00	375.000	0.581	0.000	0.384	0.00	414.000
Measured data	GSE-1G	375.000	0.516	502	320.000	0.425	0.390	424.00	483.00	457.00	512.00	423.00	511.00	510.00	509.00	535.00	610.00	525.00	519.00	527.00	400.00	439.00	372.000	0.578	0.000	0.384	0.00	417.000
Measured data	GSE-1G	387.000	0.514	506	292.000	0.415	0.389	427.00	476.00	466.00	495.00	425.00	515.00	530.00	526.00	514.00	599.00	526.00	531.00	539.00	404.00	442.00	419.000	0.723	0.000	0.365	0.00	391.000
Measured data	GSE-1G	393.000	0.501	512	290.000	0.420	0.390	428.00	479.00	462.00	494.00	432.00	526.00	528.00	531.00	519.00	620.00	529.00	535.00	543.00	409.00	449.00	431.000	0.742	0.000	0.386	0.00	406.000
Measured data	GSE-1G	390.000	0.492	493	284.000	0.411	0.385	417.00	475.00	453.00	483.00	429.00	521.00	522.00	525.00	503.00	618.00	517.00	522.00	543.00	400.00	439.00	422.000	0.729	0.000	0.372	0.00	396.000
Measured data	average	385.000	0.559	477	300.000	0.422	0.389	417.00	470.00	451.00	482.00	420.00	500.00	507.00	526.00	508.00	602.00	525.00	516.00	518.00	398.00	433.00	405.000	0.439	0.000	0.382	0.00	405.000
Reference	GSE-1G	390.000	0.280	450	310.000	0.427	0.392	414.00	460.00	453.00	488.00	410.00	490.00	480.00	524.00	501.00	595.00	500.00	520.00	518.00	395.00	390.00	430.000	0.320	0.000	0.380	0.00	420.000