

SUPPLEMENTARY INFORMATION

Table DR1. Representative major and minor element oxide data (WDS-EMP) from the Vedde Ash cryptotephra layer in MFM, alongside associated secondary standard analyses (StHs6/80-G and ATHO-G fused volcanic glass standards taken from the MPI-DING collection (Jochum et al., 2006). *Original analytical totals are shown, with element oxides normalized to water-free values. Fe is expressed as FeO.

SiO ₂	TiO ₂	Al ₂ O ₃	FeO	MnO	MgO	CaO	Na ₂ O	K ₂ O	P ₂ O ₅	Total*	Cl (ppm)
52.85	3.57	13.60	12.25	0.21	3.92	8.17	3.44	1.36	0.54	96.99	550
52.86	3.59	13.48	12.53	0.20	3.95	7.91	3.60	1.31	0.49	96.74	729
52.88	5.15	12.93	13.04	0.24	3.45	6.83	3.44	1.53	0.38	96.17	1172
53.12	3.54	13.56	12.31	0.23	3.90	7.86	3.62	1.34	0.43	96.71	655
53.17	3.44	13.46	12.69	0.28	3.80	8.16	3.15	1.32	0.46	97.60	598
54.09	3.44	13.45	11.84	0.28	3.83	7.94	3.22	1.33	0.48	96.35	815
54.38	3.12	13.76	11.80	0.20	3.58	7.54	3.49	1.59	0.46	96.80	658
54.96	3.23	13.51	11.53	0.19	3.50	7.19	3.81	1.57	0.43	98.50	669
55.00	3.18	13.68	11.13	0.13	3.47	7.35	3.95	1.58	0.43	98.34	765
55.27	3.26	13.11	11.13	0.18	3.91	7.54	3.66	1.45	0.40	95.09	707
55.34	3.17	13.63	11.27	0.15	3.49	7.26	3.60	1.56	0.44	97.30	633
55.57	2.98	13.80	10.96	0.22	3.43	7.14	3.72	1.72	0.38	97.36	735
55.89	2.79	14.13	10.62	0.30	3.07	6.77	3.98	1.71	0.64	98.07	821
56.04	2.80	13.95	10.78	0.25	3.19	6.82	3.91	1.65	0.52	97.87	667
56.13	3.00	13.49	10.97	0.30	3.27	6.74	3.89	1.71	0.43	97.57	638
56.25	2.95	13.70	11.03	0.28	3.21	7.04	3.38	1.62	0.37	93.54	1392
56.30	2.83	13.54	10.74	0.21	3.36	6.95	3.83	1.69	0.45	98.29	834
56.68	2.69	13.53	10.96	0.22	3.11	6.71	3.82	1.82	0.38	97.97	674
56.88	2.88	13.34	10.91	0.12	3.29	6.95	3.60	1.61	0.34	97.77	733
57.07	2.68	14.12	10.26	0.16	2.88	6.49	4.07	1.64	0.55	98.59	642
57.08	2.51	13.60	10.68	0.17	2.80	6.42	4.07	1.89	0.46	85.88	2625
57.15	2.60	13.64	10.49	0.16	3.13	6.58	3.96	1.83	0.37	97.37	781
57.54	2.51	14.15	9.94	0.27	2.82	6.28	4.01	1.73	0.62	95.71	1125
58.38	2.24	14.29	9.47	0.19	2.59	5.98	4.38	1.73	0.66	98.38	725
58.81	2.42	13.49	9.59	0.18	3.04	6.12	3.94	1.95	0.37	96.92	728
59.29	2.08	14.56	8.97	0.29	2.38	5.51	4.33	1.79	0.70	98.32	840
59.89	1.91	14.50	8.55	0.24	2.16	5.14	4.75	1.95	0.65	89.65	2080
60.01	1.91	14.39	8.99	0.26	2.24	5.18	4.39	1.96	0.58	97.75	762
60.35	2.12	14.27	8.87	0.23	2.10	5.17	4.24	2.15	0.38	97.51	929
61.36	1.80	13.80	8.36	0.19	2.17	4.95	4.63	2.28	0.35	98.79	1029
61.81	1.66	13.95	8.34	0.16	2.08	4.87	4.33	2.36	0.33	97.63	996
71.65	0.34	13.36	3.95	0.14	0.22	1.36	5.33	3.40	0.08	97.22	1467
71.70	0.29	13.40	3.68	0.20	0.20	1.47	5.34	3.46	0.06	95.78	1665
71.71	0.28	13.53	3.55	0.17	0.19	1.34	5.50	3.48	0.05	98.82	1614
71.89	0.34	13.69	3.71	0.17	0.18	1.36	5.08	3.37	0.06	99.37	1350
72.03	0.27	13.58	3.68	0.18	0.20	1.42	4.99	3.48	0.01	98.38	1340
72.10	0.34	13.73	3.65	0.13	0.20	1.30	4.86	3.41	0.07	94.59	1649
72.36	0.28	13.76	3.79	0.18	0.21	1.28	4.48	3.45	0.03	96.85	1572

StHs6/80-G (mean, 2 σ)

63.61	0.70	17.86	4.33	0.07	1.96	5.25	4.56	1.29	0.15	-	130
<i>0.91</i>	<i>0.09</i>	<i>0.34</i>	<i>0.36</i>	<i>0.07</i>	<i>0.07</i>	<i>0.12</i>	<i>0.32</i>	<i>0.08</i>	<i>0.03</i>	-	153

ATHO-G (mean, 2 σ)

74.89	0.25	12.36	3.31	0.12	0.09	1.68	4.08	2.74	0.02	-	276
<i>0.88</i>	<i>0.04</i>	<i>0.31</i>	<i>0.20</i>	<i>0.06</i>	<i>0.03</i>	<i>0.08</i>	<i>0.18</i>	<i>0.11</i>	<i>0.02</i>	-	77

References cited

Jochum, K.P., Stoll, B., Herwig, K., et al., 2006, MPI-DING reference glasses for in situ microanalysis: new reference values for element concentrations and isotope ratios: *Geochemistry Geophysics Geosystems*, v. 7, no. 2.

