

Lowenstern and Pitcher: Use of ATR FTIR to quantify H₂O concentrations in glass
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SUPPLEMENTARY METHODS FILE

Sample origins and relevant references are listed below.

MT3

May 2008 rhyolitic obsidian flow from Volcán Chaitén, Chile (Lowenstern et al., 2012).

C10D2

Hydrous lithic rhyolite clast in 2008 pyroclastic flow material from Volcán Chaitén, Chile (Lowenstern et al., 2012).

IDDP: Quenched rhyolite from hydrothermal drillcore at Krafla, Iceland (Elders et al., 2011; Melt-1 of Zierenberg et al., 2013).

88S7

Basal fallout (rhyolite) of Huckleberry Ridge Tuff A at Mount Everts, Yellowstone National Park. Collected by T. Sisson. Standard materials include a hydrous obsidian lithic fragment and two quartz-hosted melt inclusions. Chemical analysis of host deposit in Christiansen (2001).

EXP2170

Experimental run product (rhyolite) from Lautze et al. (2010). Supplied by T. Sisson, USGS.

EXP 51

EXP 54

Experimental run products (rhyolite) from Mangan and Sisson (2000). Supplied by T. Sisson, USGS.

N. Coulee

MC84-df

MC84-t

Hydrous rhyolite obsidian clasts from the Mono Craters eruption of 1340 A.D. (Newman et al., 1986, 1988). Supplied by Sally Newman, California Institute of Technology (December 2012).

SB872-3

SB872-4

SB2329

Basaltic experimental run products from D. Blatter and T. Sisson (unpublished).

PGAF40

PGAFMI-2

Quartz-hosted rhyolitic melt inclusions from the tuff of Pine Grove (Lowenstern, 1994). PGAF 40 was analyzed in the original report. The other inclusion was prepared solely for this study.

LAS-1842-3

LAS-1842-4

Quartz-hosted rhyolitic melt inclusions from dacite of Lassen Peak (Clynne and Muffler, 2010). Supplied by. Michael Clynne, USGS.

BA2065

BA2066

BA2068

BA2070

Basaltic andesite experimental run products from Pavlof Volcano (M. Mangan and T. Sisson, in prep.; Rock data from Mangan et al. 2009).

F14

F33

F40

Dacite from Fisher Volcano, Alaska (Mangan and Sisson, 2005).

REFERENCES

- Blatter, D.L., Sisson, T.W. and Hankins, W.B. (2013) Crystallization of oxidized, moderately hydrous arc basalt at mid- to lower crustal pressures: Implications for andesite genesis. *Contributions to Mineralogy and Petrology*, in press.
- Christiansen, R. L. (2001) The Quaternary and Pliocene Yellowstone Plateau Volcanic Field of Wyoming, Idaho, and Montana. U.S. Geological Survey Professional Paper , 729-G, 145 p. 3 plates.
- Clynne, M.A. and Muffler, L.J.P. (2010) Geologic Map of Lassen Volcanic National Park and Vicinity, California. U.S. Geological Survey Scientific Investigations Map 2899, scale 1:50,000.
- Elders, W.A., Guomundur, O., Zierenberg, R.A., Pope, E.,C., Mortensen, A.K., Guomundsson, A., Lowenstern, J.B., Marks, N.E., Owens, L., Bird, D.K., Reed, M., Olsen, N.J., and Schiffman, P. (2011) Origin of a rhyolite that intruded a geothermal well while drilling in a basaltic volcano, at Krafla, Iceland. *Geology*, 39, 231-234.
- Lautze, N.C., Sisson, T.W., Mangan, M.T., and Grove, T.L. (2011) Segregating gas from melt: an experimental study of the Ostwald ripening of vapor bubbles in magmas. *Contributions to Mineralogy and Petrology*, 161, 331–347.
- Lowenstern, J.B. (1994) Dissolved volatile concentrations in an ore-forming magma. *Geology*, 22, 893–896.
- Lowenstern, J.B., Bleick, H., Vazquez, J.A., Castro, J.M. and Larson, P.B. (2012) Degassing of Cl, F, Li and Be during extrusion and crystallization of the rhyolite dome at Volcán Chaitén, Chile during 2008 and 2009. *Bulletin of Volcanology*, DOI: 10.1007/s00445-012-0663-4.

- Mangan, M. and Sisson, T. (2000) Delayed, disequilibrium degassing in rhyolite magma: decompression experiments and implications for explosive volcanism. *Earth and Planetary Science Letters*, 183, 441–455.
- Mangan, M., and Sisson, T. (2005) Evolution of melt-vapor surface tension in silicic volcanic systems: Experiments with hydrous melts. *Journal of Geophysical Research*, 110, B01202.
- Mangan, M., Miller, T., Waythomas, C., Trusdell, F., Calvert, A., and Layer, P. (2009) Diverse lavas from closely spaced volcanoes drawing from a common parent: Emmons Lake Volcanic Center, Eastern Aleutian Arc. *Earth and Planetary Science Letters*, 287, 363–372.
- Newman, S., Stolper, E.M. and Epstein, S. (1986) Measurement of water in rhyolitic glasses: Calibration of an infrared spectroscopic technique. *American Mineralogist*, 71, 1527–1541.
- Newman, S., Epstein, S., and Stolper, E. (1988) Water, carbon dioxide and hydrogen isotopes in glasses from the ca. 1340 A.D. eruption of the Mono Craters, California: Constraints on degassing phenomena and initial volatile content. *Journal of Volcanology and Geothermal Research*, 35, 75–96.
- Zierenberg, R.A., Schiffman, P., Barfod, G.H., Leshner, C.E., Marks, N.E., Lowenstern, J.B., Mortensen, A.K., Pope, E.C., Bird, D.K., Reed, M.H., Fridleifsson, G.O., Elders, W.A. (2013) *Contributions to Mineralogy and Petrology*, 165, 327–347.