

Electronic Appendix 1

Measurements of pre- and post-run volatile contents. All masses given in mg.

Experiment	mSM ^a	H ₂ O ^{initial b}	Ag ₂ C ₂ O ₄ ^{initial c}	XH ₂ O _m ^d	mH ₂ O ^{fluid e}	mCO ₂ ^{fluid e}
<i>AW 82038 phonotephrite experiments</i>						
AW-06	30.5	0.6	2.7	--	0	0.6
AW-10	33.8	3.6	0	1.00	1.5	0
AW-13	29.8	2.6	2.2	0.91	0.7	0.8
AW-14	30.5	2.1	4.9	0.78	0.2	2.0
AW-17	36.7	2.1	5.7	0.75	0.5	1.6
AW-18	30.7	2.7	3.2	0.87	1.1	1.1
AW-19B	60.1	0.6	21.5	0.18	0.4	6.1
AW-20B	60.4	2.0	17.2	0.49	0.9	4.0
AW-21	30.2	2.0	6.3	0.72	0.9	1.7
AW-22	30.7	2.8	3.1	0.88	0.8	0.7
AW-23	29.8	3.7	0	1.00	1.4	0
AW-24B	52.8	0.6	17.2	0.21	0.3	4.7
AW-25	30.9	1.2	8.6	0.53	0.3	2.2
AW-26	30.2	2.0	5.6	0.75	0.5	1.6
AW-27	30.1	2.7	3	0.88	0.9	1.1
AW-28	30.3	3.6	0	1.00	1.1	0
AW-29	62.5	0.6	21.5	0.18	0	3.5
AW-33	60.6	3.2	10	0.73	0.2	0.2
AW-34	60.4	6.5	0	1.00	2.4	0
AW-37	50.3	0.6	17.9	0.21	0.3	4.6
AW-38	51.1	5.7	0	1.00	1.9	0
AW-39	50.7	4.1	5.5	0.86	2.3	0.9
AW-40	50.6	2.8	9.1	0.72	1.3	1.8
AW-41	50.4	1.6	13.7	0.49	1.2	3.0
AW-42	51.4	0.6	17.3	0.21	0.5	4.3
AW-43	50.9	0.6	17.7	0.21	0.4	4.6
AW-44	50.1	1.6	13.7	0.49	1.2	2.8
AW-45	50.8	2.8	10	0.70	1.5	1.5
AW-46	51.5	4.2	5.5	0.86	1.4	1.2
AW-47	50.7	5.7	0	1.00	1.2	0
<i>KI-04 basanite experiments</i>						
KI-05	nd	3.6	0	1.00	nd	nd
KI-06	31.5	2.6	2.6	0.89	nd	nd
KI-07	31.1	1.9	4.8	0.76	nd	nd
KI-08	30.3	1.2	7.1	0.58	nd	nd
KI-09	62.8	0.6	19.9	0.19	0.4	4.9
KI-10	60	1.7	4.7	0.75	0.6	1.2

KI-11	62	3.2	11.2	0.70	1.9	3.1
KI-12	60.5	4.8	6.5	0.86	2.6	1.8
KI-14	60.2	0.6	22.2	0.17	0.6	5.8
KI-15	49.9	1.6	13.4	0.49	1.0	3.2
KI-16	50.1	2.8	10.2	0.69	1.3	2.7
KI-17	50.1	4.1	5.1	0.87	2.1	1.5
KI-18	52.7	5.6	0	1.00	3.5	0
KI-19	51.3	5.6	0	1.00	2.4	0
KI-20	51.4	4.2	5.4	0.87	1.1	1.7
KI-21	51.5	2.8	10	0.70	1.0	2.6
KI-22	50.7	1.6	13.5	0.49	0.5	3.5
KI-23	50.3	0.6	17.2	0.21	0.3	4.6
KI-24	50.7	5.5	0	1.00	2.3	0
KI-25	51.5	4.2	5.6	0.86	2.4	1.2
KI-26	50.9	2.9	10.2	0.70	0.9	2.9
KI-27	51.8	1.6	13.7	0.49	0.7	3.6
KI-28	50.1	0.6	17.7	0.21	0.5	4.7
KI-29	50.2	0.6	17.9	0.21	0.3	4.9
KI-30	52.2	1.6	14.1	0.48	0.7	3.8
KI-31	49.7	2.9	9.6	0.71	1.5	2.5
KI-32	50.8	4.1	5.8	0.85	2.4	1.5
KI-33	52.3	5.7	0	1.00	3.3	0
KI-36	52.1	3.0	14.2	0.72	1.1	2.4
KI-37	51.2	4.3	9.7	0.85	2.4	1.5
KI-38	50.3	5.7	6.1	1.00	3.7	0

Notes: All masses shown in mg. $m\text{CO}_2^{\text{fluid}}$ calculated as the difference in total post-run capsule mass and capsule mass after liquid nitrogen bath and puncture. $m\text{H}_2\text{O}^{\text{fluid}}$ calculated as the difference in capsule mass after liquid nitrogen bath and puncture and capsule mass after drying oven. nd: not determined

^aMass of starting material rock powder added to experimental capsule.

^bMass of liquid water added to experimental capsule plus correction factor.

^cMass of silver oxalate powder added to experimental capsule.

^dMole fraction of H_2O in $\text{H}_2\text{O}-\text{CO}_2$ mixture added to capsule during capsule prep.