

Table S1. Boron isotope data from bulk solution MC-ICPMS, femtosecond LA-MC-ICPMS, and SIMS

sample	section	technique	$\delta^{11}\text{B}$ (‰)	2σ (‰)	median $\delta^{11}\text{B}$ (‰)	2σ of the median (‰)
WP22 standard	bulk solution	MC-ICPMS	16.6	0.3	—	—
all LA specimens	bulk solution	MC-ICPMS	15.99	0.3	—	—
LA specimen 1	large crater	fs-LA-MC-ICPMS	15.42	0.87	—	—
LA specimen 2	large crater	fs-LA-MC-ICPMS	16.07	0.85	—	—
LA specimen 3	large crater	fs-LA-MC-ICPMS	16.26	0.87	15.63	1.8
LA specimen 3	umbilical knob	fs-LA-MC-ICPMS	14.99	0.85	—	—
LA specimen 4	large crater	fs-LA-MC-ICPMS	15.5	0.87	14.8	1.99
LA specimen 4	umbilical knob	fs-LA-MC-ICPMS	14.09	0.82	—	—
LA specimen 5	large crater	fs-LA-MC-ICPMS	15.49	0.82	15.87	1.06
LA specimen 5	umbilical knob	fs-LA-MC-ICPMS	16.24	0.85	—	—
LA specimen 6	large crater	fs-LA-MC-ICPMS	16.24	0.83	16.06	0.52
LA specimen 6	umbilical knob	fs-LA-MC-ICPMS	15.87	0.85	—	—
LA specimen 7	large crater	fs-LA-MC-ICPMS	16.51	0.8	15.67	2.38
LA specimen 7	umbilical knob	fs-LA-MC-ICPMS	14.83	0.82	—	—
LA specimen 8	large crater	fs-LA-MC-ICPMS	15.83	0.8	15.94	0.3
LA specimen 8	umbilical knob	fs-LA-MC-ICPMS	16.04	0.8	—	—
LA specimen 9	large crater	fs-LA-MC-ICPMS	14.46	1.08	14.84	1.07
LA specimen 9	umbilical knob	fs-LA-MC-ICPMS	15.22	1.08	—	—
LA specimen 10	large crater	fs-LA-MC-ICPMS	15.94	0.82	15.74	0.57
LA specimen 10	umbilical knob	fs-LA-MC-ICPMS	15.54	0.8	—	—
LA specimen 11	large crater	fs-LA-MC-ICPMS	16.21	0.85	17.81	4.53
LA specimen 11	umbilical knob	fs-LA-MC-ICPMS	19.41	0.86	—	—
LA specimen 12	large crater	fs-LA-MC-ICPMS	16.8	0.87	17.34	1.53
LA specimen 12	umbilical knob	fs-LA-MC-ICPMS	17.88	0.68	—	—
LA specimen 13	large crater	fs-LA-MC-ICPMS	14.28	0.75	15.54	3.56
LA specimen 13	umbilical knob	fs-LA-MC-ICPMS	16.8	0.66	—	—
LA specimen 14	large crater	fs-LA-MC-ICPMS	15.03	0.68	15.84	2.29
LA specimen 14	umbilical knob	fs-LA-MC-ICPMS	16.65	0.87	—	—
LA specimen 15	large crater	fs-LA-MC-ICPMS	17.62	0.66	17.27	0.99
LA specimen 15	umbilical knob	fs-LA-MC-ICPMS	16.92	0.66	—	—
LA specimen 16	large crater	fs-LA-MC-ICPMS	16.05	0.66	16.67	1.74
LA specimen 16	umbilical knob	fs-LA-MC-ICPMS	17.28	0.66	—	—
LA specimen 17	chamber f-1	fs-LA-MC-ICPMS	17.37	0.93	16.66	1.1
LA specimen 17	chamber f-2	fs-LA-MC-ICPMS	16.84	0.72	—	—
LA specimen 17	chamber f-3	fs-LA-MC-ICPMS	16.71	0.6	—	—
LA specimen 17	chamber f-4	fs-LA-MC-ICPMS	16.61	0.76	—	—
LA specimen 17	chamber f-5	fs-LA-MC-ICPMS	16.23	0.99	—	—
LA specimen 17	chamber f-6	fs-LA-MC-ICPMS	16.46	0.76	—	—
LA specimen 17	chamber f-7	fs-LA-MC-ICPMS	15.86	0.67	—	—
LA specimen 17	chamber f-8	fs-LA-MC-ICPMS	16.42	0.9	—	—
LA specimen 17	chamber f-9	fs-LA-MC-ICPMS	17.67	0.58	—	—
LA specimen 17	umbilical knob	fs-LA-MC-ICPMS	17.18	0.59	—	—
LA specimen 18	final chamber	fs-LA-MC-ICPMS	16.19	0.72	16.07	1.14
LA specimen 18	chamber f-1	fs-LA-MC-ICPMS	16.06	1.14	—	—

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LA specimen 18	chamber f-2	fs-LA-MC-ICPMS	15.99	0.77	—	—
LA specimen 18	chamber f-3	fs-LA-MC-ICPMS	15.86	0.85	—	—
LA specimen 18	chamber f-4	fs-LA-MC-ICPMS	16.08	0.63	—	—
LA specimen 18	chamber f-5	fs-LA-MC-ICPMS	15.8	0.95	—	—
LA specimen 18	chamber f-6	fs-LA-MC-ICPMS	15.99	0.68	—	—
LA specimen 18	chamber f-7	fs-LA-MC-ICPMS	17.57	0.77	—	—
LA specimen 18	chamber f-8	fs-LA-MC-ICPMS	17.04	0.56	—	—
LA specimen 18	umbilical knob	fs-LA-MC-ICPMS	16.41	0.76	—	—
SIMS specimen 1	chamber f-1	SIMS	18.35	1.27	15.71	4.6
SIMS specimen 1	chamber f-2	SIMS	16.67	1.16	—	—
SIMS specimen 1	chamber f-2	SIMS	14.41	1.14	—	—
SIMS specimen 1	chamber f-3	SIMS	16.25	1.34	—	—
SIMS specimen 1	chamber f-4	SIMS	15.71	1.41	—	—
SIMS specimen 1	chamber f-4	SIMS	13.27	1.74	—	—
SIMS specimen 1	chamber f-5	SIMS	15.04	1.27	—	—
SIMS specimen 1	chamber f-9	SIMS	12.13	2.38	—	—
SIMS specimen 1	chamber f-10	SIMS	14.51	2.8	—	—
SIMS specimen 1	chamber f-11	SIMS	16.09	1.06	—	—
SIMS specimen 1	f-11 chamber	SIMS	21.1	1.77	—	—
SIMS specimen 1	chamber f-11	SIMS	16.71	1.36	—	—
SIMS specimen 1	umbilical knob	SIMS	13.18	1.66	—	—
SIMS specimen 1	umbilical knob	SIMS	16.45	1.31	—	—
SIMS specimen 1	umbilical knob	SIMS	17.06	1.03	—	—
SIMS specimen 1	umbilical knob	SIMS	14.09	1.48	—	—
SIMS specimen 1	umbilical knob	SIMS	13.5	1.54	—	—
SIMS specimen 1	umbilical knob	SIMS	14.55	1.36	—	—
SIMS specimen 1	umbilical knob	SIMS	19.82	1.38	—	—
SIMS specimen 2	chamber f-1	SIMS	17.89	1.29	14.28	4.66
SIMS specimen 2	chamber f-4	SIMS	14.69	1.14	—	—
SIMS specimen 2	chamber f-5	SIMS	13.94	1.44	—	—
SIMS specimen 2	chamber f-6	SIMS	16.91	1.31	—	—
SIMS specimen 2	chamber f-8	SIMS	15.76	1.08	—	—
SIMS specimen 2	chamber f-9	SIMS	13.37	1.67	—	—
SIMS specimen 2	chamber f-10	SIMS	12.3	1.51	—	—
SIMS specimen 2	chamber f-11	SIMS	14.3	1.01	—	—
SIMS specimen 2	chamber f-12	SIMS	11.49	1.79	—	—
SIMS specimen 2	umbilical knob	SIMS	14.26	1.5	—	—
SIMS specimen 2	umbilical knob	SIMS	20.17	1.75	—	—
SIMS specimen 2	umbilical knob	SIMS	17.47	1.98	—	—
SIMS specimen 2	umbilical knob	SIMS	14.04	1.63	—	—
SIMS specimen 2	umbilical knob	SIMS	16.13	1.24	—	—
SIMS specimen 2	umbilical knob	SIMS	13.63	1.49	—	—
SIMS specimen 2	umbilical knob	SIMS	12.28	1.39	—	—
SIMS specimen 3	chamber f-9	SIMS	16.47	1.72	17.02	5.17
SIMS specimen 3	chamber f-9	SIMS	15.35	1.62	—	—
SIMS specimen 3	chamber f-11	SIMS	17.02	1.5	—	—

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SIMS specimen 3	umbilical knob	SIMS	14.06	1.28	—	—
SIMS specimen 3	umbilical knob	SIMS	18.85	1.22	—	—
SIMS specimen 3	umbilical knob	SIMS	18.72	1.58	—	—
SIMS specimen 3	umbilical knob	SIMS	20.26	1.78	—	—
SIMS specimen 3	umbilical knob	SIMS	21.76	1.39	—	—
SIMS specimen 3	umbilical knob	SIMS	14.93	1.87	—	—
SIMS specimen 4	chamber f-3	SIMS	18.61	1.5	17.84	4.83
SIMS specimen 4	chamber f-4	SIMS	17.07	1.49	—	—
SIMS specimen 4	chamber f-4	SIMS	16.67	1.37	—	—
SIMS specimen 4	chamber f-5	SIMS	18.84	1.65	—	—
SIMS specimen 4	chamber f-6	SIMS	19.88	1.6	—	—
SIMS specimen 4	chamber f-7	SIMS	11.71	1.2	—	—
SIMS specimen 4	chamber f-8	SIMS	14.79	1.35	—	—
SIMS specimen 4	chamber f-9	SIMS	16.76	1.65	—	—
SIMS specimen 4	chamber f-10	SIMS	16.69	1.26	—	—
SIMS specimen 4	umbilical knob	SIMS	20.21	1.71	—	—
SIMS specimen 4	umbilical knob	SIMS	19.17	1.41	—	—
SIMS specimen 4	umbilical knob	SIMS	19.02	1.4	—	—
SIMS specimen 5	chamber f-1	SIMS	15.91	1	16.08	6.78
SIMS specimen 5	chamber f-2	SIMS	18.51	1.32	—	—
SIMS specimen 5	chamber f-2	SIMS	14.06	1.38	—	—
SIMS specimen 5	chamber f-3	SIMS	14.06	1.88	—	—
SIMS specimen 5	chamber f-3	SIMS	19.46	1.28	—	—
SIMS specimen 5	chamber f-4	SIMS	20.89	1.9	—	—
SIMS specimen 5	chamber f-5	SIMS	12.36	1.13	—	—
SIMS specimen 5	chamber f-5	SIMS	12.97	0.95	—	—
SIMS specimen 5	chamber f-8	SIMS	22.82	1.49	—	—
SIMS specimen 5	chamber f-9	SIMS	16.08	2.91	—	—
SIMS specimen 5	chamber f-9	SIMS	22.92	1.41	—	—
SIMS specimen 5	chamber f-10	SIMS	17.84	1.74	—	—
SIMS specimen 5	chamber f-10	SIMS	15.23	1.28	—	—
SIMS specimen 5	umbilical knob	SIMS	19.06	1.71	—	—
SIMS specimen 5	umbilical knob	SIMS	12.5	1.98	—	—
SIMS specimen 5	umbilical knob	SIMS	18.27	1.15	—	—
SIMS specimen 5	umbilical knob	SIMS	14.83	1.49	—	—