

Table S1: Results of fluid inclusion analysis

Sample	Host mineral	Type	Diameter	Gas-liquid	Th	Tm	Salinity	Density
			(μm)	ratio(%)	(°C)	(°C)	(NaCl wt.%)	(g/cm <sup>3</sup> )
GZ-411-S1 (n = 25; this study)								
S1-1	Quartz	I	7.3	5	164.2	-3.1	5.11	0.94
S1-2	Quartz	I	5.2	5	172.4	-0.8	1.40	0.91
S1-3	Quartz	I	6.1	10	180.2	-0.5	0.88	0.90
S1-4	Quartz	I	5.4	10	152.4	-1.6	2.74	0.94
S1-5	Quartz	I	9.8	5	165.3	-1.7	2.90	0.93
S1-6	Quartz	I	10.2	30	192.4	-0.3	0.53	0.88
S1-7	Quartz	I	5.5	10	172.1	-0.7	1.22	0.91
S1-8	Quartz	I	7.2	5	172.8	-1.4	2.41	0.92
S1-9	Quartz	I	6.5	5	156.3	-1.6	2.74	0.94
S1-10	Quartz	I	9.5	5	166.4	-0.2	0.35	0.91
S1-11	Quartz	I	6.4	10	163.5	-0.7	1.22	0.92
S1-12	Quartz	I	8.5	5	181.4	-2.9	4.80	0.92
S1-13	Quartz	I	5.5	10	159.5	-1.7	2.90	0.93
S1-14	Quartz	I	12.3	5	165.8	-0.5	0.88	0.91
S1-15	Quartz	I	5.6	5	190.2	-2.6	4.34	0.91
S1-16	Quartz	I	7.4	5	187.1	-3.5	5.71	0.92
S1-17	Quartz	I	6.5	10	159.8	-0.2	0.35	0.92
S1-18	Quartz	I	6.7	10	174.3	-0.6	1.05	0.91
S1-19	Quartz	I	6.5	20	142.8	-0.8	1.40	0.94
S1-20	Quartz	I	7.1	5	146.7	-1.4	2.41	0.94
S1-21	Quartz	I	7.5	5	166.4	-1.8	3.06	0.93
S1-22	Quartz	I	5.7	5	136.9	-0.8	1.40	0.95

S1-23	Quartz	I	8.1	20	124.9	-0.9	1.57	0.96
S1-24	Quartz	I	6.7	10	158.6	-3.5	5.71	0.95
S1-25	Quartz	I	6.3	10	142.8	-5.8	8.95	0.99
GZ-411-S2 (n = 30; this study)								
S2-1	Quartz	I	8.1	15	187.2	-1.2	2.07	0.90
S2-2	Quartz	I	7.5	15	165.3	-1.2	2.07	0.92
S2-3	Quartz	I	8.6	15	143.8	-0.5	0.88	0.94
S2-4	Quartz	I	5.5	15	184.2	-1.5	2.57	0.90
S2-5	Quartz	I	7.2	20	216.3	-0.6	1.05	0.85
S2-6	Quartz	I	8.1	5	175.2	-2.5	4.18	0.93
S2-7	Quartz	I	6.8	5	210.3	-1.7	2.90	0.87
S2-8	Quartz	I	9.4	15	167.5	-1.9	3.23	0.93
S2-9	Quartz	I	10.3	15	169.8	-2.2	3.71	0.93
S2-10	Quartz	I	6.3	30	157.6	-1.8	3.06	0.94
S2-11	Quartz	I	7.4	40	178.5	-2.5	4.18	0.92
S2-12	Quartz	I	6.9	20	174.2	-0.4	0.70	0.90
S2-13	Quartz	I	11.5	15	179.3	-0.8	1.40	0.90
S2-14	Quartz	I	6.5	10	184.2	-0.6	1.05	0.89
S2-15	Quartz	I	5.5	10	208.3	-1.9	3.23	0.88
S2-16	Quartz	I	7.4	5	169.5	-1.5	2.57	0.92
S2-17	Quartz	I	12.7	10	173.2	-1.6	2.74	0.92
S2-18	Quartz	I	6.8	20	184.2	-1.8	3.06	0.91
S2-19	Quartz	I	9.4	20	152.3	-0.9	1.57	0.93
S2-20	Quartz	I	8.8	30	197.5	-2.7	4.49	0.90
S2-21	Quartz	I	7.9	5	185.6	-3.5	5.71	0.92
S2-22	Quartz	I	5.9	5	175.3	-0.7	1.22	0.91
S2-23	Quartz	I	6.5	10	179.8	-0.6	1.05	0.90
S2-24	Quartz	I	7.3	10	192.6	-1.8	3.06	0.90
S2-25	Quartz	I	8.4	20	164.5	-1.3	2.24	0.92

S2-26	Quartz	I	8.8	10	163.9	-1.6	2.74	0.93
S2-27	Quartz	I	7.2	20	187.4	-1.7	2.90	0.90
S2-28	Quartz	I	6.4	15	156.8	-1.8	3.06	0.94
S2-29	Quartz	I	9.2	10	177.2	-2.4	4.03	0.92
S2-30	Quartz	I	7.8	30	184.1	-5.8	8.95	0.95
GZ-411-S3 (n = 33; this study)								
S3-1	Quartz	I	8.6	10	175.2	-1.5	2.57	0.91
S3-2	Quartz	I	10.2	5	154.2	-5.8	8.95	0.98
S3-3	Quartz	I	7.5	5	136.8	-0.5	0.88	0.94
S3-4	Quartz	I	6.2	10	146.8	-0.7	1.22	0.94
S3-5	Quartz	I	8.4	10	168.3	-2.4	4.03	0.93
S3-6	Quartz	I	5.5	10	154.2	-0.8	1.40	0.93
S3-7	Quartz	I	5.6	5	156.7	-1.4	2.41	0.93
S3-8	Quartz	I	8.2	10	137.8	-0.2	0.35	0.94
S3-9	Quartz	I	7.4	10	139.5	-0.7	1.22	0.94
S3-10	Quartz	I	6.8	20	172.5	-2.6	4.34	0.93
S3-11	Quartz	I	7.4	10	165.4	-1.9	3.23	0.93
S3-12	Quartz	I	5.9	10	155.9	-6.4	9.73	0.98
S3-13	Quartz	I	10.2	5	126.9	-2.4	4.03	0.97
S3-14	Quartz	I	9.5	5	171.2	-0.7	1.22	0.91
S3-15	Quartz	I	6.7	5	173.5	-1.5	2.57	0.92
S3-16	Quartz	I	8.4	10	164.2	-1.7	2.90	0.93
S3-17	Quartz	I	7.5	10	179.2	-1.5	2.57	0.91
S3-18	Quartz	I	10.6	5	126.3	-0.4	0.70	0.95
S3-19	Quartz	I	8.2	5	143.5	-0.8	1.40	0.94
S3-20	Quartz	I	6.2	10	165.9	-0.6	1.05	0.92
S3-21	Quartz	I	7.4	5	122.7	-1.5	2.57	0.96
S3-22	Quartz	I	9.2	10	146.2	-5.7	8.81	0.98
S3-23	Quartz	I	7.4	5	144.3	-6.1	9.34	0.99

S3-24	Quartz	I	12.7	10	181.6	-2.7	4.49	0.92
S3-25	Quartz	I	6.3	5	131.2	-1.9	3.23	0.96
S3-26	Quartz	I	6.8	10	139.6	-1.5	2.57	0.95
S3-27	Quartz	I	7.3	20	142.8	-0.2	0.35	0.93
S3-28	Quartz	I	5.9	15	142.6	-0.3	0.53	0.94
S3-29	Quartz	I	6.7	20	187.2	-0.7	1.22	0.89
S3-30	Quartz	I	8.4	5	123.4	-8.7	12.51	1.03
S3-31	Quartz	I	7.6	5	152.7	-6.4	9.73	0.99
S3-32	Quartz	I	9.5	10	146.2	-0.8	1.40	0.94
S3-33	Quartz	I	6.6	5	137.5	-0.7	1.22	0.94
GZ-411-S4 (n = 29; this study)								
S4-1	Quartz	I	6.4	10	142.5	-2.5	4.18	0.96
S4-2	Quartz	I	8.1	10	168.7	-2.6	4.34	0.93
S4-3	Quartz	I	5.5	10	156.8	-3.3	5.41	0.95
S4-4	Quartz	I	5.8	5	175.2	-1.5	2.57	0.91
S4-5	Quartz	I	5.5	5	174.2	-6.5	9.86	0.97
S4-6	Quartz	I	7.1	10	176.8	-7.1	10.61	0.97
S4-7	Quartz	I	5.9	5	198.5	-0.8	1.40	0.88
S4-8	Quartz	I	6.2	5	210.3	-2.6	4.34	0.89
S4-9	Quartz	I	8.4	5	165.9	-0.5	0.88	0.91
S4-10	Quartz	I	7.2	20	175.2	-3.4	5.56	0.93
S4-11	Quartz	I	5.9	20	220.3	-2.8	4.65	0.88
S4-12	Quartz	I	6.4	20	167.9	-4.4	7.02	0.95
S4-13	Quartz	I	7.2	10	182.6	-0.7	1.22	0.90
S4-14	Quartz	I	6.2	5	187.5	-2.8	4.65	0.92
S4-15	Quartz	I	7.5	5	194.7	-0.8	1.40	0.88
S4-16	Quartz	I	6.3	10	172.6	-2.9	4.80	0.93
S4-17	Quartz	I	8.4	5	179.8	-3.4	5.56	0.93
S4-18	Quartz	I	6.5	10	168.2	-2.5	4.18	0.93

S4-19	Quartz	I	5.7	10	156.2	-1.9	3.23	0.94
S4-20	Quartz	I	5.6	5	155.7	-1.8	3.06	0.94
S4-21	Quartz	I	5.8	5	178.2	-2.8	4.65	0.93
S4-22	Quartz	I	5.5	20	187.2	-0.7	1.22	0.89
S4-23	Quartz	I	7.2	15	163.2	-0.5	0.88	0.92
S4-24	Quartz	I	7.1	10	198.7	-1.2	2.07	0.88
S4-25	Quartz	I	6.8	5	182.3	-1.2	2.07	0.90
S4-26	Quartz	I	6.3	5	208.5	-6.1	9.34	0.93
S4-27	Quartz	I	7.1	10	175.2	-1.9	3.23	0.92
S4-28	Quartz	I	10.5	5	184.2	-2.2	3.71	0.91
S4-29	Quartz	I	5.8	5	156.4	-0.8	1.40	0.93
GZ-411-S5 (n = 30; this study)								
S5-1	Quartz	I	7.2	10	187.4	-2.2	3.71	0.91
S5-2	Quartz	I	5.5	10	177.2	-2.5	4.18	0.92
S5-3	Quartz	I	6.5	10	165.3	-2.3	3.87	0.93
S5-4	Quartz	I	5.7	15	142.9	-5.5	8.55	0.99
S5-5	Quartz	I	6.7	15	197.5	-1.2	2.07	0.89
S5-6	Quartz	I	6.6	20	172.3	-1.6	2.74	0.92
S5-7	Quartz	I	7.1	5	156.2	-2.1	3.55	0.94
S5-8	Quartz	I	5.5	10	187.5	-6.4	9.73	0.95
S5-9	Quartz	I	5.8	15	177.2	-0.5	0.88	0.90
S5-10	Quartz	I	5.5	15	174.6	-0.9	1.57	0.91
S5-11	Quartz	I	10.7	15	168.2	-3.2	5.26	0.94
S5-12	Quartz	I	6.1	20	175.2	-2.2	3.71	0.92
S5-13	Quartz	I	5.4	20	168.2	-3.2	5.26	0.94
S5-14	Quartz	I	8.7	20	178.5	-2.4	4.03	0.92
S5-15	Quartz	I	6.4	15	176.2	-2.1	3.55	0.92
S5-16	Quartz	I	6.2	15	142.6	-2.4	4.03	0.96
S5-17	Quartz	I	6.5	30	186.3	-1.8	3.06	0.91

S5-18	Quartz	I	6.5	30	197.5	-2.5	4.18	0.90
S5-19	Quartz	I	5.5	15	175.2	-1.7	2.90	0.92
S5-20	Quartz	I	8.4	10	177.6	-0.8	1.40	0.90
S5-21	Quartz	I	8.2	10	154.2	-2.4	4.03	0.95
S5-22	Quartz	I	8.4	10	168.3	-1.7	2.90	0.92
S5-23	Quartz	I	5.9	30	178.5	-3.5	5.71	0.93
S5-24	Quartz	I	6.7	30	187.6	-0.5	0.88	0.89
S5-25	Quartz	I	7.2	15	199.5	-0.7	1.22	0.88
S5-26	Quartz	I	7.2	10	156.8	-2.1	3.55	0.94
S5-27	Quartz	I	6.4	10	187.6	-2.2	3.71	0.91
S5-28	Quartz	I	6.2	20	178.4	-0.5	0.88	0.90
S5-29	Quartz	I	6.5	15	168.5	-0.6	1.05	0.91
S5-30	Quartz	I	5.5	10	153.9	-0.5	0.88	0.93
GZ-411-S6 (n = 29; this study)								
S6-1	Quartz	I	7.1	10	172.5	-0.8	1.40	0.91
S6-2	Quartz	I	6.2	10	189.2	-1.1	1.91	0.89
S6-3	Quartz	I	5.4	5	201.5	-1.8	3.06	0.89
S6-4	Quartz	I	7.5	5	142.3	-2.2	3.71	0.95
S6-5	Quartz	I	10.1	5	184.5	-1.9	3.23	0.91
S6-6	Quartz	I	8.1	10	162.9	-2.5	4.18	0.94
S6-7	Quartz	I	9.2	10	191.7	-2.2	3.71	0.90
S6-8	Quartz	I	8.1	10	200.7	-4.5	7.17	0.92
S6-9	Quartz	I	6.5	10	156.2	-4.4	7.02	0.96
S6-10	Quartz	I	5.5	5	174.2	-3.7	6.01	0.94
S6-11	Quartz	I	6.2	10	128.7	-3.6	5.86	0.98
S6-12	Quartz	I	6.7	5	184.9	-2.9	4.80	0.92
S6-13	Quartz	I	7.4	10	179.2	-2.5	4.18	0.92
S6-14	Quartz	I	6.3	10	175.6	-1.9	3.23	0.92
S6-15	Quartz	I	7.2	10	192.8	-1.8	3.06	0.90

S6-16	Quartz	I	6.5	10	163.7	-1.6	2.74	0.93
S6-17	Quartz	I	9.3	15	188.1	-2.3	3.87	0.91
S6-18	Quartz	I	11.2	15	192.6	-1.1	1.91	0.89
S6-19	Quartz	I	8.2	15	172.6	-1.2	2.07	0.91
S6-20	Quartz	I	9.3	10	187.6	-4.2	6.74	0.93
S6-21	Quartz	I	10.7	10	175.2	-0.8	1.40	0.91
S6-22	Quartz	I	8.1	5	153.6	-0.2	0.35	0.92
S6-23	Quartz	I	7.6	5	157.4	-0.4	0.70	0.92
S6-24	Quartz	I	9.2	15	166.7	-1.5	2.57	0.92
S6-25	Quartz	I	5.8	15	179.2	-2.7	4.49	0.92
S6-26	Quartz	I	6.3	5	173.9	-3.1	5.11	0.93
S6-27	Quartz	I	6.7	5	168.2	-0.9	1.57	0.92
S6-28	Quartz	I	5.8	10	174.9	-0.7	1.22	0.91
S6-29	Quartz	I	5.5	5	166.5	-1.3	2.24	0.92