

Supporting Information

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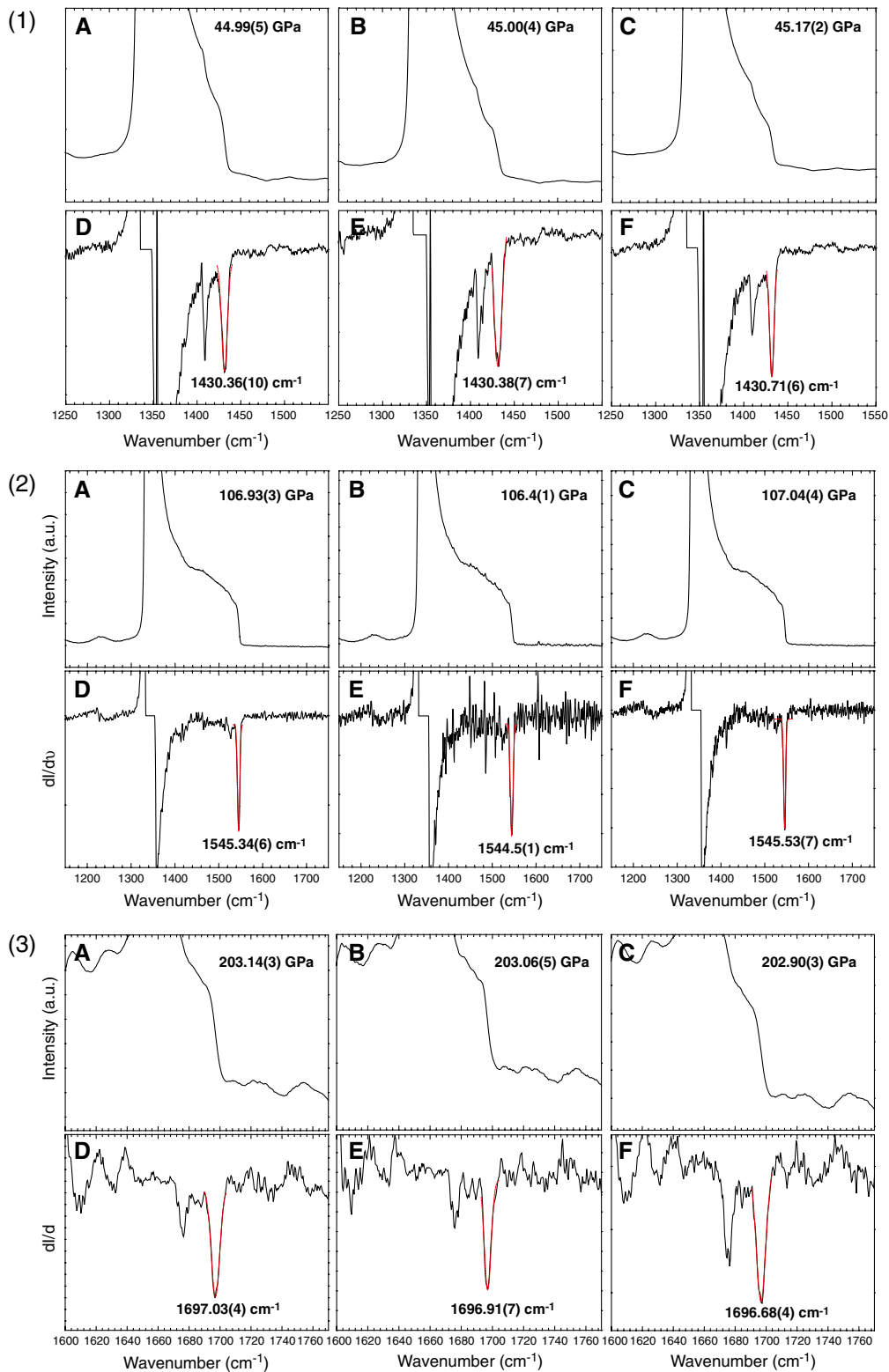


Fig. S1. Representative Raman spectra of different pressure conditions [(1), (2), (3)] from different analyzed positions within approximately 20 μm in diameter (*A, B, C*) around the center of the sample where the probe laser for Brillouin scattering measurements was irradiated, and their differential spectra dI/dv (*D, E, F*). The high-frequency edge of the Raman band was defined as a minimum of the dI/dv . The red lines represent the fitting curves using Gaussian function for determination of the minimum position. Number in parenthesis represents uncertainties in the last digit for both wavenumber and pressure. Uncertainties for the wavenumber of the minimum position of dI/dv in each spectrum is derived from the errors of the curve fitting. The total uncertainties of pressure was finally estimated from the standard deviation (-1σ) of each determined pressure value in each point.

Table S1. Peak position of the Raman differential spectrum (dI/dv) for pressure determination (*R* peak), pressure (*P*) and shear velocity (V_s) of MgSiO_3 glass, and full width at half maximum (FWHM) of Raman differential peak (FWHM-1) and Brillouin peak from TA mode of the sample (FWHM-2)

<i>R</i> peak (cm ⁻¹)	<i>R</i> peak error (cm ⁻¹)	FWHM-1 (cm ⁻¹)	FWHM-1 error (cm ⁻¹)	<i>P</i> (GPa)	<i>P</i> error (GPa)	V_s (km/s)	V_s error (km/s)	FWHM-2 (GHz)	FWHM-2 error (GHz)
1,361.6	0.2	3.2	0.4	12.5	0.1	4.08	0.03	0.32	0.02
1,375.1	0.0	8.4	0.6	18.6	0.0	4.42	0.05	0.26	0.02
1,385.5	0.0	4.5	0.1	23.4	0.0	4.65	0.03	0.32	0.02
1,394.3	0.2	4.6	0.2	27.5	0.1	4.80	0.02	0.42	0.01
1,401.8	0.6	4.7	0.3	31.1	0.3	4.93	0.03	0.70	0.07
1,405.8	0.2	4.7	0.3	33.0	0.1	4.90	0.04	0.40	0.01
1,413.3	0.4	4.6	0.6	36.6	0.2	5.02	0.02	0.38	0.01
1,413.7	0.0	4.8	0.3	36.8	0.0	5.03	0.07	0.68	0.07
1,421.7	0.4	5.0	0.2	40.7	0.2	5.08	0.01	0.98	0.09
1,423.9	0.0	4.4	1.3	41.8	0.0	5.15	0.02	0.38	0.01
1,430.3	0.2	4.9	0.2	45.0	0.1	5.22	0.00	0.44	0.03
1,432.2	0.2	5.8	0.4	45.9	0.1	5.24	0.01	0.30	0.01
1,440.4	0.2	5.3	0.4	50.0	0.1	5.31	0.05	0.70	0.02
1,444.1	0.2	3.9	0.4	51.9	0.1	5.32	0.01	0.54	0.04
1,450.2	0.8	6.2	0.7	55.0	0.4	5.35	0.08	0.64	0.03
1,452.3	0.7	4.0	0.1	56.1	0.3	5.41	0.03	0.46	0.02
1,457.4	0.2	6.1	0.3	58.7	0.1	5.45	0.02	0.40	0.03
1,464.3	1.0	5.9	0.4	62.3	0.5	5.51	0.04	0.88	0.09
1,470.6	0.4	4.5	0.1	65.6	0.2	5.52	0.03	0.44	0.01
1,474.8	0.4	5.1	0.4	67.8	0.2	5.55	0.02	0.80	0.01
1,483.6	0.6	6.1	0.7	72.5	0.3	5.59	0.02	0.46	0.01
1,491.6	0.5	7.0	0.3	76.8	0.3	5.67	0.04	0.34	0.01
1,501.7	0.5	5.9	0.2	82.3	0.2	5.77	0.03	0.40	0.01
1,510.7	0.6	7.8	0.4	87.3	0.3	5.77	0.01	0.40	0.01
1,520.6	1.2	5.5	0.4	92.8	0.7	5.88	0.05	0.54	0.03
1,526.4	0.7	8.1	0.6	96.1	0.4	5.94	0.06	0.36	0.02
1,528.7	0.2	4.5	0.2	97.4	0.1	5.89	0.00	0.54	0.04
1,531.0	2.6	6.8	0.4	98.7	1.5	5.93	0.07	1.02	0.07
1,536.1	0.3	14.1	7.5	101.6	0.2	5.96	0.05	1.02	0.02
1,538.4	0.3	5.1	0.2	102.9	0.2	5.98	0.01	0.42	0.03
1,539.1	0.5	5.4	0.7	103.3	0.3	6.00	0.06	0.62	0.06
1,544.8	1.9	6.0	0.6	106.6	1.1	5.99	0.03	0.56	0.05
1,545.1	0.5	5.3	0.3	106.8	0.3	6.00	0.01	0.48	0.03
1,559.0	0.3	6.4	0.8	114.9	0.2	6.02	0.01	0.34	0.04
1,566.6	1.0	3.5	0.4	119.4	0.6	6.08	0.05	0.44	0.05
1,571.8	0.3	3.9	0.3	122.5	0.2	6.05	0.05	0.64	0.05
1,573.8	2.4	12.6	5.0	123.7	1.5	6.08	0.03	0.42	0.02
1,580.1	0.3	17.5	3.0	127.5	0.2	6.09	0.02	0.56	0.01
1,585.2	0.6	10.8	0.7	130.6	0.4	6.13	0.06	0.46	0.02
1,587.1	0.4	14.0	0.5	131.8	0.2	6.14	0.07	0.56	0.05
1,591.1	0.5	10.6	0.6	134.2	0.3	6.18	0.04	0.64	0.05
1,597.1	0.1	6.2	0.9	137.9	0.1	6.20	0.06	0.60	0.05
1,601.5	0.3	3.4	1.3	140.6	0.2	6.19	0.05	0.46	0.03
1,608.8	0.5	1.4	0.5	145.2	0.3	6.28	0.04	0.46	0.02
1,611.2	0.4	7.3	1.0	146.7	0.2	6.26	0.03	0.66	0.05
1,613.5	0.3	10.5	0.3	148.1	0.2	6.30	0.02	0.98	0.16
1,617.6	1.3	6.7	0.7	150.7	0.8	6.31	0.04	0.44	0.02
1,619.6	0.7	15.7	1.2	152.0	0.4	6.32	0.03	0.60	0.01
1,625.3	3.0	10.5	0.9	155.6	1.9	6.35	0.04	0.72	0.09
1,630.0	0.8	5.2	0.6	158.6	0.5	6.40	0.01	0.74	0.13
1,633.3	1.1	6.8	0.7	160.7	0.7	6.41	0.06	0.54	0.03
1,644.7	0.5	6.8	0.4	168.1	0.3	6.44	0.02	0.64	0.04
1,654.8	1.8	8.8	1.4	174.7	1.2	6.50	0.03	0.78	0.08
1,656.8	1.0	2.3	0.3	176.0	0.7	6.49	0.01	1.10	0.18
1,666.7	0.6	8.7	0.7	182.6	0.4	6.57	0.03	0.60	0.03
1,675.2	0.6	8.1	2.3	188.3	0.4	6.62	0.01	0.52	0.02
1,682.6	0.2	5.5	0.4	193.3	0.1	6.63	0.01	0.96	0.10
1,690.1	0.6	4.5	0.5	198.4	0.4	6.64	0.03	0.68	0.07
1,696.8	0.2	5.4	0.1	203.0	0.1	6.66	0.04	0.46	0.03