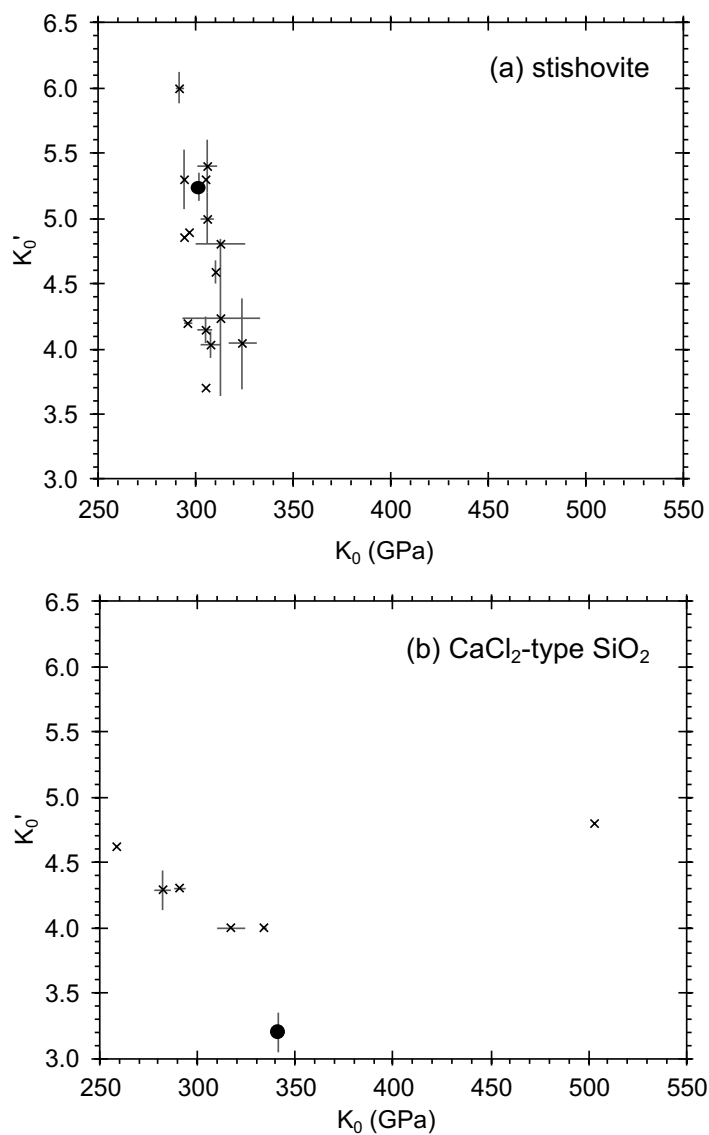
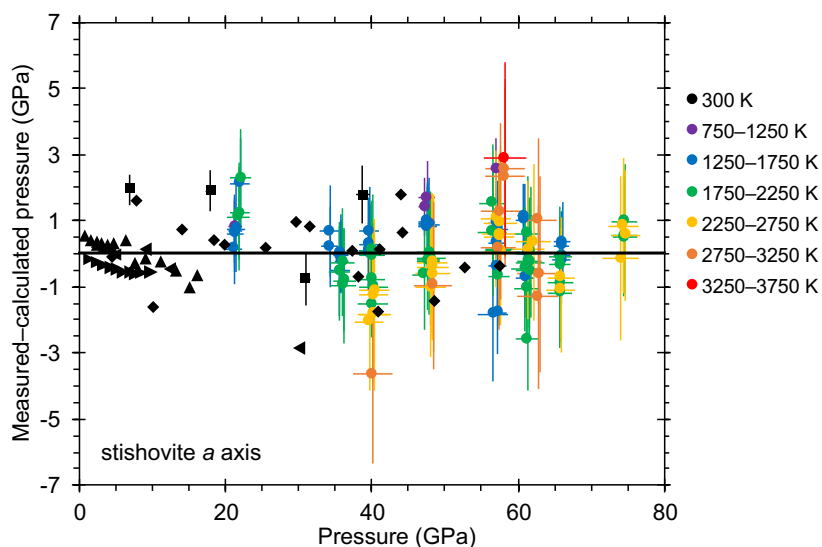


Figure S1



**FIGURE S1.** Tradeoff between  $K_0$  and  $K'_0$  for (a) stishovite and (b) CaCl<sub>2</sub>-type SiO<sub>2</sub>. Filled circles: this study. x symbols: literature values, taken from Tables 1–2 of the main text.  $K_0$  and  $K'_0$  are inversely correlated due to tradeoffs between these parameters, and the values from this study fall within the range defined by previous studies. Error bars are shown if uncertainties were reported by the original study.

Figure S2



**FIGURE S2.** Residuals to the lattice parameter fit for the  $a$  axis of stishovite. Data and fit are shown in Figure 5 of the main text, and fitted parameters are listed in Table 3. Circles: this study. Diamonds: Hemley et al. (2000). Squares: Grocholski et al. (2013). Upwards-pointing triangles: Ross et al. (1990). Right-pointing triangles: Andraut et al. (2003). Left-pointing triangles: Yamanaka et al. (2002). Horizontal and vertical error bars are both uncertainties in measured pressure. Hemley et al. (2000), Ross et al. (1990), and Yamanaka et al. (2002) do not report pressure uncertainties. Data have been corrected to a common pressure scale.

Figure S3

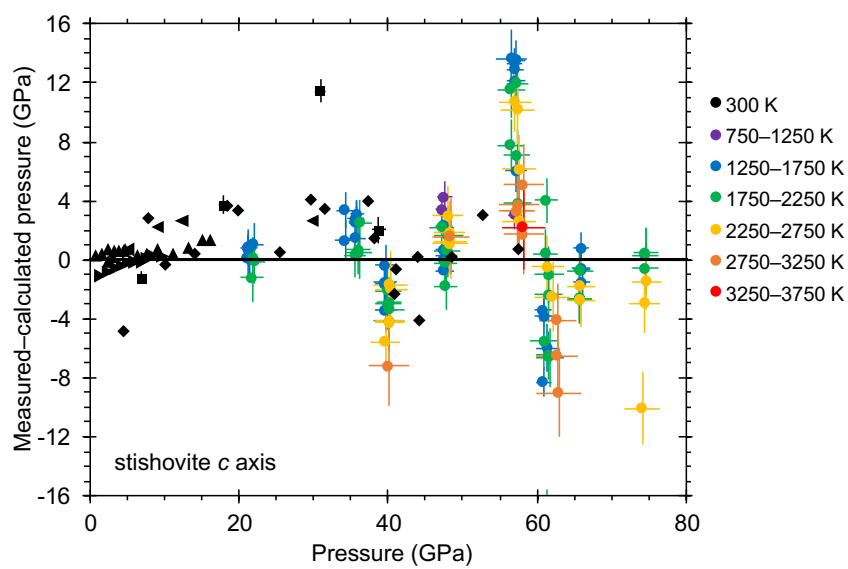
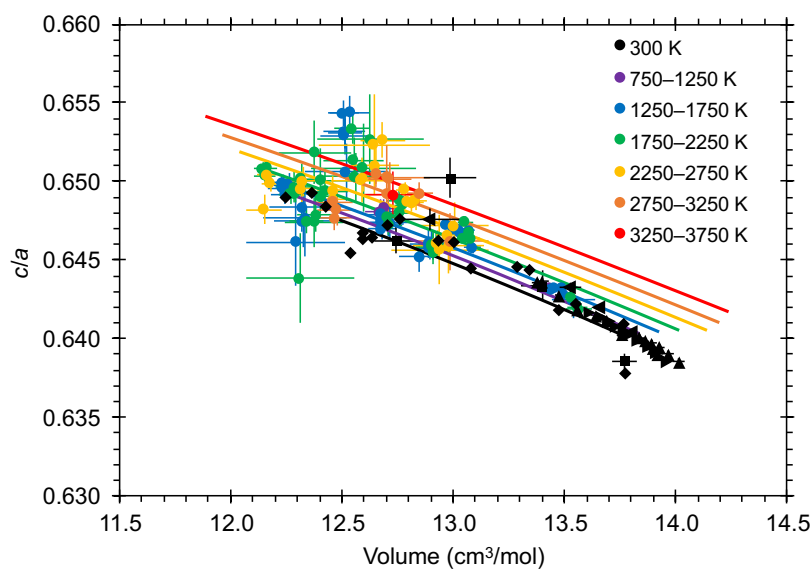
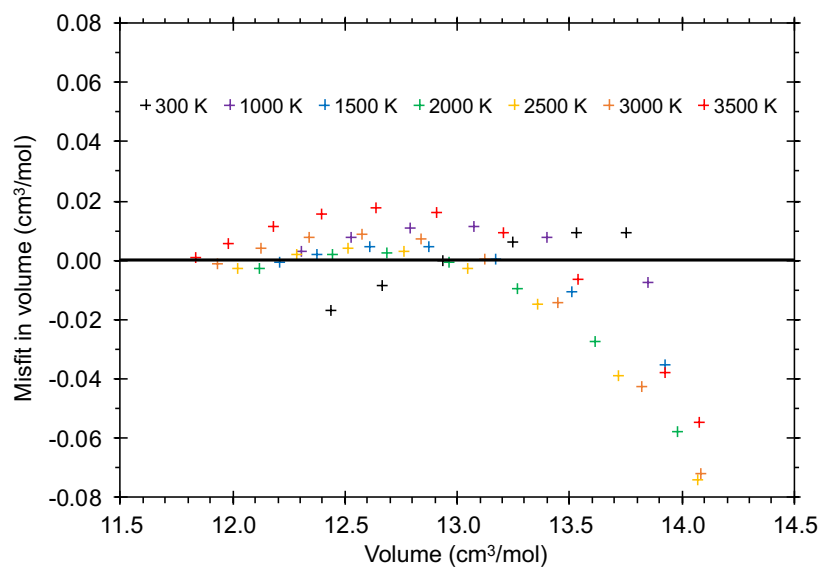
FIGURE S3. Residuals to the lattice parameter fit for the *c* axis of stishovite. Analogous to Figure S2.

Figure S4



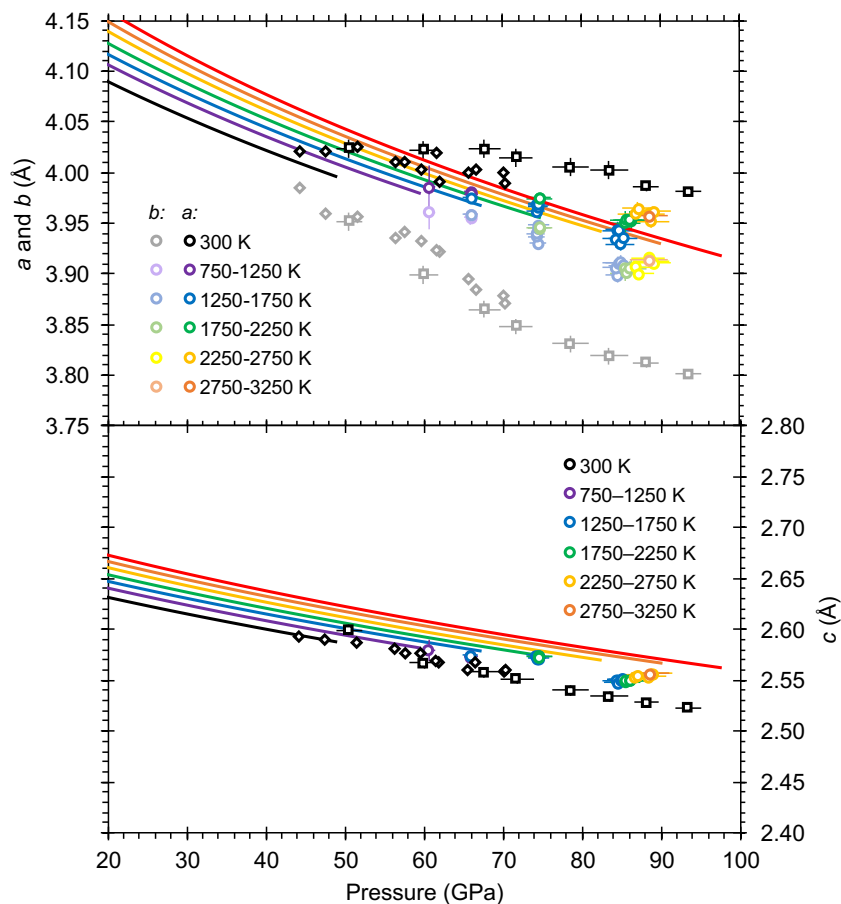
**FIGURE S4.** The axial  $c/a$  ratio of stishovite as a function of volume and temperature. Symbols are as in Figure S2. Solid lines are isotherms calculated from our lattice parameter fits for the  $a$  and  $c$  axes for the midpoint of the indicated temperature range. Note that the range of the vertical axis is only 0.03, and the vertical scatter in the data is only  $\sim 0.005$ , or  $\sim 0.7\%$  of the measured  $c/a$  ratios.

Figure S5



**FIGURE S5.** Synthetic dataset illustrating the misfit between volumes calculated from the stishovite equation of state (Table 1 of the main text) and those calculated from the lattice parameter fits of the stishovite *a* and *c* axes (Table 3 of the main text). The misfit plotted is the volume from the lattice parameter fits minus that of the bulk equation of state.

Figure S6



**FIGURE S6.** Lattice parameters of orthorhombic  $\text{CaCl}_2$ -type  $\text{SiO}_2$ . Curves are isotherms calculated for the midpoint of the indicated temperature ranges from the fits of the  $a$  and  $c$  axes of stishovite (Table 3 of the main text), and are truncated at the edge of the stability field of stishovite (Shen and Lazor 1995; Zhang et al. 1996) (Figure 3 of the main text). Circles: this study. Diamonds: Hemley et al. (2000). Squares: Grocholski et al. (2013). Darker symbols:  $a$  and  $c$  axes. Lighter symbols:  $b$  axis. Hemley et al. (2000) does not report uncertainties. Data are corrected to a common pressure scale.