Supplemental materials to:

Structure of basaltic glass at pressures of up to 18 GPa

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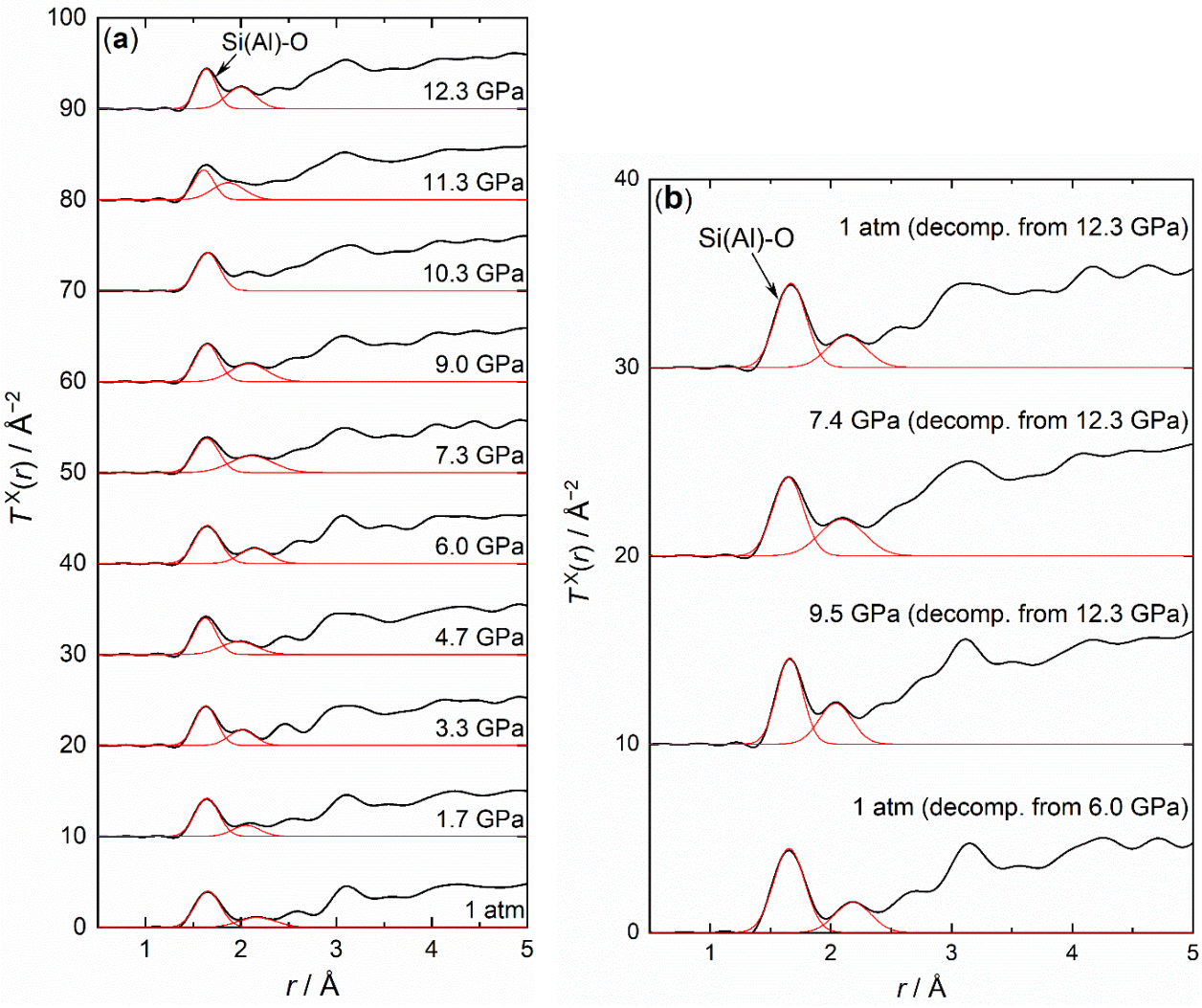

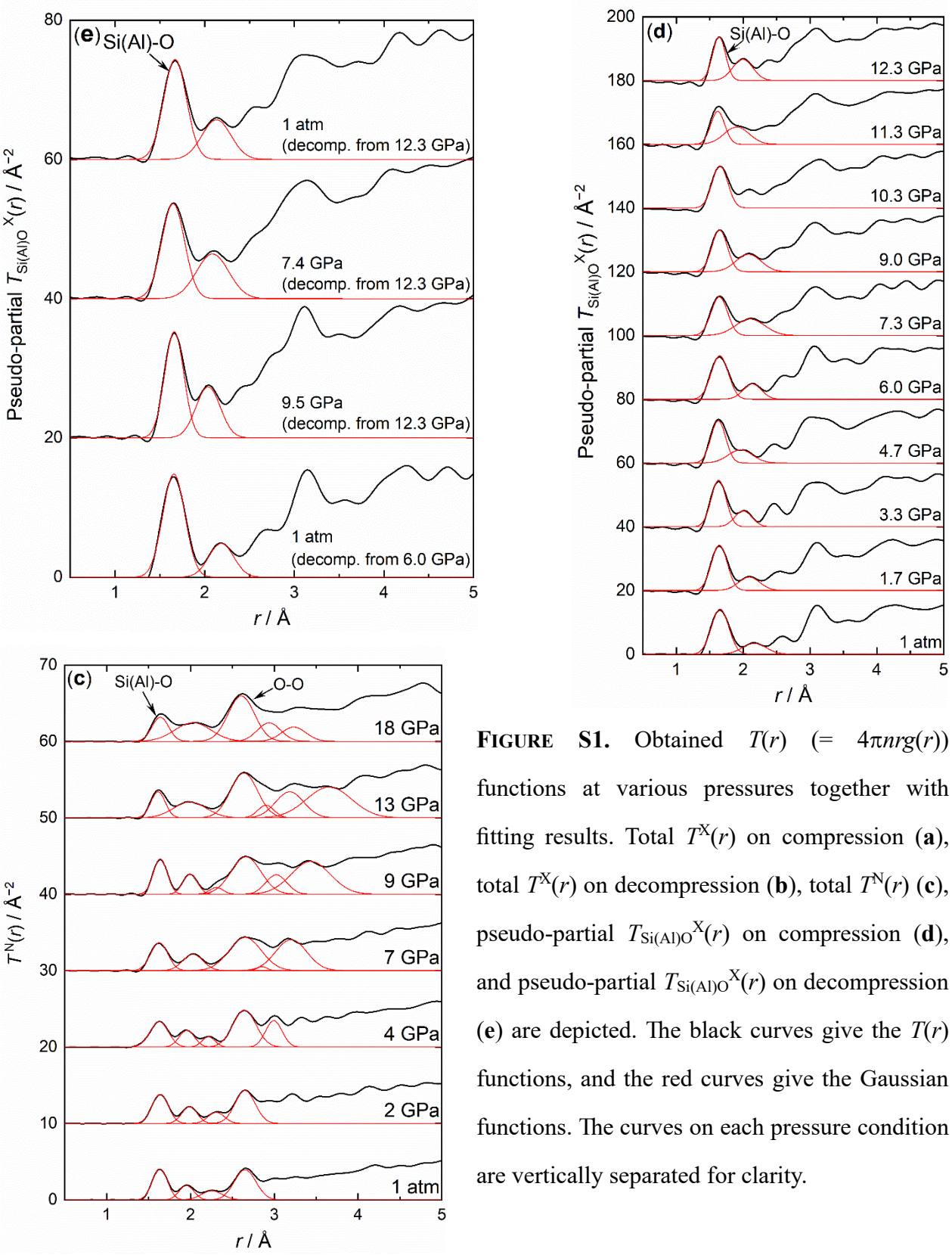

FIGURE S1. Obtained $T(r)$ (= $4\pi nrg(r)$) functions at various pressures together with fitting results. Total $T^{X}(r)$ on compression (**a**), total $T^{X}(r)$ on decompression (**b**), total $T^{N}(r)$ (**c**), pseudo-partial $T_{Si(Al)O}{}^{X}(r)$ on compression (**d**), and pseudo-partial $T_{Si(Al)O}{}^{X}(r)$ on decompression (**e**) are depicted. The black curves give the $T(r)$ functions, and the red curves give the Gaussian functions. The curves on each pressure condition are vertically separated for clarity.

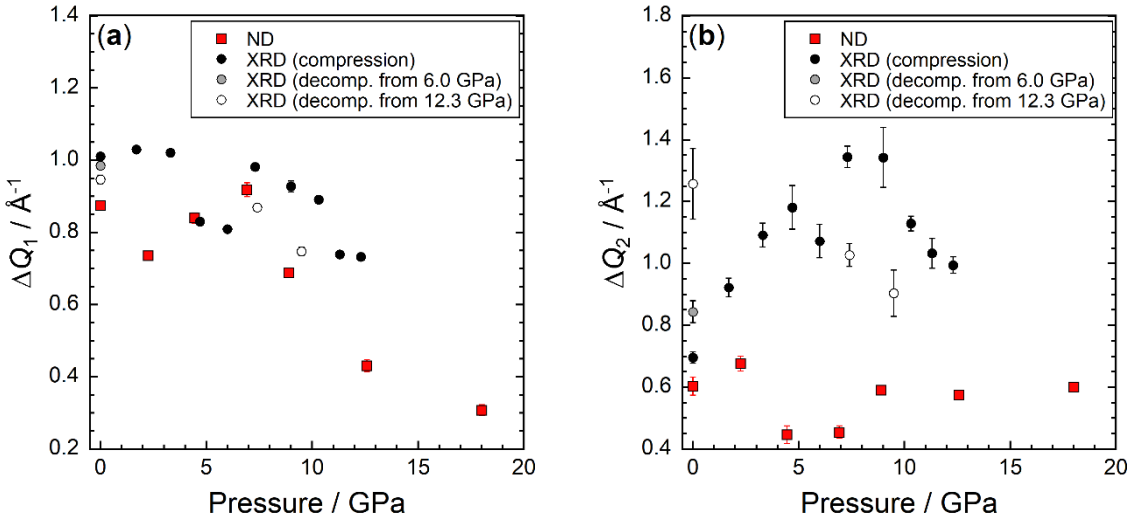

FIGURE S2. Comparisons of the ΔQ_1 (**a**) and the ΔQ_2 (**b**) data in $S^X(Q)$ and $S^N(Q)$ at various pressures. "Decomp." in the legend denotes the decompression. Vertical errors are originated from Lorentzian multiple-fitting errors. For symbols without error bars, error bars are smaller than the symbol size.

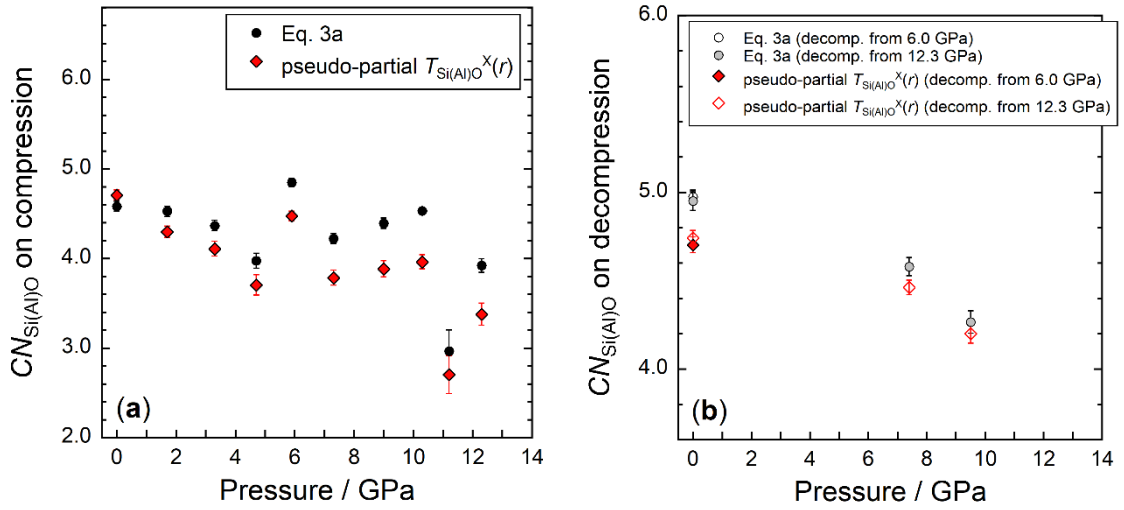

FIGURE S3. Comparison of the $CN_{Si(Al)O}{}^X$ data derived from Eq. 3a and from the method of Prescher et al. (2017). Each figure depicts the data on compression (**a**) and on decompression (**b**). "Decomp." in the legend denotes the decompression. Vertical errors are originated from Gaussian multiple-fitting errors.

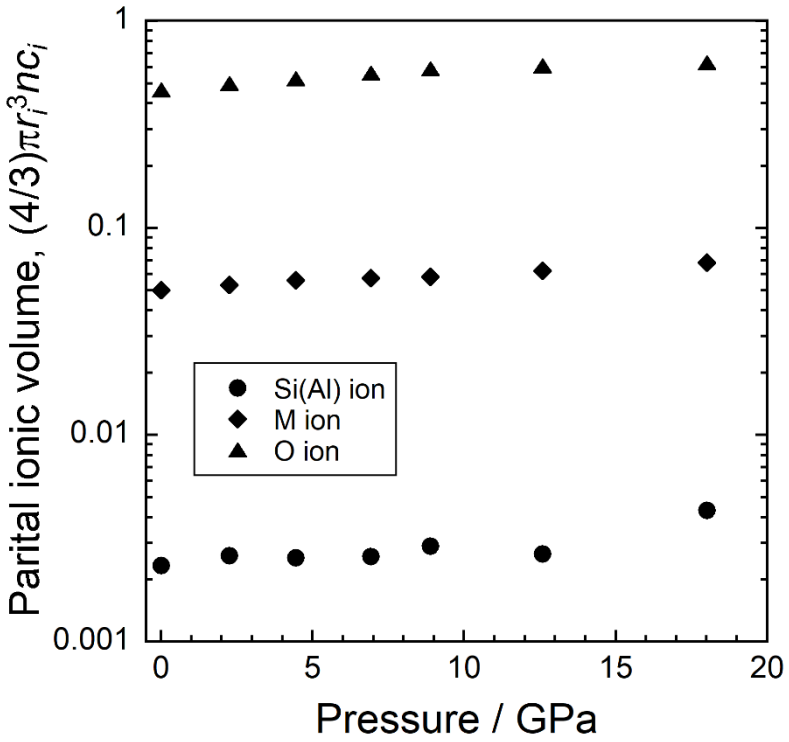

FIGURE S4. Partial ionic volumes, $(4/3)\pi r_i^3 nc_i$, for i = Si(Al), M, and O ions at high pressures. For the calculation of partial volume of M ion, the high-pressure r_{MO} data by Karki et al. (2018) were used. Error bars are smaller than the symbol size.

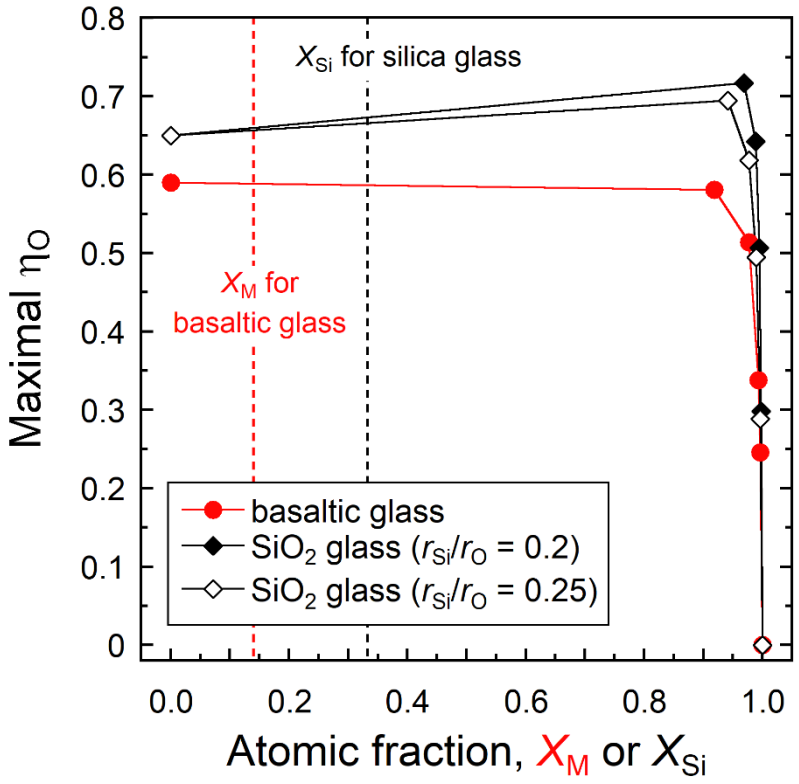

FIGURE S5. Maximal η_O as a function of atomic fractions of M for basaltic glass and of Si for SiO_2 glass. For basaltic glass, we assumed that $r_{Si(Al)} : r_M : r_O = 1 : 3 : 5$ and roughly estimated the maximal η_O using the random-packing data of tridisperse hard spheres by Wong and Kwan (2014). Due to the very small contribution of Si(Al) ions, the partial ionic volume of Si(Al) ion is not considered. For SiO_2 glass, we used the random-packing data of bidisperse hard sphere (r_{Si}/r_O = 0.2, 0.25) by Meng et al. (2014). Since $X_M = 0.14$ for basaltic glass and $X_{Si} = 0.33$ for SiO_2 glass (the vertical dashed lines), the maximal η_O values are almost those of X_{Si}, $X_M \rightarrow 0$ limit. Hence, these glasses can be treated as monodisperse glasses.

TABLE S1. $CN_{Si(Al)O}^{X}$ values calculated from the pseudo-partial $T_{Si(Al)O}^{X}(r)$ functions at various pressures

P (GPa)	$CN_{Si(Al)O}^{X}$
10^{-4}	4.71(5)
1.72(5)	4.30(6)
3.31(8)	4.11(8)
4.73(5)	3.7(1)
5.95(9)	4.48(5)
10^{-4} (on decompression)	4.70(5)
7.25(3)	3.79(9)
8.99(6)	3.89(9)
10.3(1)	3.97(8)
11.2(2)	2.7(2)
12.3(2)	3.4(1)
9.46(9) (on decompression)	4.20(6)
7.44(4) (on decompression)	4.46(4)
10^{-4} (on decompression)	4.74(4)

Note: Errors on the *CN* values are based on the error propagation of the Gaussian fitting errors.

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