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### Title

BORON ISOTOPE EFFECT ON THE HIGH TEMPERATURE VISCOSITY OF SODIUM BOROSILICATE GLASSES

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### Abstract

Borosilicate glasses are important for many technical applications. However, they contain two kinds of network forming oxides, and so relationships between composition and properties are complicated. Viscous flow is one of the properties for which the mechanism is not yet clarified. Previously we measured the boron isotope effect for high temperature thermal properties of  $B_2O_3$  glass. In the present study, the boron isotope effect on the viscosity of the  $33Na_2O \cdot (67-y)B_2O_3 \cdot ySiO_2$  glass system, with  $y=5$  to 20, was investigated around  $10^3$  Pa s as a function of the  $B_2O_3/SiO_2$  ratio. The isoviscous temperature of the glass made from  $^{11}B$  is found to be lower than for the glass made from  $^{10}B$ . Mixing of isotopes is found to further decrease the isoviscous temperature. These results suggest that the breaking of B–O covalent bonds dominates the viscous flow of the examined glass compositions.