

## Elastic wave velocities of SiO<sub>2</sub> glass using ultrasonic method under high pressures and high temperatures

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P and S wave velocities of silica glass were measured at temperatures and pressures up to 1273 K and 6 GPa using combined ultrasonic and synchrotron X-ray techniques in multi-anvil apparatus at SPring-8. Sample lengths at high temperatures and pressures were measured directly using the X-ray radiography technique. Three runs were made with fixed pressure loads to measure temperature dependence of the P and S wave velocities of silica glass at high pressures. We observe anomalous temperature dependence for both P and S wave velocities at each run. With increasing temperature at each high pressure run, the P and S wave velocities are both almost constant or decrease slightly in the range from 300 to 573 K, however increase rapidly between 573 and 973 K, then become almost constant again after 973 K. The rapid increase in the sound velocities at high temperatures and high pressures is well explained by gradual structural transitions of low to high density silica glass.