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Phase boundary between perovskite and post-perovskite structures in $MnGeO_3$ determined by in situ X-ray diffraction measurements using sintered diamond anvils

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Abstract

To determine the phase boundary between the perovskite and post-perovskite structures in $MnGeO_3$, in situ X-ray observations were carried out at pressures of 57–68 GPa and temperatures of 1000–1900 K using the Kawai-type high-pressure apparatus equipped with sintered diamond anvils interfaced with synchrotron radiation. The phase boundary was determined to be P (GPa) = 39.2 + 0.013T (K) based on Tsuchiya's (2003) gold pressure scale. The Clapeyron slope, dP/dT, of 13(+12/–5) MPa/K, determined in the present study is larger that of $MgGeO_3$ and $MgSiO_3$.

Keywords: Post-perovskite, in situ X-ray observation, high pressure, phase boundary