

Thermal diffusivities of MgSiO₃ and Al-bearing MgSiO₃ perovskites

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ABSTRACT

Thermal diffusivities of MgSiO₃ perovskite (MgPv) and MgSiO₃ perovskite containing 2 wt% Al₂O₃ (Al-MgPv) were measured at ambient conditions using the micro-spot heating angstrom method. The obtained values of thermal diffusivities of MgPv and Al-MgPv are 2.6 ± 0.1 and 2.4 ± 0.1 mm²/s, respectively. Present result for MgPv is much higher than previously reported value of 1.7 mm²/s. Substitution of aluminum into MgPv has little effect on its thermal diffusivity at ambient conditions, and such an impurity effect would remain insignificant at high pressures and high temperatures corresponding to the Earth's lower mantle.

Keywords: Thermal diffusivity, thermal conductivity, MgSiO₃ perovskite (MgPv), Al-bearing MgSiO₃ perovskite (Al-MgPv)