

Core Formation Process and Percolation of Metallic Melt in the Early Earth

Yuichi Kanbe[1], Eiji Ohtani[2], Tomoaki Kubo[3], Akio Suzuki[4]

[1] Inst. Min. Petro. and Eco., Tohoku Univ, [2] Institute of Mineralogy, Petrology, and Economic Geology, Tohoku University, [3] Tohoku Univ, [4] Faculty of Science, Tohoku Univ.

In this study, we determined the dihedral angles of contacts between metallic liquids and (Mg, Fe)SiO₃ perovskite, and (Mg, Fe)O at 24 GPa and temperature ranging from 2273 to 2473K. The examination of the effect of temperature and light elements (Sulfur, Oxygen) in metallic components on dihedral angle has been made. Increase of the amount of oxygen in metallic melt from 85 to 78 degrees decreases dihedral angle of contacts between (Mg, Fe)SiO₃ perovskite and metallic melts. The effects of sulfur in metallic melt and temperature on dihedral angle are very weak. This study show that percolation of metallic melts into the solid silicate is not an effective process for the core formation at the upper part of the lower mantle.