

Phase relation of Allende meteorite at high pressures

Yuki Asahara[1], Eiji Ohtani[2]

[1] Inst.Mineral,Petrol.,and Eco.Geol.,Tohoku Univ., [2] Institute of Mineralogy, Petrology, and Economic Geology, Tohoku University

The phase relations of Allende meteorite have been investigated in the pressure range from 20 to 23 GPa, at 1200-2200 degree C using the Kawai type multianvil apparatus. Pressure calibrations were made at high temperatures using il-pv phase transition, post spinel phase transition [1], Al₂O₃ content of Pv [2] determined by in situ X-ray diffraction measurements with the Anderson's Gold scale [3]. The liquidus phase is garnet and the second liquidus phase is magnesiowustite, and the subsolidus phase assemblage of the silicate component is (Mj, Rw, Mw) at 20 GPa. Whereas, the liquidus phase is Mg-perovskite and the second liquidus phase is magnesiowustite, and the subsolidus phase assemblage of the silicate component is (Mg-Pv, CaMgAl-Pv, Mw) at 23 GPa.

Reference

[1] Kuroda et al., Determination of the phase boundary between ilmenite and perovskite in MgSiO₃ by in situ X-ray diffraction and quench experiments, *Phys. Chem. Minerals*, 27, 523-532, 2000

[2] Hirose et al., In situ measurements of the phase transition boundary in Mg₃Al₂Si₃O₁₂, implications for the nature of the seismic discontinuities in the Earth's mantle, *Earth Planet. Sci. Lett.*, 184, 567-573, 2001

[3] Anderson et al., Anharmonicity and the equation of state for gold, *J Appl Phys*, 65,1535-1543, 1989.