Phase relations in the system Mg2SiO4-H2O at the conditions from the mantle transition zone to the lower mantle

Yuji Higo [1], Toru Inoue [2], Tetsuo Irifune [1]

[1] Dept. Earth Sci., Ehime Univ., [2] Dept. Earth Sciences, Ehime Univ.,

Phase relations in the system Mg2SiO4-H2O with low H2O content were experimentally investigated at pressures of 20-23GPa and temperatures of 1673-1873K using MA8-type apparatus. As the result, superhydrous B ,ilmenite (or perovskite) and brucite were observed at 21.0-22.2GPa and 1673K. Gamma-phase, ilmenite (or perovskite) and superhydrous B were observed at 20.4-21.5GPa and 1873K. In hydrous system, gamma-phase can contain H2O in it's crystal structure, and become hydrous gamma-phase. Hydrous gamma-phase was stable at higher pressures more than 0.5GPa comparing with anhydrous-gamma phase at 1873K. Superhydrous B is stable in the condition of the mantle transition zone with low H2O content. Thus superhydrous B would be important water reservoir in the mantle transition zone.