Phase relations of Fe-Si alloy up to core conditions

Hidetoshi Asanuma[1]; Eiji Ohtani[2]; Takeshi Sakai[1]; Hidenori Terasaki[3]; Seiji Kamada[1]; Naohisa Hirao[4]; Nagayoshi SATA[5]; Yasuo Ohishi[6]

[1] Inst.Mineral. Petrol.& Econ. Geol., Faculty of Sci.,Tohoku Univ; [2] Depart. Earth and Planetary Materials Science, Tohoku Univ; [3] Inst. Mineral. Petrol. and Econ. Geol., Tohoku Univ.; [4] JASRI; [5] IFREE, JAMSTEC; [6] JASRI/SPring-8

X-ray diffraction experiments were conducted to 257 GPa and high temperature in situ on an iron-silicon alloy, a candidate for the inner Earth core forming material.Dissolution of silicon in the liquid outer core following reaction with the silicate mantle during core formation strongly suggests the existence of silicon in the solid inner core. We decided the structure of the iron-silicon alloy up to 242 GPa, 3600 K and 257 GPa, 2400 K.