

### **Phase Transformation in FeO under Deep Mantle Conditions**

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Numerous studies have been made on the phase transformation in FeO under deep mantle conditions. However, the results are still controversial. We have studied the transition using both powdered FeO and single crystal of olivine-structured Fe<sub>2</sub>SiO<sub>4</sub>(fayalite) as starting materials. High pressure and high temperature in situ X-ray diffraction studies were carried out at the Photo Factory, Tsukuba, to clarify the stability of B1-B8-rhombohedral phase boundaries. Basic results are consistent with that reported by Kondo et al. [1].

In order to get homogeneous Debye rings of the high-pressure phase of FeO, single crystal of fayalite was used as starting material. Sudden change in color accompanied with the change in X-ray diffraction pattern was observed during room temperature compression at around 30 GPa. Clear diffraction spots from crystalline phase were observed even at 80 GPa. This result is in contrast with the previous report that powdered fayalite becomes amorphous at around 40 GPa when compressed at room temperature [2, 3].

[1] Kondo et al., *Phys. Earth Planet. Inter.*, 2004, **143-144**, 201-213. [2] Richard, Richet, *Geophys. Res. Let.*, 1990, **17**, 2093-2096. [3] Andrault et al., *Phys. Chem. Minerals*, 1995, **22**, 99-107.

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