

Pressure-induced phase transformation of fayalite

Nobuyoshi Miyajima[1]; Takehiko Yagi[2]

[1] Inst. Solid State Phys., Univ. Tokyo; [2] Inst. Solid State Phys, Univ. Tokyo

http://www.issp.u-tokyo.ac.jp/labs/new_materials/yagi/

The phase transition of single-crystal fayalite has been investigated under high pressure conditions up to 80 GPa, using a raman spectroscopy and in-situ high pressure X-ray diffraction combined systems of a diamond anvil cell and a synchrotron X-ray beam on the BL13A beam line at KEK, Tsukuba. Although the thin slice of fayalite is transparent against an optical light at ambient conditions, the color was changed into opaque under pressures around 30 GPa at room temperatures. The X-ray diffraction patterns showed a preferred orientation just after the color change and a strong diffuse scattering with increasing pressure up to 80 GPa. However, some spots of the diffraction pattern still have enough intensity to be a crystal state under those high pressures. The preliminary results are inconsistent with fayalite becoming an amorphous state under pressures around 40 GPa at room temperatures.