

Pressure induced phase transformation in andradite

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Andradite is a garnet which contains ferric iron and we have studied its behavior by high pressure and high temperature in situ X-ray study. The sample was formed into disk-shape and was compressed in Ar-pressure medium using diamond anvil cell and heated by Nd:YAG laser. After quenching to room temperature, high-pressure in situ X-ray diffraction measurements were carried out at the photon factory BL-13B2. At 19 GPa, andradite decomposed into two (or more) phases; a pressure-unquenchable cubic perovskite structure phase and a pressure-quenchable phase(s). At 25 and 37 GPa, most of the diffraction lines were explained by a cubic perovskite structure but there were some other unknown diffraction lines, which were also unquenchable on release of pressure.