

## In situ X-ray observation of the phase transformations in MgAl<sub>2</sub>O<sub>4</sub> at pressures to 40 GPa

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Phase transformations in MgAl<sub>2</sub>O<sub>4</sub> have been studied by in situ X-ray diffraction measurements at high temperature and high pressure using a combination of synchrotron radiation at SPring-8 and large multi-anvil apparatus, SPED-1500. Sintered diamond anvils were also adopted for pressure generation above 30 GPa. We were able to conduct such experiments at pressures to 35 GPa and at temperatures to 1500C, and confirmed the appearance of a mixture of simple oxides (i.e. MgO and Al<sub>2</sub>O<sub>3</sub>), e-MgAl<sub>2</sub>O<sub>4</sub>, and CaFe<sub>2</sub>O<sub>4</sub>-type MgAl<sub>2</sub>O<sub>4</sub> according to the pressure ranges studied. The possible phase relations among these phases are discussed on the basis of the present in situ X-ray observations.