

The 481th Geodynamics Seminar

CPO of the experimentally deformed coesite at high pressure

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Abstract

Coesite, which is constituent mineral of the subducting continental crust seems to play a major role in deformation of the crust at the ultra-high pressure metamorphism condition. Flux of the crust seems to be largely determined by viscosity of coesite and it could affect terrestrial thermal history and chemical evolution. So we should understand deformation properties of coesite including microstructural mechanism. However, pressure conditions in the previous studies based on deformation experiments (Renner et al., 2001; Zhang et al., 2013; Idrissi et al., 2008) are limited to 4 GPa because of the limitation of the apparatus. In this study, we conducted deformation experiments of coesite at temperature of 900-1000°C, pressure of 3-9 GPa using D111 and D-DIA type deformation apparatus at the synchrotron beamline NE7A, PF-AR, KEK and Ehime university. We determined crystallographic-preferred orientation (CPO) of recovered samples by EBSD analysis using the FE-SEM and two-dimensional X-ray diffraction method. In this presentation, we will show the slip system at high pressure determined from CPO and discuss the implication for strength of the continental crust.

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