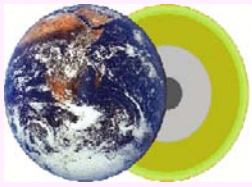
Geodynamics Seminar

第307回ジオダイナミクスセミナー

Determination of akimotoite-perovskite transition in $MgSiO_3$ and post-spinel transition in Mg_2SiO_4: negative Clapeyron slopes in the two major mantle minerals

Yume Kinoshita
(Msc. Student, Ehime University)

主催：愛媛大学地球深部ダイナミクス研究センター
日時：10/28（金）午後 4時30分～
場所：総合研究棟 4F 会議室



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Abstract

The clapeyron slope of the post spinel phase transition in olivine component is one of the most fundamental parameters in mantle dynamics. It has been believed that this slope is negative (-2 to -3 MPa/K: Ito and Takahashi, 1989; Irifune et al., 1998) and that the negative slope makes resistance to subducting slabs, resulting in stagnation of the slabs in mantle transition zone and the upper part of lower mantle. Recently, some experimental results proposed that the value of this slope is almost zero or very small negative, about -1 MPa/K (Katsura et al., 2003; Fei et al., 2004). Some geodynamics simulation studies suggest that the slope should be about -2 MPa/K when an appropriate viscosity contrast between the upper and lower mantle and an appropriate trench retreat speed are employed (e.g., Torii and Yoshioka, 2007). In the present study, we are trying to redetermine the clapeyron slope in Mg_2SiO_4 as well as that in $(Mg_{0.9},Fe_{0.1})_2SiO_4$. Generated pressures are carefully determined by X-ray diffraction measurements of MgO and platinum at high pressure and temperature using a combination of a Kawai-type multi-anvil apparatus and synchrotron radiation in SPring-8. In the present experiments, we also put $MgSiO_3$ in sample capsules to determine the clapeyron slope of akimotoite-perovskite transition. In this seminar, I will talk about details of the present experimental results and an implication for interpretation of topography of 660 km seismic discontinuity.

詳細は当センターホームページ: http://www.ehime-u.ac.jp/~grc/をご覧ください
問い合わせ先：桑山 靖弘（TEL:089-927-8408,e-mail:kuwayama@sci.ehime-u.ac.jp）