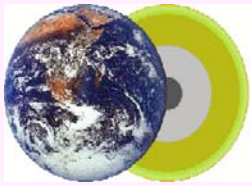
Geodynamics Seminar

第368回ジオダイナミクスセミナー

Coupled substitution of H^+ and Al^{3+} into dense hydrous magnesium silicate (DHMS) phases

Dr. Toru Inoue (Professor, GRC)

主催：愛媛大学地球深部ダイナミクス研究センター
日時：10/25（金）午後 4時30分～
場所：総合研究棟Ⅰ 4F 共通会議室



EHIME UNIVERSITY GRC GEODYNAMICS RESEARCH CENTER

Abstract

Subducting slabs are supplying water into the deep mantle, and some hydrous minerals may be present in the mantle transition zone and even in the uppermost lower mantle. The water storage capacities of mantle minerals are supposed to be significantly coupled with Al by a substitution with Mg^{2+}, Si^{4+} or Mg^{2+} + Si^{4+}, because Al^{3+} is the trivalent cation, and H^+ is the monovalent cation. We have examined the effect of Al for the water content and the stability of some hydrous phases in the system MgO - Al_2O_3 - SiO_2 - H_2O in the uppermost lower mantle condition. We succeeded to synthesize the Al-bearing hydrous minerals (Al-bearing phase B, Al-bearing superhydrous phase B, Mg-Si bearing δ-AlOOH), and found that the significant coupling of H and Al were occurred in these minerals. The chemical compositions and the lattice parameters are discussed about the difference between the pure chemical forms. Still more, the substitution mechanisms were considered basically by the chemical compositions and the information of the crystal structures. Our study suggests that water can be stored in the uppermost lower mantle in the form of Al-bearing hydrous minerals or nominally anhydrous minerals.

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： 出倉 春彦（TEL:089-927-8408,e-mail:dekura@sci.ehime-u.ac.jp）