The 393th Geodynamics Seminar

Chemistry and stability of phase H in the lower mantle

Masayuki Nishi (Postdoctoral Researcher, ELSI-ES, GRC)

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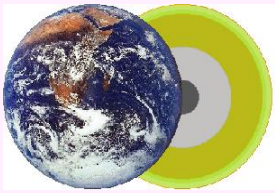

EHIME UNIVERSITY GRC GEODYNAMICS RESEARCH CENTER

Abstract

Previous experimental and theoretical studies show that the high-pressure forms of hydrous silicates (dense hydrous magnesium silicates, DHMS) and δ-AlOOH play important roles in transportation of water into the deep Earth's interior via subduction of oceanic slabs. We recently found the new dense hydrous silicate, phase H ($MgSiH_2O_4$), at pressures above ~40 GPa using multianvil technology combined with sintered diamond anvils and theoretical calculations [Tsuchiya, 2013; Nishi et al., 2014]. Phase H – δ-AlOOH solid solution can deliver significant amount of water to the deeper regions of the lower mantle and probably to core-mantle boundary (~2900 km depth)[Ohira et al., 2014]. However, previous studies were based on the simple MgO-SiO_2-Al_2O_3-H_2O system, and the effect of the other component on the stability of phase H have not been reported. Here I show the possible chemical compositions of hydrous silicate phase H coexisting perovskite in the multi-component systems. We used natural antigorite and chlorite, and mixed oxide powder as starting materials. Based on the experimental results, the effect of Fe on the stability of phase H will be discussed.

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）