Geodynamics Seminar

第361回ジオダイナミクスセミナー

Stability fields of dense hydrous magnesium silicates in the lower mantle

Dr. Masayuki Nishi (JSPS Postdoctoral Fellow, GRC)

主催：愛媛大学地球深部ダイナミクス研究センター
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Abstract

It is widely accepted that the most important transportation process of water into deep mantle is subduction of cold slab. Recent experimental and theoretical studies suggest that dense hydrous magnesium silicates (DHMSs) are stable over a wide range of pressure, and therefore DHMSs possibly carry water into the deep Eath's interior. Based on these studies, it has been recognized that phase D is stable at least under the uppermost part of the lower mantle conditions along cold slab geotherms. However, little is known about the high pressure transformation of phase D and the other DHMSs that can be stable in the lower mantle. In order to clarify the stability of DHMSs in the lower mantle, we conducted in situ X-ray diffraction measurements using a large volume multianvil apparatus at BL04B1, Spring-8. Sintered diamond was used as the second-stage anvils. Quench-type experiments were also perfumed at Ehime University. The microstructures and chemical compositions of the recovered samples were examined using a field emission-scanning electron microscope with an energy dispersive x-ray spectroscopy. The melting temperatures of DHMSs were determined up to 50 GPa. Also, we found that the increase of the melting temperature by Al incorporation into phase D. Based on these results, stability fields of the DHMSs in the lower mantle 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：桑山 靖弘（TEL:089-927-8408,e-mail:kuwayama@sci.ehime-u.ac.jp）