

The 451st Geodynamics Seminar

Transformation of hydrous oxides at high pressures

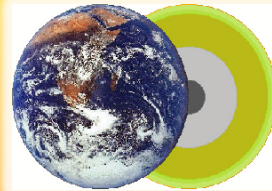
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Research Bldg. 1, Ehime Univ.**

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**場所：愛媛大学 総合研究棟 I
4階共通会議室**



Abstract

Hydrogen and oxygen are the most abundant elements in the universe. These elements have played an important role in the structure, dynamics, and evolution of the planets because of their strong effects on oxygen fugacity and melting relations at high pressure. The concentration of these elements in the Earth is changed by the global circulation mechanism through the mantle convection. The discovery of high pressure hydrous minerals implies that the deep water transportation via subduction of oceanic plates reach to the bottom of the Earth's lower mantle. Also, dehydration process of hydrous phase in down-going slab may affect the oxygen cycle in the Earth's interior. Here, I report the new experimental results on $(\text{Mg,Si})\text{OOH}$, AlOOH , FeOOH and their solid solutions under the deep lower-mantle conditions. The structural changes, spin transition of Fe, and dehydration processes of these hydrous phases were studied by in-situ X-ray diffraction experiments. Based on the chemical composition and phase relations of the hydrous phases, I discuss the oxygen and hydrogen cycles in the Earth and the other extra-solar planets.