

The 465th Geodynamics Seminar

Experimental study on the metasomatic reaction
between brine and crustal materials in subduction zones

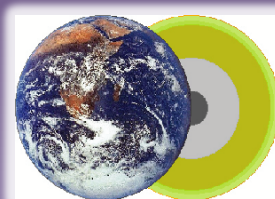
Dr. Hiroaki Ohfuji (Professor, GRC)

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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

Fluid inclusions found in high-pressure metamorphic rocks and mantle diamonds provide information to understand the chemical composition of water (fluid) that is transported to deep mantle through subduction of oceanic plates. The results of chemical analysis on such fluid inclusions revealed that in many cases the fluid is dominated by saline components such as Na^+ , K^+ and Cl^- (e.g. Izraeli et al., 2001). Although the origin of the “brine” is expected to be from the sea water by thermodynamic calculation based on chemical equilibrium (Glassley, 2001), the fact that brine inclusions found in cloudy diamonds are rich in K^+ rather than Na^+ implies that extensive metasomatic reaction between sea water and crustal rocks occurs along with its concentration during subduction to deep mantle.

To investigate the potential reaction between brine and crustal materials, we first conducted a series of high pressure experiments using K-feldspar as a starting material and a large-volume press. Microtexture observation and chemical analysis of the recovered reaction products revealed the formation of jadeite and coesite mixtures in the reaction zones, suggesting a metasomatism of K-feldspar by brine under high P-T. We are currently performing a new series of experiments using alkaline basalt as a starting material to further understand the metasomatism and elemental transportation through brine in multi-component systems.

詳細は当センターホームページ: <http://www.grc.ehime-u.ac.jp/> をご覧ください
問い合わせ先: 西 真之 (TEL: 089 927 8153, e-mail: nishi@sci.ehime-u.ac.jp)