Elemental Transportation From Subducting Slab to the Sub-arc Mantle Though Fluid Process: Study from High Pressure Experiments

Yoshiyuki Iizuka [1], Eizo Nakamura [2], Katsura Kobayashi [3], Bjorn Mysen [4]

[1] IES, Academia Sinica, [2] ISEI(Misasa), Okayama Univ., [3] ISEI, Okayama University, [4] Geophysical Lab, Carnegie Inst.

Aqueous fluids derived from subducting oceanic crust control material recycling and chemical evolution of the descending slabs and overlying mantle wedge. High pressure experiments on dehydration of the slab and metasomatism of the mantle has been carried out at subsolidus temperatures to characterize these processes. High-LREE/HREE and alkali-silica-enriched aqueous fluids were released from the slab and resulted in formation of a silica-rich layer by reaction with mantle olivine. The chemical compositions of aqueous fluids, which are source of silica-metasomatism in the mantle wedge, should be controlled by mineral phases, especially garnet, in the descending oceanic slabs.