

## 塩水による島弧下マントルへのイオン半径の大きな親石元素の移動 Large ion lithophile elements delivered by saline fluids to sub-arc mantle

川本 竜彦<sup>1\*</sup>; 三部 賢治<sup>2</sup>

KAWAMOTO, Tatsuhiko<sup>1\*</sup>; MIBE, Kenji<sup>2</sup>

<sup>1</sup> 京都大、理・地球熱学, <sup>2</sup> 東京大、地震研

<sup>1</sup>Inst Geotherm Sci, Grad School Sci, Kyoto Univ, <sup>2</sup>Earth Research Institute, Univ of Tokyo

Geochemical signatures of arc basalts are explained by addition of aqueous fluids, melts, and/or supercritical fluids from subducting slab to sub-arc mantle. Partitioning of large ion lithophile elements between aqueous fluids and melts is crucial as these two liquid phases are present in the sub-arc pressure-temperature conditions. Using synchrotron x-ray beams, in-situ x-ray fluorescence (XRF) spectra are obtained from aqueous fluids and silicate melts at high-temperature and high-pressure conditions under varied concentrations of (Na, K)Cl (0-25 wt.%). There is a positive correlation between partition coefficients and pressure, as well as partition coefficients and salinity. In the systems with 13-25 wt.% (Na, K)Cl, partition coefficients of Rb, Cs, and Pb are greater than unity, indicating the capacity of such highly saline fluids to effectively transfer those elements. Enrichment of large ion lithophile elements in arc basalts relative to mid oceanic ridge basalts has been attributed to the mantle source fertilization by aqueous fluids from dehydrating oceanic plate. Such aqueous fluids are likely to contain Cl, although their amount remains to be quantified.

キーワード: 沈み込み帯, マグマ, 高温度高圧力, マントルウェッジ, 放射光 X 線, 塩素

Keywords: subduction zone, magma, high temperature and high pressure, mantle wedge, synchrotron X-ray, chlorine