

## Slab-fluids: saline fluids in fore arc regions and supercritical fluids under volcanic arcs

Tatsuhiko Kawamoto<sup>1\*</sup>, yoshitaka kumagai<sup>1</sup>

<sup>1</sup>Inst Geotherm Sci, Grad School Sci, Kyoto Univ

Chemical features of slab-fluids are essential to understand the geo processes in subduction zones. We studied the amphibole and phlogopite bearing harzburgite xenolith collected from the Pinatubo 1991 eruption. The harzburgite has coarse olivine having many fluid inclusions. The fluid inclusions are composed of H<sub>2</sub>O-CO<sub>2</sub>-Cl fluids with 5.1 +/- 1 wt% NaCl. The Pinatubo volcano is located at the volcanic front of the Luzon arc subducted by South China Sea plate. We suggest that such CO<sub>2</sub> bearing saline fluids are infiltrated in the forearc mantle. We also studied plagioclase lherzolite xenoliths collected from the Ichinomegata volcano, Northeast Japan arc. The xenoliths have orthopyroxene grains having many CO<sub>2</sub>-H<sub>2</sub>O-Cl-S fluid inclusions with 3.7 +/- 0.8 wt% NaCl. We suggest that such fluids can be formed through degassing of arc magmas. We estimate that slab-fluids to produce the arc magmas have 1.1 ? 1.4 wt% NaCl with assumption of Cl partitioning between basaltic magmas and aqueous fluids.

The origin of such saline fluids remains unanswered at this moment. If the slab-fluids are saline fluids, their percolation processes may differ from pure H<sub>2</sub>O fluids. Pressure-temperature conditions of critical endpoints between magmas and fluids may be different from those in the pure H<sub>2</sub>O systems. There still remains to be investigated to answer for those questions. The chemical analyses of fluid inclusions in mantle rocks and melt inclusions in volcanic rocks should be conducted in more localities with more elements. And high-pressure and high-temperature experiments using saline solutions should be conducted to understand the role of saline fluids in subduction-zone processes.

Keywords: subduction zone, magma, fluid inclusion, mantle wedge, dehydration, chlorine