Japan Geoscience Union Meeting 2012
(May 20-25 2012 at Makuhari, Chiba, Japan)

SGC55-P04 Room:Convention Hall Time:May 23 15:30-17:00

Behavior of platinum-group elements during peridotite partial melting

KOGISO, Tetsu[1*]

[1]Graduate School of Human and Environmental Studies, Kyoto University

Platinum-group elements (PGE) are key tracers for the chemical differentiation of the early Earth and the subsequent chemical evolution of the Earth's interior. PGE abundances in the mantle are much higher than expected from core-mantle equilibration, which is often attributed to late meteorite bombardment (so called "late veneer") on the Earth after core formation, although alternative hypotheses have also been proposed. A critical point to testify the models for the excess PGE in the mantle is accurate estimation of the PGE abundances in the primordial mantle. Many peridotite samples with relatively primitive composition have broadly chondritic relative abundances of PGE, which is in favor of the late veneer hypothesis. However, absolute concentrations of PGE are strongly variable among rock types and sample locations, because PGE concentrations in peridotite samples are likely to be modified by partial melting processes the samples experienced. Thus it is highly required to understand the PGE behavior during partial melting processes in order to accurately estimate the PGE abundances in the mantle. Since PGE in peridotite samples are dominantly concentrated in base metal suflides (BMS) and platinum-group minerals (PGM), it is necessary to know the phase relations of BMS and PGM in partially molten peridotite minerals. I will review the experimental studies on the stability of PGM and BMS during partial melting of peridotite, and discuss the role of these minerals for the generation of the diversity of PGE concentrations in peridotite samples.

Keywords: platinum-group element, platinum-group mineral, mantle, partial melting