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Geochemical and Sr-Nd isotopic variations of spinel peridotite xenoliths from Kurose, Kyushu, Japan

Masako Yoshikawa[1*], Tomoyuki Shibata[1], Satoko Ishimaru[2], Shoji Arai[2]

[1]IGS., Kyoto Univ., [2]Dept. Earth Sci., Kanazawa Univ.

The Cenozoic alkaline magmas in SW Japan frequently contain peridotite xenoliths (e.g. Takamura, 1973; Aoki, 1987). The peridotite xenoliths from Kurose near the Genkai-jima island in the Hakata Bay, northern Kyushu, are interpreted to have escaped from Fe-rich metasomatism related to the host alkali basalt magmatism and asthenospheric upwelling (e.g. Arai et al., 2001). On the other hand, Abe et al (2003) suggested that the Kurose peridotite xenoliths from SW Japan were suffered by cryptic metasomatism with enrichment in light rare earth elements (LREE) and incompatible elements with less extent of Fe-enrichment. To investigate the relationship between chemical and Sr-Nd isotopic compositions, we determined major element compositions of minerals and trace element compositions of clinopyroxene for selected xenolith samples.
The forsterite content of olivine ranges from 90 to 91. The cr-number (=100 x Cr/(Cr + Al) aomic ratio) and mg-number (=100 x Mg/(Mg + Fe)) of spinel range from 22 to 56 and from 62 to 77, respectively. The CaO and Al_2O_3contents of orthopyroxene are from 0.73 to 0.92 wt % and from 2. 0 to 4.0 wt%, respectively. The Na_2O content of clinopyroxene is lower than 1.1 wt%. These chemical variations are within the ranges for other peridotite xenoliths from the Japan arcs and abyssal peridotites (e.g. Arai et al. 2006; Neuman and Simon, 2009). Equilibrium temperature obtained from two-pyroxenes thermometers (Wells, 1977; Brey & Kohler, 1990) ranges from 980 to 1060 ?C.
Clinopyroxene shows various chondrite-normalized REE patterns, ranging from LREE-depleted ($(Ce/Yb)_N$=0.02; subscript N shows chondrite normalized) through spoon-shaped to LREE-enriched ones ($(Ce/Yb)_N$=12). The Ti/Zr ratio of clinopyroxene also varies from 26 to 2700. These variations are wider than the range for Japan arc xenoliths (e.g. Abe et al., 1998; Arai et al., 200 6).
We will report Sr-Nd isotopic variations of clinopyroxene in these samples and discuss cause of chemical and isotopic variations.