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大町海山蛇紋岩から推定される IBM マントルの発生と進化
Generation and evolution of lithospheric mantle beneath Izu-Bonin-Mariana: Deduced from Ohmachi Seamount serpentinites

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At the base of western slope of the southern half of the Ohmachi Seamount, Izu-Bonin frontal arc, a large exposure of highly metamorphosed serpentinites has been well known (Yuasa et al., 1998; Niida et al., 2001, 2003; Ueda et al., 2004; Hirauchi et al., 2010). The serpentinite basement is divided into massive serpentinites and schistose serpentinites (antigorite schists) in association with a rare occurrence of eclogite (Ueda et al., 2004).

The massive serpentinites, carrying small amounts of primary mantle minerals, can be identified into three different peridotite types as their original lithologies. One is lherzolite, which represents a fertile, residual mantle peridotite (UMP) with primary olivine (Mg#=89˜91) and spinel (Cr#=13˜18). The second is dunite-chromitite, which represents an island-arc type magma channel sample (MCP), having a distinct mineralogy of olivine (Mg#=91.5˜92.5) and spinel (Cr#=65˜80) from the residual mantle lherzolite. The third type is cumulates (CUM: wehrlite ˜ olivine clinopyroxenite ˜ clinopyroxenite) composed of cumulus olivines and clinopyroxenes crystallized within a deep-seated magma chamber and/or magma conduit.

It is deduced from the above lithology and primary mineralogy that the Ohmachi Seamount serpentinite was originated as fertile mantle lherzolite, probably from the upper mantle beneath continental margin (Niida et al., 2001, 2003), before the opening of the West Philippine basin. Prior to the settlement into the the active Izu-Bonin arc system, the lithospheric mantle was modified by channeling of island-arc type magmas generated in Paleogene along old island-arc systems of the Ogasawara Ridge and the Kyushu-Palau Ridge. Then, the mantle peridotites were experienced in antigorite metamorphism of serpentine schist (Hirauchi et al., 2010) and in coupling with eclogite and amphibolite (Ueda et al., 2004) generated within a subduction channel.

References:

Hirauchi, K., Michibayashi, K., Ueda, H. and Katayama, I., 2010, EPSL, 299, 196-206.
Niida, K., Izumino, T. and Yuasa, M., 2003, Chikyu Monthly Extra, 43: 90-100.
Niida, K., Yuasa, M., Nishimura, A., Fujiwara, T. and Watanabe, T., 2001, JAMSTEC J. Deep Sea Res., 19, 77-86.
Ueda, H., Usuki, T. and Kuramoto, Y., 2004, Geology 32, 849-852.
Yuasa, M., Nishimura, A., Niida, K. and Ishizuka, O., 1998, JAMSTEC Deep Sea Res., 14, 269-277.

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