Petrological characteristics of serpentinized peridotites dredged from oceanic core complexes in the Shikoku Basin

Izumi Segawa[1], *Ken-ichi Hirauchi[1], Yasuhiko Ohara[2,3], Yui Kouketsu[3], Katsuyoshi Michibayashi[3]

1. Department of Geosciences, Faculty of Science, Shizuoka University, 2. Hydrographic and Oceanographic Department of Japan, 3. Department of Earth & Planetary Sciences, Graduate School of Environmental Studies, Nagoya University

In order to understand the structure of oceanic lithosphere and the nature of rheological weakening in oceanic detachment faults, we carried out petrographic, petrological, mineralogical analyses of mantle peridotites dredged from oceanic core complexes (Mado Megamullion and Non-Transform Offset Massif at 23°30′N) in the Shikoku Basin. The peridotites consist of harzburgite/lherzolite (H/L-type) or dunite (D-type), and represent refractory residues after low degrees of partial melting (8-14%). Mylonitic deformation at high temperatures leads to the formation of elongated porphyroclasts of pyroxenes and spinel, defining foliation. The mylonitic foliation is cut by gabbroic veins consisting of amphibole, chlorite and diopside. The peridotites undergo significant shallow serpentinization under hydrostatic conditions, which produces lizardite characterized by mesh textures and bastite. The pseudomorphic serpentinites are replaced mainly by talc, resulting in the formation of localized share zone. These results suggest that hydrous minerals formed through hydrothermal and metasomatic alteration of peridotites play a role in contributing to long-term strain localization into a single detachment fault.

Keywords: oceanic core complex, peridotite, metasomatism, serpentinization

©2020. Japan Geoscience Union. All Right Reserved.