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

MIS31-08 会場:106 時間:5 月 24 日 11:15-11:30

MORB の形成過程：北部オマーンオフィオライトにおける調和的なダナイト脈からの示唆
Petrogenesis of MORB: a implication from concordant dunite bands of the northern Oman ophiolite

秋澤 紀克 [1*], 荒井 章司 [1], 田村 明弘 [2]
AKIZAWA, Norikatsu[1*], ARAI, Shoji[1], TAMURA, Akihiro[2]

[1] 金沢大学・自然科学・地球, [2] 金沢大・フロンティアサイエンス機構
[1]Kanazawa Univ. Natural Sci. Earth Sci., [2]Kanazawa Univ. FSO

Dunite bands and veins in the ophiolitic mantle peridotite are interpreted as melt conduits within the suboceanic mantle. In particular, concordant dunite bands are possibly important as melt conduits, through which parental melts of MORB (mid-ocean ridge basalts) were transported to shallower mantle beneath the ridge axis. However, no detailed petrological data of concordant dunite bands and surrounding peridotites have been published. We found concordant dunite bands from various ”stratigraphic levels” in the mantle section of the northern Oman ophiolite. They are various in thickness (few millimeters ˜ few tens of centimeters) and frequency of appearence. Dunite bands are almost pyroxene-free, and orthopyroxenes, if any, are vermicular in shape. Modal clinopyroxenes in wall peridotites increase toward the dunite band.

Mineral chemistry shows systematic variations in the wall peridotites toward the dunite bands: (1) a decrease in the Fo content (92 to 90.5) of olivines, (2) an increase in the Cr/(Cr + Al) atomic ratio (0.5 to 0.6) and TiO2 content (nil to 0.25 wt %) in spinels, and (3) an increase in the Na2O content (almost nil to 0.2 wt%) of clinopyroxene. In residual peridotites, rare earth element (REE) patterns of clinopyroxene incline from light-REE (LREE) to heavy-REE (HREE) monotonously. REE patterns of clinopyroxene in peridotites near dunite bands are U-shaped or flat. REE characteristics of clinopyroxene in dunite bands within the mantle away from the layered gabbro/peridotite boundary suggest an involvement of ”slightly depleted MORB melts”, which are slightly more enriched in LREE than the melts in equilibrium with residual peridotites.

We conducted simplified modeling for REE enrichment in clinopyroxenes by using chromatographic approach. The results indicate that MORB melts and ”slightly depleted MORB melts” were transported through the present-day concordant dunite bands within the Oman mantle; MORB melts were migrated around the layered gabbro/peridotite boundary. The primitive MORB melts might have changed to MORB through ”slightly depleted MORB melts” by interaction with peridotites en route to the uppermost mantle.

Keywords: Oman ophiolite, concordant dunite band, MORB, melt/rock interaction