

Compositionally and genetically distinct domains found in the southernmost Salahi mantle section in the Oman ophiolite Compositionally and genetically distinct domains found in the southernmost Salahi mantle section in the Oman ophiolite

藤井 悟^{1*}; 高澤 栄一²

FUJII, Satoru^{1*}; TAKAZAWA, Eiichi²

¹ 新潟大学大学院自然科学研究科, ² 新潟大学理学部

¹Graduate school Science and Technology, Niigata University, ²Faculty of Science, Niigata University

We investigate spatial variability in mineral compositions in the southernmost part of the Salahi mantle section and discuss genetic relationship between highly refractory peridotites and less refractory plagioclase-bearing peridotites in this region. The study separates the study area into two domains based on spinel Cr# such as high Cr# domain in the eastern part that is closer to Moho and low Cr# domain in the central part. Concordant dunites commonly occur in the low Cr# domain whereas discordant dunites are common in the high Cr# domain. Plagioclase-bearing peridotites and wehrlite also occur in the low Cr# region.

Highly refractory dunite with spinel Cr# >0.7 frequently occurs in the high Cr# domain. In the low Cr# domain, spinel Cr# is low and ranges from 0.47 to 0.57. We analyzed clinopyroxene (cpx) in dunites and harzburgite from both domains for REE abundances by LA-ICP-MS. The results show that harzburgite cpxs in the high Cr# domain and low Cr# domain are highly depleted in LREE ([Ce]CH = 0.01~0.02) with [Yb]CH = 2~3. Dunite cpxs in the low Cr# domain have REE abundances similar to the harzburgites in the same outcrop whereas those in the high Cr# domain are enriched in LREE relative to the harzburgite cpxs in the same outcrop. This implies that dunite cpxs in the high Cr# domain were reacted with LREE-enriched fluid infiltrated from the base of the ophiolite.

In the low Cr# domain, plagioclase-bearing dunite, plagioclase-bearing lherzolite vein occur and phlogopite-bearing wehrlite discordantly cuts them. The spinel Cr# of these dunites are in a range from 0.46 to 0.56. Abundances of REE in a melt in equilibrium with cpx in plagioclase-bearing peridotites and associated dunites are similar to those of N-MORB. On other hand, a melt in equilibrium with wehrlite cpx resembles to those of boninitic dikes from the Fizh block in the northern Oman ophiolite (Yamazaki, 2013). From the field occurrence, plagioclase-bearing dunite and plagioclase-bearing lherzolite formed by a reaction with MORB melt beneath spreading ridge whereas cumulative wehrlite was crystallized from a boninitic melt.

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