

## Spatial compositional distribution in the southernmost part of the Salahi mantle section, the Oman ophiolite

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An ultramafic complex (8 km x 5.5 km) occurs in the southwest part of the Salahi block from the northern Oman ophiolite. It consists of highly refractory dunite with spinel Cr# >0.8 associated with minor amount of harzburgite and pyroxenite (Nomoto and Takazawa, and 2013). It is considered that an infiltration of fluid from the base caused flux melting of harzburgite and formed boninitic melt associated with highly refractory dunite. There are two other ultramafic complexes of the same scale located in the direction of south-southeast of this complex and the distributions of highly refractory peridotites are expected like the northern part of Fizeh mantle section (Kanke and Takazawa, 2013). This study reports the spatial compositional distribution of the mantle section including an ultramafic complex in the southernmost part of Salahi mantle section.

Spinel Cr# of harzburgite has a narrow range of 0.46-0.67 whereas dunite's spinel Cr# varies from 0.43 to 0.80 showing a wider compositional range associated with highly refractory end member. Moreover, dunite with spinel Cr# >0.7 frequently occurs in the eastern part of the study area. On the other hand, in the central part, the dunite's spinel Cr# (0.47-0.57) is systematically lower than the spinel Cr# (0.53-0.67) of harzburgites. In terms of structure, the southernmost part of Salahi block is nearly horizontal in foliation, so that there is little variation in the depth from the Moho. Therefore, on the surface, the uppermost part of mantle section is widely observed. Moreover, as a result of examining the depth from the Moho using a cross section, the central part with the low Cr# spinel is equivalent to the shallower part compared to the area of the high Cr# spinel in the eastern side. The dunites with a low Cr# spinel were formed by a reaction between MORB melt and harzburgite beneath a spreading ridge. On the other hand, the dunites with a high Cr# spinel were located in the deeper part relative to the former and were produced by a flux melting of harzburgite due to a fluid infiltration from the base during the incipient island arc stage.

In the central part of the ultramafic complex, dunite's spinel Cr# shows relatively high value of 0.74-0.80 whereas in the border part the dunite's spinel Cr# is 0.54-0.67 lower than the central part. Moreover, in a border part, plagioclase-bearing dunite, plagioclase lherzolite and a phlogopite-bearing wehrlite occasionally occur indicating some reactions with MORB melt and/or fluid. Apparently the combination of the formation of highly refractory dunites by infiltration of fluid from the base, and a formation of the plagioclase-bearing peridotite by a reaction with a MORB melt in a single ultramafic complex needs to be resolved.

Keywords: oman ophiolite, mantle section, high refractory zone, spinel, peridotite, MORB