

Spatial variability of serpentinization in the Salahi mantle section, the Oman Ophiolite

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The Oman ophiolite is presumed to be an oceanic lithosphere formed in Neo-Tethys Sea during the late Cretaceous and settled at the eastern end of the Arabian Peninsula through an uplift process associated with subduction. The peridotites of the Oman ophiolite are subject to serpentinization with various degree, and the Salahi mantle section located in the northwest of the ophiolite is no exception. In this study, we observed the process of serpentinization recorded in the peridotites.

The results of microscopic observation of altered minerals and identification of mineral species by laser Raman spectroscopy indicated that all samples underwent low temperature type serpentinization. Most of them show mesh structure or vein. In addition, antigorite, a high-temperature serpentine and talc were widely distributed. However, both of them distributed less frequently in the northwest area. On the other hand, tremolite and chlorite were observed in some samples. Presence of antigorite suggests that there was hydrothermal alteration at about 500 °C. Moreover, it's possible that there was a difference in the amount of hydrothermal water penetration depending on the location.

Then, we analyzed the mineral composition of the serpentine by SEM-EDS. These results indicated that these sample were poor in Si+Al and rich in Mg+Fe in the order of lizardite, chrysotile and antigorite. Also, serpentine forming mesh texture was richer in Fe+Mg than forming vein. Because serpentine forming mesh texture is far from the ideal ratio to the veined serpentine, the degree of serpentinization seems to be low due to some influence, and it may be mixed with brucite. On the other hands, iron-rich peridotite (Mg# 71-88) was sometimes present, that was adjacent to orthopyroxene and talc, peridotite.

Based on our observation and analysis the causes of spatial variability of serpentinization in the Salahi mantle section will be discussed.

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