

## Discovery of komatiites exposed with picrite in the Oman ophiolite: a new model for the late intrusive rock genesis

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The late intrusive rocks cut the whole crustal sequence of the Oman ophiolite. It is getting more important to analyze these intrusions to solve the genetical problem of the Oman ophiolite. The late-intrusive rocks mainly consist of dunite, wehrlite, troctolite and olivine-gabbro. Effusive phase of the late-intrusions is picrite. In both late intrusives Cr# of chromian spinel is 0.5 to 0.9. Komatiites were found as a quenched margin of picrite. These komatiites are regarded as primitive magma of late-intrusive rocks. High-Cr chromian spinels in the late-intrusives suggest that the late-magmatism occurred at island-arc setting. But subduction magmatism could be somewhat different from present-day one. A unique history of formation of the Oman ophiolite will be clarified from the komatiites.

The late intrusive rocks cut the whole crustal sequence (layered gabbro, sheeted dike complex and effusive) of the Oman ophiolite. These late intrusions occupy 20 to 40% in volume of the whole crustal sequence. But till now, they have not been investigated in detail, therefore there are no clear interpretations about their origin. In our research, it is now being clear that these intrusions did not originate in on-ridge and off-ridge magmatism and have some similarities with the rocks derived from island-arc magmatism. And it is getting more important to analyze these intrusions to solve the genetical problem of the Oman ophiolite. Additionally, the late magmatism is very important also in view of modification of oceanic crust. The late-intrusions cause various reactions when they intrude into the normal oceanic crust.

The late-intrusive rocks mainly consist of dunite, wehrlite, troctolite, and olivine-gabbro. Cumulus olivine and chromian spinel are poikilitically included by clinopyroxene, plagioclase, hornblende, and rare orthopyroxene. Olivine occupies over 60% in volume of intrusive rocks. Fo content of olivine is 85 to 91 and Cr# of chromian spinel is 0.5 to 0.8. Effusive phase of the late-intrusions is picrite in the upper lava sequence. The phenocrysts are olivine, chromian spinel, and clinopyroxene, and olivine occupies 40% in modal composition. Fo content of olivine is 89 to 91 and Cr# of chromian spinel is 0.7 to 0.9. And in this picrite body, komatiites were found as a quenched margin of picrite. These komatiites are peridotitic to basaltic, and are regarded as an equivalent to primitive magma of late-intrusive rocks. Up to the present, various late-magmatism products have been reported in the Oman ophiolite, and the late-intrusive rocks which consist of ultramafic and mafic rocks have been interpreted as consolidated crystal mush of olivine and basaltic melt. But on this discovery, it became clear that the late-intrusive rocks originated in ultramafic melts, and also, a new model of the late magmatism can be proposed. High-Cr chromian spinels in the late-intrusive rocks strongly suggest that the late-magmatism occurred at island-arc setting. But subduction magmatism could be somewhat different from present-day one. A unique history of formation of the Oman ophiolite will be clarified from the komatiites.