

Petrological and spacial variations of the near off-axis magmatism controlled by a ridge segment structure

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It is thought that the ridge segment structure controls partial melting proceses of upper mantle and supply system of magmas at the mid-ocean ridges (MacDonald et al., 1988), and we may observe these occurrences at the Oman ophiolite. Fizeh and Salahi blocks of the northern Oman ophiolite is corresponded to the 2nd order ridge segment (Adachi and Miyashita, 2003; Miyashita et al., 2003), wehrlitic intrusions of the near off-axis magmatism are identified different petrological features. The presence of magmatic hornblende is rare in the segment centre but more abundant of hornblende and orthopyroxene at the segment margin (Adachi and Miyashita, 2003; Kaneko et al., 2014). The forsterite content of olivine and the Mg# of clinopyroxene from the wehrlitic intrusions of the segment margin are more evolved than in rocks from the segment centre. Chlorine contents of magmatic hornblende from the segment centre and margin show high contents.

Although Phyton et al. (2007) identified that the seawater penetrates the lower oceanic crust, this study suggests the fluid of seawater implicates magma compositions of near off-axis magmatism. We focus on vertical variations of wehrlitic intrusions, and show the spatial variation of petrographic features and mineral compositions in the along ridge axis, and then perform a three-dimensional study of hydrothermal circulation along the ridge segment structure. It is important to elucidate of the seawater penetrating depth at the oceanic crust formation, we discuss the change in the penetration depth of the seawater along axis, trying to understand of the oceanic crust formation process.

Keywords: near off-axis magmatism, ridge segment structure, wehrlitic intrusion, Oman ophiolite