

Gabbronorites from the Fizh block of the northern Oman ophiolite

Sumio Miyashita[1], Yoshiko Adachi[2], Shiki Okazawa[2]

[1] Dep. Geol., Fac. Sci., Niigata Univ., [2] Fac. Sci., Niigata Univ.

<http://ataka.sc.niigata-u.ac.jp/staff/miyashita/index.html>

The appearance of gabbronorite in the Oman ophiolite has a special significance and are regarded as an indicator of segment boundary (Juteau et al., 1988; MacLeod et al., 1992; Lachize, 1996; Boudier et al., 2001). We defined four different types of the gabbronorites from Wadi Fizh area where second or third order of the segment discontinuity has been reported. These are summarized as follows; 1) gabbronorite sills intruding into layered gabbros of comparatively upper horizon at retreating axis, 2) gabbronorite in the intruded gabbros, 3) gabbronorite dikes intruding into upper gabbros at advancing axis, and 4) gabbronorites in the Fizh-south complex of the later magmatic event (corresponding to the Alley volcanics).

On the other hand, three different mode of occurrences of gabbronorites were defined from Wadi Thuqbah to Ays area where locates at the central part of segment. They are summarized as follows; 1) gabbronorites occurring in the upper gabbros, 2) gabbronorite sills in the layered gabbro, and 3) gabbronorite body appearing at the boundary between main layered gabbro complex and derivative gabbro complex. Therefore, gabbronorites appear not only at the segment boundary but also at the central part of ridge segment. Besides, narrow gabbronorite dikes were found from Wadi Sudum area where possibly corresponds to some intermediate part between the end and the center of segment as judged from the occurrence of the thickest gabbro layer in the northern part.

Except for those of the Fizh south complex, these gabbronorites are mainly composed of plagioclase and two pyroxenes. Olivine and/or Fe-Ti oxides occur in places. A small amount of brownish hornblende appears in most gabbronorites. Bulk rock compositions of these gabbronorites were analyzed by XRF. The gabbronorites from the Fizh-south complex are distinguished from all other gabbronorites in respect to lower TiO₂ contents in the bulk rock and clinopyroxene compositions than those of other gabbronorites, which are comparable with the Alley volcanics. Except for the gabbronorites from the Fizh-south complex, all other gabbronorites show similar features. For example, though, the compositional ranges of the gabbronorites are different from each other due to their locations, major element contents show similar and systematic variations with MgO contents. TiO₂, Fe₂O₃*, Na₂O and P₂O₅ increase with decreasing MgO, while CaO contents decrease with decreasing MgO. It is noticed that these variations are nearly similar with those of the sheeted dike complex (Miyashita and Adachi, submitted), implying that these gabbronorites are derived from similar magmas regardless of the different mode of occurrence and locations. Clinopyroxene compositions from various gabbronorites except for those of the Fizh-south complex, show also similar compositional features.

Based on these data, significance of gabbronorites in the Oman ophiolite is discussed.