

Mode of occurrence of mafic dykes and enclaves in the Shikanoshima Granodiorite, Shikanoshima Island, north Kyushu

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Many mafic enclaves are in the Shikanoshima Granodiorite in the Shikanoshima Island, north Kyushu. It is thought that these enclaves are inclusion from the Shikanoshima basic rocks (Karakida, 1967; Karakida et al., 1994). Yoshikura et al. (1999) pointed out existence of syn-plutonic mafic dykes and mafic microgranular enclaves (MME) in the Shikanoshima Granodiorite. We report mode of occurrence, petrography and bulk chemical composition of mafic dykes and enclaves, and investigate formation process of them.

The Shikanoshima Granodiorite, associated with gabbroic mass, is widely distributed in northeast part of the Shikanoshima Island. Mafic dykes intruded into these rocks. The Shikanoshima Granodiorite is composed of medium-grained hornblende biotite granodiorite and biotite granite. Gabbroic mass is composed of medium to coarse-grained hornblende gabbro and quartz monzogabbro. Mafic dykes are composed of fine-grained equigranular and porphyritic quartz diorite. The mafic dykes were regarded as a member of the Shikanoshima basic rocks (Karakida et al., 1994). But, Yuhara and Uto (2005) and Yuhara et al. (2005) distinguished those from the Shikanoshima basic rocks, based on mode of occurrence and distribution. These dykes are up to 2m in width, and partly have chilled margin. Part of mafic dykes indicates feature of syn-plutonic dyke as back-veined dyke, fragmented dyke and disrupted dyke. There is a mode of occurrence that enclaves are formed by disruption of dykes. Mafic enclaves in the Shikanoshima Granodiorite are divided into two types. One type is medium to coarse-grained gabbro, which is distributed around the gabbroic mass. Another type is composed of quartz diorite and quartz monzodiorite, which are widely distributed in the Shikanoshima Granodiorite. These enclaves have circular, lenticular and irregular shapes and mainly clear margin. Whole-rock chemical compositions of these enclaves differ from that of gabbroic rocks, like that of mafic dykes. Thus, mafic enclaves are MME derived from syn-plutonic mafic dykes intruded into the Shikanoshima Granodiorite magma, as shown by Yoshikura et al. (1999).