

Timing of intrusion and Sr isotopic composition of granodiorite porphyrites in the Noko Island, western part of northern Kyushu

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The granodiorite porphyrite dykes are intruded into the Kitazaki Tonalite and metamorphic rocks distributed in Noko Island, western part of northern Kyushu. The petrological features of those dykes suggest that granodiorite porphyrite has been formed by mixing of tonalitic magma, which is different from the Kitazaki Tonalite, and granitic magma (Yuhara, 2017).

The granodiorite porphyrite dyke includes lamprophyre (Yuhara et al., 2007), and the lamprophyre dyke cuts granodiorite porphyrite dyke. These occurrences imply that both dykes intruded at the same time. Ishibashi et al. (2007) reported K-Ar whole rock age of 90.7 ± 1.2 Ma from lamprophyre dyke, and interpreted timing of intrusion. Thus, granodiorite porphyrite dykes intruded at about 90.7 Ma. Both dykes cut fine-grained granitic dykes intruded into the Kitazaki Tonalite.

Initial Sr isotopic ratios (Sr_i) of granodiorite porphyrites and mafic enclaves range from 0.70459 to 0.70487 and from 0.70430 to 0.70466, respectively. That of lamprophyre is 0.70414. Sr isotopic ratios calculated at 90.7 Ma of the Kitazaki Tonalite and fine-grained granites range from 0.70435 to 0.70480 and from 0.70512 to 0.70580, respectively. Sr_i of granodiorite porphyrites and mafic enclaves are lower than that of fine-grained granites, and in range of Sr_i of the Cretaceous granitic rocks in northern Kyushu (Owada et al., 1999; Yuhara et al., 2005; Kawano and Yuhara, 2008). Sr_i of lamprophyre is lower than that of the Cretaceous granitic rocks in northern Kyushu, but within that of the Shikanoshima basic rocks (Yuhara et al., 2016).

Keywords: granodiorite porphyrite, lamprophyre, Sr isotopic composition, Kitazaki Tonalite, Noko Island, Cretaceous granitic rocks in northern Kyushu