

Isotopic geological study of the Yakushima pluton, Kagoshima Prefecture

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The Miocene Yakushima pluton intruded into Shimanto Super Group in Yakushima Island, Kagoshima Prefecture. The pluton consists of four members with granitic dike: Yakushima main granite (YMG), core granodiorite (CGD), core cordierite granite (CCG), marginal facies granite (MFG) and late granite dike (LGD). K-Ar biotite and whole rock ages of the pluton range from 15.7 to 12.2 Ma (Shibata and Nozawa, 1968; MITI, 1992). Recently, Anma et al. (2003) reported fission track ages of zircon and apatite, and SHRIMP U-Pb ages. Anma et al. (1998) revealed geotectonic and petrological features of the pluton, and suggested that the YMG has different origin from other members. Then, only the YMG is discussed in this research.

Initial Sr isotopic ratios of the YMG calculated using 16Ma, which is estimated from SHRIMP U-Pb dating. The YMG is divided into three facies (central, transitional and marginal) based on the initial ratios. Four rock samples from the transitional facies give defined Rb-Sr isochron with age of 16.1 ± 1.6 Ma. It harmonizes with pre-existing radiometric data at this age. On the other hand, marginal and central facies of the YMG give no isochrons. Furthermore, the transitional facies has slightly higher ^{1000}Sr ratios than the marginal facies, and lower ratios than the central facies. From these evidences, it seems that the YMG of the Yakushima pluton was originated by mixing of different magmas.