

U-Pb zircon ages of the Ashizurimisaki igneous complex in SW Shikoku

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Ashizurimisaki igneous complex (Murakami et al., 1989) occupies the southern half of the Cape Ashizuri-misaki in the Tosashimizu city of the Kochi Prefecture. It is comprised of the alkaline dolerite/gabbro, syenite, and alkali granite, and the lithology is peculiar among the Miocene igneous activities in SW Japan. Since Shibata and Nozawa (1968) reported the first K-Ar age of 13 ± 2 Ma, the Ashizurimisaki complex have been considered to be formed coeval with the felsic igneous rocks of the Outer Zone of SW Japan. The range of the K-Ar and FT ages reported so far is 10 - 16 Ma, which support the rough contemporaneity between the Ashizurimisaki complex and the felsic igneous rocks of the Outer Zone. However more precise data is necessary for detailed chronological discussion among them. In this study, we will present U-Pb age of the zircons separated from two samples of the Ashizurimisaki complex analyzed on LA-ICP-MS and discuss their implications for the origin of the Ashizurimisaki complex.

Murakami et al. (1989) divided the Ashizurimisaki complex into five stages (stage I to V). One of the analyzed samples is a quartz syenite (ASH54) of stage II, the other is a coarse-grained biotite granite (ASH5) of stage IV. The latter sample were collected at the same locality where Murakami et al. (1989) previously reported K-Ar age of 12.9 ± 0.6 Ma, and FT zircon age of 16.1 ± 0.7 Ma. ASH54 contains both red and light brown zircon grains with small amount of dark brown grains. Ages of concordant analytical points ($n=31$) ranges in 12.2 - 13.3 Ma. Data of some analytical points seem to be affected by common Pb, we calculated intercept age of 12.7 ± 0.1 Ma determined by regression line of 38 analytical points and the concordia line (Gibson and Ireland, 1996).

Ninety percent of of zircons of ASH5 are red grains with small amount of light brown and dark brown grains. Concordant analytical points ($n=23$) ranges in 12.2 - 13.7 Ma. A light brown grain shows 15.5 Ma concordant U-Pb age. We also obtained intercept age of 12.8 ± 0.2 Ma determined by regression line of 21 analytical points and the concordia line using data of red zircon grains.

Obtained ages from the samples of stages II and IV well accord each other within error. Stage I is assigned to igneous enclaves in rocks of other stages, and stage V to dikes intruding host rocks of stage II/III. Hence most of igneous activities of the Ashizurimisaki complex took place after the clockwise rotation of the SW Japan arc and the igneous activities of the felsic igneous rocks of the Outer Zone. Ashizurimisaki complex is ca. 5 Ma younger than lamprophyre dikes in Shingu area of Ehime prefecture and Tanegashima. It was proposed that the basaltic rocks of the Ashizurimisaki complex were originated from off-ridge alkaline volcanism of the Shikoku Basin. However the activities of the Ashizurimisaki complex was younger than the decreasing stage of the spreading of the Shikoku Basin. As suggested by geochemical characteristics of basaltic members (Shinjoe et al., 2008), the basaltic rocks of the Ashizurimisaki complex may be derived from asthenospheric mantle beneath the Shikoku Basin.