

Uraninite and thorite ages of Cretaceous granitic rocks in northern Kyushu

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Cretaceous granitic rocks are widely exposed on the northern Kyushu. Based on lithofacies, structures, relationships, and other characteristics, these are divided into at least 15 masses; Kitazaki-, Shikanoshima-, Itoshima-, Fukae-, Saga-, Sawara-, Asakura-, Masaki-, Soeda-, Yusubaru-, Hirao-, Katsuyama-, Kaho-, Kurate-, and Kawara-masses. Host rocks of these granitic masses are mainly Sangun metamorphic belt and Cretaceous Kanmon Group. In these granitic masses, many ages were determined by terms of Rb-Sr biotite and whole rock isochron and K-Ar methods. The age data are variable from 80 to 120 Ma. It was hard to obtain geological relationships among the masses by these methods.

In this study, accurate ages were determined by electron microprobe (EPMA). Total U-Th-Pb dating was carried out on uraninite, thorite and monazite from granitic rocks of 9 masses; Kitazaki-, Shikanoshima-, Itoshima-, Fukae-, Saga-, Sawara-, Asakura-, Masaki-, and Soeda-masses. In addition, heavy mineral assemblage was obtained from these rocks. Both the Kitazaki- and Shikanoshima-masses were dated as 115-110 Ma. Granites from both the Itoshima- and Fukae-masses were dated as 109-104 Ma. Outer Masaki-mass was dated as 105-100 Ma, and inner Masaki-mass was dated as 102-97 Ma. Asakura-mass was dated as 101-96 Ma. Most of the granites in the Masaki- and Asakura-masses contain uraninite, and many rocks of inner Masaki-mass and Asakura-mass contain allanite and titanite. Sawara-mass was dated as 98-92Ma. Saga-mass could not be dated definitely because it had few uraninite and thorite.

On the basis of age data, granitic rocks in northern Kyushu can be classified into three stages of granitic igneous activity.

Stage1: Kitazaki- and Shikanoshima-masses which are distributed 50 km from east to west and 30 km from north to south were formed during 115-110 Ma.

Stage2: Itoshima- and Fukae-masses were formed during 109-104 Ma. Masaki- and Asakura-masses were formed during 105-96 Ma. These masses distributed 90 km from east to west and 40 km from north to south.

Stage3: Sawara-mass was formed during 98-92 Ma. This mass is distributed 35 km from east to west and 18 km from north to south. It intruded center of stage2 granitic masses.

Consequently, three stages of granitic activities were recognized in northern Kyushu during 115-90 Ma. Especially, during 109-96 Ma, the maximum granitic activity occurred in northern Kyushu.

Keywords: northern Kyushu, Cretaceous, granitic rocks, U-Th-Pb ages, uraninite, thorite