

SHRIMP U-Pb dating of detrital zircons in psammitic schists occurring in the northern Kyushu

Yukiyasu Tsutsumi[1], Kazumi Yokoyama[2], Kentaro Terada[3], Yuji Sano[4]

[1] Earth and Planetary Sys. Sci., Hiroshima Univ., [2] Dept. Geology and Paleontology, National Science Museum, Tokyo, [3] Earth and Planetary Systems, Hiroshima Univ., [4] Ocean Res. Inst. Univ. Tokyo

In contrast to the zoned structure of geological terranes in southern Kyushu, Shikoku, Chugoku and Kinki Provinces, geological structure of northern Kyushu is obscured due to granitic intrusion and pyroclastic cover. At least four types of metamorphic terranes occur in northern Kyushu. Although the metamorphic ages were obtained in three terranes, fossil has not been discovered in all these terranes and therefore the depositional age of original rock has not been elucidated. Recently, we succeeded to discuss the deposition age and provenances of the metamorphic rocks in western Chugoku province through measurement of isotope data of detrital zircons by SHRIMP II. Zircons from the psammitic schists of northern Kyushu are presumed to provide the upper age limit of deposition of the rocks in the area. Variation in zircon ages helps to compare the provenance of original sediment.

Four psammitic schists were collected from the Nagasaki, Kurume (Sangun), Konoha and Kiyama metamorphic terranes. Konoha metamorphic rocks occur at the northwestern part of Kumamoto Prefecture. There is no isotope age for these rocks. Mineral assemblage of the rock shows low-pressure type metamorphism. The other three metamorphic terranes consist of high-pressure type metamorphic rocks. K-Ar ages of mica were reported: 70-88, 153, 177 Ma in Nagasaki area, 168-183 Ma near the sampling area of the Sangun belt and 297-337 Ma in the Kiyama area.

Detrital zircons from the Nagasaki, Kurume and Konoha areas are bimodal in age: 2000-1800 Ma and 330-175 Ma. The older ones were clearly derived from Precambrian basement rocks. The Korean Peninsula was evolved mainly during 2000-1800 Ma. Hence, it is considered that the clastics including zircons were brought mainly from the Korean Peninsula. Younger data of zircon ages of psammitic schists in the Nagasaki, Kurume, and Konoha areas show almost continuous distribution. Although it is not always possible to obtain the depositional age directly from the detrital zircons, the youngest zircon ages represent an upper limit of the depositional age of the rock: the youngest Pb-U ages of psammitic schists in the Nagasaki, Kurume, and Konoha areas are 238 \pm 13Ma, 249 \pm 13 Ma, and 175 \pm 4 Ma, respectively.

As far as the youngest zircon and age distribution of detrital zircons are concerned, the meta-sediments in the Kurume and Nagasaki areas are corresponding to those of the Suo zone which was reported by Tsutsumi et al. (2001). Data from the Konoha metamorphic rocks are similar to those from the Mino belt reported by Sano et al. (1998).

Kiyama metamorphic rock is different from the others. Their zircons are concentrated at 400-500 Ma and the youngest age is 382 Ma. Such ages were not reported from the Korean Peninsula but present in the drainage basin of the Yellow River. Detrital minerals in the rock were derived probably from the area in China.