領家帯三河地域に産する清崎花崗閃緑岩と三都橋花崗閃緑岩から得られた U-Pb ジルコン年代

高塚 紘太[1]、河上 哲生[1]、スクリペク エティエン[1]、坂田 周平[2]
[1] *京都大学*
[2] *学習院大学*

U-Pb zircon ages obtained from the Kiyosaki granodiorite and the Mitsuhashi granodiorite in the Mikawa area, Ryoke belt, SW Japan

Kota Takatsuka[1], Tetsuo Kawakami[1], Etienne Skrzypek[1], Shuhei Sakata[2]
[1]*Kyoto University*
[2]*Gakushuin University*

The Ryoke belt consists of Late Cretaceous high-T/low-P type metamorphic and plutonic rocks, and records magmatic activity at the continental margin of East Asia. Granitoids are widely distributed in the Ryoke belt, and divided into the Older Ryoke granitoids and the Younger Ryoke granitoids based on their lithology and intrusive relationships. Suzuki and Adachi (1998) reported CHIME monazite ages from metamorphic and granitic rocks in the Mikawa area (eastern part of the Ryoke belt) and Yanai area (western part of the Ryoke belt). Recently, however, discrepancies between U-Pb zircon and CHIME monazite ages have been reported from some granitoids in both areas (Skrzypek et al., 2016; Takatsuka et al., 2016a, b).

In the Mikawa area, the Kamihara tonalite, Tenryukyo granite and Kiyosaki granodiorite are classified into the Older Ryoke granitoids, whereas the Shinshiro tonalite, Mitsuhashi granodiorite, Inagawa granite and Busetsu granite are classified into the Younger Ryoke granitoids (Makimoto et al., 2004). Takatsuka et al. (2016a, b) reported U-Pb zircon ages from the Kamihara tonalite (ca. 99 Ma), Tenryukyo granite (ca. 78 Ma), Shinshiro tonalite (ca. 70 Ma), Inagawa granite (ca. 75 Ma and 69 Ma) and the Busetsu granite (ca. 70 Ma). There is no report of U-Pb zircon ages from the Kiyosaki granodiorite and the Mitsuhashi granodiorite. In this study, LA-ICP-MS U-Pb zircon dating for the Kiyosaki granodiorite and the Mitsuhashi granodiorite were carried out.

The sample of the Kiyosaki granodiorite shows a gneissose structure defined by the arrangement of biotite. The mineral assemblage of this sample is plagioclase, quartz, biotite and clinopyroxene with a small amount of hornblende and K-feldspar. The sample of the Mitsuhashi granodiorite also shows a gneissose structure defined by the arrangement of biotite and hornblende. The mineral assemblage of this sample is plagioclase, quartz, biotite and hornblende with a small amount of K-feldspar. Both samples contain apatite, zircon and titanite as accessory minerals, whereas monazite is absent.

The results of LA-ICP-MS U-Pb zircon dating are given below as weighted mean ^{238}U-^{206}Pb ages (±2σ error) calculated using concordant data only. The Kiyosaki granodiorite gave 94.7±0.7 Ma (MSWD=1.4, n=19). The Mitsuhashi granodiorite gave 73.2±0.7 Ma (MSWD=0.91, n=11), with one inherited core age of 501±18 Ma. The ages of 94.7±0.7 Ma and 73.2±0.7 Ma are interpreted to represent the timing of solidification of the Kiyosaki granodiorite and the Mitsuhashi granodiorite, respectively.

Morishita et al. (1996) reported the CHIME monazite ages of 87.0±2.6 Ma and 86.6±3.2 Ma from the Kiyosaki granodiorite, but the details of dated samples are not described. Suzuki et al. (1994) reported that the CHIME monazite age of the Mitsuhashi granodiorite is 83.8±1.3 Ma. The sample was collected from a pegmatite vein intruding into pelitic gneiss, and contains coarse quartz, K-feldspar, albite, biotite and muscovite (Suzuki et al., 1994). The lithology of the sample used in the CHIME monazite dating is different from that of the sample in this study for the Mitsuhashi granodiorite. There is a possibility that the difference between U-Pb zircon and CHIME monazite ages is caused by the difference in lithology, and the CHIME ages probably do not represent the solidification timing of the main lithology.

References

Makimoto, H., Yamada, N., Mizuno, K., Takada, A., Komazawa, M. and Sudo, S., Geological map of Japan 1: 200,000, Toyohashi and Irago Misaki, Geological Survey of Japan, AIST, 2004.

Morishita, T., Suzuki, K. and Nasu, T., CHIME ages of monazites from granitoids in the Mikawa-Tono area, central Japan, Abstract of the 103rd Annual Meeting of the Geological Society of Japan, 282 p, 1996.

Skrzypek, E., Kawakami, T., Hirajima, T., Sakata, S., Hirata, T. and Ikeda, T., Revisiting the high temperature metamorphic field gradient of the Ryoke Belt (SW Japan): New constraints from the Iwakuni-Yanai area, Lithos, 260, 9-27, 2016.

Suzuki, K. and Adachi, M., Denudation history of the high T/P Ryoke metamorphic belt, southwest Japan: constraints from CHIME monazite ages of gneisses and granitoids, Journal of Metamorphic Geology, 16, 23-37, 1998.

Suzuki, K., Morishita, T., Kajizuka, I., Nakai, Y., Adachi, M. and Shibata, K., CHIME ages of monazites from the Ryoke metamorphic rocks and some granitoids in the Mikawa-Tono area, central Japan, Bull. Nagoya Univ. Furukawa Museum, 10, 7-38, 1994.

Takatsuka, K., Kawakami, T., Skrzypek, E., Sakata, S., Obayashi, H. and Hirata, T., U-Pb zircon ages younger than regional metamorphism obtained from gneissose granitoids in the Mikawa area, Ryoke belt, Abstract of the Japan Geoscience Union Meeting 2016, SMP43-03, 2016a.

Takatsuka, K., Kawakami, T., Skrzypek, E., Sakata, S., Obayashi, H. and Hirata, T., Discrepancy between U-Pb zircon and CHIME monazite ages of Younger Ryoke granites in the Mikawa area, Ryoke belt, Abstract of the 123rd Annual Meeting of the Geological Society of Japan, R4-O-2, 2016b.