K-Ar ages of the volcanic rocks around the Utsukushigahara and Mitsumineyama, the northwestern margin of Chushin Highland area

Masashi Mukai[1]; Kuniaki Nishiki[2]; Akikazu Matsumoto[3]; Kozo Uto[3]; Yasuyuki Miyake[4]; Tomoyoshi Kosaka[5]

[1] Shinshu Univ.; [2] Geology Sci.,Shinshu Univ; [3] GSJ, AIST; [4] Dept.Geology, Fac.Sci.,Shinshu Univ.; [5] Fac.Sci.,Shinshu Univ.

In Utsukushigahara Plateau and its adjacent area in the northwestern margin of Chushin Highland area, central Japan, the volcanic activity is characterized by thick andesite lavas, which is preceded by dacite to andesite volcanic rocks. Volcanostratigraphy in this area is being prepared by Mukai et al. (in prep.). The several radiometric ages from Chushin Highland Volcanoes (it almost corresponds to Enrei Volcanic Rocks by Makimoto et al., 1996) including this area were already reported, and it was suggested that the volcanic activity in Chushin Highland Volcanoes started at the northwestern margin of Chushin Highland area (Matsumoto et al., 2007; Mukai and Kosaka, in press). But the duration of the volcanic activity of Chushin Highland Volcanoes is not clarified enough, because the ages of the volcanic rocks around Utsukushigahara Plateau and Mitsumineyama area are not sufficient yet. So, the authors measured K-Ar ages of volcanic rocks sampled after the volcanostratigraphy by Mukai et al. (in prep.), and examined the duration of intimate volcanic activity in the northwestern margin of Chushin Highland area.

The argon isotope was analyzed by isotope dilution at AIST. The analyses and the age determination were based on the method described by Uto et al. (1995). Samples were crushed and sieved to obtain 0.25 mm to 0.50 mm fractions. Phenocrysts were removed from the fractions using a hand magnet and an isodynamic separator. The concentration of potassium was determined by flame spectrometric analysis, and the method was described by Matsumoto (1989).

From the previous data and newly obtained K-Ar ages, it is clarified that the volcanic activity in Utsukushigahara Plateau area started ca. 1.6 Ma, and the most of the lava flows effused within a short range as 0.1 Mys (ca. 1.6 to 1.5 Ma). After that, the volcanic activity once paused for ca. 0.1 Mys (ca. 1.5 to 1.4 Ma; Momose et al., 1966; Mankinen and Dalrymple, 1979; Matsumoto et al., 2007). After then, the last lava flow effused at ca. 1.3 Ma in Utsukushigahara Plateau area. During this obvious dormant duration (ca. 1.5 to 1.4 Ma), the volcanic activity occurred around Mitsumineyama area. In the previous work, though it was considered that a time gap existed between dacite volcaniclastic rocks (Karasawagawa volcanics) and the andesite lava of Utsukushigahara Plateau area (Utsukushigahara volcanics), which had erupted after Karasawagawa volcanics (Compilation Group of Natural History in Suwa, 1975), it is clarified that both activities were continuous.