

K-Ar ages of the Chongok Basalts in the Choogaryeong Fault system, the central part of Korean Peninsula

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The intraplate volcanism in East Asia has sometimes formed huge volcanic bodies such as Mt. Baekdu and Jeju Island. The Chongok Basalts filled up the Choogaryeong Fault System located between Wonsan and Seoul, central part of Korea Peninsula are also distributed at relatively large areas. The Chongok Basalts are composed of eleven units in upstream of Hantan River. Two units of them are observed in Chongok. Nagaoka et al. (2008) revealed a distinct unconformity between the two units and named the upper Chatan and the lower Chongok. We determined the precise ages of the Chatan and Chongok basalts using K-Ar analysis to reveal the timing of the Chongok volcanism and to make a time constraint on the Chongok-ri Paleolithic site where the Chongok basalt occurs below the sediments containing the Paleolithic artifacts (Matsufuji, 2008).

The Chatan and Chongok basalts are almost aphyric (phenocrysts ~5 vol%). They have normally zoned olivine phenocryst with spinel inclusions (~10 micro-m) although some samples have trace amount (<<1 vol%) of plagioclase with strongly corroded core and clinopyroxene microphenocrysts. Groundmass in the both the Chatan and Chongok basalts is composed of plagioclase, Ti-augite, olivine, alkali-feldspar, magnetite, and ilmenite.

Based on the petrographical analyses, we chose feldspars in groundmass for K-Ar analyses. EMP analyses revealed the alkali-feldspars are anorthoclase (Or35-65, Ab33.8-57, An1.2-6.8) and plagioclases are labradorite (An50-70).

The hand specimens were sliced (ca. 0.5cm) to check xenoliths and xenocrysts in the sample. The xenoliths and xenocrysts were removed. The samples were crushed with a crusher and then sieved to get 120-250 mesh size fractions to separate feldspars. The fraction was passed through an isodynamic magnetic separator. Heavy liquid technique was also used to concentrate the feldspars. Potassium was analyzed by flame photometry using a 2000 ppm Cs buffer. Argon was analyzed on a 15 cm radius sector type mass spectrometer with a single collector system using the isotopic dilution method and argon 38 spike. The K-Ar analyses of the feldspar separates give the ages from 0.14 Ma to 0.18 Ma for the Chatan basalt and the ages from 0.49 Ma to 0.55 Ma for the Chongok basalt, indicating that the Chatan and Chongok basalts have clearly different age.

Keywords: Korea, Choogaryeong Fault system, Chongok Basalts, K-Ar ages