

K-Ar age of fault gouges along the Median Tectonic Line in Chubu district

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The Median Tectonic Line (MTL) has a history of activities about 100 million years, and records multiple activities of different stages. In this study, we re-examined the history of the activities using K-Ar age of fault gouges along the MTL in Chubu district. Authigenic mica clay minerals (illite) formed by hydrothermal alteration of protolith are contained in fault gouges derived from polydeformed schists. The stages were divided using K-Ar ages of illites. In the previous method (e. g. Shibata and Takagi, 1988; Takagi and Shibata, 1992), the influence on the age by contamination of detrital illite or muscovite was estimated by illite crystallinity for only $<2\ \mu\text{m}$ fractions. Pevear (1992) proposed the illite age analysis (IAA) calculated by the intercept of regression line, using polytypes and K-Ar ages of clay fractions separated. Thereby, the age of authigenic illite could be estimated, and K-Ar age dating of fault gouges reported by Takagi and Shibata (1992) is needed to re-examine. In this study, we applied the fault gouges along the MTL to IAA and estimated the timing of major fault activity along the MTL. As a result, illite-bearing fault gouges from Anko-W and Shimohira outcrops yield 15.2 ± 1.8 Ma and 12.1 ± 6.3 Ma, respectively. The age, 18.7–16.8 Ma given the sample from Tochushima that cannot be applied to IAA is considered as the age of authigenic illite owing to Kübler index and particle morphology observed by SEM. In addition, fault gouge from Taki outcrop in eastern Kii Peninsula yields 39.4 ± 1.6 Ma. The Akaishi phase only in the Chubu district from previous method should be modified 5–10 myr younger. The K-Ar age of 12.1 Ma from Shimohira outcrop presumably reflects the Ishizuchi phase (c. 14–12 Ma) or Akaishi phase considering the amount of its error. The K-Ar age of 39.4 Ma from the Taki outcrop reflects the “Pre-Tobe phase”, therefore it is suggested that the age of c. 15 Ma becomes more clear stage of the Akaishi phase of the MTL activities including the activity of the Akaishi Tectonic Line (Tanaka et al., 1995) only in the Chubu district, where collision of Izu-Bonin arc forms large-scale bending of the MTL at this stage.

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Keywords: Median Tectonic Line, Akaishi Tectonic Line, fault gouge, illite, K-Ar age, IAA