

Fluid infiltration in a deep fault zone: evidences from the Hatagawa Fault Zone, NE Japan

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K-Ar ages and fission-track ages of granitic rocks in the Hatagawa Fault Zone (HFZ), NE Japan were measured to examine fluid infiltration in a deep fault zone. The HFZ consists of a conspicuous cataclasite and two types of mylonite with a sinistral sense of shear. One type of mylonite is a mylonite with microstructure A, which is mainly developed for a length of 6 km along the HFZ. The other is a mylonite with microstructure B, which is widely distributed in the HFZ. Most of K-Ar ages of hornblende and biotite from granitic rocks are about 110 Ma and show no obvious differences along the strike of the HFZ or among different granite bodies. This implies that the granitic rocks in the HFZ have a similar cooling history and cooled rapidly from closure temperature of hornblende to that of biotite. Fission-track ages of zircon and apatite from the samples in and near the areas where the mylonite with microstructure A is developed are older than those for other areas. Infiltration of near-surface derived water into the mylonite with microstructure A in the brittle regime may account for the accelerate cooling of the HFZ.