

Alteration process along a small-scale fault at the depth of -500m in the MIU site

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In order to understand the hydrological feature of underground environment, it is important to clarify the analogous history of water-rock interaction and function of flow-path. In particular, it is considered that fractures and faults play an important role on elemental migration in underground environment. Although the example of single fracture has been studied, the hydrological feature of a small-scale fault is still not well understood. Therefore, structural, mineralogical and geochemical characteristics and formation process of a small-scale fault and alteration process along the fault with fracture fillings at -500 m identified in Toki granite distributed in Central Japan was investigated. Investigation was mainly conducted by observation of a borehole core sample excavated in the JAEA's Mizunami Underground Research Laboratory. Various studies on geology, geochemistry and hydrology in and around the fault were carried out including the data analysis provided by hydrological borehole logging. Based on the results, faulting and alteration processes due to groundwater flow along the fault are considered as follows: 1; Intrusion of the pluton and its cooling.2; Formation of the fault and associated fractures.3; Hydrothermal alteration through the fault and fractures in deep underground.4; Calcite precipitation and smectite formation by relatively low temperature meteoric groundwater in shallow underground. This result implies that such investigations can be applied for to know the history of water-rock interaction and hydrological feature of a fault and associated fractures.

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