

## Alteration of subsurface granitic rock in Okayama area, Japan

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In order to understand the alteration process of subsurface granitic rocks, drilled core (100 meters deep) taken from granitic rock in the Okayama area of Japan has been investigated. The rock is characterized by the coarse size of rock-forming minerals such as quartz, plagioclase, K-feldspar and biotite. The borehole logging and core observations show that there are several fractured zones, and almost all these structural features are associated with alteration zones that have been formed by water-rock interaction. The studied samples were collected from one of the fracture zone and the associated alteration zone (mainly at the location of 40 to 50 meters below the ground surface).

Detailed analysis of pore geometry, mineralogical observation and geochemical analysis were carried out in order to reveal the changes of textural and geochemical characteristics due to water-rock interaction. It is revealed that plagioclase and biotite partly altered to sericite and chlorite in whole rock, respectively. Near the fracture zone, plagioclase altered to smectite and shows lower Ca concentration and high Fe concentration. Biotite faintly altered to vermiculite in the fracture zone.

The alteration feature suggests that the granitic body has two stages of water-rock interactions. One is the high-temperature hydrothermal alteration taken place at relatively early stage of granitic body formation, and the other is low-temperature alteration probably due to groundwater circulation after the rock body exposed at the surface. This kind of alteration of subsurface granitic rock along the water-conducting feature can be identical in almost all granitic rock and quite effective to analysis of the alteration history due to the water-rock interactions.