

Weathering process of andesitic rock by hydrothermal alteration in Tatun volcanic area, north Taiwan

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In the Tatun Volcano area, an andesitic rock formed by volcanic activity up to 2.5 million years ago is distributed, and many acidic hot springs related to the volcanic activity can be seen in this area. In order to elucidate the effect of the acidic hot spring water on volcanic rock, geochemical studies were conducted on weathering and alteration processes of the rock by acidic hot spring water, which are pH=1 and 90 °C or higher, in Kuinguiping, Tatun area. The changes of mineral and chemical compositions during weathering process were studied by XRD, EPMA, microscopic techniques, XRF and ICP-MS.

Mass transfer of major elements showing mol/L shows that the Al, Fe, Mg, Mn Ca and Na decrease as alteration proceeds. The Ti and P do not move due to alteration. The Si and K increase in the early stage. In the molar ratios of incompatible elements in each zone normalized by C1 chondrite, LIL elements are decrease, and HFS element tend not to change by alteration. In particular, decrease of Rb is remarkable. The molar ratios of LREE in each zone normalized by C1 chondrite decreased less than MREE and HREE by reaction with acidic hot spring solution, and this result shows a tendency somewhat different from the results reported from other regions. We will report the weathering process of the andesite by interaction of acidic hot spring water in Tatun while comparing with the experiment results of previously reports [1].

[1] Kobayashi et al. (2016) *Jour. Hot Spring Sci.* **66**, 89-106.