

Volcanic ash erupted from Owakudani fumarolic area of Hakone volcano on June 30, 2015, and its soluble components

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Volcanic ash erupted from Owakudani fumarolic area of Hakone volcano on June 30, 2015, was collected, and their constituent minerals, chemical compositions, and water soluble components were analyzed.

Smectite, pyrite, tridymite, cristobalite, gypsum, anhydrite, plagioclase and quartz were detected in the volcanic ash by XRD and microscopic observation. This mineral assemblage indicates that the volcanic ash was derived from relatively low-temperature alteration zone of the hydrothermal system beneath the Owakudani fumarolic area. The volcanic ash contains relatively lower concentrations of some elements such as Na, K, Ca and Mg than andesitic lava in the Owakudani area (Takahashi et al. 2006), supporting that the volcanic ash was derived from hydrothermal alteration zone. Water soluble components seemed to be derived from thermal water because high amount of Cl^- and SO_4^{2-} (12.2 and 6.6g/kg, respectively) and Cl/S ratio of 5 were detected. Considering that there are thermal waters which have Cl/S ratio of about 2 at depth around 29-36m (Watanuki, 1966) and that of 7-18 at depths around 500m (Oki and Hirano, 1974), volcanic ash seems to be erupted from depths of around 500m below the surface, or more shallow depth.

Keywords: Hakone volcano, phreatic explosion, volcanic ash, hydrothermal mineral, water soluble component