

浅間前掛火山のブルカノ式噴火の噴出物の岩石組織の多様性

—天仁噴火から2004年噴火まで—

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(2005年4月15日受付, 2005年11月11日受理)

Textural Variety in the Eruptive Products of Vulcanian Eruptions between 1108 A.D.
and 2004 A.D. on Asama-Maekake VolcanoMaya YASUI*, Masaki TAKAHASHI*, Masayuki SAKAGAMI* and Research Group
on the Asama 2004 Eruption at Nihon University**

Ash fall deposits composed mainly of lithic fragments are often recognized in the eruptive products of Asama-Maekake Volcano. A comparative study was made on microscopic textures of coarse-grained particles of 1 to 2 mm in diameter from thirteen ash-fall deposits. Average composition of the ash particles from Vulcanian eruptions after the 1783 eruption was also investigated using the cumulative ash-soil mixtures. More than 70 percent of the particles are sub-angular and blocky in shape. Crystalline, grayish, and non-vesicular grains are also abundant. These features suggest that most particles have been produced by brittle fracture of solidified magma. Individual ash-fall deposit has a particular composition. Some ash falls, which were generated after the large-scale eruption in 1108 A.D., have fragments of welded pyroclastic rock as well as those of altered lava. It suggests that they might have been generated from the specific condition inside the vent after the formation and collapse of proximal pyroclastic cone. A series of ash falls through the 2004 eruption show obvious temporal variation in their textures and compositions. Vitric and vesicular grains increased after the appearance of molten lava in the crater-bottom on 16th September and decreased thereafter. Instead, crystalline, grayish, and sub-angular particles increased with time. Oxidized particles have been recognized in the later stage. These temporal variations might correspond to the processes of the appearance and cooling of newly supplied magma.

Textures of thirty ballistics including bread-crust bombs from Vulcanian eruptions between 1783 A.D. and 1983 A.D. were observed. Half of them have unbroken, euhedral phenocrysts in the homogeneous groundmass suggesting that they have been originated from magma column of the ordinal coherent lava (Type 1). Forty percent of them contain the veins filled with fine-grained crystal debris in the matrix which is similar to Type 1 (Type 2). Ten percent of them show remarkable eutaxitic texture indicating that they are fragments of welded pyroclastic rocks (Type 3). These textures of the ballistics could account for the variety of ash particles and also imply the processes of fragmentation of magma in the conduit. Micro-faults are sometimes observed in the groundmass of Type 2. It indicates that the outer part of solidified magma in the conduit experienced the pulverization probably due to shock wave throughout Vulcanian explosion. Zigzag cracks running through a single phenocryst are also found around the veins. Characteristic vein filled with fine-grained crystal debris in Type 2 might be the evidence of the ejection of pulverized materials which occurs immediately after the explosion.

Key words: Asama-Maekake volcano, Vulcanian eruption, lithic fragment, texture, fragmentation

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