

浅間火山 2004年9月噴火の本質噴出物について

三宅康幸*・高橋 康**・津金達郎**・牧野州明*・
角前壽一*・西来邦章**・福井喬士*・
信州大学浅間火山04年噴火調査グループ***

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On the Essential Ejecta of the September 2004 Eruptions
of the Asama Volcano, Central Japan

Yasuyuki MIYAKE*, Kou TAKAHASHI**, Tatsuro TSUGANE**, Kuniaki MAKINO*,
Hisakazu KAKUZEN*, Kuniaki NISHIKI**, Takashi FUKUI*
and Shinshu University Research Group for Asama 04 Eruptions***

Asama volcano in central Japan became active on September 1st, 2004 with a vulcanian eruption which was the biggest eruption among a series of small eruptive events from September to December in 2004. The ejecta of the Sept. 1st eruption were mostly polygonal fresh andesitic lithic fragments. Most of them were derived from the andesite body which played the role of cap rock for the rising new magma and escaping volcanic gas. Less amount of pumice fragments were also ejected and most of them are mantled by the black and dense andesitic crust, which is broken and expanded to form breadcrust structure. These breadcrust pumices are concluded to have been the fragments of the new magma. After they were broken into pieces by the explosion, the outer margin of them rapidly consolidated, and then degassing and inflation in the inner melt caused rupturing of the outer crust. The pumices are clearly discriminated from the andesitic lithic fragments by their whole rock chemistry. The next vulcanian eruption occurred on September 23rd. Majority of the ejecta were again polygonal lithic fragments of andesite, although their chemistry corresponds not to the lithic fragments, but to the pumices of the Sept. 1st eruption. Small amount of scoria are found among the Sept. 23rd ejecta. Their whole rock chemistry and the assemblage and chemical composition of phenocrysts are quite similar to those of the Sept. 1st pumice. The black appearance of the scoria is derived from the less crystalline, therefore less differentiated groundmass glass in the scoria than in the pumice.

From these petrologic evidences the following magmatic processes are deduced. Before Sept. 1st, a column of new magma had risen into the pre existing andesite body beneath the crater floor. On Sept. 1st, the built up gas pressure surpassed the tensile strength of the andesite body to result in a vulcanian eruption. This eruption provided fragments of the pre-Sept. 1st andesite as polygonal lithic fragments, along with smaller amounts of the breadcrust pumices. In the course between Sept. 1st and Sept. 23rd, the column of new magma uplifted because the cap rock had disappeared. The upper part of the column was cooler and more crystalline than the lower. Some portion of the upper part of the magma column effused and made a dome inside the crater. On Sept. 23rd, next vulcanian eruption took place. The ejecta consisted of the lithic fragments which had been upper part of the consolidated magma column, and the scoria derived from the lower level of the same magma column.

Key words: Asama volcano, vulcanian eruption, essential ejecta, breadcrust pumice

* 〒390-8621 松本市旭 3-1-1

信州大学理学部地質科学科

Department of Geology, Faculty of Science, Shinshu University, Asahi 3-1-1, Matsumoto 390-8621, Japan.

** 〒390-8621 松本市旭 3-1-1

信州大学大学院工学系研究科地球システム科学専攻
Division of Environmental System Science, Graduate

School of Science and Technology, Shinshu University, Asahi 3-1-1, Matsumoto 390-8621, Japan.

*** 高塚哉子・向井理史・山下太一・横地順平・馬場章・中島由記子・児玉 優・小島 萌・柏原秀雄

Corresponding author: Yasuyuki Miyake
e-mail: ymiyake@gipac.shinshu-u.ac.jp