

## Volcanic activities and magma accumulation process of Hijiori volcano

# Isoji MIYAGI[1]

[1] GSJ

<http://staff.aist.go.jp/miyagi.iso14000/>

The volcanic activity of Hijiori volcano is reported in detail as a case study to understand how a new felsic volcano commences the activity. Hijiori volcano, a small caldera with approximately 2 km in diameter, is one of the 108 active volcanoes in Japan, which erupted at about 12,000 years ago (in Calendar age) on the location where no volcanic body existed before the activity. From the field survey, it turns out that the suite of activities initiated by the major eruption that deposited a valley filling non-welded pumice flows. Finally the pumice flows covered the range 5 km to the southward and 9 km to the northward with total maximum thickness of about 150 m. The accompanying pumice fall and ash fall extends 60 km to the eastward. Although span of the activity is as short as the resolving power of radiocarbon dating, there recognized a quiescence for three times. After the every quiescence, phreatic (or phreatomagmatic) activities deposited lapilli falls and flows in the proximity. Total volume of the valley filling pyroclastic flows and the air falls are estimated to be 1.4 and 0.6 cubic km, respectively. All the pumices from the three major eruptions are similar in their phenocryst content (50- vol. percent), phenocryst assemblages (Pl, Qz, OPx, Hb, and Mt), bulk chemistry (c.a. 64 wt. percent SiO<sub>2</sub>), and in isotopic (Sr, Nd) compositions. Mt phenocrysts have no zoning profiles and their chemical compositions (Al<sub>2</sub>O<sub>3</sub>, Mg/Mn) are mostly unique through the eruptive sequences, suggesting that the physicochemical conditions of the magma were the same just before the each eruption. On the contrary Pl, Qz, OPx and Hb phenocrysts showed distinct zoning, suggesting that the magma chamber of Hijiori volcano had been disturbed repeatedly by such as magma mixing that continued intermittently before and during the eruptive activities. The observed difference between Mt and the other phenocrysts implies that there were repeated input of crystal poor hot magma into a crystal rich cool magma chamber, and that the mass ratio of new magma input to the existing magma body may be small enough to retain the physical and chemical conditions of the crystal rich magma chamber almost the same. Due to rapid chemical diffusion Mt phenocrysts can easily be re-equilibrated with the new environments within a few months. The depth where the magma mixing happened is estimated to be about 10 km from the observed water concentration in melt inclusions. To summarize, repeated input of felsic magma prepared a crystal rich magma chamber beneath Hijiori volcano for the commencement of the first eruption.