

# Magma feeding system of the latest magmatic unit of Azuma volcano, NE Japan

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The magma feeding system of Ohana unit, the latest magmatic eruption unit of Azuma volcano, was petrologically examined. Azuma volcano is one of representative active stratovolcanoes in NE Japan. The activities past ca. 7,000 years occurred in the eastern part of this volcano.

The samples were collected from juvenile bombs in the vulcanian fall deposits of Ohana unit. The bombs are divided into dark gray and whitish gray types. Banded bombs composed of both types are sometimes observed. The rocks are olivine-orthopyroxene-clinopyroxene andesite and belong to medium-K and calc-alkaline series. Olivines are more abundant in the dark gray type than the whitish gray type. All samples are plotted on same linear trend in SiO<sub>2</sub> variation diagrams. SiO<sub>2</sub> contents of dark gray and whitish gray types are 58–59 wt% and 60–63 wt%.

Most of pyroxenes have homogeneous low-Mg core with or without intermediate-Mg mantle. Pyroxenes with intermediate-Mg mantles are dominant in dark gray and less dominant in whitish gray type. Plagioclase phenocrystic cores are mostly oscillatory zoned by low- and intermediate-An zones. The zones are sometimes discontinuous. High-An homogeneous/honeycombed phenocrystic cores are also observed. Most of the olivine phenocrysts have Fo-rich core and show normal zoning. Cr-spinel is included in the Fo-rich part. Low-Mg pyroxenes and low-An plagioclases were from felsic magma, while Fo-rich olivine and Cr-spinel were from mafic magma. Intermediate-Mg and-An pyroxenes and plagioclase were formed during mixing of the felsic and mafic magmas. Using the pyroxene thermometry and MELTS program, felsic and mafic magmas were estimated to be dacitic (64–66 wt% SiO<sub>2</sub> and 910–940 °C) and stored at ca. 4–12 km and basaltic (ca. 49 wt% SiO<sub>2</sub> and 1160–1170 °C) at ca. 20–25 km in depth. The stored depths of the magmas are consistent with recently reported geophysical data.

The shallow felsic magma was repeatedly injected by the mafic magma, that resulted in the formation of mixed magma. Thereafter, these three magmas incompletely mixed during the eruption. The mixed magma and the felsic magma dominant parts solidified to become the dark gray and whitish gray types, respectively.