

大雪火山群, 御鉢平カルデラ形成期における  
珪長質マグマ溜まりの進化過程佐藤 鋭一<sup>\*,\*\*</sup>・和田 恵治<sup>\*</sup>

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Evolution of Silicic Magma Chamber for Caldera-forming Eruption of Ohachidaira  
in the Taisetsu Volcanic Group, Central Hokkaido, JapanEiichi SATO<sup>\*,\*\*</sup> and Keiji WADA<sup>\*</sup>

The 30 ka caldera-forming eruption of Ohachidaira started with plinian pumice fall and pyroclastic flows. The deposits contain pumice ( $\text{SiO}_2 = 64.9\text{--}68.4$  wt.%), scoria ( $\text{SiO}_2 = 56.6\text{--}59.0$  wt.%), and banded pumice. This study examined the evolution processes of silicic magma chamber through mineralogical and petrological analyses of the eruption products. Three types of plagioclase phenocrysts such as An-rich (type A : An<sub>70-90</sub>), An-poor (type B : An<sub>36-56</sub>), and intermediate (type C : An<sub>56-70</sub>) were observed. Type-A plagioclase phenocrysts were further classified into two sub-types on the basis of MgO content in the cores; type A1 (MgO > 0.05 wt.%) and type A2 (MgO < 0.05 wt.%). Type-A1 and type-A2 plagioclase phenocrysts were derived from mafic magma, type-B plagioclase phenocrysts were derived from silicic magma, and type-C plagioclase phenocrysts were derived from hybrid magma formed by the mixing of mafic and silicic magmas. The pumice mainly contains type-B plagioclase phenocrysts with rare type-A2 and type-C plagioclase phenocrysts. The scoria contains type-A1, type-A2, and type-B plagioclase phenocrysts with rare type-C plagioclase phenocrysts. These assemblages in the products can be explained by the mixing of magmas. Initially, mafic magma including the type-A1 plagioclase phenocrysts was injected into the bottom of the silicic magma chamber, and a density-stratified magma chamber was formed. The first mixing occurred at the interface of mafic and silicic magmas, and a hybrid magma was formed at the interface of the two magmas. During the period from the mixing to the eruption, type-A2 plagioclase phenocrysts were formed due to the diffusion of MgO in type-A1 plagioclase phenocrysts. Whereas, type-C plagioclase phenocrysts were derived from hybrid magmas. During the eruptions, the lower-layer magmas (hybrid and mafic magmas) were sucked into the conduit due to the viscous force of the upper-layer silicic magma. Outer part of the conduit, silicic and hybrid magmas mixed. The mixed magma contained type-B, type-A2, and type-C plagioclase phenocrysts. Whereas, in the center of the conduit, the mixing of the three magmas (mafic, hybrid, and silicic magmas) occurred, and the mixed magma containing the type-A1, type-A2, type-B, and type-C plagioclase phenocrysts was formed.

**Key words:** Taisetsu volcanic group, Ohachidaira caldera, magma mixing, magma chamber, plagioclase

## 1. はじめに

島弧火山では噴火前にマグマ混合が生じている例が多く (Eichelberger, 1978, 1980; Sakuyama, 1979, 1981). その場合、マグマは均質または不均質に混合した状態で噴出

する。また、マグマ混合は噴火のトリガーになり得るばかりでなく (Sparks *et al.*, 1977; Blake, 1981; Pallister *et al.*, 1992), マグマ供給系の進化過程に影響を与える (Tomiyama and Takahashi, 1995; Chertkoff and Gardner, 2004; Toya *et*

\* 〒070-8621 旭川市北門町9  
北海道教育大学旭川校地学教室  
Earth Science Laboratory, Hokkaido University of Education at Asahikawa, Hokumon-cho 9, Asahikawa 070-8621, Japan

\*\* 現所属 : 〒657-8501 神戸市灘区鶴甲1-2-1

神戸大学大学教育推進機構  
Institute for Promotion of Higher Education, Kobe University, Tsurukabuto 1-2-1, Nada, Kobe 657-8501, Japan

Corresponding author: Eiichi Sato  
e-mail: esato@people.kobe-u.ac.jp