

# Formation of anorthite megacrysts in the Mt. Kayo Oguro Lava in Senboku City Akita Prefecture

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## Abstract

An anorthite megacrysts with a maximum length of about 3 cm is found in the Oguro lava of Mt.Kayo in Senboku City Akita Prefecture. These megacrysts are characteristic minerals of volcanic rocks from the Japanese Islands, but their formation and origin remain largely unexplained. Outside Japan, only a few megacrysts smaller than 1 cm have been reported from the Isle of Skye, Scotland (Donaldson 1975) and the Galapagos Islands (Sinton et al. 1993). Although several hypotheses have been proposed as the formation mechanism of anorthite megacrysts, there is no model that considers the internal structure and chemical zoning of anorthite megacrysts. In this study, describe the mineralogical characteristics of the anorthite megacrysts from Mt.Kayo Based on the results of the analyses, the causes of the formation of anorthite megacrysts.

One of the characteristics of the anorthite mafic crystals in the Oguro lava is that the grain size of the anorthite mafic crystals is uniform in the upper part of the lava, and the anorthite megacrysts are abundant in the significantly foamed part. Polarized light microscopy revealed that the mottled minerals are normal pyroxene and anorthite, and the lithic base is autoclase plagioclase. From SEM-EDS observations, it was found that the feldspar mottle has a low An # (about 50%) rim and a high An # (83%-86%) core, and the rim has a similar An component value to that of the base. From the samples collected at the boundary between the Oguro lava and the Maego lava of the upper layer, an inverse accumulation zone structure was found in the middle part of the core and rim sections. In addition, some low-An# rims were found in the feldspar mottling of the foam part, surrounding several high-An# anorthite cores and forming a single large mottling. The whole rock composition analysis showed that the lava was classified as basalt, and there was no significant change in chemical composition between the upper foam and the lower part.

In this paper, discuss the origin and formation environment of the anorthite megacrysts of Mt.Kayo. The boundary between the core and the rim is not as sharply zoned as that of the samples collected at other sites, and the extinction angles of the non-twinned portions are not identical in polarized light microscopy. It is thought that the megacrysts grew into megacrysts by coalescence of the feldspar base with relatively large nearby mottle crystals due to magma mixing. In spite of the difference in crystal diameter and lithology between the upper and lower part of the lava, the results of XRF analysis are similar. This suggests that advanced magma mixing was occurring in the magma pool before the eruption of the Oguro lava. It is considered that the magma mixing was caused by the inflow of magma from the magma pool, and crystals were mixed during the mixing, and the rim part was crystallized surrounding the core part during the cooling process.