Anorthite megacrysts within the basaltic andesite of Hokiyadake volcano, central Japan: Geochemical and mineralogical constraints for their generation

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Anorthite (Ca-rich plagioclase) megacrysts are frequently found in the basaltic rocks in the island arc volcanoes (e.g., [1][2]). The megacrysts (in general 0.5~4 cm) occur as disequilibrium crystals with the other common phenocrysts (< 2 mm), and have high and homogeneous anorthite mol% (An_{91}~An_{94}) in the core part. Recent approaches to calcic plagioclases have suggested that they were crystallized in low pressure condition and with high H_2O contents (e.g., [3][4]). However, there are still uncertainities for the generation processes and original magma chemistries.

Basaltic rocks from Hokiyadake (Pliocene volcano in central Japan) frequently contains anorthite megacrysts (up to 2 cm), which are characteized by rounded shape and pale-yellow coloration. The megacrysts (An_{92}-An_{94}) have slightly higher FeO contents (0.5-0.6 wt.%) compared with those of the colorless ones in the other volcanoes. The yellow-color of the megacrysts could have been due to partial substitution of Fe^{3+} for Al^{3+} in crystal structute of plagiocalse as suggested for anorthites in Hakone volcano [5]. Sr (and Nd) isotope ratios of the megacrysts are similar to those of host rocks and basaltic rocks in neighboring volcanoes, implying that the megacrysts were originated from the similar-series of magma. Chemistriies of the anorthite megacrysts will be discussed with estimation of parental magma and generation process.

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