

Omine volcano erupted just before Aso-4 pyroclastic flow

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Eruption of Omine pyroclastic cone and effusion of associated Takayubaru lava occurred just before the caldera-forming Aso-4 pyroclastic eruption. Composition of Takayubaru lava and that of Aso-4 pumice are similar, but the former was flowing eruption, while the latter was explosive volcanic eruption. We examined the composition of phenocrysts and melt inclusions in Omine scoria, and compared composition with those of Aso-4 pyroclastic flow deposits.

Phenocrysts of Omine scoria is composed of plagioclase, clinopyroxene, orthopyroxene and opaque minerals, and scoria contain microphenocrysts of hornblende. Most of Plagioclase has honeycomb structure.

Whole-rock chemical composition of Takayubaru lava and that of Omine scoria are similar. Whole-rock chemical composition of Omine scoria overlap with that Aso-4 pyroclastic flow deposits in some elements, however they show distinct compositional trends in other elements such as TiO_2 , Na_2O and MgO .

The plagioclase phenocryst composition of Omine scoria shows bimodal distribution. Main peak is An_{55} and sub peak is An_{45} . Plagioclase which has sub peak has honeycomb structure and show reverse zoning. The clinopyroxene phenocryst composition shows unimodal distribution and normal zoning, but the orthopyroxene phenocryst composition shows normal and reverse zoning.

Composition of Omine melt inclusion in plagioclase, clinopyroxene and orthopyroxene are plotted in a narrow range of 68 - 70 wt.% SiO_2 , but several melt inclusion in orthopyroxene are plotted 71 -74 wt.%. Omine melt inclusions show distinct trends in major element vs. SiO_2 plots, and have less H_2O than Aso-4 melt inclusion.

Sr isotopic ratios of Aso-4 and Takayubaru lava are nearly equal. The results indicate that the magma supply system of Omine volcano was different from that of Aso-4. In addition, Omine magma chamber was injected magma of different composition.

Keywords: Omine volcano, melt inclusion, honeycomb structure