Chemical composition of Omine volcanic products which actived 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 Omine scoria and that of Takayubaru lava are similar, but the former shows a wider variation and a little more felsic than the latter. Whole-rock chemical composition of Takayubaru lavas overlaps with that of Aso-4 pyroclastic flow deposits in some elements, however they show distinct compositional trends in other elements such as TiO_2 and Na_2O.

We further examined the composition of melt inclusions in the phenocrysts of plagioclase and orthopyroxene in Omine scoria by FT-IR. Composition of Omine melt inclusions in plagioclase is plotted in a narrow range of 67-70 SiO_2, contrasting with 71-74 wt.% SiO_2 of Aso-4 pyroclastics. Omine melt inclusions show distinct trends in MgO, FeO, TiO_2 vs. SiO_2 plots, and have more SO_3 and less H_2O than Aso-4 pyroclastics. Melt inclusions in plagioclase are SiO_2-poor and less fractionated than groundmass glass. Thus they probably represent earlier stage of magma supply system.

The plagioclase phenocryst composition of Omine scoria shows a unimodal distribution. Whereas, those of Aso-4 pyroclastic flow deposits often show bimodal distribution and are more Ab-rich. Plagioclase phenocrysts of Omine scoria are either clear or with honeycomb structure. They both are in the similar compositional range; the latter showing a little wider range.

All the results indicate that the magma supply system of Omine volcano was different from that of Aso-4.

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