

Petrographic description of volcanic products from Aso Nakadake, November 2014 and later

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Aso Nakadake volcano made a magmatic eruption on November 25, 2014.

The earliest stage of activity characteristically includes Strombolian eruption. It discharged scoria and ash around the crater between the night of November 26 and the morning of November 27. The maximum scoria size was 30 cm. We will report petrographic description of scoria and volcanic ash sampled from the crater rim on November 27.

The 5-cm scoria observed under microscope was vesicular with rounded vesicles attaching each other. Phenocrysts and microphenocrysts of olivine, clinopyroxene, and plagioclase were found between bubbles. Rare orthopyroxene phenocrysts with reaction rim of clinopyroxene, and a few opaque minerals of phenocryst to microphenocryst size were also found. Groundmass is mostly occupied by pale brown glass and shows hyalopilitic texture. Bulk composition corresponds to low-MgO basaltic andesite.

Scoria found northwest of Nakadake crater representing 1989 eruption was analyzed for comparison. It is also vesicular, however, vesicles do not attach each other. Phenocryst and microphenocryst include olivine, clinopyroxene, and plagioclase, with a few orthopyroxene with reaction rim of clinopyroxene and opaque minerals. Plagioclase crystals with honey comb structure are found. Groundmass show intersertal texture, and include microlites and dark brown glass. This scoria is low-MgO basalt.

Volcanic ash sampled near Nakadake crater rim on November 27 contain crystals of olivine, clinopyroxene, and plagioclase. Observed samples do not include orthopyroxene. Some plagioclase crystals show honey-comb structure. Crystals with groundmass or lithic volcanic rock fragments are often found. Few are vesicular. Pale brown glass observed among groundmass of scoria samples from current eruption are few, whereas dark brown glass and microlites are abundant. Altered volcanic rock fragments and crystals are also observed as well as fresh ones.

Miyoshi et al., (2005) classified post-caldera Aso volcanic rocks into seven groups based on chemistry and petrography. The scoria samples we described this time belong to group VII (Orthopyroxene olivine clinopyroxene basalt to basaltic andesite), the most magic group. It includes volcanic rocks from Nakadake, Takadake, Ojodake, Kijimadake, and Komezuka, and is associated with orthopyroxene with clinopyroxene reaction rim and plagioclase with honey-comb structure. The samples we observed in this study include rare existence of orthopyroxene with reaction rim, however, do not include plagioclase with honey-comb structure. Such plagioclase was only found among volcanic ash samples. Petrological characters of volcanic products from Aso volcano are probably explained by the interaction between shallow silicic magma reservoir system and deep-seated mafic magma supply.

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