

SVC050-04

Room:302

Time:May 23 09:15-09:30

Magma of the January 2011 eruption of Shinmoedake, Kirishima Volcano

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A sub-plinian eruption occurred on 26-27 January, 2011, from Shinmoedake, Kirishima Volcano and produced ca 7×10^7 ton of andesitic pumice tephra. Prior to the onset of pumice eruption on 26 - 27 January, the volcano repeated small phreatic - phreatomagmatic eruption since 2008. Continuous ash emission and intermittent violent explosions follow the pumice eruption and lava is filling the previous summit crater of Shimoedake since 30 January. Total volume of the products is approaching to 108 tons on 4, February. The tephra ejected on 19 January contain pumiceous particles about 10% of total volume. The tephra ejected 26-27 January consists mainly of poorly-vesiculated pumices. The intense explosion on 1 February ejected bombs with cooling joints and chilled margin. These grains are the magmatic materials which is driving this eruption.

Our primary petrological examinations are revealing the nature of the magma. The juvenile materials erupted during 26-27 January eruption consists mainly of light-gray pumice associating with small amount of white pumice. Banded pumice consists of gray part and white part are often observed.

Whole-rock compositional analysis by XRF indicates that the composition of gray pumice concentrates around $\text{SiO}_2=57$ wt% and the white pumice $\text{SiO}_2=62-63$ wt%. These whole rock compositions of the juvenile materials are almost same as the previous magmatic eruption in 1716-17. The gray pumices have andesitic composition and contain olivine, orthopyroxene, clinopyroxene plagioclase and magnetite. Core compositions of plagioclase have wide compositional range from 46 to 90 in An contents. Mg# values of orthopyroxene concentrate around $\text{Mg\#} = 72$ and clinopyroxene around $\text{Mg\#}=66$. These mineral compositions are also similar to that of the 1716-17 tephra.

Keywords: Volcano, Eruption, Magma, Kirishima, Shinmoedake