

## Remelting experiments of the erupted materials of the 2011 eruption of Sinmoedake, Kirishima Volcano

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The 2011 eruption of the Sinmoedake crater was the first sub-Plinian eruption in the last 300 years in the Kirishima volcanic chain. The activity in January and February showed eruption styles changing from sub-Plinian to vulcanian. The apparent color variation of the erupted materials was mainly resulting from crystallinity of groundmass.

The white pumice has scarce microlites, with few dendritic ones. The crystallinity of microlite increases in the following order: white pumice, gray pumice, dark-gray lithic fragments, and volcanic bombs. The microlites of gray pumice, lithic fragments, and volcanic bombs are composed of plagioclase, pyroxene, and Fe-Ti oxide. The highly crystallized groundmasses include abundant small crystals with sub-micrometer size.

In order to investigate the magma ascent and emplacement processes in the 2011 eruption, we conducted non-crushed reheating experiments of the gray pumice with a silica-glass tube covered with a bolt/nut cell. The samples were heated at a temperature of 957°C under the pressure of 0-8 MPa with NNO buffered fO<sub>2</sub> and water-saturated conditions for 0.5 h to 1 week.

The crystallinity of microlites in the groundmass increased from that the initial crystallinity of the gray pumice at all the experiments performed at 0-8 MPa pressure. The crystallization of FeTi-oxide nanolites first proceeded at 0.5 hours run, and then the crystallization of plagioclase, pyroxene, and FeTi-oxides followed for 1 week. The crystallinity of the run products covers the range of natural samples except for that of white pumice and the highly-crystallized volcanic bomb. The emplacement pressure of the magmas of gray pumice was inferred to be larger than 8 MPa. The effects of the melt composition, water vapor pressure, and run duration should be further investigated.

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