Japan Geoscience Union Meeting 2012
(May 20-25 2012 at Makuhari, Chiba, Japan)

SVC50-P07 Room:Convention Hall Time:May 24 15:30-17:00

Shallow magma feeding system of the 1914 eruption of Sakurajima inferred from mineral chemistry and volatile contents

SATO, Tomoki[1*], NAKAMURA, Michihiko[1], OKUMURA, Satoshi[1], MIKI, Daisuke[2], IGUCHI, Masato[2]

[1]Earth Material Sci., Tohoku Univ., [2]S.V.R.C., D.P.R.I., Kyoto Univ.

Volatile contents and major element compositions of eruptive materials provide key information on eruption phenomena. To explore the pre-eruptive magmatic processes of the 1914 Plinian eruption of Sakurajima volcano, we analyzed volatile contents and major compositions of melt inclusions, and their host phenocrysts in the pumices.

Major compositions of pyroxenes and melt inclusions were analyzed by using EPMA (JEOL JXA-8800M). The core compositions of ortho- and clinopyroxene phenocrysts showed a wide range, but divided into two groups showing reverse and normal zonings toward the rim, with the boundaries of Mg# of 69 and 73, respectively. The higher-Mg# pyroxenes are normally zoned, while the lower-Mg# groups, reversely. The pyroxene phenocrysts contained plagioclase as a mineral inclusion. The range of An content of the plagioclase inclusions was 52-83. When the host pyroxene shows high-Mg#, the An content was more than 80.

The FT-IR analyses on melt inclusions were carried out using a Nicolet iN10. The analytical results showed a wide ranges of H_2O and CO_2 contents (H_2O=0.8-2.5 wt.%, CO_2<40 ppm).

The volatile saturation pressures of the silicic magma, which was represented by the melt inclusions in the lower-Mg# pyroxenes, was calculated approximately to be 60 MPa (corresponding to the depth of ca. 2.4 km). This depth may be consistent with the shallow magma chamber suggested in the previous geophysical studies. In addition, we found melt inclusions which contain relatively high CO_2 and low H_2O. Such volatile compositions cannot be produced only by a degassing process but suggest fluxing of relatively CO_2-rich fluid or mixing with mafic magmas.