

SVC047-P03

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The transition of eruptive style and crystallization process in the 1914-1915 eruption of Sakurajima volcano

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We investigated the 1914-1915 eruption of Sakurajima volcano as a test case of the eruptive style transition, because the factor of such a transition in a single sequence of eruption hasn't been elucidated yet. In this eruption, explosive eruption produced a large amount of pumices in the early stage, and subsequently the lava flew out by non-explosive eruptions after the middle stage.

To get the clue of factors controlling the transition of eruptive style, in this paper, we examine the crystallization process of plagioclase microlites and phenocrysts in pumice and lava. Microlite is a minute crystal smaller than 100 micrometer in length, crystallizes in the conduit. Microlites crystallize when the ascending magma in the conduit experiences decompression and vesiculation and H₂O exsolution occurs. H₂O exsolution increases the liquidus temperature of the magma and leads to the supercooling state of the magma.

We sampled the pumices and lavas erupted by Sakurajima Taisho eruptions in order to examine the difference of the eruptive style. Sakurajima Taisho pumice is classified into white pumice(major) and gray pumice(minor), both of which we analyzed. Sakurajima Taisho lava is classified into 16 units in the order of flow. We analyzed 8 units of them. To discuss the behavior of magma just before it flew out of the conduit, I analyzed the composition of plagioclase microlites and rims of plagioclase phenocrysts using FE-EPMA. We measured plagioclase microlite crystals size distribution using image processing software "ImageJ".

The results are, An content of microlite is about 45-55 mol%, in contrast, that of phenocryst rim is about 50-65 mol%. There is no difference in chemical composition of plagioclase microlite between lava and pumice. Regarding CSD, the plagioclase microlites are dominated in sizes smaller than 10 micrometer in lavas, whereas they are 10-20 micrometer in pumice. Plagioclase microlite number density of lava is considerably larger than that of pumice.

It is considered that the magma composition or physical condition when microlite crystallized is certainly different from one when phenocryst rims grew. The difference of eruptive style influences rather both the crystallinity and number density of plagioclase microlite than the chemical composition of plagioclase microlite.

Keywords: Sakurajima, microlite, eruptive style, chemical composition, pumice, lava