

[JJ] Evening Poster | S (Solid Earth Sciences) | S-VC Volcanology

[S-VC41]Active Volcanism

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This session discusses various aspects of active volcanisms including, but not limited to, recent and historical eruptions, various phenomena associated with the volcanic activities, underground structures of the volcanoes, and developments of new instruments based on geophysical, geochemical, geological, and multidiscipline approaches. We also welcome studies on understanding and predicting the transitions of the eruptive activities from observational, theoretical, and experimental approaches.

[SVC41-P02]Eruption history and magma plumbing system of Me-akan volcano, eastern Hokkaido, in the last 1000 years

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The Me-akan volcano (1499 m) is active volcano located in the Akan caldera, eastern Hokkaido. Volcanic activity of the Me-akan volcano produced eight volcanic bodies with different peaks (Katsui, 1951; Wada, 1991). Among them Akanfuji (1476 m) comprising basaltic scoria falls and lava flows is the newest volcanic body (2 ka to 1 ka) in the Me-akan volcano (Sato and Wada, 2017). Subsequently, the eruption center shifted and the basaltic andesite magma erupted from the Ponmachineshiri crater, forming scoria layers (Pon-S, about 1000 years ago), which was regarded as the ejecta due to the latest magmatic eruption of Me-akan volcano. It is pointed out that the eruption activity of Me-akan volcano recent 1000 years has no significant magmatic eruption so far; about 30 phreatic explosions occurred and the old crater and the Akanuma crater opened at the summit of Ponmachineshiri.

Thus, phreatic explosion occurred intermittently after magmatic eruption at Ponmachineshiri crater 1000 years ago, but the magma plumbing system during this period is not known in detail. In this study, we investigated the magma plumbing system by the petrological method about the Pon-S layer ejecta (ca. 1 ka), and in the subsequent eruption activity whether there was no magmatic eruption involving new magma, and the transition of magma plumbing system during 1000 years.

1. Magma plumbing system of Ponmachineshiri scoria (Pon-S layer, ca.1 ka)

The Pon-S layer is composed of 8 units consisting of scoria, bomb and volcanic block as essential ejecta, including pumice by location. The phenocrysts (39 vol.%) with aggregate texture are plagioclase (An₉₅₋₆₀) including large size, orthopyroxene, clinopyroxene (including diopside), and titan-magnetite.

Plagioclase phenocrysts show repetitive zoning in the core and show remarkable reversed zoning in the rim. It was thought that the eruption (Pon-S) would have occurred by injection of basaltic magma with Ca- and Al-rich components including plagioclase (>An₉₀) and diopside into the andesite to dacite mush magma chamber where injection of mafic magma repeatedly occurred.

2. Eruption history and magma plumbing system for 1000 years

Geological survey of pits at foot of Me-akan volcano and cross section of summit crater wall, and 150 m

boring core survey (JMA-V) near summit crater was carried out. Volcanic ash particles from the Me-akan volcano recent 1000 years had small amounts of fresh volcanic glass fragments with characteristics different from those of wide-spread volcanic ash and Akanfuji and Pon-S scoria fragments. The chemical composition of these fresh glasses is concentrated in the independent compositional region in the relation diagram of TiO_2 - K_2O .

This shows these fresh glass particles (referred as Pon-T) are derived from the new magma of Me-akan volcano. Since the fresh fragments contain a small amount of microlite and phenocryst, although the glass composition of Pon-T is 76 - 77 wt.% SiO_2 , their whole rock composition is expected to be dacite. Thus the magma plumbing system could be changed during 1000 years from that of Pon-S eruption at 1 ka.