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

[S-VC39]Pre-eruptive magmatic processes: petrologic analyses, experimental simulations and dynamics modeling

convener:Michihiko Nakamura(Division of Earth and Planetary Materials Science, Department of Earth Science, Graduate School of Science, Tohoku University), Akihiko Tomiya(Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology), Shanaka L de Silva (共同), Fidel Costa(Earth Observatory of Singapore, Nanynag Technological University)
Thu. May 24, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
Processes leading to volcanic eruptions are central and yet still enigmatic issues in volcanology. Recent advances in understanding thermo-mechanical and open-system behavior of magma reservoirs and mineral zoning stratigraphy allow us to take a step forward to reveal the complex incubation processes during volcanic dormancy and following magma chamber tapping. This session aims at putting together recent knowledge on magmatic processes including 1) magma chamber evolution through magma reintrusion, crystallization-induced volatile exolution, magma mixing and gas fluxing, 2) externally-driven eruption trigger mechanisms, and 3) conduit processes and controls on eruption styles such as outgassing, dehydration-induced crystallization, fragmentation and rheological transition of ascending magmas. We welcome contributions based on petrological, mineralogical and geochemical analyses of pyroclasts and volcanic gasses, experimental simulations of magma reservoir conditions and conduit flow dynamics, and numerical modeling to integrate the elementary processes.

[SVC39-P12]MAGMA GENESIS OF SLAMET VOLCANO, CENTRAL JAVA, INDONESIA

*Yogi Adi Prasetya[1], Atsushi Toramaru[1], Tomoharu Miyamoto[1] (1.Graduate school of science, Department Earth and Planetary Science Kyushu University Nishi-ku, 744, Motooka, Fukuoka 819-0395, Japan)
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Slamet Volcano is one of Indonesia Quaternary Stratovolcanoes in Central Java Province. Slamet volcano is divided into two parts, Old Slamet in the western part and Young Slamet in the eastern part, both of them were formed in Pleistocene (2.6 million – 11.600 years ago). The rock compositions are basaltic andesite to andesitic for Old Slamet, basaltic to basaltic andesite for Young Slamet and dacite was formed in the transitional stage between Old and Young Slamet. Previous researchers characterized Slamet Volcano rocks as calc-alkaline and high-K calc-alkaline series.

Several researchers have studied Slamet Volcano and gave a general process in Old Slamet and Young Slamet. Vukadinovic and Sutawidjaja (1995) discuss that Old Slamet had more fractionation crystal and there was mafic, hot, fluidal magma recharge in Young Slamet. In the present study, we focus on Young Slamet Complex and will use more samples from different rock units based on Young Slamet Stratigraphy to conclude the magma genesis process of Young Slamet Volcano in detail with calculating magma pressure, temperature and oxygen fugacity.

Six different units rock samples, including lava and scoria samples, have been collected for the stratigraphic units: the oldest rock unit is Slamet Lava 1 (SL1), above it then deposited Slamet Lava 2 (SL2), Scoria Fall 1 (SJP1), Scoria Cones (KSL), Slamet Lava 3 (SL3) and the youngest is Scoria fall 2 (SJP2). Those samples were analyzed using an optical microscope, XRF, SEM-EDS, and EPMA.

The phenocrysts are plagioclase, pyroxene, olivine and amphibole with textures such as zoning, glomerocrysts, synneusis and sieve texture. Young Slamet bulk compositions for 25 samples show SiO_2 and K_2O contents from 46.7 – 59.12 wt.% and 1.06 – 2.47 wt.%, respectively. The rock samples are classified as calc-alkaline to high-K calc-alkaline series and classified from basalt, trachybasalt to andesite. The widest ranges of the anorthite (An) content of plagioclase from 51.06 to 86.81 mol %, magnesium content of pyroxene from 73.64 to 89.81 mol % and forsterite (Fo) content of olivine from 58.7 to 86.5 mol % are observed in SL1, and gradually decrease in SL2 and then increase in SJP1. Bimodal distribution of anorthite and forsterite were observed in SJP1 samples. Based on these data we suggest that several times of magma mixing occurred in Young Slamet Complex. Magma pressure, temperature and oxygen fugacity will be determined from iron and titanium oxide minerals and two pyroxenes to quantitatively know the physical condition of magmatic processes.