Oral | Symbol S (Solid Earth Sciences) | S-VC Volcanology

[S-VC54_1AM1]Volcanic and igneous activities, and these long-term forecasting

Convener:*Teruki Oikawa(Institute of Geology and Geoinformation, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology), Daisuke MIURA(Geosphere Sciences, Civil Engineering Research Laboratory, Central Research Institute of Electric Power Industry), Takeshi Hasegawa(Department of Earth Sciences, College of Science, Ibaraki University), Nobuo Geshi(Geological Survey of Japan, The National Institute of Advanced Industrial Science and Technology), Yoshihiro Ishizuka(Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology), Chair:Maya Yasui(College of Humanities and Sciences, Nihon University), Mitsuhiro Yoshimoto(Faculty of Science, Hokkaido University)

Thu. May 1, 2014 9:00 AM - 10:45 AM 411 (4F)

This session focuses on generation and accumulation processes of magmas, magma-crust interaction and degassing, and modes of eruption, long-term forecast of eruption, dispersal and emplacement of the volcanic products. The discussion spans petrological, geochemical, geophysical, and geological processes related with volcanic activity and products in the past, the present and the future.

10:15 AM - 10:30 AM

[SVC54-P14_PG]Origin and deformation of the clastic flow bands in the Takanoobane rhyolite lava

3-min talk in an oral session

*Kuniyuki FURUKAWA[1], Tatsuo KANAMARU[2], Koji UNO[3] (1.Faculty of Business Administration, Aichi University, 2.Department of Geosystem Sciences, College of Humanities and Sciences, Nihon University, 3.Graduate School of Education, Okayama University)

Keywords:rhyolite, lava, flow band, conduit, Aso

In this study, we showed that the clastic flow bands, which are developed in the Takanoobane rhyolite lava, were formed by shear fracturing of the high viscous magma within the shallow conduit. The flow bands broke up into the small particle-rich flow lines, which are ubiquitously observed in obsidian lavas. The Takanoobane rhyolite lava (TR lava) is located at the Aso caldera in the middle of Kyushu Island in SW Japan. The lava is effused at 51+/-5 ka (Matsumoto et al., 1991). The thickness, estimated volume, and bulk rock chemistry of TR lava are 60-90 m, 0.14 km^3 (Miyabuchi et al., 2004), and 71-72 SiO_2 wt.% (Furukawa, 2006), respectively. In this study, we examined two drill cores (AVL1 and AVL4) provided by the Aso Volcanological Laboratory. Both drill holes penetrated the proximal part of TR lava. TR lava is composed of an inner crystalline part and marginal glassy parts. The black to dark gray colored flow bands within a few millimeters thick are concentrated around the boundary between crystalline part and basal obsidian. The bands are composed of clastic materials with a diameter below a few mm. The clastic materials are composed of glassy lithics and minerals. Some clasts are rounded and fluidal shapes and show different textural occurrences from the surrounding rhyolite. The chemical compositions of the glassy lithics and those of glassy matrix of the surrounding rhyolite are slightly different. Within the bands, the streak texture, which is defined by difference of clasts and microlite contents, is conspicuous. The differences in texture and chemical compositions between the clasts in the bands and surrounding rhyolite indicate that the clastic bands were not formed by autobrecciation within the lava. These observations indicate that the clastic bands are likely to be formed by shear fracturing of the high viscous magma within the shallow conduit such as Tuffen et al. (2003). The fractures would become

©Japan Geoscience Union

pathway of the volcanic gasses, and the clasts were transported by the gas transport. The streak texture within the bands is interpreted as sedimentary structures, which were formed by gas transportation of clasts through fracture system. The rounded and fluidal shapes of the clasts indicate that the fracturing occurred when the conduit magma was enough hot. The clastic bands consequently break up and disappear. The bands show progressive loosening along the individual streak, where will be the structural weakness. Consequently, the streak develops into the individual thin bands. The small particles, such as glass particles, microlites and lithics, are released from margin of the clastic bands to the surrounding rhyolite. Since the high viscosity of the lava inhibits their homogenization, the particles are likely to be aligned along the flow line. The clastic flow bands, originated from shear fracturing, will thoroughly break up via this process. Our results mean that the clastic flow bands developed within silicic lavas is important for understanding of the shallow conduit system of silicic magma.

©Japan Geoscience Union