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

[S-VC43]Volcanic and igneous activities, and these long-term forecasting

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Sun. May 20, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

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.

[SVC43-P01]Heating experiments on the obsidian from Shirataki, Hokkaido, Japan -Relations between foaming texture (perlite) and lava structure-

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The recent observation on Cordon Caulle (Chile, 2011–12) reported the explosive-effusive hybrid activity (Schipper et al., 2013), and we can consider that this eruption reflects heterogeneous processes such as vesiculation and outgassing in volcanic conduit. Obsidian can be observed as pyroclastic and effusive-lava products of such a silicic and viscous magma eruption, and we can consider that obsidian contains the heterogeneities in rock textures such as crystallinity, water concentration oxidation state, and structure of glass networks.

The effusive obsidian contains the small amount of water (-0.5 [wt.%]) and can be foamed by the heating experiment. The foamed obsidian is known as a perlite. Recent experimental study to form the perlite revealed that (1) the foaming-start temperatures (Tf) of perlite have a positive correlation with water concentration in obsidian from different lava eruptions and (2) perlite texture shows the differences in bubble number density and size (Wada et al., 2016 JpGU), and we could use these characteristics as the indicator of heterogeneity in viscous lava flow. Thus in this study, we conducted the obsidian heating experiment with focusing on the heterogeneity of lava structure in the single lava flow.

We conducted the heating experiments by using the obsidian samples from Horoka-Yubetsu lava from Shirataki, Hokkaido, Japan. We collected the samples of the obsidian layer from the bottom-up within the Horoka-Yubetsu lava. We made the obsidian cube with 10 [mm] on each side and use this cube for heating experiment. The experimental condition was he heating temperature (T) between 900 and 1150 [deg.C] and duration of 30 [min].

On the basis of the experiment we newly identified the heterogeneity of Tf in the obsidian layer of single obsidian lava. The Tf of the sample from the bottom of the obsidian region is 1000 [deg.C], on the other hand, the Tf of the sample from the upper part of the lava is 1100 [deg.C]. Furthermore, the bubble textures in 1150 [deg.C] experiments apparently show that samples from the bottom of the lava show the low bubble number density and large size of bubbles, on the other hands the upper samples show high bubble number density and small size of bubbles. In this study, we discuss the heterogeneity of obsidian lava based on experimental results, rock texture and bubble textures of perlite.