Structure, texture and water concentration profiles of obsidian lavas -Insight for magma ascent and structure formation processes-

KYOHEI SANO[1*], EIICHI SATO[2], YOSHIHIKO GOTO[3], KEIJI WADA[4]

[1] Shirataki Geopark, 138-1, Shirataki, Engaru, 099-0111, Hokakido, Japan (*correspondence: k.sano@engaru.jp)

[2] Kobe Univ. Institute for Promotion of Higher Education, Kobe, 657-8501, Japan

[3]Muroran Institute of Technology, Hokkaido, 050-8585, Japan

[4]Hokkaido University of Education at Asahikawa, Hokkaido, 070-8621, Japan

Structures of obsidian lava are mainly divided into two regions; obsidian and rhyolite. These are defined based on differences in appearance of hand specimens and rock texture. The recent observation on Cordón Caulle reported the explosive-effusive hybrid activity of viscous magma (Schipper et al., 2013), and we can consider that such hybrid activity reflects heterogeneous processes such as vesiculation and outgassing in volcanic conduit, and is the key process to form the obsidian and rhyolite.

In order to reveal heterogeneous vesiculation and outgassing processes of viscous magmas, we performed water concentration analyses with comparing structure and rock texture for samples from Sanukayama (SN) obsidian lava at Kozu island, one of the Izu archipelago, south of Tokyo, and Akaishiyama (AK) obsidian lava at Shirataki, northern Hokkaido, Japan.

Water concentrations in SN samples were 0.07 – 3.06 [wt.%] and the degree of hydration is higher in clinker region than lower rhyolite. Water concentrations in AK samples were in the range of 0.01 – 1.10 [wt.%], and spherulite bands show hydration. We can consider that hydrated water concentrations reflect the connected vesicularity, that is, development of permeability.

We compared the water concentration profile with lava structure and rock texture at SN and AK lava. Water concentration profiles give us the useful information to reveal the vesiculation and outgassing processes in obsidian lava.