[JJ] Evening Poster | S (Solid Earth Sciences) | S-CG Complex & General

[S-CG60]Petrology, Mineralogy and Resource Geology

convener:Koichi Momma(National Museum of Nature and Science), Tatsuo Nozaki(Research and Development Center for Submarine Resources, Japan Agency for Marine-Earth Science and Technology), Satoshi SAITO(愛媛大学大学院理工学研究科, 共同), Nobutaka Tsuchiya(Department of Geology, Faculty of Education, Iwate University)

Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

We widely invite presentations in the fields of petrology, mineralogy and resource geology. Especially description of minerals and rocks, investigation of their origin and evolution by field investigation and/or laboratory experiments, and development of new methods are accepted.

[SCG60-P09]The origin of Quaternary rhyolitic magma from Hime-Shima volcanic group

*Takehiro Hirayama[1], Tomoyuki Shibata[1], Masako Yoshikawa[2], Keiji Takemura[2] (1.Department of Earth and Planetary Systems Science, Graduate School of Science, Hiroshima University, 2.Beppu Geothermal Research Laboratory, Institute for Geothermal Sciences Graduate School of Science, Kyoto University)

Keywords:Garnet, Rhyolitic magma, Hime-Shima volcanic group

Hime-Shima island is located in about 4 km north offshore of Kunisaki peninsula, Kyushu, Japan. On this island, seven Quaternary monogenic volcanoes, which are composed of dacite and rhyolite (Himeshima rhyolite), form the Hime-Shima volcano group. The Philippine Sea Plate (PSP) is subducting beneath the volcanic group. The magmas from this volcanic group is thought to be formed with magma mixing between dacitic and rhyolitic magmas based on existing of disequilibrium amphibole in the rhyolite and linear trends of major elements with respect to the SiO_2 contents. According to the geochemical features, such as high Sr/Y ratios (some 100), low Y contents (< 14.3 ppm) and low $^{87}Sr/^{86}Sr$ rations (0.7037), the dacitic endmembers thought to be generated by partial melting of subducted PSP (Shibata et al., 2014). However, the genesis of rhyolitic endmember is still a matter of debate. To better understanding of this problem, we investigated the petrography and mineral chemistry of HimeShima rhyolites collected from Darumayama and Shiroyama volcanoes.

Lava samples are garnet-bearing rhyolites in Darumayama and Shiroyama volcano. Darumayama lava is mainly composed of garnet, plagioclase and amphibole with groundmass of plagioclase, biotite and quartz. Shiroyama lava is composed of garnet, sillimanite, plagioclase and zircon with glassy groundmass of plagioclase, biotite and quartz. Major element compositions of amphiboles and garnets were determined om an Electro Probe Micro Analyzer.

According to calculated temperature condition (924 - 949 ℃) and SiO_2 in coexisting liquid (62 - 64 wt%), amphiboles in rhyolite comes from dacitic magma due to magma mixing. This argument quantitively supports the point of view suggested that garnets in Himeshima rhyolite crystallized in dacitic magma by Itoh (1990).

In Shiroyama lava, we confirmed the part of a lot of garnets coexists plagioclase, sillimanite and zircon. These minerals are subhedral or anhedral. This mineral assemble is like metapelites as xenolith found in dacite in Himeshima volcanic group. The possibility of these minerals are remaining minerals when metapelites melt in rhyolitic magma is high. Chemical compositions of garnets in both lavas are Al-rich

and similar. Garnets of rhyolite in Himeshima volcanic group have low CaO (< 4.0 wt%) and high MnO content (5.6-7.0 wt%). Their chemical composition range is like that of garnets in metapelites. Thus, it is estimated garnets of rhyolites in Himeshima volcanic group are xenocrysts from metapelites. The implication is that crustal material such as metapelites influences the genesis of rhyolitic magma in Himeshima volcanic group.