[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-P05]Generation and evolution processes of rhyolitic magma in Niijima volcano, Izu-volcanic arc, Japan: petrological and geochemical constaints

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Keywords:Niijima volcano, High silica rhyolite, Izu volcanic arc, Cummingtonite

We examined the petrography, petrology and geochemistry of the high-silica rhyolite in Niijima volcano at the northern part of the Izu-Bonin volcanic arc, Japan, for clarifying their origin and evolution process. The Niijima volcano, located in the rear arc, consists predominantly of rhyolitic lavas and pyroclastics accompanied by minor basaltic and andesitic pyroclastics. The rhyolites with 12 distinct eruption units are classified into four types based on the mafic phenocryst assemblage: orthopyroxene-cummingtonite type, cummingtonite-type, cummingtonite-biotite type and biotite type (e.g., Isshiki, 1987). Hornblende phenocrysts are sometimes included. Anorthite content (An mol %) of plagioclases and Mg value (Mg#) of mafic mineral phenocrysts decrease with eruption period. The whole rock chemical compositions of the rhyolites are characterized by high SiO_2 (wt.%) (73-78%) and K_2O (wt.%) (1.5-3.5%), and the major and trace element contents show slight differences among the four types and eruption units.

Mineral assemblages particularly with cummingtonite and without clinopyroxene, and high SiO_2 and K_2O contents of rhyolites suggest that the magmas were produced under low temperature (< 800ºC) and pressure (< 3kb), and hydrous conditions. The major and trace element characteristics indicates prominent fractionation of amphiboles and plagioclase from the parental magmas, and this is supported by tonalitic cumulate xenoliths found in the rhyolitic lavas and pyroclastics (Arakawa et al., 2017). The primitive magma is assumed to have been generated by partial melting of middle crust rather than the mafic lower crust. In comparison with the other rhyolites in volcanic front and rear arc regions in northern Izu-Bonin arc, the Niijima rhyolites show distinct features from the others, possibly representing the differences in magma source, and generation and differentiation processes of silicic magmas.