[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-P13]Origin of low-Sr granitoids from the northeastern part of Kyushu

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Cretaceous to Paleogene granitic rocks are widely exposed on the eastern margin of Asian continent. The northern part of Kyushu, Southwest Japan, is underlain by the Cretaceous plutonic rocks. These granitoids are distinguished between low-Sr and high-Sr granitoids by their Sr contents. Low-Sr granitoids are exposed on the east side of the Kokura-Tagawa tectonic line. On the other hand, in the west side of the tectonic line, high-Sr granitoids are distributed. Izawa et al. (1990) suggests fractionation of hornblende in the lower level of continental crust and supply of periodic primitive magma into magma chamber as genesis of the high-Sr granitoids. Yada and Owada (2003) also presumed differentiation process of the Itoshima granodiorite (high-Sr granitoid in the west side) by mainly fractionation of hornblende and plagioclase from its parental magma. However, little research on genesis of the low-Sr granitoids has been done. In this study, the author discusses genesis of the low-Sr granitoids of the Hirao granodiorite.

The Hirao granodiorite occurs as a stock with 16 km N-S and 4 km E-W. The granodiorite consists mainly of plagioclase, quartz, K-feldspar, biotite, and hornblende. In addition, the granodiorite dike occurs in the study area. The granodiorite dike has mineral assemblage similar to that of the Hirao granodiorite. Sr contents of the Hirao granodiorite and dike plot within the low-Sr granitoids field. SiO_2 contents of the Hirao granodiorite range from 62 to 67 wt.%, these of dike show 73.3 wt.% and 74.0 wt.%. SiO_2 contents of the Hirao granodiorite increase with decreasing modal values of hornblende, biotite and plagioclase. The granodiorite dike shows more evolved composition with decreasing of these minerals. Chondrite normalized REE patterns for the Hirao granodiorite and dike show negative Eu anomaly. These characteristics are inferred that main fractionated minerals are of hornblende, biotite and plagioclase. Results of geochemical modeling reveals that compositional variation of the Hirao granodiorite is mainly caused by fractionation of plagioclase accompanied by hornblende.

The Hirao granodiorite shows K-Ar age of 99.1 Ma. Initial isotopic ratio of the Hirao granodiorite and dike show similar value. Furthermore, these ratios resemble that of the granitoids in west side of the Kokura-Tagawa tectonic line.

The Hirao granodiorite can be originally derived from similar source rocks to the granitoid from the west side of the tectonic line because of similarity of their isotopic compositions. On the other hand, the lowest SiO_2 sample in the Hirao grandiorite also show negative Eu anomaly. This feature indicates that a restite of granodiorite magma contains a large amount of plagioclase. In addition, plagioclase is main subtracted phase during crystallization of the Hirao granodiorite magma. Therefore, plagioclase is

largely involved in magma processes in the low-Sr granitoids from the northeastern part of Kyushu batholiths.