Japan Geoscience Union Meeting 2014
(28 April - 02 May 2014 at Pacifico YOKOHAMA, Kanagawa, Japan)
©2014. Japan Geoscience Union. All Rights Reserved.

SIT41-02 Room:314 Time:April 28 10:15-10:30

Gabbroic petrology of oceanic lithosphere: comparison between Godzilla Megamullion and megamullions in mid-ocean ridges

YAMASHITA, Hiroyuki[1*] ; OHARA, Yasuhiko[2] ; ARIMA, Makoto[3]

[1]Kanagawa Prefectural Museum of Natural History, [2]Hydrog. & Oceanog. Dept. of Japan, [3]Yokohama National University

Godzilla Megamullion is the largest oceanic core complex on the Earth, with the dimension 125 km (along axis) and 55 km (across axis) (Ohara et al., 2001). Our study has revealed systematic petrological characteristics of the gabbroic rocks from the Godzilla Megamullion. In this contribution, we will report these characteristics and compare the results with those of gabbroic rocks from mid-ocean ridges.

Low modal abundance of olivine and high abundances of amphibole and iron oxide minerals are the prominent feature of the majority of the gabbroic rocks recovered from the Godzilla Megamullion. The studied gabbroic rocks are classified into troctolite, olivine gabbro, gabbro, hornblende pyroxene gabbro, pyroxene hornblende gabbro, hornblende gabbro on the basis of the classification by Streckeisen (1976). The chemical compositions of constituent minerals show systematic variations that are indicative of magmatic differentiation. Anorthite content in plagioclase, XMg (Mg/ (Mg + Fe) value in olivine and clinopyroxene decrease from less differentiated to highly siliceous evolved rocks. The mineral compositions indicate that troctolite is the most primitive variety and that trondhjemite is the most differentiated variety in the Godzilla Megamullion.

Troctolite, olivine gabbro and gabbro were recovered only from the distal parts of the Godzilla Megamullion. An age of ˜13 Ma has been reported from this region (Tani *et al*., 2011). On the other hand, trondhjemite was recovered from the medial and proximal parts of the megamullion, with ages of 11 and 8.7 Ma (Tani *et al*., 2011), respectively. Gabbroic rocks with relatively primitive composition were recovered from the Neck Peak region (age of 8.4 Ma; Tani *et al*., 2011). The spatial and temporal distribution of gabbroic rocks in the Godzilla Megamullion suggests the following magmatic model: a robust magmatic activity was predominant in the distal part, a declined magmatic activity in the medial to proximal parts, and a resurgent magmatic activity in the Neck Peak region. This model is consistent to the results obtained independently from petrological analysis on the peridotites from the Godzilla Megamullion (Snow *et al*., in preparation).

The lithological proportions of the gabbroic rocks in the Godzilla Megamullion are characterized by lower primitive gabbro (troctolite and olivine gabbro) ratio than in the Kane Megamullion in the Mid-Atlantic Ridge and in the Atlantis Bank in the Southwest Indian Ridge.

Keywords: Parece Vela Basin, Godzilla Megamullion, gabbro, Oceanic core complex