# Geochemical study on Bousei, Hotta and Smetanin Seamounts near the Japan Trench in Northwestern Pacific Ocean

G. SHIMODA[1], O. ISHIZUKA[1], K. YAMASHITA[2,3], M. YOSHITAKE[3], M. OGASAWARA[1] AND M. YUASA[1]

[1]Geological Survey of Japan, AIST, Tsukuba, Japan (h-shimoda@aist.go.jp, o-ishizuka@aist.go.jp, masa.ogasawara@aist.go.jp, yuasa-m@aist.go.jp)
[2]Institute for Study of the Earth's Interior, Okayama University, Misasa, Japan (kty@misasa.okayama-u.ac.jp)
[3]Department of Earth and Planetary Sciences Kobe University, Kobe, Japan (miwa@kobe-u.ac.jp)

The Northwestern Pacific plate is characterized by existence of a large number of seamounts (Koppers *et al.*, 1998). It is widely accepted that these seamounts were produced by extensive magmatic activity during the Cretaceous in the South Pacific that is considered to be one of the largest volcanic events in Earth's history. As this magmatism would represent large-scale mantle upwelling, the magmatism could provide a key constraint to understand chemical evolution of the Earth. Due to this importance, many researches have been conducted on the south Pacific islands, and thus present-day magmatism in the South Pacific is well constrained. In contrast, little constraint has been given to the past volcanic activity in this region.

It has been reported that there are two peaks in the volcanic activity in the South Pacific during the Cretaceous (after Winterer, 1976). As the volcanic peaks should be essential to understand the large mantle up-welling, an investigation on the volcanism during the Cretaceous should be important. The Cretaceous age seamounts near the Japan Trench (e.g., Takagi *et al.*, 1989) are thus suitable examples to study the magmatism in the South Pacific. For the evaluation of the origin of these seamounts, we collected samples from these seamounts during Geological Survey of Japan Daini-Hakureimaru cruise. Drilling and dredging were conducted at 12 sites and fresh samples, alkali basalts and andesites, were recovered from three Seamounts; Bousei, Hotta and Smetanin Seamounts. The phenocrysts are mainly plagioclase and pyroxene with/without hornblende. The geochemical character of the rocks from the Bosei and Hotta are HIMU-type. In contrast, those from the Smetanin show less HIMU signature. In this presentation, we will discuss the origin of Seamounts along Japan Trench and constrain the volcanic activity in the South Pacific.

## References

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# The influence of Philippine Sea Plate on the composition of mantle beneath Kyusyu, SW Japan arc: Along-arc variation of B data

M. SHIMONO[1] M. MIYOSHI[1] T. FUKUOKA[2] T. SANO[3] AND T. HASENAKA[1]

[1]Graduate School of Science and Technology, Kumamoto University, Japan (shimono@es.sci.kumamoto-u.ac.jp, miyoshim@es.sci.kumamoto-u.ac.jp, hasenaka@sci.kumamoto-u.ac.jp)
[2]Department of Environmental Systems, Rissho University, Japan (tfukuoka@ris. ac.jp)
[3]National Science Museum, Tokyo, Japan (sano@kahaku.go.jp)

Volcanism in Kyusyu island is associated with subduction of Philippine Sea Plate (PSP) under Eurasian plate. Kyusyu-Palau Ridge, which subducts nearly at right angles to central part of Kyusyu, marks the boundary between young (15-26 Ma) PSP in the north and old (37-115 Ma) PSP in the south. Thus volcanic rocks from Kyusyu are good samples to test the compositional difference resulting from the subduction of ocenic plates with different ages.

We studied the difference in subduction component using boron element, As boron is enriched in altered oceanic crust and ocean sediment, it is one of the best indicators to show the contribution of fluid phase coming from the subducting plate to the mantle beneath volcanic arc. The release of the fluid phase from the oceanic plate is believed to occur in two manners. One is by aqueous fluid at high temperature, and the other is by the dehydration process, i.e. the breakdown of hydrous phases at high pressures. In this case, fluid is continously released from the plate with increasing pressure, because various phases were involved in producing boron-rich fluid at different pressures.

The ratio of B/Nb was used to see the contribution of the subducting plate. It eliminates the influence of different degrees of partial melting in the mantle and fractional crystallization and crustal contaminationin the crust.

The across-arc variation as observed by B/Nb ratios in volcanic rock is almost absent in the northern Kyusyu (NK), whereas it shows a gradual decrease in B/Nb from the volcanic front to the back-arc side in southern Kyusyu (SK). In addition, the B/Nb ratio of rocks from the volcanoes at the volcanic front is relatively high in the SK (~7.5), whereas it is relatively low in the NK (~3.5).

The lack of lateral variation in subduction component in volcanic rocks from the NK indicates a possibility that the relrease of fluid phase is completed before the oceanic plate reaches the volcanic front. The relatively low number in B/Nb ratio also supports this hypothesis. The young age of oceanic plate suggests a high temperature gradient in the depth profile of the subducting plate. In contrast, the volcanic rocks from the SK show a normal across-arc variation of subduction component typically related with the subduction of relatively old and cold oceanic plate.