

Geochemical study on the seamounts along the Japan Trench

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The Northwestern Pacific plate is characterized by existence of a large number of seamounts that is defined as Western Pacific Seamount Province (WPSP) (Koppers et al., 1998). The seamounts that are situated along the Japan trench (Takuyo, Erimo and Ryofu-Daini Seamounts, and Joban Seamount Chain) are old seamounts in WPSP of which ages are Early to Late Cretaceous (Ozima et al. 1970; Takagi et al., 1989; Masalu et al., 1997; Nakanishi and Winterer 1998; Kobayashi et al., 1998). These seamounts are considered to be produced by intra-plate volcanism on the Early Cretaceous Pacific Plate.

The Joban seamounts form seamount chain, suggesting their genetic relationship. However, the chain is neither parallel nor perpendicular to the magnetic lineation. It follows that spreading ridge related processes can not explain the origin of Joban seamount chain. In addition, the chain was not in parallel with Pacific Plate motion during Jurassic to Cretaceous (Duncan and Clague, 1985). Consequently, the Joban seamount chain could not be produced by a stationary hot spot. Therefore, the origin of these seamounts is still ambiguous and in controversy (e.g., Masalu et al., 1993, 1997).

In order to evaluate the origin of these seamounts, we collected samples during Geological Survey of Japan (GSJ) Daini-Hakureimaru cruise 05GH. Drilling was conducted at 10 sites, i.e., Ryofu-Daini seamounts (4 sites), Joban Seamount chain (6 site) including; Bousei seamount (2 sites), Daisan-Kahisma Northwest seamount (3 site) and Daisan Kashima seamount (1 site). The samples from the Bousei Northeast were also collected by dredging (2 sites). Among these site, fresh samples were recovered from Bousei, Bosei Northeast and Ryofu-Daini seamounts. These samples are alkali basalts and andesites that are porphyritic and poorly to moderately vesiculated. The phenocrysts are mainly plagioclase and pyroxene with/without hornblende. The geochemical character of the rocks from the Bousei and Bosei Northeast is HIMU-type. However, those from the Ryofu-Daini show less HIMU signature. In this presentation, we will discuss the origin of Seamounts along Japan Trench.