

Petrological study of basaltic rocks in the northern Mariana trough

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The area in the northern end of Mariana trough is a boundary between Izu-Bonin arc and Mariana arc. There are activities of back-arc rifting in the area between lat. 13 degrees N to 22 degrees N, whereas no activities in the north area from lat. 22 degrees N. The area northern than lat. 22 degrees N shows tectonics characterized by an early stage of back-arc rifting. During NT06-08 cruise (R/V NATSUSHIMA) in the area of the most northern Mariana arc (lat. 23 degrees N to 24 degrees N), we carried out 26 dredge hauls and bathymetric and geomagnetic surveys in order to understand evolutionary processes at the early stage of back-arc rifting.

Basaltic rocks were collected from monogenic volcanoes in the most northern area of Mariana trough. Spinel chemistries of the basaltic rocks from the monogenic volcanoes show back-arc basin basalt-like natures. On the basis of olivine chemistries of the basaltic rocks, primary magmas which produced these basaltic magmas have some chemical variations, indicating that mantle source could have chemical diversities. We would examine spatial and temporal changes of magmatism at the early stage of back-arc rifting in the future.