

Volcanisms at the Shikoku Basin during middle Miocene

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Because the Shikoku Basin has been subducted along the Nankai trough beneath the Southwest Japan, volcanic and development history of the Shikoku Basin is important to consider the onland geology and/or volcanism at the Southwest Japan.

The Shikoku Basin started rifting ~30 Ma and ceased spreading at ~15 Ma (e.g., Okino et al., 1994). Spreading direction changed from approximately E-W to NE-SW at around 19 Ma.

Two volcanic activities after the cessation of the Shikoku Basin spreading occurred at the Kinan Seamount Chain and Mikawa and Komahashi-daisan seamounts at the eastern edge of the Shikoku Basin.

The Kinan Seamount Chain lies close to the extinct spreading center of the Shikoku Basin, and volcanic rocks are approximately 15.4 Ma (Ar-Ar age: Ishii et al., 200) and 7 to 8 Ma (K-Ar age: Katsura et al., 1994; Sakamoto and Kim, 1999). Sato et al. (2002) reported their higher Sr and lower Nd isotopic ratios than the Shikoku Basin tholeiites, suggesting significant contributions of enriched magma source to the Kinan Seamount Chain basalts.

Komahashi-daisan seamount is approximately 11.3 Ma (K-Ar age: Katsura et al., 1994). Volcanic rocks from Mikawa and Komahashi-daisan seamounts exhibited calc-alkaline compositional trends with higher Rb/Zr, Rb/Nb, and Nb/Zr ratios than those at present volcanic front. The petrological and geochemical characteristics of volcanic rocks from Mikawa and Komahashi-daisan seamounts are similar to those from an echelon seamount chain on the Nishi-Shichito Ridge (Hochstaedter et al., 2001; Machida and Ishii, submitted), suggesting that volcanic activity was extended around these seamounts at approximately 11 Ma.