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ベーリング海、Bowers Ridge の起源と漸新世島弧火成作用：IODP exp. 323, Hole U1342 から得られた結果
Origin of Bowers Ridge and its Oligocene arc magmatism: Results from the IODP Expedition 323, Hole U1342

川畑 博[1*] ; 佐藤 佳子[2] ; 木村 純一[2] ; 常 青[2] ; 仙田 量子[2] ; 高橋 俊郎[3] ; 平原 由香[4] ; 宮崎 隆[2] ; Scholl David W.[5]
KAWABATA, Hiroshi[1*] ; SATO, Keiko[2] ; KIMURA, Jun-ichi[2] ; CHANG, Qing[2] ; SENDA, Ryoko[2] ; TAKAHASHI, Toshiro[3] ; HIRAHARA, Yuka[4] ; MIYAZAKI, Takashi[2] ; SCHOLL, David W.[5]

[1] 高知大学, [2] 海洋研究開発機構, [3] 新潟大学, [4] 愛知教育大, [5]U.S. Geological Survey,
[1]Faculty of Science, Kochi University, [2]Japan Agency for Marine-Earth Science and Technology (JAMSTEC), [3]Faculty of Science, Niigata University, [4]Aichi University of Education, [5]U.S. Geological Survey,

The Bowers Ridge is an 800 km-long arcuate aseismic ridge extending northward from the Central Aleutian Ridge. IODP Expedition 323 drilled a total of 41.54 m of igneous basement at site U1342 in the northwestern Bowers Ridge, where an 800 m-deep wave-eroded platform exist. The recovered basement, composed of andesitic lavas and basaltic to andesitic volcaniclastic rocks (Kawabata et al., 2011), provide an opportunity to explore temporal change in magma composition at Bowers Ridge just before the cessation of arc magmatism in the Oligocene.

The recovered volcanic samples yield 26-34 Ma ^{40}Ar-^{39}Ar ages (Sato et al., 2015) and have arc signature characterized by depletion of HFSE and enrichment of LILE on the multi-element diagrams normalized to NMORB. The trace element features, with the presence of anorthitic plagioclase phenocrysts (An93), confirm the arc-origin of the ridge that was deduced from dredge samples around Site U1342 (Cooper et al. 1987; Wanke et al., 2012). In arc magmatism, flux from subducted oceanic crust played an important role as suggested by high Ce/Pb and unradiogenic ^{206}Pb/^{204}Pb.

Temporal change of magma chemistry was examined from both the core and reported dredge samples. Lower units of core samples exhibit low to middle-K series, whereas both the upper units of core and dredge samples show middle to high-K series. In addition, the dredge samples are more enriched in LREE, Rb, and Ba, and show higher (LREE, MREE)/HREE ratios than the core samples. The dredge basalts and andesites fall within the adakite field on the discrimination diagrams of Sr/Y vs Y and La/Yb vs Yb (Wanke et al., 2012), whereas all the core samples are non-adakitic basalts and andesites. These geochemical results suggest that the difference in magma compositions between the core and dredge samples could mainly reflect the difference in the amount of slab-derived flux and/or the flux compositions. In this context, the inferred slab melting event (Wanke et al., 2012) may not be a unique scenario for producing the adakitic dredge basalts and andesites. Larger amount of slab-derived flux and higher melting pressure can also explain the change in magma compositions from the non-adakitic core samples to the adakitic dredge samples. Thus, more careful examination is required to determine whether or not the already inferred extraordinary high geothermal gradient is essential for the Oligocene magmatism at the Bowers Ridge.

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