

Bulk-rock and mineral major element chemistries of the Pacific crust subducting into the Izu-Bonin Trench

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Oceanic crust samples were successfully taken from several dredge stations at the edge of the Mesozoic Pacific Plate subducting along the Izu-Bonin Trench during the RR1412 cruise aboard R/V Roger Revelle in 2014. The main objective of the cruise was to test the hypothesis that the altered oceanic crust (AOC) is a major source for the volcanic rocks erupting along the Izu-Bonin arc. The compositions of volcanic rocks that have formed in the Izu-Bonin arc since about 42 Myr ago are distinctly different from those that formed earlier and this may have been due to compositional change in the subducting AOC along the trench [1]. The samples were collected through dredging of the active, vertical fault scarps along the subducting plate from 27.5 N to 34.5 N, roughly between the Ogasawara Plateau in the south and Honshu Island in the north. The samples were taken along a nearly 700 km trench transect and, thus, are useful for determining any latitudinal compositional variation of the AOC. The major element chemistry of the whole rock basaltic samples varies from tholeiitic to alkaline, with high K₂O (up to 4.2 wt%) and TiO₂ (up to 2.96 wt%) contents. Significantly, the alkaline basalts are mainly from the northernmost part of the area near the T-T-T triple junction in the mid-Cretaceous Quiet Zone of the Pacific Plate, where a propagating ridge was discovered [2].

[1] Straub *et al.* (2009) *Nat Geo* **2**, 286-289. [2] Nakanishi (2011) *Modern Approach. Solid Earth Science* **8**, doi:10.1007/978-90-481-8885-7_1.