Evolution of Rear Arc Magmas following backarc basin formation behind the Izu arc: Site U1437, IODP Exp. 350

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IODP Site U1437 is located in the Izu rear-arc region, at 31.790 N, 139.026 E. The recovered core consists of seven lithologic units. The oldest four (Units IV through Unit VII) that include volcaniclastics and hyaloclastites with coarse lava clasts as well as tuff and lapilli-tuff, and have ages of about 6–15 Ma [1, 2] is focused to investigate the evolution of that mantle soon after Shikoku back arc basin opened between 24-15 Ma. Recent geochemical studies clarified that the previous stage of N-Izu rear arc volcanism was not consistently same to current form [3, 4, 5]. To test and constrain these hypotheses in detail, we investigated the early N-Izu rear-arc magmatism using our new Sr-Nd-Hf-Pb isotope data and the Arc Basalt Simulator v. 4 (ABS4) coded by [6]. Like to the classification of [5], three types of volcaniclastic sediments characterized the Izu reararc at Site 1437 from 15 to 6 Ma, based on our new Sr-Pb-Nd-Hf isotope and trace element ratios. They are RASC (Rear Arc Seamount Chains), Rift, and VF (Volcanic Front)-types. Rift-type sediments dominate from 15 to 9 Ma, and RASC-type from 9 to 6 Ma. Both are from proximal sources. VF-derived sediments are less common and randomly distributed. The models of ABS4 for mafic Unit VII samples show the magma genesis that are similar to those for basalts in the modern rift environment indicating the addition of ~1% of a melt-rich slab component generated at ~125 km to a Philippine Sea Plate ambient mantle that was more depleted than DMM. The magma source and tectonic implications of this evolution will be discussed.
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