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Supra subduction zone chemistry of intrusions into a Miocene accretionary prism, southwest Japan

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We analyzed exceptionally fresh glass from the chilled margin of a basaltic dike of Miocene Muroto gabbroic suite, within the youngest part of the Shimanto accretionary prism, Japan. The REE pattern closely resembles to the standard sample JA-1, Hakone volcano calc-alkaline andesite, and clearly differs from MORB. The-MORB-normative pattern of incompatible elements also resembles calc-alkaline andesite, except for some mobile elements. These geochemical results show that Muroto gabbroic suite that intrudes the accretionary prism has a petrogenesis similar to the Izu-Bonin immature arc. Paleogeography indicates, however, that the Muroto gabbroic suite is not related an accreted equivalent of the Izu-Bonin arc. We propose that the near-trench intrusions formed as a result of subduction of the North New Guinea-Pacific Ridge. We propose that spreading ridge failed to subduct as a result of buoyancy and a new subduction zone initiated seaward so that fluids from the subducting slab infiltrated the hot mantle beneath the stalled spreading center, resulting in supra-subduction zone magmatism that locally intruded the accretionary prism.

Keywords: Muroto gabbroic suite, basaltic dike, fresh glass, Hakone JA-1 standard sample, calc-alkaline, Izu-Bonin arc