

Origin of Cretaceous high Magnesian andesites from southeast Kalimantan

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Abstrak

High magnesian andesites are found in the Cretaceous Haruyan volcanics in Southeast Kalimantan. The rocks have Mg# 67 ? 69, but low concentrations of Ni (44 ? 60 ppm), Cr (37 ? 411 ppm) and, except two samples of 95UH23C and 96UH23, ratios of Sr/ Y are also low. Geochemical and tectonic studies show that the high magnesian andesites were originated from a subduction zone-type magma similar to that of the most ?normal? Haruyan volcanics. . Two possible origins of the Cretaceous high magnesian andesites are proposed. First, melting of the mantle wedge above the slab to produce a basaltic magma followed by crystal fractionation, especially olivine and pyroxene, during magma ascent to the surface resulted in a derivative magma with low Ni and Cr concentrations. A collision between the pre-Mesozoic Paternoster platform (microcontinent ?) and the Sundaland continent in the Upper Cretaceous-Lower Miocene might cause the magma ascent to pool immediately in the lower crust-upper mantle boundary. The impending magma then reacts with hot mantle peridotite to produce the high magnesian andesites. Secondly, the high magnesian andesite may resulted from a reaction between silicic magma and hot mantle peridotite. The collision may also cause lower crust melting resulted in granitic magma (? The Hajawa Granite), which then reacts with hot mantle peridotite to produce the adakitetype high magnesian magma, such as samples 95UH23C and 96UH23.