

Tholeiitic Basalt in Banyumas Basin (Kebasen, Central Java): The Evidence of Sedimentary Recycling Input and the Contribution of Oceanic Slab on Fore-arc Active Continental Margin (ACM) Magmatism

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Abstract	DOI:10.17014/ijog.8.2.233-253 The study of tholeiitic basalt is a general-classic study from geotectonic MORB, ocean island (OIB), continental rift, volcanic-arcs {IAB or Active Continental Margin (ACM)}. However, the geotectonic study of the tholeiitic volcanic-arcs is still unclear at the moment. In general, the arc tholeiitic is directly pointed to an island-arc volcanic, and the result of google search engine defines no existence of tholeiitic geochemistry which is formed from continental-arc volcanic (ACM). The problem lies in the model of discrimination diagram which is not able to discriminate ACM from the island arc volcanic. The spider diagram shows relatively similar of patterns as well as in the use of the isotope $^{143}\text{Nd}/^{144}\text{Nd}$ versus $^{87}\text{Sr}/^{86}\text{Sr}$. Tholeiitic Kebasen pillow lava exhibits a slightly hydrothermal alteration (propylitic alteration) which consists of plagioclase (labradorite-bytownite), olivine, pyroxene (diopside), hornblende, volcanic glass and other secondary minerals (such as iddingsite, zeolite, carbonate, sericite and opaque minerals). The results of the interpretation using the overlay diagram of Mg# and $\text{FeO}(t)/\text{MgO}$, diagram Nb/La vs. La/Yb, the overlaid diagram between the diagram of Zr/Y vs. Zr, newly developed diagram for sedimentary recycling (Th/Ce vs. SiO_2) reveal the Kebasen lava is a differentiated tholeiitic rock with relatively low of Mg# ($\text{Mg}\# < 55$) which is generated from geotectonic forearc ACM (Active Continental Margin) and involves the sedimentary recycling ($\text{Th}/\text{Ce} > 0.1$); furthermore, the trace element constituent is interpreted based upon the melting of oceanic slab ($\text{Zr}/\text{Y} \sim 3$). The magmatism of Kebasen lava is potentially formed at temperature of ~ 1240 oC and a pressure of ~ 1.7 GPa at the depth of ~ 56 Km.
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