Petrography of basalt between Lat 4º.06' – 3º.50' N from Carlsberg Ridge, Indian Ocean

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Pillow Basalt with Glass rims collected from ocean bottom is pristine sampling material to understand the mineralogical and geochemical characteristics of magma composition and its implication to Mid Oceanic Ridge (MOR) petrogentic processes. Lithologies vary from pillow and vesicular basalts with glass rims thickness of ~3 to 5 mm. Alteration reduces the thickness of glass rims and leads to brown alteration product (Palagonite). The samples show a wide range of textures from aphyric to highly porphyritic basalts. The main phenocrysts mineral phases are plagioclase, olivine and clinopyroxene. Plagioclase is euhedral-subhedral and the most abundant mineral phase followed by olivine with trapped spinel with ± clinopyroxene. Glomerophyric and hetrocumulate textures with olivine and plagioclase coexist as clusters with occasional melt inclusions. The matrix is glassy to microlithic, consisting of thin plagioclase needles forming intersertal textures.

Secular evolution of Cretaceous-Cenozoic lithosphere mantle beneath the Cathaysia block: Geochemical evidence for temporal variations in basaltic magmatism

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Introduction

Recent study indicates that ancient lithosphere mantle, has been removed and replaced by thinner material during Late Mesozoic to Cenozoic time. Nevertheless, the timing and mechanisms for this event still remain to be poorly understood, largely owing to the lack of knowledge about nature of mantle source during the Mesozoic-Cenozoic time in this region.

Discussion and conclusion

Cretaceous basaltic rocks show enriched geochemical and isotopic compositions, whereas a number of late Cenozoic basalts which crop out in the Cathaysia block display geochemical characteristics with OIB. Paleocene basaltic rocks exhibit transitional features between Cretaceous and late Cenozoic basaltic magmatism in geochemical and isotopic compositions. The temporal shift from a lithospheric to asthenospheric magma source took place during the Paleocene which was probably related to lithospheric thinning/ replacement in this region, which was probably related to lithosphere extension and asthenospheric upwelling, resulting from the retreating and steepening of the Pacific plate due to injection of asthenospheric material into the mantle wedge beneath the Cathaysian block.

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