



Ages and geochemistry of Cretaceous mafic dikes in Southeastern China: implications for paleo-Pacific subduction evolution during Cretaceous

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The spatial and temporal distribution of two Cretaceous mafic dike populations in SE China provides an opportunity to study the mantle evolution related to the paleo-Pacific subduction. They include early Cretaceous (143-131 Ma) mafic dikes in the interior SE China (Jiangxi and north Guangdong), and late Cretaceous (98-79 Ma) mafic dikes in the coastal area of Fujian and Hong Kong. All these rocks exhibit some arc-like geochemical signatures, such as large ion lithophile element (LILE; Rb, Ba) enrichment and high field strength element (HFSE; Nb, Ta, Ti) depletion. However, the former have higher concentrations in TiO_2 , Nb, Ta and lower La/Nb ratio. Sr and Nd isotope data indicate that they may involve two end-members, one with lithosphere-modified OIB-like asthenosphere composition and the other with subduction-modified lithosphere composition. These results suggest that asthenospheric mantle probably play a role for the formation of early Cretaceous mafic dikes. Conversely, the latter exhibits typical mantle compositions of an arc system.

Abundances of Jurassic basalts in the interior SE China with typical asthenosphere signatures suggest that they might be the products in response to the delamination of partially over-thickened lithosphere under a rifting environment. Appearance of early Cretaceous mafic dikes, tinged with OIB-like in addition to the arc-like signatures in the interior SE China, may be an indication that paleo-Pacific subduction started or resumed at the beginning of the early Cretaceous. On the other hand, the coastal SE China was characterized by the formation of a NE-trending A-type granite and rhyolite belt near the end of the late Cretaceous, a sign for the epilog of the paleo-Pacific movement. Therefore, widespread of the late Cretaceous mafic dikes would be a reflection of a well-modified mantle by the paleo-Pacific before the cessation of the subduction system in the coastal SE China.

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