

Recycling of Paleo-Pacific oceanic crust and genesis of intraplate basalts in eastern Asian continent

YI-GANG XU¹

¹ State Key Laboratory of Isotope Geochemistry, Guangzhou Institute of Geochemistry, Chinese Academy of Sciences, Guangzhou, 510640, China

Ubiquitous oceanic crustal components are present in Cenozoic intra-continental basalts in eastern Asia. The main arguments in support of this include: (a) strong similarity of their trace element patterns and Fe/Mn ratios with respect to oceanic island basalts; (b) coupled high Fe₂O₃ and water contents and low ⁸⁷Sr/⁸⁶Sr ratio; (c) high δ¹⁸O less than mantle values recorded in olivine and cpx phenocrysts; (d) pyroxenite-dominated source as constrained by olivine chemistry and melt inclusions. These recycled oceanic components are likely from the mantle transition zone given the following considerations: (a) Geophysical studies show a stagnant Pacific slab within the mantle transition zone underneath the studied region. Such a sandwich structure prevailed at least since late Cretaceous thus ruling out the possibility that oceanic crustal components from the CMB; (b) Pb isotopes suggest a young age of recycled components. (c) The same Indian MORB-like isotopic composition is found in Cenozoic basalts and in the extinct Izanaghi–Pacific plate of NW Pacific. We thus speculate that not all recycled oceanic components are carried to the surface by mantle plumes, but can be transported to the shallow level by other processes from the mantle transition zone.