Recycled oceanic crust from the core-mantle boundary has been widely accepted as important components in the sources of many hot spot-associated basalts. However, other than the core-mantle boundary, the mantle transition zone may be the other ‘graveyard’ for subducted crust, because the subducted slabs are usually stagnant there. To date, whether and how such recycled crust of stagnant slab contributes to the genesis of intraplate basalts is still poorly understood. In eastern China, the subducted Pacific slab is stagnant as a high-velocity anomaly in the mantle transition zone, and Cenozoic alkaline basalts are widely distributed as typical intraplate basalts in continental background, which provide a chance to explore this question. Here we found that alkaline basalts from Shandong, a province just above the eastern front of the stagnant Pacific slab in central eastern China, can be mainly produced by mixing of two endmember components. The two components are represented by two kinds of alkaline basalts which have similar (and moderately depleted) isotopic compositions but complementary (sub-mantle and super-mantle) incompatible element ratios of K/U, Ba/Th, and Ti/Gd. These complementary geochemical signatures are accordant with those of carbonatitic melts and solid residue from recycled young oceanic crust, respectively. This observation supports that recycled crust from the stagnant slab has experienced recent low-degree melting in deep upper mantle, possibly in an adiabatic process induced by a kind of edge flow at the eastern front of the stagnant slab, and feed the shallow sources of alkaline basalts with two kinds of components, carbonatitic liquids and eclogitic residues, respectively.

Key words: Recycled oceanic crust, deep melting, carbonatitic liquids, Cenozoic basalts, eastern China