

## **Two types of the crust-mantle interaction in continental subduction zones**

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Plate subduction is an important mechanism for exchanging the mass and energy between the mantle and the crust, and igneous rocks above subduction zones are an important carrier to investigate the recycling of crustal materials and the crust-mantle interaction. This study presents a synthesis of geochronological and geochemical data for postcollisional mafic igneous rocks from the Hong'an-Dabie-Sulu orogens and the southeastern edge of the North China Block, eastern China. The available results indicate two types of the crust-mantle interaction in the continental subduction zone, which are represented by two types of mafic igneous rocks with distinct geochemical compositions. The first type of mafic igneous rocks exhibit arc-like trace element distribution patterns (i.e. enrichment of LILE, LREE and Pb, but depletion of HFSE) and enriched radiogenic Sr-Nd isotope compositions, whereas the second type of mafic rocks show OIB-like trace element distribution patterns (i.e. enrichment of LILE and LREE, but no depletion of HFSE) and depleted radiogenic Sr-Nd isotope compositions. Both of them have variable zircon O isotope compositions, different from those of the normal mantle zircon, and contain residual crustal zircons. These geochemical features indicate that the two types of mafic igneous rocks were originated from the different natures of mantle sources. The mantle source for the second type of rocks would be generated by reaction of the depleted MORB mantle with felsic melts originated from previously subducted oceanic crust, whereas the mantle source for the first type of rocks would be generated by reaction of the cratonic mantle of the North China Block with felsic melts from subsequently subducted continental crust of the South China Block. It is these crust-derived melts that transfer these different geochemical signatures to the mantle sources of postcollisional mafic igneous rocks, and the crust-mantle interaction in subduction channels is realized by the different types of source mixing. Therefore, there exist two types of the crust-mantle interaction in the continental subduction zone, and the postcollisional mafic igneous rocks provide petrological and geochemical records of the slab-mantle interactions in continental collision orogens.