

Geochemistry and geochronology of migmatites in Cretaceous in the North Dabie Complex Zone, China

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The North Dabie Complex Zone (NDZ), central China is a high-T ultrahigh-pressure metamorphic terrane [1-4]. It underwent a complex process involved in multistage metamorphism [1,4,5] and partial melting in Mesozoic, including decompression melting in the early stage of exhumation and heating melting during post-collision delamination. The widely distributed migmatites in the NDZ is primarily a result of partial melting in the early Cretaceous.

Metatexite, especially layered migmatites are widespread over the NDZ. Element geochemistry of the leucosomes here with the petrography of migmatites shows that leucosomes can at least be subdivided into three groups. These leucosomes have different $(La/Yb)_N$ ratios, Sr/Y ratios and Eu anomaly, indicating that they were ascribed to different protoliths, partial melting paths and crystallization stages. Nevertheless, All of the three groups have a similar Sr-Nd-Pb isotope character to middle-lower crust, consistent with the result of geothermobarometer calculations which shows the rocks formed at depths of more than 20 km. On the other hand, zircons from the Cretaceous leucosomes in the NDZ generally display two separate domains with sharp boundary in CL images. Zircon SHRIMP U-Pb dating also shows two peaks, including partial melting at 129 ± 1 Ma and thermal metamorphism at 127 ± 2 Ma, respectively.

Therefore, the migmatites in the NDZ is a result of partial melting of middle-lower crust rocks in early Cretaceous. The different leucosomes were resulted from various processes and/or protoliths. Zircons from the leucosomes in the NDZ record the complicated history of partial melting and subsequent thermal metamorphism during post-collision delamination.

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