

## **New petrogeochemical and geochronological constraints on multiple anatexis and mountain-root collapse in the Dabie orogen**

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The North Dabie complex zone (NDZ), China underwent long-lived high-T evolutionary processes coupled with slow cooling and anatexis in Mesozoic [1,2]. Multistage granulite facies overprinting during continental collision and mountain-root collapse in Cretaceous induced various degrees of anatexis and migmatization, resulted in metadiorites and widely distributed migmatites in the NDZ.

Four types of leucosomes have been recognized in the NDZ migmatites. Similar Sr-Nd-Pb isotopic characters of different leucosomes suggesting a common protolith. Peritectic garnets enclosed in plagioclase-quartz assemblage in leucosomes and high Rb/Sr ratios indicating genesis of fluid-absent decompression melting at  $209 \pm 2$  Ma. However, peritectic amphiboles in Amp-rich leucosomes with low Rb/Sr ratios and melting temperatures revealing H<sub>2</sub>O-present conditions. Consistent zircon U-Pb ages and gradual changes in mineral assemblages and chemical constituents from Amp-rich, Amp-poor to Kfs-rich leucosomes indicating these leucosomes were related to fluid-flux heating anatexis during the Cretaceous Mountain-root collapse. On the other hand, metadiorites with K-feldspar augens display low initial <sup>87</sup>Sr/<sup>86</sup>Sr ratios and  $\epsilon_{Nd}(t)$  values, suggesting a crustal-derived source. Besides, metadiorites share consistent Pb isotopic compositions with eclogites in the region, indicating genesis with the NDZ mafic lower crustal rocks.

Therefore, biotites dehydration under high-T induced fluid-absent anatexis and produced the Grt-bearing leucosomes during the initial stage of exhumation. Post-orogenic mountain-root collapse and asthenosphere upwelling in the early Cretaceous resulted in large-scale fluid-flux partial melting and migmatization associated with formation of other leucosomes and metadiorites.

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[1] Liu *et al.* (2007) *JMG* **25**, 975-989. [2] Liu *et al.* (2015) *Gondwana Res* **27**, 410-423.