

## **Growth of multiple garnets in metagranite from the Dabie UHP metamorphic belt, central China**

ZHANG CHENGWEI LIU YICAN

CAS Key Laboratory of Crust-Mantle Materials and Environments, School of Earth and Space Sciences, University of Science and Technology of China, Hefei 230026, China (\*correspondence: zhcw@mail.ustc.edu.cn)

The Dabie orogen is a Triassic continental collision zone between the South China Block and North China Block[1,2]. It comprises five fault-bounded lithotectonic units with various metamorphic grades and evolutionary histories. Among of them, the central Dabie UHP metamorphic zone contains vast majority of granitic orthogneiss and metagranite with subordinate eclogite, meta-peridotite, amphibolite, marble and paragneiss[1-5]. However, peak P-T conditions and detailed evolutionary process of the metagranite here remains in dispute. So, we performed an integrated mineral chemistry and petrographic study on the metagranite.

The obtained results suggest that six generations of garnet (Grt) have been recognized from metagranites: (1) magmatic Grts, <300 $\mu$ m, ragged to euhedral, rich in almandine (Alm) and spessartine (Sps) with weakly Sps U-shaped compositional zoning; (2) peak eclogitic Grts, grossluar (Grs) content up to 57mol%; (3) retrograded Grts with rutile inclusion, Grs amount up to 31-48 mol%; (4) peritectic Grt1, the content of Grs up to 21-30 mol%, paragenesis with k-feldspar, albite, quartz, biotite; (5) peritectic Grt2, <50 $\mu$ m, coexisted with muscovite, biotite, k-feldspar, albite and quartz veinlet, poor in Grs and rich in Sps relative to peritectic Grt1; (6) rare metasomatic Grts, ~10 $\mu$ m, coexisted with chlorite and titanite, andradite concentration up to 75-86 mol%, suggestive of greenschist facies. Peritectic Grt1 and Grt2 provide for the first time robust petrographic evidences that the Dabie UHP belt underwent two episodes of anatexis during exhumation. Growth of multiple metamorphic and peritectic garnets at the boundary and absence of metamorphic zircon and garnet at the core of metagranite lense highlight the fluid-induced metamorphism and anatexis.

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