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# Zircon ages and Hf isotopic composition of gneisses from the Sulu UHP terrain, China

XIANGHUI LI [1, 2], FUKUN CHEN [1, 2], CHAOFENG LI [1, 2]

[1] State Key Laboratory of Lithospheric Evolution, Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing, 100029, China (lixianghuiboy@163.com)

[2] Laboratory for Radiogenic Isotope Geochemistry, Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing, 100029, China

Identification of coesite and micro-diamond inclusions in eclogites of the Dabie-Sulu terranes in east-central China [1-2] demonstrates that supracrustal material was subducted to mantle depth of >120 km and underwent UHP metamorphism. Time of this collision was constrained at ca. 230-220 Ma by radiometric studies [3-4]. UHP eclogites occur as lenses in dominant gneisses of different types.

This study presents zircon U-Pb ages and Hf isotopic composition of gneisses in the Sulu UHP terrain for origin and provenance of the protoliths. Zircon grains from three samples of gneiss yield SHRIMP U-Pb ages of 710- 770 Ma, consistent with protolith ages of eclogites and orthogneisses in other regions of the Dabie–Sulu orogen, interpreted as formation time of magmatic protoliths of the gneisses, which were contemporaneous with the magmatism during the breakup of the suppercontinent Rodinia. Initial $\varepsilon_{Hf}$ values (at 750 Ma) and Hf modal ages of zircon grains from the fourteen gneiss samples are variable. Zircon grains from two gneiss samples commonly give very low initial $\varepsilon_{Hf}$ values (average -16.4) and a mean Hf modal age of about 2.70 Ga. Seven gneiss samples contain zircon grains that yield a mean initial $\varepsilon_{Hf}$ value of -7.7 and Hf modal age of 2.15 Ga. These results suggest that part of protoliths were formed in Neoproterozoic by remelting Archean to Paleoproterozoic crustal material and further indicate existence of Archean crustal section probably of the Yangtze affinity beneath the Sulu UHP terrain. Other six gneiss samples mostly contain young zircon grains, having mean initial $\varepsilon_{Hf}$ values of -0.56 to 6.6. Part of them give Hf modal ages of 0.81 to 0.94 Ga. This suggests magmatic activity of mantle origin, new crustal formation and coeval crust-mantle interaction probably during breakup of suppercontinent Rodinia in Neoproterozoic. Underplating of magmas of mantle origin caused remelting of the overlying Archean - Paleoproterozoic crustal section to form granitic magma along rift zones or marginal regimes of the Yangtze block.

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