Neoproterozoic Trench-arc System in the Western Segment of Jiangnan Orogenic Belt, South China

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Abstract: The Jiangnan orogenic belt is a key to understanding of the Neoproterozoic tectonic evolution of the South China Block. We investigate the mafic-ultramafic suites of lherzolite, pyroxenite, gabbro, pillow basalt and gabbroic diorite as well as red jasper interbedded with marine marbles that are mainly exposed as fault-trapped blocks in the Yuanbaoshan and Longsheng domains of the western Jiangnan belt. The post-collisional granite plutons that intruded the ultramafic-mafic rocks are developed well. Zircons in the gabbro yield crystallization ages of 867±10 Ma, 863±8 Ma, 869±9 Ma and 855±5 Ma whereas those from the granites show ages of 823±5 Ma, 831±5 Ma, 824±5 Ma and 833±6 Ma. The Neoproterozoic serpentinited ultramafic samples display minor REE enriched pattern with depletion of Rb, Ba, Nb, Ta and Ti, similar to those of SSZ type ophiolite. The coeval gabbro shows tholeiitic features and is characterized by negative Ba, Nb, Ta, Zr, Hf and Sr anomalies and LREE enriched patterns, with a minor negative Eu anomaly. Some zircon grains from the Longshen gabbro yield Neoarchean-Paleoproterozoic ages (2859–2262 Ma), suggesting its continental arc setting. The pyroxene-bearing diorite exhibits a distinctive arc affinity. The zircons from the gabbro show positive εHf(t) values ranging from 3.9 to 13.8. The granitoids are typical S-type granites with high ACNK values (1.15–1.40) and negative εHf(t) values (−15.1 to −3.2), and are classified as collision-related granites. Combined with the occurrences of mafic-ultramafic rocks, siliceous marble and red jasper mixed with basalt, our new results suggest the presence of a Tonian (863–869 Ma) SSZ ophiolite system and continental arc-type magmatism in the western Jiangnan orogen.

Key words: ophiolitic mélangé, trench-arc system, Neoproterozoic, Western Jiangnan Belt, South China

References

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