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Petrogenesis of Triassic granite from the Jintan pluton in Central Jiangxi Province, South China: implication for uranium enrichment

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Abstract

Numerous Triassic biotite granites and two-mica granites crop out in the interior of South China, and some of them possess high U contents, which have been regarded as the sources for later hydrothermal mineralization. Their petrogenesis is therefore crucial for constraining the possible origins of the U enrichment. Here we report new LA-ICPMS zircon U-Pb ages, mineral geochemistry of biotite and muscovite, whole rock geochemical results and Sr-Nd and zircon Hf isotope data from the Jintan pluton in Central Jiangxi Province, South China. LA-ICPMS zircon U-Pb dating indicates that both biotite granite (BG) and two-mica granite (TMG) in the Jintan pluton crystallized at ~220Ma. The TMG have higher U contents (7.85 to 48.90 ppm, average 18.44 ppm) than the BG (4.99 to 17.72 ppm, average 8.64 ppm). Both BG and TMG show negative whole-rock $\epsilon_{Nd}(t)$ and zircon $\epsilon_{Hf}(t)$ values and contain some inherited zircons. The TMG are strongly peraluminous ($A/CNK=1.13-1.33$), contain abundant primary muscovite, and display S-type affinity on plots of Y vs Rb and Th vs Rb, suggesting that they are S-type granites. The BG also display S-type granite affinities on plots of Y vs Rb and Th vs Rb. The suites display

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