

Geochemistry, Sr-Nd-Pb isotopic compositions and zircon U-Pb geochronology of Neoproterozoic mafic dyke in the Douling Complex, South Qinling belt, China

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Mafic dyke swarm is widely developed in Proterozoic continental lithosphere. The Gangou diabase dyke from the Xixia area, intruded into the Douling complex of the South Qinling belt, yields zircon U-Pb age of 731 Ma. It has low SiO₂ content (49.02 %-49.37 %) and Mg# (34.0-37.7) and shows characteristics of subalkaline tholeiite series. They show high Σ REE (155.5×10^{-6} - 184.7×10^{-6}), weak negative Eu anomaly (δ Eu=0.88-0.93), slight depletion of Nb and Ta, and enrichment of LILE. Their major and trace element, Sr-Nd-Pb isotope and clinopyroxene compositions indicate that it originated from the partial melting of the asthenospheric mantle within-plate extension setting and was slightly contaminated by crust compositions. The similarities of formation age, petrogenesis, source characteristic and tectonic setting for Gangou diabase with mafic dykes in Wudang block and mafic volcanic rocks in Yaolinghe group indicate that the South Qinling belt underwent strong continental extension in Neoproterozoic during 796-685 Ma most likely correspondence to the breaking-up of the Rodinia supercontinent.