

Petrogenesis of middle Proterozoic A-type granites in southern North China

ZHIYI WANG, DR. JUN HE, JINGXIN ZHAO AND FUKUN CHEN

School of Earth and Space Sciences, University of Science and Technology of China

Presenting Author: zywang97@mail.ustc.edu.cn

Proterozoic A-type granites (~1.8-1.5 Ga) along the southern margin of North China are of significance for understanding its tectonic evolution and reconstruction of Columbia supercontinent. They were interpreted as magmatic products during the tectonic transition from post-collision to anorogeny in North China, related to formation and breakup of Columbia. Here we report zircon ages and geochemical data of the Maping A-type granite pluton and discuss origin and tectonic setting. This pluton consists of quartz monzonite porphyry and granite porphyry. The dating results point to two magmatic stages in ~1.65 Ga and ~1.6 Ga. Both have similar features of high contents in alkaline and HFSEs, high Ga/Al and Fe/Mg ratios, high magma temperatures, and old inherited zircons. Granites are of peraluminous and have low whole-rock initial ϵ_{Nd} and zircon ϵ_{Hf} values (-6.4 to -5.9; -9.6 to -3.3), while monzonites are of metaluminous and have relatively high initial ϵ_{Nd} and ϵ_{Hf} values (-5.4 to -4.5; -8.5 to -1.5). The isotopic data indicate complex magma sources contributed by ancient and juvenile crustal rocks beneath North China with variable ratios. The juvenile crustal rocks should be underplated in the lower crust prior to ~1.65 Ga. From the early to late magmatic stages, Sr/Y ratios of granites decrease from 1.6-7.6 to 0.2-0.4 with increasing of magma temperatures from ~900 °C to ~930 °C, indicating that upwelling of the asthenosphere became intense in the extension.