

Petrogenesis and tectonic implications of
Neoproterozoic metavolcanic rocks in the
Dengfeng complex, southern margin of the
North China Craton

JUAN ZHANG^{1*}, HONG-FU ZHANG^{1*}

¹ Department of Geology, Northwest University,
Xi'an 710069, China (*correspondence:
zjuan@nwu.edu.cn, hfzhang@mail.igcas.ac.cn)

The tectonic setting of the Neoproterozoic rocks in the North China Craton (NCC) is still controversial. In this study, we examine the geochemical and zircon U-Pb-Hf-O isotopic signatures of the Neoproterozoic metavolcanic rocks (amphibolite, leptynite and leptyte) from the Dengfeng Complex, southern margin of the NCC.

SIMS zircon U-Pb dating reveals that the protoliths of the amphibolites were emplaced from 2.83 Ga to 2.51 Ga, and underwent metamorphic event at 2.48 Ga, the felsic metavolcanic rocks erupted at 2.54-2.52 Ga. The amphibolites are characterized by high Mg#, and enrichments in LILEs. Their zircons show positive $\epsilon_{\text{Hf}}(t)$ and mostly high $\delta^{18}\text{O}$ values, indicating that they were derived from modified mantle wedge. The felsic metavolcanic rocks are characterized by low Mg#, enrichments in LILEs, depletions in HFSEs. Their zircons display positive $\epsilon_{\text{Hf}}(t)$ and mantle-like $\delta^{18}\text{O}$ values, suggesting that they were mainly derived from juvenile crustal components. Based on these new data, we proposed a new tectonic model for the Neoproterozoic tectonic evolution from subduction (as early as 2.83 Ga) to collision (2.48 Ga).