

# The closure of the Paleo-Tethys Ocean at Middle Triassic in the East Kunlun Orogenic Belt: evidence from the Permian to Triassic granitoids

CHONGWEN XU<sup>1</sup>, XU ZHAO<sup>1,2</sup>, WEI JUNHAO<sup>1</sup> AND HONGZHI ZHOU<sup>3</sup>

<sup>1</sup>School of Earth Resources, China University of Geosciences, Wuhan

<sup>2</sup>Guangzhou Institute of Geochemistry, Chinese Academy of Sciences, Guangzhou

<sup>3</sup>Electronic Information School, Wuhan University, Wuhan

Presenting Author: Chongwenx@163.com

The Permian to Triassic granitoids widely emplaced within the East Kunlun Orogenic Belt (EKOB) are the important objects to investigate the evolution of the Paleo-Tethys Ocean. This study investigates the Permian-Triassic granitoids from the Nagengkangqieer (NG) region, east segment of EKOB. The Late Permian granodiorite (ca. 252Ma) are high-K calc-alkaline and metaluminous with moderate SiO<sub>2</sub> (63.31%-65.43%), MgO (2.03%~2.60%) contents, relatively high Mg# (47-52, >45) and low Sr/Y ratio. They display enrichment in large ion lithophile elements (LILEs) and depletion in high field strength elements (HFSEs) with arc affinity and show negative  $\epsilon_{\text{Nd}}(t)$  values of -5.14 to -5.53 and  $\epsilon_{\text{Hf}}(t)$  values of -1.1 to -5.6. These geochemical signatures suggest that the Late Permian granodiorite originated from the partial melting of mafic lower crust with mantle materials addition in the source area. The Triassic porphyritic monzogranite (ca. 239Ma) and syenogranite (ca. 239Ma) are high-K calc-alkaline to shoshonitic and weak peraluminous with high SiO<sub>2</sub> contents (71.94%~76.54%) and low Mg# values (19-36). They enriched in light rare earth elements (LREEs) and LILEs, and depleted in HFSEs. Their element and isotope composition ( $\epsilon_{\text{Nd}}(t)=-7.87$  to  $-6.71$ ;  $\epsilon_{\text{Hf}}(t)=-1.2$  to  $-13.7$ ) indicate that the Triassic granitoids were derived from the partial melting of ancient crustal source. Comprehensive analysis of the spatio-temporal distribution of regional magmatism, metamorphism and sedimentary facies reveals that Late Permian granodiorite formed in a subduction setting, and Middle Triassic porphyritic monzogranite and syenogranite formed in a syn-collision setting. As a result, we contend that the closure of the Paleo-Tethys Ocean and the onset of collision between the EKOB and Songpan-Ganzi Complex occurred at the Middle Triassic (ca. 240Ma).