

## **Tectonic evolution of the Irtysh collision belt: New zircon U-Pb ages of deformed and collisional granitoids in the Kalaxiangar area, NW China**

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The CAOB is thought to have formed by multiple accretion and collision of various microcontinents, island arcs, oceanic plateaus and accretionary wedges due to the closure of the Paleo-Asia Ocean [1, 2, 3]. The Irtysh collision belt is located at the middle-western part of the CAOB and generally thought to be the result of the collision of the Sawuer Island arc and the Altay Terrane, subsequent to the consumption of the Early Paleozoic Junggar Ocean, a branch of Paleo-Asia Ocean. Therefore, the exact timing of the Irtysh collision belt is crucial for a better understanding of the tectonic evolution of this collision belt and will provide constraints on the evolution of the CAOB.

Recently, we discovered various collisional granitoids in the Kalaxiangar tectonic belt (KTB), which is located in the eastern part of the Irtysh collision belt. In this contribution, we report new geochemical whole-rock, zircon U-Pb and Hf isotopic data of the arc-related and collisional granitoids. Our new results reveal that 1) the arc-related granodioritic porphyries formed at ca. 374 Ma. Furthermore, recrystallized zircons from the granodioritic mylonite and ultramylonite of the Laoshankou ductile deformation zone have a similar U-Pb age of ca. 360 Ma; 2) the syn-collisional granodioritic porphyries, which distribute along cleavage, were emplaced at ca. 355 Ma; 3) the post-collisional A-type granodioritic porphyry, which cuts the NW-NNW trending schistosity at a low angle, has an age of ca. 323 Ma,  $\epsilon_{\text{Hf}}(t)$  values from + 7.5 to + 14.4, and young Hf model ages between 387 and 658 Ma; 4) the post-collisional A-type granite dykes, which are exposed along strike-slip faults, have ages between 282.5 and 279.2 Ma,  $\epsilon_{\text{Hf}}(t)$  values from + 4.8 to + 12.6, and Hf model ages between 436 and 729 Ma; 5) the A-type biotite granite dykes that intruded along conjugate tension joints have ages between 273.9 and 271.4 Ma,  $\epsilon_{\text{Hf}}(t)$  values from + 1.1 to + 12.8, and Hf model ages between 393 and 979 Ma. In conjunction with the published data, we suggest that the collision between the Sawuer Island arc and the Altay Terrane occurred in the Early Carboniferous (ca. 360-354 Ma), and that the subsequent post-collisional tectonic process continued to the Late Carboniferous (ca. 323 Ma). It is further suggested that the Irtysh collision belt underwent large-scale strike-slip deformation during the Middle Permian (283-279 Ma). The termination of the Irtysh collision belt orogeny is thought to have also occurred during the Middle Permian (274-271 Ma)

[1] Kröner, A., et al. Geological Society of America Memoirs 200 (2007): 181-209.

[2] Windley, Brian F., et al. Journal of the Geological Society 164.1 (2007): 31-47.

[3] Xiao, W. J., et al. American Journal of Science 309.3 (2009): 221-270.