

Deformed zone hosted gold deposits in the Chinese-Kazakhstan-Kyrgyzstan-Uzbekistan Tian Shan

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The Tian Shan represents the world's second largest gold ore cluster and hosts an array of world-class and large–superlarge gold deposits, constituting a giant cross-broad gold metallogenic belt that extending westward from Central Xinjiang in China, via southeastern Kazakhstan and Kyrgyzstan to Uzbekistan. What metallogenic settings had been responsible for the large-scale gold mineralization of the Tian Shan giant gold belt? What are the key factors that controlling the gold mineralization? What are the criteria for gold prospecting in the Tian Shan giant gold belt? All these are crucial geological and prospecting problems that highly concerned by the academy and mining industry. Based on an extensive and thorough literature review, along with comprehensive field investigations on geology and gold deposits of the Tian Shan orogen, this paper suggest that the large-scale gold mineralization of the Tian Shan had formed during terrane assembling deformation subsequent to the final closure of the Paleo-Asian Ocean in the Late Carboniferous–Early Permian, whereas minor gold mineralization had formed during intracontinental strike-slip deformation in the Middle–Late Permian (Fig. 1). The large brittle / ductile–brittle deformation zones, situated near the tectonic sutures of the northern and southern margins of the Middle Tian Shan, are the key controlling factors to the large-scale gold mineralization of the Tian Shan. Multi-stage overprinting mineralization is a significant feature for the Tian Shan deformed zone hosted gold deposits. The crustal initial enrichment, structural deformation activation and magmatic-hydrothermal overprinting are the main factors controlling the Tian Shan deformed zone hosted gold deposits. Fine-grained carbonaceous clastic rocks, ductile–brittle deformed zones and the late Hercynian granitic intrusions are the key prospecting criteria for deformed zone hosted gold deposits in the China-Kazakhstan-Kyrgyzstan-Uzbekistan Tian Shan.

This research was supported by the National Key R&D Program of China (2017YFC0601201) and National Science Foundation of China (41602076).

