



Multi-phase Rifting during Carboniferous to Early Permian in Junggar Basin: Constraints to Accretion of Central Asia Orogenic Belt

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The Junggar Basin locates in the central part of Paleo-Asian Ocean tectonic domain, and records the dynamic processes of the Central Asian Orogenic Belt from subduction-accretion-collision to later intra-continental deformations. Carboniferous to Permian is the key period from subduction to closure in the tectonic evolution of Paleo-Asian Ocean. Based on the borehole, outcrop, seismic and gravity and magnetic anomaly data, the paper made detailed analysis of the basin evolution during Carboniferous to Permian.

The Carboniferous to Early Permian saw three periods of rifting, the early Early Carboniferous, the early Late Carboniferous, and the early Early Permian respectively. Each rift stage is characterized by igneous rocks and zones of half grabens or grabens, and followed by the post-rift depression and the inversion and compression structures at the end of rifting cycle, which is indicated by a regional unconformity. The rifts show a distinct orientation mainly in NWW-SEE of NW-SE direction. The zones of rifts exhibit a wide-rift origin, which is developed under a retro-arc setting.

From the early Carboniferous to early Permian, the extension shrank southward. The rift zone migrated southward accordingly, which is due to the gradually accretion of the Carboniferous arc to the northern archipelagos. However, the three rifting periods and their later inversion indicate that the southward accretion underwent a complex process experiencing the cycle from extension to compression repeatedly.