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## THE LATE PALEOZOIC EVOLUTION OF THE CENTRAL INNER MONGOLIA, CHINA: A PERSPECTIVE FROM METAMORPHIC STUDY

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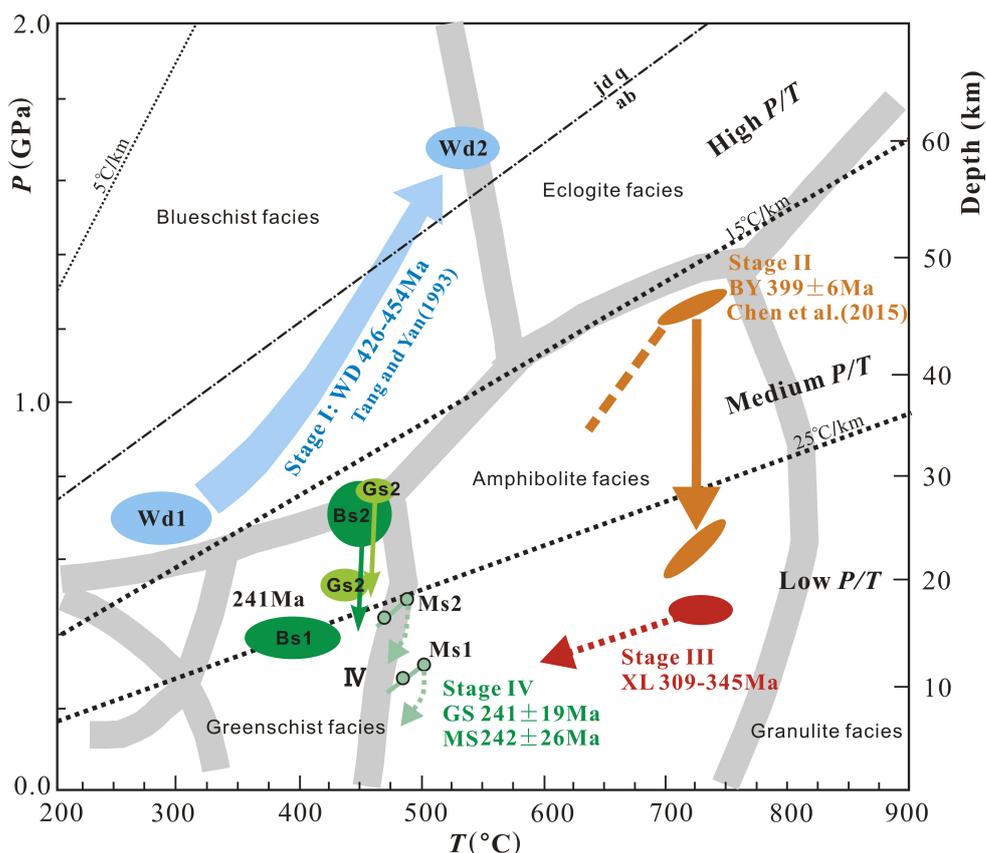
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The Xing'an-Inner Mongolia Orogenic Belt (XIMOB) exposed in the eastern section of the Central Asian Orogenic Belt (CAOB) is generally thought to have resulted from closure of the Paleo-Asian ocean [Sengör *et al.*, 1993]. However, the current hot debate is focused on whether the orogen formed through continuous subduction and accretion over a prolonged period of time until the closure of the Paleo-Asian ocean at the Early Triassic [Xiao *et al.*, 2003], or through the subduction of the Paleo-Asian ocean and related collision in the Early-Mid Devonian [Xu *et al.*, 2013], and the tectonic setting in the Late Paleozoic to Mesozoic has been a pivotal issue. In order to establish the tectonic framework and orogenic processes of XIMOB, systemic

researches of petrology, geochemistry, phase equilibria and zircon geochronology were carried on the metamorphic rocks in the central Inner Mongolia, such as the Xilingol complex and the low-grade metamorphism in the Carboniferous to Permian sequences along the Solonker suture zone [Dong *et al.*, 1986]. The results suggest that the Xilingol complex is characterized by clockwise  $P$ - $T$  evolution with  $T_{\max}$  condition of 770–790 °C for a pressure of 5–6 kbar, being in typical high-temperature and low-pressure (HT-LP) type; and the low-grade metamorphism along the Solonker suture zone is characterized by clockwise  $P$ - $T$  paths with the peak  $P$ - $T$  conditions of metabasite and mica-schist being intermediate and low  $P$ / $T$  series respectively.



The four periods of metamorphism identified in the central Inner Mongolia.

Based on the previous study, four periods of metamorphism can be identified in the central Inner Mongolia since the Paleozoic (Figure): the first period is the high P/T metamorphism occurred in the Late Silurian (426 Ma), represented by the Early Paleozoic Ondor Sum Group which is attributed to the subduction of the Paleo-Asian ocean [De et al., 2006]; the second period is the medium P/T metamorphism in the early Devonian (400 Ma), represented by the Baoyintu Group in the western Inner Mongolia, which is related to the orogenic progress as a result of collision, following the closure of the Paleo-Asian ocean [Chen et al., 2015]; the third period is the low P/T metamorphism in the Middle-Late Carboniferous (309–345 Ma), represented by Xilin Gol complex, which is probably related to the re-

gional extension after collision process; the fourth period is the low-medium P/T metamorphism in the Early Triassic (240 Ma), represented by the regional greenschist to epidote-amphibolite facies metamorphism in the central Inner Mongolia, which is attributed to the thickening process due to the closure of limited ocean basins. It is suggested that the Solonker suture zone may not represent a typical suture after closure of the Paleo-Asian ocean but a tectonic belt that records the closure of the limited basins in the early Mesozoic. The closure of the Paleo-Asian ocean in the central Inner Mongolia should have occurred much earlier in the Devonian. The metamorphism evolution should record the multiple orogenic process of subduction-collision-breakup-closure in the central Inner Mongolia.

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