Middle Paleozoic convergent orogenic belts in western Inner Mongolia (China): framework, kinematics, geochronology and implications for tectonic evolution of the Central Asian Orogenic Belt

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Abstract

Based mainly on field geological observation and geochronologic data, six tectonic units have been recognized in western Inner Mongolia (China), including, from south to north: North China Craton (NCC), Southern Orogenic Belt (SOB), Hunshandake Block (HB), Northern Orogenic Belt (NOB), South Mongolia microcontinent (SMM), and Southern margin of Ergun Block (SME), suggesting that the tectonic framework of the CAOB in western Inner Mongolia is characterized by an accretion of different blocks and orogenic belts. An obvious northward sequence has been well defined in the SOB including, from north to south: fold belt, mélange, arc-pluton belt, and retroarc foreland basin, representing a southern subduction-collision system between the NCC and HB blocks during 500-440 Ma. The NOB consists also of four units: arc-pluton belt, mélange, foreland molasse basin, and fold belt, from north to south, representing a northern subduction-collision system between the HB and SMM blocks during 500-380 Ma. A convergent orogenic system, composed of the NOB and SOB, constrained the closure process of the Paleo-Asian Ocean in western Inner Mongolia during the Early to Middle Paleozoic, implying that oceanic lithosphere has not existed between the NCC, HB, and SMM since the Late Devonian and that two subduction-collision accretional events, in the south and then in the north, were the dominant geodynamic processes for the eastern part of the CAOB during the early to middle Paleozoic.