



## **Giant late Carboniferous-early Permian alkaline granite belt along the China and Mongolia Border and its implication for the evolution of the CAOB**

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The Central Asian Orogenic Belt (CAOB), located between the Siberian Craton and the Tarim-North China Craton, is the largest Phanerozoic accretionary orogenic belt in the world. It is composed of a series of micro-continents, island arcs, residual oceanic crust and continental margin facies rocks with the Paleozoic Asian Ocean subduction. The terminal of this ocean is a long controversial issue. Volume granitoids were distributed in this orogen and recorded its evolution history from Neoproterozoic to Mesozoic. Which present the chance to reveal the process of the formation of CAOB. Alkaline (A-type) granites in this CAOB has attracted more attention for their excellent tectonic setting sign, because this special type granitic rock always intruded in extensional setting.

As the volume granitoids in CAOB, a large number of alkaline, alkaline granites and A-type granites, forming two giant alkaline (A-type) granite belts, including the northern Mongolia-Baikal belt in the north and the northern Xinjiang-southern Mongolia-northern Inner Mongolia-Heihe (NE China) belt in the south. The south alkaline (A-type) granite belt extends over 3000 km along the China and Mongolia Border, forming the largest and longest alkaline (A-type) granite belt in the world. Most of them are alkaline (A-type) granites with some syenites, and aluminous A-type granites, and a number of contemporaneously A-type rhyolites also erupted along this belt. In the west part of this belt, most alkaline (A-type) granites formed during Late Carboniferous and Early Permian [U+FF08] 325-270 Ma [U+FF09] with few of them were intruded in Late Devonian. These synchronous (A-type) granites have no spatial migration character from north to the south. In the central part, less alkaline granites are distributed in southern Mongolia with biggest Khanbogd granitic pluton and mainly formed in the late Carboniferous-early Permian [U+FF08] 310-290 Ma [U+FF09]; In the east part, alkaline granites are most developed in the northern part of Inner Mongolia (Erlian-Hegenshan area), and their formation age is late Carboniferous-Early Permian (307-276 Ma); To the far east, alkaline (A-type) granites mainly concentrated in Heihe area with the Early Permian ages (299-275 Ma). In general, most alkaline (A-type) granites in this belt were intruded during the Late Carboniferous and early Permian, except for the older (Late Devonian-Early Carboniferous) plutons in the northern Xinjiang. There is no clear temporal-spatial difference of the alkaline (A-type) granites in this belt. These Carboniferous-Permian alkaline (A-type) granites formed in a long and narrow belt indict large-scale regional synchronous extension. They cannot be interpreted as the subduction of oceanic ridges or the back-arc extension. Besides, there is no report of the mantle plume during this period. Except one early Carboniferous alkaline granite has A1-type characters (intraplate), all late Carboniferous-Permian alkaline (A-type) granites in this belt show A2-type granite features, which indicates that this giant late Paleozoic alkaline (A-type) granite formed in a post-collisional large-scale extension setting. That means main part of the Paleo-Asian Ocean must be closed before middle Permian.