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Microcontinent and Arc Collision in the Beishan Orogen: Constraint from Detrital Zircon U-Pb and $^{40}\text{Ar}/^{39}\text{Ar}$ Geochronology: Implications for Continental Growth of the Southern Altaids

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The mechanism of continental growth of the Altaids is currently under debate between models invoking continuous subduction-accretion or punctuated accretion by closure of multiple ocean basins. We use the Yueyashan-Xichangjing ophiolite belt of the Beishan Collage (southern Altaids) to constrain the earliest oceanic crust in the southern Paleoasian Ocean. Five lithotectonic units were identified from south to north: the Huaniushan block, a sedimentary passive margin, the structurally incoherent Yueyashan-Xichangjing ophiolite complex, a coherent sedimentary package, and the Mazongshan island arc with granitic rocks. We present a structural analysis of the accretionary complex, which is composed of the incoherent ophiolitic melange and coherent sedimentary rocks, to work out the tectonic polarity. A new weighted mean $^{206}\text{Pb}/^{238}\text{U}$ age of 534.4 ± 3.4 Ma from a plagiogranite in the Yueyashan-Xichangjing ophiolite

indicates that the ocean floor formed in the early Cambrian. Furthermore, we present new geochemical data to constrain the tectonic setting of the Yueyashan-Xichangjing ophiolite, and obtained seven U-Pb ages of Sandstone and granitoid and five Ar/Ar ages. The Yueyashan-Xichangjing ophiolite was emplaced as a result of northward subduction of an oceanic plate beneath the Mazongshan island arc to the north at about 420 Ma. Together with data from the literature, our work demonstrates that there were multiple overlapping periods of accretion existed in the Palaeozoic in the northern and southern Altaids. Therefore, a model of multiple accretion by closure of several ocean basins is most viable.

Key words: Beishan, Yueyashan-Xichangjing, ophiolite, Accretionary complex, Altaids.

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