
Accreted Terranes in the Paleo-Asian Ocean

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Abstract

Terrane accretion is considered to be one of the main contributors to the growth of continental crust (Stern and Scholl, 2010). Allochthonous terranes can be categorized into three general groups, including island arcs, seamounts (oceanic plateaus, submarine ridges), and continental fragments. The Central Asian Orogenic Belt (CAOB) is one of the largest and long-lived accretionary collages on the globe, and is composed of numerous island arcs, and accretionary wedges, seamounts, and microcontinents associated with the growth and consumption of the Paleo-Asian Ocean (Fig.1; Şengör et al., 1993; Windley et al., 2007; Xiao et al., 2015; Yang et al., 2015).

Fig.1. Tectonic sketch map of Central Asian Orogenic Belt showing the seamounts and intra-oceanic arcs systems with different ages (modified after Şengör et al., 1993, Xiao et al. (2015), and Safonova et al. (2017)).

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Based on geological, geochronological, geochemical and isotope data in previous study, Twenty one intra-oceanic arcs have been identified in the CAOB by Safonova et al. (2017). Moreover, four groups of intra-oceanic arcs have been recognized: Neoproterozoic – Early Cambrian, Early Paleozoic, Middle Paleozoic and Late Paleozoic (Fig. 1). The lithologies of fossil arcs are similar to the modern, although the fossil arcs contain more calc-alkaline varieties indicating either their more evolved character or different conditions of magma generation. Many accretionary wedges are formed during the accretion of the intra-oceanic arcs of Paleozoic age to the continents, characterized by ophiolite, tectonic mélange, volcanics, clastics and limestones (Safonova and Santosh, 2014), and mainly included the Erementau-Yili, Zhaman-Sarysu, North Balkhash, Junggar-Balkhash, and Karamai accretionary wedges from west to east (Windley et al., 2007). Numerous Late Neoproterozoic to Late Paleozoic seamounts in theShim-Middle Tianshan, and Aktau-Junggar in the middle of the CAOB.

References