

**The orthometamorphites from  
the south margin of the  
Dunhuang Block:  
Geochemistry, zircon U-Pb  
dating, Hf isotopes and tectonic  
implications**

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The Dunhuang Block, as a Precambrian terrane, has aroused a hot controversy on its affinity and crustal evolution history recently. The extensive metavolcanic rocks and their associated granitic rocks in the Dunhuang Block preserve important imprints about the continental crust thus could be used to trace the evolution of the geological history. Here we present detailed whole-rock geochemistry of amphibolites and related orthogneisses from the northeast Altyn Tagh, Dunhuang Block, to constrain their petrogenesis and provide new insights into the Precambrian crustal growth and reworking history of the Dunhuang Block. The amphibolite bearing a remarkably close resemblance to the tendency of E-MORB, but the conspicuous depletion in Nb, Ta, Zr, Hf and Th that are akin to the typical geochemical features possessed by arc-origin rocks. These features suggest that the amphibolites are subduction-related and formed in a back-arc basin setting. The orthogneisses share typical features with the high-Al TTG generated by slab melting except the extremely low Cr and Ni contents, and the slight discrepancy suggest that these orthogneisses are likely to be resulted from the partial melting of subducted slab without interaction with the peridotite in the mantle wedge. The steep negatively slope of the REE patterns indicate that high pressure garnet and/or hornblende extraction was involved in their forming process.