WAS THE DUNHUANG BLOCK INVOLVED INTO THE CENTRAL ASIAN OROGENIC BELT? EVIDENCES FROM TITANITE U-PB DATING

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The Dunhuang Block is one of microcontinents in the Central Asian Orogenic Belt (CAOB), it is not only mainly consists of Archean to Paleoproterozoic crystalline basement, but also extensively contains the Paleozoic complex that related to accretionary and amalgamation of Central Asian Orogenic Belt (CAOB). It remains a main controversial whether the whole Dunhuang Block experienced the Paleozoic tectonothermal events. Titanite, as one of the common U-bearing accessory minerals, occurs in the majority of igneous and metamorphic rocks. Since it has closure temperature of U–Pb system could be about 650–700 °C, which lower than that of zircon's, thus titanite may record relatively late-stage tectonothermal events of the metamorphic rocks.

In this paper, we conducted LA-ICPMS zircon and titanite U-Pb dating for the Neoarchean rocks from the Dunhuang Block. Zircons from the early Precambrian rocks yielded the formation ages of 2.7-2.5Ga with the metamrophic ages of 2.0-1.8Ga, none of zircon grains logged Paleozoic metamorphic ages. Contrarily, all of the ages of titanites in the same rocks have recorded the Paleozoic tectonothermal events with the metamorphic ages of 405-350Ma. This evidence suggests that the Dunhuang Block has totally involved and modified by the subduction and collsion of the CAOB, and leaded to the Archean to Paleoproterozoic metamorphic rocks have been strongly metamorphosed and deformed to be a part of the CAOB.