Geochronology, Geochemistry and Geological Significances of the Middle Ordovician Wulanwuzhuer Intermediate-acidic Intrusive Rocks in the Qiman Tagh area, Eastern Kunlun Orogenic Belt

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A huge area of intermediate-acidic intrusive rocks occurred in Qiman Tagh area of the Eastern Kunlun Orogen. In this paper, we preset the U-Pb age and whole-rock major-trace element of intrusive rocks near Wulanwuzhuer Cu-Sn deposite in Northern Qiman Tagh, in order to discuss their formation time, petrogenesis, and tectonic background. The rocks are composed of fine-grained granodiorite and gneissic granite. LA-ICP-MS U-Pb dating on zircons from gneissic granite give a weighted average age of (475.3 ± 2.0) Ma, indicating a formation age of the Caledonian, rather than Hercynian as previously thought. The gneissic granite are weakly peraluminous, belonging to high-K calc-alkaline series. Meanwhile, the granodiorite belongs to shoshonitic series. And they are weakly peraluminous to metaluminous with A/CNK=0.79-1.26. The Wulanwuzhuer gneissic granite might derive from partial melting of the continental crust that was caused by underplating of arc magma in subduction settings. While the granodiorites are most likely to represent the arc magma derived from melting of metasomatized mantle during dehydration of oceanic crust, which then mixed with crustal material on various extent. Combined with the age and tectonic evolution published previously, these rocks were formed in island arc-type active continental margin, responding to the Proto-Tethys oceanic crust subduction beneath Qaidam massif from south to north along the vicinity of modern Middle Kunlun Fault in the Early Caledonian.