岩石学报
ACTA PETROLOGICA SINICA

张进,李锦轶,刘建峰,李岩峰,曲军峰,冯乾文. 2012. 早古生代阿拉善地块与华北地块之间的关系:来自阿拉善东缘中奥陶统碎屑锆石的信息. 岩石学报, 28(9): 2912-2934

早古生代阿拉善地块与华北地块之间的关系:来自阿拉善东缘中奥陶统碎屑锆石的信息

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基金项目：本文受国家重点基础研究发展计划(2007CB411306)；国家自然科学基金(41172198、40702032)和中国地质调查局项目(1212010611806、1212010611817)联合资助

摘要：

阿拉善东缘奥陶纪地层位于鄂尔多斯(华北地块)与北祁连早古生代造山带之间的过渡地区,该区的构造背景一直是长期争论的问题,它涉到阿拉善地块是否与华北地块相连、奥陶系的物源以及"贺兰拗拉槽"是否存在等问题。分布于阿拉善地块东缘的中奥陶统米钵山组的碎屑锆LA-ICP-MS U-Pb年龄测试表明,样品中数量最多的锆石年龄为900~950Ma,Alxa-1的峰值年龄为916Ma,Alxa-2的峰值年龄为953Ma,者在494~623Ma之间,这个区间内存在多个峰值,如Alxa-1存在505Ma和588Ma两个主要峰值,Alxa-2则存在494Ma、517Ma、623M等几个峰值。在2.5Ga左右两个样品都存在一个弱的峰值,Alxa-1峰值为2517Ma,而Alxa-2峰值为2552 Ma和2670Ma。除此之外,两个品都有个别大于3.0Ga的成分,Alxa-1样品中最年轻的锆石为451±8Ma,Alxa-2样品则为483±4Ma。这些年龄以及沉积特征表明:(1)传认为的奥陶纪"贺兰拗拉槽"并不存在,鄂尔多斯西南缘地区以及阿拉善东部地区当时属于北祁连早古生代周缘前陆盆地系统; (2)早古生代主物源来自北祁连造山带,新元古代物源来自阿拉善地块; (3)鄂尔多斯西缘整个米钵山组的锆石年龄分布及其变化,指示出北祁连造山带(岛弧渐靠近阿拉善地块,其间洋盆逐渐消失的过程; (4)阿拉善地块基底与华北有明显差别,阿拉善地块明显受到新元古代和古生代构造热事件的影响,两者可能是在中奥陶世或之后才拼贴在一起。

英文摘要：

Located between the North China Plate to the east, and the North Qilian Orogenic Belt to the southeast, the ea ern Alxa Block is the key region to answer many controversies surrounding the tectonic setting of this region in the rly Paleozoic; among them the debates on the basement composition of the Alxa Block, whether the Alxa Block con cted to the North China Plate in the Early Paleozoic, when exactly this event did happen, where the Lower Paleozoi sedimentary rocks along the southwestern Ordos had their provenances, and whether the so-called Helan Aulacog formed in the Ordovician are the key questions to be solved. Laser-ablation inductively coupled plasma mass spect copy U-Pb dating of detrital zircons in two samples from Middle Ordovician sandstones to the west of Helan Shan lo ted in the eastern Alxa Block yields a majority of $^{206}Pb/^{238}U$ ages between 900Ma and 950Ma with peak ages at 9 Ma in Sample Alxa-1 and 953Ma in Sample Alxa-2, respectively, a smaller group yields $^{206}Pb/^{238}U$ ages between 49 Ma and 623Ma with peak ages at 505Ma and 588Ma in Sample Alxa-1 and 494Ma, 517Ma and 623Ma in Sample Alx 2, respectively. Two samples all have a minor peak age at ca. 2500Ma with 2517Ma in Alxa-1 and 2552Ma and 267 a in Alxa-2. Moreover, there are a few zircons older than 3000Ma. The youngest $^{206}Pb/^{238}U$ ages of the two sampl are similar with 451±8Ma in Alxa-1 and 483±4Ma in Alxa-2. These zircon U-Pb ages combined with several lines of dimentary evidence imply that the so-called Helan Aulacogen did not exist in the Ordovician; a peripheral foreland b in related to the North Qilian Orogenic Belt developed instead, the Early Paleozoic detritals mainly came from the No h Qilian Arc, the Neoproterozoic detritals mainly came from the Alxa Block, the detrital zircon ages along the whole stern Ordos showing that the North Qilian Orogenic Belt (Arc) came closer to the Alxa Block, and the ocean betwee hem closed gradually, and the basement of the Alxa Block is different from that of North China Plate, the Alxa Block derwent important tectono-magmatic events during the Paleozoic and Neoproterozoic, which have not found in the orth China Plate. The Alxa Block may connect with the North China Plate during the Middle Ordovician or after it.

关键词：中奥陶世 阿拉善地块 碎屑锆石 米钵山组 贺兰拗拉槽

投稿时间： 2011-09-05 最后修改时间： 2011-12-02