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东昆仑牦牛山组流纹岩锆石U-Pb年龄及构造意义

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摘要：

东昆仑水泥厂地区造山后火山-沉积盆地内形成的牦牛山组磨拉石建造不整合覆盖在前泥盆系地层之上,其形成时代的研究对限定东昆仑早古生代洋盆关闭的时间具有重要意义。应用激光烧蚀多接收器电感耦合等离子体质谱仪(LA-MC-ICPMS)方法,对火山-沉积盆地内牦牛山组不同层位的流纹岩夹层进行了精确的锆石U-Pb定年研究。结果表明,盆地北缘牦牛山组底砾岩之上的流纹岩(B743-2)中岩浆锆石$^{206}Pb/^{238}U$年龄平均值为423.2±1.8Ma,盆地西缘牦牛山组底砾岩之上的流纹岩(B820-1)中岩浆锆石$^{206}Pb/^{238}U$年龄平均值为408.2±2.4Ma,盆地西缘和南缘牦牛山组中上部碎屑岩中流纹岩夹层(B705-1和B656-1)的岩浆锆石$^{206}Pb/^{238}U$年龄平均值分别为404.9±4.8Ma和399.6±2.8Ma。它们代表了牦牛山组不同层位火山岩的形成年龄,由此可以限定水泥厂地区牦牛山组形成时间为400~423Ma。上述年代学结果较为精确地限定了东昆仑早古生代洋盆关闭的构造年代。流纹岩中2486~920Ma元古代继承锆石的发现,说明东昆仑南的变质基底和扬子板块变质基底类似,是晋宁期0.9~1.0Ga罗迪尼亚超大陆形成时发育起来的。

英文摘要：

The Maoniushan Formation of molasse, formed in a post-orogenic volcano-sedimentary basin at the Shuinichang area in the East Kunlun Mountains, rest unconformably on pre-Devonian strata and its forming time is important for determining the closure of the Early Paleozoic Ocean in this region. We made zircon U-Pb dating for rhyolite interlayers from different levels of this formation by LA-MC-ICPMS. The rhyolite (sample B743-2) above the basal conglomerate of the Maoniushan Formation on the northern margin of the basin yielded an average zircon U-Pb age of 423.2±1.8Ma and the rhyolite (sample B820-1) above the basal conglomerate of the formation on the west margin of the basin yielded an average zircon U-Pb age of 408.2±2.4Ma. The rhyolite interlayers (samples B705-1 and B656-1) from detrital rocks of the middle-upper formation yielded two average zircon U-Pb ages: 404.9±4.8Ma and 399.6±2.8Ma. These ages should represent the forming times for different levels of the Maoniushan Formation and thus provide a constrain to the forming time of the formation in this area, that is, 400~423Ma. Therefore, it is suggested that the closure time of the Early Paleozoic Ocean should be in the Late Silurian. The discovery of 2468~920Ma zircon of the Proterozoic age in the rhyolite shows that the metamorphic basement south of the East Kunlun Mountains would be similar to that of the Yangtze plate and would develop during the formation of the Rodinia supercontinent 900~1000Ma ago.

关键词：牦牛山组 流纹岩 锆石U-Pb年龄 晚志留世-早泥盆世 东昆仑造山带

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