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## 摘要:

东准噶尔扎河坝地区发育的大规模古生代中晚期中酸性火山岩的岩浆源区、岩石成因和构造环境以及年代学迄今尚未得到很好的约束,对上述问题的深入分析有助于揭示东准噶尔晚古生代的岩浆作用过程及中亚地壳生长方式。野外地质考察得出,东准噶尔蕴都卡拉地区展现北东-南西向区域性挤压构造变形,原巴塔玛依内山组为一套基性岩、中酸性岩以及火山碎屑岩组合。本文报道了东准噶尔扎河坝地区蕴都卡拉流纹岩的锆石SHRIMP U-Pb年代学、全岩地球化学和锆石Hf同位素分析结果。3个流纹岩的锆石SHRIMP U-Pb定年结果共同指示,蕴都卡拉流纹岩形成于276.0~279.8Ma。流纹岩高硅( $\text{SiO}_2=60.61\% \sim 78.07\%$ )、高碱( $\text{K}_2\text{O}+\text{Na}_2\text{O}=6.46\% \sim 9.28\%$ )、高 $\text{Fe}_2\text{O}_3^{\text{T}}$ (0.70%~3.30%)、Ga/Al,低CaO(0.18%~2.79%)、MgO(0.13%~1.31%),富集轻稀土和高场强元素(Zr、Hf),亏损Ba、Sr、Eu,弱亏损Nb、Ta,具有A型过铝质中-高钾钙碱性花岗岩的特征。锆石具有正的 $\epsilon_{\text{Hf}}(t)$ (10.3~14.6)和年轻的地壳模式年龄(348~557Ma),表明其可能来源于年轻的下地壳物质的重熔。综合东准噶尔区域地质资料以及前人对本区蛇绿岩带的研究得出,蕴都卡拉地区在早二叠世处于伸展环境,该流纹岩可能是弧-弧或弧-陆后碰撞伸展背景下,软流圈物质上涌过程中造成年轻下地壳发生部分熔融产生的酸性岩浆在上升、侵位的过程中的产物,同时表明垂向生长在中亚造山带早二叠世地壳生长过程中占主导地位。

## 英文摘要:

The magma source, petrogenesis, tectonic setting and its geochronology of the Middle-Late Paleozoic felsic volcanic rocks, which widely exposed in the Zhaheba area, East Junggar, remain not restriction well so far. A better understanding of these issues above will help us to reveal the magmatic processes and the continental growth of Central Asia. The field investigation showed significant structural characteristic with NE-SW trending compression and the Batamayineishan Formation is represented by typical basic and intermediate-felsic volcanic rocks and pyroclastic rocks. This paper reports zircon SHRIMP U-Pb age, whole-rock geochemistry and zircon Hf isotope analysis results from the Yundukala rhyolite, East Junggar. Three zircon SHRIMP U-Pb ages indicate that the rhyolite in the Yundukala area were formed at 276.0~279.8Ma. The rhyolites are rich in silica ( $\text{SiO}_2=60.61\% \sim 78.07\%$ ), alkali ( $\text{K}_2\text{O}+\text{Na}_2\text{O}=6.46\% \sim 9.28\%$ ) and have high  $\text{Fe}_2\text{O}_3^{\text{T}}$  (0.70%~3.30%) contents and Ga/Al ratios, low CaO (0.18%~2.79%) and MgO (0.13%~1.31%) contents, and it is a typical high-medium-K calc-alkaline A-type rhyolite with character of enrichment of LREE and HSFE (Zr, Hf) and depletion of Ba, Sr, Eu, Nb and Ta. They have high values of  $\epsilon_{\text{Hf}}(t)$  (10.3~14.6) and young crustal model ages (348~557Ma), suggesting that they were generated by partial melting of juvenile lower crust. Integrating regional geological data of the eastern Junggar and previous research on the nearest ophiolite belt, it is concluded that the Yundukala region was in an extensional setting in the Early Permian and the rhyolites may be the products of felsic magma during its ascend and emplacement processes when upwelling asthenosphere triggered partial melting of juvenile lower crust in an arc-arc or arc-continent post-collisional extensional setting, indicating that the vertical growth play an important role in the continental crust of Central Asia in the Early Permian.

关键词: [地球化学](#) [锆石SHRIMP U-Pb定年](#) [锆石Hf同位素](#) [流纹岩](#) [蕴都卡拉](#) [东准噶尔](#)

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