

张晓静,张连昌,靳新娣,吴华英,相鹏,陈志广. 2010. 内蒙古半砬山钼矿含矿斑岩U-Pb年龄和地球化学及其地质意义. 岩石学报, 26(5): 1411-1422

内蒙古半砬山钼矿含矿斑岩U-Pb年龄和地球化学及其地质意义

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基金项目: 国家重点研究基础发展项目(2006CB403507和2006CB403506)资助

摘要:

内蒙古半砬山钼矿位于西拉木伦钼多金属矿带东北段,是新近发现的一个中型斑岩钼矿床。LA-ICP-MS锆石U-Pb定年结果表明,含矿花岗闪长斑岩成岩年龄 $133.5 \pm 1.7\text{Ma}$,说明半砬山钼矿是早白垩世构造-岩浆活动的产物;赋矿围岩流纹斑岩的成岩年龄为 $160 \pm 2\text{Ma}$,早于成矿年龄 27Ma 。锆石Hf同位素组成显示流纹斑岩和花岗闪长斑岩的 $\epsilon_{\text{Hf}}(t)$ 基本为不大的正值,集中在 $+2 \sim +3.5$ 左右,说明其岩浆来自亏损地幔新增生的地壳物质。除同位素特征相似外,流纹斑岩与花岗闪长斑岩具有类似的地球化学特征,比如都具有富Al、K,低Mg、Ca及TFe,呈高钾钙碱性特征;稀土和微量元素组成特征上,流纹斑岩与花岗闪长斑岩都具有轻重稀土分馏较明显,相对富集Rb、Ba、Th等大离子亲石元素,而亏损Nb、Ta、Zr等高场强元素的特征,所不同的是流纹斑岩 ΣREE 含量较花岗闪长斑岩高,Eu负异常也较明显,并且流纹斑岩为低Sr高Yb (Sr平均为 37.3×10^{-6} , Yb平均为 4.81×10^{-6}),而花岗闪长斑岩为高Sr低Yb (Sr平均为 628×10^{-6} , Yb平均为 1.64×10^{-6})。这些特征暗示流纹斑岩形成的源区可能为中上地壳,花岗闪长斑岩源区物质可能为加厚的下地壳熔融产物,即在岩石圈不断伸展过程中,成岩岩浆源区不断加深。

英文摘要:

The Banlashan molybdenum deposit, located in the northern segment of Xilamulun molybdenum metallogenic belt, is a newly found medium porphyry molybdenum deposit. Zircon LA-ICP-MS U-Pb dating gives that ore-forming granodiorite porphyry was emplaced with age of $133.5 \pm 1.7\text{Ma}$. Therefore, the Banlashan molybdenum deposit was formed after 133Ma , in the Early Cretaceous. The wall rock- rhyolite porphyry was emplaced with age of $160 \pm 2\text{Ma}$, earlier than the ore-forming age 27Ma at least. Hf isotope analyses for the rhyolite porphyry and granodiorite porphyry gives positive $\epsilon_{\text{Hf}}(t)$ values, which suggest that the source materials of two types of rocks come from newly accreted crustal materials. Besides the isotope similarity between rhyolite porphyry and granodiorite porphyry, they also resembled in the geochemical features, which is presented by high Al and K contents, low Mg, Ca and TFe contents, belonging to high K and calc-alkaline series; and they are both enriched in LREEs and LILEs, such as Rb, Ba and Th, and depleted in HFSEs, such as Nb, Ta and Zr. However, the main differences between them are that ΣREE and europium depletion of rhyolite porphyry are higher than those of granodiorite porphyry, and that rhyolite porphyry is low Sr and high Yb (Sr = 37.3×10^{-6} , Yb = 4.81×10^{-6}), but granodiorite porphyry is high Sr and low Yb (Sr = 628×10^{-6} , Yb = 1.64×10^{-6}). All the features mentioned above indicate that rhyolite porphyry is probably derived from medium and upper crust, while granodiorite porphyry is the product of melting thickened lower crust. The source regions of the two types of rocks were deepening during the strong extension of lithosphere.

关键词: [斑岩钼矿](#) [花岗闪长斑岩](#) [LA-ICP-MS锆石U-Pb定年](#) [岩石地球化学](#) [Hf同位素](#)

投稿时间: 2010-02-05 最后修改时间: 2010-03-26

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