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西天山莱历斯高尔一带铜(钼)矿成矿斑岩年代学、地球化学及其意义

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摘要:

西天山位于伊犁板块北部,即准噶尔板块与伊犁盆地之间的造山带。位于别珍套-科古琴晚古生代岛弧中段的莱历斯高尔一带斑岩型矿床主要分布有莱历斯高尔钼矿和3571铜矿,直线距离不足1km,与成矿作用有着密切关系的斑岩体以二长闪长斑岩、花岗闪长斑岩为主。对两个斑岩体的锆石LA-ICP-MS测年结果表明,3571铜矿和莱历斯高尔钼矿斑岩体的形成年龄分别为 $354 \pm 0.65\text{Ma}$ 和 $346 \pm 1.2\text{Ma}$,指示其均形成于早石炭世。主要元素和微量元素具有典型钙碱性岩系火山弧花岗岩的特征,暗示其形成于大陆弧环境。结合区域构造背景,推测斑岩体的形成可能与晚古生代准噶尔洋板块向南的俯冲作用有关。本区两个斑岩体的锶同位素初始值 I_{Sr} 和 $\epsilon_{\text{Nd}}(t)$ 分别为 $0.7079 \sim 0.7103$ 和 $-0.61 \sim -3.71$,其源区物质主要来源于地壳(50%~70%),并有少量的地幔物质的混入。由于两个斑岩体的地球化学特征均显示出它们具有同源演化关系,推测3571出露的岩脉可能相当于莱历斯高尔斑岩体的上部,其深部可能存在莱历斯高尔式的斑岩钼矿化,因此3571铜矿区具有很好的找矿前景。

英文摘要:

Western Tianshan is located in the north part of the Yili plate, i.e., orogenic belt between Junggar plate and Yili basin. The Lailisigao' er Mo deposit and 3571 Cu deposit no more than 1 km distance are situated in the middle section of the Late Paleozoic Biezhentao-kokirgin island arc. The porphyries closely related to metallogenesis, are predominated by monzodioritic porphyry and granodioritic porphyry. LA-ICP-MS U-Pb zircon dating on the two porphyries yield the average ages of $354 \pm 0.65\text{Ma}$ and $346 \pm 1.2\text{Ma}$ respectively, implying that they are co-magmatic in the early Carboniferous. Their major- and trace-element compositions suggest that they are the typical calc alkaline volcanic arc granites, formed a continental arc setting. Combined with its geological background, the porphyries might be related to the southward subduction of the Junggar plate during the Late Paleozoic time. Their I_{Sr} and $\epsilon_{\text{Nd}}(t)$ ratios range from 0.7079 to 0.7103 and -0.61 to -3.71 respectively, suggesting that they were mainly derived from crust (50%~70%) contaminated by minor mantle materials. Their geochemical compositions reflect that the two porphyries are co-magmatic relationship, and the dykes outcropped in the 3571 copper porphyry was inferred to correspond with the upper part of the Lailisigao' er Cu-Mo porphyry. Thus, there may be a potential region beneath the 3571 mine for prospecting for the Lailisigao' er type porphyry Cu-Mo deposit.

关键词: [斑岩](#) [年代学](#) [莱历斯高尔](#) [西天山](#) [新疆](#)

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