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广西栗木钽铌锡多金属矿床的成矿流体演化及其对成矿过程的制约

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摘要:

广西栗木钽铌锡多金属矿床既产具明显垂直分带的花岗岩型钽铌锡矿体,又有石英脉型钨锡矿体,是研究岩浆-热液演化过程的典型实例。本次研究对栗木矿区中水溪庙和金竹源两个矿床开展了系统成矿流体研究。研究表明栗木矿区中的包裹体类型主要有盐水溶液包裹体、 H_2O-CO_2-NaCl 包裹体和熔体包裹体三类。白云英岩化钠长石花岗岩 \rightarrow 似伟晶岩 \rightarrow 长石石英脉型 \rightarrow 锂云母萤石脉,盐水溶液包裹体逐渐由定向分布的次生包裹体特征,转变为面状孤立分布的原生包裹体特征,而且均一温度、盐度和密度逐渐降低,具有低均一温度(150~210°C)、低盐度(1.0%~9.0% NaCleqv)和低密度(0.83~1.05g/cm³)的特点。 H_2O-CO_2-NaCl 包裹体和熔体包裹体主要产在钠长石花岗岩和似伟晶岩中, H_2O-CO_2-NaCl 包裹体孤立分布,均一温度为260~350°C,盐度为0.8%~8.5% NaCleqv;熔体包裹体的固相初熔温度为560~600°C,完全均一温度为704~853°C,流体相具有与盐水溶液包裹体相近的均一温度和盐度。根据以上资料,本文把栗木矿区的成矿作用分为岩浆阶段的钽铌锡成矿作用和岩浆热液阶段的钨锡成矿作用,估算成矿压力约为270MPa,这有利于栗木矿区的钽铌锡在花岗岩浆阶段发生了相对贫化的富集作用,钽、铌、锡、钨等元素在熔体/流体的分配系数制约了钽铌成矿作用发生在岩浆阶段,而钨锡成矿作用主要发生在热液阶段。

英文摘要:

Limu Ta-Nb-Sn polymetallic deposit in Guangxi, China, composed of granite type Ta-Nb-Sn ore body with vertical mineralization zoning, and quartz vein type W-Sn ore body, is a typical case for us to research the melt-fluid evolution at magmatic to hydrothermal transition. In this paper, we analyzed the ore-forming fluid features of Shuiximiao deposit and Jinzhuyuan deposit in Limu ore area systematically. The experimental results showed that brine fluid inclusions, H_2O-CO_2-NaCl fluid inclusions and melt inclusions were hosted in quartz in Limu ore area. From greisenization albite granite, stockscheider, feldspar quartz vein, to lithium mica fluorite vein in turn, brine fluid inclusions exist with the feature changing from secondary origin of directional distribution to primary origin with isolated distribution. The results of microthermometric analyses for brine fluid inclusions showed a low homogenization temperature (150~210°C), a low salinity (1.0%~9.0% NaCleqv.) and a low density (0.83~1.05g/cm³), which all decreased gradually from the lower to upper mineralization zone. H_2O-CO_2-NaCl fluid inclusions and melt inclusions were mainly hosted in albite granite and stockscheider. H_2O-CO_2-NaCl fluid inclusions usually distribute in isolation with the homogenization temperature of 260~350°C and salinities of 0.8%~8.5% NaCleqv. The initial melting temperatures and completely homogenization temperatures of melt inclusions were 560~600°C and 704~853°C respectively, and the fluid phase within melt inclusions have similar homogenization temperature and salinity with that of brine fluid inclusions. Based on the experimental results, the mineralization of Limu ore area can be divided into two stages, one is the mineralization of Ta, Nb and Sn in the magmatic stage, and the other is the mineralization of W and Sn in the magmatic hydrothermal stage. We estimated the ore-forming pressure was about 270MPa, which benefit the enrichment of Ta, Nb and Sn in the granitic magma stage. The different distribution coefficient of Ta, Nb, W and Sn between melt and fluid phases is an important factor controlling the mineralization of Ta and Nb in the magmatic stage, and the mineralization of W and Sn in the hydrothermal stage.

关键词: [成矿流体](#) [稀有金属](#) [花岗岩](#) [熔体包裹体](#) [热液金刚石压腔](#)

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