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新疆阿尔泰克因布拉克铜锌矿床地质特征及成矿作用

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摘要:

克因布拉克中型铜锌矿床赋存于早二叠世花岗岩外接触带的上志留统-下泥盆统康布铁堡组黑云石英片岩、变质石英砂岩中。矿床的形成经历了夕卡岩期、热液期和表生期,铜锌矿主要形成于热液期。矿石中石英和方解石流体包裹体划分为 $H_2O-NaCl$ 型和 $H_2O-CO_2(\pm CH_4/N_2)-NaCl$ 型。成矿温度变化于 $146\sim 448^\circ C$,在 $170^\circ C$ 、 $270^\circ C$ 和 $350^\circ C$ 出现峰值;流体盐度变化于 $0.2\%\sim 46.9\%$ $NaCl_{eq}$,峰值为 1.5% $NaCl_{eq}$ 和 5.5% $NaCl_{eq}$;流体的密度 $0.55\sim 1.19g/cm^3$ 。硫化物的 $\delta^{34}S$ 集中变化于 $-8.4\%\sim 1.9\%$,峰值为 0% ,表明硫来自岩浆。石英和方解石 δD_{SMOW} 介于 $-130\%\sim -79\%$, $\delta^{18}O_{SMOW}$ 值介于 $8.0\%\sim 11.6\%$, $\delta^{18}O_{H_2O}$ 值为 $-1.7\%\sim 4.43\%$,表明成矿流体主要是岩浆水,混合大气降水。方解石中 $\delta^{13}C_{PDB}$ 变化于 $-5.3\%\sim -1.1\%$,暗示碳来自花岗质岩浆。成矿时代为早中二叠世,成矿作用与花岗质岩浆期后的热液活动有关。

英文摘要:

The Keyinbulake copper-zinc deposit occurs in the exocontact zones between Early Permian granite and Upper Silurian-Lower Devonian biotite-quartz-schist and meta-quartz-sandstone of Kangbutiebao Formation. On the basis of field evidence and petrographic analysis, the ore-forming process can be divided into three mineralization periods: Skarn, hydrothermal and supergene. The hydrothermal period represents the main copper-zinc mineralization episode in the Keyinbulake deposit. Two types of fluid inclusions, namely $H_2O-NaCl$ and $H_2O-CO_2(\pm CH_4/N_2)-NaCl$ types, have been recognized in quartz and calcite. Homogenization temperatures of fluid inclusions vary from 146 to $448^\circ C$, with peaks temperature of $170^\circ C$, $270^\circ C$ and $350^\circ C$. Salinity ranges from 0.2% to 46.9% $NaCl_{eq}$ at peaks around 1.5% $NaCl_{eq}$ and 5.5% $NaCl_{eq}$. Ore fluid densities range from 0.55 to $1.19g/cm^3$. The $\delta^{34}S$ values of sulphide associated with copper-zinc mineralization range from -8.4% to 1.9% at a peak around 0% , indicating that the sulfur was derived from magma. The δD values of quartz and calcite range from -130% to -79% , $\delta^{18}O_{SMOW}$ values range from 8.0% to 11.6% , with corresponding $\delta^{18}O_{fluid}$ values of -1.7% to 4.43% . The δC_{PDB} values in calcite from the Keyinbulake copper-zinc deposit define a narrow range of -5.3% to -1.1% . The combined isotopic data imply that the ore-forming fluids of the Keyinbulake copper-zinc deposit were mainly derived from magmatic fluids, with some contributions from meteoric water, and the carbon in the ore fluids was mainly derived from granitic magmatic source. The Keyinbulake copper-zinc mineralization took place in the Early-Middle Permian with its metallogenesis related to the hydrothermal from granitic magmatic.

关键词: [铜锌矿床](#) [流体包裹体](#) [碳氢氧同位素](#) [成矿作用](#) [克因布拉克](#) [阿勒泰](#)

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