

Ore-forming Fluid Geochemistry of Zhaxikang Antimony Polymetallic Deposit in Southern Tibet, China

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The Zhaxikang is a representative antimony polymetallic deposit in the gold-antimony mineralization belt, which is located in southern Tibet, China. Microscopic observation and microthermometric study using infrared microscopy were performed on fluid inclusions hosted in stibnite, sphalerite and quartz.

Infrared microscopic observation shows that the fluid inclusions hosted in stibnite, sphalerite and quartz are mainly NaCl-H₂O type. According to results of microthermometry, three main mineralization stages can be recognized, sphalerite-galena; quartz-stibnite and breccious ore stages (from early to late). The fluid inclusions hosted in sphalerite have two ranges of salinity values. One is 4.702wt%-2.794wt%NaCleqv, which is similar to those hosted in stibnite and symbiotic quartz; the other is higher, between 6.374wt%-10.228wt%NaCleqv. It may indicate that Zn preceded Sb during mineralization. In addition, fluid inclusions hosted in quartz veins of breccious ores have salinities close to 0wt%NaCleqv, showing that fault activity may lead to the forming of these breccious ores after Zn and Sb mineralization. Together with Laser Raman analysis, the ore-forming fluid of the Zhaxikang antimony polymetallic deposit is a NaCl-H₂O fluid system characterized by medium homogenization temperature, low salinity, low density and trace CO₂ and CH₄ gases.

D_{H₂O} and ¹⁸O_{H₂O} of the ore-forming fluids are -146.5‰ ~ -165.7‰ and -2.7‰ ~ -13.2‰ respectively, implying that the fluid originated from geothermal water. Along with carbon and sulfur isotopic compositions, the Zhaxikang antimony polymetallic deposit is a mesothermal type. The metallogenic fluid is derived from geothermal water and the ore-forming elements mostly come from strata.

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