

Ore-forming fluid geochemistry of Cheqiong Zhuobu antimony deposit in southern Tibet, China

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Cheqiong Zhuobu antimony deposit is located in Southern Tibet, and it's a representative antimony deposit in this area. Microscopic observation and microthermometric study using infrared microscopy were performed on fluid inclusions hosted in ore minerals stibnite and quartz.

Infrared microscopic observation shows that the fluid inclusions hosted in stibnite and quartz are mainly NaCl-H₂O type. According to results of microthermometry, four types of fluid inclusions can be recognized: liquid-rich two-phase fluid inclusion, gas-rich two-phase fluid inclusion, liquid aqueous inclusion and pure gas inclusion

The fluid inclusions hosted in sphalerite have two ranges of salinity values. One is 1.0 wt%-2.0 wt% NaCl_{eqv}, which is similar to those hosted in symbiotic quartz; the other is higher, between 2.0 wt%-5.0 wt% NaCl_{eqv}. It is indicated that ore-forming fluids can be divided into two stages, fluid in the earlier stage had higher salinity. While the crystallization proceeded, the salinity decreased. Together with Laser Raman analysis, the ore-forming fluid of the Cheqiong Zhuobu antimony deposit is a NaCl-H₂O fluid system characterized by low-medium homogenization temperature, low salinity, low density and trace CO₂ and CH₄ gases.

D_{H₂O} and ¹⁸O_{H₂O} of the ore-forming fluids are -133.7‰ ~ -172.0 ‰ and 1.9 ‰ ~ 6.5‰ respectively, implying that the fluid originated from hydrothermal water. Along with carbon and sulfur isotopic compositions, the Cheqiong Zhuobu antimony deposit is an epithermal type. The metallogenic fluid is derived from hydrothermal water and the ore-forming elements mostly come from strata.

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