

Trace elements in fluid inclusions of Dongping and Xiaoqinling vein gold deposits in China*

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Trace elements in fluid inclusions of gold-bearing quartz veins were conducted by using Hard X-ray Microfocusing Beamline (BL15U1) in Shanghai Synchrotron Radiation Facility (SSRF), Shanghai Institute of Applied Physics, Chinese Academy of Sciences.

Samples were selected from the Dongping and the Xiaoqinlin gold deposits, which are giant gold deposits in China. Fluid inclusions in the Dongping deposit are abundant, and mainly low salinity H₂O-CO₂-NaCl inclusions. Micro thermometry shows that the bubbles in H₂O-CO₂ fluid inclusions are mainly vapor CO₂; a few H₂O-CO₂ inclusions have thin films of liquid CO₂ around bubbles, with -58.3~-57.6 °C of T_{m,CO₂} and 27.8~30.9 °C of Th_{,CO₂}. The total homogenization temperatures (Th_{,tot}) are mainly between 290~330 °C. Figure 1 shows that trace metal elements are obviously concentrated in a fluid inclusion from gold-bearing quartz vein, especially for Au, As, Cu, Te, Sb, as well as Fe, Zn, Co, Sn, W (not shown in Figure 1). Ag, Pb, Mn and Bi were also analysed, but they are not clearly enriched.

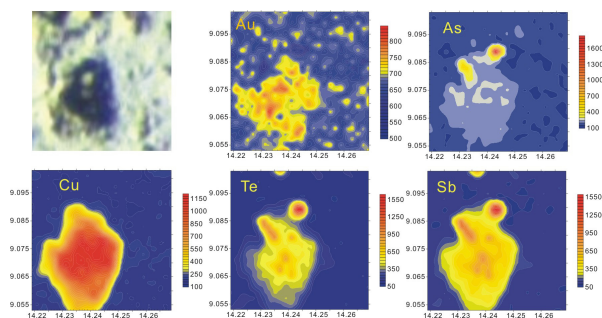


Figure 1 μ -XRF element mapping of a fluid inclusion (Sample DP010) in gold-bearing quartz vein from the Dongping gold deposit (The size of each 50 μ m \times 50 μ m)

Fluid inclusions in gold-bearing quartz veins are extremely abundant. They are CO₂-rich and low salinity H₂O-CO₂-NaCl inclusions. CO₂ phases may occupy more than 50% of total volume, and liquid CO₂ can be usually existed. The μ -XRF analysis (sample TY012) show that Au is not enriched in liquid CO₂ phase, but As, Cu, Zn, Fe, Co, Mn, Te, Sb, Sn and W are concentrated.

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