

Geology, geochronology, and fluid inclusion characteristics of the Dongxi epithermal gold deposit, central China

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The Dongxi gold deposit is an important epithermal gold deposits in the Tongbai-Dabie orogenic belt, central China, with reserves of >5 tons Au. It belongs to a suite of low-sulfidation epithermal systems that are associated with Yanshanian volcanism. Gold mineralization is hosted in Early Cretaceous andesite, and consists primarily of auriferous calcite-quartz veins that are confined to NW-trending faults. The mineralization process was composed of two stages, including deposition of coarse-grain calcite veins (Stage I) and quartz + calcite veins (Stage II). Primary fluid inclusions in calcite include three types: monophasic vapor, monophasic liquid, and two-phase liquid-rich inclusions. The early-stage fluid inclusions have low homogenization temperatures (128~172°C) and low salinities (0.4 to 0.9 wt% NaCl equiv.), whereas the late-stage fluid inclusions have homogenization temperatures of 105~160°C and salinities of 0.2~0.9 wt.% NaCl equiv. The temperatures and salinities of the ore-forming fluids tend to decrease progressively with time. The ore-forming fluid is assumed to be a mixture of magmatic and meteoric components. The crystallization age of the ore-bearing andesite has been measured as 126.7±1.4 Ma (1 σ , MSWD=0.95), using U-Pb analyses of zircons by LA-ICP-MS. The Dongxi deposit likely formed during lithospheric extension and mantle upwelling, a setting which provided abnormally high heat and fluid fluxes necessary for gold mineralization.