

## **Carlin-type Au deposits in Youjiang Basin, Southwest China**

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Following the discovery of the Banqi gold deposit in 1978, numerous similar Au deposits were discovered in the Youjiang Basin, Southwest China, with most deposits located in Southwest Guizhou (hereinafter referred to as Guizhou deposits). Currently, the Au endowment of Guizhou deposits is more than 900 tons of Au.

According to the ore-controlling factors, the Au mineralization was divided into two types, including strata-bound and fault-controlled mineralization. Strata-bound mineralization occurs in bioclastic limestone and the unconformity between Maokou and Longtan Formations. These deposits are mainly hosted in the platform facies strata. The fault-controlled mineralization is mainly in high-angle faults and occurs in both platform and basin facies strata.

Gold is mainly ionically bound ( $\text{Au}^{1+}$ ) in trace element-rich, subhedral-euhedral arsenian pyrite, with minor Au in arsenopyrite, although trace visible native Au has been observed in a few deposits. Alteration includes dissolution of calcite, jasperoid replacement of calcite, sulfidation of Fe in Fe-dolomite/Fe-calcite to form Au-bearing pyrite and dolomite, minor illite replacement of K-feldspar/muscovite, and formation of minor quartz veins. Late-ore-stage stibnite, realgar, calcite, quartz, and lesser orpiment and cinnabar precipitated in open space within veins. Fluid inclusion studies reflect these deposits formed at depths between 2 and 8 km and at temperatures of 190 to 300°C (average ~250°C) from low-salinity (<5 wt % NaCl equiv.) and  $\text{CO}_2$ -rich (6–75 mole %) reduced fluids.

Comparison of Guizhou deposits with Nevada Carlin-type deposits reveals both similarities and differences between the two districts. Dolomite-stable alteration in Guizhou formed from less acidic,  $\text{CO}_2$ -rich ore fluids at higher temperature and pressure compared with Nevada deposits, reflecting similarities between Guizhou deposits and orogenic systems. Guizhou deposits may have formed in a transitional setting between typical orogenic gold and shallow Carlin-type deposits.