
The Sediment-hosted Stratiform Copper Deposits in the Lixi District, SW China

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1 Geological Setting

There are numerous copper deposits in the Lixi district of the Sichuan province, SW China, and these copper deposits are divided into two groups as iron oxide copper-gold deposits (IOCG) (Zhu and Sun, 2013) and sediment-hosted stratiform copper deposits (SSC). The former includes the Lala deposit and Hongnipo deposit, the latter includes the Heiqing deposit and Xinqiaolaopengwan deposit. The Lixi district lies tectonically on the western margin of the Yangtze Block. The strata occurring in the Lixi district include the Paleoproterozoic Hekou Group and the Mesoproterozoic Dongchuan Group.

2 SSC Mineralization

The Lixi deposit is hosted by the stratiform dolomite marble of the Paleoproterozoic meta-sedimentary sequences of the Luoxue Formation of the Dongchuan Group. The ore hosting dolomite marble has high content of organic substances. The orebodies mostly occur as stratiform, stratoid and lentoid in accordance with host-rock. The orebodies are variable in size from 60 m to 600 m long, 1 to 25.6 m thick and 10 m to 600 m in vertical extent. The ore minerals comprise chalcopyrite, bornite and minor chalcocite, cubanite, digenite, tetrahedrite and pyrite. The common gangue minerals comprise dolomite, calcite and quartz. The copper mineralization occurred mainly as disseminated, banded and veined sulfides.

The $\delta^{34}S$ value of sulfide (chalcopyrite, pyrite chalcocite and bornite) range from -3.46‰ to 10.62‰ and indicate that the sulfur mainly originated from seawater sulfate. The Pb isotopes of ores indicate that the main Pb source were underlying volcanic rocks of the Yinmin Formation or the Hekou Group.

3 Ore Genesis and Exploration Strategy

The geology, mineralization and geochemistry of Lixi copper deposits demonstrate that these deposits are similar to those observed in the Tangdan SSC deposit and other SSC deposits worldwide (Hitzman et al., 2005; Zhao et al., 2012).

The stripe-like dolomite-marbles enriched in organic substances and proximity to fault zones are the most important ore controlling factors. The future exploration should focus on the stripe-like dolomite marbles of the Luoxue Formation in the Lixi district.

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References


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