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The Occurrence State of Gold in Liwu Copper Deposit, Jiulong, Sichuan, China

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Sichuan Liwu copper deposit is the rare rich copper deposit in China, which is located in metamorphic core complexes of Jianglang dome that next to the west of the Yangtze Platform. The Liwu copper deposit now called, includes the Daliwu, Heiniudong, Dig Jin Gou, Bai Xianglin, Zhongzui, Shanghai Di, Baiyanzi, Sunyelin copper deposit (point), so called the Liwu copper polymetallic ore field.

Whether gold remains in Liwu copper deposit is important both to their economic attractiveness and to the distribution of gold in the upper crust. Cu/Au atomic ratios of Liwu copper ore deposits form a continuous range from about 2000 to 2,000,000. Gold is found in solid solution in Liwu copper deposit in Cu-Fe, Fe or Zn sulfides as small grains of kushelite, usually along boundaries or cracks of chalcopyrite and magnetic pyrite or marmatite. EPMA analyses of ore minerals from the gold-rich samples show that chalcopyrite contains about 300ppm Au, whereas magnetic pyrite contains about 200ppm, Marmatite

contains about 100ppm. The amount of gold presently in solid solution in Cu-Fe-Zn sulfides is not adequate to account for all the gold in Liwu copper deposits, and the remainder is present as micron scale grains of kushelite.

Through the study, we find that the tested hydrothermal ore sample, formed in mid-late phase of Yanshan 104~142.2 Ma, is the product of once again enrichment and mineralization resulted by part tectonic movement and metallogenic hydrothermal solution beyond mid phase of Yanshan. The ratio of Ag/Au is 1.38~4.59, it is inferred that the metallogenic temperature is less-than-or-equal-to 227°C, besides, in the metallogenic process, a lot of sulfide precipitation with high-middle temperature in early stage and chlorite and sericite with low-middle temperature appear in the late stage.

Key words: Liwu copper deposit; Gold element; Occurrence state

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