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Analysis of Structural Ore-controlling Rules and Mechanism of the Laosuzhai Copper Deposit in Jiangcheng, Yunnan Province

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1 Introduction

The Laosuzhai copper deposit is located in the southern border region in Jiangcheng of yunnan province, and its bordering on Vietnam and Laos, tectonically belonging to the south of Mesozoic-Cenozoic of Lanpin-Simao Basin which is the transition area of Tethys structural domain and the Pacific structural domain(Liao et al,2005; Li et al,1994). The deposit as one of the important nonferrous metal metallogenic belts in China(Xue et al, 2002; Li et al, 1995). Through preliminary exploration, authors think this deposit has great perspective prospecting. However, prospecting work there is still lack, because it is a new developing mine. Hence, the authors do many detailed and extensive work and summarize metallogenic regularity for guidingprospecting exploration work. Moreover, based on a lot of field geological research work, the authors found that the structure has an important control action to ore body in space distribution in the deposit.

2 The Mining Geological

Outcropped strata in the main mining area is mainly the lower cretaceous and the Early Tertiary Paleocene, the former is included strata are Jingxing gormation(K_1j), Wushahe formation(K_1w), Mangang formation(K_1m), the latter is mainly Mengyejing Formation(E_1m), and soil, sand and gravel layer in quaternary(Q). There are four large fault zones, but no intrusive rocks, volcanics and veins exposure.

3 Ore-controlling Regularity

(1)Comparison of the fracture structure development, mainly by five breaking through the mining area; In addition to nearly east-west F_1 fracture, The rest of the four fracture(F_1 , F_2 , F_3 , F_4) mostly is NW-SE, and its scale relatively larger.

(2)Analysis of Structural Ore- Controlling Mechanism.

The spatial form of ore body has a direct relationship with structure in Laosuzhai deposit: the strike of four orebody strike is basically identical with F_2 , NW-direction, belong to channeling structure, and the host structure is interlayer fracture zone of hanging wall of F_2 . Deep ore-bearing fluid collect and transport upward along F_2 fault into the interlayer fracture zone, and then gather to form deposits by filling metasomatism mineralization. Studies show that the deposit suffers from two-phase tectonic extrusions. The first phase is mainly SW-NE direction mechanics which take F_2 , F_3 and F_5 into place, accompanied by forming local drag crumpled and rock breaking formation during the first phase of mechanical extrusion, which is metallogenic fault. The second phase is mainly NEE-SWW direction mechanics. It cut fracture structure and mineralization in the first phase, and make application of a force again to stratum and rock by F_2 , F_3 , F_4 holding. It makes the space of ore reservoir larger and provides advantageous condition for repeated migration enrichment of the ore-forming fluid. Because formation of hanging wall of F_2 have been extruded many times on the mechanical properties, rock crushing degree is relatively high, after ore fluid along the fault F_2 upward migration filled in the interlayer fracture zone, with the surrounding rock hydrothermal filling metasomatism to form ore deposit. It also formed the characteristics of brecciated, disseminated, net vein of minera and irregular nervation, lenticular, lenticular of ore bodies.

At present, Mining area were delineated four copper ore bodies, orebody occurrence in interlayer fracture zone of purplish grey pebbly sandstone and sandstone in Mangang group(K_1m) of lower cretaceous in hanging wall of F_2 . It is high degree of ore bodies are controlled by F_2 , especially alongside side of secondary small faults is closely related to mineralization, so along with the strike of F_2 will fond a larger prospecting space. In addition, The wall rock alteration near the ore body are silicide, kaolinite and barite, but the wall rock alteration far the ore body are

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barite, specularite, calcite and siderite. This phenomenon reflects the characteristics of low temperature hydrothermal genesis in this deposit (Liu et al, 2000). It belongs to meso-low temperature hydrothermal filling metasomatic copper deposit which is controlled by the faulted fracture zones.

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