Migration Regularity of Major Elements and REE in Altered Rocks of Hongdoushan Copper, Yunxian, Western Yunnan

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Abstracts: The south Lancangjiang belt is part of the Sanjiang structure-magmatic-metallogenic belt in western Yunnan, which has superior metallogenic conditions and has formed a series of Cu, Pb-Zn, and Ag polymetallic deposits, typical representative copper polymetallic deposits include the Minle copper deposit (Zhang, 2007) and the Guanfang copper deposit (Tian et al., 2006). The Hongdoushan copper deposit is located in north part of South Lancangjiang volcanic metallogenic belt, which is a newly discovered deposit in recent years. Through the large scale structure-alteration precise measuring in 1272 and 1220 level in newly discovered deposit in recent years. Through the large scale of South Lancangjiang volcanic metallogenic belt, which is a 2006). The Hongdoushan copper deposit is located in north part (Zhang., 2007) and the Guanfang copper deposit (Tian et al., 2006). According to the characteristics of altered rocks in the area, from the fault zone to the hanging wall rock, there are four obvious alteration zones, which are Cataclastic rock zone (I)→felsic lithification–carbonate–sericite zone (II)→silicification–chlorite–epidote zone (III)→weakly felsic lithificated andesite zone (IV). The ore-bodies are located mainly in the felsic lithification–carbonate–sericite zone and silicification–chlorite–epidote zone. The samples of representative altered rocks from different zones were selected for the determination of major elements, trace elements and REE. The composition, distribution and migration regularity of major elements, trace elements and REE in the main altered rocks of the various alteration zones shows that:

1) Themigration regularity of major elements is obvious. The major componentswhich migrated from the weakly felsic lithificatedandesites (IV) to (I, II and III) altered rocks included TiO2, Na2O, Al2O3, MgO and P2O5, suggesting that the liquids with abundance Na2O, Al2O3 etc. The components SiO2, CuO, MnO, Fe2O3, CaO and K2O were obviously brought in, implying that mineralization made such major components as SiO2, CuO, Fe2O3, CaO and K2O move into and concentrated in the ore body. (2) Trace elements like Cu, Zn, Ba, Rb, Mo, Ag, U, Th, K, Th and Sr keeps immigrating during alteration and maximizes in the zone of (II and III), suggesting that (II and III) are closely associated with the mineralization, the metallogenic hydrothermal solution of the altered zone is rich in the above components, which is conducive to the precipitation of copper. (3) REEvalues are range from 100.78 to 203.49ppm, which indicated that REE was brought in and brought out during the mineralization process. The total REE show a gradual downward trend from weakly felsic lithificated andesites (IV) to (II and III) altered rocks. δEu values are all lower than 1,showing negative Eu anomaly,whereas δCe values are all higher than 1, the mineralization took place in an oxidation environment. The LREE/HREE and La/Yb values are all higher than 1. The REE curves assume a rightly dipping REE pattern, indicating that LREE are more enriched than HREE in the mineralization process, the source of ore–forming hydrothermal solution was derived from the deep fluids rich in HREE. It is important to enrich the metallogenic theory and to guide the prospecting and exploration in this area, by discussing the characteristics of element enrichment during the alteration process, analyzing the properties of ore–forming fluids and understanding the intrinsic relationship between alteration and mineralization.

Key words: geochemistry, major elements, REE, migration regularity, Yunxian Hongdoushan copper

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