1 Introduction

The iron oxide copper-gold (IOCG) deposits are copper-gold (-silver-niobium-platinum group element-rare earth element-uranium) deposits that contain iron oxides (magnetite and/or hematite) more than 20%. Generally, these deposits have the following characteristics: (1) abundant low Ti Fe-oxides; (2) hydrothermal characteristics and structural controls, commonly with breccias; (3) Cu + Au as economic metals; (4) lack of abundant syn-sulfide quartz veins; (5) LREE enrichment and low S sulfides; and (6) a temporal relationship with magmatism, yet no close spatial association with causative intrusions (Groves et al., 2010). Because of their polymetallic nature and the potential of large tonnage at moderate to high grades, the geological features, metallogenetic mechanism and prospecting models of the IOCG deposits have attracted much attention (Zhao et al., 2011).

The Dahongshan Cu-Fe deposit is an important Fe and Cu resource base in China; it contains about 450 million tonnes (Mt) of Fe (metal) and more than 1.5 Mt of Cu (metal) (grade:0.3-1.2wt.%) (Fig.1), and associated with considerable amounts of Au, Ag, and Co. In recent research, this deposit was suggested to be an important part of the IOCG metallogenic province in the Kangdian region, SW China (Nie et al., 2008; Zhao et al., 2011). Although it was previously considered to be volcanogenic in origin, a model similar to VMS deposits (Qian and Shen, 1990).

This paper represents the geological features of the Dahongshan deposit, and points out its similarities and differences to typical IOCG deposits by comparison.

2 Geology of the Dahongshan Deposit

The Dahongshan Cu-Fe deposit is located about 10 km northeast of the Jiasa town and Red River Fault, occurs in the outcrop of the Dahongshan Group. The deposit consists of one Fe-Cu orebody and four Fe-oxide orebodies (Fig. 1a), which are hosted in the garnet-biotite schists and meta-tuffaceous rocks of the lower Manganghe Formation, and the meta-volcanic rocks of the upper Hongshan Formation, respectively. The orebodies are roughly congruent with stratification, and both of them are cut by dolerite and brecciated lava. "YANG Guangshu, ZHANG Junwei, WEN Hanjie, YAN Yongfeng and FENG Pengyu, 2014. Comparison of the Dahongshan Cu-Fe Deposit with Typical IOCG Deposits Worldwide. Acta Geologica Sinica (English Edition), 88(supp. 2): 399-400.

Comparison of the Dahongshan Cu-Fe Deposit with Typical IOCG Deposits Worldwide

YANG Guangshu¹, ², ZHANG Junwei¹, WEN Hanjie³, YAN Yongfeng¹ and FENG Mengyu¹

¹ Kunming University of Science and Technology, Kunming 650093, China
² Yuxi Dahongshan Mining Co., Ltd., Xinping Country 653405, Yunnan Province, China
³ Institute of Geochemistry, Chinese Academy of Science, Guiyang 550002, China

Fig. 1. Geological map of the Dahongshan Cu-Fe deposit showing the entity model of the ore bodies (a) and section map of the deposit (b) (Map b modified after Zhao et al, 2013).
numerous mafic dykes (Fig. 1b). The orebodies and host rocks are partly deformed and recrystallized, the brecciation and Na alteration are well developed at the edge of Fe-oxide ore-bodies, as well as in the faults.

3 Similarities and Differences to Typical IOCG Deposits

Table 1 shows the geological characteristics of the Dahongshan Cu-Fe deposit and typical IOCG deposits in the world. The Dahongshan deposit exhibits several similarities to the typical IOCG deposits, such as the associations of ore-forming elements, ore-controlled factors, mineral compositions alteration features and tectonic background, etc. However, the Dahongshan Cu-Fe deposit has some specific characteristics, such as the ore-body features and ore-forming mechanism. The Cu ore-bodies of Dahongshan deposit occur as bedded and lenticular in the garnet-biotite schists and meta-tuffaceous rocks, with stable occurrence and no brecciation; the mineralization can be divided into two stages, the banded ores (consist of disseminated chalcopyrite and pyrite) are formed by volcanic sedimentation in the early stage, the veined ores (consist of chalcopyrite and bornite) are formed by hydrothermal activities in the later stage.

4 Conclusion

The Dahongshan Cu-Fe deposit shows many similarities and some differences to the typical IOCG deposits, it may belong to a special type of IOCG deposit.

Acknowledgements

This work was financially supported by the National Natural Science Foundation of China (41103026) and Talent Training Foundation of Kunming University of Science and Technology (14118135).

References

