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Ore-controlling Regularities of Thrust-fold structures and features of Tectono-geochemical Anomalies at the Xiaozhuqing Exploration Area in the Huize Zn-Pb District

Gong Hongsheng, Han Runsheng*, Li Ziteng, Ren Tao and Wang Jiasheng

Faculty of Land Resources Engineering / Southwest of Geological Survey, Geological Survey Center for Non-ferrous Metals Resources, Kunming University of Science and Technology, Kunming, Yunnan 650093

1 Introduction

The huize Zn-Pb ore district in Yunnan province is located in the central southern of the Sichuan—Yunnan—Guizhou Pb-Zn Poly-metallic Mineralization Area in the southwestern margin of the Yangtze Block, and is strictly controlled by fault structures. It has developed to one of the famous production bases of lead & zinc and germanium in China.

For more than ten years, Han RS et al. (2001, 2003) achieved a series of great ore-finding breakthroughs in the depth of the Huize Zn-Pb district and its peripheral area by applying the fine tectono-geochemical exploration technology to successfully predict and find concealed ore-bodies, and found a series of steep vein rich-ore-bodies, and increased abundant Pb-Zn metal reserves. Based on the unique geological characteristics and ore-forming setting of the Huize Zn-Pb ore district, Han RS et al. (2012) newly proposed the Huize-type (HZT) Zn-Pb deposit, and established the deposit model of structural-fluid injecting mineralization. Han RS et al. (2014) further proposed the hierarchical ore-controlling system of thrust-fold structures, and put forward the studying procedures of fine tectono-geochemical exploration method. But geological works have not studied in the Xiaozhuqing exploration area in the peripheral area of the Huize ore district. Based on summarizing the hierarchical ore-controlling laws of thrust-fold structure, ore-finding target areas in the Xiaozhuqing exploration area were predicted by tectono-geochemical exploration method.

2 Geological Characteristics of the Xiaozhuqing Exploration Area

The main structure in the Xiaozhuqing exploration area is the Yinchangpo thrust-fold tectonic zone. The fault zone, which is an important part of Kuangshanchang–Jinniuchang NE-trending tectonic belt, is mainly the altered fracture zone which has the compressive-shear mechanics property. The Yinchangpo fault zone traverses the exploration area, and is divided into east part and west part fractures in central southern, and merges in the southern to form the lens-shaped plot. The fault belongs to a typical oblique-thrust fault, and the fault surface occurs in slow wave-shaped. The hanging plate of the Yinchangpo fault distributes an overturned anticline structure, and is developed strata of the Sinian, the Cambrian, the Devonian, the Carboniferous, the Permian systems in turn from fault surface to the upper plate.

3 Hierarchical Ore-controlling Laws of Thrust-fold Structure

The Kuangshanchang–Jinniuchang NE-trending tectonic belt had been controlled by the Xiaojiang fault, and controlled the position of the Huize Zn-Pb ore-field by providing links to the Xiaojiang fault and the base of the Kunyang Group. The three thrust-fold structure zones of Kuangshanchang, Qilinchang and Yinchangpo limited the deposit in the fold of its hanging wall, and provide a benefit tectonic background and hydrothermal migration channel for the mineralization. In the exploration area, the different grades of ore-controlling structures separately controlled ore district, deposit and ore-bodies.

* Corresponding author. E-mail: 554670042@qq.com.

The Yinchangpo fault controlled the Yinchangpo deposit in the exploration area, and is ore-leading structure; the NE-trending interlayer fault zones are the main ore-bearing structures, and the NW-trending faults and reversal anticline are the ore-matching structures, and the EW faults are the ore-breaking structures.

4 Characteristics of Tectono-geochemical Anomalies and Ore-finding Prognosis

The anomalies of Pb and Zn are overlapped or adjacent with the F_2 (Pb, Zn, Cd) element combinations anomalies by fine tectono-geochemical mapping. The anomalies which are located in the hanging wall of Yinchangpo fault mainly include two parts: (1) The NW part anomaly is distributed in alteration dolomites of the Dengying Fm.; (2) The SE part anomaly is distributed in the alteration dolomites of Baizuo Fm. near the turning end of anticline.

In combination with the hierarchical ore-controlling laws of thrust-fold structure, there are two favorable ore-finding targets in the Xiaozhuqing exploration area: (1) The secondary faults of in the Sinian Dengying Fm. along the fault in the hanging wall of the Yinchangpo fault; (2) NE-trending interlayer fault zones in the lower Carboniferous Baizuo Fm. and Upper Devonian Zaige Fm. which are located in the turning end of thrust anticline in the hanging wall of the Yinchangpo fault.

5 Conclusion

(1)The tectono-geochemical anomalies are basically

consistent with the favorable ore-finding targets in the Xiaozhuqing exploration area.

(2) In the hanging wall of Yinchangpo fault, the secondary fault zones in the Dengying Fm. along the fault and Baizuo Fm. near the turning end of anticline are the prospecting targets.

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