
**Metallogenic Condition, Prospecting Indicators and Prospecting Prediction of Xinghua Antimony Ore Zone in Rongjiang County, Guizhou Province**

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1 Introduction

Xinghua antimony ore zone is located to the east of Danzhai mercury-gold, antimony-gold, lead-zinc ore belt and in the south section of Leigongshan-Xinghua copper, lead, zinc, antimony metallogenic belt, in which Bameng, Huoshaozhai, Gaopai and other antimony deposits (ore spots) have been found at present (Fig. 1). Although some studies were conducted such as the typical ore deposits features (Chen et al., 2009), analysis of ore-control conditions (Fan et al., 2003; Diao et al., 2009), ore genesis (Chen et al., 2004), geochemical characteristics (Wang et al., 2004; Xiang, 2007), regularity of ore formation (Zhu et al., 1999). The Prospecting work in this area has not made great breakthrough. This paper designates two favorable prospecting targets in unexplored area by using geological-geophysical-geochemical-remote sensing data based on the summary of the known deposit mineralization law, metallogenic conditions and prospecting indicators, so as to provide certain reference for exploration work in the next.

2 Geological Background

The ore-bearing formations in the zone mainly are Pinglue formation (Pt3xjp) and Longli formation (Pt3xjl) in Xiajiang Group, Upper Proterozoic. The host rock is grayish-white and grayish-green low-grade metamorphic sandstone. The orebodies are mainly distributed in the NNE, NE and SN striking small secondary fracture zones and in joints aside these zones. The orebodies occur in lentoid and irregular vein. Ore structures include disseminated, veinlet and brecciated. The wall rock alteration mainly includes silicification, pyritization and arsenopyritization.

3 Metallogenic Conditions

3.1 Structural conditions

Xinghua antimony ore zone locates on the western margin of the South China tectonic fold belt, and the basal reverse thrust belt of Xuefeng Mountain in the fold-thrust belt at southern passive margin of Yangtze landmass. It had undergone multiple tectonic movements, with developed and complex structural phenomena. Remote
sensing interpretation for structure, hydroxyl and iron staining in scale of 1:50,000 shows that the ring structures in the zone distribute in fashion of linear and the rings connect by faults. There are several hydroxyl anomalies beside the ring structure and the north-north-east, north-east, near north-south linear structures, and the deposits (ore spots) are in good agreement with such hydroxyl anomalies. It indicates that there is a close relationship between the deposit and the structure. The developed linear and ring structures within the zone indicate that the metallogenic tectonic conditions in the studied zone are very favorable.

### 3.2 Geochemical conditions

The data statistics of geochemical survey analysis of 1:200,000 and 1:50,000 stream sediment shows that this zone is the significantly high background zone of Sb, As, and Au, whose average is 3-13 times higher than that of the surrounding areas, while Cu, Pb, Zn, Hg, Ag, W and other elements are only 1-1.5 times higher. The degree of enrichment of three elements including Sb, As, Au in this zone is 1.46-13.07, and the degree of dispersion is 14-246.1, with a highly enriched and highly discrete feature, indicating the presence of mineralization enrichment in some sections.

According to geochemical characteristics of the known deposits in the zone, the combination of elements in the Huoshaozhai ore zone includes Sb, As and Hg, and that in the Bameng zone include Sb and Hg, which is substantially consistent with the background zones showing significantly high contents of Sb, As and Au, suggesting that the geochemical conditions of antimony mineralization are good in this zone.

### 4 Prospecting Indicators

Given geological-geophysical-geochemical-remote sensing characteristics and metallogenic characteristics of the known deposits (ore spots), the antimony ore prospecting indicators mainly include lithological indicator: low-grade metamorphic sandstone; geochemical indicators: the zone with high background values containing Sb, As, Au or combination of Sb and As; structural indicators: small secondary fractures and cleavage fractures beside the north-north-east, north-east, nearly north-south main fractures; geophysical indicators: high-polarizability and low-resistivity zones; remote sensing indicators: hydroxyl anomaly concentration zones beside the intersection of the ring structure and the linear structure.

### 5 Prospecting Target Prediction

According to the above prospecting indicators, prospecting prediction has been carried out in the studied zone, of which the zones with good prospecting potential include Yagong-Yihai and Dapo (Fig.1).

Xinyue-Yihai prediction zone is to the west of Xinhua syncline and Xinhua fracture, where a series of north-east and north-north-east small fractures have been developed, metamorphic sandstone occurs, these features are similar to the Bameng antimony deposit in structure and lithology. Remote sensing interpretation indicates that this area sits in the junction of ring structure and northeast faults and with hydroxyl anomaly concentration. Tests of induced electric-medium gradient apparent chargeability and apparent resistivity show that this area is with high chargeability and low resistivity. All these features are similar to that of Bameng district. By analogy, Xinyue-Yihai prediction zone is a potential prospecting area.

Dapo prediction zone is located at the acute angle area in the intersection of the northeast striking Denian fracture and the north-north-east Baibang slip fault, in which small secondary fractures are developed. 1:25,000 geochemical soil survey shows that this zone is the high Sb and As content zone. By anomaly verification of high Sb and As concentration on spot, it is found stibnite develops in a radial pattern in quartz vein. The occurrence of stibnite is controlled by fractured space in the quartz vein. And some quartz particles are seen to be cemented by stibnite. This zone is also remote sensing hydroxyl anomaly concentration zone.

### 6 Conclusion

Comprehensive studies show that Xinyue-Yihai and Dapo prediction zones have clear prospecting indicators as well as good prospecting potential, and it is expected that new deposits (ore occurrences) will be found in these two zones.

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