Dual-source Metallogenic Mechanism: the Evidence from Magmatic Rocks in Eastern Guizhou

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1 Introduction

The Eastern Guizhou region referred in this paper included Tianzhu county, Jinping county, and Liping county of Qiandongnan Miao and Dong Autonomous Prefecture. This region covers an area of about 10000km² and is adjacent to Hunan province. Gold prospecting work still has some problems. In my opinion, the relationship between its gold deposits and magmatic rocks fails to get very good interpretation. Therefore, whether the magmatic rocks develop in the deep like those of Hunan or not is a key research subject that will make breakthroughs in gold prospecting of East Guizhou region.

2 Regional Geology

Just like Western Hunan, the study area is located in the tectonic belt of Xuefeng mountain. However, the research on the tectonic setting has different opinions. Xu et al. (1987) suggests that this area is a nappe tectonic belt, whereas Dai et al. (2010) suggests it a orogenic belt. The gold deposits occur in epimetamorphic rocks of Proterozoicer termed as the Xiajiang Group, which is made up of the metamorphic conglomerate, sandstone, silty slate, slate, phyllite, and schist, etc. The tectonic outline has unique shape. There are many NE to NNE fractures intersecting with folds of different periods by crossing angle of 20-30°. Therefore the strata are divided into several diamond-shaped bodies. In the deep, Su et al. (2006) found that three east-west tectonic belts in the adjacent area of Xiangqian area intersecting with the surface structures. There are no magmatic rocks exposed in the surface of this area, thus most studies consider that there is no relationship between the gold deposits and the magmatism in this area or the relationship is not important. But in recent years, more and more evidences indicate that concealed magmatic rocks may exit in the deep (Zhu et al., 1992).

3 Deep Prospection of Gold

3.1 Discovery of concealed magmatic rocks

In order to explore the relationship between mineralization and magmatic rocks in the study area, we have made some detailed field route reconnaissances based on detailed observation about the remote sensing maps of whole district. Finally we find magmatic dike rocks in Hu Pen gold deposit.

Hu Pen gold deposit occurs in shallow metamorphic rocks of Proterozoicer termed as the Pinglue formation and Qingshuijiang formation of Xiajiang group which is made up of the sericite chlorite slate, tuff, tuffaceous slate and blastopsammite. The vein rock intruded into the blastopsammite and thin layer palimpsest phosphorite with clear contact boundary. The attitude of stratum is 315°∠45° while the attitude of vein rock is 355°∠82°. Based on the microscopic identification and the chemeial analysis of the main and trace elements, we can definit it as intermediate-acid igneous rocks with carbonatization, chloritization, and sericitization Furthermore, continuous conductivity imaging results provided by Guizhou 104 team can be further testified in the deep that there has a big rock mass can match the remote sensing ring structures.

3.2 Relationship between magmatic rocks and gold deposits

The discovery of vein rocks can verify the correctness of the remote sensing interpretation, so we match the known gold deposits and gold geochemical anomalies with the Qiandongnan concealed orebody presumed graph (Wang et al., 2003). In space, most ore deposits are on or nearby the concealed rock mass and several gold blocks chemical abnormality concentration centers coincide exactly with the concealed rock mass positions. Lu et al.
(2011) consider that the source of ore-forming fluids may be a mixture of magmatic water and meteoric water. Where the two deep fractures (Kai Zhai-Gao Niang basement fault zone and Kai Li-Tai Jiang-Jian He-Qi Meng basement fault zone) get through, there are many gold deposits (or points) and concealed rock mass. Because of the concealed rock mass and deep fracture structure, the ore-forming materials and hydrothermal can migrate to the place where the ore deposits occur. Furthermore, the organic connection between deep structures with superficial structures lay the foundations for the mineralization.

3.3 Deep prospection of gold

The discovery of concealed magmatic rocks makes it bright to strengthen the exploration of gold in East Guizhou. No matter in space or in origin, the gold deposits in deep must have close relationship with the concealed magmatic rocks. On the other hand, because of relatively shallow denudation, gold deposits can be well preserved. So strengthen the deep prospection of gold in the future is so imminent.

References


