
**The Geochemical Characteristics and the Genesis of the Nachitai Gold Deposit**

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1 Introduction

The Nachitai Gold Deposit is in Golmud of Qinghai province, which is in the central of east section of East Kunlun, which is in East Kunlun orogenic belt (I 2), snowy peaks-the middle piece of Boolean Khan Buda Hill orogenic subzone(I 2), between the two major fault in the central Kunlun and southern Kunlun.

2 Regional Geology

The main stratum in the ore district consists of a set of metamorphic clastic rocks, volcanic and carbonate rocks of Wanbaogou group. The carbonate rock group is a group of light gray dolomite, marble banded siliceous dolomite with limestone, metasandstone sandy slate and so on. The ore district shows a set of stable sedimentary stratum, metamorphism deforming highly, various crumpled, boudin, pleated laminated and other widely developed, metamorphic grade up to greenschist facies, which is the ore bearing strata in mining area (Zhao, 2008).

Regional faults structure are well developed, ranging from the size, orientation varying. The ore body mainly occur in the nearly north-south, east-west fault and the North West, North East to the joints, fractures. The fracture plays a role in controlling of the formation of structure (Shu, Wang and Wu, 2007).

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3 Geochemical Characteristics

The 4 arsenopyrite samples in this study are all steel gray, with gray-black streak, metallic luster, opaque, and incomplete cleavage. It smells garlicky when hammered. The ΣREE of the 4 arsenopyrite samples is between 9.18–61.19×10⁻⁶, and the average value is 23.86×10⁻⁶. The LREE is between 7.82 - 52.47, with an average of 20.23, while HREE is between 1.36–8.72, with an average of 3.63. LREE/HREE is between 4.62–6.02, whose average value is 5.28. It is Significant that the light rare earth element are relatively enriched to heavy rare earth elements, which belongs to the LREE enrichment type. The value of La/Sm is between 2.53–6.95, with an average of 4.11. The value of Gd/Yb is between 2.08–3.07, with an average of 2.54. It indicates that the LREE and the HREE are both enrich, but the LREE is enricher that the HREE. δEu distributes between 1.29–1.56, which average is 1.44. So it shows a positive Eu anomaly. δCe distributes between 0.38–0.65, with an average of 0.54, which shows a negative Eu anomaly. That indicates the ore-forming environment is reducing environment. In addition, the Au grade is 12.0–28.3×10⁻⁶ in the arsenopyrite samples, which shows arsenopyrite veins is an important carrier of gold mineralization, and the ore-bearing potential is well. The carbonate rock constitutes the major source of ore mine, and it provides abundant material basis for the gold mineralization of the area.

4 Genesis of mineral Deposit

The gold mineralization of Nachitai gold deposit and faulting, magma intrusion in the process of orogeny is inseparable. People have different idea about the genesis of mineral deposit. I tend to think this deposit belongs to orogenic mesothermal hydrothermal filling gold deposits. The deposit is located in southern compound margin of Kunlun orogeny. A large number of undersea volcanic activity deposited gold metallic material in mid-late Proterozoic period, which lays the foundation of late Transforming metallicigenic. In late Variscan-indo-china period, With the subduction, collision, metamorphism, deformation being strong and thrust, strike-slip faults being developing of the Pale-
Tethys, thermal events leads to deep penetration magmatism occurred widely. The magmatic goes along the fracture emplacement carrying ore-forming fluid, metallogenic material, extracting a large number of rock minerals in surrounding rock. Because of being affected by fracture properties and host rock properties (limestone, dolomitic limestone), the ore-forming fluid goes along the ductile shear zone and limestone joint, cracks precipitation ore-forming, closely associated with arsenopyrite veins. With the evolution of fluid, temperature, pressure gradually decreases, it precipitates pyrite with weak gold mineralization, which superimposes early gold ore body, but the scale becomes smaller (Zhao, 2008).

**Acknowledgements**

This study is financially supported by the Program of National Natural Science Foundation of China (41171302) (41372093).

**References**

