Geological characteristics of the Nachatang north skarn Pb - Zn deposit in Tibet

Chenglong Dai¹ *, Wenbao Zheng², Pan Tang¹, Hao Wang¹, Shuo Shi¹

1 Chengdu University of Technology, Chengdu, Sichuan, China
2 Institute of Mineral Resources, Chinese Academy of Geological Sciences, Beijing, China

1 Introduction

It is located in the middle of the Gangdise-Nyainqentanglha plate, the first tectonic unit of the Tethyan-Himalayan tectonic domain in Tibet. According to the Mesozoic tectonic formation pattern, this mine belongs to the Jurah-Menba intracontinental rift zone in the eastern segment of the Gangdise-Nyainqentanglha tectonic belt(Yuan, et al., 2015). The Gangdese metallogenic belt in Tibet is a world-class giant copper-polymetallic mineralization belt located between the Brahmaputra and Bangong-Nujiang Belt(Wang, et al.,2005; Zhao, et al., 2011). The formation of the skarn lead-zinc deposit (contact metasomatic skarn type and stratabound skarn type) in the Gangdese metallogenic belt is closely related to the magmatic activity. The metallogenic epochs are the Mesozoic Yanshanian, the Cenozoic Himalayan and late Himalayan, stratabound skarn-type lead-zinc ore is one of the important mineralization types in the Gangdese metallogenic belt (Zhang, et al., 2013). The strata of the mine is well exposed, the tectonic background is complex, the magmatic activity is frequent, and the source material is rich, which provides the favorable geological conditions for the mineralization.

2 Geological survey of mining area

The exposed strata in the mine area are mainly the Upper Carboniferous-Lower Permian Xigu Formation (C2-P1l3) and the Quaternary Deposits (Q). The third lithologic section of Laogu Formation is mainly distributed in the middle and north of the mine. The deposits of the Quaternary are distributed in valley, gully and hillside front. The exposed magmatic rocks in the mining area are mainly Late Quaternary quartz diorite rock and brecciated granite mixed rock. The dikes are mainly granodiorite porphyry dikes, biotite granitic dikes, altered quartz diorites Porphyry veins and diabase porphyry veins. The tectonic activity in the mining area is strong, with the main development of the NW-trending fault, which has a damaging effect on the ore body; the development of a dip-down anticline and an up-down synclinal.

Author: Chenglong Dai, Chengdu University of Technology, Chengdu, Sichuan, 610059, China
Email: 837207170@qq.com
3 Geological characteristics of the deposit

3.1 Ore body characteristics

The distribution of ore bodies is closely related to the skarn distribution, mainly lead, zinc and silver deposits. Therefore, according to the distribution of skarn belts in the mining area, the skarn belts in the mining area are divided into the northern skarn zone (northern zone) and the southern skarn zone (south zone) of the mining area. The northern part of the skarn belt is mainly distributed in the third and the second sub-sections, the surface distribution is continuous, the surface is generally distributed in the northeast, is divided into five skarn belts, from west to The skarn zone of the south belt is intermittently distributed in the north-east direction. It is divided into five skarn belts, which are numbered Ⅰ, Ⅱ, Ⅲ, Ⅳ, Ⅴ, the detailed characteristics of the ore bodies in Table 1.

<table>
<thead>
<tr>
<th>Ore body number</th>
<th>Ore body type</th>
<th>Yield scale</th>
<th>Ore body morphology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ⅰ Pb - Zn ore body</td>
<td>The inclination is about 140°–190°, Inclination is about 60°–70°</td>
<td>The surface is about 1500 m in length and about 0.5–3 m in width, and is located in the south of the mining area</td>
<td>Irregular veins</td>
</tr>
<tr>
<td>Ⅱ Pb - Zn ore body</td>
<td>The inclination is about 150°–170°, Inclination is about 70°–80°</td>
<td>The surface is about 1 000 m in length and about 5–40 m in width, and is located in the southeast of the mine</td>
<td>Irregular veins</td>
</tr>
<tr>
<td>Ⅲ Pb - Zn ore body</td>
<td>The inclination is about 25°–30°, Inclination is about 70°–80°</td>
<td>The surface is about 250 m in length and 8–20 m in width, and is located in the middle of the mine</td>
<td>Irregular veins</td>
</tr>
<tr>
<td>Ⅳ Pb - Zn ore body</td>
<td>The inclination is about 190°–200°, Inclination is about 70°–80°</td>
<td>The surface is about 1000 m long and about 1–25 m wide, which is located in the middle of the mine</td>
<td>Lenticular, Irregular veins,</td>
</tr>
<tr>
<td>Ⅴ Pb - Zn ore body</td>
<td>The inclination is about 130°–170°, Inclination is about 60°–70°</td>
<td>The surface is about 50–80 m long, 1–2 m wide, located in the north east of the mining area</td>
<td>Irregular veins</td>
</tr>
</tbody>
</table>

3.2 Ore structure and mineral assemblage

Ore structure for its granular structure, it granular granular crystal structure; ore structure for the infection-like structure, uneven infection-like structure, infection-
vein-agglomerate structure, intensive infection - strip structure. Minerals are mainly pyrrhotite, sphalerite, galena, chalcopyrite, pyrite, magnetite, ilmenite, bornite and covellite. Gangue minerals are mainly garnet, diopside, wollastonite, quartz, calcite, epidote, chlorite, actinolite, vesuvianite.

### 3.3 Wall rock alteration

From the surface work and the adit of cave work, ore mineralization alteration is obvious, mineralization is mainly pyrrhotite, pyrite, sphalerite, galena mineralization, limonitization and a small amount Malachite and chalcopyrite, alteration can be seen mainly skarn, silicification, green curtain petrochemical, carbonation, marble, etc.

### References


