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Geological Characteristics of the Herenping Albite-quartz Lode Gold Deposit, Western Hunan, South China

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1 Introduction

Lode gold deposits are widespread in Precambrian low-metamorphic clastic rocks in the Xuefeng Range, western Hunan, South China (Li, 1991; Luo et al., 1996). Among them, most deposits are typified by quartz-dominant vein systems with less carbonate and sulfide minerals (less than 5%), similar to most orogenic gold deposits worldwide. However, auriferous albite-quartz veins are widely distributed in the Liulincha region, western Hunan, there albite usually accounts for about 20-40% of ore veins.

Up to now, more than 20 gold deposits/occurrences have been discovered in the Liulincha region, there almost all gold deposits occur in the Madiyi Formation, Neoproterozoic Banxi Group, and albite in ore veins is usually pink, therefore it has been mistaken as K-feldspar before 2006 (Wang et al., 2008).

The Herenping deposit, as the largest gold deposit in the Liulincha region, was initially mined at the end of the Qing Dynasty. In spite of the long-term mining, this gold deposit is poorly constrained on its geological characteristics and its ore origin.

2 Geological Characteristics of the Herenping Gold Deposit

Strata outcropped in the Herenping deposit mainly consists of the Neoproterozoic Banxi Group, including the Madiyi Formation and Wuqiangxi Formation, and the latter concordantly overlies the former. All orebodies occur in the purple-red slate of the Madiyi Formation. Magmatic activity is absent in the mining district and adjacent region.

More than 20 gold-bearing veins have been found in the Herenping mining district, the ore veins are predominantly bedded quartz-albite veins, which is generally concordant

to the host strata and locally crosscut the latter (Fig.1).

Quartz dominates vein mineralogy, but albite usually forms up to 30-40% in ore veins (Fig. 1), even locally reaches more than 60%. Carbonate and sulfides are usually less than 5% in ore veins. Pyrite, galena, sphalerite, chalcopyrite and tetrahedrite are common sulfides in the studied deposit. Visible native gold always occur in quartz and albite, especially in the border of both minerals, fine-grained gold is usually distributed in the fissure of pyrite. Noticeably, the high-grade ores with visible gold usually contains galena.

Hydraulic breccias are common throughout the Herenping deposit, revealing there existed an overpressured fluid system during gold mineralization in this deposit.

It is worthwhile that, similar albite-quartz ore veins have been also discovered in Bendigo deposit, western Australia (Lindgren, 1906), Douglas Island, Big Hurrah and Mother Land gold deposits in the United States (Read and Meinert, 1986), and those gold deposits in Porcupine, Ontario, Canada (Hurst, 1935; Keys, 1940), and gold-bearing veins in Torlesse Terrane, New Zealand (Becker, et al., 2000). Therefore, the albite-quartz lode gold deposits aren't uncommon worldwide, and more attention should be placed on this type of gold deposits in the future.

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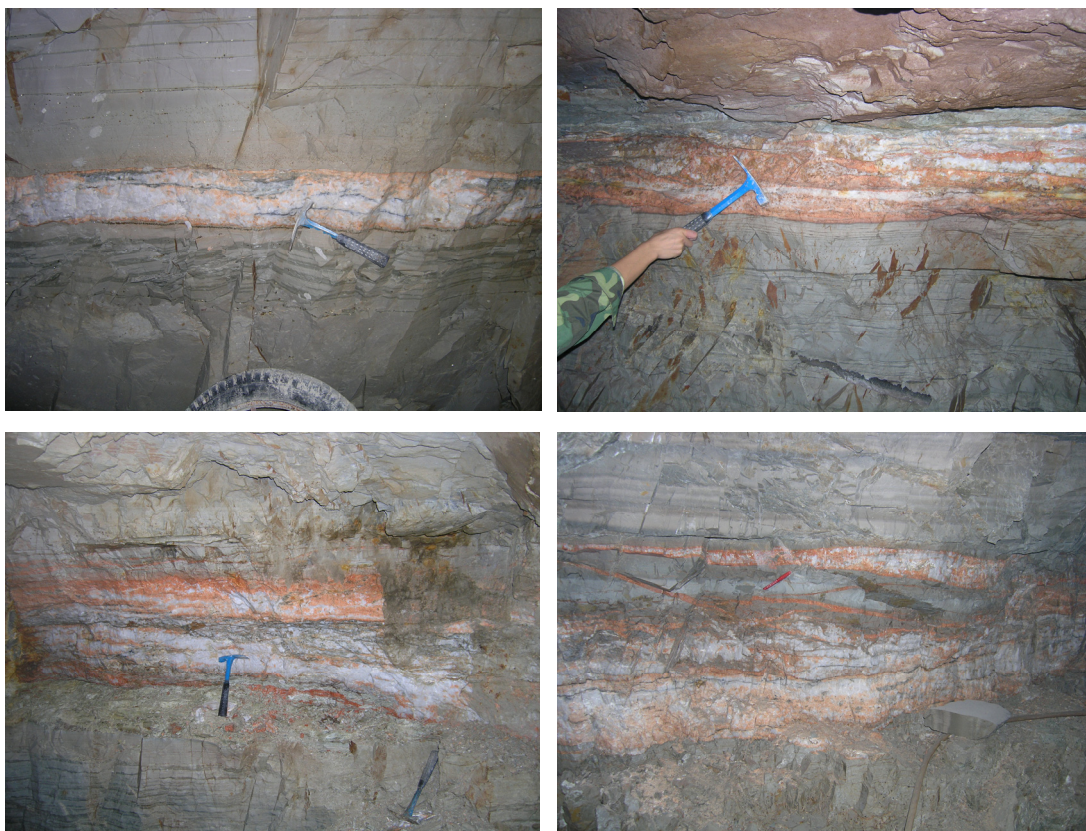


Fig. 1. The bedded and stratiform albite-quartz ore veins in the Herenping gold deposit, western Hunan

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