

SHEN Jun, HE Mouchun and DING Zhenju, 2014. Geological Characteristics and Discussion on Metallogenic Epoch of Zhengguang Gold Deposit, Heihe City, Heilongjiang Province. *Acta Geologica Sinica* (English Edition), 88(supp. 2): 599-600.

Geological Characteristics and Discussion on Metallogenic Epoch of Zhengguang Gold Deposit, Heihe City, Heilongjiang Province

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The Zhengguang gold deposit, Heihe City, Heilongjiang Province, is located in the Duobaoshan metallogenic belt in the northeastern Great Hinggan Range. The Au-bearing veins occur in the contact zone between diorite pluton and the Middle Ordovician Duobaoshan Formation, and are controlled by faults. At present, the total gold reserve, that has been proved, is 12 tons.

The deposit is discovered nearly one decade. So far, the ore-controlling structure, metallogenic regularity, ore-forming material source and characteristics of ore-forming fluids, etc. have been done by some researchers these years. However, the rock-forming and Ore-forming Age of the deposit is short of related research.

Middle Ordovician Tongshan(O_2t^3) and Duobaoshan formation(O_2d^1, O_2d^2, O_2d^3) are the main strata in the Zhengguang gold deposit mining area, and Duobaoshan formation is the important source bed of this gold deposit. The fracture in the mining area is developed and has a long-term inheritance activities characteristics. The intrusive rocks outcropped in the mine are mainly diorite and a small amount of andesite and diorite porphyrite.

Zhengguang gold deposit contains three ore body(I, II, III) and the II among them is the main ore body in the mining area, which is nated to diorite and Duobaoshan formation contact zone. The main ore body in the contact zone with the parallel to the small group of ore bodies which are strictly controlled by the contact zone and related fissure system.

Ore types are mainly of crack belt zone-hosted alteration rock, followed by gold-bearing quartz fine network vein type. Wall rock alteration related to the mineralization are mainly silicification, sericitization and pyritization, and these alteration minerals often output together in space, which composed the beresitization and

sericitization and to be the most important gold alteration type.

This deposit mineralization can be divided into hydrothermal mineralization stage and supergene stage two metallogenic period. Then hydrothermal mineralization can be divided into four stages, i.e., quartz-pyrite stage(1), quartz-polymetallic sulfide stage(2), calcite-quartz-polymetallic sulfide stage (3) and carbonate stage (4), with stages 2 and 3 as the main Au mineralization stages and characterized by complicated metallic mineral assemblage of pyrite-sphalerite-galena-chalcocopyrite $\pm$ native gold.

We use the high precision LA-ICP-MS zircon U-Pb

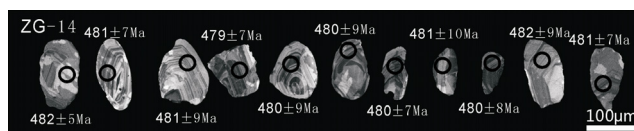


Fig. 1 Cathodoluminescence images of representative zircons from diorite(ZG-14) of the Zhengguang gold deposit

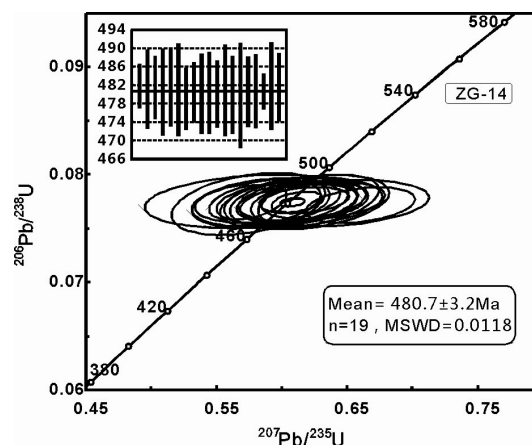


Fig. 2 LA-ICP-MS zircon U-Pb concordia diagrams for Diorite(ZG-14) from the Zhengguang gold deposit

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dating for mineralization related rock(diorite). The zircon grains have relatively low Th/U ratios of 0.21 to 0.63, possibly due to the high U content of the parental magma. All the zircons display apparent oscillatory zoning in the CL images(Fig. 1), indicating their magmatic origin. 19 analyses yield a concordant group with a weighted mean $^{206}\text{Pb}/^{238}\text{U}$ age of 480.7 ± 3.2 Ma(MSWD=0.0118) (Fig. 2), which represents the crystallization age of the diorite.

Due to it is a porphyry gold deposit and the ore body is in diorite and Duobaoshan formation contact zone, which is closely associated with mineralization, so the 480.7 ± 3.2 Ma age may represent the ore-forming age.

Acknowledgements

This research was funded by the Special Scientific Research Fund of Public Welfare Profession of China (Grant Nos.201211008) and the resource compensation of

Heilongjiang Province (Grant Nos. SDK2010-25). We appreciate the thoughtful reviews provided by Dr X. L. Hu, Prof. S.Z. Yao, and an anonymous reviewer. Y. Meng, X. Wang, G. P. Zeng are thanked for their assistance in LA-ICP-MS U-Pb dating.

Keywords: Metallogenic Epoch; U-Pb SHRIMP dating; geochemical characteristics; Zhengguang Gold Deposit

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