Study on the Metallogenic Geochronology of the Jinchanggouliang Gold Deposit in Inner Mongolia

HOU Wanrong¹, LIU Chunhua², ZHAI Yufeng³, LIU Fulin³, ZHAO Chunrong⁴ and BIAN Hongye⁴

1 The Second Gold Party of CAPF, Huhhot 010010, Inner Mongolia, China
2 The Institute of Mineral Resources, Chinese Academy of Geological Sciences, Beijing 100037, China
3 Inner Mongolia Jintao mining CO, LTD, Aohan banner 024327, Inner Mongolia, China
4 The First Gold General Party of CAPF, Harbin 150086, Heilongjiang, China

1 Geological Outline

Jinchanggouliang gold deposit is located in Jinchanggouliang town of Aohan banner, Chifeng city, Inner Mongolia, and about 160 km to the southeast from Chifeng. The tectonic setting lies in the northern margin of North China Craton (NCC) Nuluerhu mountain metallogenic belt. Jinchanggouliang gold deposit, Erdaogou gold deposit to its east, and Changgaogou gold deposit to its southwest formed a circle round Duimiangou intrusive complex, they together constituted Jinchanggouliang-Erdaogou ore-field, accumulated proved gold resource reserves is more than 50t. Among them, Jinchanggouliang gold deposit was divided into east and west mining areas, the orebodies are mainly hold within the metamorphic rocks of Xiaotazigou Formation of Neoarchean Jianping group; The orebodies of Erdaogou gold deposit to the east of it occurred in Jurassic volcanic rocks; The gold ore veins of Changgaogou gold deposit to the southwest of it hosted in Xitaizi porphyritic granite (Fig.1). The most type of it's gold ore veins is quartz-sulfide composite vein type. The length of ore veins is generally about 30~1000m, the thickness is 0.3~1.0 m, and the average grade is $7.67 \times 10^{-6} \sim 19.45 \times 10^{-6}$. The ore veins are strictly controlled by faults, distributed spatially along the faults. The ore veins strikes of Jinchanggouliang are NW, NNW and SN, the ore veins strikes of Erdaogou are NNW and EW, and the ore veins strikes of Changgaogou are SN and NNE, generally radial distributed around Duimiangou intrusive complex.

2 Metallogenic Geochronology

In order to accurate defining gold mineralization age, biotite trachyandesite porphyry dyke Sample (JCG581) were collected from the fifteen level (altitude130 m) of the first mining area in Jinchanggouliang deposit, the dykes mutual interpenetrated with No.58 gold ore vein of Jinchanggouliang. zircon separation was completed at Langfeng Keda mineral sorting technology company, cathodoluminescence images (CL) were completed with

* Corresponding author. E-mail: wanrong_01@sina.com
the electron microprobe analysis at Institute of geology Chinese Academy of geological sciences, zircon LA-ICP-MS U-Pb Dating was completed at MC-ICP-MS laboratory of Institute of mineral resources Chinese Academy of geological sciences. Th,U Contents of Zircon show a large variation, uranium contents are \((61 \sim 487.59) \times 10^{-6}\), thorium contents are \((38.92 \sim 451.92) \times 10^{-6}\), Th/U ratios are 0.57 \sim 1.66, and all more than 0.5, Which Possesses magmatic zircon characteristics. Except No.7, 10, 11, 13, 16, 17, 19, 20 measuring points, their \(^{206}\text{Pb}/^{238}\text{U} \) age values had big errors, the others twelve measuring points Constituted a good age group, their \(^{206}\text{Pb}/^{238}\text{U} \) weighted mean age is \(131.7 \pm 1.1\) Ma (MSWD=1.9) (Fig.2), which represented the biotite trachyandesite porphyry dyke crystallizing age. The dyke is mutual interpenetrated with Jinchanggouliang gold ore veins, thus the age basically constrained Jinchanggouliang gold metallic age.

Wang Jianping et al. (1992) obtained the altered whole rocks K-Ar ages from 121.71 Ma to 100.02Ma, so he concluded that gold mineralization occurred at 121.71 \sim 117.74 Ma; Zhou Naiwu (2000) based on the synthetic analysis considered that main metallogenic stage is 141.7 \sim 135.26Ma; Pang Jiangli (1999) obtained 140 \pm 2.8 Ma alteration mineral sericites \(^{40}\text{Ar}/^{39}\text{Ar} \) ages of Erdaogou gold deposit, he thinks Erdaogou gold mineralization was related to Volcanism. Those previous ages mainly were altered minerals K-Ar or Ar-Ar ages, which have large error. This time, according to dykes and ore veins intercalated relationship, through biotite trachyandesite porphyry dyke ages precise determination, Thus, it is more effective to determine the age of the main mineralization stage of the gold deposit.

**Acknowledgments**

This work was jointly supported by the Major State Basic Research Program of China (No. 2013CB429805), Geological Survey Project (No.12120113072200) and the Fundamental Research Funds for Central scientific research institutes (K1311). We sincerely appreciate the great support and assistance provided by Inner Mongolia Jintao mining Co., Ltd.

**References**