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

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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 7.67×10^{-6}～19.45×10^{-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.

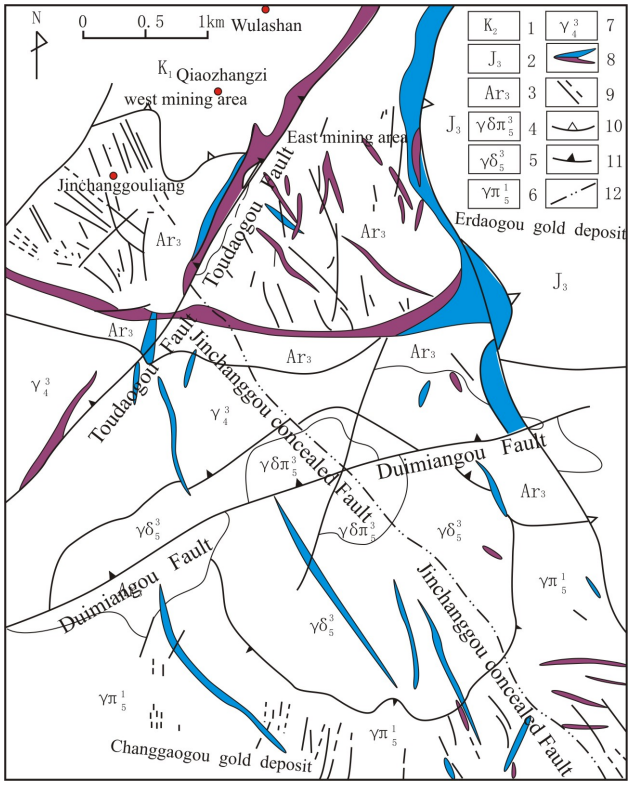

Fig. 1. The sketch geological map of the Jinchanggouliang-Erdaogou gold orefield (modified after Wang et al.,1998).
1-Early Cretaceous volcanic rocks; 2-Late Jurassic rhyolite; 3-Archeozoic Gneiss; 4-Duimiangou porphyritic granodiorite; 5-Duimiangou granodiorite; 6-Jinchanggouliang gneissic monzogranite; 7-Xitaizi porphyritic monzogranite; 8-dykes; 9-gold ore veins; 10-volcanic faulted basin; 11-faults; 12-aeromagnetic inferred faults

2 Metallogenic Geochronology

In order to accurate definiting 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 Langfang Keda mineral sorting technology company, cathodoluminescence images (CL) were completed with

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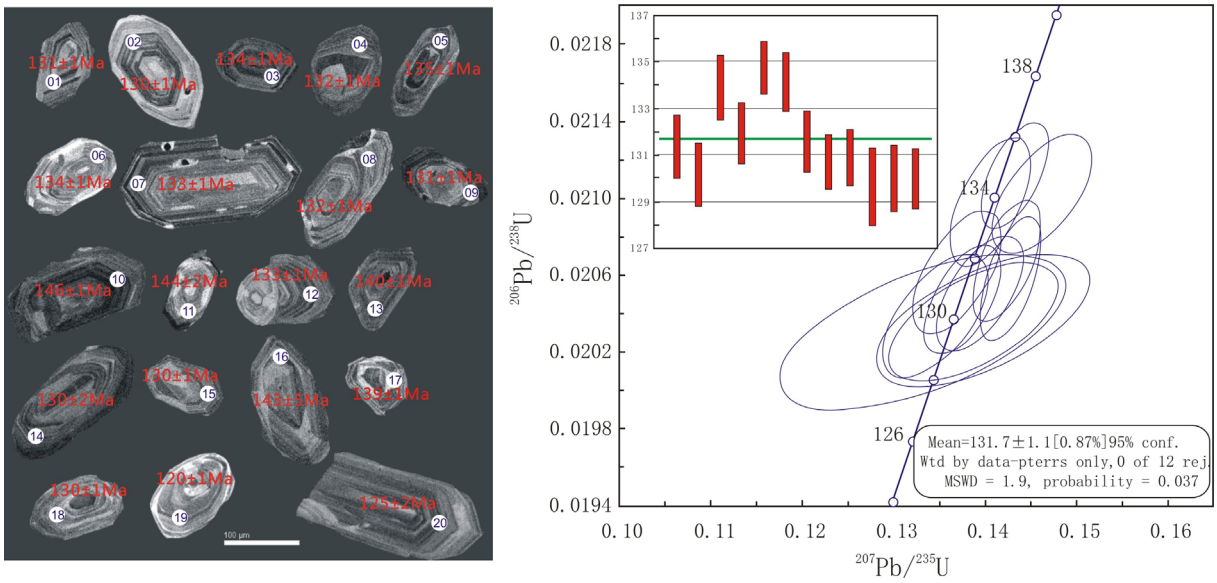

Fig. 2. CL images and Zircon U-Pb ages concordia diagram, weighted mean model age diagram of the biotite trachyandesite porphyry dyke.

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 (61～487.59) $\times 10^{-6}$, thorium contents are (38.92～451.92)$\times 10^{-6}$, Th/U ratios are 0.57～1.66, and all more than 0.5, Which Possesses magmatic zircon characteristics. Except No.7, 10, 11, 13, 16, 17, 19, 20 measuring points, their $^{206}Pb/^{238}U$ age values had big errors, the others twelve measuring points Constituted a good age group, their $^{206}Pb/^{238}U$ weighted mean age is 131.7 ± 1.1Ma (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 metallogenic age.

Wang Jianping et al.（1992）obtained the alterated whole rocks K-Ar ages from 121.71 Ma to 100.02Ma, so he concluded that gold mineralization occurred at 121.71～117.74 Ma; Zhou Naiwu (2000) based on the synthetic analysis considered that main metallogenic stage is 141.7～135.26Ma; Pang Jiangli (1999) obtained 140±2.8Ma alteration mineral sericites $^{40}Ar/^{39}Ar$ 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.

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