Zircon U-Pb Ages of Postore Dykes in Xiejiagou Gold Deposit Northwest Jiaodong Peninsula, China and its Geological Significance

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Abstract: The northwest Jiaodong peninsula is one of the largest gold ore concentration area in China, with the gold resource reserves have exceeded 4500 tons (Song, 2015). Most deposits in the area are controlled by Sanshandao, Jiaojia and Zhaoping faults. The Xiejiagou gold deposit is located in the west and footwall of the Zhaoping fault, controlled by NWW and NEE secondary faults, which is different from the deposits occurring within the Zhaoping fault such as Dayinggezhuan gdeposit, Xiadian deposit and so on. In the Xiejiagou gold deposit, the main types of orebody are pyrite-sericite-quartz altered rocks and sulfide-bearing quartz-vein type. The former orebodies are continuous but its gradeis lower than the latter type, while the continuity of the latter type is poor. Gold is present as native gold or electrum. It occurs as gold inclusions in sulfides, in intercrystalline, and in fissuresin sulfides, and closely associated with pyrite or chalcopyrite (Deng et al., 2007).

Three stages of alteration can be found though investigations of the tunnels. The first stage is potassic alteration. The disseminated potash feldspar and quartz-Kfeldspar vein occur in this stage, and mainly develops in the distal area of the orebodies. The second stage is phyllic alteration. The silicification and sericitization formed in the wallrocks of granite and overlapped the former potassic alteration. The third stage is strong silicification. Facial silicification and massive sulfide-bearing quartz veinlets formed in this stage, overlapping the first and second alteration, and enriching the early gold mineralization.

Previous studies found that the gold mineralization occurred approximately between 105–130Ma with K-Ar dating (Xin et al., 2006). Though the investigation of tunnels in Xiejiagou gold deposit, we found two kind of dikes, cutting though the mineralization and alteration bodies. The first dike is quartz diorite porphyrite, cutting through the quartz-Kfeldspar vein from the first stage alteration, and gives zircon U-Pb ages of 118.0±1.1Ma. The second dike is granodiorite, cutting through sulfide-bearing quartz veins of the third stage alteration, giveszircon U-Pb ages of 118.41±0.87Ma. Those dikes are post-ore intrusive rocks, informing that the lower limit age of mineralizationis 118Ma inthe Xiejiagou gold deposit. The gold forming in northwest area of Jiaodong peninsula mainly had completed before118Ma.

Keywords: Chronology, LA-ICP-MS, Xiejiagou, Jiaodong peninsula, Gold deposit

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