GEOCHEMISTRY AND METALLIZATION OF MYLONITE-HOSTED GOLD DEPOSIT IN SOUTHERN CHINA. H. N. Wang, J. Chen, J. F. Ji, and C. Y. Sun, Nanjing University, China (wanghn@990.net).

Introduction: Many large gold deposits have a close genetic relationship to ductile shear zones. These gold deposits can be divided into three types: 1) mylonite-hosted; 2) Crush belt-hosted; 3) Quartz vein. In recent years, the mylonite-hosted gold deposit has been found to be one of the largest gold deposits in South China.

1. Ore Deposit Geology: gold deposit is contained within a ductile shear zone. The ores occur as veins or as lenticular bodies within altered mylonite and ultramylonite host rocks. Native gold is disseminated in silicified, pyritized, and sericitized phyllo-nites. The auriferous shear zone has undergone two stages of evolution. The early stage was characterized by ductile deformation during which auriferous mylonite containing $n \times 10^6$ Au was formed. The later stage was developed in brittle-ductile and brittle environments in which magmatic hydrothermal mineralization was superimposed, resulting in local gold enrichments or auriferous quartz vein.

2. The Features of Au in Dislocation Wall

Based on the study of TEM, dense dislocations can be seen under bright field transmission. The Au-concentrated bright spots are regularly arranged in the dislocation wall. Gold deposits in ductile shear zone have an obvious cause of structural formation. During ductile shearing, large quantities of quartz which exist in a shear zone form the dynamic dislocation walls which are the important structures for Au to migrate to the shear zone and for increasing the total gold content of the shear zone.

3. Trace Element and Isotopic Geochemistry: The auriferous silicified mylonite is similar in geochemical characteristics of REE and trace elements to the country rock, which may have provided ore-forming materials for the first stage of mineralization. The chemical and isotopic characteristics of the fluid inclusions from the auriferous quartz veins indicate that the ore-forming fluid responsible for the second stage of mineralization came from meteoric water or magmatic hydrothermal. The sulfur and lead isotopes of ores reflect the fact that the ore-forming materials originated mainly from a wall-rock source.

4. Gold Enrichment by Ductile Shearing

The geological characteristics, orebody occurrences, and gold existence forms all indicate that ductile shearing leads to gold enrichment in mylonite belts. This conclusion is supported by the following observations: 1) The orebodies occur in the mylonite belts and are associated with phyllonite and ultramylonite. The occurrence of orebodies correlates directly with the occurrence of the mylonite belts. The scale of orebodies is positively proportional to the scale of the mylonite belts and the strength of shearing strain. The dip and angle of orebodies are basically consistent with those of the shear zone; 2) Native gold is disseminated in alternated mylonite ores. In polished section, native gold grains are oriented along phyllonite cleavages. 3) A large quartz sub-grain with some bright Au-concentrated area regularly arranged in the dislocation wall. 4) Regional geochemical sections show that the metamorphosed rocks and migmatite that underwent ductile shearing have a preliminary gold enrichment.