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Shedong W-Mo Deposit——a New Discovered Early Silurian Porphyry-skarn-quartz Vein Type Deposit in Cangwu County, Guangxi Province, China

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1 Introduction

Shedong W-Mo deposit, located in the southern of Dayaoshan Uplift, southwestern of Qin-Hang metallogenic belt in south China (Fig 1), is a new discovered large scale porphyry-skarn-quartz vein type deposit. The estimated reserves of WO_3 is of 80000 tons with the grade of WO_3 0.06～4.63%, Mo 0.03～0.43%.

2 Geological Characteristics of the Deposit

The stratigraphic unit of the ore deposit belongs to the Huangdongkou Formations of Cambrian, which comprises marine face flyschoid sandstone and shale, partly interlayered with limestone.

The Baoshan complex intrusive rocks consist of Early Silurian granodiorite as the principal part (LA-ICP-MS zircon U-Pb age is 435.8±1.3 Ma) and two small Late Cretaceous granite porphyries (LA-ICP-MS zircon U-Pb age is 91.05±0.31 Ma)（Chen et al., 2011）.

Early Silurian granodiorite (porphyry) dominantly exhibit low Si, K, high Na, Al, and are characterized by low REE contents, high LREE/HREE ratios, weakly Eu depletion, depletion of Ti, Nb, Ta, enrichment of Th, U, Pb, Zr, Hf, low Rb/Sr ratio(0.78), obviously enrichment of W, Mo, (Cu) (Chen et al., 2012). The rocks were I-type granite which originated as partial melts of low maturation arenite, and formed in compression tectonic setting of early collision stage in intra-continent orogenic belt.

The deposit consists of Pingtoubei and Baoshan ore zone. Pingtoubei ore zone includes II and III ore domains.

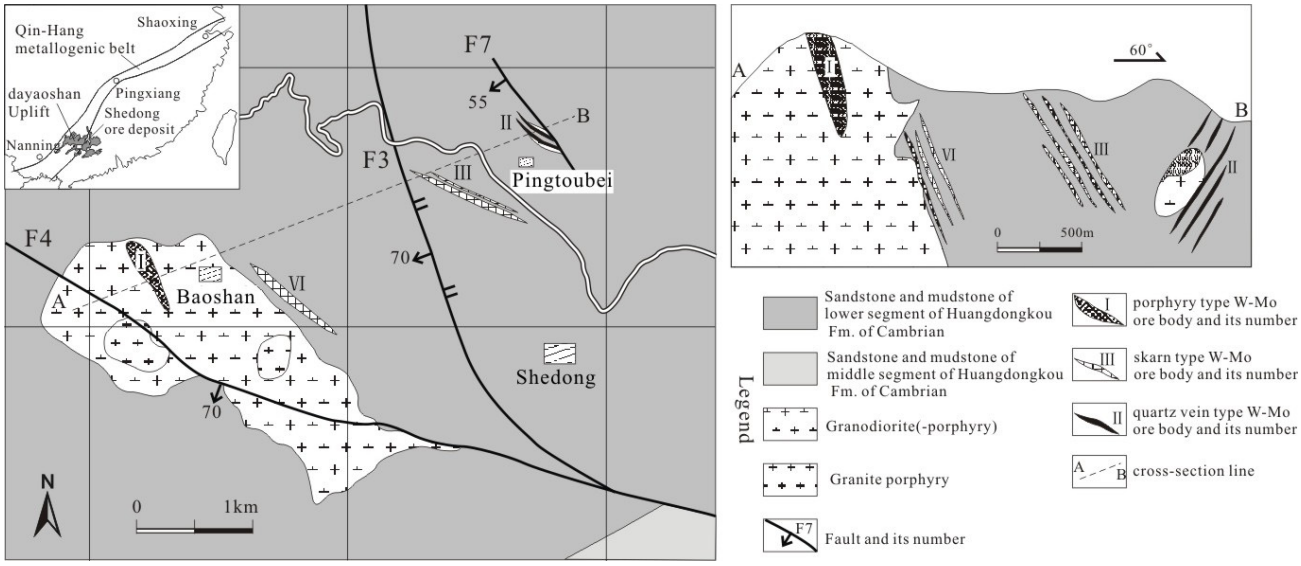

Fig. 1. Geological map（left）and simplified cross section (right) of Shedong W-Mo deposit in Cangwu,Guangxi,China.

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There are 19 scheelite-molybdenite-quartz veins and one buried porphyry ore body in deep of northwest in II ore domain. III ore domain is chiefly skarn type scheelite ore. The Re-Os isochron age of molybdenite (437.8±3.4Ma) （Chen et al., 2011） indicates the relationship between metallogenesis and Early Silurian granodiorite porphyry. Baoshan ore zone consists of I and Ⅵ ore domains. I ore domain spreads in Baoshan granodiorite, and is characteristic of porphyry type orebody, with scheelite – chalcopyrite -molybdenite filling in 0.2~2cm thick quartz veins or disseminated in granodiorite. Ⅵ ore domain locates on the external contact zone of Baoshan granodiorite and mainly have skarn type scheelite.

W and Mo mineralization are closely related with granodiorite (porphyry) temporally and spatially, and present a variety from porphyry type to skarn type, and finally quartz vein type, distributing from the interior to outerior of granodiorite.

Sulphides of ore are mainly molybdenite, pyrrhotite, chalcopyrite and pyrite. Non-metallic minerals are quartz, calcite, diopside and epidote. Wall rock alteration mainly included silicification, pyritization-sericitization-silification, sericitization and chloritization.

3 Genesis of Deposit

The mineralizing process of the quartz vein type deposit can be divided into four stages, namely ①quartz-pyrite stage, ②quartz-scheelite-molybdenite stage, ③quartz-polymetallic sulfide stage and ④quartz-calcite-fluorite stage. The second and third stages are main metallogenic stages. The homogenization temperatures from ① to ④ stage gradually decrease (550℃→370℃, 370℃→330℃, 330℃→240℃, 190℃→140℃). Instead, the density keeps increasing ($0.61g/cm^3$→$0.72g/cm^3$→$0.82g/cm^3$→$0.94g/cm^3$). The salinities (NaCl) increase from ① to ④ stage (5.86% ~ 8.55% $NaCl_{eqv}$, 4.49% ~ 43% $NaCl_{eqv}$, 0.53% ~ 46.37% $NaCl_{eqv}$, 0% ~ 12.85% $NaCl_{eqv}$) （Zhang et al., 2014）. The ore forming fluid belongs to NaCl-H_2O system, however, the composition changes during the metallogenic procedure, which is indicated by Laser Raman composition analysis. The ore-orming fluid evolved from magma, and mixed by the meteoric water later. This was implied by the isotopic composition of H-O isotopes from the quartz veins of all stages and S isotopes from sulfides (-3.8‰ ~ +1.7‰, -0.46‰ for the average). The primary reason for deposition is mixture of fluids. In a word, the ore-forming fluid of the Shedong quartz vein type deposit belongs to the NaCl-H_2O hydrothermal system with medium-high temperature, medium-low salinity, and low density. The metallogenesis is closely connected with Early Silurian magmatism.

As the first discovered large scale Early Silurian W-Mo deposit, Shedong deposit provides an example for the future prospecting of porphyry-skarn-quartz vein type W-Mo deposits related with Early Silurian granodiorite (porphyry) in Dayaoshan Uplift.

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References

Chen Maohong, Mo Cisheng, Huang Zhizhong, Li Bin and Huang Hongwei. 2011. Zircon LA-ICP-MS U-Pb ages of granitoid rocks and molybdenite Re-Os age of Shedong W-Mo deposit in Cangwu county,Guangxi and its Geological Significance. Mineral Deposits, 30(6):963-978 (in Chinese with English abstract).

Chen Maohong, Huang Zhizhong, Li Bin, Huang Hongwei. 2012. Geochemistry of granitoid rocks of Shedong W-Mo deposit district in Cangwu county, Guangxi and its relation to mineralization. Acta Petrologica Sinica, 28(1): 199-212 (in Chinese with English abstract).

Zhang Zhiqiang, Chen Maohong, Mo Jianming, Xiao Liuyang, Huang Zhizhong, Luo Jun and Ou Chaohui. 2014. Evolution and source tracing of the Shedong quartz vein type scheelite-molybdenite polymetallic deposit in Cangwu County, Guangxi. Acta Petrologica Sinica, 30(1): 281-291 (in Chinese with English abstract).