

# **The Mexican Pb, Zn and Ag Massive Sulfide Deposits in Youxi County, Central Fujian Province and Its Relationship with Paleo-rift mineralization Environment**

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## **INTRODUCTION**

Meixian deposits in Youxi county of central Fujian province are located on the compound place among the paleo-uplift of northern Fujian province, Yongmei depression of late Paleozoic era and the volcanic rifting belt of central Fujian province. In recent years, a lot of Cu, Pb, Zn and Ag deposits have been explored along the NE trend mineralization belt. And these deposits are distributed on the metamorphic basement which is window of volcanic rocks. It indicates that these metamorphic basement is closely relative with polymetal mineralization. It is proved that Mexican massive sulfide deposit was formed in continental rift environment. And just because of having the characteristics of typical massive sulfide deposit, Mexican deposits combining with the other deposit in central Fujian province are called Mexican style deposit. Due to finding and studying on this kind of deposit in this area, there will be increasing confidence on searching for prospective area of mineralization.

## **REGIONAL GEOLOGICAL SETTINGS**

Central Fujian province has experienced the history of several phases of tectono-magmatic-metallogenic evolution, which includes paleo-cratonization phase, paleo-continental rift phase and circum Pacific ocean active continental margin phase. Mineralization in central Fujian province is related with the two tectonic environment, such as paleo-rift pre-cambrian period and volcanic rifting on Cenozoic era. Paleo-rift environment pre-cambrian period provides enough heat energy and space for mineralization, and so creates favorite metallogenic settings for large and super-large scale Pb, Zn, Cu and Ag deposits, especially formed Meixian volcanic massive sulfide deposits in central Fujian province(fig.1).

The main regional stratum are metamorphic rocks pre Cambrian period and land volcanic rocks, volcanic clastic rocks and clastic sedimentary rocks. The ore controlling strata is greenschist belong to Longbeixi group of the lower Sinian system. The origin rock of greenschist is a set of volcanic sedimentary formation containing intra plate basalt. And it can be divided three members. The first member is actinolite schist, the second member is albite actinolite schist and the third member is epidosite. The boundary style between ore-bearing strata and its overlying rock is nonconformable.

The main intrusive is granite porphyrite and quartz porphyry. The metamorphic strata has experienced four phases folding deformation.

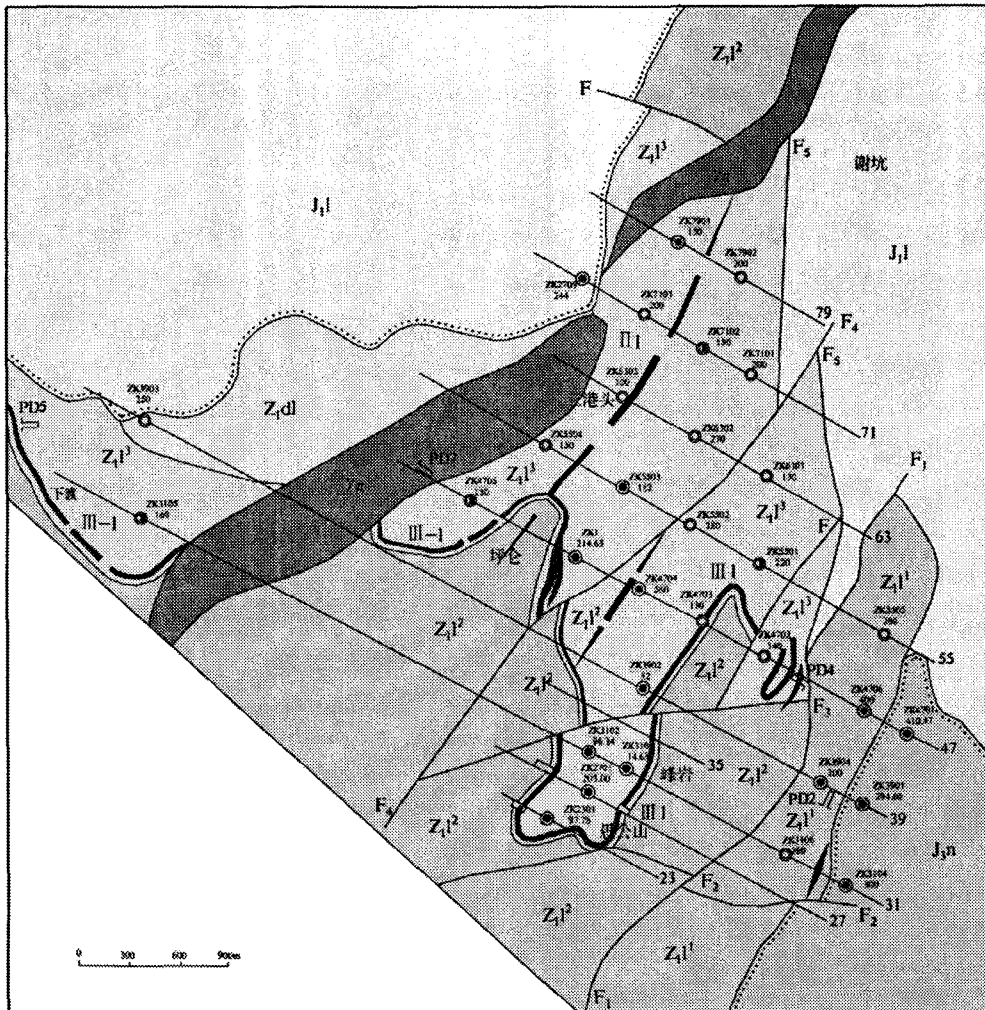


Fig.1 Sketch geological map of Meixian Pb,Zn deposits in central Fujian Province

### RIFT MINERALIZATION ENVIRONMENT

Mexican deposits are situated at the south segment of plaeo-rift of central Fujian province pre-Cambrian period. The rift zone of central Fujian province was developed at stable cratonic basement of Cathaysia. And its eastern and western boundaries are separately Zhenghe-Dapu fault zone and Pucheng-Wuping fault zone. The evolution of this rift includes phase of extension of continental crust and phase of continental collision and close of rift at Caledonian epoch. The rift sea was deep at north part and shallow at south part. At the same time, there deposited several thousand meters flysch volcanic sedimentary formation. The volcanic process is of multi-cycle and bimodal characteristics. And nearby the boundary of rift zone, there exists chaotic mélangé, thrusts, ductile shear zone and collision granite

belt. And the above evidence can prove the collision characteristics of rift zone. According to the age of S-type collision granite, it is indicated that the close time of rift is Caledonian epoch. Just because of the extension process of rift, there exists plenty of developed tensional cracks and the crust is in high heat flow condition. And it is useful to the formation volcanic hot water and then causes the appearance of massive sulfide deposits.

### **CHARACTERISTICS OF MASSIVE SULFIDE DEPOSIT**

Mexican style massive sulfide deposit is controlled by greenschist of Sinian system Longbeixi group. Ore bodies are layer-like and conform the contact rocks. The origin rock of greenschist is a set of volcanic sedimentary formation containing intra plate tholeiite. The mineral assemblage and ratio value of Zn/Pb have zonation. The layer-like ore bodies have vein-type and net vein-type mineralization and altered zones.

The main ore has clear bastobedding structure and amygdaloidal structure. Intergranular space consisted by Perthites is filled by pyroxene and chlorite. The deposit is of characteristic of strata-control. Pb and Zn mineralization is controlled by the upper member of Longbeixi group. And shape of ore-bodies is strata-like, lens-like.

Not only the structures of ore but the metamorphic rock indicate the typical mark of hot water sedimentary deposit, which is the contemporaneous fault.

The composition of greenschist minerals and sulfide minerals show characteristics of zonation. There divides three zones from bottom to top, which are epidosite actinolite schist, epidosite diopside schist and epidosite schist. And associated sulfide minerals are pyrrhotite, pyrite and chalcopyrite.

### **DEPOSIT GENESIS**

It is studied that Mexican style deposit is VMS deposit in continental rift environment. S isotope shows mantle-derived, Pb isotope shows multi-genesis. Ore-bearing solution mainly is sea water, mixing a little rain water and magmatic water.