

## **Mineralization and fluid inclusion study on Shizhuyuan skarn deposit, Hunan province, China**

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The Shizhuyuan deposit is the superlarge W-Sn-Bi-Mo deposits in the world, located 15 Km SE of Chenzhou city, Hunan Province, China, and in the contact zone between a Mesozoic granite and a Devonian limestone. The high garnet / pyroxene ratio, the hedenbergite, the diopside rich pyroxene and the andradite rich garnet show the skarn belongs to the oxidized skarn type. The mineralization consists of 4 types: stockwork Sn (Be) deposits in marble and porphyry (I); massive skarn W, & Bi ore bodies (II); stockwork greisen-skarn W, Sn, Bi & Mo ores (III); and greisen W, Sn, Mo & Bi ores (IV).

Detail fluid inclusions studies of granite, greisen, skarn and veinlets samples reveal four types of inclusions: melt and melt-fluid inclusion; aqueous inclusion, CO<sup>2</sup> inclusions and daughter mineral bearing ones. There are at least two types of fluids existed during the mineralization. The homogenization temperatures (Th) of fluid inclusions in massive skarn range from 335 to 520°C with eutectic temperatures (Te) range from -50 to -58°C. The Th of fluid inclusions in veins and veinlets range from 225 to 325°C with Te range from -28 to -18°C. Scheelite hosted inclusions homogenized between 210 to 405°C, and that for fluorite from 205 to 300°C.

Geochemical studies show the Shizhuyuan region are the W, Sn, Bi, Mo, F & Cl rich anomaly area and the mineralization are associated with Qianlishan granites by a long term magma differentiation and elements mobilization. At first, it forms the skarn and later on the ore bearing hydrothermal fluids form the W, Bi, Mo & Sn ores. Isotope studies reveal that the fluids are from magma and meteoric water. The source of ore forming elements are multiple including that from granite, the precambrian strata and the possible deep source through up the faults.