

Geochemical characteristics of the Xiaosigou Mo deposit, Liaoning province, China

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The Yanshan-western Liaoning(Yan-Liao)) area is an important metallogenic belt for Cu, Ag, Pb-Zn,Au on the northern margin of the North China Block and where more than 20 Mo (Cu) deposits have been explored by now. There are present in the northern Hebei province and western Liaoning province and are mainly porphyry types, quartz vein types and skarn types. we selected Xiaosigou (quartz vein types) to detail study.

That is located in Liaoning province. Its major molybdenite orebodies are situated at the inner of fine granite of Hongluoshan and the contact zone between fine granite and coarse granite. The wallrock alteration consists of potassium alteration, silicification, greisenization and hydromuscovite alteration in Xiaosigou deposits. Petrographic shows that aqueous two-phase inclusion is the mainly fluid inclusion type in molybdenite quartz veins and the homogenization temperatures and salinities of the inclusion in ore-forming stage range from 172 to 385°C, 3.7~15.8% NaCl equivalent, respectively. Laser Raman Spectroscopic analysis of fluid inclusions suggest that the ore-forming fluids once were of NaCl-H₂O±(CO₂) system. The hydrogen and oxygen isotopic components of typical ores indicate that the δD values of ore-forming fluids from -79‰ to -105‰ and the δ¹⁸O_{H₂O} values vary from -0.2‰ to 4.3‰, which suggested that the ore-forming fluids could be produced by mixing magmatic and meteoric water. During mineralization stages, the fluid inclusions with lower salinities underwent mixing processes with the fluid inclusion with middle salinities, which brought positive influence to molybdenite mineralization and concentrate. Comparative studies on geological features, mineralization, wallrock alteration, fluid inclusions characteristics and H, O isotope, we confirm that there are many differences between Xiaosigou and porphyry Mo deposit. The genesis is of quartz vein type Mo deposit.

Keywords: Yan-Liao metallogenic belt; Mo(Cu) deposits; fluid inclusions;