岩石学报
ACTA PETROLOGICA SINICA

吴华英,张连昌,陈志广,万博,相鹏,张晓静. 2010. 西拉木伦多金属成矿带鸡冠山斑岩钼矿富氟高盐度高氧逸度流体包裹体研究. 岩石学报, 26(5): 1363-1374

西拉木伦多金属成矿带鸡冠山斑岩钼矿富氟高盐度高氧逸度流体包裹体研究

作者	单位	E-mail
吴华英	中国科学院地质与地球物理研究所, 中国科学院矿产资源研究重点实验室, 北京 100029	wuhuaying@mail.iggcas.ac.cn
张连昌	中国科学院地质与地球物理研究所, 中国科学院矿产资源研究重点实验室, 北京 100029	
陈志广	中国科学院地质与地球物理研究所, 中国科学院矿产资源研究重点实验室, 北京 100029	
万博	中国科学院地质与地球物理研究所, 岩石圈演化国家重点实验室, 北京 100029	
相鹏	中国科学院地质与地球物理研究所, 中国科学院矿产资源研究重点实验室, 北京 100029	
张晓静	中国科学院地质与地球物理研究所, 中国科学院矿产资源研究重点实验室, 北京 100029	

基金项目：国家重点基础研究发展规划项目(2006CB403506)资助

摘要：

鸡冠山斑岩钼矿床位于西拉木伦多金属成矿带南侧、内蒙古赤峰市北东约35km处,大地构造位置属于华北板块北缘造山带中段。辉钼矿化主要呈浸染状、细脉浸染状分布在花岗斑岩中,部分成细脉浸染状分布在流纹质角砾凝灰岩中,同时,在矿区出露的辉绿岩和流纹岩中也有少量的细网脉状钼矿化。矿石矿物主要有辉钼矿、黄铁矿和少量黄铜矿、闪锌矿、磁铁矿,脉石矿物主要有石英、长石、绢云母和少量方解石、萤石。矿脉穿插关系和矿物组合显示了早、中、晚3个阶段的矿化: (1)石英-辉钼矿阶段; (2)萤石-(石英)-辉钼矿多金属硫化物阶段; (3)贫矿萤石阶段。各阶段广泛发育流体包裹体,包裹体类型众多,包括气液两相水溶液包裹体(W型),H_2O-CO_2包裹体(C型)及含子矿物多相包裹体(S型),其中以大量发育含子矿物多相包裹体为特征。子矿物种类有石盐、钾盐、赤铁矿、石膏、辉钼矿、方解石等及其他未鉴别透明、不透明子矿物,有时一个包裹体含有多达4~5个子矿物。包裹体大量的赤铁矿、石膏和金属子矿物的出现,说明含矿流体具有高的氧逸度和很强的金属携带能力。包裹体岩相学、激光拉曼和显微测温结果表明,成矿流体主要为来自高温、高盐度、高氧逸度的岩浆流体和部分天水与岩浆热液混合所形成的中低温、低盐度流体两个端员组份。高温、高盐度流体以含子矿物多相包裹体为代表,其形成温度大于440℃,盐度变化范围为: 28%~76% NaCleqv,部分高于76% NaCleqv。中低温、低盐度流体主要源自矿化后期天水与岩浆热液的混合,温度在322℃以下,盐度变化范围为: 0.9%~20.3% NaCleqv。实验结果表明鸡冠山矿区含矿硫化物主要沉淀温度区间在310~400℃之间,其次为210~320℃,钼矿化主要形成于高温、高盐度、高氧逸度及富氟元素的H_2O-NaCl流体体系,温度降低、流体沸腾作用及流体混合是该钼矿床的主要成矿机制。

英文摘要：

Jiguanshan porphyry molybdenum deposit in the southern part of Xilamulun metallogenic belt, located NE 35km of Chifeng City, tectonically belonged to the northern marginal orogen of North China Block. Molybdenum mineralization is disseminated in the granite porphyry, and is partly developed in the rhyolitic breccia-bearing tuff, rhyolite and diabase occurring as stockwork. Ore minerals in the deposit are mainly molybdenite and pyrite with minor chalcopyrite, sphalerite and magnetite. The gangue minerals in the ores are predominately quartz, feldspar and sericite with minor amounts of calcite and fluorite. Mineral assemblage and crosscutting relationship of the stockworks suggest the ore-forming process may include three stages corresponding to three mineralization-related veins: (1) Quartz-molybdenite veins; (2) Fluorite-(Quartz)-molybdenite polymetallic sulfide veins; (3) Barren fluorite veins. The mineralization-related veins contained abundant various fluid inclusions including aqueous water (W-type), H_2O-CO_2 (C-type) and daughter mineral-bearing inclusions (S-type). The S-type inclusions are prominent, in which abundant daughter minerals including halite, sylvite, hematite, anhydrite, molybdenite, calcite and some other unknown minerals are contained, and sometimes a single inclusion may contain as much as 4~5 daughter minerals. The presence of hematite, anhydrite and molybdenite indicates that the ore-bearing fluid is high in oxygen fugacity and has strong capacity of carrying the metals. Petrography, laser Raman and microthermometry analysis on inclusions show that the ore-bearing fluid consists of high-temperature, hypersaline and high-oxygen fugacity fluids with magmatic origin and medium-low temperature, low salinity ones derived from the mixing of the meteoric water with magmatic hydrothermal fluids. The high-temperature and hypersaline fluids are characterized by containing S-type inclusions with the forming temperature of over 440℃ and salinity of 28%~76% NaCleqv, and some of the inclusions may have a salinity over 76% NaCleqv. While the medium-low temperature, low salinity fluid have a salinity of 0.9%~20.3% NaCleqv with a forming temperature of 322℃. Our study show that the precipitation of the metal sulfides mainly occurred at temperature of 310 to 400℃ secondly for the temperature of 210 to 320℃. The Jiguanshan deposit is related to the high-temperature, hypersaline and high-oxygen fugacity H_2O-NaCl fluid system rich in F element and the molybdenum mineralization should be triggered by the temperature dropping, fluid boiling and mixing.

关键词：流体包裹体 沸腾作用 流体混合 斑岩钼矿 高氧逸度流体 西拉木伦多金属成矿带

投稿时间： 2010-03-01 最后修改时间： 2010-04-25