岩石学报
ACTA PETROLOGICA SINICA

魏浩,徐九华,曾庆栋,王燕海,刘建明,褚少雄. 2011. 黑龙江多宝山斑岩铜(钼)矿床蚀变-矿化阶段及其流体演化. 岩石学报, 27(5): 1361-1374

黑龙江多宝山斑岩铜(钼)矿床蚀变-矿化阶段及其流体演化

作者	单位	E-mail
魏浩	北京科技大学资源工程系, 北京 100083	
徐九华	北京科技大学资源工程系, 北京 100083	jiuhuaxu@ces.ustb.edu.cn
曾庆栋	中国科学院地质与地球物理研究所,北京 100029	
王燕海	北京科技大学资源工程系, 北京 100083	
刘建明	中国科学院地质与地球物理研究所,北京 100029	
褚少雄	中国科学院地质与地球物理研究所,北京 100029;中国科学院研究生院,北京 100039	

基金项目：本文受全国危机矿山找矿资源专项综合研究项目(20089931)、国家自然科学基金项目(40972066)和中国科学院地质与地球物理研究所开放基金项目联合资助.

摘要：

黑龙江多宝山斑岩铜(钼)矿床是大兴安岭中北部多宝山-阿尔山铜(钼)成矿带内最大的斑岩型矿床,位于兴蒙造山带的最东端。矿床赋存于花岗闪长岩及多宝山组下部地层中。据野外脉体类型和穿插关系、围岩蚀变类型、矿物组合,将多宝山斑岩铜(钼)矿床的蚀变和矿化自早至晚划分为4个阶段:Ⅰ钾硅化阶段;Ⅱ 硅化-钼矿化阶段;Ⅲ绢英岩化-铜矿化阶段;Ⅳ碳酸盐石英阶段。石英中包裹体类型主要有水溶液包裹体、富CO_2包裹体、含子晶多相包裹体、纯CO_2包裹体。成矿流体从早阶段到晚阶段具有规律性演化特征:钾硅化阶段发育水溶液包裹体、富CO_2包裹体,盐度集中在6%~10% NaCleqv,密度0.5~0.9g•cm^{-3},均一温度峰值为245~400℃;硅化-钼矿化阶段发育水溶液包裹体、富CO_2包裹体、含子晶多相包裹体均一温度峰值为260~300℃,盐度1.7%~39% NaCleqv,密度0.3~1.1g•cm^{-3};绢英岩化-铜矿化阶段发育水溶液包裹体、富CO_2包裹体,均一温度峰值220~280℃,盐度0.1%~24.8% NaCleqv,峰值集中在6%~12%,密度0.5~1.0g•cm^{-3};碳酸盐阶段仅发育水溶液包裹体包裹体,均一温度峰值为125~170℃,盐度0.5%~12.8% NaCleqv,密度0.8~0.9g•cm^{-3}。激光拉曼探针分析结果表明成分主要为H_2O和CO_2。本文对多宝山矿床主成矿期压力进行了估算,Ⅰ、Ⅱ、Ⅲ阶段捕获压力分别为110~160MPa、58~80MPa、8~17MPa。测温实验结合野外现象及包裹体岩相学表明多宝山斑岩铜(钼)矿床是一个复杂的构造-岩浆成矿系统,与成矿有关的热流体不是单一的岩浆分异的结果,构造裂隙系统也为含矿流体提供了很好的导矿与容矿空间,矿床沉淀机制为温度压力的变化及空间的开放导致流体不混溶与沸腾作用,不同流体的混合、水岩反应致使流体pH值、成分发生变化,从而导致铜、钼的矿化。

英文摘要：

The Duobaoshan porphyry Cu (Mo) deposit, located in the eastern part of Xingmeng orogenic belt, is the largest porphyry deposit in the Duobaoshan-Aershan metallogenic belt on the central and northern of Daxinganling. The orebodies are mainly hosted in granodiorite and the lower strata of Duobaoshan Formation. According to the vein types and their crosscutting relationships, wallrock alterations, mineral assemblages, alteration and mineralization of the Duobaoshan porphyry Cu (Mo) deposit can be divided into four stages from early to late stage: Ⅰ Potassium silicification stage; Ⅱ silicification-molybdenum mineralizing stage; Ⅲ phyllic-copper mineralizing stage; and Ⅳ carbonate-quartz stage. Fluid inclusions in quartz can be identified as aqueous water, CO_2-rich, daughter mineral-bearing and, pure CO_2 inclusions. Ore-forming fluids evolved with the regularity from early stage to late stage. Fluid inclusions in potassium silicification stage are characterized by aqueous water, CO_2-rich and pure CO_2 inclusions, with homogenization temperatures of 245~400℃, salinities of 6%~10% NaCleqv, and densities of 0.5~0.9g•cm^{-3}. In silicification-molybdenum mineralizing stage, fluid incusions are mainly aqueous water, CO_2-H_2O, daughter mineral-bearing, with peak homogenization temperatures of 260~300℃, salinities of 1.7%~39% NaCleqv, and densities of 0.3~1.1g•cm^{-3}. Fluid inclusions phyllic-copper mineralizing stage are much more complex, characterized by aqueous water, CO_2-H_2O with peak homogenization temperatures of 220~280℃, salinities of 0.1%~24.8% NaCleqv, and densities of 0.5~1.0g•cm^{-3}. In carbonate-quartz stage, fluid inclusios are simply aqueous water, with homogenization temperatures of 125~170℃, salinities of 0.5%~12.8% NaCleqv, and densities of 0.8~0.9g•cm^{-3}, Laster Raman spectroscopic analysis indicate that components of fliud inclusions are mainly H_2O and CO_2. In this paper, trapping pressures of fluid inclusions are estimated to be 110~160MPa, 58~80MPa, and 8~17MPa for stage I, II and III. Microthermomatic with the phenomenon of field and inclusion petrography indicate: Duobaoshan porphyry Cu (Mo) deposit is a complex tectonic-magmatic ore-forming system with thermal fluids from different sources; tectonic fracture system provided a good space for ore-forming fluids to migrate and precipitate. Boiling and Immiscibility of fluids caused by changes in temperature, pressure and open space, mixture of different fluids,changes in composition and pH resulted by water-rock interaction are main minerogene

sis mechanism of Duobaoshan porphyry Cu (Mo) deposit.

关键词：流体包裹体 成矿阶段 成矿机制 多宝山斑岩铜(钼)矿床

投稿时间： 2010-11-12 最后修改时间： 2011-03-24