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德兴铜厂斑岩型铜金矿床热液演化过程

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摘要：

德兴铜矿是中国东部大陆环境最具代表性的大型斑岩铜矿，由朱砂红、铜厂及富家坞三大矿床组成，其中
在前人研究基础上，本文通过系统的野外观测、详细的岩芯编录和全面的岩相学研究，厘定了铜厂矿床的脉体类
类脉体的流体包裹体研究，查明了成矿流体的演化过程，再塑了岩浆 热液矿化过程。初步识别出德兴矿床3组
阶段的蚀变 成矿过程：早期A脉分为4类，形成于成矿早期斑岩尚未固结时，伴有大规模的钾化和黑云母化甚至
形成于斑岩体固结后的大规模裂隙事件发育期，B脉石英呈梳状对称生长、黄铁矿以中心线生长；后期D脉共有3
量加入和硫化物大量淀积产物。观察发现，所有A、B及D脉沉淀过程中，均伴随大量的岩浆流体出溶、热液蚀变
捕获了同体系内富含的热液流体。详细显微镜鉴定表明，各类脉体的脉石矿物石英内发育的大部分包裹体与世界
似，从成矿早期A脉到成矿晚期D脉包裹体的类型发生如下变化：早期以LVH(含单子晶或多子晶包裹体发育，包裹
包裹体为主→中期以含单子晶包裹体+富气相包裹体为主，以及含有少量富液相包裹体→成矿晚期，以富液相包
显微测温结果总体上指示了温度、压力及热液成分在各类脉体的形成过程的变化规律，从早期到晚期温度和盐度
历三个阶段：早期岩浆未完全固结，温度达到800~600℃以上，压力较高（140～50MPa），发生强烈的钾硅酸盐
岩体顶部围岩裂隙发育，静岩压力向静水压力发生转换，温度下降到450～550℃，压力陡然从55～40MPa下降至
生大规模绿泥石 水云母化，温度下降至350～375℃，压力完全降低至20MPa以下；最后，与成矿作用无关的热
20～300℃和180～200℃，形成了无矿碳酸盐脉、石英脉及黑云母。 在成矿过程中，成矿热液也从形成A/B脉时
时以雨水、地下水为主。与世界典型斑岩型铜矿床相比，德兴斑岩铜矿床的蚀变 矿化系统基本一致，都由强
—泥岩蚀变带等构成，在不同的蚀变阶段形成了具有特色的不规则形状A脉、脉石矿物梳状对称的B脉及粗颗粒
矿阶段内主要成矿流体特征及其演化过程基本类似于世界典型斑岩矿床。但是，也存在不同之处，在铜厂铜金矿
包裹体，表明德兴铜厂成矿过程中CO 2参与成矿作用，世界其它斑岩型矿床或没有报道发育 CO 2 包裹体（
某个阶段发现了少量CO 2包裹体（Harris et al., 2004）。CO 2包裹体参与成矿是否有特殊指示意义，须进
论。

关键词：德兴铜厂 矿化体系 热液脉 流体包裹体 显微测温

Evolution of Hydrothermal Fluid of Dexing Tongchang Copper gold Porphyry Deposit

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Fund Project:

Abstract:

Dexing copper deposit, known for rich gold, is the most typical continental porphyry deposi
on systematic field observation of whole ore body and cataloging of core rock, alteration minera
Tongchang porphyry copper gold deposit is clearly studid to Distinguish the order of mineral vei
the microthermometere of fluid inclusions in the veins in this paper. According to the behavior o
different mineralization stages and the result of microthermometer, the characteristics of ore f
mineralization system of Dexing Tongchang porphyry copper gold deposit are completely recognized.
copper gold deposit was formed by multi stages of alteration and mineralizaiton from early to t
the four A type veins were formd when the porphyry rock is not completely solidified so that the
unclearly bordered with wall rock or porphyry rock and large scale of K feldspar alteration, bi
magnetitization. In the middle stage, the seven B type veins where symmetrical pectinate quartzs
the vein wall and metal minerals are as their centerline, were largely formed when most of the or
chalcopyrite, molybdenite, bornite and so on were formed contemporaneously. At the post minerliz
veins with or without alterated Hydromica halo and the lastest hypothermal carbnate quartz veins
fromed when the mineralizaiton system was opened and meteoric water and undergrand water infused
Mineralization and alteration system of Dexing Tongchang copper gold deposit is similar to that
deposit, showing that A type Veins and K silicification occurred on the boundary between wallro
B and D veins and propylitization occurred outspreading along the wallrock and granodiorite p
boundary, and the latest carbonate, quartz and biotite veins and argillization were spliced above
propylitization belt. Fluid inclusions of differt veins varied with the ore forming process that
or moe daugther metal mineral or transparent minerals are contained in the fluid inclusions)and V
volume) types of inclusion in the early A type veins, lots of LVH and VL and little of LV fluid
veins at middle stages, and VL and LV (less than or equal to 50% vaper in volume) fluid inclusion
veins. The behavior fluind inclusions in the temperature mearsuring process and the result of mi
to evalute the conditions of different mineralization stages. In the early stage, when porphyry m
A type veins are formed at the 600～800℃ and 120～50MPa or even above them; at the middle stage,

formed when the static rock pressure (55MPa) transferred to the static water pressure (20MPa); an
temperature and pressure totally decrease to 350～375℃. After the mineralization of Tongchang de
activation without mineralization overprinted on the former mineralization veins, respectively un
200℃. The hydrothermal fluid varied from magma fluid as A and B veins fromed to meteoric wat
type veins were formed. However, there are CO 2 bearing fluid inclusions hosted in Dexing T
deposit, which are never found in other porphyry deposits, or only little in one ore forming sta