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构造应力环境对浅成岩体成矿系统的制约:从安庆月山岩体冷却过程动力学计算模拟结果分析

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摘要：

为探讨构造应力环境对浅成岩体成矿系统的制约,以安庆地区的月山岩体及其所形成的安庆铜矿床为例,在传统地质调查研究的基础上,通过假设不同的力学边界条件进行岩体冷却过程动力学的计算模拟实验研究。计算结果显示,在没有构造应力作用时,在岩体的接触带上不可能形成有利成矿定位的局部汇流扩容空间,挤压和拉伸作用都能够在岩体接触带形成局部汇流扩容空间,但二者的空间分布规律有着极大的差别,只有拉伸构造应力作用下的动力学计算模拟实验能在已发现矿体部位形成汇流扩容空间,表明构造应力环境对成矿定位的汇流空间的制约以及拉伸构造应力作用对月山岩体成矿的重要贡献。在拉伸构造应力和无构造应力作用时,接触带上的流体压力都是随着变形的进程而趋降低的,只有在挤压构造应力作用下,流体压力才会有一个超压的过程,流体超压是形成斑岩型矿床的重要机制。可见挤压环境才是一种有利于斑岩型矿床成矿的构造环境,铜陵-安庆地区缺乏与矽卡岩矿床相对应的斑岩型矿床主要原因之一是成矿时处于一种拉伸的构造应力作用环境。

英文摘要：

For revealing the constraints of the tectonic stress regime on the mineralization system related to hypabyssal intrusion, the Yueshan intrusion and its related Anqing copper deposit are studied by computational modeling experiments on geodynamics of intrusion’s cooling process in different tectonic stress regimes, based on the common geological studies. The computational results show some important implications for the metallogenic genesis. When models subjected to non tectonic deformation, no dilation zones occur along the intrusion contact. When the models subjected to stretching deformation or shorting deformation, the dilation zones occur but in different patterns and only the dilation zone pattern produced in the models subjected to stretching deformation can explain the distribution of the existing ore bodies. It is demonstrated that the local flow-focus dilation zones along the intrusion contact, favorable for formation and localization of skarn ore bodies, are critically controlled by the tectonic stress regime, and the tensional stress regime might have played an important role in the mineralization system related to the Yueshan intrusion. When modeling in the regime of non tectonic stress or tensional stress, the fluid pressure in the contact zone must trend to decrease during the processes, but when the modeling is in the compressive stress regime, the fluid in the contact zone may become overpressure, that is favorable for porphyry mineralization, suggesting that the compressive stress regime is favorable for porphyry mineralization. The main reason for the lack of porphyry copper deposits related to the hypabyssal intrusions in the Tongling-Anqing district is that the crust in this district was under stretching setting when the hypabyssal intrusion-related mineralization took place.

关键词：构造应力环境 浅成岩体成矿系统 成矿动力学计算模拟 流体超压 月山岩体

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