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五凤浅成热液金矿床地质特征及成矿机理研究

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中文摘要:五凤金矿床是中生代陆相火山环境中的浅成热液型矿床。共典型的蚀变矿物包括绢云母、冰长石、玉髓、蛋白石、浊沸石、水自云母和蒙脱石。流体包裹体研究表明，成矿温度集中于200～240℃，含盐度很低(1.0 wt%～1.5 wt%NaCl)，成矿压力为4.0×10^7～6.8×10^7 Pa, 流体由偏碱性向弱碱性演化；稳定同位素研究结果为，δD = - 66‰～-98‰, $\delta^{18}O_{H2O}$ = -3.2‰～ -7.2‰，$\delta^{34}S$ =1.0‰～2.6‰，$\delta^{13}C$ = - 6.9‰～- 9.4‰。由此推断成矿流体为天水成因的地热水，矿质来自深源。它完全可以同世界上典型的浅成热液贵金属矿床相类比。

中文关键词:浅成热液 地热水 流体包裹体 成矿流体

Geological Characteristics And Metallogenic Mechanism Of The Wufeng Epithermal Gold Deposit,Jilin Province

Abstract: The Wufeng gold deposit is hosted by Upper Jurassic volcanic rocks and hence has been regarded as a volcanic hydrothermal deposit since 1960's. Nevertheless, systematic studies of its geological setting, alteration, fluid inclusions and stable isotopes have led the authors to believe that the deposit is actually a typical epithermal deposit formed in a continental volcanic environment. Typical altered minerals include sericite, adularia, zeolite, hydromuscovite, montmorillonite and opal; orebodies assuming veinlike forms fill shatter zones or stockwork fissure systems, auriferous veins are mainly developed in the phyllic zone and the quartz-adularia-zeolite zone. Fluid inclusion analyses show that hydrothermal fluids were under the condition of low temperature (mainly 200~ 240℃) and low salinity (chiefly 1.0 wt%～1.5 wt% NaCl) and in an alkali environment, belonging to K^+—Na^+—SO_4^{2-}—Cl^- system. The inverse correlation between Tm and Th implies that ore-bearing fluids once boiled during the precipitation of ore materials.

Stable isotope analysis has yielded the following data: δD = - 66‰～-98‰, $\delta^{18}O_{H2O}$ = -3.2‰～ -7.2‰，$\delta^{34}S$ =1.0‰～2.6‰，$\delta^{13}C$ = - 6.9‰～- 9.4‰, suggesting that ore-bearing fluids were meteoric waters circulating at depth, and sulfur and carbon were derived from surrounding volcanic rocks. In a word, the ore-forming system of the Wufeng gold deposit is similar to modern geothermal system.

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