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云南维西大宝山铜矿PGE和微量元素地球化学特征及其成因意义

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摘要:

大宝山铜矿是青藏高原东南缘哀牢山-金沙江构造带西北部雪龙山成矿带中典型的浅成中低温热液型铜矿床。矿石和围岩的PGE和微量元素地球化学分析结果表明从围岩、矿化围岩到矿石: 1)  $\Sigma$ PGE、 $\delta$ Rh逐渐增加, PPGE/IPGE、Pd/Ir、Pt/Ir和 $\delta$ Pt逐渐降低。在铂族元素原始地幔标准化图解上, 岩、矿石中Os、Ir、Ru和Pd具有相似的演化趋势, 而矿石Rh正异常、Pt负异常明显不同于围岩。在 $\delta$ Rh-Cu和 $\Sigma$ PGE-Cu关系图上, Cu含量与 $\delta$ Rh和 $\Sigma$ PGE呈明显的正相关关系, 而在 $\delta$ Pt-Cu关系图上表现为明显的负相关关系; 2) 稀土总量、轻/重稀土比值、 $\delta$ Ce渐减小, Eu和Nb、Ta、Sr、Hf、Zr的亏损程度逐渐增大, 矿石中大离子亲石元素存在不规律性的变化。这些特征揭示出大宝山铜矿矿石与围岩在PGE和微量元素地球化学特征上存在明显的差异。结合矿区内矿体呈脉状、受顺糜棱面理发育的脆韧性构造破碎带控制, 围岩蚀变强度较弱、规模小和矿区内新生代同构造岩浆岩脉发育, 以及主要矿石矿物 $\delta^{34}\text{S}$ 值主要集中在+1.3‰~-5.2‰之间, 部分落在-8.2‰~-12.8‰范围的特点, 说明大宝山铜矿中的成矿物质主要来源于新生代岩浆期后热液, 围岩的贡献很小。大宝山铜矿与矿区内新生代同构造岩浆岩脉同为雪山韧性剪切带隆升过程中形成的产物, 岩浆分异产生的含矿流体在上升过程中与地下流体混合导致物理化学条件发生明显的改变, 促使成矿物质沿构造破碎带晶出形成矿脉。

英文摘要:

Dabaoshan copper deposit is a typical epithermal deposit in Xuelongshan metallogenic belt, northwestern part Ailaoshan-Jinshajiang tectonic zone. The geochemical data of PGE and trace elements for ore and wall-rock show: 1)  $\Sigma$ PGE and  $\delta$ Rh are increasing, the ratios of PPGE/IPGE, Pd/Ir, Pt/Ir and  $\delta$ Pt are decreasing gradually from wall-rock mineralized wall-rock to ore. In primitive mantle normalized PGE pattern, the Os, Ir, Ru and Pd have the similar evolution features, but Rh with positive anomalies and Pt with negative anomalies in the ore are different from that in the all-rocks. The contents of Cu are positive correlation with  $\delta$ Rh and  $\Sigma$ PGE, and negative correlation with  $\delta$ Pt. 2)  $\Sigma$ REE, REE/HREE and  $\delta$ Ce are decreasing, and the depleted degrees of Eu, Nb, Ta, Sr, Hf and Zr are increasing gradually from wall-rock to mineralized wall-rock to ore. Which shows that the PGE and trace elements in the ore are different from that in wall-rocks. The fact that the vein orebodies, weakly alteration and developed syntectonic magmatic veins, and  $\delta^{34}\text{S}$  values of sulfides from ore (located mainly in +1.3‰~-5.2‰, and little in -8.2‰~-12.8‰), shows the ore-forming elements derived main from the Cenozoic magmatic liquid, and little from the wall-rocks. Both Dabaoshan copper deposit and the syntectonic magmatic veins are the products of tectonic movement in the uplift period of Xuelongshan ductile deformation zone in Cenozoic. During the ore-bearing fluid formed by magmatic differentiation mixed with underground fluid, the ore veins along faults were formed for the change of physical and chemical conditions.

关键词: [铂族元素](#) [微量元素](#) [大宝山铜矿](#) [雪龙山构造带](#) [维西](#)

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