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黑龙江三道湾子金矿Au-Ag-Te系列矿物特征及其成矿流体

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摘要：

本文采用光学显微镜、扫描电镜和电子探针对黑龙江省三道湾子金矿中Au-Ag-Te系列矿物碲银矿、碲金银矿、针碲金银矿、斜方碲金矿和碲金矿进行了详细的矿物学研究,本次研究还发现Au_2Te的存在。碲化物矿物多呈粒状或脉状分布于石英或硫化物矿物的裂隙中。Au-Ag-Te系列矿物中,Au含量与Ag含量呈负相关性,与Te含量呈弱的负相关性。结合Au-Ag-Te成分共生图解及镜下特征对金银碲化物矿物共生组合进行分析表明Te优先与Ag 结合形成碲银矿或碲金银矿,只有成矿流体中Ag被大量消耗后,Te才与Au结合形成针碲金银矿、斜方碲金矿、碲金矿,最后当成矿流体中Te也被大量消耗后,Au才会形成自然金。氦、氩同位素研究表明石英—黄铁矿阶段流体包裹体中$^3He/^4He$值为0.01~0.03Ra,金银碲化物阶段$^3He/^4He$值为0.08~1.04Ra,指示金银碲化物阶段有大量地幔物质参与。

英文摘要：

By means of optical microscope, scanning electron microscope and electron probe analysis, we made a thoroughly study of the tellurides in the gold deposit of Sandaowanzi, Heilongjiang. Compound Au_2Te is first discovered in this research, except for hessite, petzite,sylvanite, krennerite and calaverite. These telluride minerals appear as granule, intergrowth or veinlet in the fractures of sulfides and quartz. In the system of Au-Ag-Te tullurides, the content of gold is negatively correlated with the content of silver and has a slightly negatively correlation with tellurium. The parageneti c association of Au-Ag tellurides in sandaowanzi gold deposits has been studied based on the experimental results in Au-Ag-Te ternary system. The experiments show that Te always give priority to combine with Ag to form hessite or petzite, sylvanite, krennerite and calaverite are generated only after a huge consumption of Ag, and only after Te in the fluid consuming a lot can nature gold be generated. Helium isotope studies of fluid inclusions indicate that the ratio $^3He/^4He$ is 0.01~0.03Ra in the stage of pyrite-quartz, while it is 0.08~1.04Ra in the stage of tellurides, which indicated that large quantities of mantle fluids were involved in the stage of tellurides.

关键词：He-Ar同位素 碲化物 金矿 三道湾子 黑龙江

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