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新疆阿尔泰塔拉特铁铅锌矿床流体包裹体研究及矿床成因

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摘要:

塔拉特铁铅锌矿位于新疆阿尔泰造山带南缘的阿巴宫多金属成矿带,矿体赋存于克兰盆地下泥盆统康布铁堡组中,为一套海相中酸性火山岩-火山碎屑岩、陆源碎屑沉积岩-碳酸盐岩建造,脉状矿体受阿巴宫大断裂次级断裂控制。根据矿物组合和脉体穿插关系,塔拉特铁铅锌矿可分为4个成矿阶段:矽卡岩、氧化物、硫化物和碳酸盐阶段,后3个阶段均有石英共生。其中,硫化物(方铅矿-闪锌矿±磁黄铁矿±黄铜矿)阶段是铅锌成矿的主要阶段。不同阶段石英中广泛发育流体包裹体,可分为水溶液包裹体(W型)、纯CO₂包裹体(PC型)、CO₂-NaCl-H₂O包裹体(C型)及含子矿物多相包裹体(S型)4类。冷热台显微测温和激光拉曼分析表明,氧化物阶段石英含有4种类型的包裹体,以W型为主,C型和S型包裹体次之,包裹体均一温度介于271~426℃,W型和C型盐度范围0.5%~22.4% NaCleqv,S型包裹体盐度30.5%~40.6% NaCleqv;硫化物阶段的石英流体包裹体为W型、C型和PC型,均一温度为204~269℃,盐度介于0.2%~15.6% NaCleqv之间;碳酸盐阶段的矿物只含W型包裹体,均一温度集中在175~211℃之间,盐度为1.1%~9.9% NaCleqv。利用C型包裹体对硫化物阶段成矿压力估算,得到107~171MPa,对应深度为4~6km。塔拉特铁铅锌矿初始成矿流体具有高温、高盐度、富CO₂的特征,但碳酸盐阶段低盐度、贫CO₂,流体不混溶和混合作用导致了成矿物质的沉淀。塔拉特铁铅锌矿的地质和成矿流体特征显示其为碰撞造山体制形成的矽卡岩型成矿系统。

英文摘要:

The Talate Fe-Pb-Zn deposit is located in Abagong poly-metallic metallogenic belt of the Altay Orogen. The ore bodies, occur as veins in the Kangbutiebao Formation which contains intermediate-acid marine volcanic rocks and terrigenous clastic sedimentary-carbonate rocks, and are jointly controlled by faults. Considering the mineral assemblages and crosscutting relations of veinlets, the mineralization process can be divided into four stages, from early to late, for ming the skarn minerals, veins of quartz-oxide (OO), quartz-sulfide (QS) and quartz-carbonate (QC) assemblages. Among them the quartz-sulfide (galena-sphalerite±pyrrhotite±chalcopyrite) stage is the main Pb-Zn mineralization stage. Four compositional types of fluid inclusions are observed at the deposit, i.e. aqueous inclusions (W-type), pure CO₂ inclusions (PC-type), CO₂-NaCl-H₂O inclusions (C-type) and daughter mineral-bearing inclusions (S-type). Microthermometric data and laser Raman analyses show that the quartz accompanying oxides contains all of the four inclusion types, with the W-type being predominant. They are mainly homogenized between 271°C and 426°C. The salinities of fluid inclusions of the W- and C-types range from 0.5% to 22.4% NaCleqv, and those of the S-type fluid inclusions from 30.5% to 40.6% NaCleqv. The quartz of quartz-sulfide stage contains the W-, C- and PC-types of fluid inclusions, which are homogenized at temperature of 204~269°C, with salinities of 0.2%~15.6% NaCleqv. The minerals of quartz-carbonate stage have only the W-type fluid inclusions yielding homogeneous temperature of 175~211°C and salinities of 1.1%~9.9% NaCleqv. The C-type fluid inclusions in quartz of the quartz-sulfide stage yield trapping pressures of 107 MPa to 171MPa, corresponding to a depth of 4~6km. Holistically, the fluids in the quartz-oxide and quartz-sulfide stages are hypothermal, CO₂-rich and high salinity, but in the quartz-carbonate stage are low salinity and CO₂-poor. Fluid immiscibility and/or boiling are the main factors resulting in precipitation of metallic minerals. The geology and ore-forming fluid characteristics presented in this paper shows that the Talate Fe-Pb-Zn deposit was a typical skarn-type mineralization system formed in the continental collision orogeny.

关键词: [流体包裹体](#) [富CO₂包裹体](#) [塔拉特铁铅锌矿](#) [矽卡岩矿床](#) [阿尔泰造山带](#)

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