西藏甲玛铜多金属矿富银矿体地质特征、银赋存状态及富集机理研究

引用本文：胡正华,唐菊兴,丁枫,郑文宝,邓世林,杨毅,张志,王艺云,林彬,丁帅.2011.西藏甲玛铜多金属矿富银矿体地质特征、银赋存状态及富集机理研究[J].地球学报,32(6):668-680.

DOI：10.3975/cagsb.2011.06.04

作者	单位	E-mail
胡正华	成都理工大学	hucdut@qq.com
唐菊兴	成都理工大学；中国地质科学院矿产资源研究所	
丁枫	成都理工大学	
郑文宝	成都理工大学	
邓世林	四川省地矿局物探队	
杨毅	成都理工大学	
张志	成都理工大学	
王艺云	成都理工大学	
林彬	成都理工大学	
丁帅	成都理工大学	

基金项目:自然科学基金(编号: 41172077)；中央公益性行业专项(编号: 201011013-3)；国家973项目(编号: 2011CB403103)

中文摘要:位于西藏墨竹工卡县的甲玛铜多金属矿床是冈底斯中东段近年来新发现的超大型矿床,已探明伴生银资源量大于6000 t。根据产出特征可将甲玛矿区的银矿体分为矽卡型与大理岩型两种。通过矿相学、电子显微探针研究发现银均以不可见银和可见银两种形式存在。不可见银以晶格银的形式赋存于铜矿物中;其次以次显微包体银的形式赋存于方铅矿中。可见银通常以4种独立矿物(碲银矿、银金矿、银铅矿、自然银)交代斑铜矿和黄铜矿等硫化物或充填在硫化物和脉石的显微裂隙内。甲玛矿区铜、钼、金、铅、锌、银等金属离子在成矿早期高温阶段以氯络合物的形式搬运,随着成矿热液温度和氧逸度的降低以及pH值的升高,氯络合物因稳定性降低而解体。解体之后的铜、钼、金、铅、锌、银等金属离子主要以硫氢络合的形式迁移,在迁移过程中随着温度的降低,首先是铜、钼等金属硫氢络合物的分解,形成辉钼矿、黄铜矿和斑铜矿等硫化物,此时部分银以显微和次显微包体银和晶格银的形式分布于这些硫化物中。随着温度的持续降低矿区铅、锌硫化物的大量沉淀引起成矿热液组成和性质的显著变化,最终导致银从硫氢络合物中彻底解体,并与铜等离子结合形成大量独立银矿物,而溶液中过饱和的银则以自然银的形式沉淀。

中文关键词:甲玛 银矿体特征 赋存状态 富集机理

A Study of Features, Modes of Occurrence and Enrichment Mechanism of Silver-rich Ore Bodies in the Jiama Copper-Polymetallic Deposit of Tibet

Abstract:Located in Maizhokunggar County of Tibet, the Jiama copper-polymetallic ore deposit discovered in recent years has silver reserves of over 6000t, constituting a superlarge ore deposit in the eastern part of central Gangdise. According to modes of occurrence, the silver ore bodies in the Jiama copper-polymetallic ore deposit can be classified into skarn-type and marble-type. Mineragraphic studies and electron probe microanalysis reveal that silver exists in two types, i.e., visible silver and invisible silver, with visible silver being dominant. Invisible silver exists in copper minerals in the form of lattice silver besides existing in galena in the form of sub-microinclusions. Visible silver generally replaces sulfides such as bornite and chalcopyrite, or fills in the microsection of sulfides and lodestones in the form of four independent minerals, i.e., hessite, electrum, silver-lead ore and native silver. In the premetallogenic and high temperature phases, the metal ions in the Jiama ore deposit such as Cu, Mo, Au, Pb, Zn, Ag were transported in the form of complex compound. With the lowering of the temperature of metallogenic hydrothermal solution and the rising of the oxygen fugacity and pH value, the complex compound disintegrated due to the falling of its stability. S- and H- complex compounds constituted the main transporting form of Cu, Mo, Au, Pb, Zn, Ag. With the lowering of the temperature, the metal S- and H- complex compounds, such as Cu, Mo complex compounds, started to disintegrate and formed sulfides like molybdenum, chalcopyrite and bornite. And at this time, part of silver was distributed in these sulfides in the form of micro and sub-microinclusions and lattice silver. With the continuous lowering of the temperature, the precipitation of large quantities of Pb and Zn sulfides caused remarkable alteration of the components and properties of metallogenic hydrothermal solution, leading to thorough silver disintegration from S- and H- complex compounds and combination with Cu2+ to form large quantities of independent silver minerals, while the oversaturated silver in the solution was settled in the form of native silver.

keywords: Jiama features of silver ore body modes of occurrence enrichment mechanism