

程文斌, 顾雪祥, 唐菊兴, 王立强, 吕鹏瑞, 钟康惠, 刘晓吉, 高一鸣. 2010. 西藏冈底斯-念青唐古拉成矿带典型矿床硫化物Pb同位素特征——对成矿元素组合分带性的指示. 岩石学报, 26(11): 3350-3362

西藏冈底斯-念青唐古拉成矿带典型矿床硫化物Pb同位素特征——对成矿元素组合分带性的指示

作者	单位
程文斌	中国地质大学 地质过程与矿产资源国家重点实验室, 北京 100083
顾雪祥	中国地质大学 地质过程与矿产资源国家重点实验室, 北京 100083
唐菊兴	中国地质科学院矿产资源研究所, 北京 100037
王立强	中国地质大学 地质过程与矿产资源国家重点实验室, 北京 100083
吕鹏瑞	中国地质大学 地质过程与矿产资源国家重点实验室, 北京 100083
钟康惠	成都理工大学地球科学学院, 成都 610059
刘晓吉	中国地质大学 地质过程与矿产资源国家重点实验室, 北京 100083
高一鸣	中国地质科学院矿产资源研究所, 北京 100037

基金项目: 本文受国家重点基础研究发展规划"973"项目(2009CB421000)、国家自然科学基金(40930423, 40772060)、中国地质调查局青藏高原专项(1212010818089)、长江学者和创新团队发展计划和高等学校学科创新引智计划(B07011)联合资助。

摘要:

冈底斯-念青唐古拉成矿带矿床成矿元素组合由南向北存在着Cu-Au、Cu-Mo向Pb-Zn-Cu-Fe、Pb-Zn过渡的变化规律,但引起该变化规律的原因目前少研究。本文通过对成矿带典型矿床Pb同位素特征较为系统的总结,并结合成矿年代学和区域构造演化研究成果,从成矿物质来源的角度对该分带性进行了初步探讨。研究表明成矿带由南到北成矿物质来源存在着差异:最南端Cu-Au矿床Pb同位素组成具幔源特征($^{207}\text{Pb}/^{204}\text{Pb}$ 和 $^{208}\text{Pb}/^{204}\text{Pb}$ 平均值分别为15.490和38.016),反映成矿物质来自于俯冲过程中的交代地幔楔;最北端的Pb-Zn矿床Pb同位素组成与念青唐古拉群基底片麻岩相近($^{207}\text{Pb}/^{204}\text{Pb}$ 和 $^{208}\text{Pb}/^{204}\text{Pb}$ 分别变化于15.641~15.738和38.976~39.362),反映成矿物质来自于基底片麻岩。Pb-Zn-Cu-Fe矿床Pb同位素组成介于幔源Pb和上地壳Pb之间,且具混合线特征,反映了同碰撞期成矿物质同时从俯冲板片和念青唐古拉基底片麻岩活化的混源模式;而Cu-Mo矿床不具混合线特征的造山带Pb同位素组成,反映了成矿物质来源于俯冲阶段楔形地幔部分熔融并底侵到地壳底部与地壳发生物质交换后所形成的新生下地壳源区。甲马Cu多金属矿床Pb同位素组成具幔源和造山带两个端元,推测除新生下地壳源区提供成矿物质外,叶巴组火山岩也提供了部分成矿物质。由南向北成矿物质来源的差异很大程度上与板片俯冲的"距离效应"有关,正是由于成矿物质来源的差异导致成矿带成矿元素分带性的形成。

英文摘要:

Zonation of major ore-forming elements transiting from Cu-Au and Cu-Mo to Pb-Zn-Cu-Fe and Pb-Zn from south to north has been shown in the Gangdese-Nyainqentanglha metallogenic belt, Tibet. However, little attention has been given to the reason of this zonation. This paper presents the Pb isotopic data of typical deposits from the metallogenic belt, based on the metallogenic chronology and tectonic evolution, and discusses the reasons of this zonation from the aspect of the sources of ore-forming materials. This study indicates that there are differences in sources of ore-forming materials from south to north in the metallogenic belt. The Pb isotope composition of Cu-Au deposits in the south belt has mantle Pb isotopic characteristics (average value $^{207}\text{Pb}/^{204}\text{Pb}=15.490$, $^{208}\text{Pb}/^{204}\text{Pb}=38.016$), which reflects that the ore-forming materials were derived from the metasomatic mantle wedge during the process of subduction. The Pb isotope composition of Pb-Zn deposits in the north belt is similar to the basement gneiss of the Nyainqentanglha Group (average value $^{207}\text{Pb}/^{204}\text{Pb}=15.698$, $^{208}\text{Pb}/^{204}\text{Pb}=39.158$), indicating that the ore-forming materials originated from the basement gneiss (upper crust). The Pb isotopic characteristics of Pb-Zn-Cu-Fe deposits in the north part of the middle belt suggest a mixing-source model in which the ore-forming materials were delivered by the subducted slab and the Nyainqentanglha basement gneiss during the syn-collisional period; while the ore-forming materials of Cu-Mo deposits in the south part of the middle belt came from the newly-formed lower crust which originated from the material exchanges between the under-plated, partially melt, wedged mantle and the lower crust. In the Jiama Cu polymetallic deposit, the Pb isotopes indicate that the ore-forming materials were partly sourced from the newly-formed lower crust and partly from the volcanic rocks of the Yeba Formation. The differences in the sources of ore-forming materials from south to north in the Gangdese-Nyainqentanglha metallogenic are largely related to the "distance effect" of plate subduction. Variations in the sources of ore-forming materials caused the metallogenic zonation of the belt.

关键词: [Pb同位素](#) [成矿物质来源](#) [成矿元素分带性](#) [冈底斯-念青唐古拉成矿带](#)

投稿时间: 2010-04-01 最后修改时间: 2010-05-07

[HTML](#) [查看全文](#) [查看/发表评论](#) [下载PDF阅读器](#)

黔ICP备07002071号-2

主办单位: 中国矿物岩石地球化学学会

单位地址: 北京9825信箱/北京朝阳区北土城西路19号

本系统由北京勤云科技发展有限公司设计

[linezing.com](#)