

祝新友,王莉娟,朱谷昌,邓吉牛,樊俊昌. 2010. 青海锡铁山铅锌矿床硫同位素地球化学研究 —— 深源与海水硫的混合. 岩石学报, 26(3): 657-666

青海锡铁山铅锌矿床硫同位素地球化学研究 —— 深源与海水硫的混合

作者	单位	E-mail
祝新友	北京矿产地质研究院, 北京 100012	zhuxinyou@tom.com
王莉娟	北京矿产地质研究院, 北京 100012	wlj@mail.igcas.ac.cn
朱谷昌	北京矿产地质研究院, 北京 100012	
邓吉牛	西部资源勘查股份有限公司, 西宁 810000	
樊俊昌	西部资源勘查股份有限公司, 西宁 810000	

基金项目: 国家科技支撑计划项目(2006BAB01A06)与全国危机矿山接替资源找矿项目“青海省大柴旦行委锡铁山铅锌矿矿产预测”(200663063)及国家自然科学基金项目(40672061)的联合资助

摘要:

锡铁山铅锌矿床发育较为完整的喷流沉积系统,包括管道相、近喷口相、远端沉积相及各种喷流沉积岩,并有后期改造作用形成的脉状铅矿体。本文通过喷流沉积系统各部位硫化物硫同位素的分析,不同部位硫化物硫同位素组成不同,且规律性变化。以黄铁矿分析结果为例,网脉状石英钠长岩 $\delta^{34}\text{S}=+0.8\%$,代表供给系统的硫化物脉2.95%,非层状矿体4.48%,层状矿体3.25%,炭质片岩为+6.26%,后期改造型铅锌矿为+2.93%。代表管道相的网脉状石英钠长岩黄铁矿具有深源(幔源)的硫同位素组成,而矿体或大理岩上盘炭质片岩具有海水硫来源的特点。矿体的硫介于二者之间,更靠近炭质片岩的硫化物同位素组成,其来源可能更多受海水硫酸盐的制约,即锡铁山矿床硫具有混合来源性质,要是海水硫酸盐的还原,部分来源于深部卤水的供给。硫的还原方式以生物细菌还原为主。层状矿体中硫同位素组成由早至晚 $\delta^{34}\text{S}$ 逐渐降低表明层状矿体成矿作用过程中,发生了生物成因的 H_2S 的大量加入。

英文摘要:

Xietieshan lead-zinc deposit is located in the north margin of Qaidam basin, Qinghai Province. It has been recognized as the integrated exhalative sediment (SEDEX) system that includes breccias pipes, local vent and distal vent. The lead-zinc ore-bodies are divided into three types: Unbedded, bedded and a few reformed veins. The study on the sulfur isotope composition of sulfide minerals from different parts of the SEDEX system shows that regular changing of the $\delta^{34}\text{S}$ values from breccias pipes, local vent to distal vent. For example, results from the analysis of pyrite show that the $\delta^{34}\text{S}$ value of pyrite of stockwork quartz-albite rock (breccias pipes) is 0.8%, that of sulfide veins (feeding zone) is 2.95%, the unbedded ore-body 4.48%, bedded ore-body 3.25%, carbon schist 6.26%, and the reformed vein 2.93%. The sulfur of stockwork rock (breccias pipes) is of a $\delta^{34}\text{S}$ value of magmatic resources, and the value of the carbon schist deposit on bedded or marble represents of the reduction of the seawater sulfate. The $\delta^{34}\text{S}$ value of the ore-body is between the two of them, which suggests that the sulfur of the ore is a mixture of hydrothermal source and seawater. Seawater sulfate may ultimately be the source of sulfur for the Xietieshan deposit probably by bacteria sulfate reduction (BSR). A stratigraphic upward decrease in $\delta^{34}\text{S}$ was observed, which suggests and the mixing of hydrothermal sulfur with magnitude H_2S from onsite reduction of ambient sulfate in the ore forming process.

关键词: [铅锌矿床](#) [喷流沉积型](#) [硫同位素](#) [物质来源](#) [成矿机制](#)

投稿时间: 2009-10-28 最后修改时间: 2010-02-17