

广东大宝山多金属矿床成矿物质来源同位素证据

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中文摘要:笔者对大宝山多金属矿床矿石和脉石矿物进行铅、硫、氢和氧同位素组成测定,获得硫化物的 $^{206}\text{Pb}/^{204}\text{Pb}$ 值为 $17.930\sim 18.785$; $^{207}\text{Pb}/^{204}\text{Pb}$ 值为 $15.491\sim 15.772$; $^{208}\text{Pb}/^{204}\text{Pb}$ 值为 $37.990\sim 40.990$,并组成良好的线性关系。泥盆系地层中黄铁矿的 $\delta^{34}\text{S}$ 为 $-22.5\%\sim +17.9\%$,矿床硫化物的 $\delta^{34}\text{S}$ 为 $-2.4\%\sim +4.6\%$ 。黄铁矿、闪锌矿和方铅矿共生矿物对, $\delta^{34}\text{S}_{\text{py}}>\delta^{34}\text{S}_{\text{sp}}>\delta^{34}\text{S}_{\text{gn}}$,用磁黄铁矿的硫同位素组成估算出 $\delta^{34}\text{S}_{\Sigma}\text{S}$ 为 $2\%\pm 3\%$ 。硫化物包裹体的氢同位素在 $-101\%\sim -123\%$ 之间,与硫化物共生石英的氧同位素为 $+9.3\%\sim +17.9\%$,换算成水的氧同位素为 $+0.3\%\sim +3.9\%$,表明成矿热液来源较为复杂。

中文关键词:同位素 多金属矿 大宝山 广东

Isotope Evidence of Material Sources of the Dabaoshan Polymetallic Deposit

Abstract:According to S,Pb,H and O isotopic composition analyses of ores and gangue minerals in the Dabaoshan polymetallic deposit,the $^{206}\text{Pb}/^{204}\text{Pb}$ ratio varies from 17.930 to 21.480, $^{207}\text{Pb}/^{204}\text{Pb}$ ratio from 15.491 to 16.215,and the $^{208}\text{Pb}/^{204}\text{Pb}$ ratio from 37.990 to 40.990,forming a good linear relationship. The $\delta^{34}\text{S}$ value of pyrite in Devonian strata ranges from -22.5% to $+17.9\%$,whereas the $\delta^{34}\text{S}$ value of the sulfide deposits from -2.4% to $+4.6\%$.The association of pyrite,sphalerite and galena is characterized by $\delta^{34}\text{S}_{\text{py}}>\delta^{34}\text{S}_{\text{sp}}>\delta^{34}\text{S}_{\text{gn}}$, and the $\delta^{34}\text{S}_{\Sigma}\text{S}(0\pm 3\%)$ is estimated from the sulfur isotopic composition of pyrrhotine. The hydrogen isotope value of sulfide inclusions varies from -101% to -123% , and the oxygen isotope value of quartz associated with sulfide is $+9.3\%\sim +17.9\%$. If it is converted into the oxygen isotope of water, the value ranges from $+0.3\%$ to $+3.9\%$, suggesting that the sources of the ore - forming hydrothermal fluids were rather complex.