

C,O,ND AND PB ISOTOPE SYSTEMATICS IN THE XIKUANGSHAN ANTIMONY DEPOSIT, CHINA

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The Xikuangshan deposit located in the central Hunan, China, is the largest Sb deposit reported in the world. Ore bodies usually appear stratiform and occur in the upper Devonian limestone and clastic rocks. Stibnite, quartz and calcite are common minerals. Based on the field investigation and systematic isotope studies, some conclusions are drawn as follows. The $\delta^{13}\text{C}$, $\delta^{18}\text{O}$ of early synsulfide calcite is $-6.11\text{‰} \sim -7.02\text{‰}$, $+16.08\text{‰} \sim +17.91\text{‰}$, respectively; and its Nd (t)₀. The deep-origin components may be involved in the early mineralization. However, for the late synsulfide calcite, $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ are -0.2‰ and $+2.077\text{‰}$, $+11.21\text{‰}$ and $+17.063\text{‰}$, respectively, and a clear positive correlation exists between $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$. The calcite precipitation results from the decrease in temperature and fluid/rock interaction. The Nd (t)₀, indicative of crust-origin. The $\delta^{13}\text{C}$, $\delta^{18}\text{O}$ of postsulfide calcite is $+0.23\text{‰} \sim -0.218\text{‰}$, $+14.22\text{‰} \sim +18.08\text{‰}$, respectively. Contrary to the late synsulfide calcite, both the $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ show the negative correlation, thus the calcite precipitates from the fluid different from that of the ore-stage. Pb isotopic composition of stibnite varies greatly; there exists obviously linear array representing the mixing of the mantle-origin and crust-origin Pb. The $\delta^{206}\text{Pb}$ values and the relative deviations of the ore Pb versus the contemporaneous mantle-origin Pb, also lend strong supports for the above conclusion.