

## **Single Grain Sphalerite-Pyrite Rb-Sr Dating of the Laochang Silver Polymetallic Deposit in Lancang of Yunnan Province**

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This study employs the single grain sphalerite-pyrite Rb-Sr isotopic method to date the age of mineralization, using the example of the Laochang silver polymetallic deposit, Southwestern Yunnan Province. Analyses of four sphalerite and three pyrite samples yield an isochron age of  $45 \pm 3.6$  Ma. The initial  $^{87}\text{Sr}/^{86}\text{Sr}$  ratio is  $0.70977 \pm 0.00034$ . Considering the characteristics of the deposit, we believe the mineralization age could represent main mineralization stage of the deposit. At the same time, we obtained initial strontium isotope ratio of ores proximal to the host volcanic rocks and the blind porphyry bodies. Based on the features of the deposit and the initial strontium isotopic compositions of the ores, the host volcanic rocks, and the blind porphyry bodies, we consider that the ore-forming materials have multiple sources, and early Carboniferous blind porphyry bodies and middle-late Carboniferous limestone may provide some metallogenic materials. Based on the fact that the Rb-Sr isotopic age of the concealed porphyry bodies is consistent with the mineralization age, we conclude that ore formation is closely correlated with the blind porphyry bodies. The Laochang ore deposit metallogenic time coincides with Qinghai-Tibet Plateau mineralization during the main collisional orogenic setting. In conclusion, we conclude that the Laochang ore deposit experienced volcanic exhalative sedimentary mineralization in early Carboniferous and granite porphyry magmatic hydrothermal superimposition of mineralization in the Himalayan period.