



Origin of the Dulong Sn-Zn Polymetallic Deposit, SE Yunnan Province: Constrains from Sulfides S and Pb Isotopes Study

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Abstract: The Dulong Sn-Zn polymetallic deposit, located in Maguan country of Yunnan Province, is the third largest tin polymetallic deposit in China. This deposit consists of five ore blocks, including Tongjie, Manjiazhai, Lazizhai, Wukoudong and Nandangchang. The exposed strata in the ore district comprise Neoproterozoic to Low Cambrian Xinzhaiyan Formation, Middle Cambrian Tianpeng Formation and Longha Formation, of which the Tianpeng Formation is the ore-bearing strata. The Laojunshan granite complex is distributed at the northern part of the deposit. Zircon dating results indicate that this complex was formed at 96 – 87 Ma (Lan et al., 2016; Xu et al., 2015). Previous studies have conducted series of researches on the geological characteristic, source of ore-forming materials, evolution of ore-forming fluid, and the geochemistry of ore-related intrusions (He et al., 2014; 2015; Xu et al., 2015; Ye et al., 2016). Nonetheless, the origin of this deposit remains highly controversial. Some researchers classified the deposit as magmatic hydrothermal deposit (Song, 1989; Ye et al., 2016), whereas others argued that the deposit was typical sedimentary exhalative (sedex) deposit (Zhou et al., 1998). In addition, minor workers proposed that this deposit was composite origin that formed by sedex ore bed superimposed with regional metamorphism and magmatic hydrothermal activity (Liu, 1998). In this study, we present new sulfur (S) and lead (Pb) isotopes data to constrain the origin of this deposit.

Our studies show that S isotopic compositions of sulfides from the Dulong Sn-Zn polymetallic deposit have narrow range of variation and mainly concentrate upon 0‰~5‰. They are consistent with the characteristics of magmatic sulfur, but are different from the Precambrian seawater and pyrites from Precambrian stratigraphy (He et al., 2014). Pb isotopic compositions of sulfides from the Dulong Sn-Zn polymetallic deposit are in good agreement with the feldspar from Laojunshan granite complex. But that are inconsistent with the wall rock of marble, schist and the basement of gneiss (He et al., 2015), suggesting that the ore-forming materials were derived from Laojunshan granite intrusions. Integration of previous published geological, geochemistry, and geochronology, we support that the Dulong Sn-Zn polymetallic deposit is of a magmatic hydrothermal deposit.

Key words: Dulong Sn-Zn deposit, S isotope, Pb isotope, ore genesis

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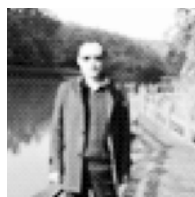
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