



Ore-forming Geological Body of the Lehong(Ge)-Pb-Zn Deposits, Northeastern Yunnan, China

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Abstract: The large clusters of Zn-Pb deposits in northeastern Yunnan, located in the southwestern margin of the Yangtze Block, are an important part of the Sichuan–Yunnan–Guizhou Pb-Zn Poly-metallic Metallogenic Triangle Area (SYGT). The area is surrounded by NE-trending Mile-Shizong fault zone, SN-trending Xiaojiang fault zone and NW-trending Ziyun–Yadu fault zone (Han et al., 2007). More than 220 Zn–Pb deposits and mineralization occurrences had been reported in SYGT. The Lehong large-sized Pb-Zn deposit is one of the most important deposits in Northeastern Yunnan Lead-zinc Deposit Concentrated District (NEYD). According to the intensification of the ore-forming geological body (Ye et al., 2015), based on studying the metallogenic time, the spatial distribution of ore-bodies, the sources of metallogenic materials and fluids, the ore-forming geological body of this deposit have been discussed in this paper.

By the research on regional tectonic evolution characteristics, regional geological survey, seismic data interpretation and ore-field structural characteristics in the northeast Yunnan, it is proposed that the lead-zinc mineralization in NEYD is the production of the structural transformation processes from the late Hercynian extension to the Indosinian collisional orogeny. At the same time, many scholars reported the ore-forming period of the deposit is 200.9±8.3 (Zhanget al., 2014). Compared with the other ore deposits in SYGT, the ore-forming ages have obvious consistency, then Zn-Pb mineralization in Indosinian has been further validated.

From ore-hosted rocks to the center of the ore-bodies, which are near the NW-trending Lehong fault zone, the altered mineral assemblage and the alteration intensity increase progressively. The occurrence of orebodies is strictly controlled by this fault. According to the spatial relationship between orebodies and ore-controlling structures, the mineralization patterns may be divided into three patterns: 1) near the Lehong fault, orebodies are massive and lenticular; 2) farther from the fault, orebodies are mesh-veined and nodular; 3) away from the fault, orebodies hosted in the interlayer fault zones are veined and disseminated.

The geochemical researches on REE and C-H-O-S-Pb-Sr isotopes show that the sources of metallogenic fluid are characterized by ‘multi-source fluids mixing’. Sulfur is mainly derived from the TSR of the sulfate in the Devonian Fm. except that BSR has a certain influence on the sulfur source. The carbonate isotopic characteristics indicate that the ore-forming fluid is derived from the mixture of basin fluid and deep-sourced fluid. The evolution process of C source origins from marine carbonate to altered dolomite to calcite; H-O isotopic characteristics also show similar fluid origin. The geochemical characteristics of Sr isotopic composition and REE

indicates that the ore-forming materials are derived from the sedimentary cover and the metamorphosed basement. Therefore, it is concluded that the combination of NW-trending fault and the altered dolomite in the Sinian Dengying Fm. (*Z₂dn*) is the ore-forming geological body of the deposits.

Key words: ore-forming geological body, metallogenic period, spatial distribution of ore-bodies, metallogenic material sources, Lehong Zn-Pb deposit

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