

## Zinc isotopes in sphalerite from Linxi hydrothermal deposit in Da Hinggan Mountains, China

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In this study, we first present the zinc isotope results, trace element concentrations and rare earth elements of sphalerite samples from Linxi magmatic hydrothermal deposit in the Middle-southern Part of Da Hinggan Mountains, China. Zn isotopic composition of sphalerite samples shows a  $\delta^{66}\text{Zn}$  variation of  $+0.23\text{‰} \sim +0.36\text{‰}$  relative to the Lyon JMC 3-0749L zinc standard and exhibits a unimodal distribution pattern that is the salient feature of magmatic hydrothermal deposit. The results reveal a trend of increasing  $\delta^{66}\text{Zn}$  values from west to east (from porphyry type, cryptoexplosion breccia type to hydrothermal filling type), also the lower  $\delta^{66}\text{Zn}$  values can be observed at deeper levels and the higher  $\delta^{66}\text{Zn}$  values exists at upper levels from the same borehole.

The spatial variation revealed by the zinc isotope data shows that the formation of cryptoexplosion breccia in the Linxi magmatic hydrothermal deposit was caused by the quartz porphyry intruded into the eastern slate strata, and the ore-bearing hydrothermal fluid be filled in the internal or external contact zone of the eastern diorite bodies, at last, 3 kinds of hydrothermal deposit were formed in a system. Zinc isotope in the magmatic hydrothermal system has a similar effect with isotopic fractionation in high-temperature silicate melts. We conclude that the primary control on isotopic variation with the sphalerite  $\delta^{66}\text{Zn}$  values is temperature gradient, instead of the source rock variation.