WU Yongtao, HAN RunSheng, 2017. REE geochemistry of fluorite from the Maozu Pb-Zn deposit, northeastern Yunnan, China.*Acta Geologica Sinica* (English Edition), 91(supp. 1): 241-242.

REE Gochemistry of Fuorite from the Maozu Pb-Zn Dposit, Nrtheastern Yunnan, China

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1 Introduction

The Maozu Pb–Zn deposit, located in the Northeast of Yunnan Province, southwest China, is a typical carbonate-hosted deposit in the Northeast of Yunnan Pb–Zn metallogenic province. Fluorite is the main gangue mineral of Maozu Pb-Zn deposit, and symbiosis with lead-zinc mine closely together. The research of rare earth elements geochemistry characteristics of fluorites can provide important information source and evolution of ore-forming fluid. This paper attempts to study the geochemical characteristics of rare earth elements of fluorites in different stages of mineralization and discusse the possible genesis of fluorites. The mineralization and alteration zonation of this deposit is very obvious, from the surrounding rock to the ore body, it can be divided into: dolomitization, star-like mineralization, veinlet-disseminated mineralization and ore body. The field observation and rock ore appraisal study shows that the fluorites of this deposit can be further divided into two stages, early and late. Fluorite of the early generation formed in the primary mineralization stage of sulphide. It can be divided into two kinds, one formed in the ore bodies coexist with dense massive lead-zinc ore, the other formed in the veinlet-disseminated mineralization coexist with veinlet-disseminated lead-zinc ore. Fluorite of the late generation formed in the late mineralization stage of sulphide, which located in star-like mineralization that coexist with calcite and star-like lead-zinc ore. The samples of this paper come from different mineralizations and different mineral assemblages. From ore body, veinlet-disseminated mineralization and star-like mineralization, 12 samples were collected from these three mineralizations.

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2 REE Geochemistry of Fluorite from the Maozu Pb-Zn Deposit

2.1 Characteristics of Fluorites from Different Mineralization

REE geochemistry of fluorites from the Maozu Pb-Zn deposit show that REE content of fluorites are not high, but change a lot (ΣREE= 0.43×10^{-6}~38.92×10^{-6}). ΣLREE/ΣHREE values range from 0.50~1.40, which shows the differentiation is not obvious between LREE and HREE. REE content of fluorites vary greatly, their characteristic parameters are different, but the chondrite-normalized curves are quite consistent. With the chondrite-normalized curves are quite consistent and REE geochemistry change gradually, it indicate that fluorites of this deposit formed at different mineralization stages， but in a contunuous action process that the ore-forming fluid evolved. From ore body to veinlet-disseminated mineralization, and then star-like mineralization, REE content reduces gradually and the LREE enrichment gradually becomes HREE enrichment With Eu gradually changed from positive anomaly to negative anomaly and negative Ce anomaly increases gradually. All these characteristics indicate that the ore-forming fluid evolved from ore body to veinlet-disseminated mineralization, and then star-like mineralization, which formed fluorites of different mineralizations.

2.2 Possible Genesis of Fluorites

The Y/Ho and La/Ho ratios of fluorites from the ore bodies and veinlet-disseminated mineralization are horizontal in the diagram of Y/Ho vs. La/ Ho, but fluorites from the star-like mineralization are different. The Tb/La and Tb/Ca ratios of fluorites from this deposit are devided into two types in the diagram of Tb/La vs. Tb/Ca. Fluorites from the ore bodies and the veinlet-disseminated

mineralization are hydrothermal type, Fluorites from the star-like mineralization are sedimentary type. From ore body to star-like mineralization, the Tb/Ca ratios of fluorite decrease more than 100 times and the fluorites from the star-like mineralization belong to sedimentary type. It shows that the genetic type of fluorites in this deposit belong to hydrothermal type. Fluorites from the ore bodies and veinlet-disseminated mineralization were formed in the similar physical-chemical condition and have the same source. Fluorites from the star-like mineralization were formed in different physical-chemical condition. It is possible that the ore-forming fluid evolved from ore body to the mineralization periphery of the ore body. In the star-like mineralization, water-rock interaction happened at the late mineralization stage. This study is meaningful to reveal the ore-forming mechanism of this deposit.

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