

Origin of lamprophres in the Xikuangshan Antimony Deposits, Hunan, P.R. China: evidence for combined trace element with Sr and Nd isotope studies

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Introduction

The Xikuangshan antimony deposits located in Hunan province, the center part of China, which have about 2110,000 ton total Sb metal reserves, is the largest Sb deposits in the world till now. The lamprophres located at the east part of mine are only outcropped igneous rocks in the mine districts, little work has been done on its origin in the previous work. The article will discuss genesis of lamprophres through trace element and Sr and Nd isotope studies.

Discussion

The lamprophres studied were formed ca 120Ma ago, simultaneous last stage mineralization(124.1±3.7Ma,Sm-Nd of hydrothermal calcites), and are considered to be closely related to antimony mineralization in the Xikuangshan deposits. The MORB-normalized spidergrams of sample studied are characterized by enrichment high field element, depleted Nb-Ta and non depleted Ti, strong enrichment Th and weak enrichment Ce ,being similar to spidergrams of volcanic arc basalt, their tectonic setting probably are destructive plate boundaries of within continent. The rare-earth element of sample studied have characteristics of high total contents (375-531ppm) and non-distinct Eu anomalies (0.85-0.98) and enriched LREE. The isotopic contents of sample have high ⁸⁷Sr/⁸⁷Sr (0.7098-0.7109) and low ¹⁴³Nd/¹⁴⁴Nd(0.51205-0.51244).

Conclusions

Combining trace element and isotope geochemistry with geological history, the lamprophres studied in the area result from partly melting of enrichment REE and HSFE fluid related to subduction metasomatic mantle, mixing with little underlying granite and limestone compositions.

References

- Guiqing Xie, Jiantang Peng and Ruizhong Hu ,et al, (2001),Acta Petrologica Scinica,4,629-636.
Jiantang Peng, Ruizhong Hu and Yuanxian Lin,et al, (2002), Chinese Science Bulletin,12.

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