Re-Os isotope dating of molybdenite in the Huangshaping polymetallic deposit, Hunan, China, and its geological significance

RENMIN HUA AND JUNMING YAO

State Key Laboratory for Mineral Deposits Research, Department of Earth Sciences, Nanjing University, Nanjing, 210093, China

The Huangshaping mine in southern Hunan Province, China, is a large pollymetallic deposit which produces maily Pb, Zn, W and Mo. It is considered to be related spatially and temporally to the Huangshaping granite complex, including quartz porphyry, dacite porphyry and predominantly granite porphyry. The LA-ICPMS zircon dating yield an age 161.6±1.1 Ma for the Huangshaping granite porphyry [1]. But there is no age dating for the mineralization.

Re-Os isotope dating was applied in this paper. Six representative molybdenite samples from the mining quarry and drill cores, mostly in skarn ore-bodies, were collected for Re-Os analyses, which defined an isochron age of 154.8±1.9 Ma with an initial ^{187}Os value of 0.004±0.022 (MSWD=1.5) and a correlation coefficient of 1. The calculated model ages for these samples range from 150.9 Ma to 156.9 Ma.

This ore-forming age of the Huangshaping deposit is in consistence with many other rare-metal ore deposits in the Nanling Range area of South China, which all related with the continental crust re-melting type granitoids of the middle Yanshanian Period (180~140Ma). They formed the second large-scale metallogenic event in Mesozoic Era in South China [2]. However, the age difference between the granite emplacement and ore formation in Huangshaping is also a very common phenomenon in this region. The published data show that the ore-forming ages are about 7 to 20 m.y. later than the corresponding granitoids. It is suggested that this temporal difference might reflect the differences in forming mechanisms, material sources, as well as geotectonic settings between the Mesozoic granitoids of crust remelting types and related mineralizations It is concluded that, although the granitoids were formed by re-melting of the crust material, the large-scale metallogeny in the Nanling Range area was essentially related with extension geotectonic setting, crust-mantle interaction, high heat flow, and the participation of deep-sourced fluids.

References

[1] Yao J., Hua R., and Lin J. (2005). *Acta Petrol. Sinica*, **21**, 688-696 (in Chinese with English abstract).

[2] Hua R., Chen P., Zhang W., and Lu J. (2005). In: Mao & Bierlein (eds.), *Mineral Deposit Research: Meeting the Global Challenge,* **Vol. 1,** Springer, 401-404.