

MENG Fang, YE Huishou, GAO Yang, 2014. Geological Characteristics and Molybdenite Re-Os Isotopic Dating of the Doupo Mo Deposit, Dabie Orogen, Eastern China. *Acta Geologica Sinica* (English Edition), 88(supp. 2): 102-103.

Geological Characteristics and Molybdenite Re-Os Isotopic Dating of the Doupo Mo Deposit, Dabie Orogen, Eastern China

MENG Fang¹, YE Huishou², GAO Yang²

¹ School of Geology, China University of Geosciences, Beijing 100083, China

² MLR Key Laboratory of Metallogeny and Mineral Assessment, Institute of Mineral Resources, Chinese Academy of Geological Sciences, Beijing 100037, China

1 Geological Characteristics of Deposit

The Doupo Mo Deposit is adjoined The Lingshan granite which between Lingshan- Luoshan, Xinyang area, Henan province, and Dawu, Hubei province, in the northern Dabie orogenic belt. The hydrothermal alteration types of wall rocks in the Doupo Mo deposit include silicification, K-felspar alteration, sericitization, and pyritization, etc. and the main ore-forming types are disseminated, veinlet, stockwork and laminated molybdenite mineralizations. The major metallogenic epoch could be divided into 4 stages: K-felspar-quartz stage, quartz-molybdenitestage, quartz-polymetallic sulfidestage, and quartz-carbonate stage. The deposit is of typical porphyry Mo deposit type.

Aqueous two-phase inclusions is predominant of the main metallogenic epoch in fluid inclusion. Their homogeneous temperatures of the main metallogenic epoch were concentrated in 170.4–432.1°C, their salinities were concentrated in 0.35–13.5 wt% NaCleq., Their average ore-forming pressures and depths were 21.39MPa and 0.79km respectively. Gas composition of fluid inclusions mostly includes H₂O, CO₂, N₂ and O₂ and a small amount of reducing gas like CH₄, C₂H₄, C₂H₆, C₂H₂. Cations of liquid composition are dominant with Ca²⁺, Na⁺, K⁺, followed by Mg²⁺. Anions are mainly consist of SO₄²⁻, F⁻, Cl⁻, with minor Br⁻. H-O isotope analyses suggest that the source of ore-forming fluid is probably the combination of magmatic water and the meteoric water. The Surfer isotope composition shows that it comes from the mantle. The Pb isotope composition shows that the metallogenic material was mainly derived from the crust with mingling of mantle materials.

2 The Result of Re-Os Isotopic Dating

Five main metallogenic stage of molybdenite samples were used as the experiments in Re-Os isotopic dating. With isoplot software to calculate a weighted mean of model ages (Fig. 1) and the isochron age of five points (Fig. 2), and the results were 126.8±1.9 Ma and 125.4±1.2 Ma. From MSWD value and fitting the probability, the weighted mean model age and the isochron age are reliable.

3 Summary

Re-Os isotopic dating of the molybdenites symbiosis with magnetites obtained model ages of (125.4±1.2) Ma, and the LA-MC-ICP-MS U-Pb dating of the deep Lingshan granite is from (122.14±0.38 ~124.21±0.28) Ma. Doupo Mo deposit was formed in the Early-Cretaceous, which is consistent with the emplacing age of the host rock Lingshan granitic pluton. These features indicated that they were produced in the same structure- magma-fluid

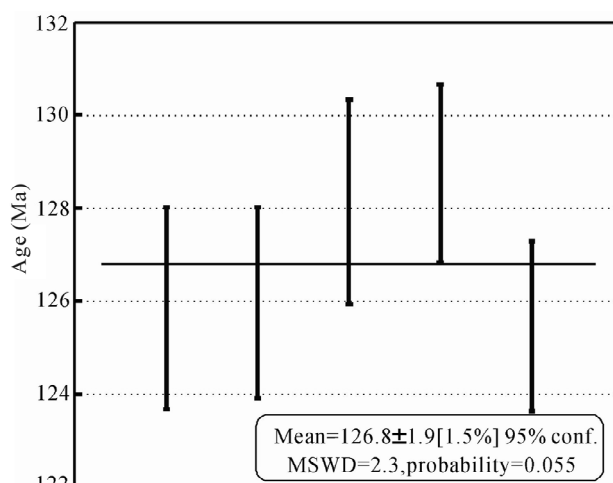


Fig. 1 Weighted mean of Re-Os model ages of molybdenite from Mo deposits in the Doupo Mo Deposit

* Corresponding author. E-mail: mengfang@cugb.edu.cn

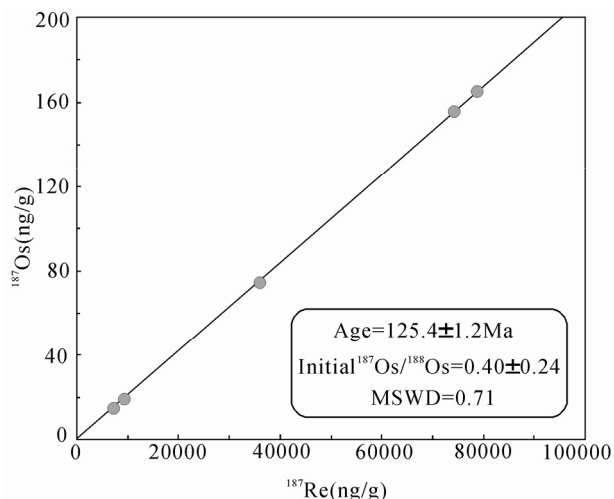


Fig.2 Re-Os isochron age of molybdenite in the Doupo Mo Deposit

activity. The Doupo Mo deposit was formed under an extensional tectonic environment, the corresponding tectonic setting can be ascribed to Dabie orogenic belt large-scale lithospheric thinning, delamination and thermal erosion.

Acknowledgements

This research was supported by the Geological Survey Project (1212011220869), the National Science & Technology Pillar Program (2011BAB04B06), the National Natural Science Foundation of China (No. 41272104).

References

- Mao Jingwen, Wang Yitian, Zhang Zuoheng, Yu Jinjie and Niu Baogui. 2003. Geodynamic settings of Mesozoic large-scale mineralization in North China and adjacent areas-implication from the highly precise and accurate ages of metal deposits. *Science in China (Series D)*, 46(8): 838~851
- Mao Jingwen, Xie Guiqing, Bierlein F, Qü Wenjing, Du Andao, Ye Huishou, Pirajno F, Li Houmin, Guo Baojian, Li Yongfeng, Yang Zeqiang. 2008. Tectonic implications from Re-Os dating of Mesozoic molybdenum deposits in the East Qinling-Dabie orogenic belt. *Geochimica et Cosmochimica Acta*, 72(18): 4607~4626
- Mao Jingwen, Xie Guiqing, Pirajno F, Ye Huishou, Wang Yitian, Li Yongfeng, Xiang Junfeng, Zhang Haijie. 2010. Late Jurassic-Early Cretaceous granitoid magmatism in Eastern Qinling, central-eastern China: SHRIMP zircon U-Pb ages and tectonic implications. *Australian Journal of Earth Sciences*, 57(1): 51~78
- Mao Jingwen, Pirajno F, Xiang Junfeng, Gao Jianjing, Ye Huishou, Li Yongfeng, Guo Baojian. 2011. Mesozoic molybdenum deposits in the east Qinling-Dabie orogenic belt: Characteristics and tectonic settings. *Ore Geol. Rev.*, 43(1): 264~293