

Re-Os isotopic dating for molybdenite from Huanggangliang Fe-Sn Deposit, Great Xing'an Rang, China

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Located in the northern Keshenketeng Banner in Inner Mongolia, the Huanggangliang Fe-Sn skarn deposit belong to Huanggang-Ganzhuer'miao metallogenic belt of south Great Xing'an Rang. In this study, the molybdenite of 07HGL-04 is occurred as cluster block in the skarn, and the molybdenite of 07HGL-07 is spotted-like in the stratiform skarn. The Re-Os isotope (Table. 1) of molybdenite was analyzed in National Geological Experimental Testing Center, China.

Sample No.	Wt (g)	¹⁸⁷ Re (ng/g)	¹⁸⁷ Os (ng/g)	Model age (Ma)
07HGL-04	0.659	20.6	0.0485	141.2±4.3
07HGL-07	0.446	51.25	0.2266	264.8±3.9

Table 1. Result of Re-Os dating for molybdenite in Huanggangliang Fe-Sn skarn deposit.

This testing model ages of the two samples are 141.2±4.3 Ma and 264.8±3.9 Ma respectively. This paper provide the evidence of accurate chronology for two metallogenic periods even though there are many previous suggestions for the genesis of the deposit [1, 2]. The Re-Os isotopic dating for molybdenite of two occurrences reveal that Permian sedimentary basin evolution is indeed an important metallogenic event that submarine sedimentary exhalative hydrothermal mineralization, and large scale tectonic-magmatic activity of Yanshanian period finally result in the formation of the deposit based on Permian mineralization. This discovery provides an important direction for exploration and metallogenic geodynamics research in this area.

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[1] J.M. Liu (2004) *Earth Sci Frontiers* **11**, 269–277. [2] J.W. Mao (2005) *Acta Petrol Sinica* **21**, 169-188.

The biogeochemical cycle of sulfur during the coal accumulation process in early paleozoic of Southern China

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The early Paleozoic coals were well-developed in coal resource-poor southern provinces of China. 'Stone Coal' was widely spreaded throughout southern China. Though the Stone Coal bed is discontinuous, the horizon can be recognized in a band of transitional shelf zone sediments stretching 1600 km only across southern China from Zhejiang Province to Guangxi Province. There contains and sometimes enriches a variety of metal elements in Stone Coal. It has been found that as many as 60 species of associated elements such as vanadium, molybdenum, phosphorus, barium, nickel, uranium, gold, silver, etc.. Researches show that Stone Coal was formed in the marine reducing environment with abundant bacteria and algae bioaccumulation. A large number of fossils, such as bacteria and algae (e.g. Cyanobacteria and brown algae), acritarchs, the paleospore, the sponge spicules and a number of primitive fauna and flora whose categories are not clear. Low carbon, high ash and high sulfur contents were the main characteristics of Stone Coal. The high sulfur quantity could be commonly interpreted as the marine sedimentary environment and the mechanical concentration and sequestration of algae. Most of the enrichment metal elements in Stone Coal are chalcophile. The early coal accumulation process is an important stage with enrichment of associated elements in stone coal. Polymetallic sulfides e.g. sulfur, pyrite, chalcopyrite, sphalerite, vaesite, polydymite, dobschauite, millerite, blucite and jordisite, etc.) are the main occurrences of metal elements. A large number of experiments and isotope data reveal that the bacterial sulfate reduction as the most likely biological agent not only leads to the large-scale mineralization of metal sulphide, but also is the major coal and ore-forming mechanism of the Stone Coal and metal sulphide deposits. But the conversion of sulfur biogeochemical processes and the relationship between the abnormal enrichment of metals and other basic geological and geochemical issues are not yet to be improved to solve during the early coal accumulation process. So the further study of biogeochemical behavior of sulfur in the early Palaeozoic coal accumulation process helps revealing the symbiotic mechanism and ore-forming effect of stone-coal bearing formation and polymetallic sulfide in South China.