

ZHOU Su, QIU Ruizhao, ZHANG Linlin, LIU Cui, SUN Kai and GUO Qinzhang, 2014. The Ore-Forming Age of the Huojihe Molybdenum Deposit in Lesser Xing'an Range. *Acta Geologica Sinica* (English Edition), 88(supp. 2): 1059.

The Ore-Forming Age of the Huojihe Molybdenum Deposit in Lesser Xing'an Range

ZHOU Su¹, QIU Ruizhao^{2*}, ZHANG Linlin³, LIU Cui¹, SUN Kai⁴ and GUO Qinzhang¹

¹ China University of Geosciences, Beijing 100083, P. R. China

² Development and Research Center, China Geological Survey, Beijing 100037, P. R. China

³ Tianjin Datong Investment Group Co.Ltd, Tianjin 300110, P. R. China

⁴ Tianjin Center, China Geological Survey, Tianjin 300170 P. R. China

In recent years, exploration has been apparently broken through along Lesser Xing'an Range- Zhangguangcai Ling zone in eastern Heilongjiang Province and east northern Jilin, where nearly 20 molybdenum deposits (points) have been found, including one giant deposit (Daheshancuo deposit), three large and medium-sized deposits (Wudaoling deposit, Cuihongshan deposit, LuMing deposit), five small-sized (Ergudongshan deposit, Sujiaweizi deposit, Toudaogou deposit, Tiegongshan deposit, Banlashan deposit). According to estimate, the proven reserves of molybdenum metal of the magmatic molybdenum reserves of about 15.2%, ranking in second, which makes the belt becoming one of the important molybdenum metallogenic belt in China. Huojihe molybdenum deposit in the paper is located in northeast area of Lesser Xing'an Range and one of the large molybdenum deposits which was found in recent years and is exploring (Jia G., 2009) with inadequate study.

Incremental step-heating ⁴⁰Ar/³⁹Ar analysis of biotite separate in ore-bearing porphyritic biotite monzogranites batholith and of feldspar in quartz monzonitic porphyry which intruded the granite rock at the Geochronology Laboratory at China University of Geosciences (Beijing) using Macromass 5400 static vacuum mass spectrometry have been conducted and yield plateau ages of 175.95 ± 0.86 Ma and 103.30 ± 0.53 Ma respectively. The age of 175.95 ± 0.86 Ma of biotite monzogranites is 5-10 Ma younger than the results obtained by LA-ICP-MS Zircon U-Pb (there are 193.6 ± 1.4 Ma and 181.0 ± 1.9 Ma (Hongyan Tan, et al., 2013), 190.3 ± 2.4 Ma (Sheng Zhang et al., 2013), 178 ± 2 Ma (Huijun Sun, 2010), 184.92 ± 0.91 Ma (Jiia Guo, 2009), 184.1 ± 1.5 Ma (Jiin Chen, 2011) and 186 ± 1.7 Ma (Yancen Yang, et al, 2012); Meanwhile it is in accordance with Re-Os isochron age of molybdenite (176.3 ± 5.1 Ma) (Hongyan Tan, et al., 2013).

In combination with geological history, mineralogy, petrology and geochemistry study says, we infer that data of 180-190 Ma represents the formation age of the

batholith, while biotite argon - argon age of 175.95 ± 0.86 Ma may represent the post-magmatic fluid activity, which forming cluster biotite observed in thin section; And the 103.30 ± 0.53 Ma of potassium feldspar from quartz monzonitic porphyry intruded into batholith represents another magmatic activity, which is completely dissimilar with porphyritic biotite monzogranites in trace elements and REE pattern as well as lead isotope characteristics and has nothing to do with molybdenum mineralization.

Acknowledgements

Research supported by the international Science & Technology cooperation Program of China (ISTCP) (2007DFA21380, 2011DFA22460), Science & Technology Support program of China (2006BAB01A03), and China Geological Survey (1212010811066, 12120113086400).

References

- Chen J. 2011. Metallogenic setting and metallogenesis of nonferrous-precious metal in Lesser Hinggan Mountain, Heilongjiang. Jilin University: 70-90 (in Chinese with English abstract)
- Guo J. 2009. Geological charaterstic and oringin of Mo deposit in Huojihe Heilongjiang province. Jilin University: 1-28 (in Chinese with English abstract)
- Han ZX, Xu YQ and Zheng QD. 2004. Metallogenic series and its evolution of important metallic and nonmetallic minerals in Heilongjiang province. Heilongjiang People's Publishing House: 1-241 (in Chinese)
- Sun ZJ. 2010. The mineralization and geochemical features of stone forest park Mo (W) in Xiaoxing'anling. Jilin University: 1-48 (in Chinese with English abstract)
- Tan HY, Wang DD, Lü J C, et al. 2013. Petrogenesis and mineralization chronology study on the Huojihe molybdenum deposit Xiao Hinggan Mountains and its geological implication. *Acta Petrologica et Mineralogica*, 32 (5) : 733-748 (in Chinese with English abstract)
- Zhang S, Kou LL, Han RP, et al. 2013. Metallogeny and zircon U-Pb age of ore-bearing granodiorite of the Huojihe molybdenum deposit in Heilongjiang province. *Geology and Resources*, 22 (3) :169-173 (in Chinese with English abstract)

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