

Muscovite ^{40}Ar - ^{39}Ar Geochronology for the vein-type W-Sn-Nb-Ta polymetallic ores in Jinzhuyuan deposit of Limu orefield, China

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Jinzhuyuan concealed granite stock is located in the south of the Limu W-Sn-Nb-Ta polymetallic orefield of south China. The orefield is well-known for its unique trace metal association in China. The granite stock is a fine-medium-grained muscovite monzogranite and has a steep intrusive contact with its Devonian and Carboniferous country rocks. The ores either are directly hosted by the granite or occur as veins such as quartz veins and feldspar-quartz veins within the granite. Other ore-bearing veins are hosted by carbonate in the outer contact zone.

In this study, muscovite samples were selected from two ore samples that were respectively collected from a wolframite-bearing quartz vein and a greisen that occurs right next to the wolframite-bearing quartz vein. The muscovite samples were irradiated at the U.S. Geological Survey TRIGA Reactor in Denver and dated at the Noble Gas Laboratory of University of Arizona by using ^{40}Ar - ^{39}Ar step-heating method. The dating yielded a 204.8 ± 1.8 Ma plateau age for sample LM004-3 and a 205 ± 1.6 Ma plateau age for sample LM004-4. The ages clearly constrain the mineralization timing of the deposit and it was during the late Indosinian time. The near-coeval ages may also suggest that both types of ores were produced about in the same time.

The Jinzhuyuan granite has a reported zircon SHRIMP U-Pb age of 218.3 ± 2.4 Ma and a muscovite ^{40}Ar - ^{39}Ar plateau age of 212.4 ± 1.4 Ma^[1]. Obviously the mineralization age obtained in this study is about 7-14 m.y. younger than its host granite, suggesting that the W-Sn-Nb-Ta polymetallic mineralization was subsequent to the Jinzhuyuan granite emplacement and was a localized hydrothermal process associated with the igneous activity.

[1] Feng, Zuihai *et al* (2013) *Resource Geology* **63**, 320-329.

Acknowledgement: This research was financial supported by a NSFC (No. 40772126).