

## The Shipingchuan large-scale vein-type molybdenum deposit, SE China: source and timing of mineralization

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The hydrothermal vein-type is one of the most significant molybdenum mineralization in eastern China, and is associated with magmatic rocks. The Shipingchuan (SPC) molybdenum deposit is located in the Sunkeng Volcanic Basin, SE China, and is a large-scale quartz vein-type deposit. It contains Mo resources more than 50,000 t with average grade of 0.374%. The quartz-molybdenite ore veins are hosted by different direction-trending faults surrounding the SPC K-feldspar granite with alteration assemblages of quartz, K-feldspar, sericite, and local fluorite. It was formed by three stages, i.e., the quartz-coarse pyrite stage (I), quartz-molybdenite-sphalerite-galena stage (II), and quartz-calcite stage (III).

Seven molybdenite samples yield model ages ranging from 105.1±1.5 to 106.6±1.6 Ma with a weighted mean age of 105.6±0.6 Ma (MSWD=0.3). These samples also define a Re-Os isochron with an age of 105.4±0.9 Ma (MSWD=0.5). Zircon LA-ICP-MS U-Pb dating yields a weighted age of 101.4±0.7 Ma for the K-feldspar granite and 93.0±1.1 Ma for the monzogranite porphyry. The molybdenite Re-Os ages are identical to the U-Pb age of the K-feldspar granite, but ~12.5 Ma older than the monzogranite porphyry.

The  $\delta^{34}\text{S}$  values for five pyrite samples from stage I range from 3.1 to 4.2‰ with an average value of 3.8‰, whereas,  $\delta^{34}\text{S}$  values for four molybdenite samples range from 4.7 to 5.6‰. Four molybdenite samples have Pb isotopic ratios of  $^{206}\text{Pb}/^{204}\text{Pb}=18.413\text{--}18.468$  (average=18.448),  $^{207}\text{Pb}/^{204}\text{Pb}=15.644\text{--}15.724$  (average=15.667), and  $^{208}\text{Pb}/^{204}\text{Pb}=38.796\text{--}39.241$  (average=39.033). Five K-feldspar granite whole-rock samples have age-corrected Pb isotopic data of  $(^{206}\text{Pb}/^{204}\text{Pb})_t=18.189\text{--}18.433$ ,  $(^{207}\text{Pb}/^{204}\text{Pb})_t=15.599\text{--}15.771$ , and  $(^{208}\text{Pb}/^{204}\text{Pb})_t=38.618\text{--}39.014$ , which are similar to those of sulfides. The constraints of Re-Os and U-Pb ages, together with these isotopic compositions, confirm a genetic relationship between molybdenum mineralization and the K-feldspar granite and probably indicate a common source.

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