

Multistage Cu-W-Pb-Zn polymetallic mineralization at Jiepai deposit, South China: constrain from U-Pb, Ar-Ar and Re-Os ages

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Traditionally, Caledonian granite was regarded as not related to metal mineralization in South China. Several Silurian Cu, W, Mo deposits were discovered in past ten years (e.g. Jiepai Cu-W, Baishiding Mo, Shedong W-Mo).

Jiepai Cu-W-Pb-Zn-Mo polymetallic deposit is located in the northeast Guangxi Province, South China. The orebodies occurs as skarns at the zone between the Yuechengling pluton and Cambrian dolomitic limestone and slate. Yuechengling pluton is the multistage intrusions, including Silurian, Trassic, Middle Jurassic, and Late Jurassic. Zircon SHRIMP U-Pb shows several stages intrusions emplced at the Jiepai deposit, e.g. 448.4 ± 4.6 Ma, 429.4 ± 4.5 Ma, 156.0 ± 3.0 Ma. The molybdenite Re-Os age (423.0 ± 4.0 Ma) indicated the skarn Cu-W mineralization occurred in Silurian, followed the Silurian biotite granite. The muscovite Ar-Ar age spectrum suggests the late hydrothermal activity overprinted the earlier mineralization.

The hydrothermal biotite Ar-Ar age (152.2 ± 1.1 Ma) indicated the Late Jurassic hydrothermal activity is responsible for late Cu-Pb-Zn mineralization. The hydrothermal biotite in biotite-chalcopyrite-quartz vein get the Ar-Ar age of 140.4 ± 1.1 Ma, which indicates the late Cu mineralization in the Jiepai deposit.

The zircon U-Pb, moybdenite Re-Os, biotite and muscovite Ar-Ar ages at Jiepai deposit indicated the Silurian mineralization dominated by Cu-W, and the Jurassic mineralization dominated by Cu-Pb-Zn. Although the Jiepai Silurian Cu-W mineralization was overprinted by late several stages magmatic-hydrothermal activities, the Silurian Cu and W mineralization did not strongly influenced.

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