

Late Jurassic - Early Cretaceous W-Sn-Be mineralization revealed by ^{40}Ar - ^{39}Ar dating of mica and biotite from granitoid in the southeastern Yunnan Province

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The southeastern Yunnan is located in the combination of the South China block, the Yangtze block, and the Tethys orogenic belt, and is an important tungsten-tin polymetallic mineralization belt and one of the important emerald sources in China. The formation of large and super-large tungsten-tin and other polymetallic deposits, as well as emerald deposits, is closely related to the late Yanshan-age granitic magmatism in this area (Li et al., 2013), and the determination of the precise age of diagenesis is important for the study of the background of diagenesis and the prediction of mineralization for the W-Sn-Be deposits of the southeastern Yunnan. Sn-Be deposits in southeastern Yunnan are of great significance for the study of the diagenetic and metallogenic background of the deposits, the genesis of the deposits, and the prediction of mineralization. The accurate determination of petrogenetic and metallogenic age is of great significance for studying the petrogenetic and metallogenic geological background, genesis, and metallogenic prediction of the W-Sn deposit in southeastern Yunnan. ^{40}Ar - ^{39}Ar dating method was used to determine the crystallization ages of the regional granitoids. The ages biotite of skarn garnet biotite schist, granodiorite gneiss, and plagioclase gneiss were tested, and the results showed that their plateau ages are close to each other, which are 77.15 ± 0.62 Ma, 69.86 ± 0.56 Ma, and 77.73 ± 0.65 M, respectively. The plateau age of the mica in the diamictite quartz schist is 123.68 ± 0.97 Ma. We suggest that two phases of W-Sn-Be mineralization (late Early Cretaceous ~120 Ma and Late Cretaceous ~80 Ma) existed in southeastern Yunnan, which corresponded to the peak mineralization period in southeastern Yunnan (77 ~ 94 Ma, Liu et al., 2021). The results suggest that the diagenetic mineralization event may be related to the lithospheric extension since the Late Mesozoic in the South China block. This new finding and understanding is of great practical significance for regional prospecting deployment.