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Age of the granitic magmatism and the W-Mo mineralizations in skarns of the Seridó Belt (NE Brazil) based on zircon U-Pb (SHRIMP) and Re-Os determinations

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Abstract

Over five hundred W-Mo skarns have been reported in the Neoproterozoic Seridó belt in the northeastern Brazil. The origin of these mineralizations has been attributed to metasomatic reactions occuring after the infiltration of hydrothermal fluids that are mostly derived from the plutonic magmatic activity that ranged between approximately 600 and 525 Ma. Here we date molybdenite using N-TIMS on Re-Os analysis of three major scheelite deposits (Brejuí, Bonfim and Bodó) hosted in the skarn horizons of the metasedimentary sequence. Molybdenite is an integral part of the mineralizations that include scheelite in skarns and, in the Bonfim deposit, gold concentrate in late brittle faults. The Re-Os ages are 554 ± 2 Ma (Brejuí), 524 ± 2 Ma (Bonfim) and 510 ± 2 Ma (Bodó). The age of the Brejuí molybdenite, however, appears to be anomalous based on the local geology of the deposit, which is located next to the contact of a batholith dated ca. 575 Ma. In turn, the Bonfim molybdenite yields similar ages in replicated samples with variable high Re contents, attesting to the reliability of the Re-Os system in the Bonfim samples. New U-Pb SHRIMP ages of four biotite (leuco)granite plutons vary from 577 ± 5 Ma to 526 ± 8 Ma, which overlap with molybdenite crystallization. These results indicate a close connection between the W-Mo mineralizations and the plutonic activity that intruded the belt after the peak HT/LP metamorphism. The latest pulses of felsic magmatism, which were contemporaneous with the emplacement of Be-Ta-Nb-Li pegmatites, therefore constitute a potential guide in the Seridó belt for prospective W-Mo deposits.

Keywords: Re-Os molybdenite, U-Pb SHRIMP, W-Mo skarns, granitoids, Seridó belt, Brazil

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