

Re-Os AGES FOR THE ERDENET AND TSAGAAN SUVARGA PORPHYRY
Cu-Mo DEPOSITS, MONGOLIA, AND TECTONIC IMPLICATIONS

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Abstract

The Erdenet and Tsagaan Suvarga deposits are the two largest known porphyry Cu-Mo deposits in Mongolia. Replicate Re-Os analyses of molybdenite from these deposits yield ages of 240.7 ± 0.8 and 240.4 ± 0.8 Ma for Erdenet and 370.1 ± 1.2 and 370.6 ± 1.2 Ma for Tsagaan Suvarga (2 σ errors). The Re-Os age of Erdenet is significantly older and that of Tsagaan Suvarga is slightly older than published $^{40}\text{Ar}/^{39}\text{Ar}$ ages for sericite associated with mineralization in these deposits (207.4 ± 5.0 and 364.9 ± 7.0 Ma, respectively). These Re-Os results suggest that in the hydrothermal environment, $^{40}\text{Ar}/^{39}\text{Ar}$ ages may be partly to significantly reset, whereas Re-Os ages record and maintain the age of primary mineralization events.

These Re-Os ages indicate that porphyry mineralization at Erdenet and Tsagaan Suvarga are related to porphyritic intrusions representing the youngest event during regional magmatism in northern and southern Mongolia, respectively. The Re-Os age of Erdenet marks the final stage of arc magmatism in northern Mongolia, followed by Late Permian collision between the Mongolian-North China and Siberian blocks. The Re-Os age of Tsagaan Suvarga indicates that Devonian arc magmatism in southern Mongolia was active at the present latitude of 44° N at least until 370 Ma.