

**Re-Os and U-Pb geochronology of the Au-U mineralization at Rompas, Peräpohja Schist Belt, northern Finland**

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The sedimentary and volcanic rocks in the Peräpohja Schist Belt were deposited from 2.44 Ga to 1.92 Ga during the protracted rifting of the Archaean basement. Greenschist to amphibolite facies metamorphism and multiple folding took place during the Svecofennian orogeny (1.9-1.8 Ga), with local intrusions of post-orogenic granitoids (1.81-1.76 Ga; Ranta et al., 2014).

The Rompas Au-U mineralisation is hosted by folded dolomite-quartz veins in mafic metavolcanic rocks, and contains uranium-bearing zones without gold and pockets of high grade gold with uraninite. Deposition and metamorphic re-crystallization of uraninite was followed by formation of pyrobitumen crusts around uraninite in some zones. Precipitation of native gold together with some telluride, arsenide and sulphide minerals was confined to fractures in uraninite and to cracks and surfaces of pyrobitumen, suggesting that gold enrichment occurred during a late hydrothermal event. Molybdenite is associated with uraninite and pyrobitumen and it is also present in quartz veins of skarn rocks around granitoid intrusions next to Rompas. Re-Os dating of molybdenite suggest 2128-2168 Ma for the primary uraninite mineralization. The 1780 Ma age obtained from molybdenite of quartz veins in skarn confirms the role of post-orogenic granite intrusions in the late hydrothermal processes of the area. Results of the *in situ* LA-ICPMS U-Pb dating of uraninite grains indicate that some small domains in uraninite preserve the original pre-metamorphic crystallisation age, whereas other grains were formed during the Svecofennian orogeny (~1.8-1.9 Ga). Results of the chemical age dating and variation in composition of uraninite are also in agreement with these observations.

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**References:**

Ranta, J-P., Lauiri, L.S., Hanski, E., Huhma, H., Lahaye, Y., Vanhanen, E., 2014, U-Pb and Sm-Nd isotope constraints on the evolution of the Paleoproterozoic Peräpohja Belt, northern Finland. *Precambrian Research*, 266, 246-259.