

*GEOCHEMISTRY OF URANIFEROUS BITUMEN IN THE
SOUTHWEST ATHABASCA BASIN, SASKATCHEWAN, CANADA*

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Abstract

The sediment-hosted unconformity-type Southwest Athabasca uranium mineralization in northern Saskatchewan, Canada, contains uraniferous bitumen, as observed elsewhere in the Athabasca basin. Uraninite is present either as micron-sized grains dispersed in bitumen (uraniferous bitumen) or as larger grains situated in the pore space between bitumen globules. The spatial and textural relationships between uraninite and bitumen suggest that they were co-precipitated. LA-ICP-MS U/Pb dating of uraniferous bitumen yielded an age of 1575 ± 53 Ma, similar to that of other unconformity-type uranium mineralization in the Athabasca basin, indicating that the bitumen was formed early in the history of the basin. Nitrogen, carbon, and sulfur isotope analyses of uraniferous bitumen indicate that its source material was probably kerogen produced by cyanobacteria in a clastic environment.

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