

## Biogeochemical Interactions of Uranium and Organic Matter in Mineralized Deposits

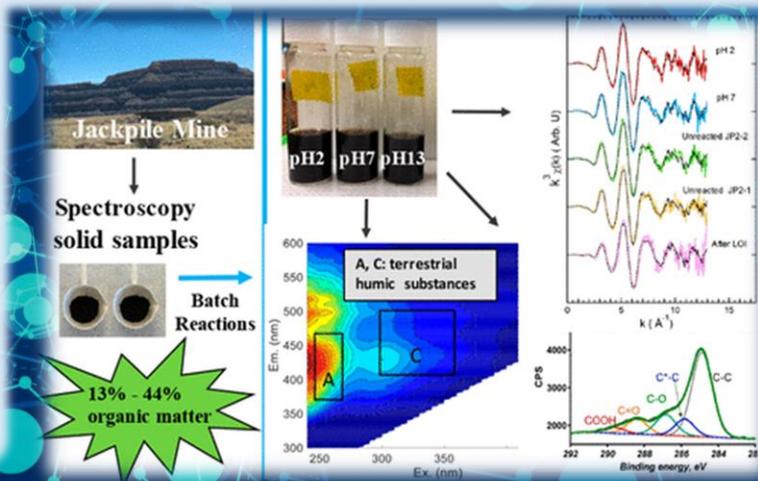
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The reaction of U and organic matter was investigated as a function of pH in solids from mineralized deposits and in controlled laboratory experiments with Suwanee River natural organic matter. This study integrated aqueous chemistry experiments, X-ray spectroscopy, excitation emission matrix, spectroscopy, and electron microscopy. Phenolic and carbonyl functional groups were detected at higher intensities than carboxylic groups in supernatant samples from batch extractions conducted at pH 13, 7, and 2 with solids from mineralized deposits.

The presence of U(IV) and U(VI) species was detected in the supernatant after batch extractions with solids from mineralized deposits conducted under oxidizing conditions. Experiments with Suwanee River natural organic matter indicate that precipitation reactions can affect U and organic matter solubility at pH 2 and 4. Additional experiments indicated that calcium in carbonate water at circumneutral pH facilitates the transport of U(VI) in plant roots. These results are relevant to well buffered surface waters and those affected by acid mine drainage in the proximity of uranium mineralized deposits.



**September 06<sup>th</sup> @ 12 pm – Jones Annex 101**