Virtual

Seminar

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Small but mighty - algal and bacterial biodegradation of naphthenic acids for oil sands process-affected water treatment

ABSTRACT

Naphthenic acids are a class of compounds associated with all crude oils and become enriched in heavy oils such as the bitumen associated with Alberta's oil sands resources. During surface mining of the oil sands, naphthenic acids partition into waste fluids that are stored in holding areas frequently referred to as tailings ponds. The wastewater present in tailings ponds containing naphthenic acid and other substances is referred to as oil sands process-affected water (OSPW). As naphthenic acids have some known toxicity, developing various approaches that can be applied to reduce their concentrations in OSPW are of interest. Biodegradation of naphthenic acids by bacteria and algae naturally found in the oil sands region represents one potential solution for OSPW treatment. This talk will highlight some recent studies examining the potential for bacteria and algae found in oil sands tailings ponds and constructed wetlands treating OSPW to biodegrade naphthenic acids. Microbial community analysis, isolate characterization, transcriptome studies, and biodegradation studies show that algae and bacteria have strong potential for utilizing naphthenic acids, suggesting the use of these small but mighty organisms to treat OSPW.

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