Comparison of the Levels of Chloride Ions with the Characterization of Oil Sands Polar Organics in Natural Waters by use of Fourier Transform Ion Cyclotron Resonance Mass Spectrometry

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Results and Discussion

Oil sands processed water (OSPW) is known to have elevated levels of chloride ions above the background in the Athabasca River in Alberta, Canada. The solubility of oil sands polar organics (including naphthenic acids) can be affected by the salt content of the water, which in turn is hypothesized to affect the distribution of organics in aquatic environments. Salt interactions are shown to affect the distribution of polar organics observed by electrospray ionization Fourier transform ion cyclotron resonance mass spectrometry of environmental samples (OSPW, river water and ground water). Acidic oxygen-containing species (O_n in which n = 2-10, were prevalent in most samples, the relative distribution of which depended on both the sample location and chloride levels of the water. Likewise the distribution of heteroatomic sulfur species (O_nS_s species in which n = 2-8 and S = 1-2) also depended on the sample location and chloride ion concentration of the waters investigated. Environmental monitoring of oil sands polar organics and naphthenic acids should therefore be conducted concurrently with measurement of chloride ions (and other salts).[1]

Acknowledgements

Samples were collected by Greg Bickerton, Environment Canada. The program of energy and research development (PERD) is acknowledged for funding of the research, as well as NSF Division of Materials Research through DMR-06-54118 and the State of Florida.

References

[1] Headley, J. V., *et al.*, Energy & Fuels, **26**, 2585-2590 (2012)