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Advanced polymer materials for sequestration of oxyanions

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Abstract

The fate and transport of oxyanion species such as orthophosphate (Pi) in aquatic environments is gaining greater concern for agriculture, industry, and aquatic environments. The uncontrolled release and buildup of nutrients such as Pi and other oxyanions in aquatic environments have unintended effects such as eutrophication that pose a concern for global water security. Synthetic modification of biopolymers provide an opportunity to design improved polymer materials for the controlled removal of oxyanion species in aqueous media. This presentation will provide an outline of recent developments at the University of Saskatchewan (U of S) related to studies focused on the synthesis and characterization of modified biopolymer materials and their application as adsorbents. Synthetic modification via surface functionalization, cross-linking, and composite formation of various biopolymers have led to materials with enhanced physicochemical properties related to adsorption. Case studies of biopolymer materials will highlight their responsive behaviour to external stimuli (pH, ionic strength, temperature, etc.) and evidence of the unique adsorption properties of such materials toward oxyanions in aqueous media. The examples described herein reveal that such studies contribute to the field of advanced polymer materials.

Biography

Lee D. Wilson is an Indigenous Scholar and Associate Professor of Chemistry at the University of Saskatchewan. He specializes in Physical Chemistry and Materials Science of Polymers with an established research program on the development of new types of sorbent materials that are relevant to the environment, biotechnology, medicine, chemical delivery/separation systems, and materials for water treatment and energy transfer. Wilson obtained a PhD in Physical Chemistry from the University of Saskatchewan (Saskatoon, Saskatchewan) and completed a PDF as a NSERC Visiting Fellow with the National Research Council of Canada in the Functional Materials Program in (Ottawa, ON.). The Wilson group has an h-index of 34 with publications (> 180) in diverse areas of Physical Chemistry, Environmental Chemistry and the Material Science of Polymers.

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