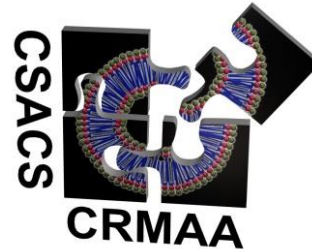


McGill Chemical Society Seminar Series



Tuesday, March 21st, 2017, 1:00 PM

Otto Maass Chemistry Building, OM10

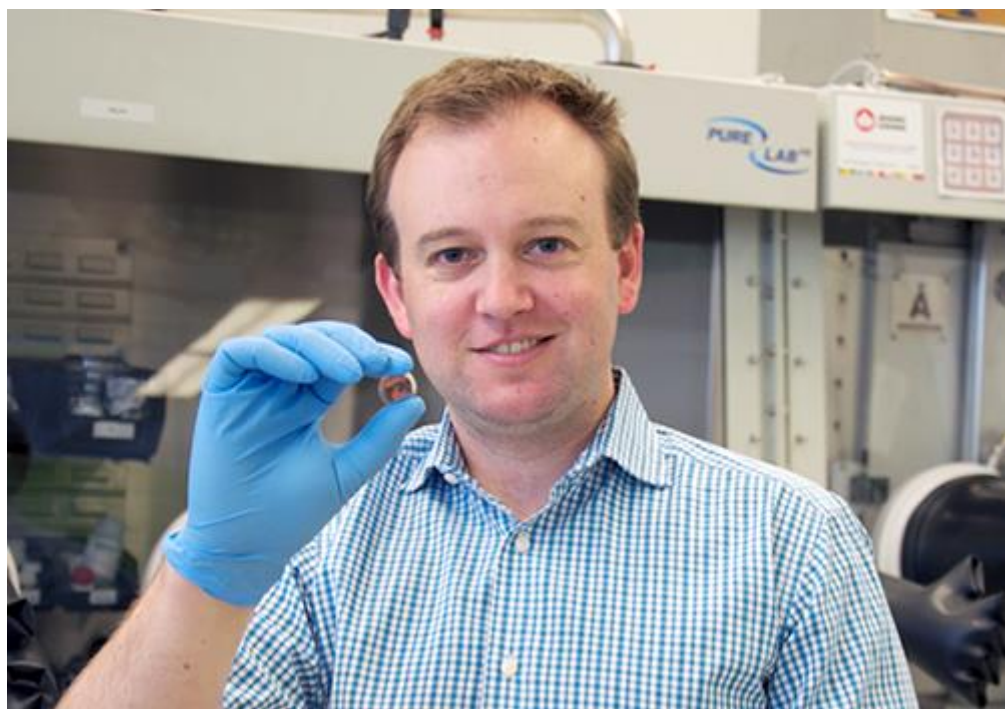


Prof. Dwight Seferos

University of Toronto

Conjugated Polymers that Contain Selenium and Tellurium.

Abstract:



For over 7 years my group has been fascinated by how tellurium and selenium can influence the optoelectronic properties of conjugated electronic materials. Some of our work has focused on the development of conjugated polymers that self-organize at the nanoscale by spontaneous phase-separation. We have been interested in conjugated block copolymers where each block contains a distinct heterocycle. These polymers are fundamentally important for testing the limits

of polymer phase separation. They are also useful in optoelectronic devices where nanoscale structure is important, such as solar cells. In this context we have developed selenophene-thiophene block copolymers and discovered that these copolymers undergo a significant amount of phase separation. This is surprising given the chemical similarity of the repeat units, however we have uncovered several properties, including crystal packing, that differ in these polyheterocycles. By increasing the compatibility of the selenophene and thiophene units and we observe co-crystallization in statistical copolymers. These statistical copolymers form nanowires and when fabricated into nanowire solar cells they operate with a greater efficiency than cells composed of homopolymer nanowires. We have also learned how to synthesize polymers and delocalized molecules based on tellurophene, and identified several unexpected properties in these materials including reversible binding of small molecules, and the ability to photo-reductively eliminate halogens. The synthesis, properties and optical applications of these materials will be discussed.

EVERYONE IS WELCOME!