Accidental discovery may lead to improved polymers

April 5 2013

Chemical Engineering Professor Tim Bender and Post-Doctoral Fellow Benoit Lessard's discovery of an unexpected side product of polymer synthesis could have implications for the manufacture of commercial polymers used in sealants, adhesives, toys and even medical implants, the researchers say.

Bender and Lessard discuss their discovery in "Boron subphthalocyanine polymers by facile coupling to poly (acrylic acid-ran-styrene) copolymers and the associated problems with autoinitition when employing nitroxide mediated polymerization," a paper published this month in *Macromolecular Rapid Communications* and online at MaterialsView.com.

"People in polymer synthesis would be very interested in the process described in our paper, as we document the discovery of a side-product. This side-product is quite unexpected based on our current knowledge of polymer chemistry," Bender said.

Bender and Lessard describe a synthesis of Boron subphthalocyanines (BsubPcs) containing polymers that can be used in organic electronic devices. What makes the article significant is that it also describes their discovery of a new side product of a common polymer synthesis technique, which would not have been observed without the addition of the BsubPc to this standard polymer.

"Currently BsubPc polymers do not have any commercial applications.

However, by studying their properties and finding new and inexpensive ways to synthesize them, we are able to open the door for potential applications in the field of organic electronics," Lessard said.

Commercial polymers may also contain this particular side product, Bender and Lessard wrote. If the side product can be reduced or eliminated, more of the polymer could be produced with more consistent quality.

Bender and Lessard are also investigating the optical and electrical properties of BsubPc polymers for possible use in organic electronic devices, such as organic field-effect transistors, organic light emitting diodes and organic photovoltaics. Applying polymers in organic electronics may lead to more flexibility, lighter weight and lower manufacturing costs, they wrote.

More information: www.materialsviews.com/boron-s … alocyanine-polymers/

Provided by University of Toronto

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