

Title: Changing up BN-Styrenes: Effect of Substitution Pattern on the Free Radical Polymerization and Polymer Properties

Abstract:

The isoelectronic and isosteric replacement of C=C for B-N units in conjugated organic systems has attracted tremendous recent interest as novel electronic properties, reactivity, and applications are achieved. Azaborinine-substituted polymers are poised to dramatically expand the diversity and functionality of polystyrenes via BN for CC substitution, but this new class of materials remains underexplored. The inherent polarity of the BN moiety can have a distinct effect on the polymerizability and the resulting polymer properties. In this presentation, we disclose the preparation of a series of new isomeric azaborinine-substituted polymers via standard free radical polymerization. The effects of the substitution pattern of vinylated B-mesityl azaborinines on the polymerization reactivity and physical properties of the respective polymers are studied. Computational studies offer insights into the subtle electronic effects that result in this differential reactivity. We also compare the properties to those of the all-carbon polystyrene analogs.