

CORE-CM SEMINAR

Michigan State University

Rebekka Klausen
Johns Hopkins University

Unconventional Building Blocks for Functional Polymeric Materials

Abstract:

The Klausen group designs and synthesizes unconventional molecular building blocks for the construction of diverse functional polymeric architectures. Motivated by the conviction that the synthesis of new materials drives the discovery of new applications, this talk will describe the synthesis and polymerization of novel hybrid inorganic-organic monomers. The materials we prepare are expected to find application in energy science as earth abundant quantum materials or as plastics with finely controlled physical properties.

The semiconductor silicon has revolutionized life in the last century, from the development of computer chips to the discovery of solar cells that make telecommunication satellites possible. The frontier for silicon research and development is at the nanoscale. The incredible potential of nanoscale silicon arises from the attractive properties it shares with bulk silicon, such as earth abundance and low precursor toxicity, and the distinctive optical and electronic properties emerging at small sizes. This talk describes the design and synthesis of new molecular forms of silicon, as well as the characterization of materials properties and the fabrication of electronic devices based on molecular silicon.

BN 2-Vinylnaphthalene (BN2VN) is a solution to a long-standing challenge in polymer chemistry, the copolymerization of nonpolar and polar monomers. Though the incorporation of polar functionality into nonpolar polymers is an essential strategy for modulating physical properties, challenges in their direct copolymerization include phase separation, significant differences in reactivity, and the limited compatibility of polar functional groups with polymerization catalysts. We show that BN2VN retains the reactivity of styrene, while post-polymerization modification of the C-B bond provides hydroxyl-functionalized polymers, or styrene-vinyl alcohol (SVA) copolymers.

Wednesday, November 7, 2018

10:30 AM*

Room 1400 – Biomedical & Physical Sciences

Professor Rebecca Anthony – Host

***Refreshments at 10:15 AM**