



Inorganic Chemistry Seminar Series

Tuesday, April 3, 2018, 12:30 pm
Seaver Science Library, Room 150

SSC Auditorium next to the library

Professor Emily McLaurin

Department of Chemistry
Kansas State University

Controlling Nanocrystal Properties using Surface Chemistry

Abstract:

Colloidal semiconductor nanocrystals (quantum dots) possess physical and chemical properties of fundamental interest that are desirable for applications ranging from display technologies to biological imaging. Attaining these nanocrystals can require time-consuming syntheses, but use of microwave reactors opens the door for new and often faster reaction pathways. Using microwave-assisted synthesis, nanocrystals with different morphologies, sizes, and optical properties are readily obtained. With fluoride-containing ionic liquids, luminescent indium phosphide nanocrystals are generated, and through ligand stripping, particles that suspend in solvents with a range of polarities are readily obtained. By changing reaction conditions, these nanocrystals form from other ionic liquids and salts, suggesting a broadly applicable method for tuning nanocrystal surfaces. Understanding these and other new microwave-assisted methods provides simpler routes to high-quality toxic-heavy-metal-free nanocrystals using safer, cheaper materials. The tunability of the nanocrystal surface chemistry provides a model system for characterization of nanocrystals and their interactions with acceptors. Understanding these interactions allows us to examine intermolecular processes and provides new insight into more complex interaction.

Hosted by Professor Richard Brutchey

The scientific community is invited

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