



UNIVERSITY OF SOUTHERN CALIFORNIA

DEPARTMENT OF CHEMISTRY

Organic / Materials Chemistry Seminar

“Assembly of 2D Particles at Fluid-Fluid Interfaces to Architect Advanced Composite Materials”

Professor Emily Pentzer
Case Western Reserve University
Department of Chemistry
Department of Macromolecular Science
and Engineering

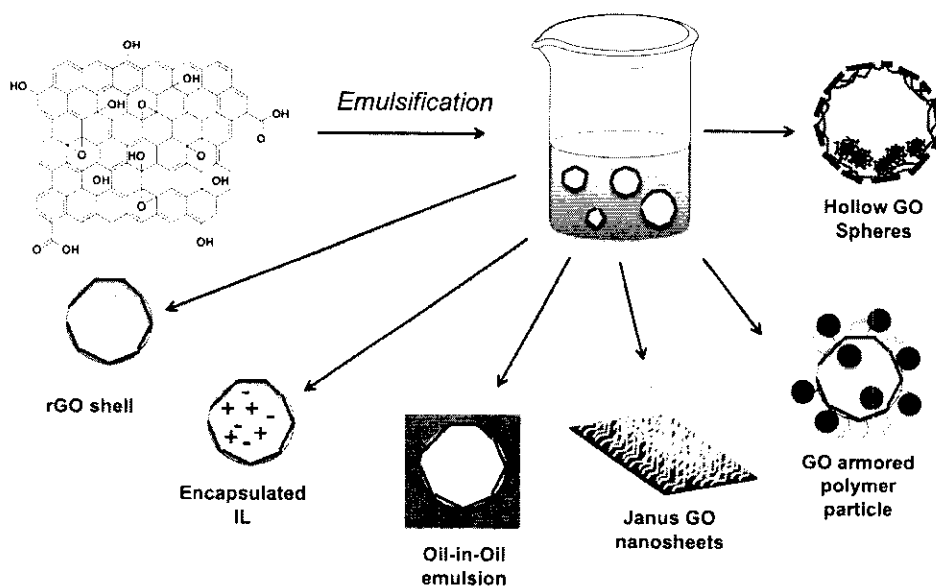
Wednesday, March 13, 2019
12:00 PM
Olah Library

Hosted by Prof. Barry Thompson

Scientific Community is Invited

Assembly of 2D Particles at Fluid-Fluid Interfaces to Architect Advanced Composite Materials

Emily Pentzer
Frank Hovorka Assistant Professor
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The interface between two fluids is not only important for defining reactivity of dislike materials, but it is also applicable for the preparation of stable higher order structures. The Pentzer lab has developed 2D carbon-based nanosheets that assemble at different fluid-fluid interfaces including oil-water, oil-oil, ionic liquid-water, and ionic liquid-oil and demonstrated the use of these Pickering emulsions as templates for the preparation of higher order composite structures. Graphene oxide (GO) and its functionalized analogues are used as the 2D particle surfactants, and are especially attractive given they have properties distinct and complimentary to the more commonly studied spherical and rod-like counterparts, and because these nanosheets are multifunctional (e.g., antimicrobial, good gas barriers, precursor to electrically conductive nanosheets, etc.). Recent advances from the Pentzer lab will be reported, including preparation of Janus nanosheets, water-sensitive reactions in oil-in-oil emulsions, GO capsules filled with ionic liquid for supercapacitor electrodes, GO capsules for compartmentalization of phase change materials, and GO coatings for 3D printable polymers to prepare conductive structures. This work makes use of fundamental organic chemistry reactions and thus gives access to unique structures and assemblies of interest for a broad range of applications in a scalable fashion.

Emily Pentzer
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Emily Pentzer is the Frank Hovorka Assistant Professor of Chemistry at Case Western Reserve University in Cleveland, OH. She received a BS in chemistry from Butler University (2005) and PhD in organic chemistry from Northwestern University (2010), where her thesis work focused on metathesis routes for preparing and polymerizing unsaturated medium-sized lactones and lactams under the direction of Professor Sonbinh T. Nguyen. She then worked with Professor Todd Emrick in the Polymer Science and Engineering Department at UMass Amherst where she focused on the synthesis and assembly of electronically active materials for organic photovoltaics as part of a DOE EFRC on Polymer-Based Materials for Harvesting Solar Energy.



In 2013, Dr. Pentzer joined the faculty at CWRU in Chemistry and received a secondary appointment in Macromolecular Science and Engineering in 2015. Her research uses organic synthesis to access new materials and assemblies as a route to understand structure-property-application relationships and access properties not possible with current state-of-the-art systems. Dr. Pentzer regularly participates and organizes events aimed at facilitating the transition of graduate students and post-docs to successful and vibrant careers in academia. She has received several awards including the NSF-CAREER award (2016) and PMSE Young Investigator Award (2017). She currently serves as an Associate Editor for the RSC journal *Polymer Chemistry* as well as the publicity chair for the Polymer Division (POLY) of the American Chemical Society.

Dr. Pentzer and her lab will move to Texas A&M University starting July 1, 2019 in the Department of Chemistry and Department of Materials Science and Engineering.