Materials Science and Engineering Department

Winter Seminar Series

Polymerizations in Pickering Emulsions as a Route to Hybrid Materials

Prof. Emily Pentzer
Department of Materials Science and Engineering
Texas A&M University

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3-4PM
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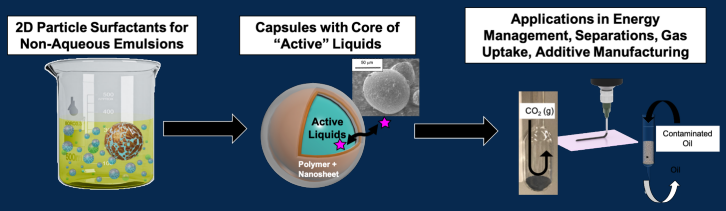
Pickering emulsions, or those stabilized by solid particles, provide a distinct template for the product ion of composite structures which combine the properties of the particles, the droplets, and any addi tional components such as polymer. This presentation will cover the use of Pickering emulsions stabili zed by 2D particles (i.e., nanosheets) to prepare capsules with core of ionic liquid or phase change material. Here, modified graphene oxide nanosheets are used to stabilize non-aqueous emulsions and polymer deposition or inter facial polymerization is used to give the capsules integrity. The prese ntation will also address the use of transition metal carbides and nitrides (solution processable MXen es) as Pickering surfactants and the pro duction of monolithic structures by tailored polymerization strategies. Application of these hybrids in gas sequestration, thermal energy storage, and electro mag netic interference (EMI) shielding will be highlighted.



Emily Pentzer is an Associate Professor in the department of chemistry and the department of materials science and engineering at Texas A& M University. She received a BS in chemistry from Butler University (2005) and PhD in chemistry from Northwestern University (2010), where her thesis focused on preparing and polymerizing unsaturated lactones and lactams. She then worked with Professor Todd Emrick in the Poly mer Science and Engineering Department at UMass Amherst where she focused on the synthesis and assembly of electronically active materi als for organic photovoltaics. In 2013, Dr. Pentzer started her independent career as an assistant professor of chemistry at Case Western Rese rve University and she moved to Texas A&M in 2019. The Pentzer Lab's research centers on developing new polymeric materials and assem blies as a route to understand structure-property-application relationships and access functions not possible with current state-of-the-art sys tems. Her group works on the encapsulation of "active" liquids and gases, polymer-based data storage in a quaternary code, and additive ma nufacturing for multifunctional materials. Dr. Pentzer regularly participates in events aimed at professional development of students and post -docs and facilitating their transition to vibrant STEM careers. She has received several awards including the NSF CAREER award (2016), PMSE Young Investigator Award (2017), CWRU Faculty Diversity Excellence Award (2019), ACS WCC Rising Star Award (2021), and was named a Texa s A&M Presidential Impact Fellow (2021). She serves as an Associate Editor for Polymer Chemistry and was elected Alt. Councilor for the Poly mer Division (POLY) of the American Chemical Society in 2020.

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Email: kn52@drexel.edu

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