



Department of Chemical Engineering presents

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"An Accessible Synthetic Approach to Novel Polyethers "

Polyethers are technologically important and are found in such diverse applications as electrolytes in lithium ion batteries, as membranes for the separation of CO₂, and as coatings to prevent fouling. The utility of polyethers stems from their functional monomer precursors, epoxides. Epoxides can possess a diverse array of functional groups, which makes them attractive as a means to prepare polymeric materials with targeted properties. However, the most common method to polymerize epoxides, anionic ring opening polymerization (AROP), suffers from a number of drawbacks and, therefore, epoxides are underutilized as a materials platform. As part of my postdoctoral work, I developed an effective and accessible method to polymerize epoxides using an aluminum-based initiator which is characterized as a mono- μ -oxo-dialuminum (MOD) species. Using the MOD initiator, epoxides of arbitrary functionality can be polymerized in minutes, which has resulted in polymers that have never been synthesized before and has vastly expanded the composition space for polyethers. In this talk, I will discuss the origins of the MOD initiator, what it can do with regards to polyether synthesis, and how I will utilize it as a platform to create advanced, functional materials that solve contemporary technological and societal challenges.