

**14 OCTOBER
2022
10 AM - 11 AM**



CENTER FOR
**PLASTICS
INNOVATION**
at the UNIVERSITY OF DELAWARE

CPI 2022 Fall Seminar Series Presents:



DAMIEN GUIRONNET

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The University of Illinois at Urbana-Champaign
Department of Chemical and Biomolecular Engineering
Department of Chemistry
Beckman Institute Faculty**

THE POWER OF REACTOR ENGINEERING TO PROGRAM POLYMERIZATION AND DEPOLYMERIZATION OUTCOMES

Abstract

Advances in polymerization techniques have enabled the synthesis of polymers with precise composition, architecture and molecular weight. My group has further extended the diversity of polymer structure achievable by these techniques through the implementation of reactor engineering principles. We pioneered two concepts where polymers with any programable shape or molecular weight distribution can be synthesized starting from a simple pen-and-paper drawing of the targeted product.

We recently implemented a reactor engineering strategy to perform the selective depolymerization of polyethylene into propylene. By performing two catalytic reactions in tandem in a flow reactor, we established that polyethylene can be converted into propylene with high selectivity and high conversion.

The precision and predictability achieved during our polymerization and depolymerization studies reside in the integration of reactor engineering principles, and advanced chemistry.

Biography

Damien Guironnet is an Associate Professor in the Department of Chemical and Biomolecular Engineering and Department of Chemistry. He joined Illinois in 2014 from BASF Corporation where he worked as a senior research scientist. At Illinois, his research focuses on the development of catalytic polymerization techniques to achieve precise control over polymer composition and architecture. They implement sophisticated reactor engineering strategies to design and automate the synthesis of tailor-made polymers.

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