

Chemistry Invited Faculty Seminar
Tomorrow (Friday) February 8 at 3:30 PM in HEC 125
Please note the room.



Dr. Paul Rugar

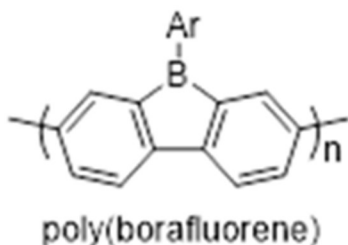
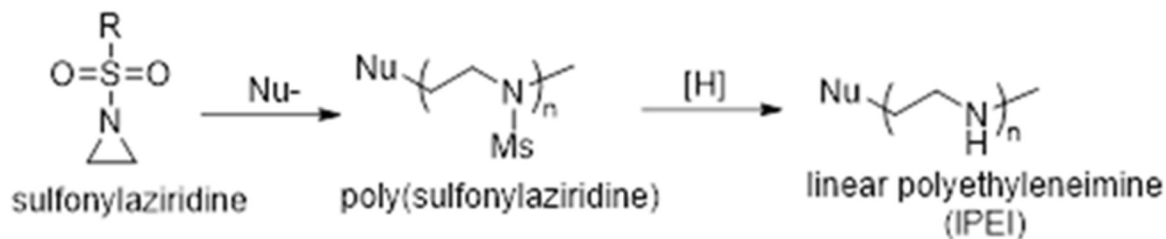
Assistant Professor
Chemistry Department
University of Alabama
Host: Titel Jurca

The Synthesis of Polyethyleneimine and Boron Containing Conjugated Polymers

Abstract

The first half of the talk will overview our work on the controlled polymerization of polyethyleneimine (PEI). PEI, a polymer with a $-\text{CH}_2\text{CH}_2\text{N}(\text{H})-$ repeat unit, is used in a wide variety of applications such as gene transfection, gas absorption/purification, and removal of metals from waste. However, the synthesis of PEI is difficult to control, and great efforts are being made to improve upon its polymerizations. We will demonstrate that the judicious selection of N-protecting groups enables the living anionic ROP of N-functionalized aziridines and subsequent conversion to linear PEI.

The second part of the talk will discuss conjugated polymers containing boron atoms. The incorporation of 3-coordinate boron is attractive as the boron empty p-orbital increases polymer electron affinity and provides the potential for polymers with inherent sensing applications.



Selected Publications

“A Poly(9-Borafluorene) Homopolymer: An Electron-Deficient Polyfluorene with “Turn-On” Fluorescence Sensing of NH₃ Vapor” Adams, I.; Rugar, P. A. *Macromolecular Rap. Commun.* 2015, 36, 1336-1340.

“Living Anionic Copolymerization of 1-(Alkylsulfonyl)aziridines to Form Poly(sulfonfylaziridine) and Linear Poly(ethylenimine).” Reisman, L.; Mbarushimana, C. P.; Cassidy, S. J.; Rugar, P. A. *ACS Macro Lett.* 2016, 5, 1137-1140.

“Anionic Ring-Opening Polymerization of N-(tolylsulfonyl)azetidines To Produce Linear Poly(trimethylenimine) and Closed-System Block Copolymers.” Reisman, L.; Rowe, E. A.; Jackson, E. M.; Thomas, C.; Simone, T.; Rugar, P. A. *J. Am. Chem. Soc.* 2018, 140, 15626-15630.