



TECHNISCHE UNIVERSITÄT
CHEMNITZ

Fakultät für Naturwissenschaften
Forschergruppe Organisch-Anorganische
Nanokomposite durch Zwillingspolymerisation

Einladung zum Gastvortrag

im Rahmen der Forschergruppe Organisch-Anorganische
Nanokomposite durch Zwillingspolymerisation

am: **20.03.2017; 11:00 Uhr**

Raum: **1/232 (Straße der Nationen 62)**

Dauer: ca. 45 Minuten

Thema:

**“The Living Polymerization of Aziridines and
the Synthesis of Inorganic Element Containing
Conjugated Polymers”**



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“The Living Polymerization of Aziridines and the Synthesis of Inorganic Element Containing Conjugated Polymers”

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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. PEI is typically formed by the cationic ring-opening polymerization (ROP) of aziridine, which produces a highly branched polymer (BPEI). The synthesis of BPEI is difficult to control, limiting the incorporation of PEI into intricate polymer structures such as block copolymers. 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.¹

The second part of the talk will discuss conjugated polymers containing boron and phosphorus atoms. The introduction of inorganic p-block elements into conjugated polymers is a powerful technique to create new functional materials. 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.² In the case of phosphorus containing polymers, the phosphorus atom is easily derivatizable and thus provides a handle for introducing new functionality into conjugated polymers.

[1] Reisman, L.; Mbarushimana, C. P.; Cassidy, S. J.; Rugar, P. A. *ACS Macro Letters*, **2016**, 5, 1137-1140

[2] Adam, I.; Rugar, P. A. *Macromolecular Rap. Commun.* **2015**, 36, 1336-1340.