DREXEL UNIVERSITY
Materials Science and Engineering
College of Engineering

Spring Seminar Series

Responsive Materials from Dynamic Bonds

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PISB 104

By relying on a variety of reversible covalent reactions that lead to readily cleaved bonds, we have prepared materials that combine the physical integrity of covalent materials and the structural dynamics of supramolecular complexes. Enaminones, oximes, boronic esters, boronate esters, and Diels-Alder linkages have all been employed to prepare these responsive and dynamic materials, with particular attention having been dedicated to the preparation of hydrogels, elastomers, and nanoparticles. We seek to exploit the reversible nature of these bonds to prepare responsive and self-healing materials. This presentation will focus primarily on our efforts to exploit reversible bonds of boron to form structurally-dynamic materials, including self-healing nanoparticles, gels, and elastomers.

Brent Sumerlin graduated with a B.S. from North Carolina State University in 1998 and received his Ph.D. in 2003 at the University of Southern Mississippi under the direction of Dr. Charles McCormick. He continued his work as a Visiting Assistant Professor/Postdoctoral Research Associate in the group of Krzysztof Matyjaszewski at Carnegie Mellon University from 2003–2005. In 2005 he joined the Department of Chemistry at Southern Methodist University as an Assistant Professor, and in 2009 he was promoted to Associate Professor with tenure. In the fall of 2012, Prof. Sumerlin joined the Butler Polymer Research Laboratory and the Center for Macromolecular Science & Engineering within the Department of Chemistry at the University of Florida, where he is currently the George Bergen Butler Professor of Polymer Chemistry. He is a Fellow of the Royal Society of Chemistry and was named a Kavli Fellow (Frontiers of Science, National Academies of Sciences). Prof. Sumerlin has won a number of awards, including the Alfred P. Sloan Research Fellow, NSF CAREER Award, ACS Leadership Development Award, Journal of Polymer Science Innovation Award, Biomacromolecules/Macromolecules Young Investigator Award, and the Hanwha-Total IUPAC Award. He is an associate editor of ACS Macro Letters.