SJSU | DEPARTMENT OF CHEMISTRY

CHEMISTRY Departmental Seminar

Spring 2019
CHEM 285/191 Schedule
Tuesday at 4:30-5:45PM
Room Duncan Hall 250

April 23rd, 2019

Mr. Hasaan Rauf
SJSU Simocko Lab

MS Final Oral Seminar

New Functional Groups for SADMET Polymerization

Olefin metathesis is one of the most widely used methods for the formation of a carbon-carbon double bonds. Using highly active catalysts, the accessibility of metathesis has broadened to other areas of research. Acyclic diene metathesis (ADMET) polymerization has been extensively used in the synthesis of precise homopolymers by using well-defined monomers to form unique polymer morphologies with intriguing physical properties.(1) Traditional ADMET polymerization cannot be used to make block polymers, since it includes reactive internal olefin bonds on the polymer backbone. The presence of a second monomer will lead to insertion and form a statistical copolymer. Due to this limitation, precise block polymers synthesized by metathesis have yet to be studied in detail.(2) Selective acyclic diene metathesis (SADMET) polymerization synthesizes a polymer with non-reactive backbone double bonds by sequentially reacting electron deficient α,ω-dienes with electron rich α,ω-dienes to form block and alternating polymers.(3) To date, only acrylates have been widely utilized in SADMET polymerizations.(4) Our work focuses on incorporating new functional groups on electron deficient and sterically hindered α,ω-dienes to function as monomers that can undergo SADMET polymerization. Alternating and block polymers will be made utilizing these functional groups to synthesize new polymers with precisely placed functional groups.

References:

(1) Baughman, T.W.; Wagener, K.B. Recent Advances in ADMET Polymerization. In: *Buchmeiser MR, ed. Metathesis Polymerization. Advances in Polymer Chemistry;* Berlin, Heidelberg: Springer Berlin Heidelberg, 200; pp 1-42.

(2) Simocko, C.; Young, T. C.; Wagener, K. B. ADMET Polymers Containing Precisely Spaced Pendant Boronic Acids and Esters. *Macromolecules* **2015**, *48* (16), 5470–5473 DOI: 10.1021/acs.macromol.5b01410

(3) Demel, S.; Slugovc, C.; Stelzer, F.; Fodor-Csorba, K.; Galli, G. Alternating Diene Metathesis Polycondensation (ALTMET) – A Versatile Tool for the Preparation of Perfectly Alternating AB Copolymers. *Macromol. Rapid Commun.* **2003**, *24* (10), 636–641 DOI: 10.1002/marc.200350007.

(4) Peres, L. B.; Preiss, L. C.; Wagner, M.; Wurm, F. R.; de Araújo, P. H. H.; Landfester, K.; Muñoz-Espí, R.; Sayer, C. ALTMET Polymerization of Amino Acid-Based Monomers Targeting Controlled Drug Release. *Macromolecules* **2016**, 49 (18), 6723–6730 DOI: 10.1021/acs.macromol.6b01530.

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