Macromolecules Innovation Institute (MII) Seminar Series

VirginiaTech
Invent the Future

Prof. Kenneth B. Wagener

"Raising High Density Polyethylene's Melting Point by 40 ˚C"

University of Florida
Department of Chemistry

Host: Richard Turner

Abstract: The talk is designed to honor the memory of Professor Jim McGrath. His work at Virginia Tech is world renowned, given the visibility he and his colleagues brought here. He also greatly influenced me during my transition to academics many years ago.

I believe Jim would like the story to be told. It is about introducing oxidized sulfur functionalities in polyethylene, where in one case - *precision aliphatic polysullfones to be exact* - we can raise the melting point of high density polyethylene by 40 ˚C….to 174 ˚C. Other sulfur functional groups that have been successfully introduced precisely include sulfites and sulfonic acids, the latter having potential use in fuel cells. For some reason the aliphatic sulfones display a reverse trend in melting point behavior when compared with typical precision-made functionalized polyolefins. We are not sure why. I will await your explanation during the presentation itself.

To help you out, a brief primer on ADMET chemistry will be given, and data generated for other systems will be shown so that you might provide an explanation for aliphatic polysulfones' melting behavior. These high melting "polyethylenes" might have potential utility, and we are planning to explore possibilities.

University of Florida
Department of Chemistry
PO Box 117200
Gainesville, FL 32611
wagener@chem.ufl.edu

Bio: Ken Wagener, the George Bergen Butler Professor of Polymer Chemistry at the University of Florida, received the 2016 Paul Flory Education Award (one polymer chemist in the USA every two years), and in 2013 the Herman F. Mark Award (Jim McGrath received both awards as well). Professor Wagener was recognized as an outstanding polymer chemist who is highly regarded for his passion for education at the undergraduate and graduate level. His research group numbers over 145 students over the years, and pioneered the ADMET reaction, which is used worldwide, leading to numerous tangible collaborations in Germany, Japan, and several laboratories in the USA. Prior to joining Florida he served in several industrial managerial positions for eleven years within Akzo Nobel, one position leading to the blood oxygenator in heart/lung machines during open heart surgery.

Other awards in recent times include being inducted as a Fellow in the Polymer Division, the PMSE Division and the American Chemical Society. The year 2012 included visiting professorships at ETH/Zürich, MPI/Polymers Mainz, & Kyoto University. He also received one of Germany's top forms of recognition by receiving a 2007 Alexander von Humboldt Senior Research Prize, along with the Max Planck Institute for Polymer Research Award in 2009. His prized forms of recognition are from his alumni universities: the 2000 Teacher/Scholar Award at the University of Florida (oldest award at university, only one faculty member per year) and in the same year being inducted into Clemson University's Academy of Engineers and Scientists (50 members in university history).

Sponsored by the
Macromolecules Innovation Institute

DATE: MAY 4, 2016
TIME: 11:15 AM – 12:15 PM
LOCATION: 310 KELLY HALL