



DIVISION OF POLYMERIC MATERIALS: SCIENCE & ENGINEERING

Cooperative Research Award in Polymer Science and Engineering

Sponsored by the Eastman Kodak Company

2011 Award Winners

Timothy E. Long
Virginia Tech University

Carl Willis
Kraton Polymers, LLC



Professor Timothy E. Long, Macromolecules and Interfaces Institute and Department of Chemistry at Virginia Tech and Dr. Carl Willis, Research Fellow, Kraton Innovation Center, Kraton Polymers, LLC are the winners of the American Chemical Society Division of Polymeric Materials: Science and Engineering's 2011 Award for Cooperative Research in Polymer Science and Engineering. This award was initiated in 1992 when it was endowed by a generous gift from the Eastman Kodak Company. The 2011 award is based on the productive and sustained interactions of almost ten years between Prof. Long and Dr. Willis. The research was initiated as an exploratory research project funded by Kraton in Prof. Long's laboratory at Virginia Tech. The trust and collaboration between Dr. Willis and Prof. Long grew over a two year period during this initial collaboration and Dr. Willis actually became a member of the graduate student's committee who was working on this project. The early work was based on a discovery of the alternating anionic copolymerization of styrene and 1,3-cyclohexadiene in Long's laboratory and this became the foundational science that eventually led to new ABA triblock copolymers with high service temperatures. This new family of products is called "Kraton A Polymers". The graduate student who worked on this project at Virginia Tech worked as an industrial intern at Kraton and was a co-inventor of a key patent in this area—US. 6,699,941.

A second area of collaboration has focused on studies on sulfonated block copolymers. Early work in the 1980's at Kraton was involved with sulfonation of the end blocks of Kraton's triblock copolymers. These materials suffered from very poor performance due to excessive sensitivity to humidity. Collaborative research was initiated between Dr. Willis and Prof. Long, with students in the Virginia Tech laboratory, to begin to explore the systematic relationship of the location of the sulfonic acid functionality in the polymer backbone and the property profiles of the resulting polymers. A Ph.D. student in the VT laboratory, with tutoring from Dr. Willis, mastered the sulfonation techniques and the new polymers that he prepared paved the way for the development of a family of sulfonated block copolymers with the trademarked name of NEXAR™. Here again this important discovery/development was made possible by the collaborations between Kraton and Virginia Tech with the graduate spending time as an intern at Kraton. A Kraton patent listing the student and Carl Willis as co-inventors, US 7,737,224, discloses these novel polymeric materials.

An award symposium to honor the 2011 winners will be held at the national ACS meeting in Anaheim on Monday March 28 and the award will be presented at the joint Division of Polymeric Materials: Science and Engineering and Division of Polymer Chemistry joint awards reception on Wednesday evening March 30 in Anaheim.

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