

ACS-GHS May Seminar Dr. Eva Harth



Thursday, May 27th
6:30 - 8:00 pm
via Zoom

Register to receive the meeting link at <https://acsghs.wildapricot.org/event-4271767>

Merging olefins and acrylates in polymer synthesis - Benefits and challenges

Non-polar polyolefins can greatly benefit from the introduction of acrylic groups into their backbones, as they add function and polarity, to bridge interphases and work as “stiches” to bring two immiscible polymers together. Specifically, when block copolymers combine these two monomer groups, the application range of polyolefins can be extended as the block copolymer itself can be tailored in their properties and existing commodity plastics can be refined and changed in their properties by adding these block copolymer structures. The lecture will give an overview of current and future applications of non-polar polyolefin- polar polyacrylate block copolymers. Synthetic challenges always exist when two monomer families are not compatible to be polymerized together with one method and different methods have been developed to prepare polyolefin-polyacrylate block copolymers. In our work, we have developed a polymerization method which uses one catalyst platform to engage in two polymerization pathways, insertion and radical polymerization under photoinitiation. It is demonstrated how two polymerization pathways can be merged and in which way detailed mechanistic investigations could lead to an optimization of the dual polymerization pathway to produce a broader range of block polymers. Polymer microstructures in polyolefins are another important factor influencing the blending and changes in mechanical properties of the blocks and in polymer mixtures. A developed isomerization polymerization will show how Lewis acids can influence the polymer microstructure of polyolefin polymers from alpha-olefins.

Biography: Dr. Harth studied chemistry at the University of Bonn, Germany and the University of Zurich, Switzerland. She obtained her PhD in 1998 from the MPI for Polymer Research in Mainz (Klaus Muellen group). In 2001, she joined XenoPort, Inc. as a Staff Scientist and started 2004 at Vanderbilt University as Assistant Professor. In 2007, she was awarded with the NSF CAREER Award. During her career at Vanderbilt, she developed the nanosponge delivery system. Starting in the Fall 2017, she moved to the University of Houston where she is appointed as Full Professor with tenure in the Department of Chemistry and serves as the Director of the *Center of Excellence in Polymer Chemistry*, funded by the Welch Foundation and the University of Houston. For more about Dr. Harth and her team, see <https://www.harth-research-group.org/members/>