Catalyzed chemical synthesis of uncommon or unnatural poly(hydroxyalkanoate)s

Andrea H. Westlie*, awestlie@colostate.edu, Eugene Y. Chen.* Chemistry, Colorado State University, Fort Collins, Colorado, United States

Poly(hydroxyalkanoate)s (PHAs) are microbial derived polyesters with diverse materials properties that are an attractive biorenewable and biodegradable alternative to petroleum-based plastics. A chemical synthesis towards PHAs offers better scalability, faster kinetics, and more tunability than traditional biosynthetic pathways. Recently we reported an efficient catalyzed chemical synthesis of highly crystalline, perfectly isotactic poly(3-hydroxybutryate) (P3HB), the most prominent member of the PHA family, using a cyclic dimer of 3-hydroxybutryate. This presentation will discuss the recent developments of this synthesis as we explore the scope of this methodology on monomer derivatives with uncommon alkyl, unnatural aromatic, and unsaturated alkenyl groups as well as the thermal and mechanical properties of the copolymers derived from this monomer class.