

Catalytic Activation of Carbon Dioxide to Make Plastics

The lecture will discuss recent research in the Williams group using controlled polymerization reactions to improve the sustainability of polymers. The first part will focus on how to exploit concepts of synergy in making high activity catalysts for carbon dioxide/epoxide ring-opening copolymerizations. The second part will introduce a form of switchable polymerization catalysis, whereby a catalyst is self-switched by the presence/absence of monomers between different mechanism. This switchable catalysis allows for the preparation of block polymers from mixtures of monomers. The catalysis will be used to make specific sequences in the block polymers to deliver improved performances as ductile plastics or pressure sensitive adhesives. The lecture will include with some reflections on the pressing contemporary challenges in these fields and some career advice for graduate students.