Abstract
Biomass conversion to fuels, chemicals, and materials has the potential to offset significant petroleum usage and enable a more sustainable approach to manufacture everyday products. To that end, our group focuses on developing integrated processes from both sugars and lignin to both direct and functional replacement products through the combination of biological and chemo-catalytic processes. This talk will review two recent developments from our group. The first part of the talk will focus on the production of PAN-based carbon fibers from sugar-derived building blocks through new catalytic transformations to acrylonitrile that exhibit significant process advantages over standard propylene ammoxidation. The second part of the talk will focus on the conversion of lignin to new monomers including for the production of new polymers and composites based on the molecular diversity of aromatic catabolic pathways in some soil microbes.