

Responsive and Dynamic Networks by Macromolecular Chemistry
Dominik Konkolewicz, Miami University (Ohio)

Introducing dynamic and exchangeable linkers into a polymer material adds responsiveness and adaptability. This responsiveness can be achieved using linkers that either exchange intrinsically, such as hydrogen-bonded linkers, stimulus responsive dynamic covalent linkers or transient linkers that are generated upon the addition of a chemical fuel. The first focal topic will be dynamic materials comprised of two distinct linkers, such as non-covalent and stimulus responsive dynamic covalent linkers. The second focus will be on networks formed and enhanced by the addition of carbodiimides as fuels to transiently form anhydrides from free carboxylic acids. This talk will highlight how changes in the underlying polymer structure, which can be tuned using prediction chemistry methods, leads to powerful enhancements in materials properties and responsiveness. This work emphasizes how the choice and design of the polymer and the bonding units can be synergistically used for materials targeting new applications.