CMCC Mechanochemistry Discussions

Online Seminar Series

Molecular Design Strategies for Mechanochemically Active Polymers

Livestreaming at
10:00 AM (CT)

THURS., February 23, 2023

on the CMCC YouTube Channel:
https://www.youtube.com/channel/UC7eCYPKbGTKpgO7W2bNABxg

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ABSTRACT:

The use of mechanical force to selectively activate covalent bond transformations presents unique opportunities for the design of stimuli-responsive polymers for applications ranging from sensing to drug delivery. By incorporating stress-sensitive molecules called mechanophores into polymer chains, force is transduced selectively to weak bonds in the mechanophore to elicit a productive chemical reaction. Mechanochromic mechanophores that produce a change in color are particularly useful and have been widely developed as molecular force probes, empowering the visualization of critical stress and/or strain in materials. These same attributes also make force-induced color changes in polymeric materials appealing for patterning and encryption. The mechanically triggered release of small molecules is also a powerful approach for sensing and delivery. This presentation will highlight some of our recent research on the development of molecular design strategies and structure–activity relationships for several different mechanophore platforms enabling visual stress reporting and mechanically triggered molecular release as well as some unusual reactivity.

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