



Organic Colloquium

“Some Simple Concepts and Their Consequences in Covalent Mechanochemistry”

Abstract:

The potential to use mechanochemistry, either in isolated polymers or in polymeric materials, to trigger a programmed, desirable covalent molecular response was first revealed only a decade or so ago. Since that time, covalent polymer mechanochemistry has undergone a renaissance in which it has been extensively explored by a number of research groups and for a variety of purposes including (but not limited to) biasing and probing reaction pathways, trapping transition states and intermediates, catalysis, release of small molecules and protons, stress reporting, stress strengthening, and soft devices. Increasingly creative mechanophore designs and new properties continue to emerge at an ever-accelerating pace.

The precision with which mechanophores can be predictively designed has increased as quantitative experimental and computational studies have provided insights into structure-activity relationships. Additional benefits will be realized as these quantitative relationships are mapped onto existing, intuitive physical organic frameworks. This talk will present quantitative studies of mechanochemical reactions and their mechanisms, highlighting opportunities for classical physical organic principles and the new chemistry empowered by mechanochemistry to enrich each other.

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