PPSM

Program in Polymers and Soft Matter

POLYMER SEMINAR

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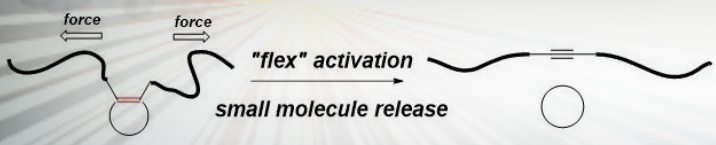
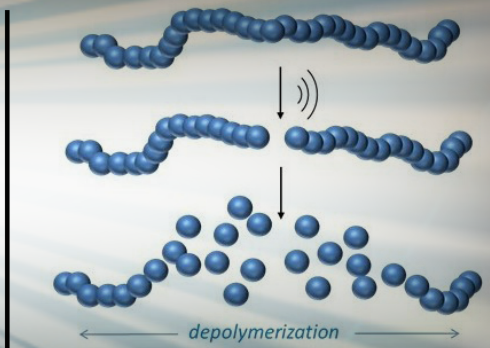
UNIVERSITY OF WASHINGTON

"Polymer Mechanochemistry for the Triggered Release of Small Molecules"

Summary

We have investigated new designs for mechanochemically-reactive species (mechanophores) and the ability to amplify chemo-mechanical coupling via force-activated self-immolative polymers (SIPs). Our new mechanophore designs are capable of activation via force-guided bond bending motions, as opposed to more common approaches that utilized bond elongation. Key features of our design include the ability to release an organic small molecule as the chemical output arising from mechanical input, and mechanochemical reactivity that does not inherently require bond scission within the polymer main chain. In addition to our current results on these "flex activated" mechanophores, we will also discuss recent progress toward mechanochemically-activated SIPs. Integrating mechanochemical activation as a triggering mechanism for SIPs gives rise to amplified responses to physical stress, and may enable new modes of small molecule release for applications including drug delivery and self-reinforcing materials.





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