PPSM

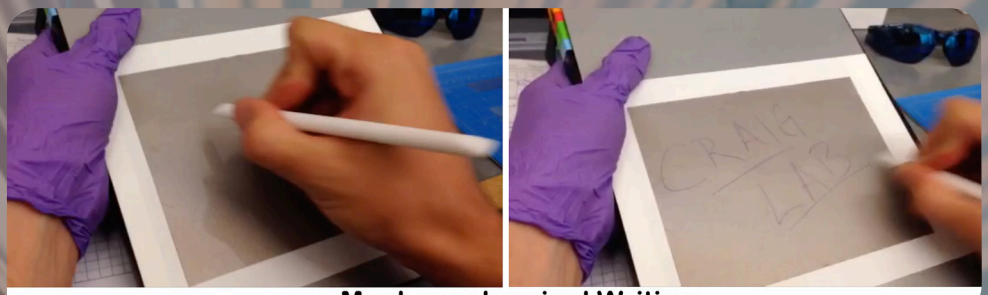
Program in Polymers and Soft Matter

POLYMER SEMINAR

Prof. Stephen Craig

Dept. of Chemistry, Duke University

"Mechanochemical Remodeling of Polymers"



Mechanochemical Writing

Summary

The forces typical of the macroscopic world (for example, those between a baby's fingers) are many orders of magnitude larger than the forces between the individual atoms of a molecule. It has been known for decades, in fact, that breaking a piece of plastic or shearing a polymer solution can lead to homolytic bond scission along the main chain of an organic polymer and a concomitant reduction in molecular weight. The magnitude of macroscopic forces, in combination with the fact that they are directional, creates an opportunity to trigger constructive covalent chemistry and to use that chemistry to imbue polymeric materials with new, stress-responsive functionality. Specific topics include the release of stored length through mechanically triggered covalent chemical reactions, the role of chemically inert functionality along a polymer backbone in mechanochemical coupling, polymers that grow stronger in response to typically destructive shear forces, and new classes of mechanochemical devices that hold promise as catalytic scaffolds.

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SEMINAR 3:30 - 5:00 PM • REFRESHMENTS 3:00 PM

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