

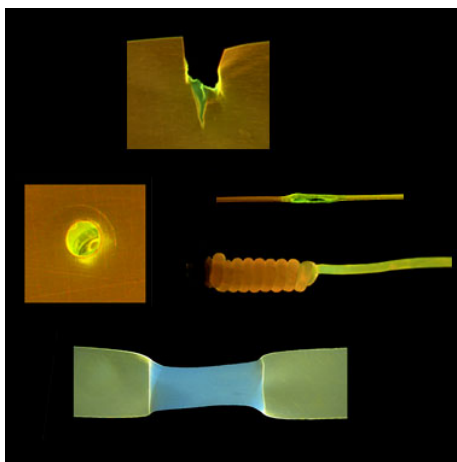
Mechanochemistry with Supramolecular Polymers

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Mechanochemical transduction processes are omnipresent in nature. An emerging approach to exploit this general principle in artificial materials relies on the integration of so-called “mechanophores” – motifs that transduce mechanical forces into structural changes or chemical reactions – into polymers. Typical mechanophores are activated by cleaving weak covalent bonds, and the ensuing chemical reactions are harnessed to elicit an ideally useful property change. An alternative approach is the use of dynamic, weak, non-covalent interactions. Supramolecular motifs are particularly useful design elements for mechanophores that impart polymers with mechanochromic (luminescent) behavior. After providing some historical perspectives on the field, several types of mechanophores that rely on this general design approach and the solid-state mechanoresponsive characteristics of recently developed polymers containing these motifs will be discussed.

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Mechanofluorochromic polyethylene samples, prepared by incorporating supramolecular motifs into this polymer.