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Title:	Photoresponsive Circular Supramolecular Polymers: A Topological Trap and Photoinduced Ring-Opening Elongation
Authors:	Adhikari, B. (/jspui/browse?type=author&value=Adhikari%2C+B.) Davis, Joyal (/jspui/browse?type=author&value=Davis%2C+Joyal)
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Abstract:	Topological features of one-dimensional macromolecular chains govern the properties and functionality of natural and synthetic polymers. To address this issue in supramolecular polymers, we synthesized two topologically distinct supramolecular polymers with intrinsic curvature, circular and helically folded nanofibers, from azobenzene-functionalized supramolecular rosettes. When a mixture of circular and helically folded nanofibers was exposed to UV light, selective unfolding of the latter open-ended supramolecular polymers was observed as a result of the curvature-impairing internal force produced by the trans-to-cis photoisomerization of the azobenzene. This distinct sensitivity suggests that the topological features of supramolecular polymers define their mechanical stability. Furthermore, the exposure of circular supramolecular polymers in more polar media to UV irradiation resulted in ring opening followed by chain elongation, thus demonstrating that the circular supramolecular polymer can function as a topological kinetic trap.
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