

Photodeformable Liquid Crystal Polymers and Bioinspired Soft Actuators

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Photodeformable liquid crystal polymers (LCPs) that adapt their shapes in response to light have aroused a dramatic growth of interest in the past decades, since light as a stimulus enables the remote control and diverse deformations of materials.[1-5] This tutorial session focuses on the growing research on photodeformable azobenzene-containing LCPs, including their basic actuation mechanisms, the various deformation modes, the newly designed molecular structures, and the improvement of processing techniques. Special attention is devoted to the novel molecular structures of LCPs, which allow for easy processing and alignment. [6-8] The soft actuators with various deformation modes such as bending, twisting, and rolling in response to light are also covered with the emphasis on their photo-induced bionic functions. Potential applications in energy harvesting, self-cleaning surfaces, sensors, and photo-controlled microfluidics are further discussed as well as the existing challenges and future directions. [9-12]

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