

Organic Molecule-Driven Polymeric Actuators

Abstract

Inspired by the motions of plant tissues in response to external stimuli, significant attention has been devoted to the development of actuating polymeric materials. In particular, polymeric actuators driven by organic molecules have been designed due to their combined superiorities of tunable functional monomers, designable chemical structures, and variable structural anisotropy. Here, the recent progress is summarized in terms of material synthesis, structure design, polymer–solvent interaction, and actuating performance. In addition, various possibilities for practical applications, including the ability to sense chemical vapors and solvent isomers, and future directions to satisfy the requirement of sensing and smart systems are also highlighted.

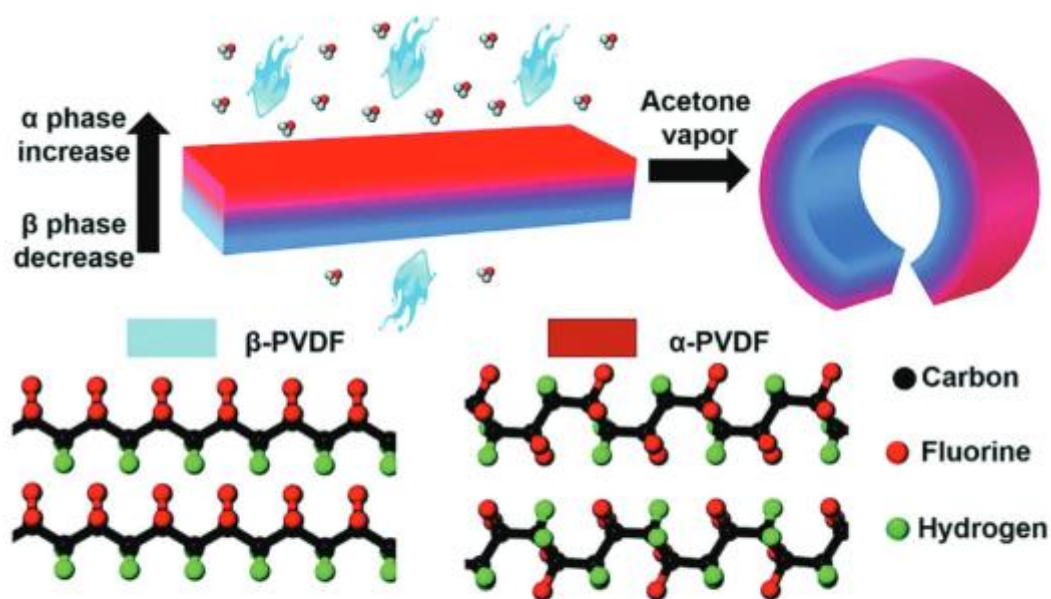


Figure 3. Schematic illustration to the bending behavior of a PVDF film with anisotropic distribution of α and β phases upon acetone vapor. Reproduced with permission.^[54] Copyright 2018, Royal Society of Chemistry.