

Electronic Supplementary Information (ESI) for:

Exploring Reversible Photomechanical Actuators with Liquid Crystal Polymer Graphene Oxide Nanocomposites

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Determination of the Optimal Thickness for the LCP

In the pursuit of determining the most suitable thickness for the liquid crystal polymer (LCP), three different LCP films were systematically investigated. Three distinct thickness categories were prepared: low (18 μm), medium (70 μm), and high (150 μm), for the LCPs.

The LCP with a thickness of 18 μm was found to be excessively thin and soft, resulting in inadequate pushing force and poor reversibility. Although easily activated by light, this evaluation rendered it unsuitable for optical actuator fabrication (see Fig. S1(a)).

Upon measurement with Polarized Optical Microscopy (POM), the LCP prepared with 70 μm thick double tape was determined to be approximately 60 μm thick. This LCP exhibited moderate structural softness and hardness, facile photo-induced deformation, and a satisfactory reversible effect (see Fig. S1(b)).

However, the LCP fabricated using double-sided tape with a thickness of 150 μm measured approximately 145 μm with POM. This LCP demonstrated a stronger structure, reduced susceptibility to deformation, albeit with poor reversibility, and necessitated a relatively high driving optical power (see Fig. S1(c)).

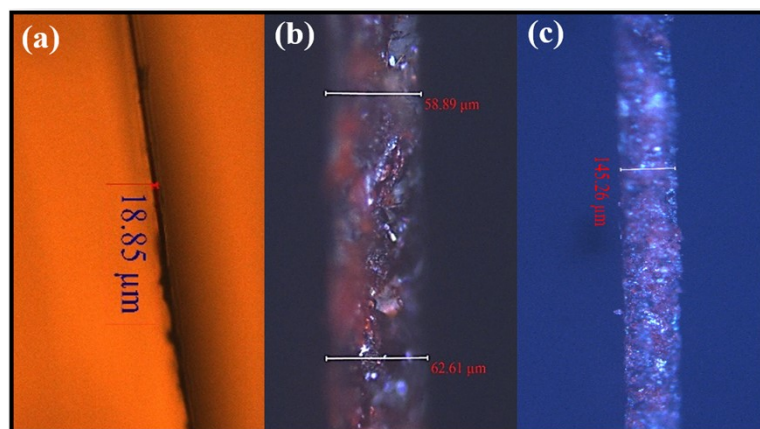


Figure S1. Measurement of LCP thicknesses: (a) 18 μm , (b) 70 μm , and (c) 150 μm , as determined using Polarized Optical Microscopy (POM).