

Electronic supplementary information (ESI)

Polarization-dependent deformation in light responsive polymers doped by dichroic dyes

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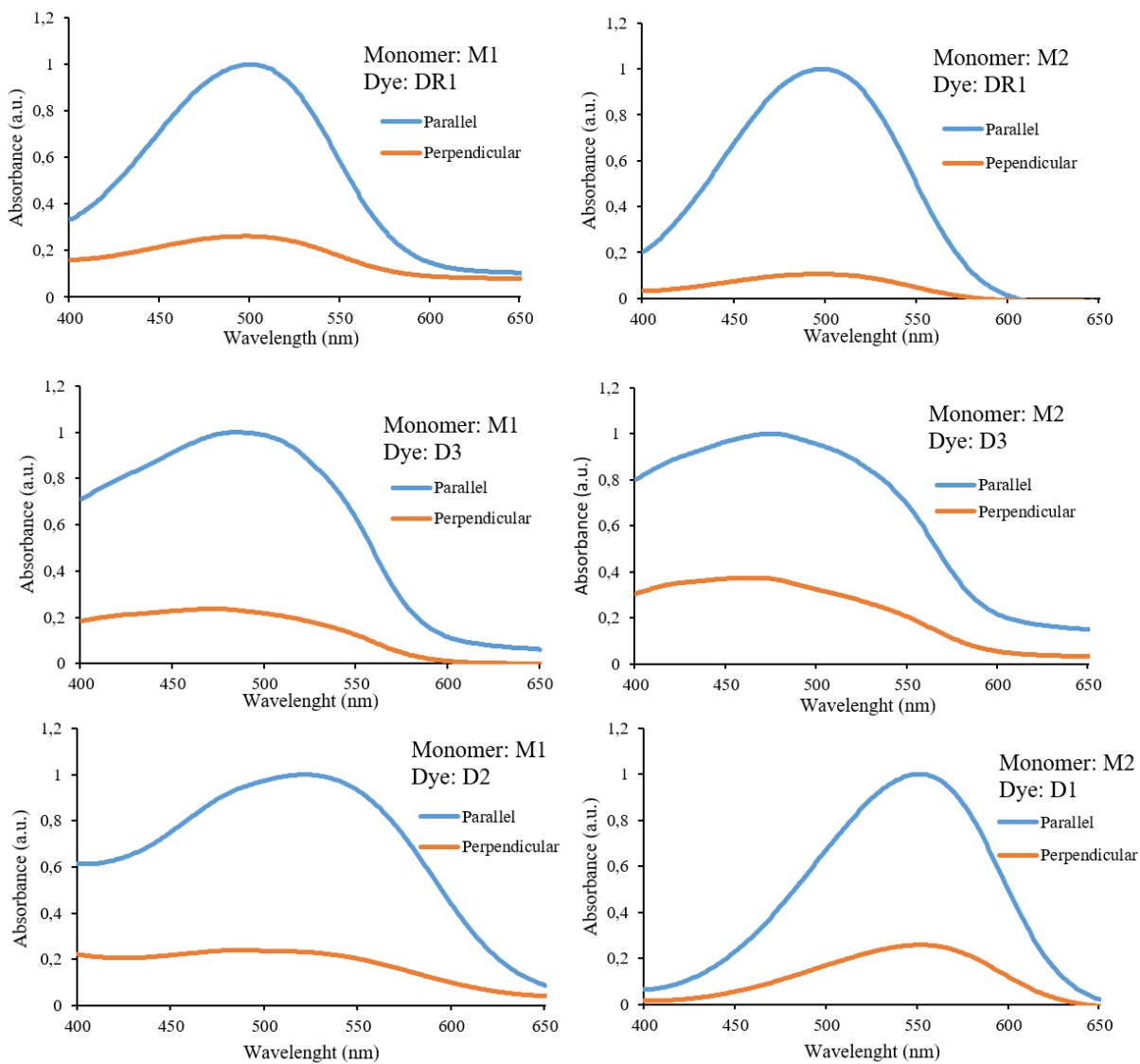


Figure S1 – Polarized absorption spectra of LCN films.

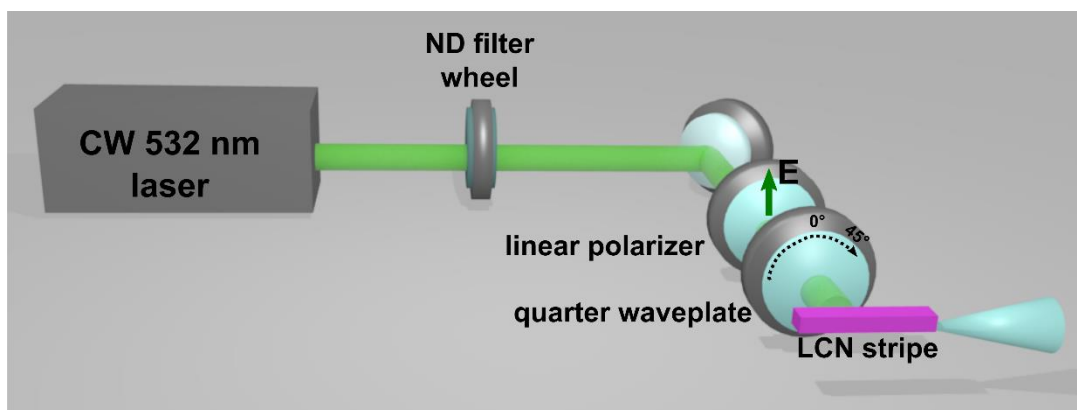


Figure S2 – Scheme of the setup for light-driven LCN deformation.

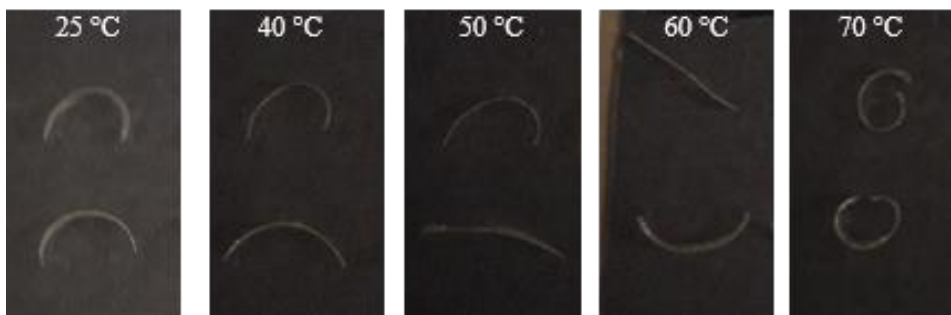


Figure S3 – Deformation of two splayed LCNs under homogeneous heating. Two strips (1 cm long, along the rubbing direction, 2mm wide) are cut from materials having the same formulation of LCN1_1 (first cantilever from the top) and LCN2_2 (second cantilever from the top) without the azodye. LCNs are heated on a hotstage and optical images at different temperatures are here reported. At room temperature, both strips present a bent shape with curvature towards the homeotropic side. Increasing the temperature, both materials first become flat and then, change their curvature toward the homogeneous planar side, as expected. LCE2_2 matrix demonstrates a slight higher thermal sensitivity presenting the inversion of curvature at around 60 °C, temperature at which LCN1_1 still results flat.



Figure S4 – Light induced deformation in polydomain LCNs: a strip of polydomain LCN2_2 is held by a glass capillary (laser off) (a) and then irradiated with green light from the top (b). After switching off the laser, the strip does not recover the original position (c).

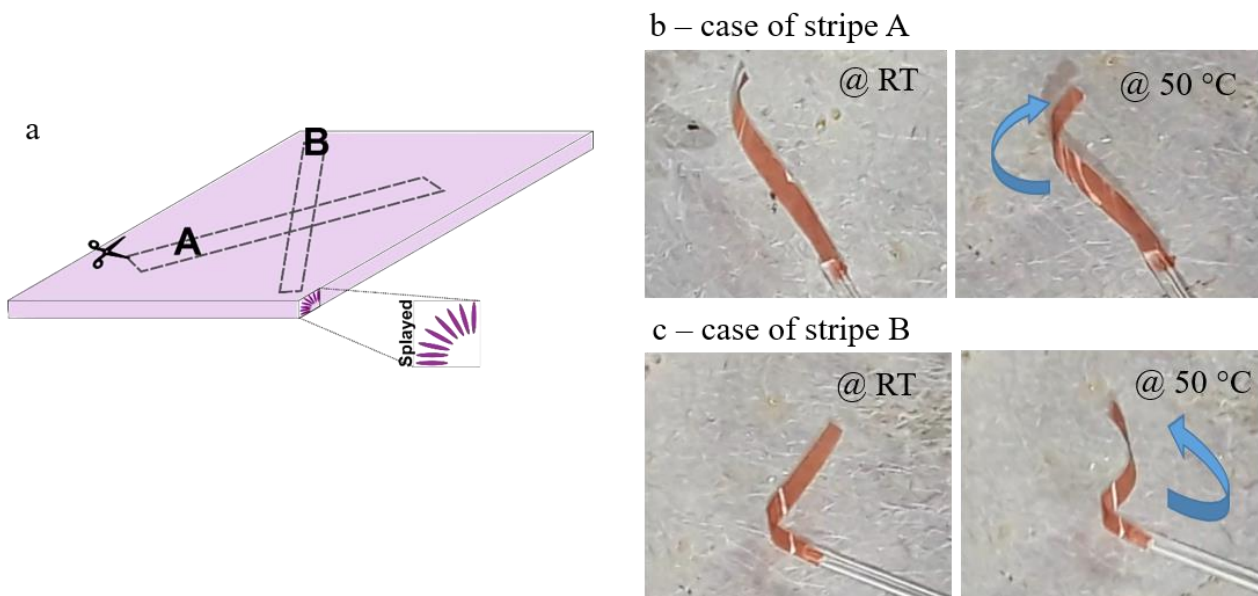


Figure S5 – Out of plane deformation in a splayed LCN. a) Graphic representation of different cuts realized at 45° in respect to the rubbing direction able to induce an out of plane deformation; b) deformation of LCN 2_2 cut following mask A: heating of the strip causes an anti-clockwise out of plane deformation; c) deformation of LCN 2_2 cut following mask B: heating of the strip causes a clockwise out of plane deformation.

Movie S1 – A strips of LCN1_1 is irradiated by a green laser with polarization perpendicular to the rubbing direction and then, the polarization is rotated. After switching off the laser, the material returns in the original position.

Movie S2 – A strips of LCN 2_2 is irradiated by a green laser with polarization perpendicular to the rubbing direction and then, the polarization is rotated demonstrating different bending. After switching off the laser, the material returns in the original position.