SUPPLEMENTARY INFORMATION

Molecular Reorientation of a Nematic Liquid Crystal by Thermal Expansion

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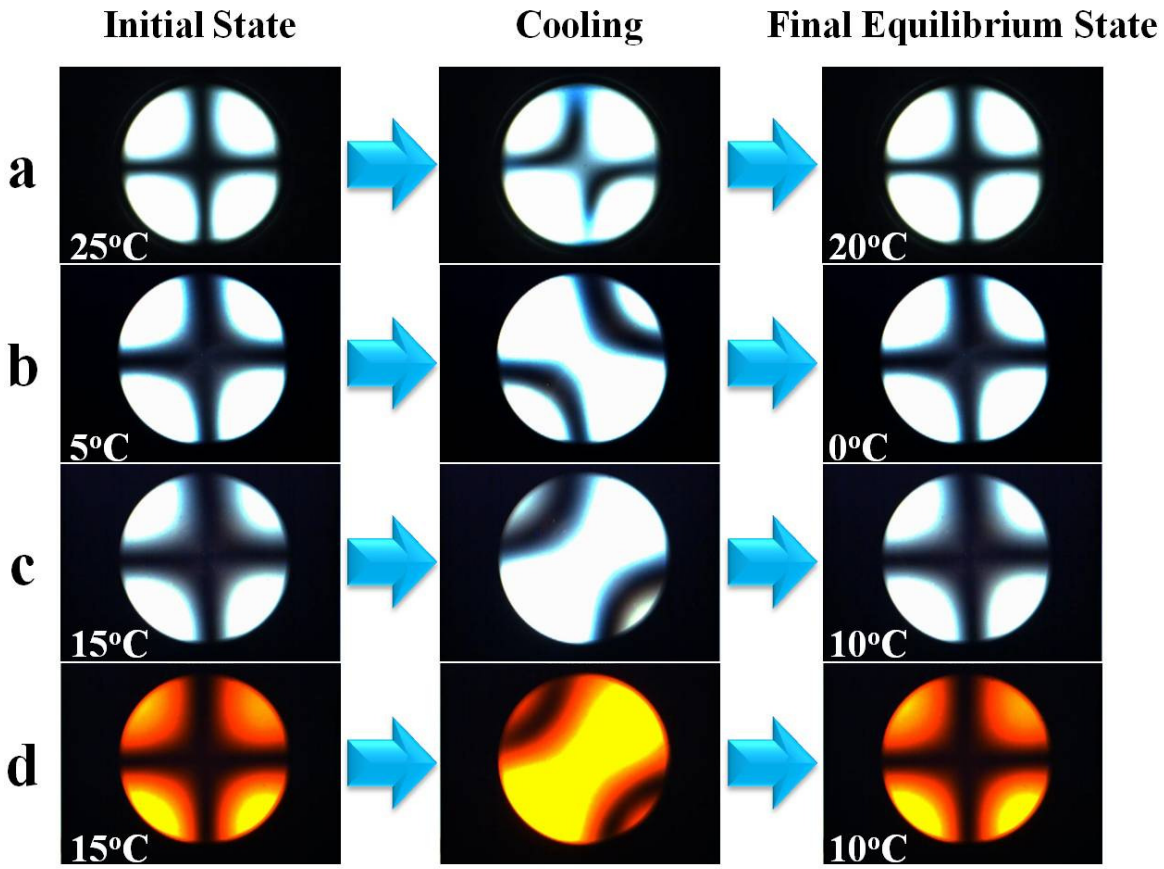
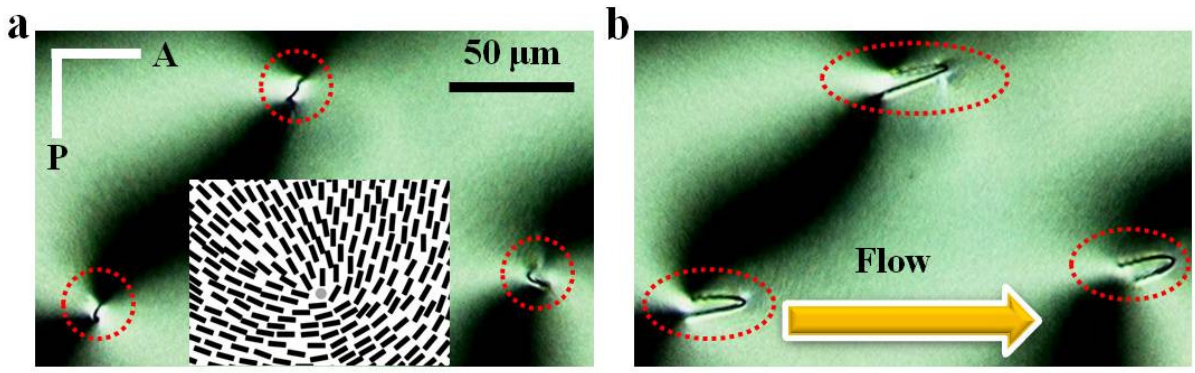
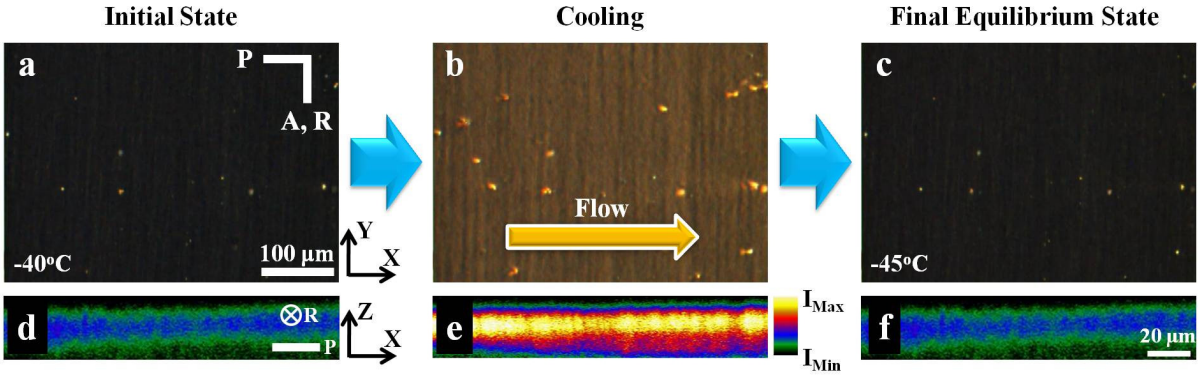
Supplementary Figures



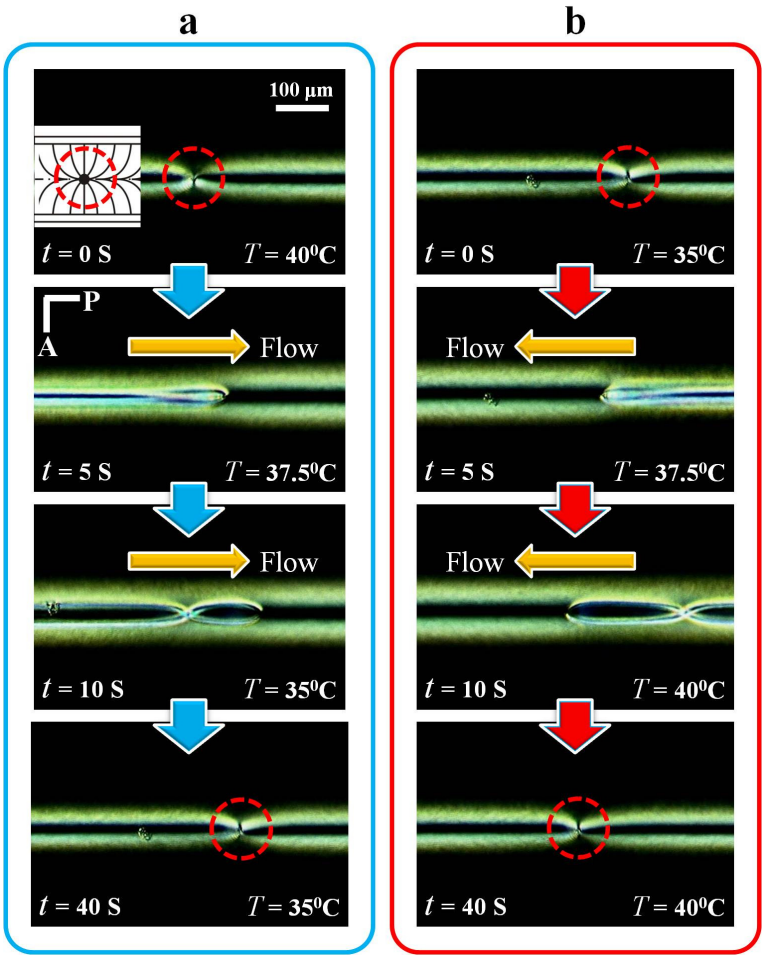
Supplementary Figure S1 | Thermally induced splitting of crossed conoscopic pattern in the homeotropic cells filled with various thermotropic and lyotropic uniaxial NLCs. The cells are filled with **a** 5CB ($T_0 = 25^0$C), **b** MLC-6815 ($T_0 = 5^0$C), **c** ZLI-2806 ($T_0 = 15^0$C), and **d** lyotropic solution of Sunset Yellow in water, 33 *wt*% ($T_0 = 15^0$C); in all cases, the cell thickness is d = 20 μm, temperature change ΔT = -5^{0}C and rate of change ξ = -30^{0}C/min.



Supplementary Figure S2 | Stretching of disclinations by thermally driven flow in the E7 cell with tangential anchoring (*d* = 20 µm). **a**, Stable nearly vertical disclination at a fixed temperature, T_0 = -25^{0}C. **b**, Stretching of disclinations along the flow; T_0 = -25^{0}C, ΔT = -5^{0}C, and ξ = -30^{0}C/min. When the temperature stabilizes, the disclinations relax to the original state **a**. The movie version is available in the Supplementary Information (Supplementary Movie 2).



Supplementary Figure S3 | Molecular reorientation by thermally driven flow in a uniform planar cell filled with E7 (*d* = 20 µm). **a,b,c**, Sequence of PM textures between the crossed polarizers, for the initial, flow-induced and final equilibrium states. R indicates the rubbing direction; the initial director orientation is along R . **d,e,f**, FCPM (x, z scan) textures corresponding to **a,b,c**, respectively. T_0 = -40^{0}C (at **a** and **d**), ΔT = -5^{0}C, and ξ = 30^{0}C/min.



Supplementary Figure S4 | Thermally activated flows and molecular reorientation in a round capillary. **a**, cooling; **b**, heating. A point defect-hedgehog at the capillary axis is marked by a red circle. Inset in **a** shows the director profile around the defect core. $\Delta T = \pm 5^0$C, and $\xi = \pm 30^0$C/min (' − ' sign for **a** and ' + ' sign for **b**). The movie version is available in the Supplementary Information (Supplementary Movie 3).

Supplementary Methods

To elucidate the effect of temperature gradients, we conducted a separate experiment to demonstrate that this effect is insignificant compared to the effect of temperature variation with time. The homeotropic sample of E7 (d = 50 μm) was placed as a bridge between a cold plate kept at 20^0C and a hot plate kept at 55^0C. The Maltese cross of the conoscopic texture maintained its fourfold symmetry characteristic of the unperturbed homeotropic state for all locations along the LC bridge and did not change when the distance between the two plates was very slowly varied between 1 mm and 8 mm.