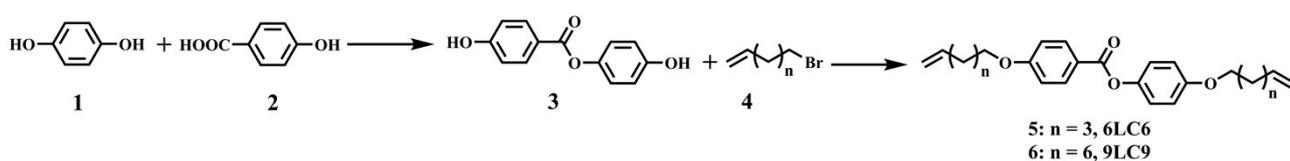


Supporting Information

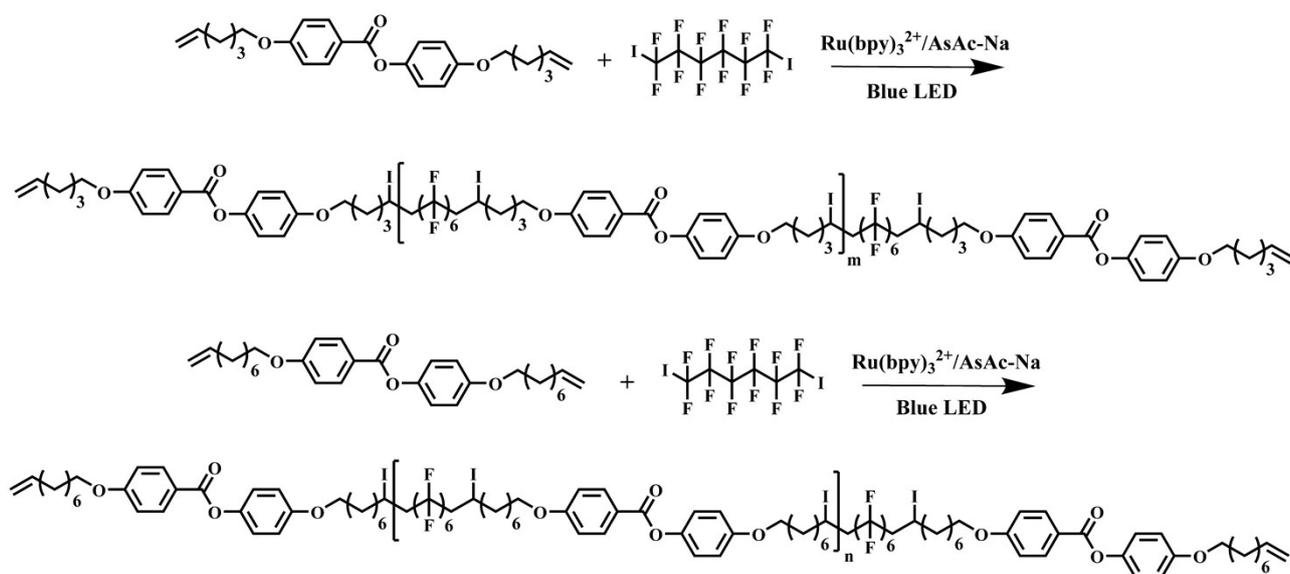
Construction of Near-Infrared Light Controlled Reciprocating Piston “Pump” Based on Soft Actuators with Fluorine-Containing Alternating Polymer

Kai Tu, Enjie He, Jiannan Cheng, Lifan Zhang*, Zhenping Cheng*, Xiulin Zhu

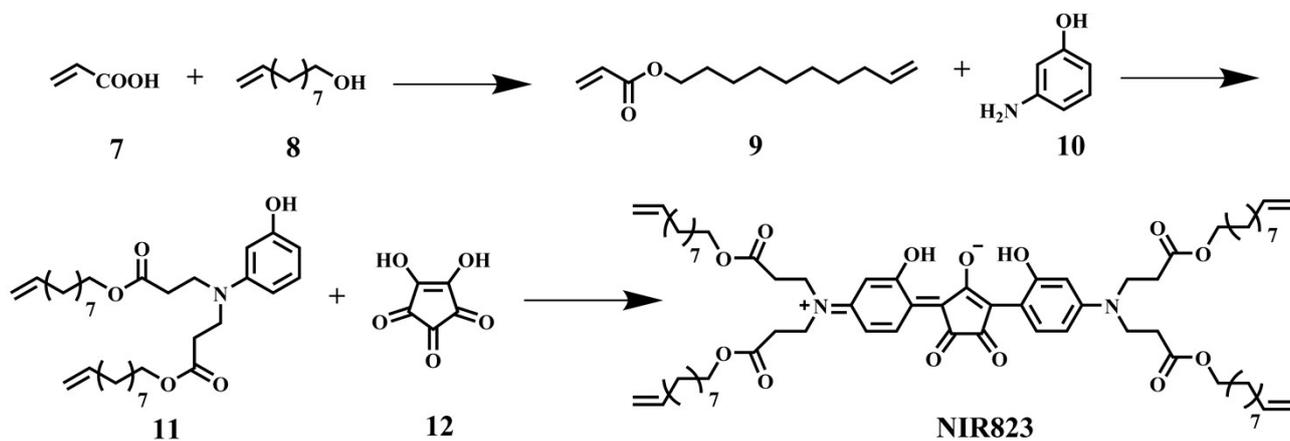
1. Synthetic Procedures



Scheme S1. Synthetic routes of 6LC6 and 9LC9.



Scheme S2. Synthetic routes of the alternating fluorine-containing macromonomer CFCI666 and CFCI969.



Scheme S3. Synthetic routes of NIR absorbing crosslinker NIR823.

2. Supplementary Figures

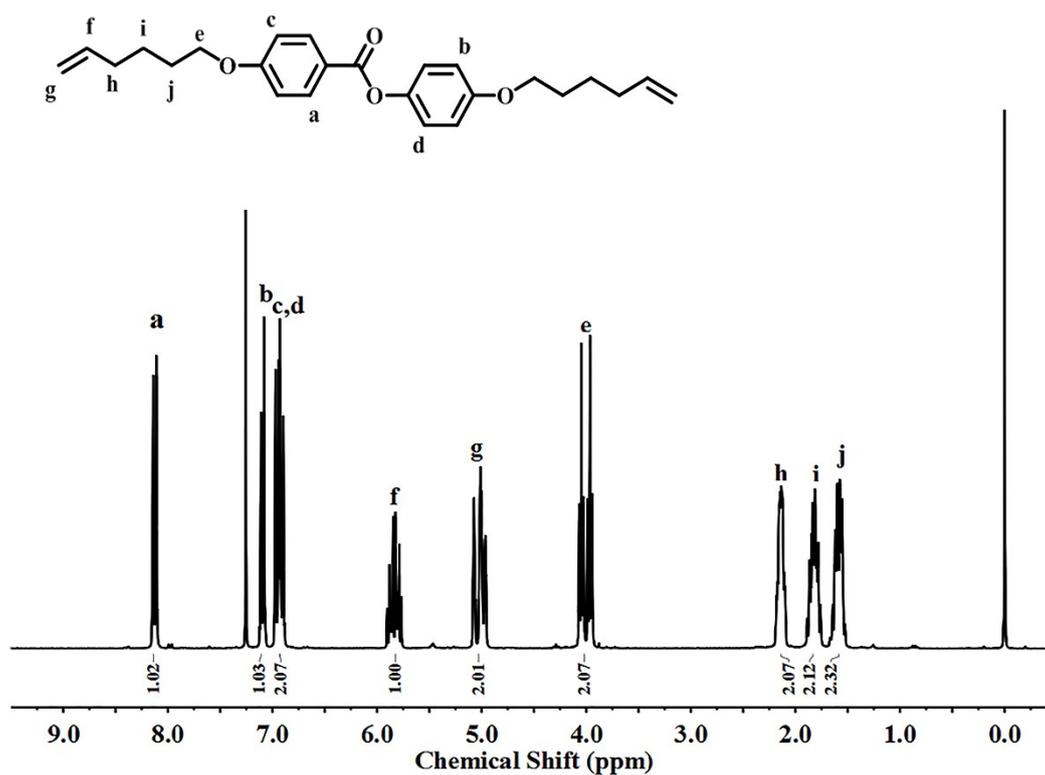


Figure S1. ^1H NMR spectrum of 6LC6.

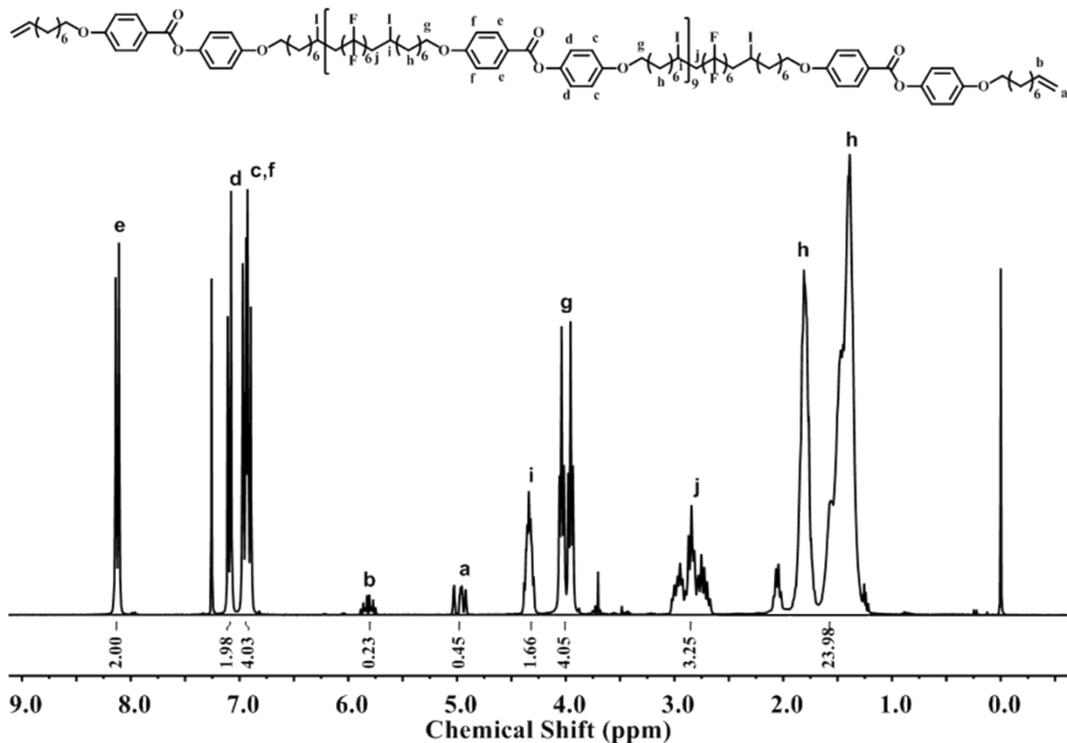


Figure S4. ^1H NMR spectrum of the alternating fluorine-containing macromonomer CFCI969.

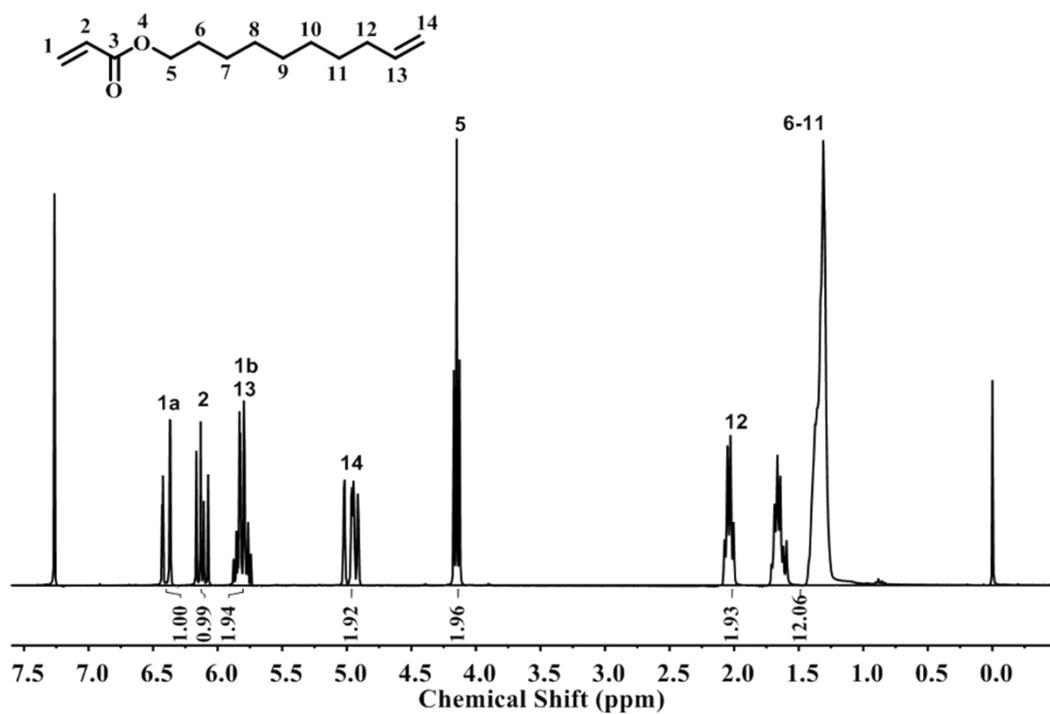


Figure S5. ^1H NMR spectrum of compound 9.

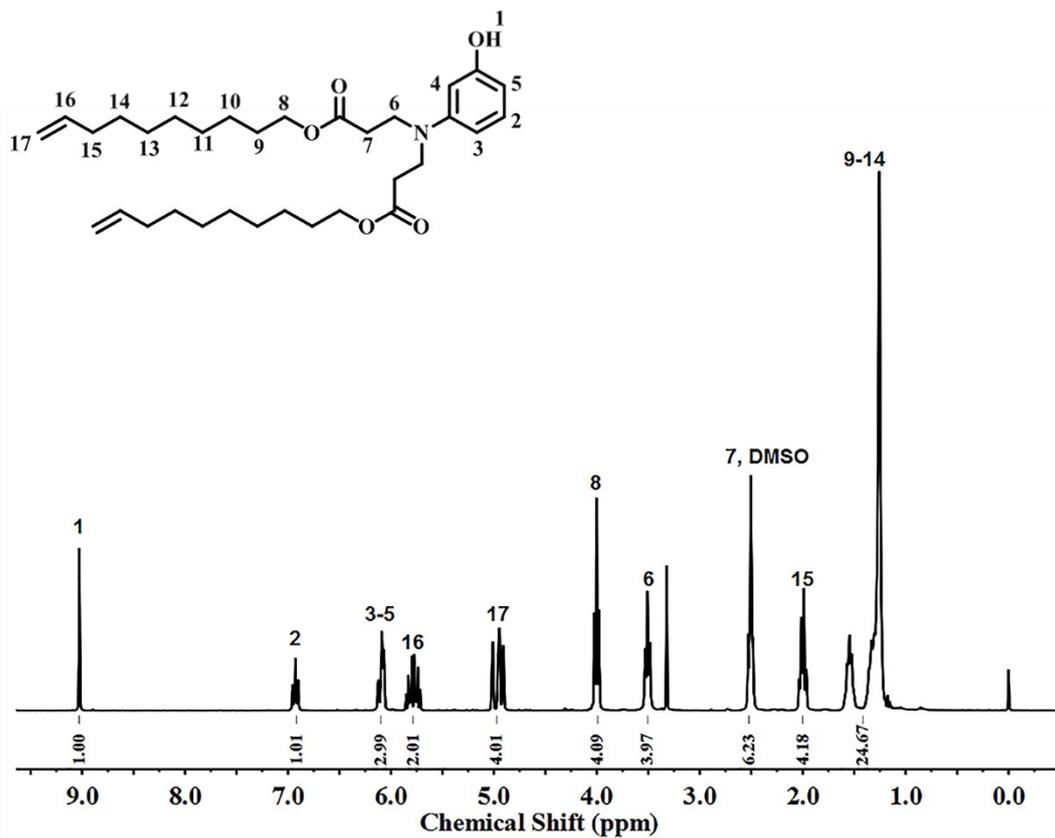


Figure S6. ^1H NMR spectrum of compound 11.

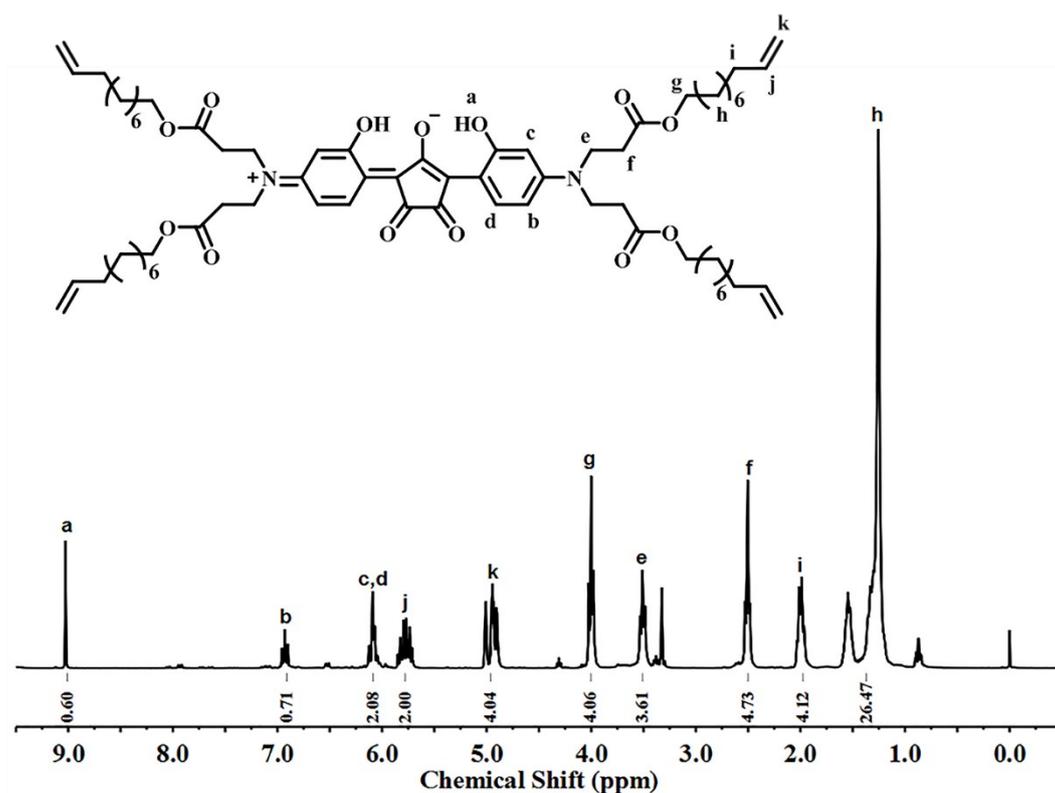


Figure S7. ^1H NMR spectrum of NIR823.

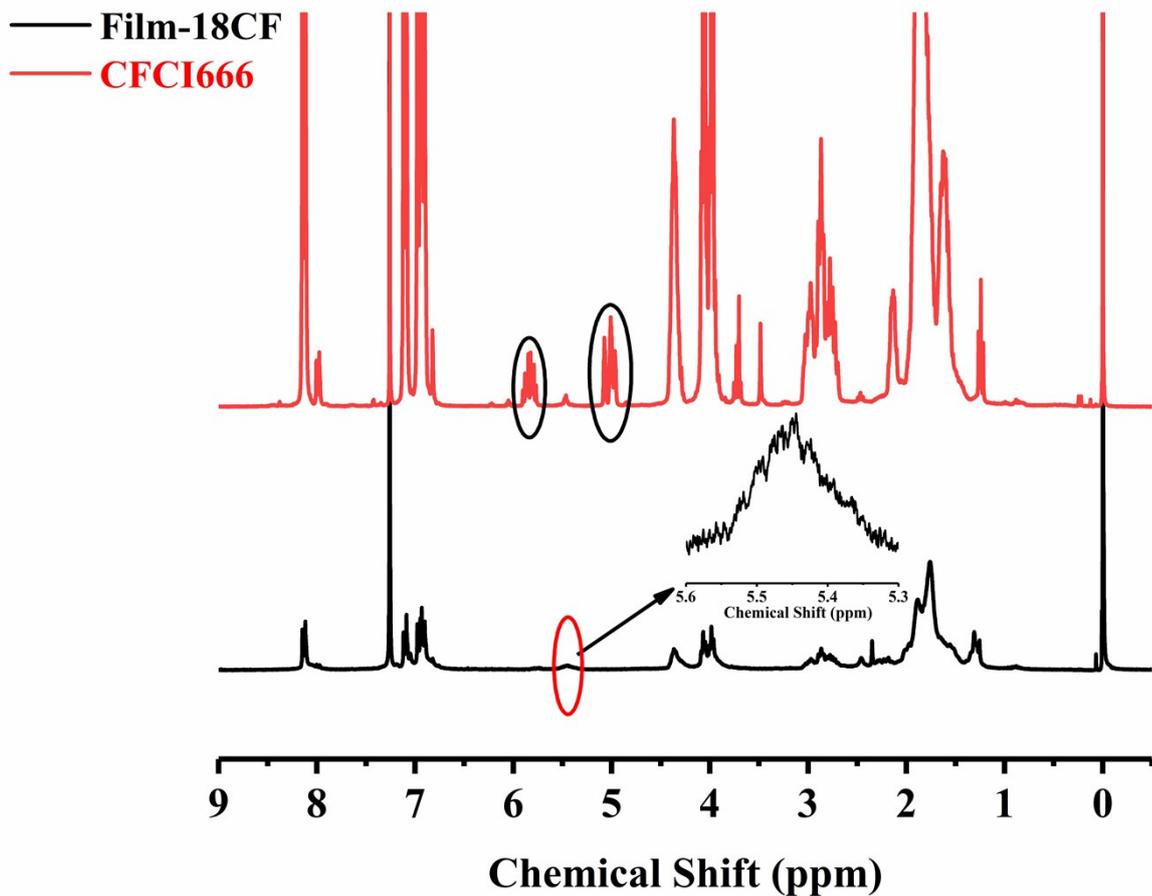


Figure S8. ^1H NMR spectra of CFCI666 and Film-18CF.

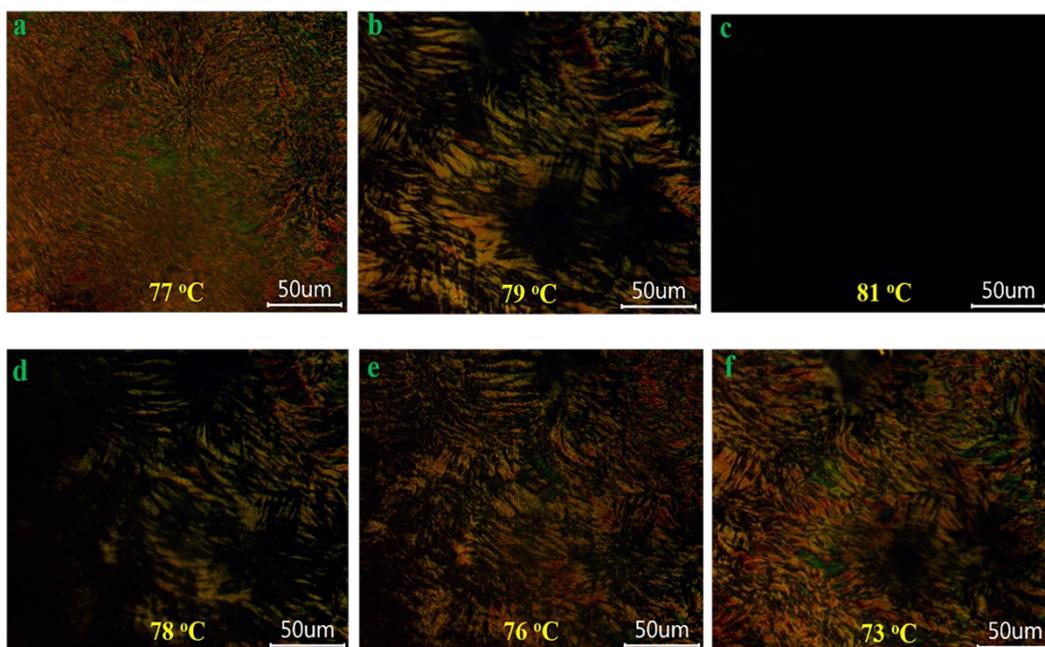


Figure S9. POM images of the alternating fluorine-containing macromonomer CFCI666, recorded during (a-c) heating and (d- f) cooling processes.

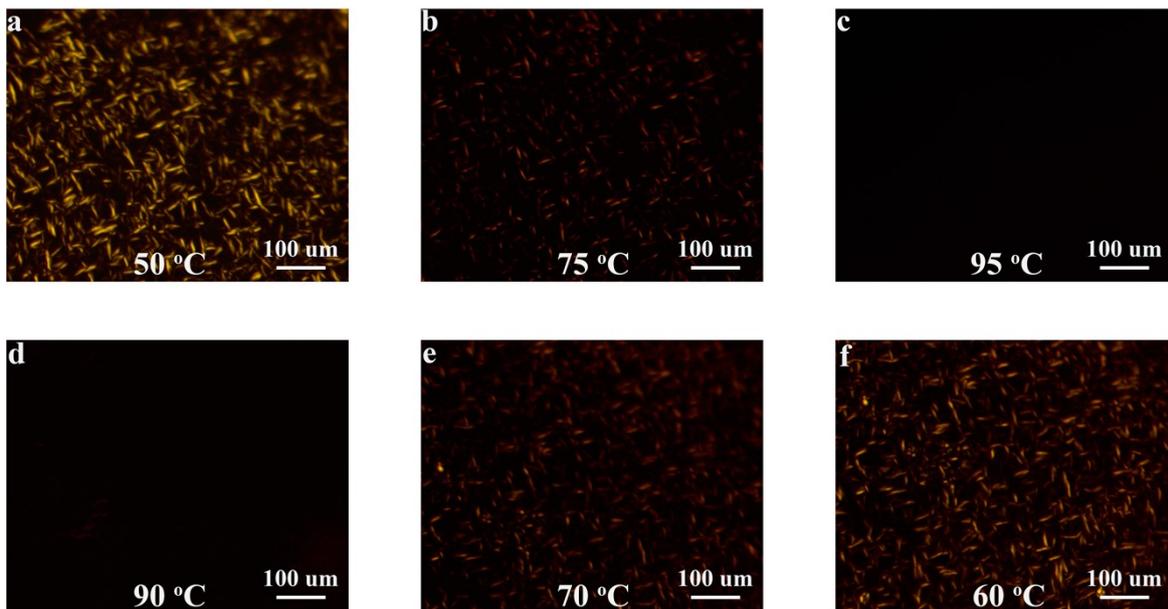


Figure S10. POM images of Film-18CF, recorded during (a-c) heating and (d- f) cooling processes.

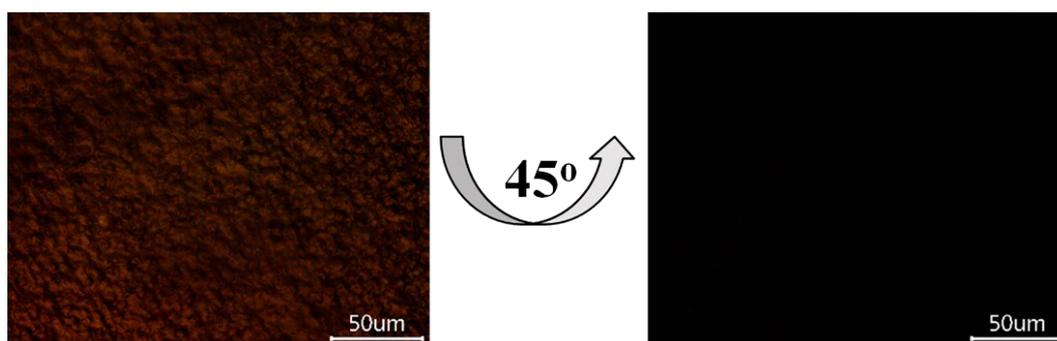


Figure S11. POM images of Film-18CF recorded at room temperature.

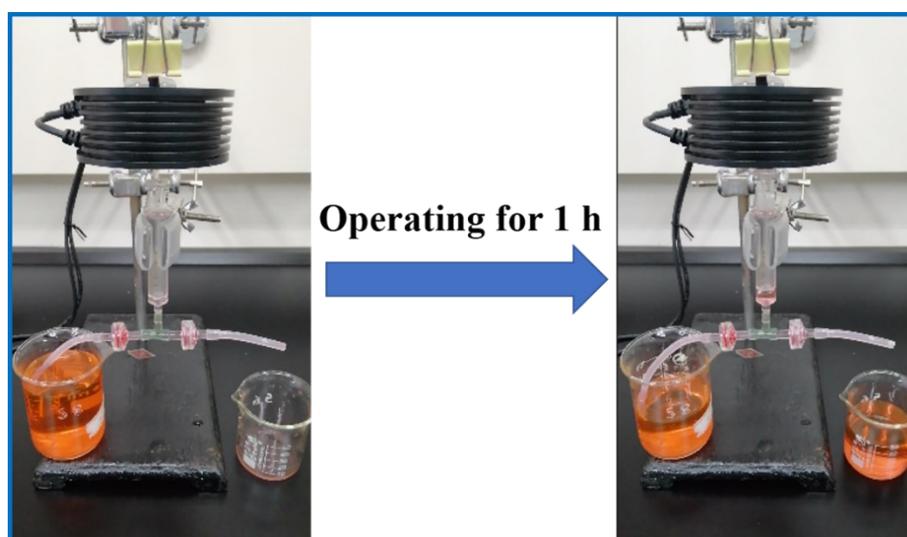


Figure S12. Photo images of the photocontrolled reciprocating piston “pump” at the beginning and after operation for 1 h.

3. Supporting Movie Captions

Movie S1. NIR light-driven shrinking and recovering of the NIR-doped LCN of Film-16C loaded with a weight of 25 g.

Movie S2. NIR light-driven shrinking and recovering of the NIR-doped LCN of Film-24CF loaded with a weight of 25 g.

Movie S3. NIR light-driven shrinking and recovering of the NIR-doped LCN of Film-18CF loaded with a weight of 25 g.

Movie S4. Working process of NIR controlled reciprocating piston “pump” (set 4x time compression).