

Supporting information

Thermo- and chemical-triggered overhand and reef knots based on liquid crystal gels

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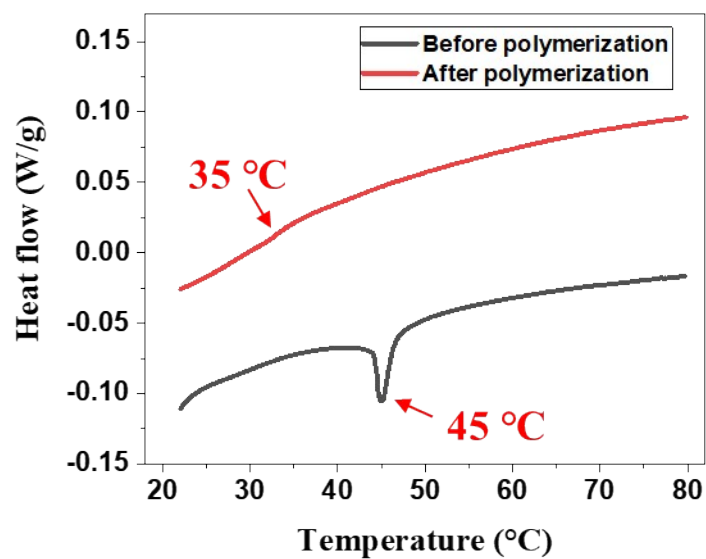


Figure S1 Heat flow of the mixture before and after polymerization. Before polymerization, the clearing point of the mixture is about 45 °C. After polymerization, no obvious clearing point is observed.

T (°C)	22	30	40	50	60	70	80	90	100
Diameter (μm)	797.43	799.88	802.54	812.76	822.99	833.21	843.43	853.66	861.32
Increment (%)	0.00	0.31	0.64	1.92	3.21	4.49	5.77	7.05	8.01

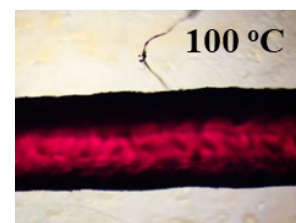
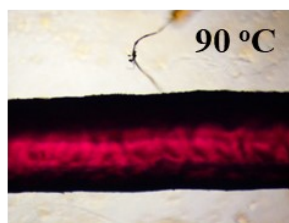
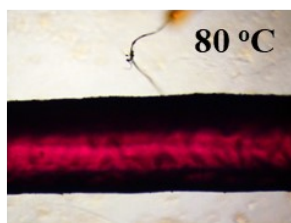
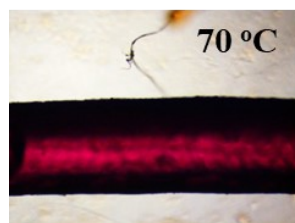
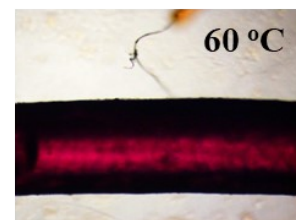
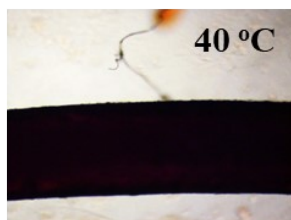
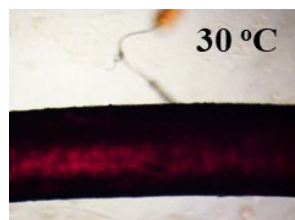
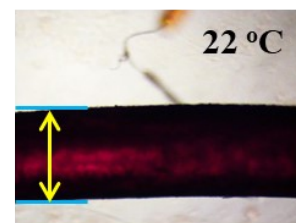


Figure S2 The increment of rod diameter with increased temperature from room temperature (22 °C) to 100 °C. The values of the diameter and the increment are shown in the table.

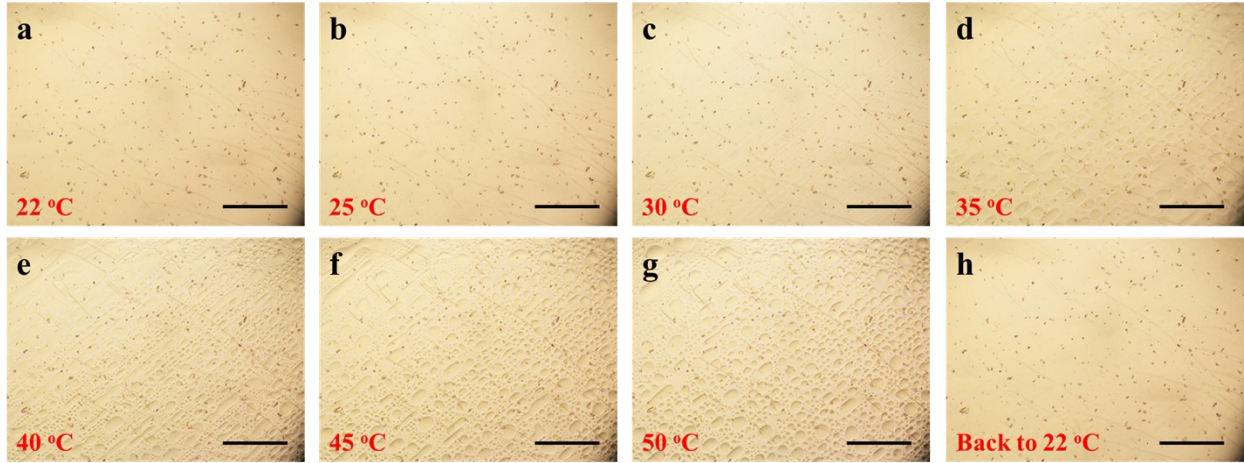


Figure S3 The texture of an LCG film under bright-field microscope at (a) 22 °C, (b) 25 °C, (c) 30 °C, (d) 35 °C, (e) 40 °C, (f) 45 °C, (g) 50 °C and (h) restored to 22 °C. The 5CB starts to emerge at the surface at 35 °C and the amount increases with increased temperature. Scale bar: 500 μm .

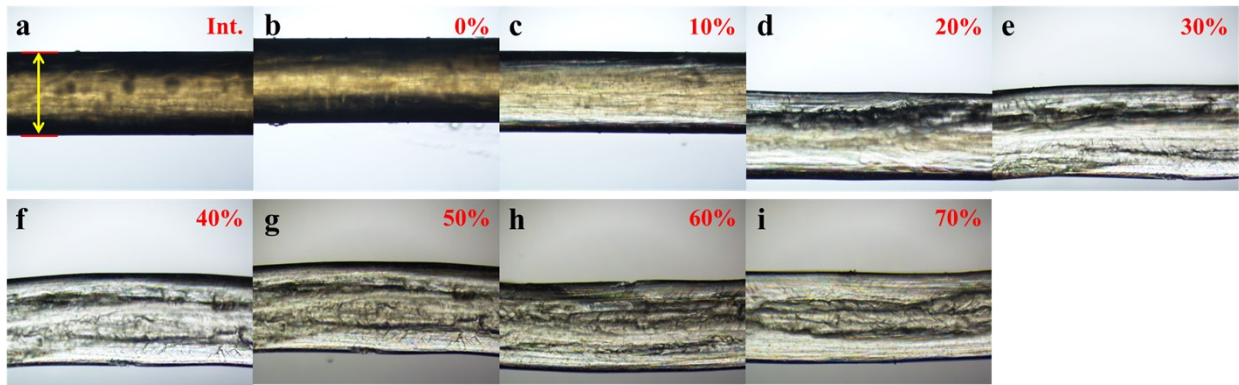


Figure S4 The change of diameter of LCG thread in different concentrations of toluene isopropanol solution. (a) Initial. (b) 0% (v/v) toluene and 100% isopropanol. (c) 10% toluene and 90% isopropanol. (d) 20% toluene and 80% isopropanol. (e) 30% toluene and 70% isopropanol. (f) 40% toluene and 60% isopropanol. (g) 50% toluene and 50% isopropanol. (h) 60% toluene and 40% isopropanol. (i) 70% toluene and 30% isopropanol.

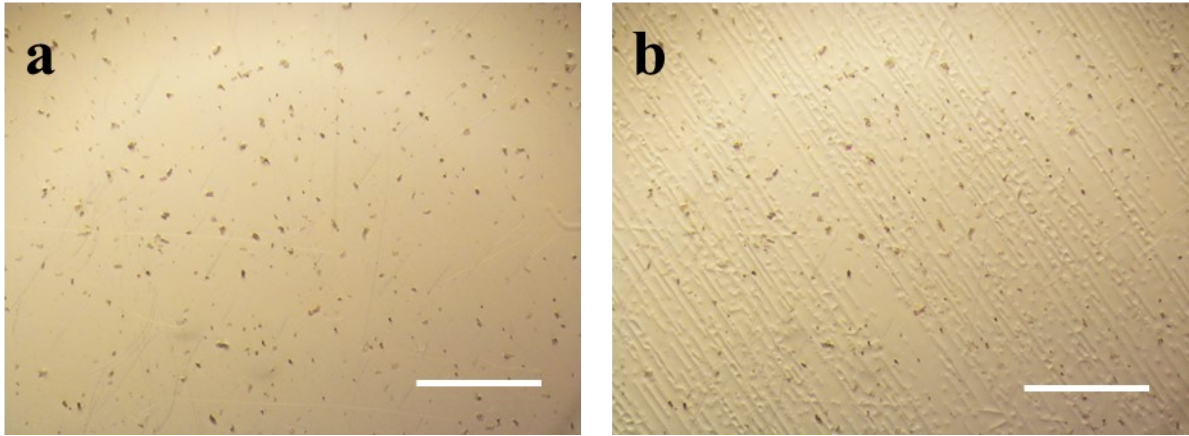


Figure S5. The texture of an LCG film under bright-field microscope with (a) no toluene and (b) saturated concentration of toluene vapor. Scale bar: 500 μm .

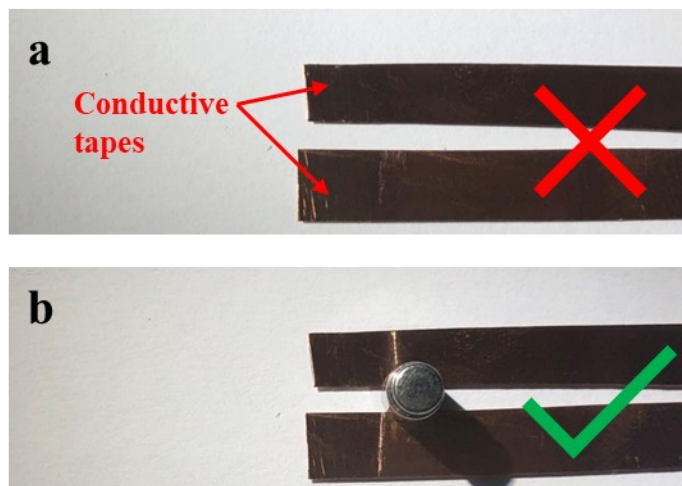


Figure S6 The switch of the control circuit at (a) off state and (b) on state.

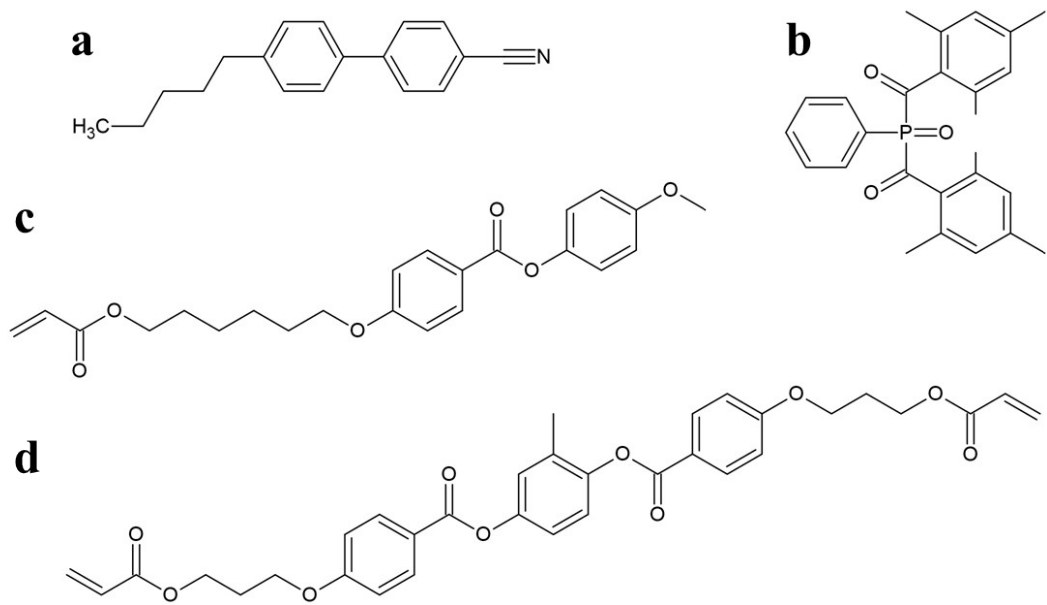


Figure S7 Chemical structures of (a) 5CB, (b) Irgacure 819, (c) RM006 and (d) RM257.

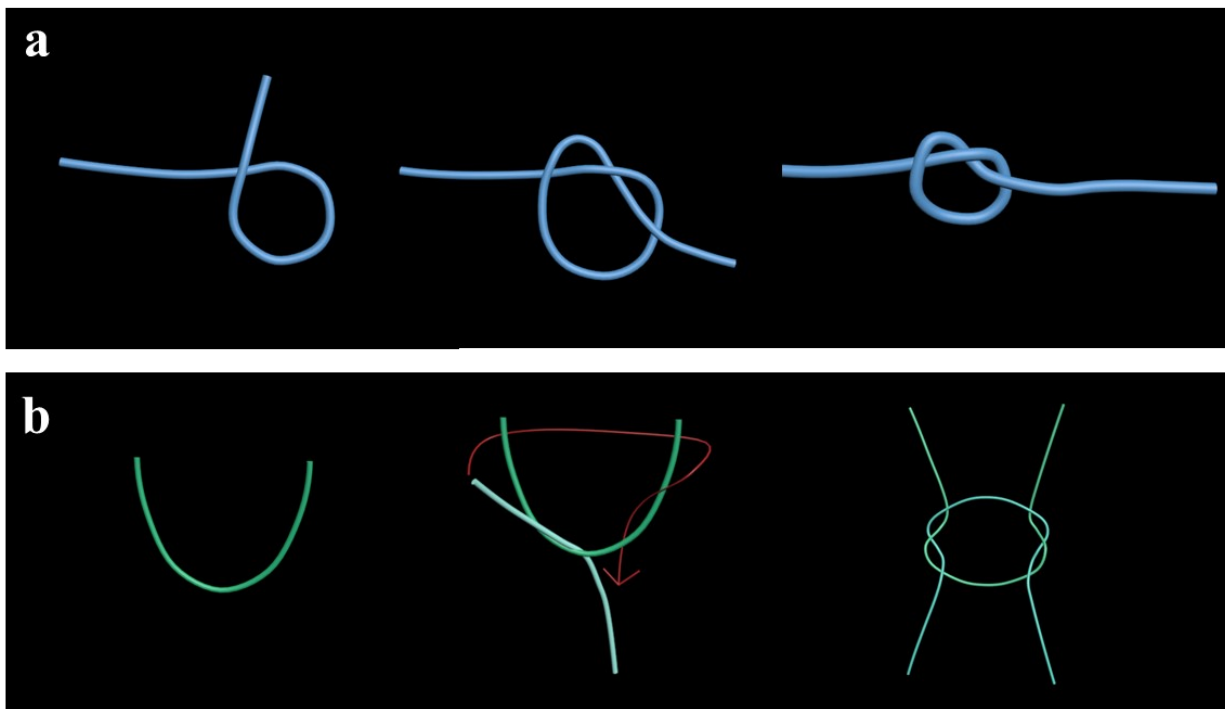


Figure S8 The fabrication process of (a) an overhand knot and (b) a reef knot.