

Electronic Supplementary Information for

Photoresponsive Chiral Molecular Crystal for Light Directing Nanostructures

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1. Materials

All chemicals were purchased from commercial sources and used without further purification. Solvents were distilled and dried by using standard methods when necessary.

2. Syntheses

Compound 1. A solution of methyl 4-hydroxybenzoate (2.0 mmol), 2-(2-{2-(4-((4-(octyloxy)phenyl)diazanyl)phenoxy)ethoxy}ethoxy)ethyl 4-toluenesulfonate (1.0 mmol) and K₂CO₃ (5.0 mmol) in 100 mL of dried dimethylformamide was refluxed for 24 h. After reaction, solvent was distilled and washed with chloroform and water. The organic layer was dried over MgSO₄. It was purified by column chromatography with silica gel using ethyl acetate:chloroform = 1:10. The resulting product was a yellowish powder (yield: 82%). ¹H NMR (400 MHz, CDCl₃): δ = 0.89 (t: 3H), 1.39 (m: 10H), 1.80 (m: 2H), 3.76 (t: 4H), 3.88 (m: 7H), 4.02 (t: 2H), 4.18 (m: 4H), 6.91 (d: 2H), 6.99 (q: 4H), 7.84 (q: 4H), 7.97 (d: 2H) ppm.

Compound 2. The compound **1** (0.5 mmol) was refluxed in 30 mL of ethanol and 10 M of NaOH solution for 12 h. The precipitate was obtained by addition of concentrated HCl solution. The crude product was filtered and purified by reprecipitation with chloroform and methanol and then dried under vacuum to afford the yellow waxy solid (yield: 98%). ¹H NMR (400 MHz, CDCl₃): δ = 0.89 (t: 3H), 1.41 (m: 10H), 1.80 (m: 2H), 3.77 (t: 4H), 3.89 (m: 4H), 4.02 (t: 2H), 4.20 (m: 4H), 6.99 (m: 6H), 7.84 (q: 4H), 8.01 (d: 2H) ppm.

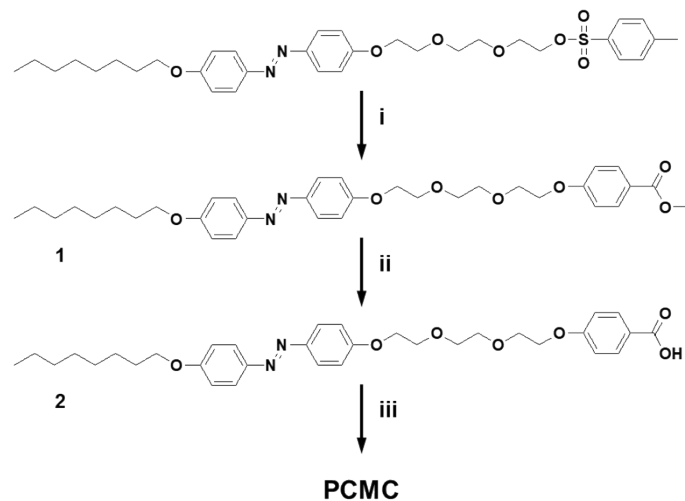


Fig. S1 Synthetic routes of PCMC. Reagents and conditions: i) K_2CO_3 , DMF, 90°C , 24 h; ii) NaOH, EtOH, 70°C , 12 h; iii) EDC, DMAP, DCM, 25°C , 48 h.

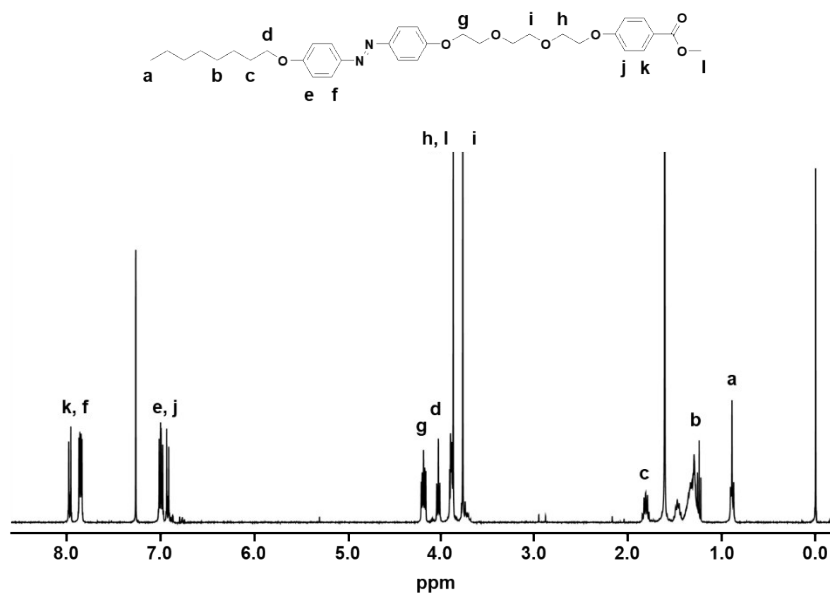


Fig. S2 ^1H NMR spectra of compound **1**.

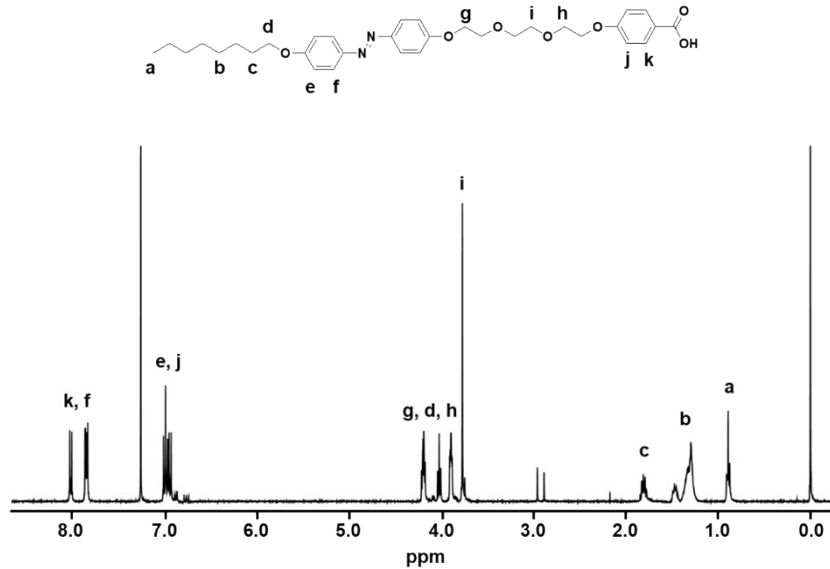


Fig. S3 ^1H NMR spectra of compound 2.

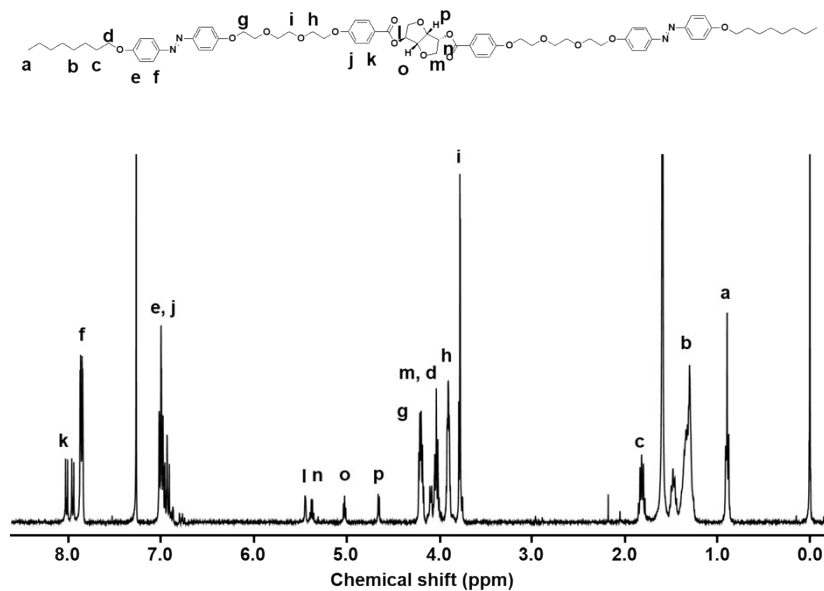


Fig. S4 ^1H NMR spectra of PCMC.

	experimental content (%)	calculated content (%)
C	68.15	68.23
	68.09	
	68.01	
H	7.14	7.16
	7.12	
	6.98	
N	4.413	4.42
	4.387	
	4.373	

Fig. S6 Elemental mass analysis of PCMC.

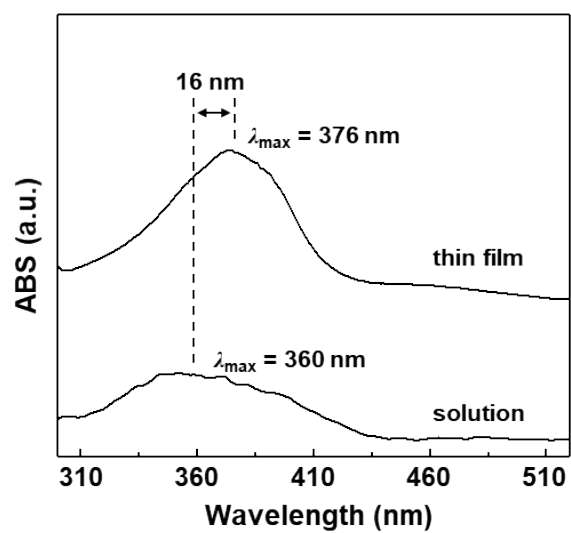


Fig. S7 UV-Vis absorption spectra of the PCMC at solid and solution state.

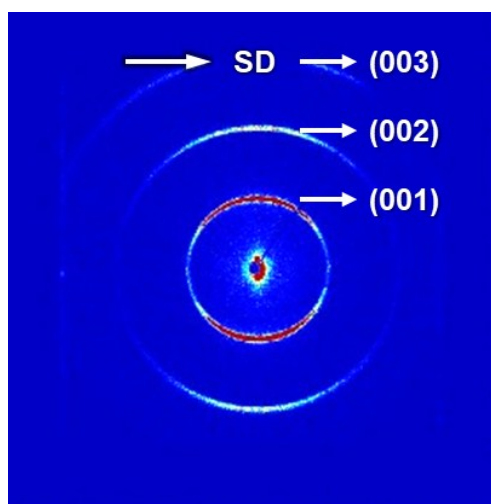


Fig. S8 2D SAXS patterns of the oriented PCMC at room temperature.

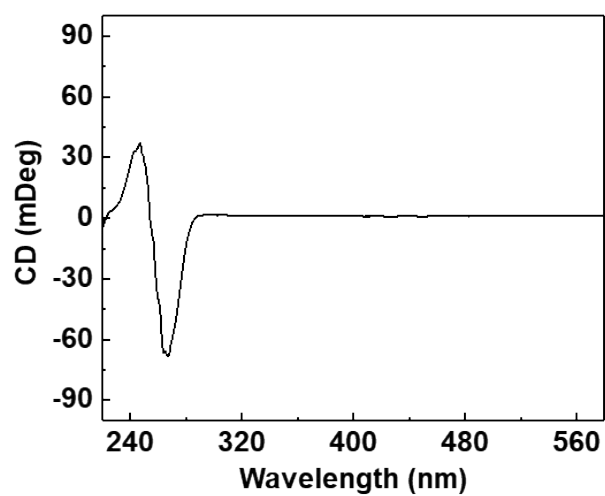


Fig. S9 CD spectra of the isosorbide in CHCl_3 solution.

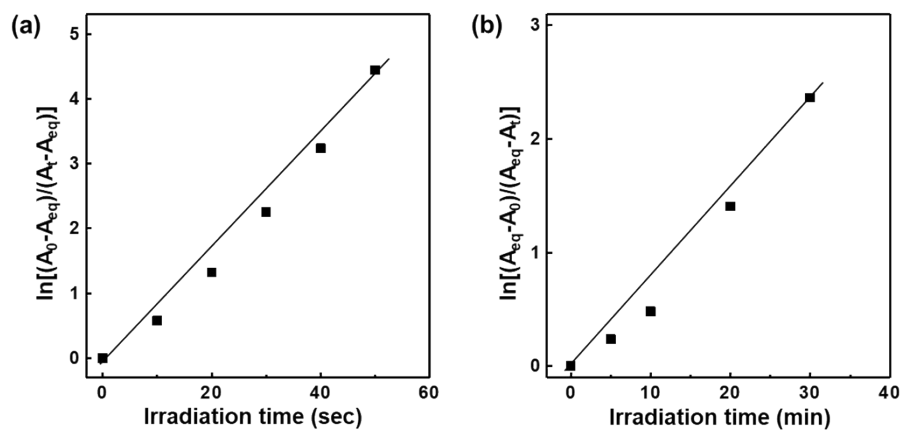


Fig. S10 First-order plots of the *trans*-to-*cis* (a) and *cis*-to-*trans* photoisomerization (b) of PCMC in CHCl_3 solution.