Electronic supporting information

Porous surface of an achiral trimer in the chiral conglomerate phase catalyzes a direct aldol reaction

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1. Characterization of trimer **I-(9,9)** and the DSC thermogram. The rate of cooling and heating was 5 °C min^{-1}.

2. Experimental procedure of the reaction of acetone with benzaldehyde using **9OPYP5O** as a catalyst.

3. Fig. S1 (a) Polarized optical textures of trimer **I-(9,9)** quenched from the isotropic liquid on a glass slide with a cover glass in the crystal between uncrossed polarizers at room temperature. (b) SEM image of the surface structure.

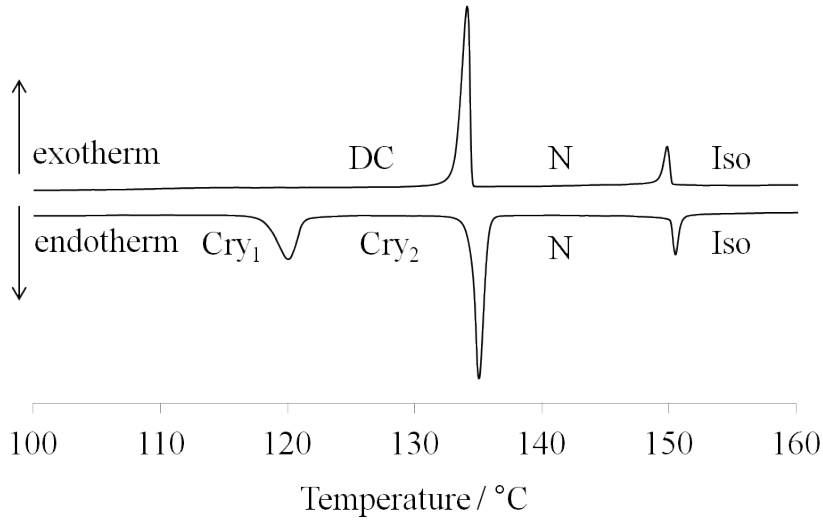
4. Fig. S2 Polarized optical textures of trimer **I-(9,9)** on a glass slide with a cover glass in the crystal between uncrossed polarizers.

5. Fig. S3 Molecular structure of **P-8-O-PIMB**

1. Characterization of trimer **I-(9,9)** and the DSC thermogram. The rate of cooling and heating was 5 °C min^{-1}.

2-{4-[9-(4-(4-Octyloxyphenyl)phenyloxy)nonyloxy]phenyl}-5-{9-[4-(5-octyloxypyrimidin-2-yl)phenyloxy]nonyloxy}pyrimidine (I-(9,9)).

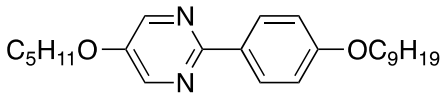
^{1}HNMR (500 MHz, $CDCl_3$, TMS): δ=8.40 (s, 4H, Ar-**H**), 8.26 (d, 4H, Ar-**H**, *J* = 8.6 Hz), 6.96 (d, 4H, Ar-**H**, *J* = 8.3 Hz), 6.93 (d, 4H, Ar-**H**, *J* = 8.0 Hz), 4.07 (t, 4H, -OC**H$_2$**-, *J* = 6.3 Hz), 4.02 (t, 2H, -OC**H$_2$**-, *J* = 6.3 Hz), 4.05 (t, 2H, -OC**H$_2$**-, *J* = 6.3 Hz), 3.99 (t, 2H, -OC**H$_2$**-, *J* = 6.9 Hz), 3.97 (t, 2H, -OC**H$_2$**-, *J* = 6.9 Hz), 1.85–1.69 (m, 12H, aliphatic-**H**), 1.47–1.29 (m, 40H, aliphatic-**H**), 0.89 (t, 6H, -C**H$_3$**, *J* = 6.9 Hz). IR (KBr):ν cm^{-1}: 2933, 2851 (C-H str), 1608 (Ar-H str), 1246 (C-O str). Elemental Analysis Calcd. for C,76.6; H, 8.76; N, 5.43. Found C, 76.8; H, 8.40; N, 5.43.



DSC thermograms of trimer **I-(9,9)**. The rate of cooling and heating was 5 °C min^{-1}.

2. Experimental procedure of the reaction of acetone with benzaldehyde using **9OPYP5O** as a catalyst.

9OPYP5O (40 mg, 0.11 mmol) was added into a DMSO (5 ml)/acetone (5 ml) mixture. **9OPYP5O** was not dissolved in the solvent. Then, benzaldehyde (60 mg, 0.60 mmol) was added to the reaction mixture and it was stirred at room temperature. A spot corresponding to the product did not appear on a thin layer chromatography even after 149 h. After working up the reaction, no product was detected.



9OPYP5O

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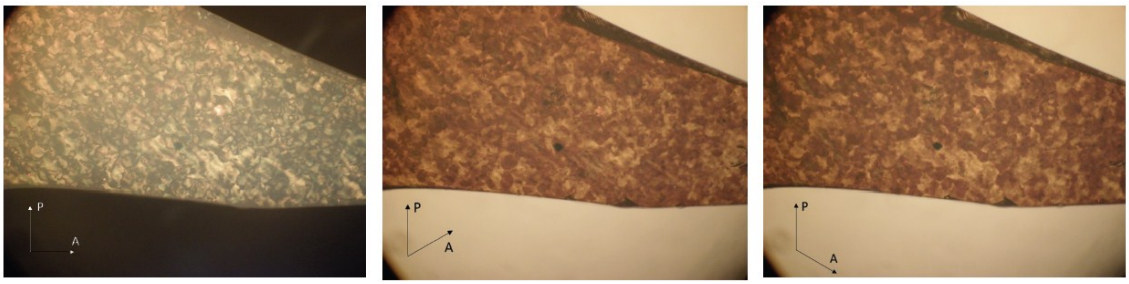
(a)



(b)

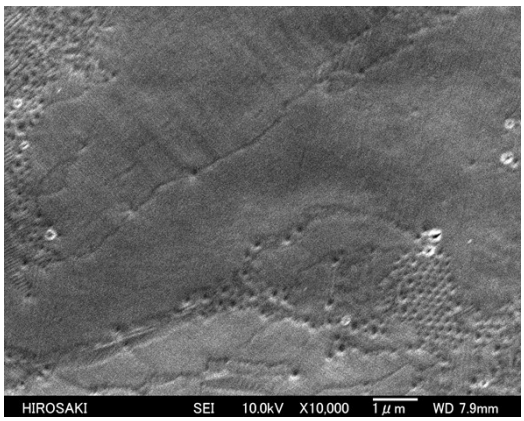


Fig. S1 (a) Polarized optical textures of trimer **I-(9,9)** quenched from the isotropic liquid on a glass slide with a cover glass in the crystal between crossed and uncrossed polarizers at room temperature. (b) SEM image of the surface structure.

4.

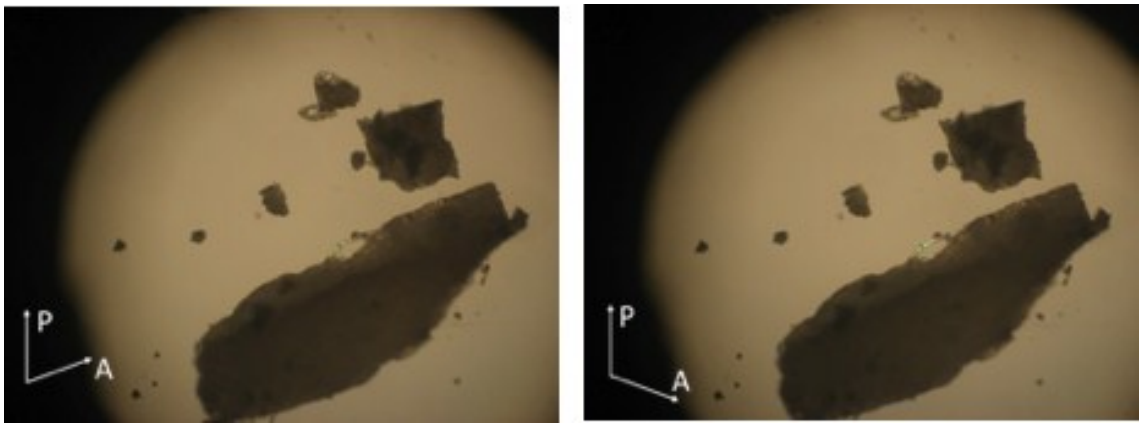
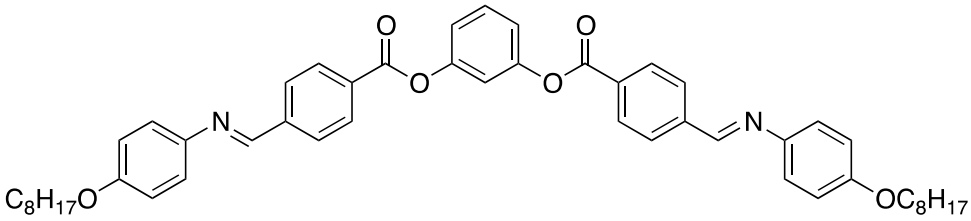


Fig. S2 Polarized optical textures of trimer **I-(9,9)** on a glass slide with a cover glass in the crystal between uncrossed polarizers.

5.



P-8-O-PIMB

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