Supporting Information

Side-Chain Labeling Strategy for Forming Self-Sorted Columnar Liquid Crystals from Binary Discotic Systems

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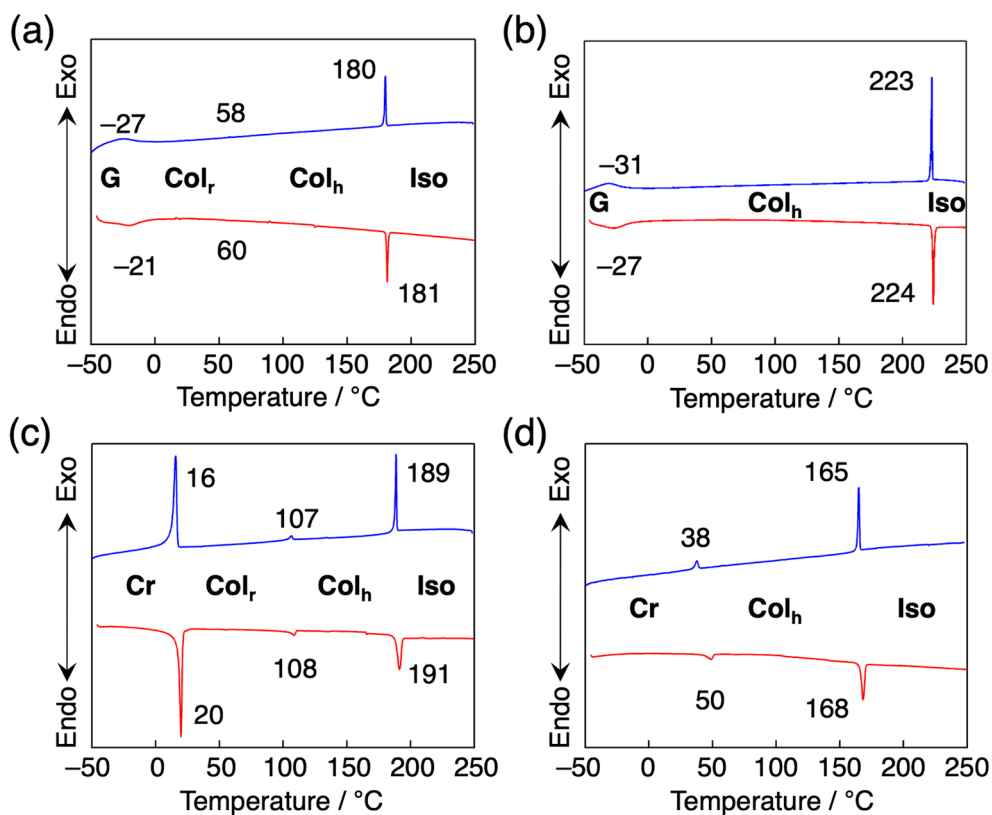
Supporting Figures

Figure S1. DSC traces of (a) **H₂Pc**, (b) **PDI$_{C12/C12}$**, (c) **PDI$_{C12/TEG}$**, and (d) **PDI$_{TEG/TEG}$** on 2nd heating/cooling cycle at 10 K/min. The phase notations; G: Glassy phase, Col$_r$: rectangular columnar mesophase, Col$_h$: hexagonal columnar mesophase, Iso: isotropic liquid phase, Cr: crystalline phase.
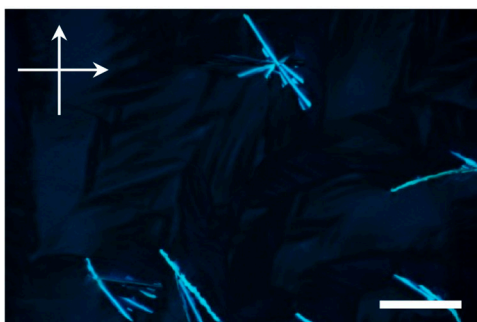

Figure S2. Crossed polarized microscopy images of **H₂Pc** in glass sandwich cell without any treatment. The image was taken at 50 °C after cooling from their isotropic melt at 10 K/min. Scale bar represent 200 μm. This image indicates that rapid cooling process interferes the perfect homeotropic alignment.
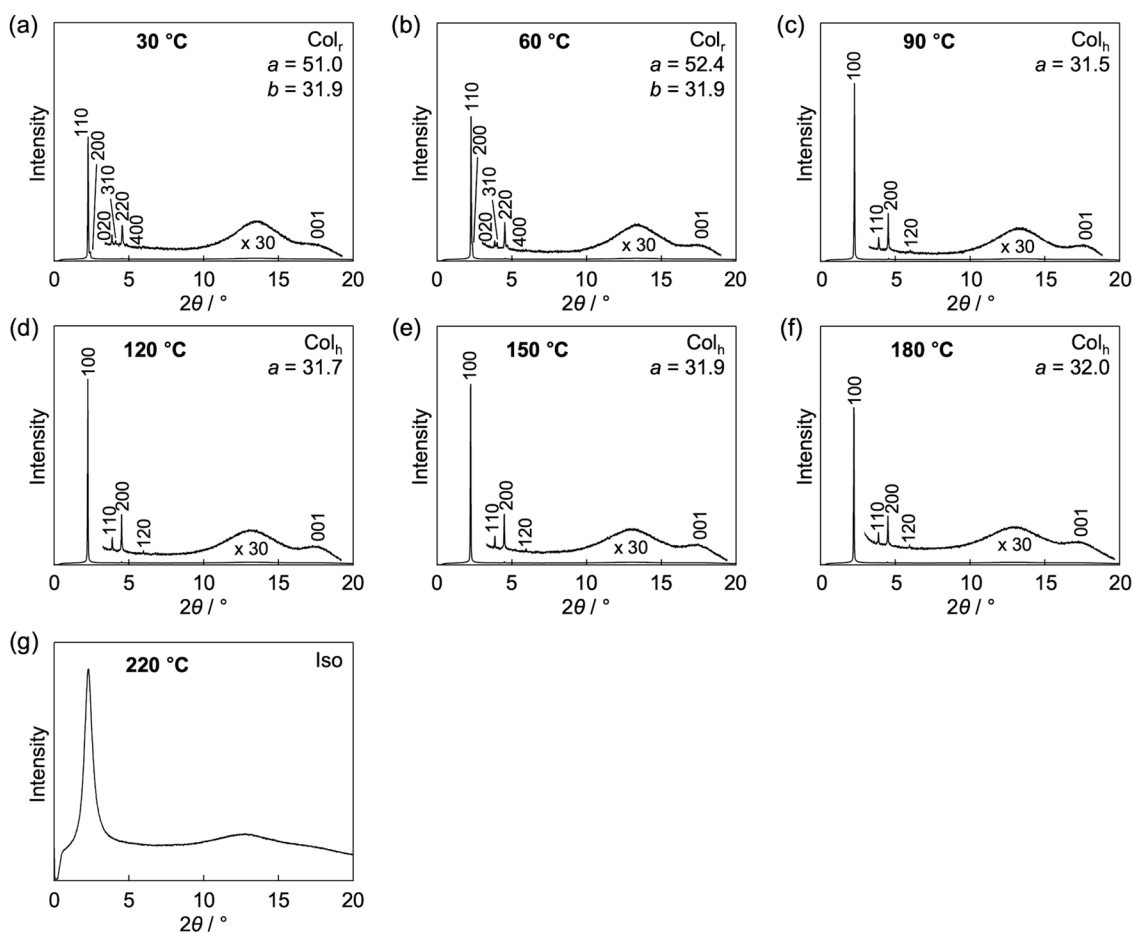
Figure S3. Variable-temperature XRD patterns of **H₂Pc** at (a) 30 ºC, (b) 60 ºC, (c) 90 ºC, (d) 120 ºC, (e) 150 ºC, (f) 180 ºC, and (g) 220 ºC on cooling. The phase assignment and cell parameters are represented at the upper right corner of each pattern.
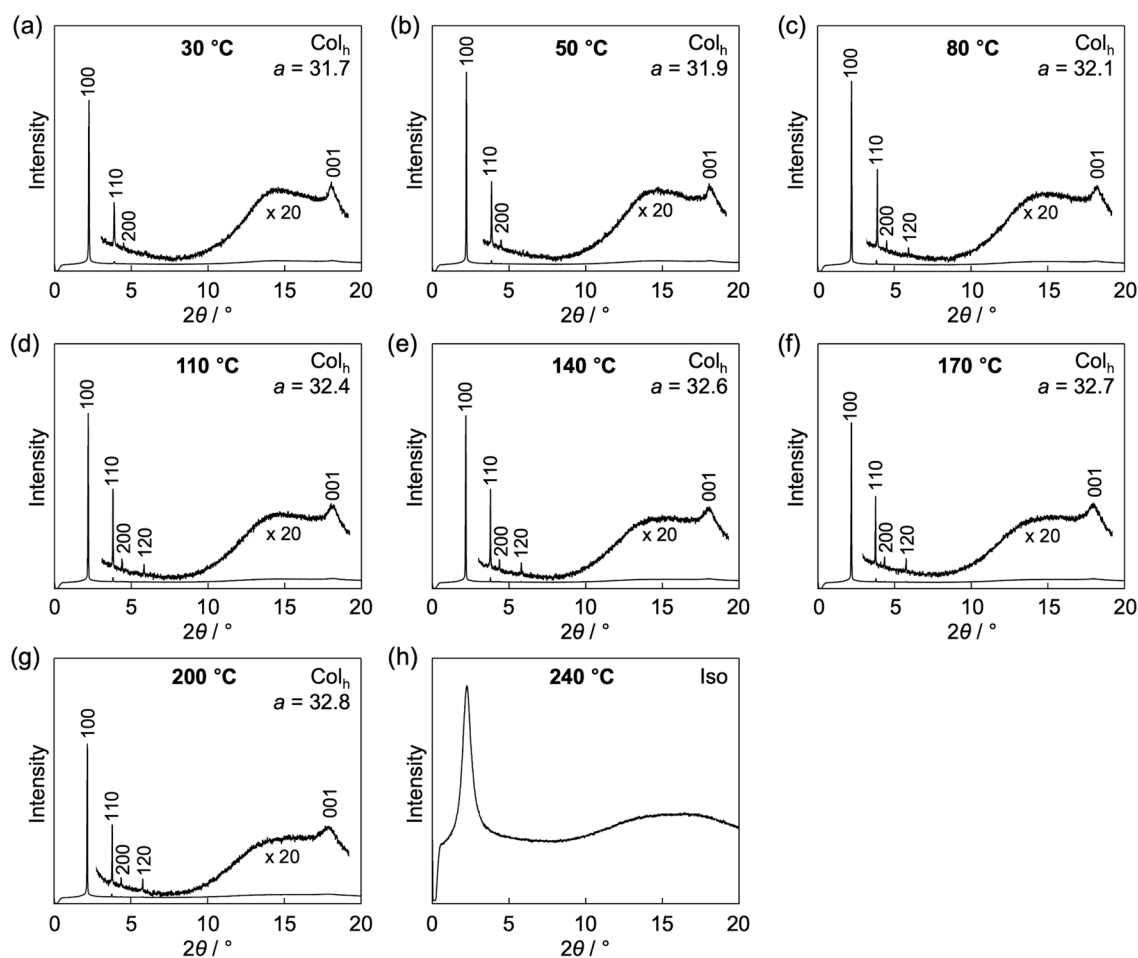
Figure S4. Variable-temperature XRD patterns of 1:1 molar ratio mixture of **H₂Pc/PDI**$_{C12/C12}$ at (a) 30 ºC, (b) 50 ºC, (c) 80 ºC, (d) 110 ºC, (e) 140 ºC, (f) 170 ºC, (g) 200 ºC, and (h) 240 ºC on cooling. The phase assignment and cell parameters are represented at the upper right corner of each pattern.
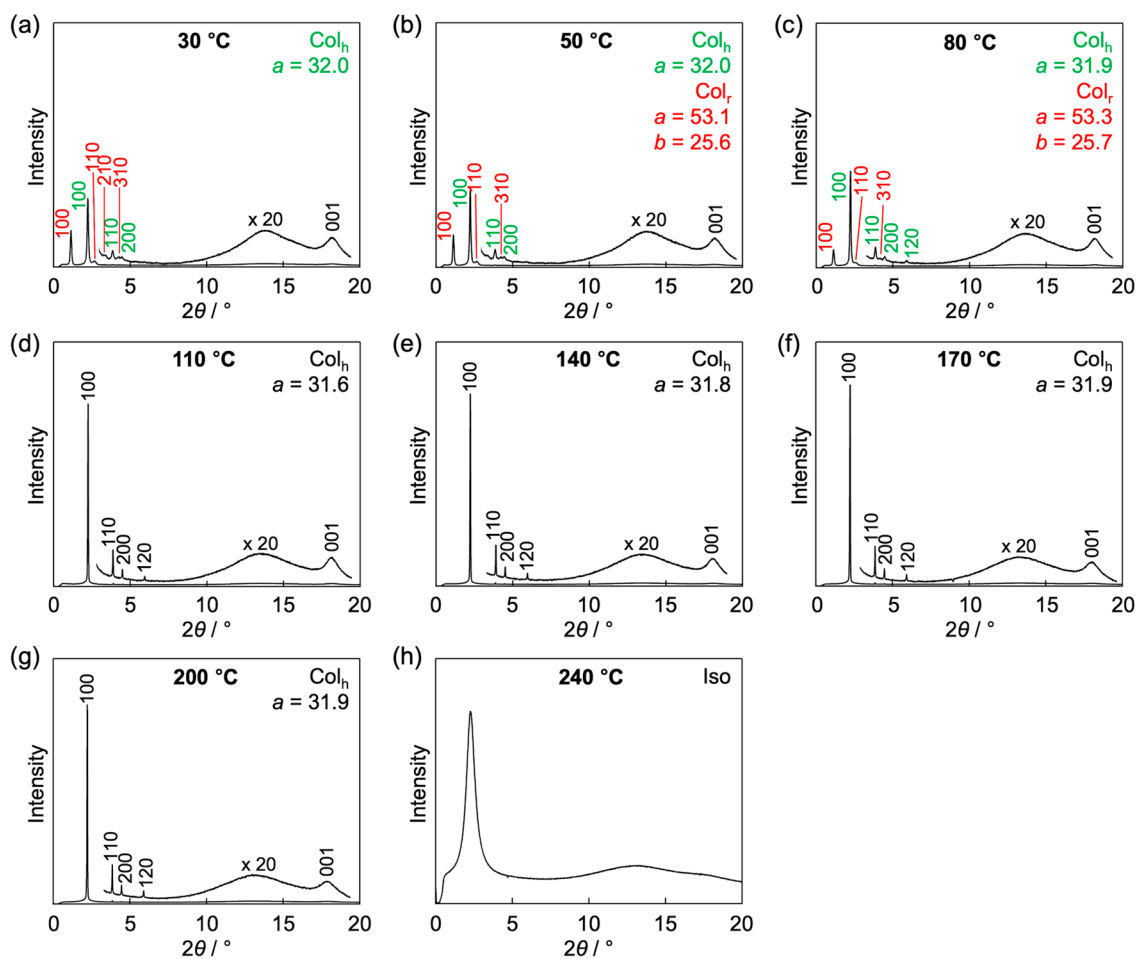
Figure S5. Variable-temperature XRD patterns of 1:1 molar ratio mixture of **H₂Pc/PDI**$_{C12/TEG}$ at (a) 30 ºC, (b) 50 ºC, (c) 80 ºC, (d) 110 ºC, (e) 140 ºC, (f) 170 ºC, (g) 200 ºC, and (h) 240 ºC on cooling.   The phase assignment and cell parameters are represented at the upper right corner of each pattern.
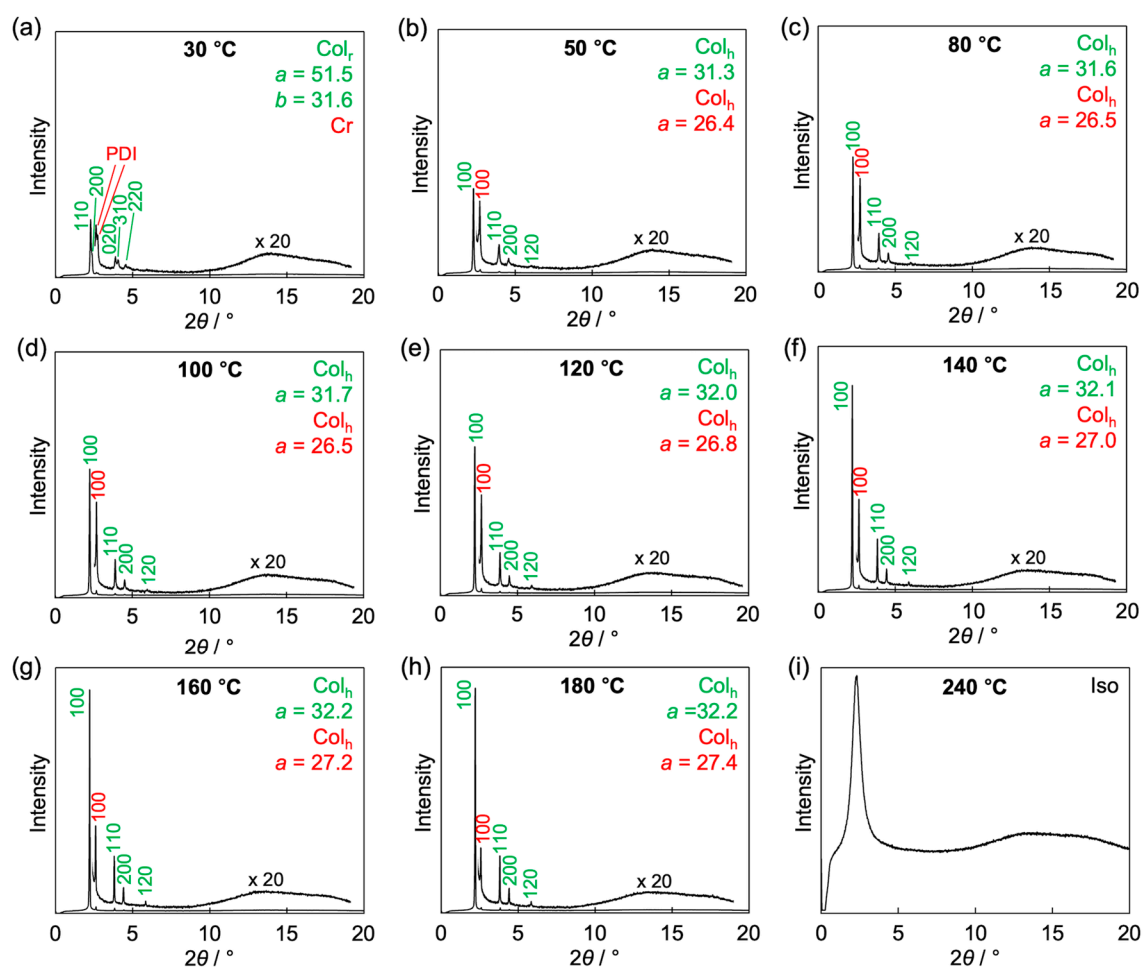
Figure S6. Variable-temperature XRD patterns of 1:1 molar ratio mixture of **H₂Pc/PDI_{TEG/TEG}** at (a) 30 ºC, (b) 50 ºC, (c) 80 ºC, (d) 100 ºC, (e) 120 ºC, (f) 140 ºC, (g) 160 ºC, (h) 180 ºC, and (i) 240 ºC on cooling. The phase assignment and cell parameters are represented at the upper right corner of each pattern.
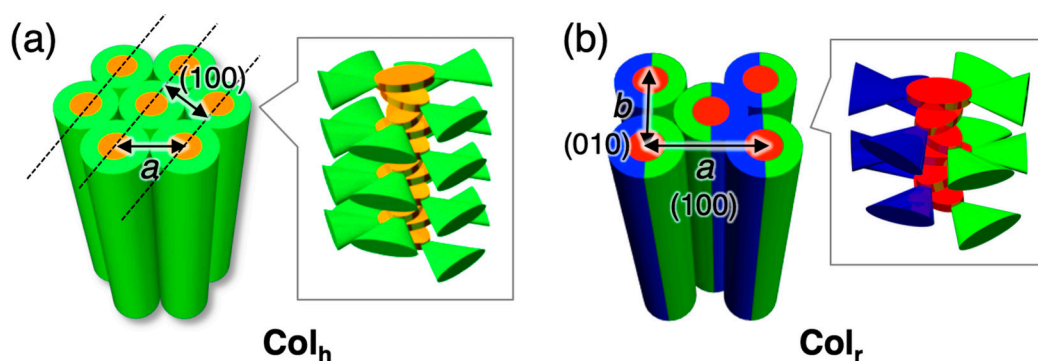

Figure S7. Schematic illustrations of (a) columnar hexagonal phase (Col_h) and (b) columnar rectangular phase (Col_r) with corresponding lattice parameters and primary diffractions.
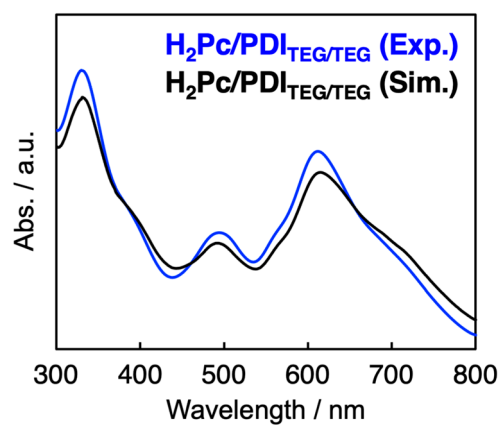
Figure S8. Absorption spectra of spin-coated film of **H₂Pc/PDI**$_{TEG/TEG}$ (blue) together with the simulated superimposed spectra constructed from those of **H₂Pc** and **PDI**$_{TEG/TEG}$ films (black).