

SUPPORTING INFORMATION

**Formation of multicomponent 2D assemblies of  $C_{2v}$ -symmetric  
terphenyl tetracarboxylic acid at solid/liquid interface: recognition,  
selection, and transformation**

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## Supplementary Figures

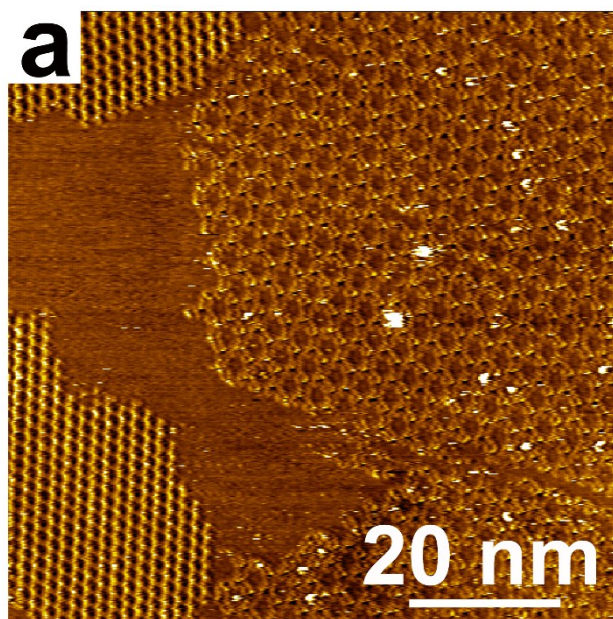


Fig. S1. Large-scale STM images of the assembly of TPTA molecule at the interface between n-octanoic acid and graphite at room temperature. (a)  $100 \times 100 \text{ nm}^2$ ,  $I_{\text{set}} = 300 \text{ pA}$ ,  $V_{\text{bias}} = 500 \text{ mV}$ .

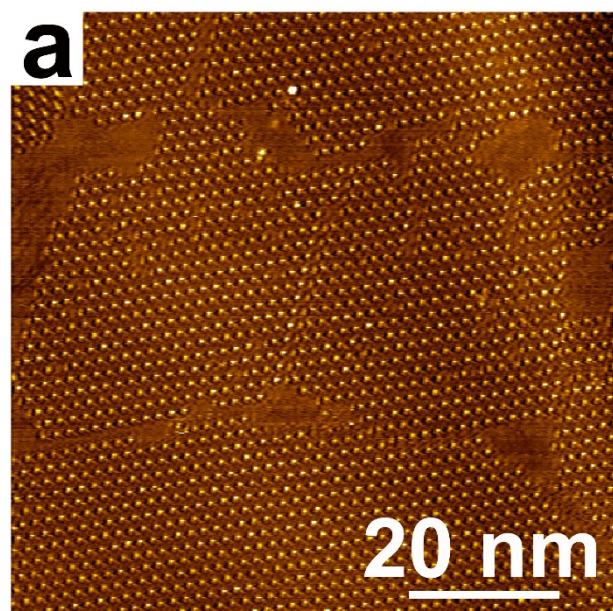


Fig. S2. Large-scale STM images of the assembly of pattern A structure of TPTA molecule at the interface between n-octanoic acid and graphite at room temperature. (a)  $100 \times 100 \text{ nm}^2$ ,  $I_{\text{set}} = 300 \text{ pA}$ ,  $V_{\text{bias}} = 500 \text{ mV}$ .

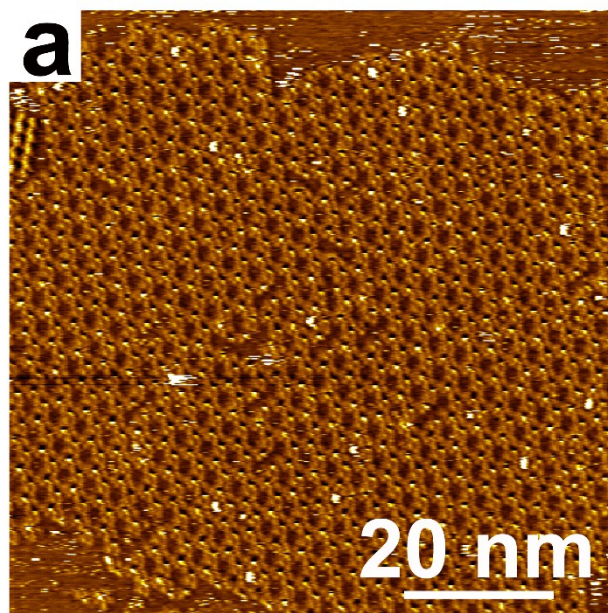


Fig. S3. Large-scale STM images of the assembly of pattern B structure of TPTA molecule at the interface between n-octanoic acid and graphite at room temperature. (a) 100x100 nm,  $I_{\text{set}} = 300$  pA,  $V_{\text{bias}} = 500$  mV.

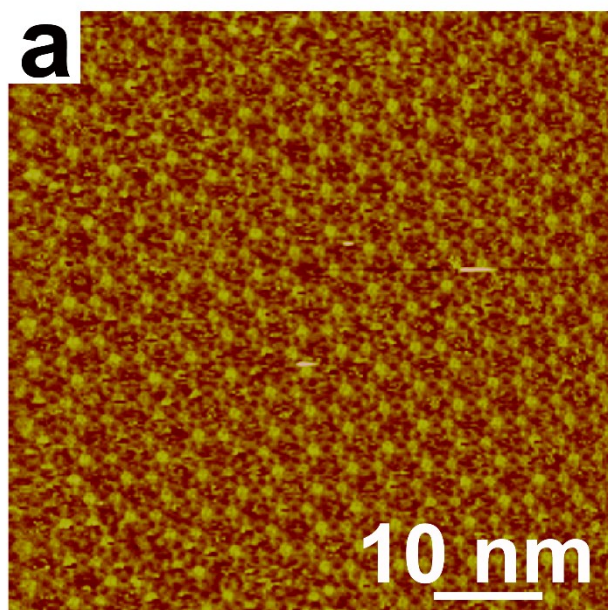


Fig. S4. A large-scale STM image after adsorption of an excess of coronene guests within the assembly structure of TPTA at the interface between n-octanoic acid and graphite at room temperature. (a) 60x60 nm,  $I_{\text{set}} = 499.7$  pA,  $V_{\text{bias}} = 698.9$  mV.

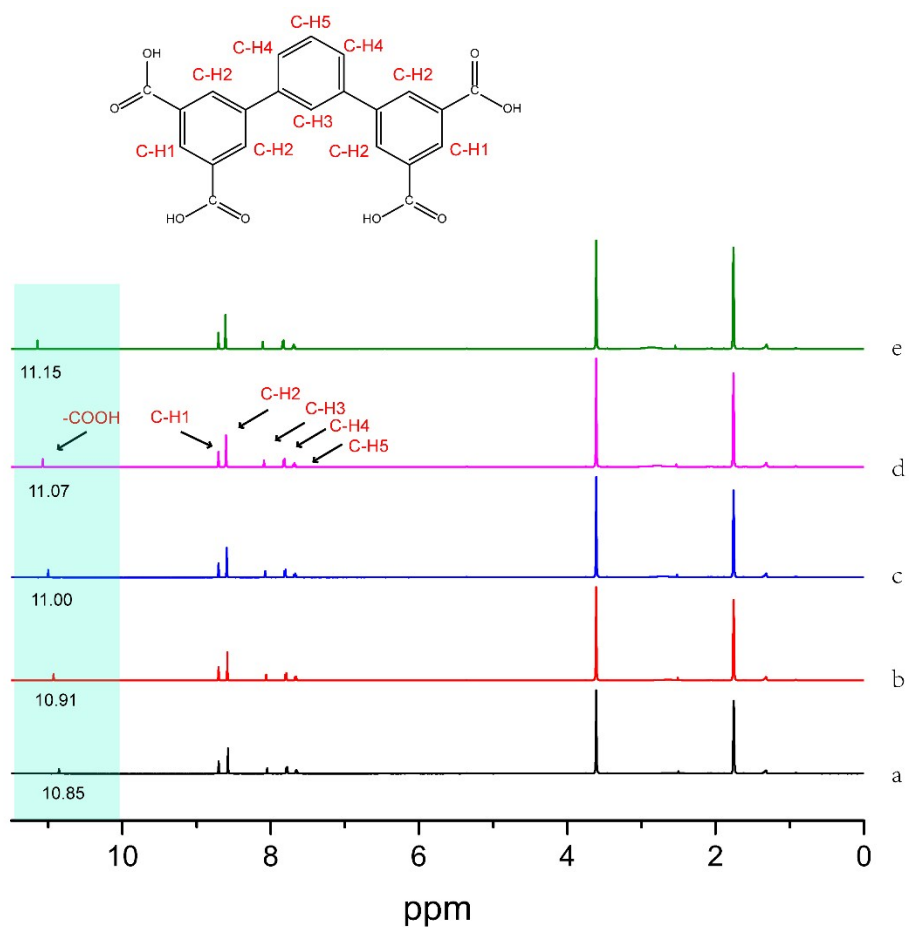


Fig. S5  $^1\text{H}$  NMR spectra of TPTA in  $\text{C}_4\text{D}_8\text{O}$  versus temperature. (a 298.2 K), (b 288.2 K), (c 278.2 K), (d 268.2 K), (e 258.2 K).

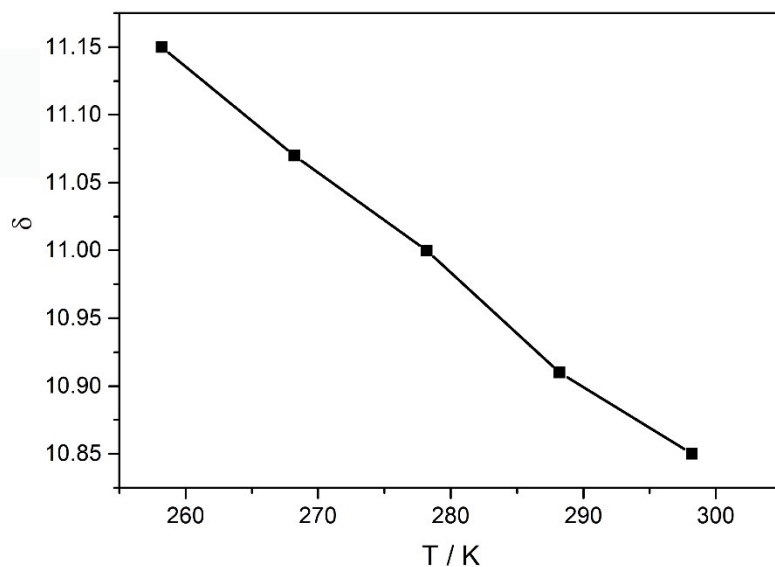


Fig. S6 The chemical shifts of carboxyl of TPTA in C4D8O versus temperature.

Variable-temperature  $^1\text{H}$  NMR spectroscopic experiments were performed to investigate the intermolecular hydrogen bonding of TPTA in solution.  $^1\text{H}$  NMR spectra were recorded with a Bruker AVIII 500 WB spectrometer, using tetrahydrofuran- $d_8$  as solvent.

Variable-temperature  $^1\text{H}$  NMR investigations from 298.2 K to 258.2 K revealed that the protons of the carboxyl group showed strong temperature dependence, and an obvious downfield shift of carboxyl was detected (as illustrated in Fig. S5,6), suggesting that the carboxylic groups are involved in intermolecular hydrogen bonding.<sup>S1,S2</sup>

#### References:

- S1. S. N. Qu, F. Li, H. T. Wang, B. L. Bai, C. Y. Xu, L. J. Zhao, B. H. Long and M. Li, *Chem. Mat.*, 2007, **19**, 4839-4846.
- S2. X. Zhao, X. Z. Wang, X. K. Jiang, Y. Q. Chen, Z. T. Li and G. J. Chen, *J. Am. Chem. Soc.*, 2003, **125**, 15128-15139.