

SUPPORTING INFORMATION

Size, shape and concentration controlled self-assembling structure with host-guest recognition at the liquid-solid interface studied by STM

Mengqi Shen,^{a,c} Zhouyang Luo,^b Siqi Zhang,^a Shuai Wang,^a Lili Cao,^a Yanfang Geng,^a Ke Deng,^{*a} Dahui Zhao,^{*b} Wubiao Duan,^{*c} and Qingdao Zeng^{*a}

^a CAS Key Laboratory of Standardization and Measurement for Nanotechnology, CAS Center for Excellence in Nanoscience, National Center for Nanoscience and Technology (NCNST), Beijing 100190, P. R. China. E-mail: zengqd@nanoctr.cn, kdeng@nanoctr.cn

^b Beijing National Laboratory for Molecular Sciences, the Key Laboratory of Polymer Chemistry and Physics of the Ministry of Education, College of Chemistry, Peking University, Beijing 100871, China. E-mail: dhzhao@pku.edu.cn

^c Department of Chemistry, School of Science, Beijing Jiaotong University, Beijing, 100044, China. E-mail: wbduan@bjtu.edu.cn

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1. Time-elapsd STM images of PBM2/COR system

The time-elapsd STM images are shown in Figure S1. The observed early-stage networks of the host-guest organic systems are the same as the final fully self-assembled molecular architecture.

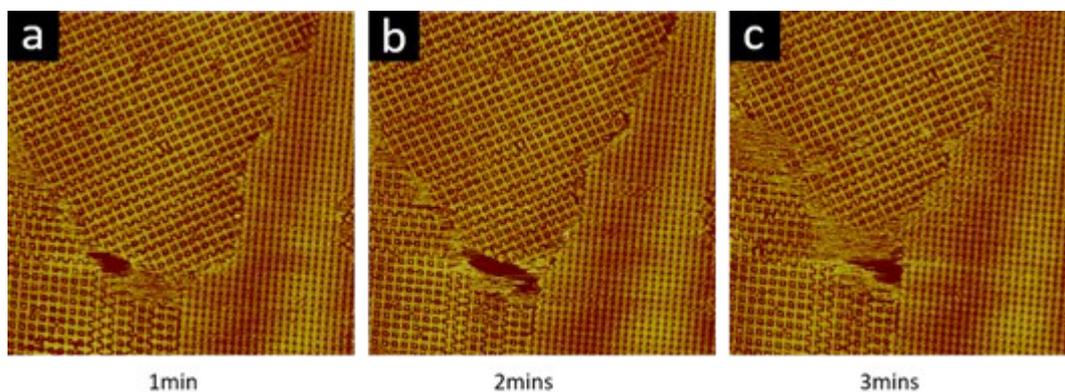


Figure S1. After depositing a droplet of solution of PBM2/COR under concentration of C2, the time-elapsd images ($110 \text{ nm} \times 110 \text{ nm}$) recorded at (a) 1min, (b) 2mins, (c) 3mins, $I_{\text{set}} = 299.1 \text{ pA}$, $V_{\text{bias}} = 596.1 \text{ mV}$, scan rate = 4.7 Hz, scan angle = 60° .

2. Split STM images

These Split STM images (Figure S2) are recorded by changing the tunneling parameters from adsorbate conditions (high voltage, low current) to graphite conditions (low voltage, high current) during the scan of the image frame. Since the unit cell parameters of graphite are known very precisely ($a = 2.46 \text{ \AA}$, $b = 2.46 \text{ \AA}$, $\alpha = 120^\circ$), the STM image can be calibrated with these values and the unit cell of the adsorbate layer can be determined.

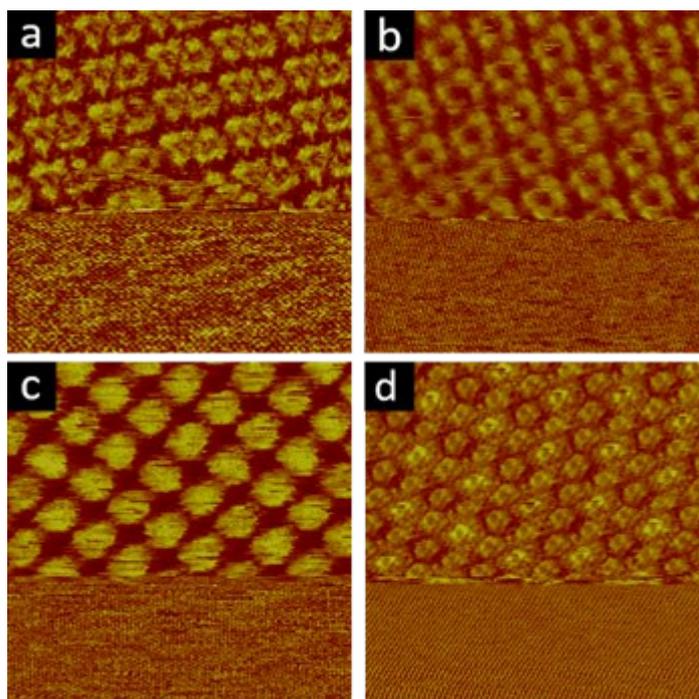


Figure S2. Split image ($20 \text{ nm} \times 20 \text{ nm}$) : the upper part shows the adsorbate layer (a) PBM1, (b) PBM2, (c) PBM2/COR(I), (d) PBM2/COR(II) and PBM2/COR(III), the lower part shows the underlying substrate (graphite). $I_{\text{set}} = 299.1 \text{ pA}$, $V_{\text{bias}} = 596.1 \text{ mV}$, scan rate = 4.7 Hz , scan angle = 60° .

3. STM investigation of PBM2 and PBM2/COR on Graphene

The STM images of the self-assemblies of PBM2 and PBM2/COR on single layer graphene grown on a polycrystalline Cu foil are shown in Figure S3. It shows that the self-assemblies of PBM2 and PBM2/COR on graphene are similar to those on HOPG, while the resolutions of the STM images on graphene are not high.

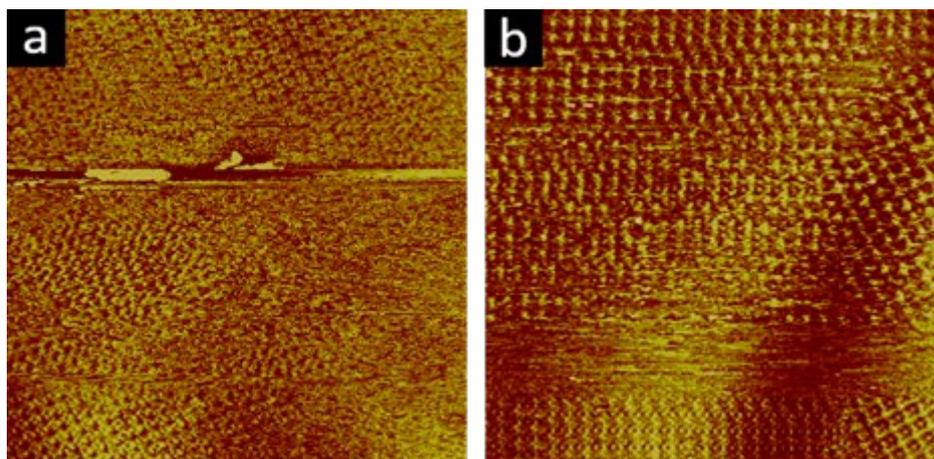


Figure S3. (a) Large-scale STM image ($83 \text{ nm} \times 83 \text{ nm}$) of PBM2 molecular self-assembly at graphene/1-phenyloctane interface, $I_{\text{set}} = 299.1 \text{ pA}$, $V_{\text{bias}} = 660.1 \text{ mV}$, scan rate = 4.7 Hz , scan angle = 60° . (b) Large-scale STM image ($88 \text{ nm} \times 88 \text{ nm}$) of PBM2/COR molecular under concentration of C2 self-assembly at graphene/1-phenyloctane interface, $I_{\text{set}} = 273.1 \text{ pA}$, $V_{\text{bias}} = 635.1 \text{ mV}$, scan rate = 4.7 Hz , scan angle = 60° .