

## *Supporting Information*

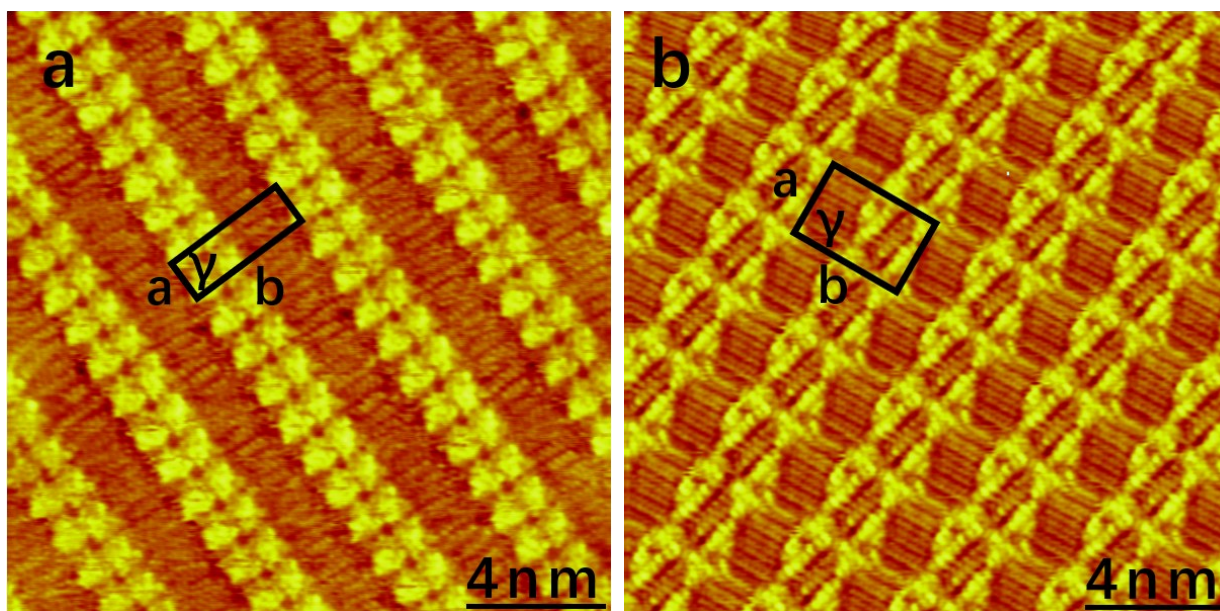
# **Halogen bonding controlled the 2D self-assembled polymorphism of regioisomeric thienophenanthrene derivatives by adsorption**

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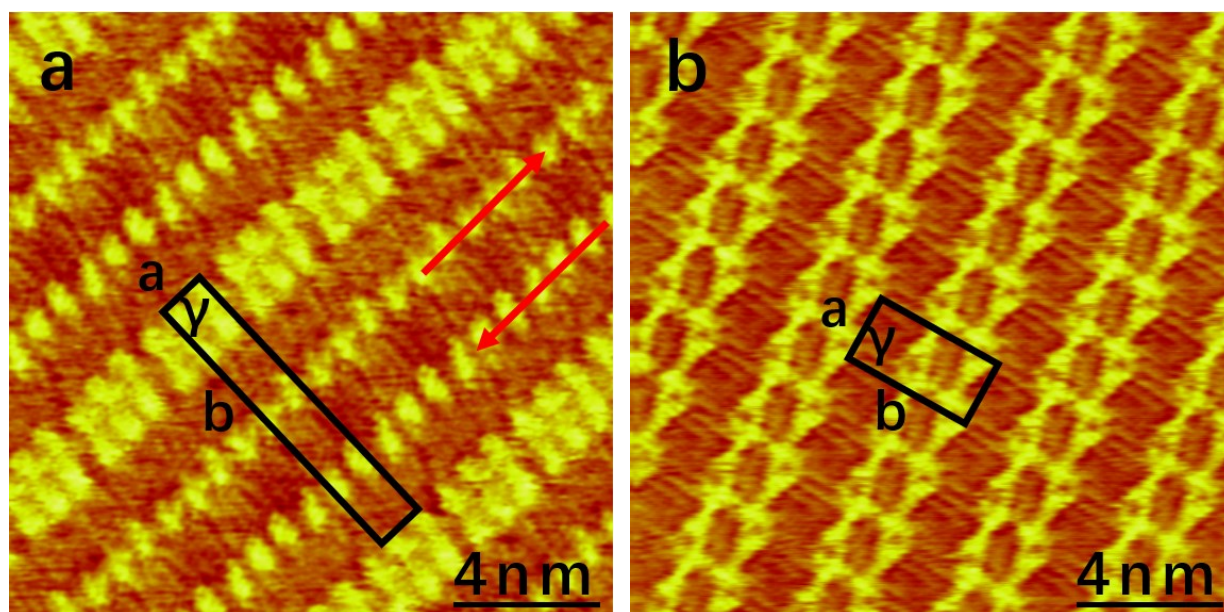
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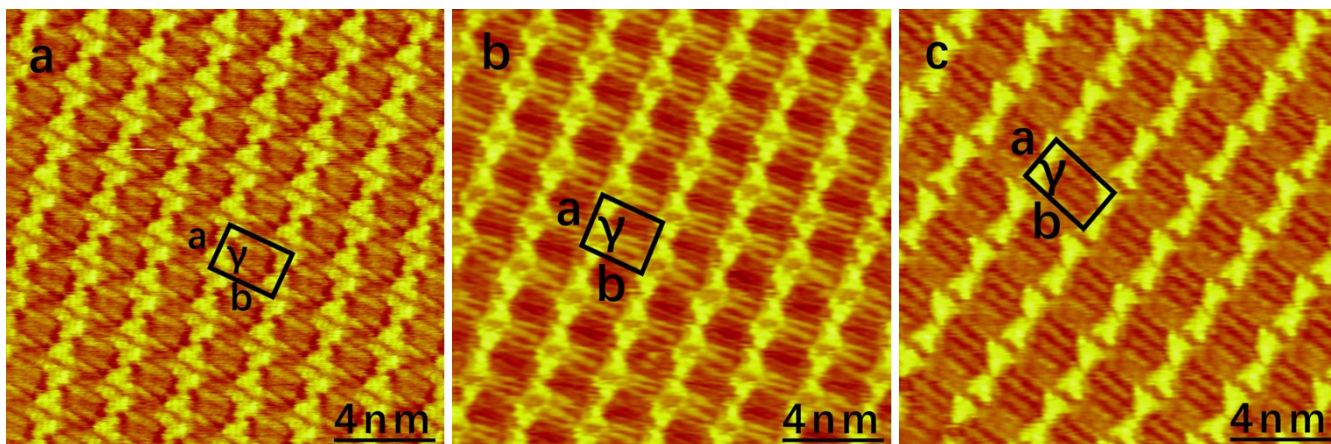
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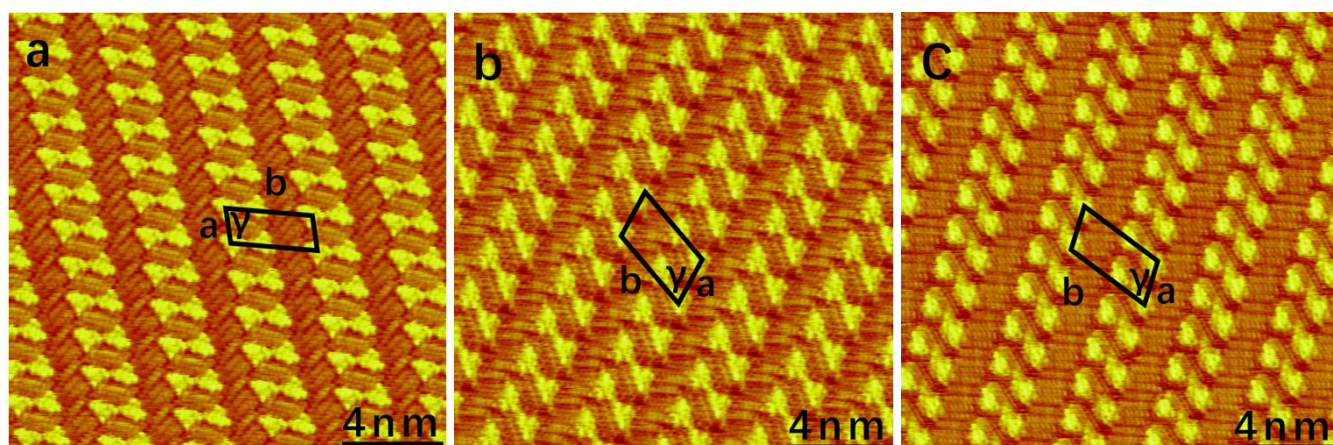
**Figure S1.** High-resolution STM images showing the self-assembled adlayers of (a) 6,9-DBTD-C14 and (b) 5,10-DBTD-C14 at the 1-phenyloctane/graphite interface.  $I_t = 500$  pA,  $V_b = 600$  mV.



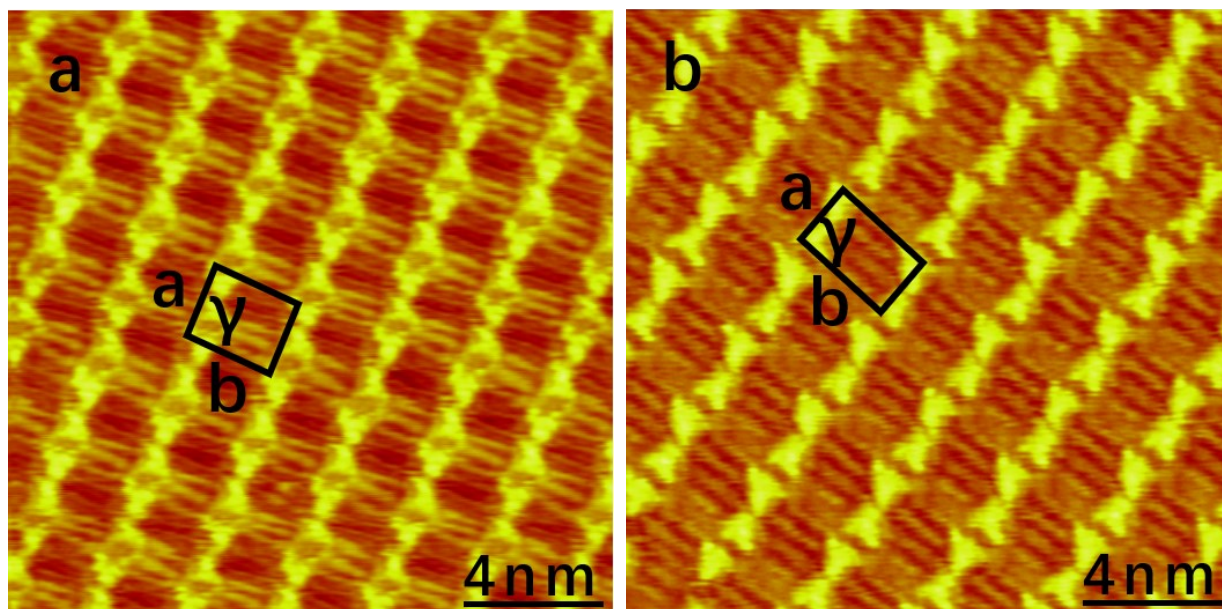
**Figure S2.** High-resolution STM images showing the self-assembled adlayers of (a) 6,9-DBTD-C14 and (b) 5,10-DBTD-C14 at the octanoic acid/graphite interface.  $I_t = 490$  pA,  $V_b = 610$  mV.



**Figure S3.** Typical high-resolution STM images showing the self-assembled adlayers of 6,9-DBTD-C14 at the (a) *n*-tetradecane/graphite interface, (b) *n*-pentadecane/graphite interface and (c) *n*-hexadecane/graphite interface.  $I_t = 488$  pA,  $V_b = 618$  mV.



**Figure S4.** Typical high-resolution STM images showing the self-assembled adlayers of 5,10-DBTD-C14 at the (a) *n*-tetradecane/graphite interface, (b) *n*-pentadecane/graphite interface and (c) *n*-hexadecane/graphite interface.  $I_t = 486$  pA,  $V_b = 616$  mV.



**Figure S5.** Typical high-resolution STM images showing the self-assembled adlayers of 6,9-DBTD-C14 at the (a) C15-Br/graphite interface and (b) C16-Br/graphite interface.  $I_t = 490$  pA,  $V_b = 614$  mV.