Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supplementary Information

Steric matching and concentration induced self-assembled structural variety of 2,7-bis(n-alkoxy)-9-fluorenone at the aliphatic solvent/graphite interface

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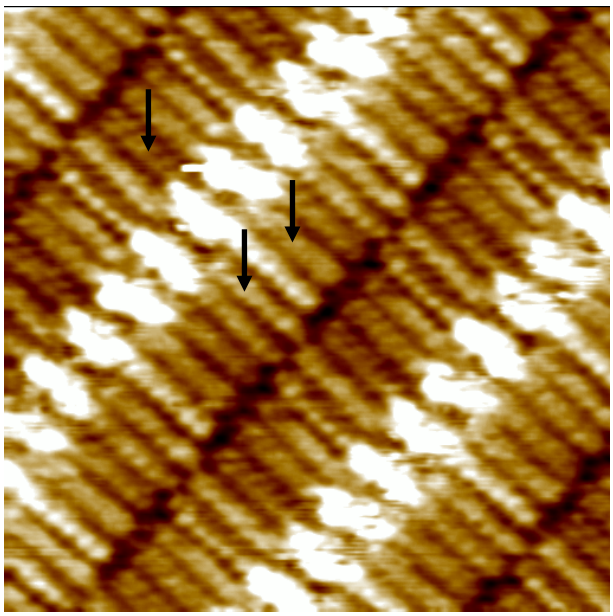


Figure S1. Higher-resolution STM image of F-OC_{14} self-assembled adlayer in tetradecane (1.3×10^{-6} mol L^{-1}) on HOPG surface showing the coadsorbed solvent as the black arrows indicated.

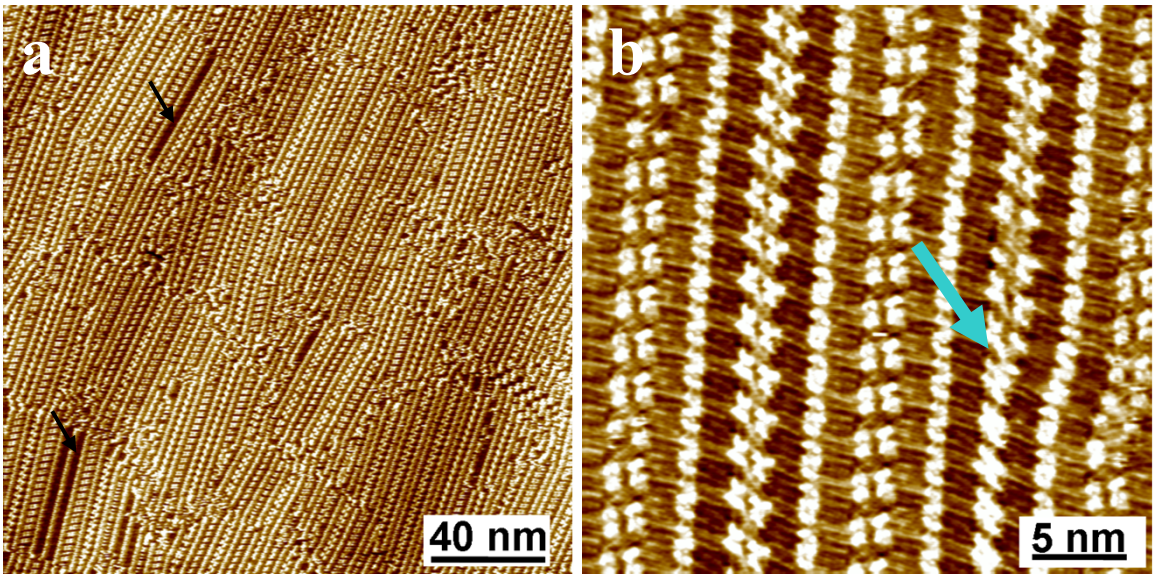


Figure S2. (a) Large-scale STM image of F-OC_{14} self-assembly in tetradecane (2.5×10^{-4} mol L^{-1}) on HOPG surface showing the whole area is covered by an alternate pattern. V_{bias} = 650 mV, I_t = 500 pA. (b) High-resolution STM image of F-OC_{14} self-assembly in tetradecane (1.5×10^{-4} mol L^{-1}) on HOPG surface showing the coexistence of two kinds of alternated patterns in one lamella indicated by a green arrow.

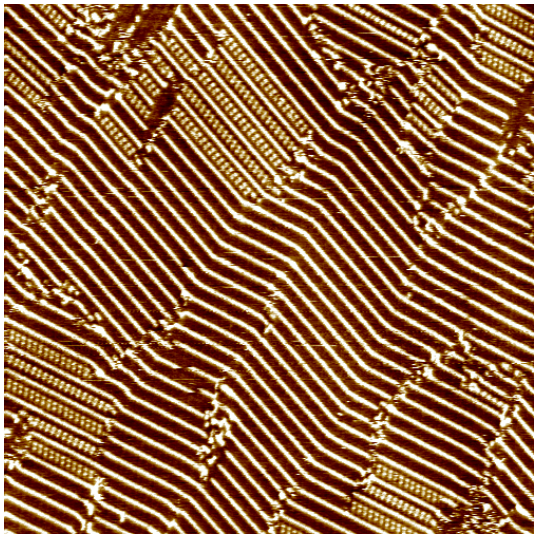


Figure S3. Large–scale STM image of F-OC14 self-assembly in tetradecane under a relative low concentration (2.5×10^{-6} mol L^{-1}) showing the coexistence of alternate pattern and coadsorbed structure. $V_{bias} = 620$ mV, $I_t = 515$ pA. Scan area: 197 nm × 197 nm.

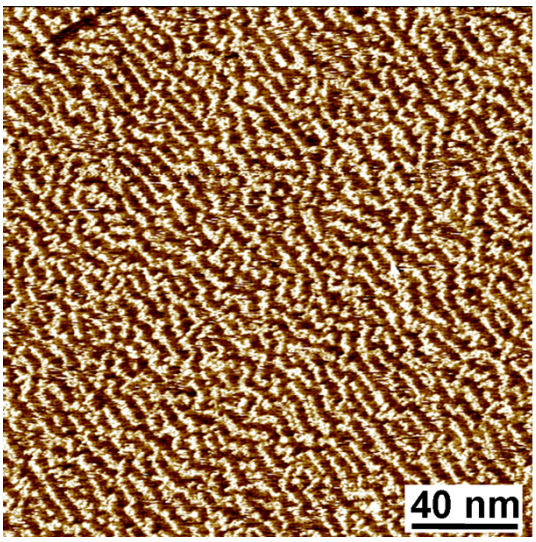


Figure S4. Large–scale STM image of F-OC14 self-assembly in tetradecane under a high concentration (7.5×10^{-4} mol L^{-1}). $V_{bias} = 640$ mV, $I_t = 520$ pA.

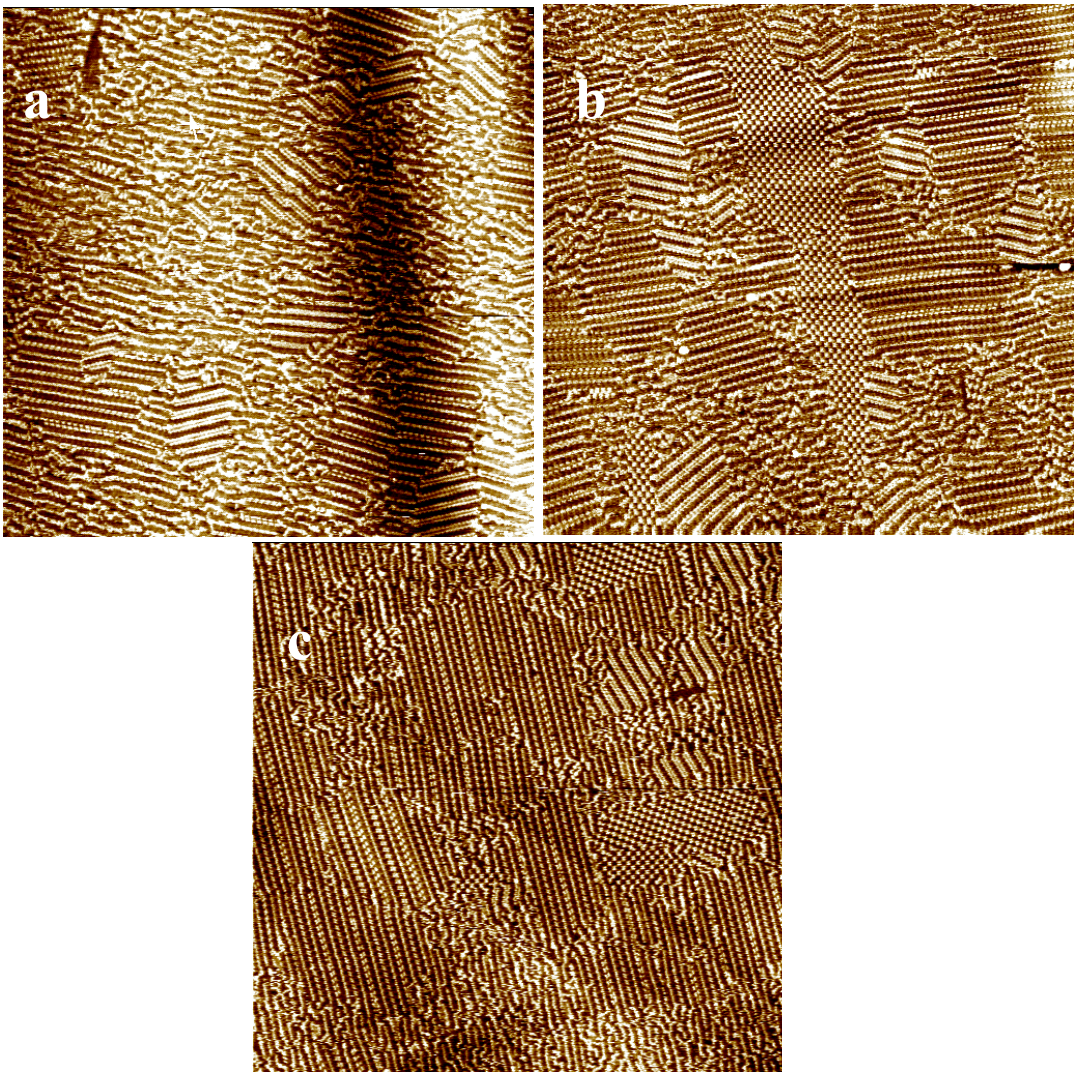


Figure S5. (a-c) Large-scale STM images obtained in different regions with the extension of the scanning time after the sample of F-OC_{14} was placed more than 5 hours. Scan area: 200 nm × 200 nm.

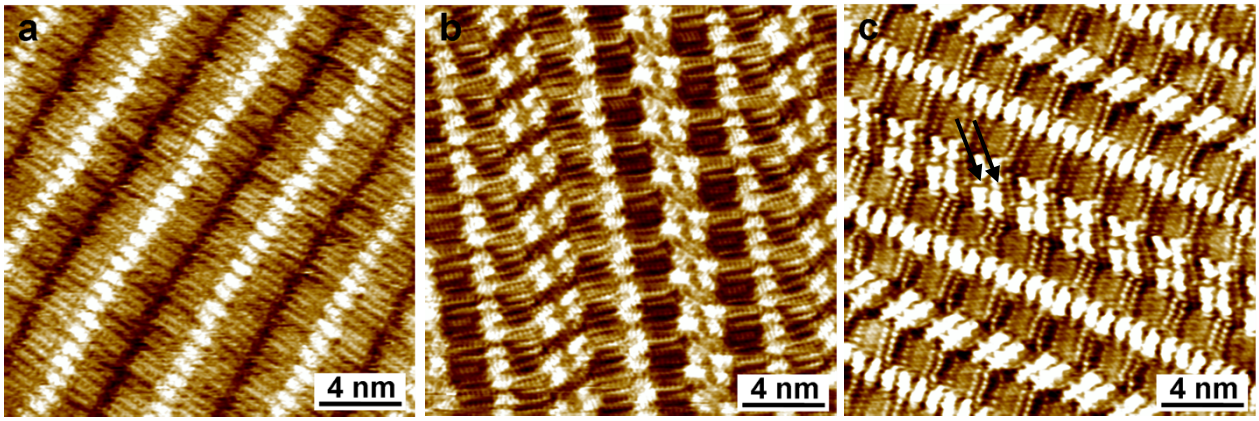


Figure S6. (a) STM image of F-OC_{14} self-assembly in tridecane (1.5×10^{-6} mol L^{-1}) on HOPG surface. (b, c) STM images of F-OC_{14} self-assembly in tridecane (3.5×10^{-4} mol L^{-1}) on HOPG surface. V_{bias} = 640 mV, I_t = 510 pA.

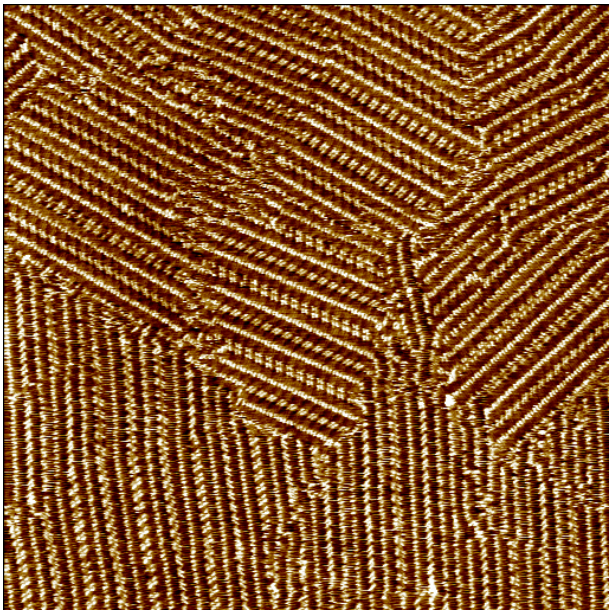


Figure S7. A typical STM image of the F-OC_{14} self-assembled monolayer in tridecane on HOPG surface after the sample was placed more than 12 hours. V_{bias} = 600 mV, I_t = 530 pA. Scan area: 132 nm × 132 nm.

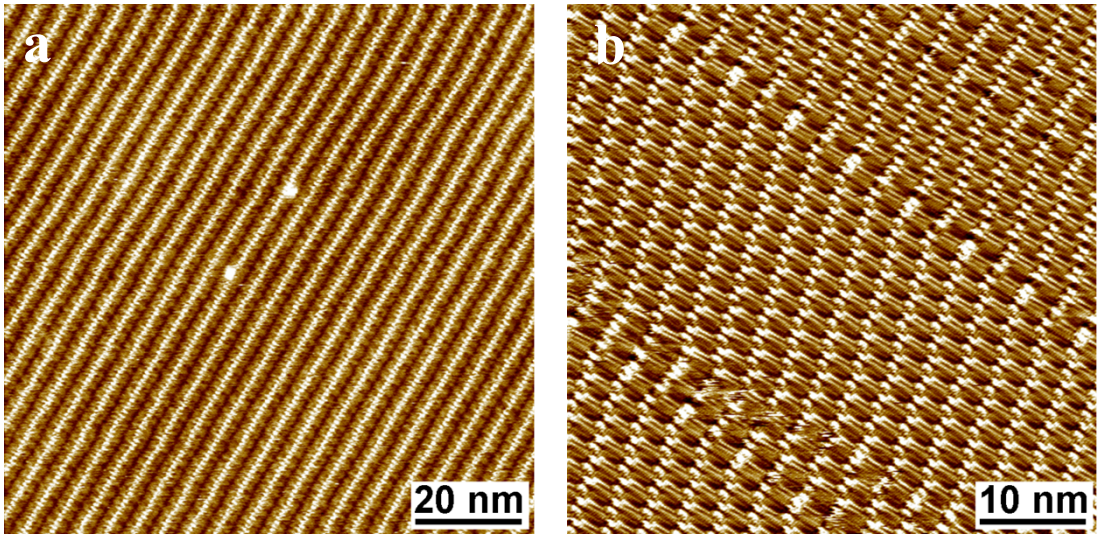


Figure S8. (a) STM image of F-OC_{12} self-assembly in tetradecane at a low concentration (1.5×10^{-6} mol L^{-1}) on HOPG surface. (b) STM image of F-OC_{12} self-assembly in tetradecane on HOPG surface after the sample was placed more than 5 hours. V_{bias} = 640 mV, I_t = 550 pA.

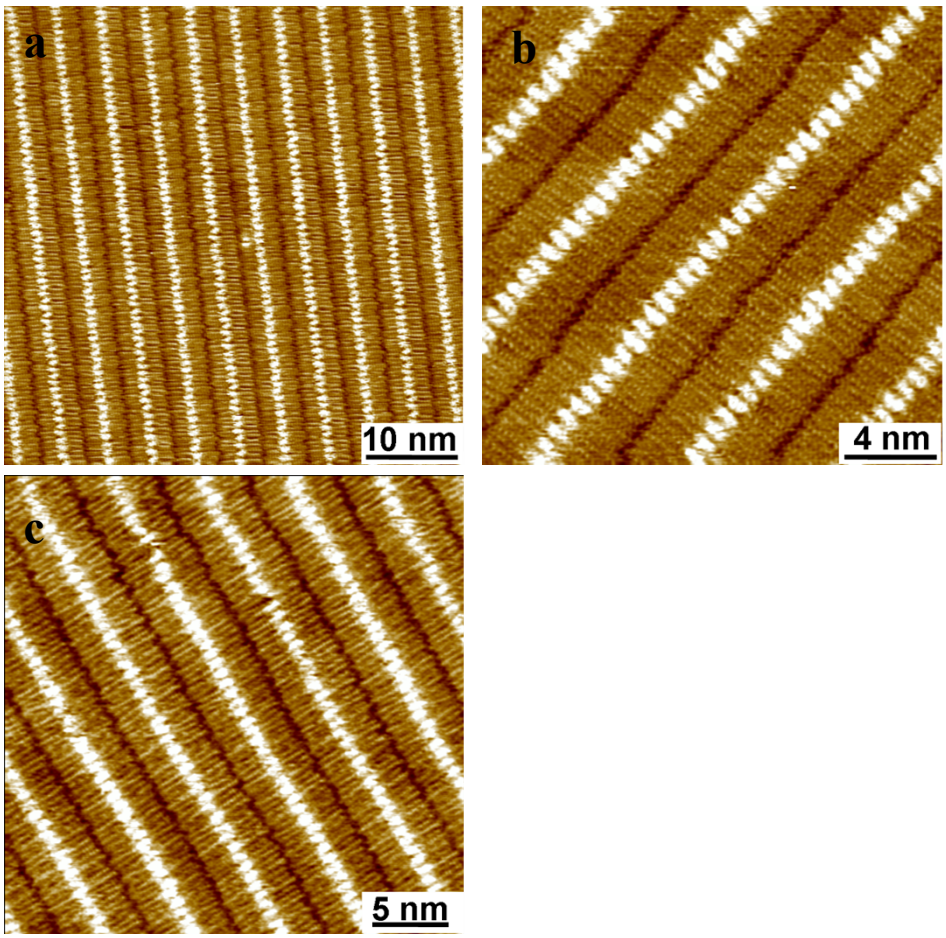


Figure S9. (a) STM image of F-OC_{15} self-assembled monolayer in tridecane (1.5×10^{-6} mol L^{-1}) on HOPG surface. (b) STM image of F-OC_{15} self-assembled monolayer in tetradecane (1.5×10^{-6} mol L^{-1}) on HOPG surface. (c) STM image of F-OC_{16} self-assembled monolayer in tetradecane (1.5×10^{-6} mol L^{-1}).

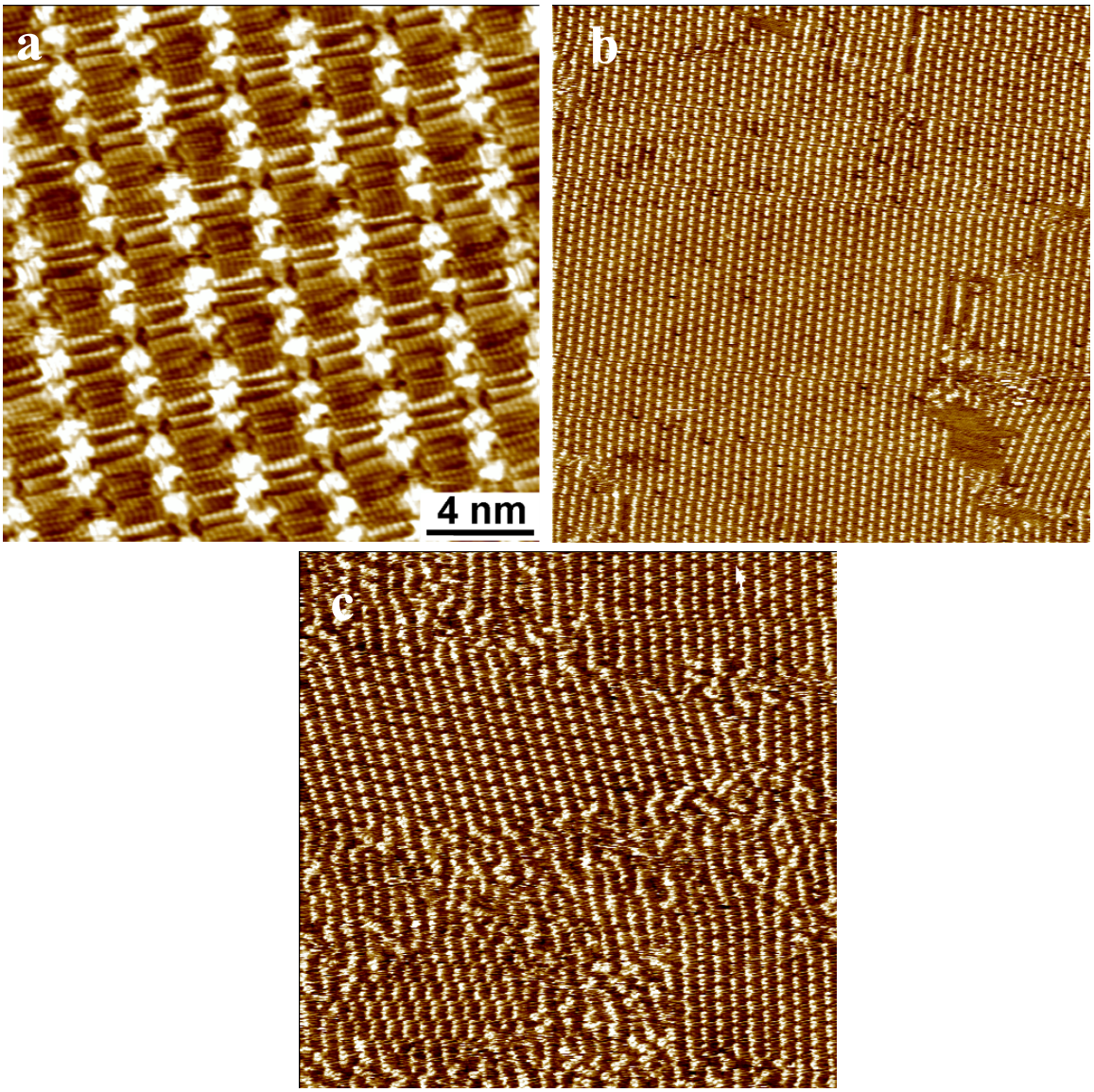


Figure S10. (a) STM image of F-OC_{15} self-assembled monolayer in tetradecane (1.0×10^{-4} mol L^{-1}) on HOPG surface after the sample was placed more than 3 hours. (b) STM image of F-OC_{15} in tridecane under a high concentration (2.0×10^{-4} mol L^{-1}). Scan area: 150 nm × 150 nm. (c) STM image of F-OC_{15} in tetradecane under a high concentration (2.0×10^{-4} mol L^{-1}). Scan area: 100 nm × 100 nm.

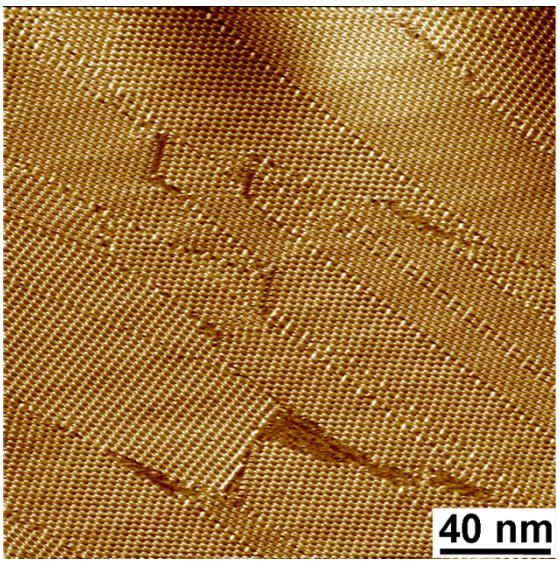


Figure S11. STM image of F-OC_{16} self-assembled monolayer in tetradecane (1×10^{-6} M) on HOPG surface.

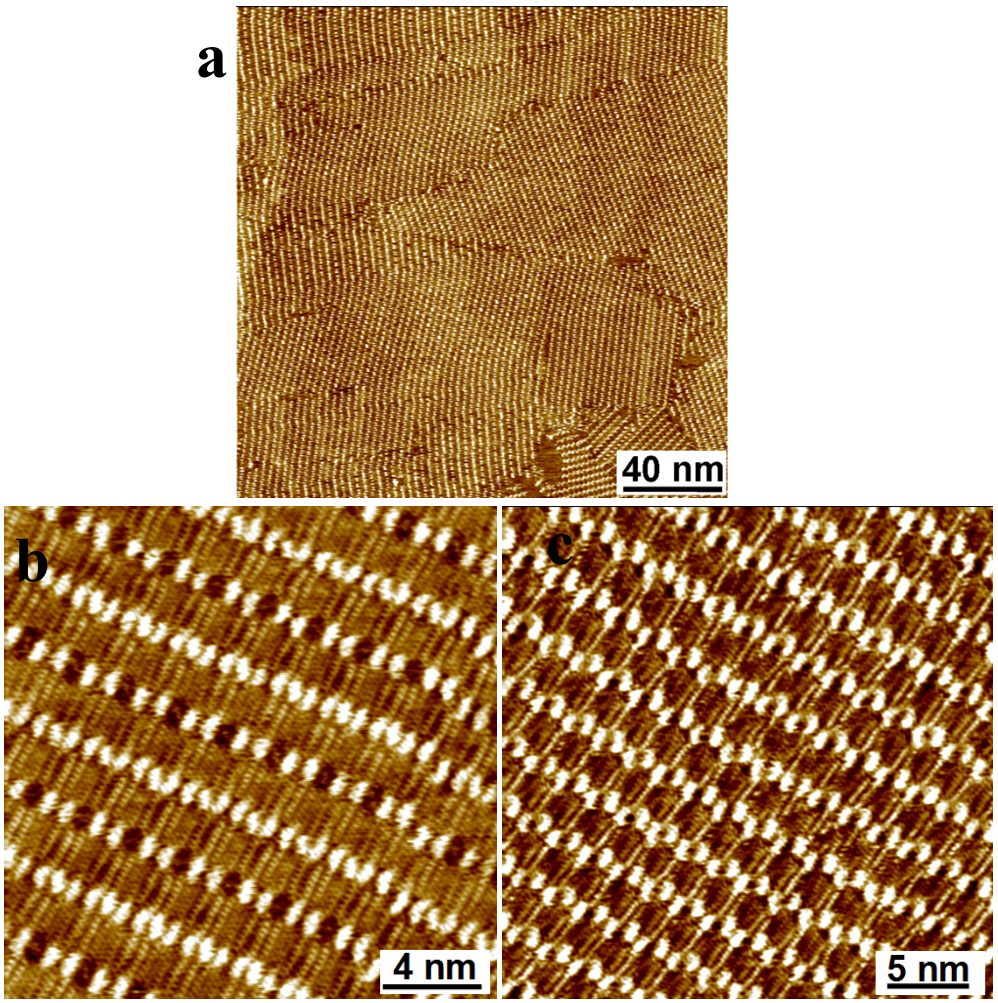
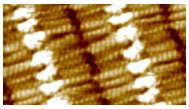
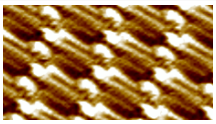
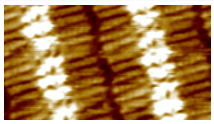
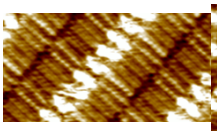
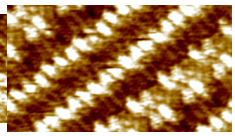
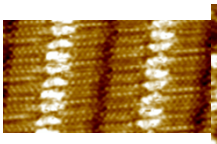
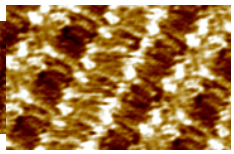
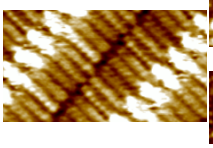
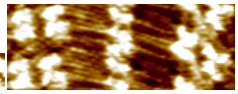
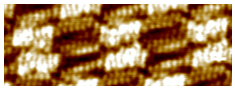
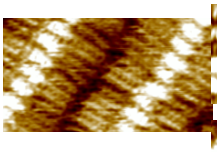
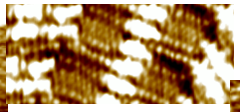
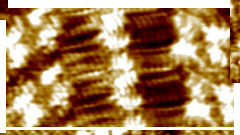
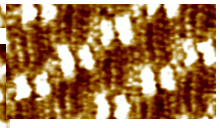
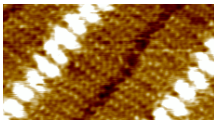
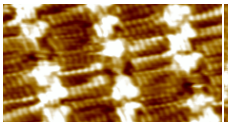
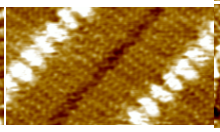
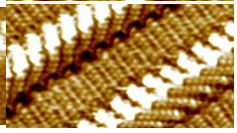
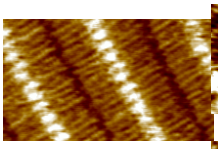
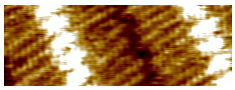
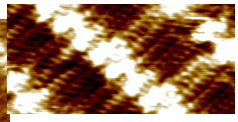
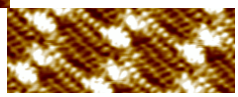
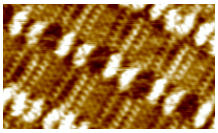
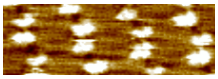
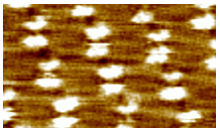


Figure S12. (a) Large-scale STM image of F-OC_{16} self-assembled monolayer in tridecane (1.5×10^{-6} M) on HOPG surface. (b) High-resolution STM image of F-OC_{16} showing the packing details of alternate pattern. (c) High-resolution STM image of F-OC_{16} showing the packing details of zigzag pattern.

Table S1. Schematic Representation of all Phases Observed in 2D Assembly of F−OC_n at Tetradecane and Tridecane/HOPG Interfaces under Different Concentrations

n	Self-assembled structures in tetradecane/concentration			Self-assembled structures in tridecane/ concentration		
	<10^{-6} mol L^{-1}	10^{-5} mol L^{-1}	>10^{-4} mol L^{-1} ~saturated	<10^{-6} mol L^{-1}	10^{-5} mol L^{-1}	>10^{-4} mol L^{-1} ~saturated
12		—			—	—
13						
14		  	—		  	
15		—				—
16		  	—	 		
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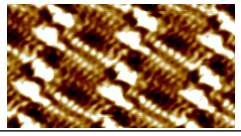
18	—	—		—	—	—

The self-assembled models of F-OC_{13} were represented according to reference 21.