Electronic Supplementary Material (ESI) for Nanoscale.

Supplementary Information

Concentration-dependent structure and structural transition from chirality to nonchirality at the liquid-solid interface by coassembly

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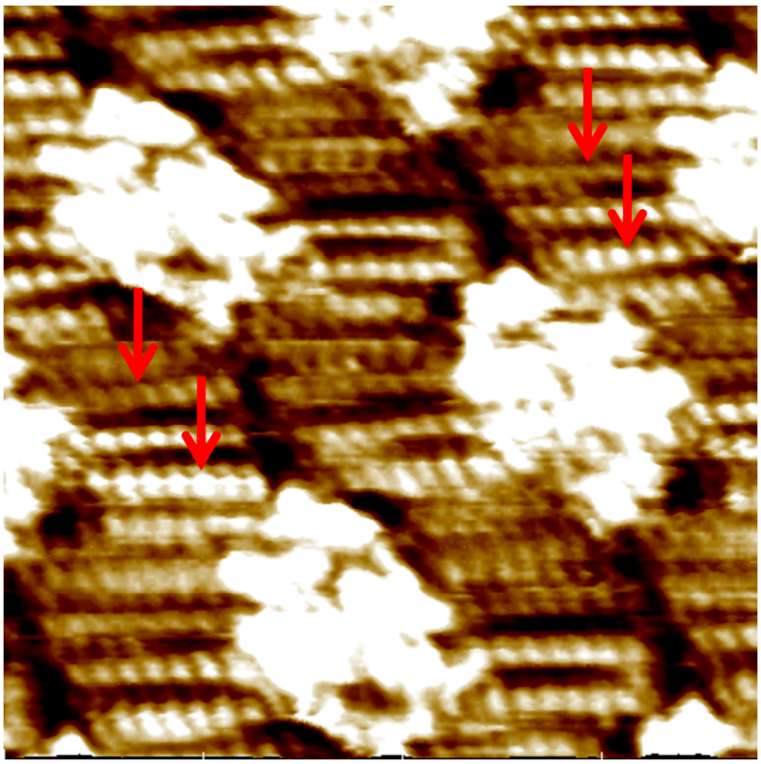

Fig. S1 Higher-resolution STM image of hexamer pattern of HPF self-assembled adlayer in hexadecane (5.5×10^{-7} mol L^{-1}) on HOPG surface, in which the coadsorbed solvents are indicated by the red arrows. Scan area: 10×10 nm^2.

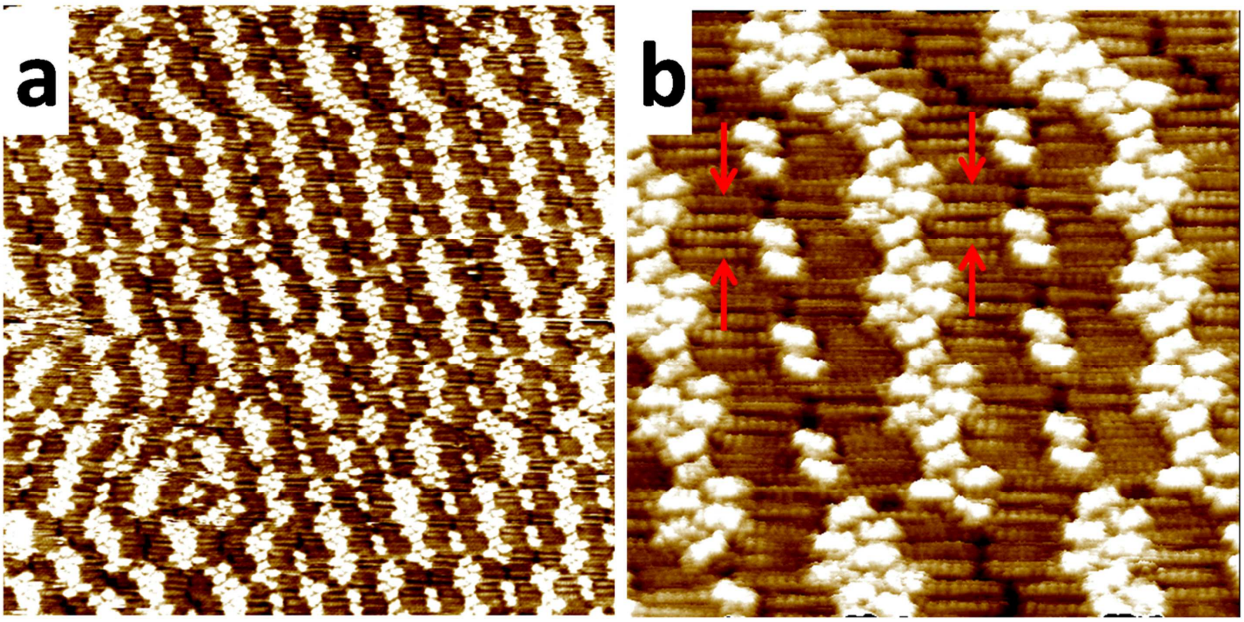

Fig. S2 (a) Large-scale STM image of HPF self-assembly in hexadecane on HOPG surface showing the domain size for the alternate pattern is relatively small. Scan area: 50 × 50 nm^2; (b) High-resolution STM image of alternate pattern of HPF self-assembled adlayer in hexadecane (1.2 × 10^{-6} mol L^{-1}) on HOPG surface, in which the coadsorbed solvents are indicated by the red arrows. Scan area: 15 × 15 nm^2.

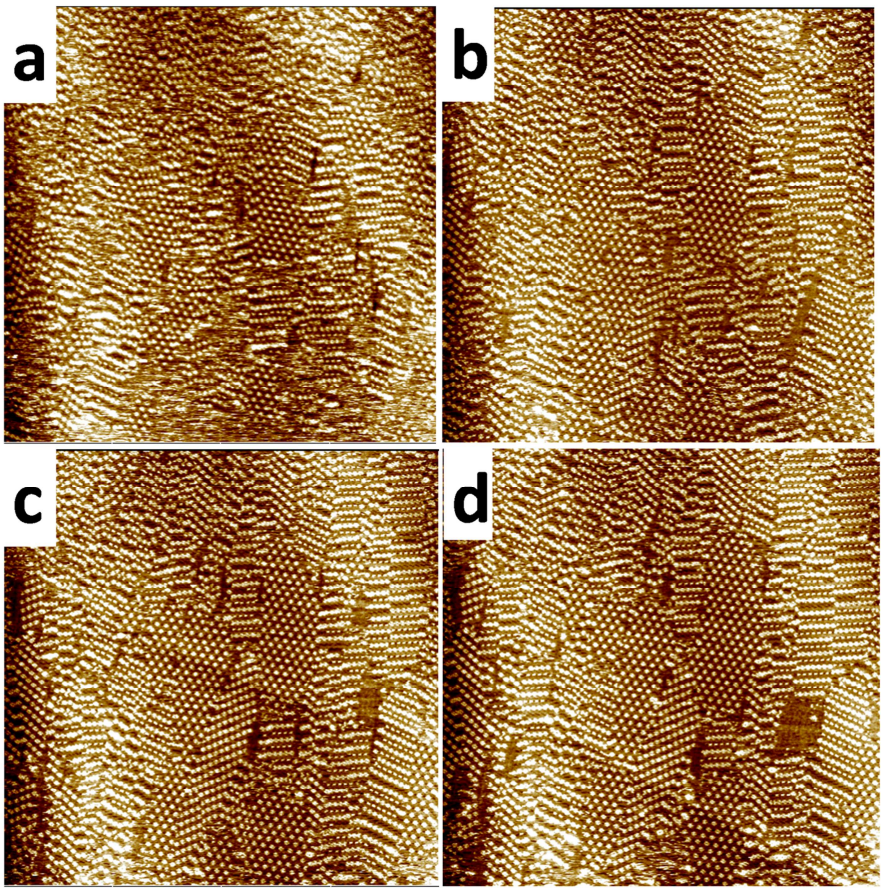

Fig. S3 (a-d) Large-scale STM images obtain in same regions with the extension from scan to next. Scan area: 200 × 200nm^2.

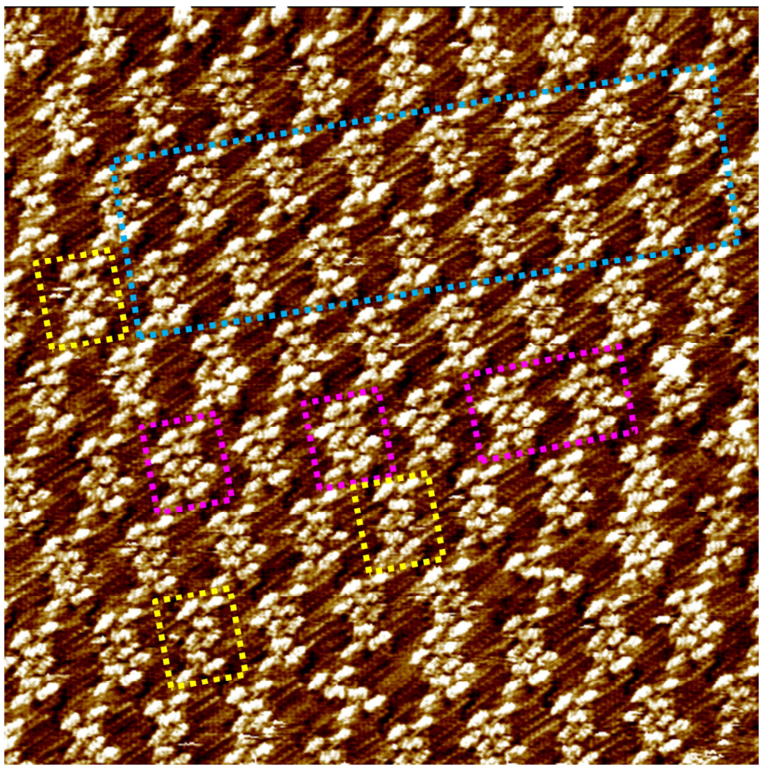

Fig. S4 STM image of HPF self-assembly in hexadecane (5×10^{-5} mol L-1) showing the multimer structure with three elementary structural units (8-, 9-, and 10-fold rings) composed. The yellow, blue, and pink dashed rectangles indicate the three kinds of multimer structures. No more than three continuous octamer or decamer are observed in the STM images. Tunneling parameters: I_t = 485 pA, V_b = 665 mV. Scan area: 30 × 30 nm^2.

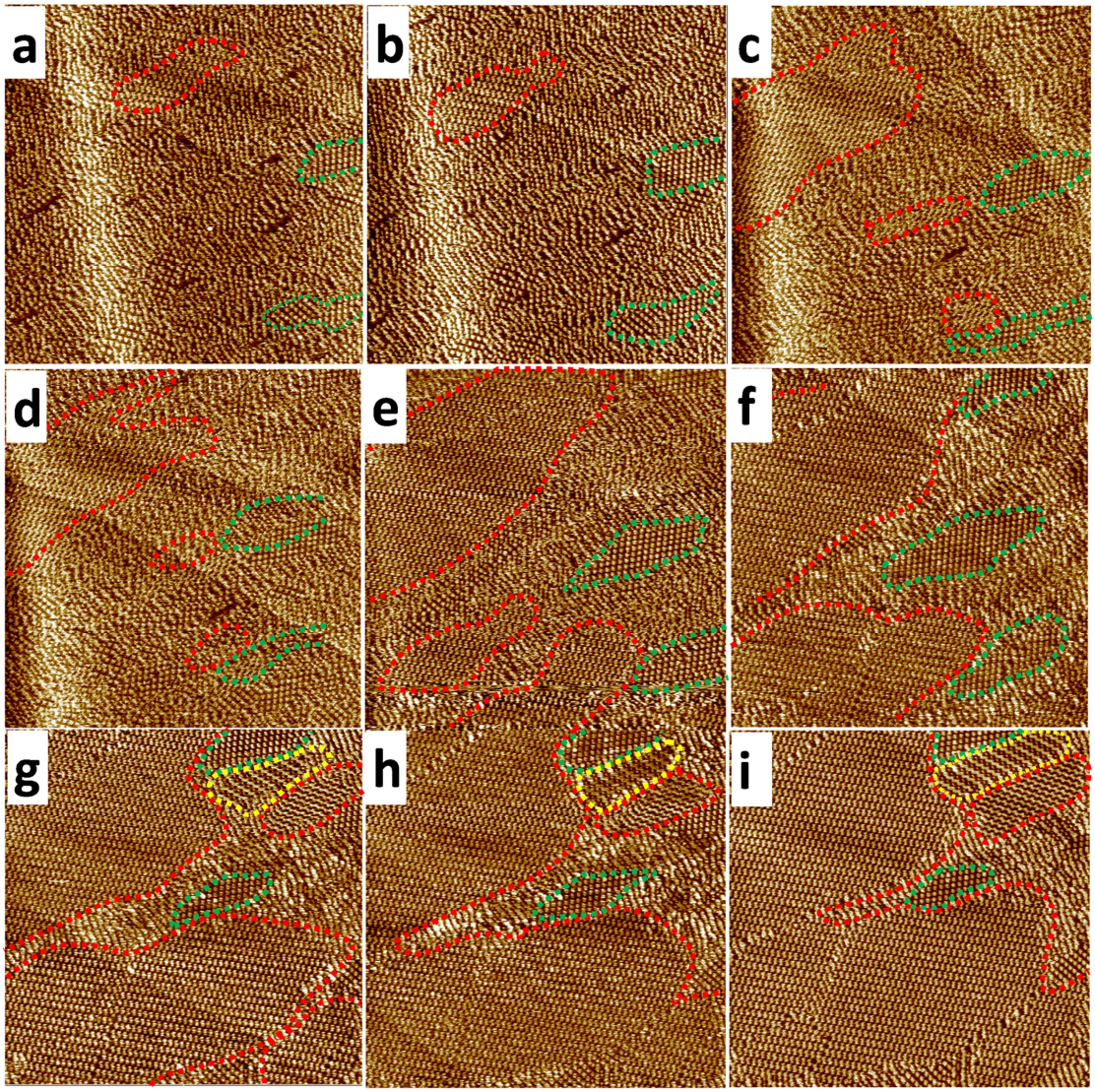

Fig. S5 Large-scale STM images reveal that three well-organized chiral structures gradually transform into nonchiral multimer structure in hexadecane by consecutive scanning for more than three hours. Tunneling parameters: I_t = 545 pA, V_b = 755 mV. Scan area: 200 × 200 nm^2.

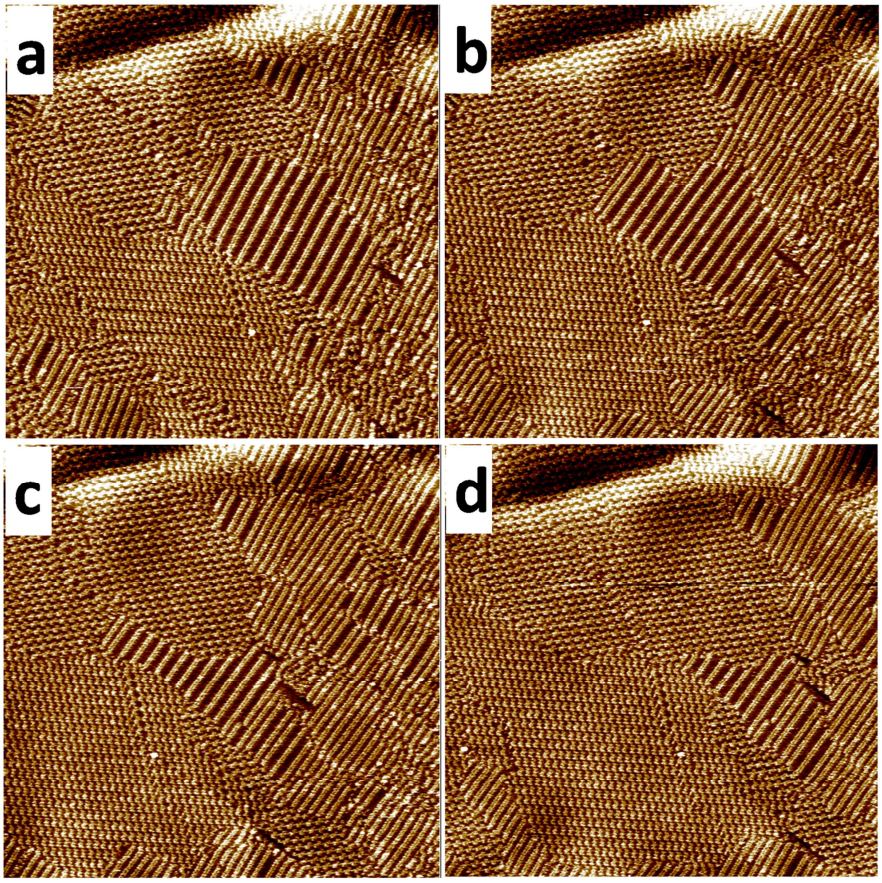

Fig. S6 Large-scale STM images show that the linear pattern gradually transforms into the multimer structures with the extension of scanning time in pentadecane. Tunneling parameters: I_t = 443 pA, V_b = 646 mV. Scan area: 200 × 200 nm^2.

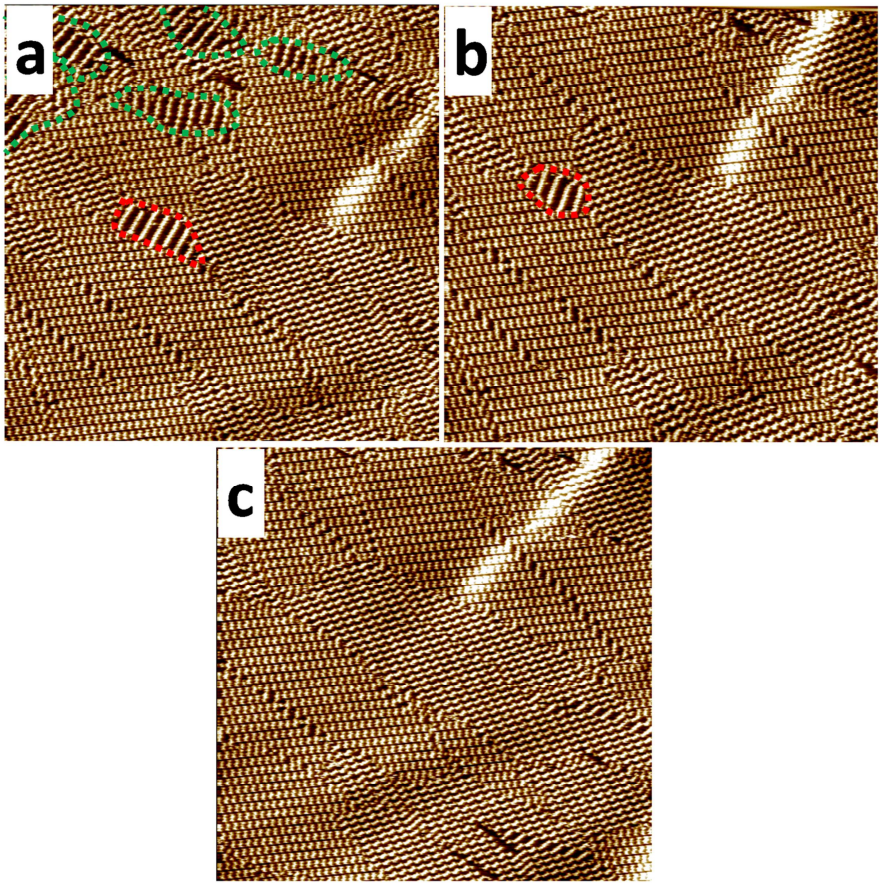

Fig. S7 Large-scale STM images show that the homochiral close-packed hexamer and linear patterns transform into the multimer structure step by step by continuous scanning in pentadecane. Tunneling parameters: I_t = 568 pA, V_b = 723 mV. Scan area: 200 × 200 nm^2.

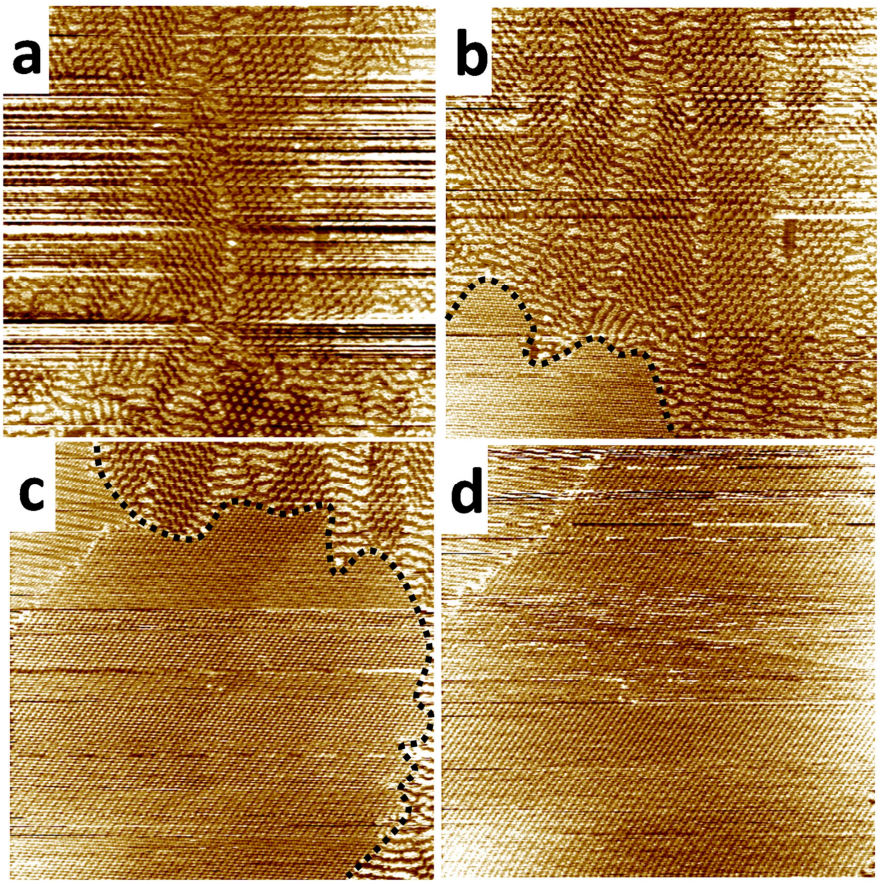

Fig. S8 Large-scale STM images show that the multimer pattern can gradually transform into the zigzag pattern with the extension of scanning time in tetradecane. Tunneling parameters: I_t = 529 pA, V_b = 705 mV. Scan area: 200 × 200 nm^2.

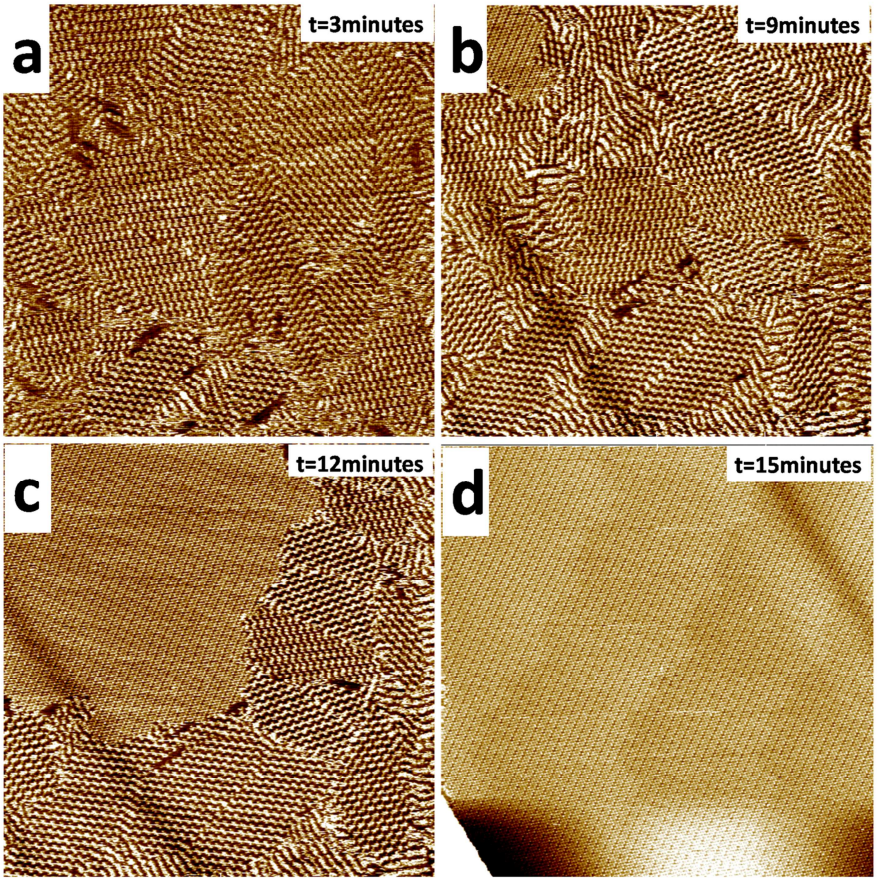

Fig. S9 Large-scale STM images show that the multimer pattern can change into zigzag pattern in no time in tridecane. Tunneling parameters: I_t = 466 pA, V_b = 574 mV. Scan area: 200 × 200 nm^2.

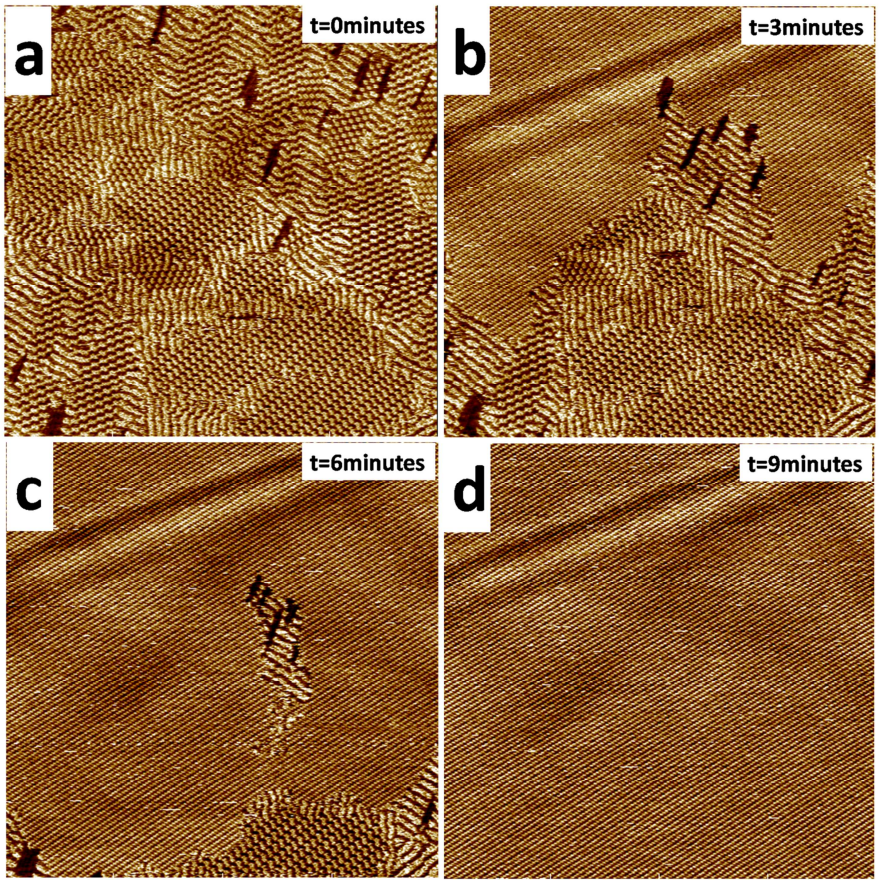

Fig. S10 Large-scale STM images show that the close-packed hexamer and multimer patterns can convert into the zigzag pattern in high-speed in dodecane. Tunneling parameters: I_t = 485pA, V_b = 717 mV. Scan area: 200 × 200 nm^2.

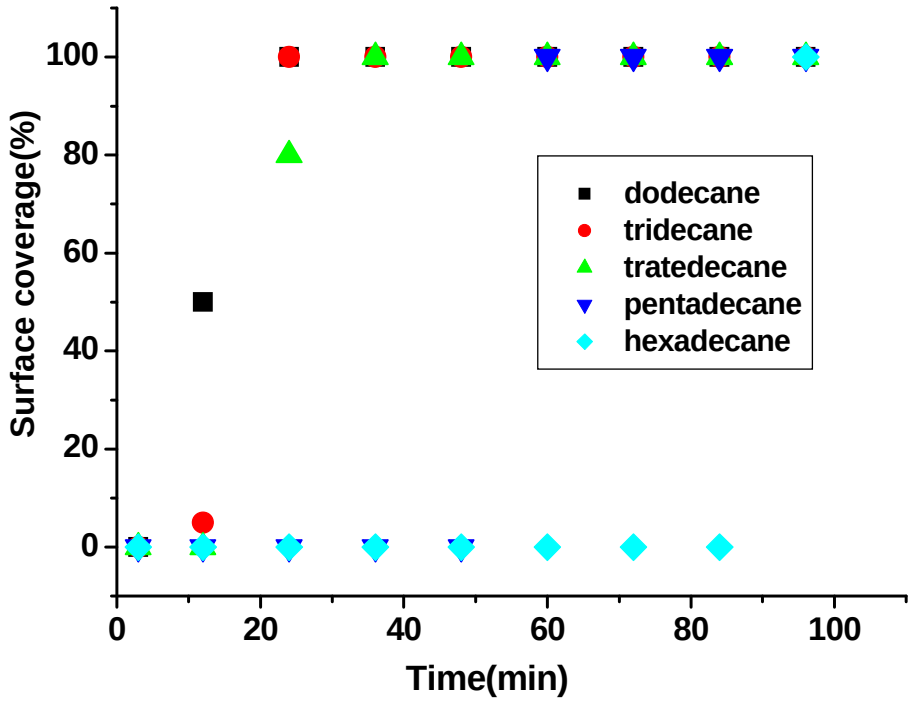

Fig. S11 Time-dependent induction of structure transformation from the inception stages of assembly to the zigzag pattern in different solvents. The colors of symbols represent the different solvents.

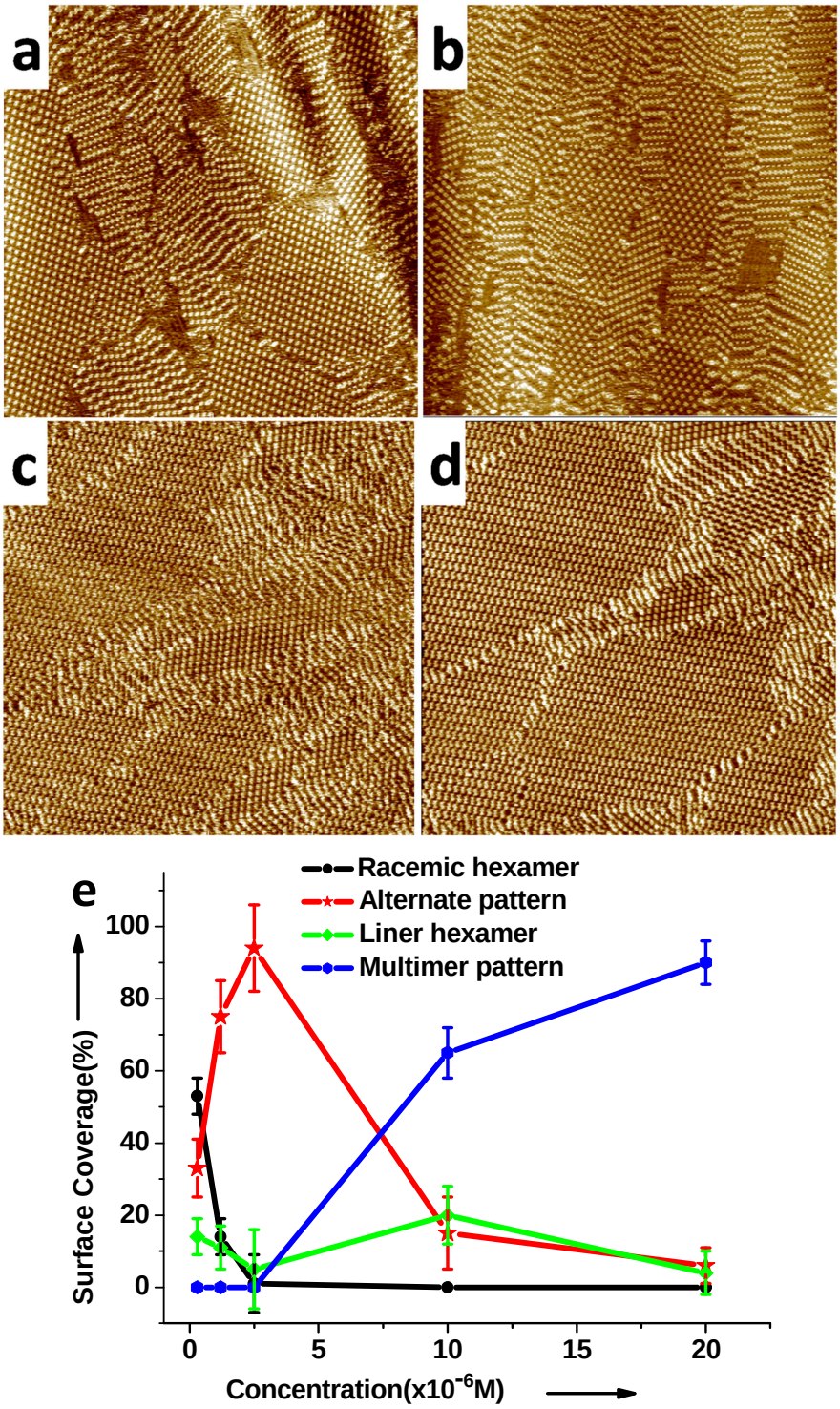

Fig. S12 Representative large-scale STM images of HPF self-assembled patterns under different concentrations at the hexadecane/graphite interface. (a) 3.0×10^{-7} mol L^{-1}; (b) 1.2×10^{-6} mol L^{-1}; (c) 1.0×10^{-5} mol L^{-1}; (d) 2.0×10^{-5} mol L^{-1}. Ambient temperature is about 22–24ºC. Tunneling parameters: I_t = 450–550 pA, V_b = 550–700 mV. Scan area: 200 × 200 nm^2; (e) Concentration-dependent surface coverage of the different structures of HPF at the hexadecane/ graphite interface. The colors of symbols represent the different patterns of HPF in the drop-casting solution.

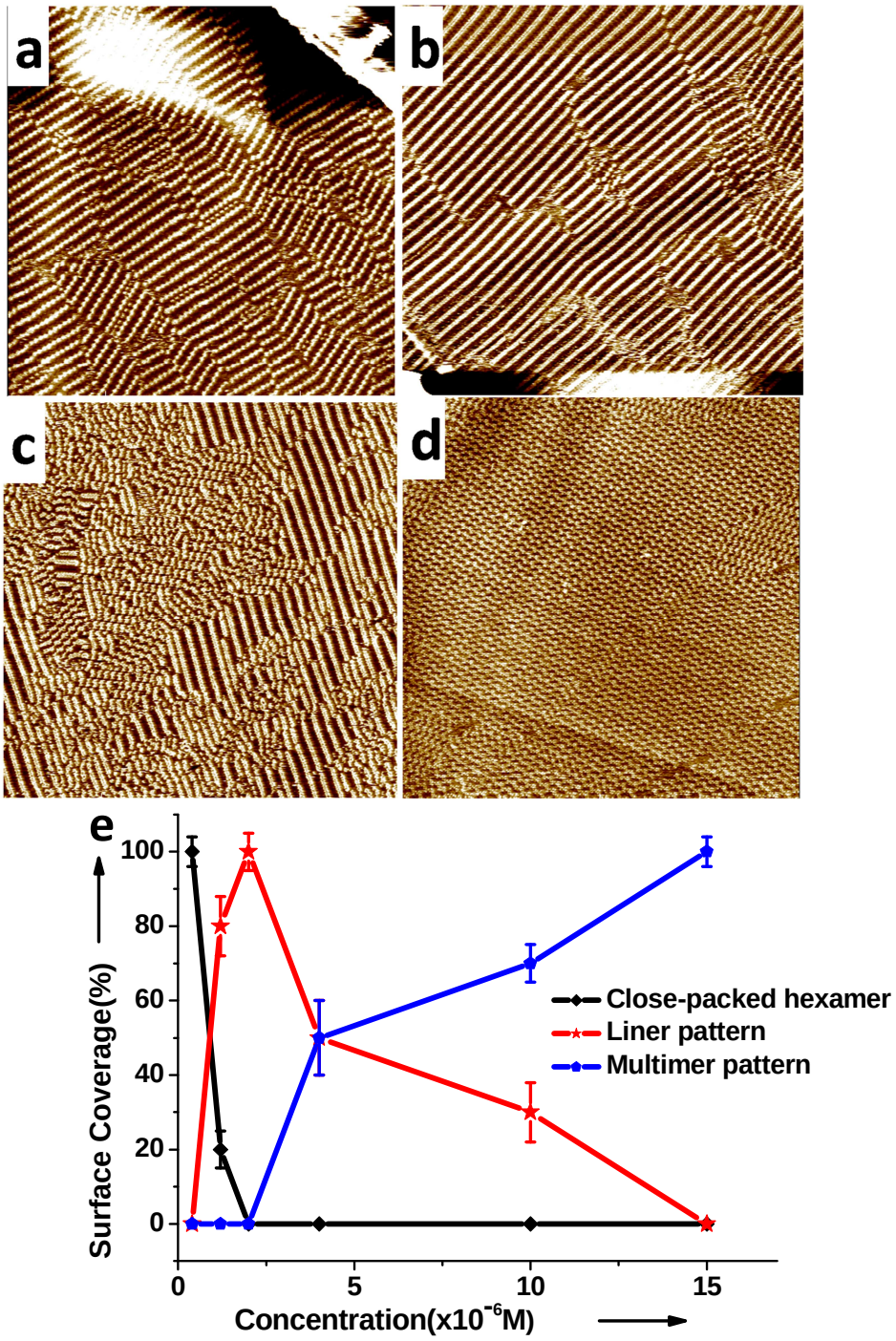

Fig. S13 Representative large-scale STM images of HPF self-assembled patterns under different concentrations at the pentadecane/graphite interface. (a) 4.0×10^{-7} mol L^{-1}; (b) 1.2×10^{-6} mol L^{-1}; (c) 4.0×10^{-6} mol L^{-1}; (d) 1.5×10^{-5} mol L^{-1}. Ambient temperature is about 22–24ºC. Tunneling parameters: I_t = 450–550 pA, V_b = 550–700 mV. Scan area: 200 × 200 nm^2; (e) Concentration-dependent surface coverage of the different structures of HPF at the pentadecane/graphite interface. The colors of symbols represent the different patterns of HPF in the drop-casting solution.

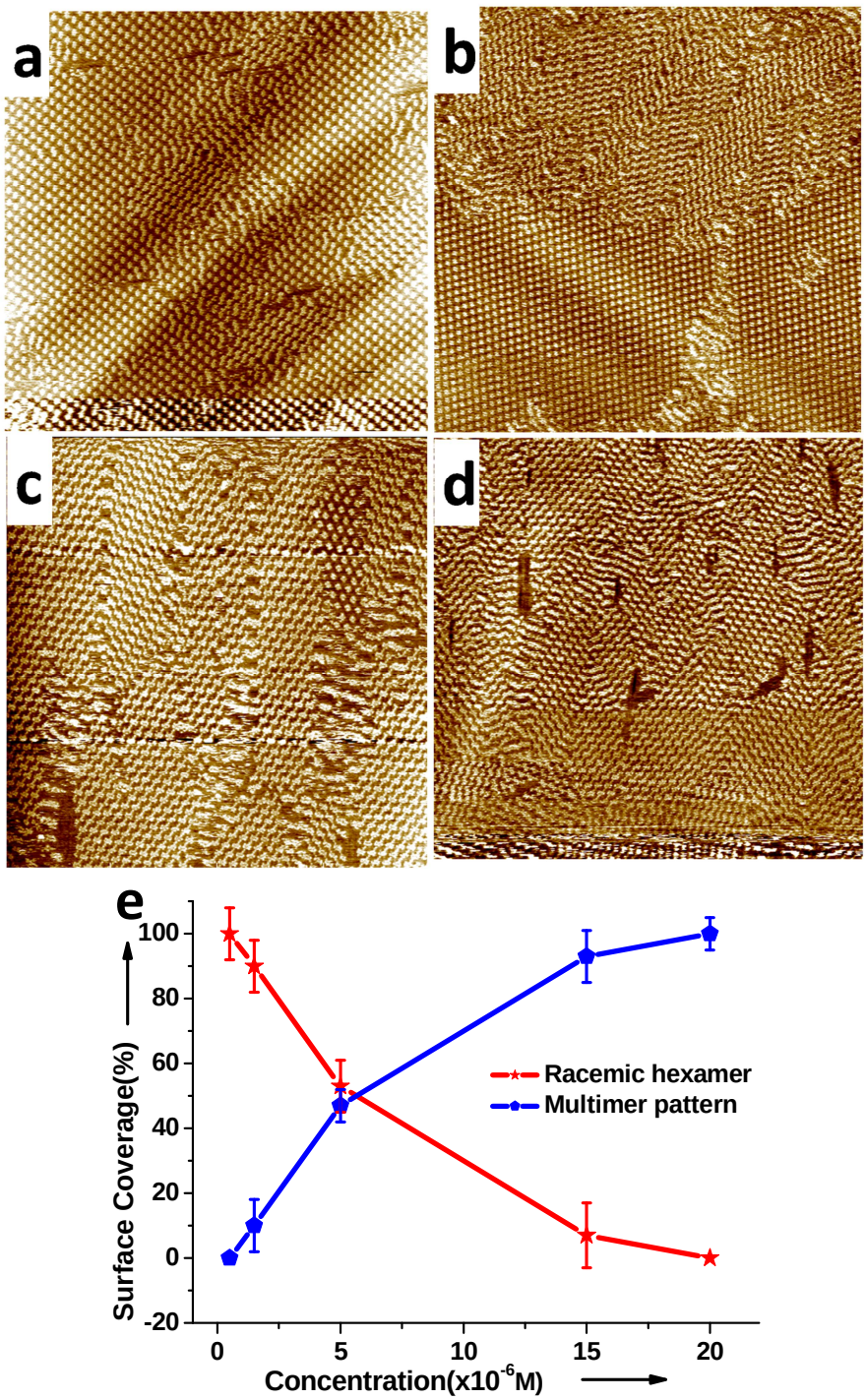

Fig. S14 Representative large-scale STM images of HPF self-assembled patterns under different concentrations at the tatredecane/graphite interface. (a) 5.0× 10^{-7} mol L^{-1}; (b) 5.0 × 10^{-6} mol L^{-1}; (c) 1.5 × 10^{-5} mol L^{-1}; (d) 2.0 × 10^{-5} mol L^{-1}. Ambient temperature is about 22–24ºC. Tunneling parameters: I_t = 450–550 pA, V_b = 550–700 mV. Scan area: 200 × 200 nm^2; (e) Concentration-dependent surface coverage of the different structures of HPF at the tatredecane /graphite interface. The colors of symbols represent the different patterns of HPF in the drop-casting solution.