

## Supporting Information Available

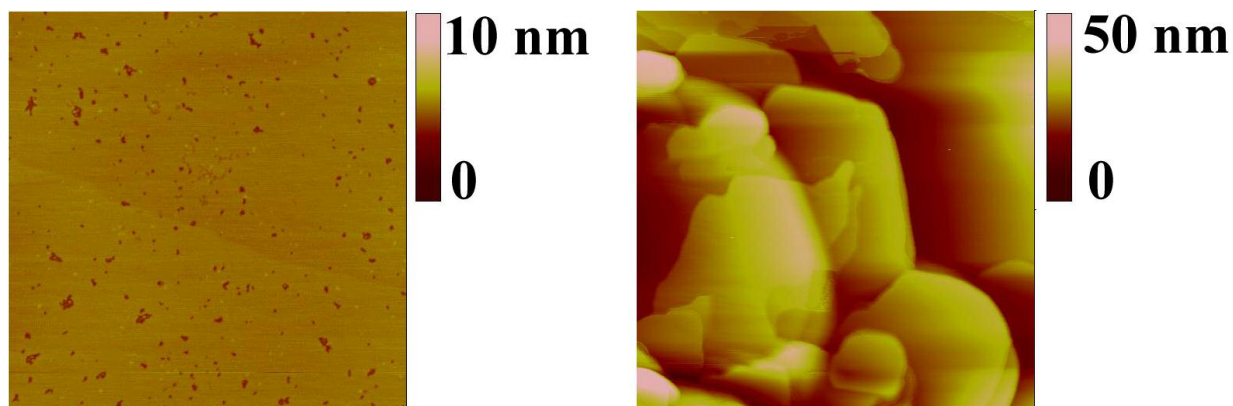
### Nanofiber and Nanospiral Fabricated through the Interfacial Organization of Partially Fluorinated Compound

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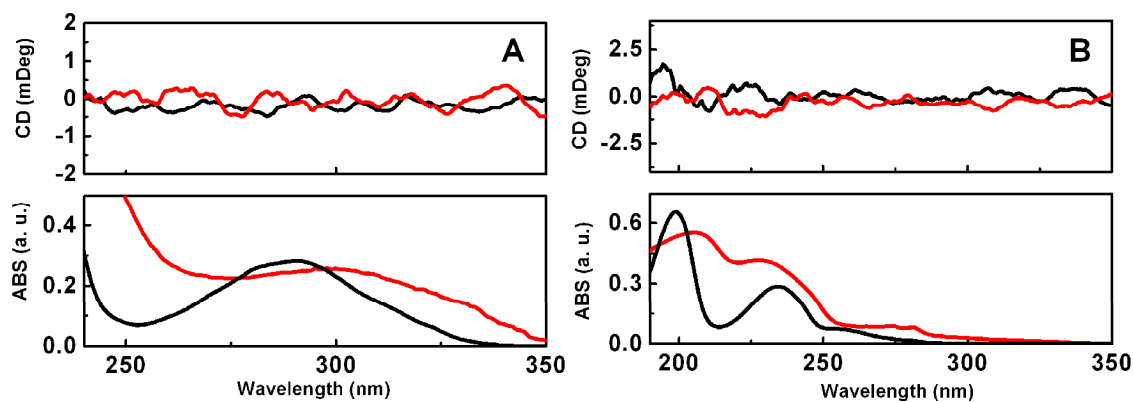
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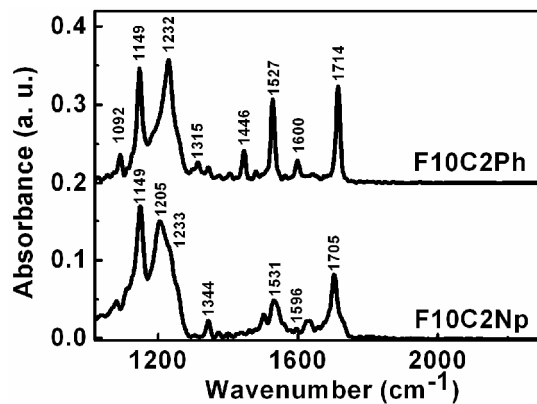
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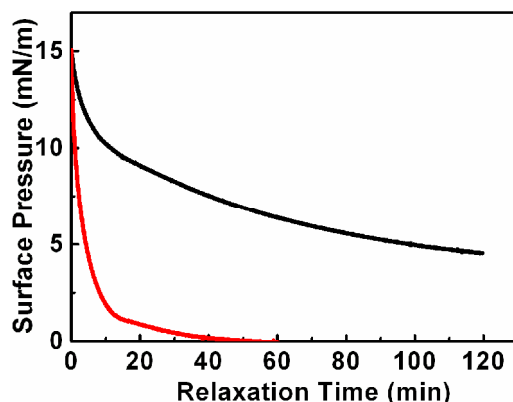
**Figure S1.** AFM images of the cast films of F10C2Np (left) and F10C2Ph (right) on freshly cleaved mica surface. Image size:  $2 \times 2 \mu\text{m}$  for both the cases.



**Figure S2.** A: bottom: UV-vis spectra of F10C2Np in acetonitrile solution (black) and in a cast film (red) formulated on hydrophobic quartz substrates; Top: the corresponding CD spectra of F10C2Np in acetonitrile solution (black) and in a cast film (red). B: those of F10C2Ph.



**Figure S3.** FT-IR spectra of the cast films of F10C2Ph and F10C2Np formulated on single face polished hydrophobic silicon substrates.

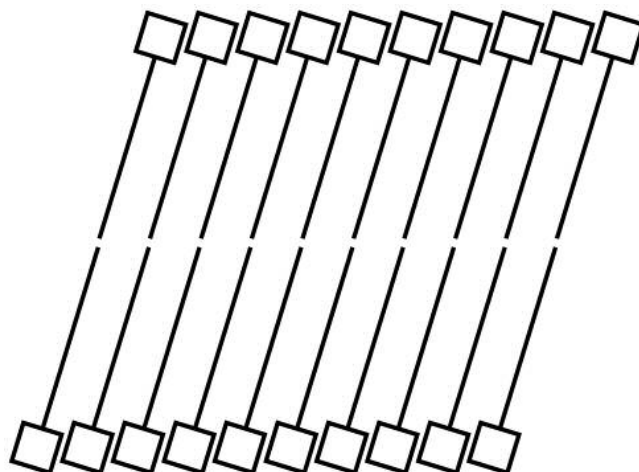


**Figure S4.** Relaxation of surface pressure of the floating films of F10C2Np (black) and F10C2Ph (red) as a function of time ( $\pi$ -t) performed at a surface pressure of 15 mN/m.

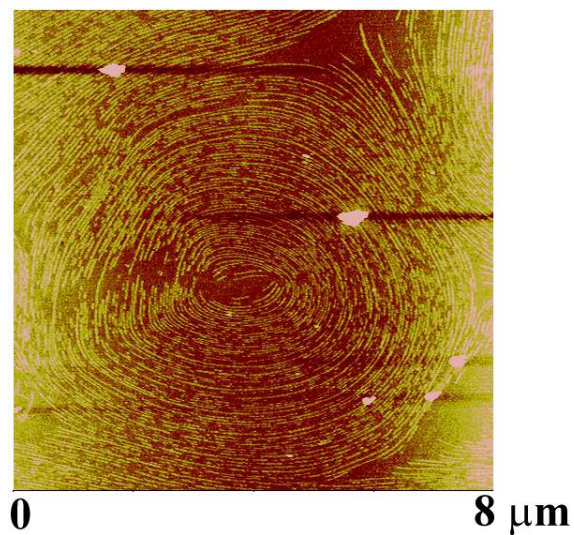


**Figure S5.** A schematic illustration of J-aggregate. The inclined bar represents the plane of chromophore.

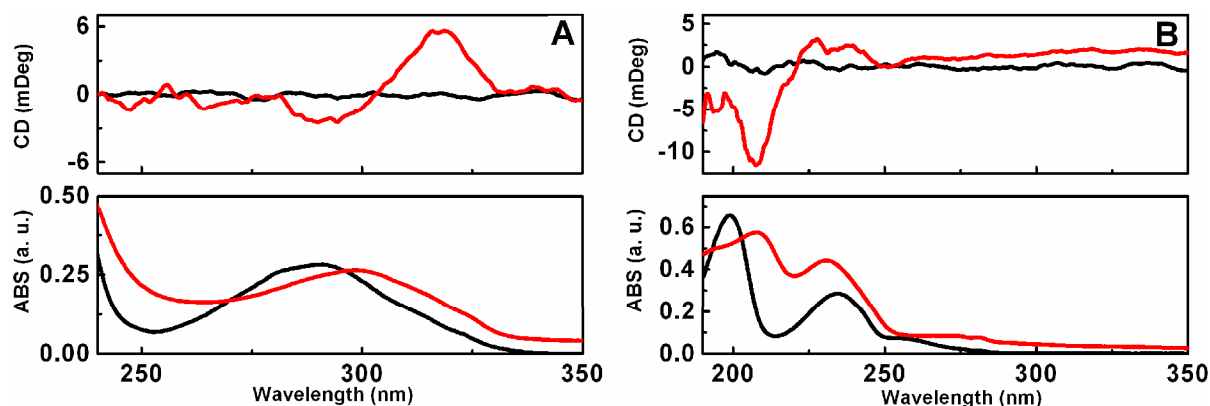
Generally, a quantificational deduction suggests that the chromophoric planes are arranged in edge-to-edge conformation in J-aggregate such that the angle ( $\theta$ ) between the transition moment of the chromophoric building blocks and the line connecting the centers of the chromophoric plane is in the range of  $0^\circ < \alpha < 54.7^\circ$  (N. C. Maiti, S. Mazumdar, N. Periadamy, *J. Phys. Chem. B* **1998**, *102*, 1528-1538; M. Yao, Y. Iwamura, H. Inoue, N. Yoshioka, *Langmuir* **2005**, *21*, 595-601; Kasha, M. In *Spectroscopy of the Excited State*; Bartolo, B. D., Ed.; Plenum: New York, 1976; pp 337-363; Gouloumis, A.; González-Rodríguez, D.; Vázquez, P.; Torres, T.; Liu, S.; Echegoyen, L.; Ramey, J.; Hug, G. L.; Guldi, D. M. *J. Am. Chem. Soc.* **2006**, *128*, 12674-12684). In the present case, the chromophores are naphthyl and phenyl groups for F10C2Np and F10C2Ph, respectively.



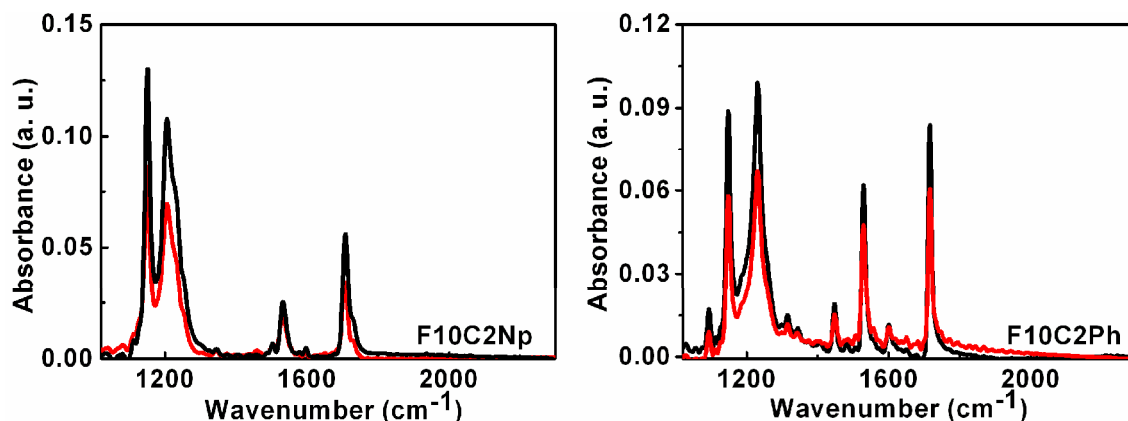
**Figure S6.** A schematic illustration of Y-type LB film. The straight lines represent fluorinated alkyl tails, and squares represent naphthyl or phenyl groups.



**Figure S7.** As it is shown, nanofibers and nanospirals could also be observed from the AFM image of one-layer LB films of F10C2Np deposited onto single face polished silicon wafer at the onset of surface pressure or  $0.47 \text{ nm}^2$  per molecule. This result is similar to what we have observed from the newly cleaved mica surface, suggesting the solid support could hardly affect the morphology of the supramolecular assemblies.



**Figure S8.** A: bottom: UV-vis spectra of F10C2Np in acetonitrile solution (black) and in a 40-layer LB film deposited at 15 mN/m (red); Top: the CD spectra of F10C2Np in acetonitrile solution (black) and in a 40-layer LB film transferred at 15 mN/m (red). B: those of F10C2Ph. The  $\text{CaF}_2$  slides were used as the solid supports.



**Figure S9.** FT-IR spectra of 60-layer LB films of F10C2Np and F10C2Ph deposited on hydrophobic silicon substrates (black) at 15 mN/m, and the corresponding spectra of the compounds deposited on  $\text{CaF}_2$  slides (red).

As presented in **Figure S8** and **Figure S9**, the CD, UV-vis and FT-IR spectra of the LB films of compounds deposited onto  $\text{CaF}_2$  slides showed essentially the same pattern as what we have described in the main context, suggesting the substrate could hardly affect the supramolecular structure assembled by the air/water interfacial organization in the present case.