

Electronic Supplementary Information

Ionic liquid induced Spontaneous Symmetry Breaking: Emergence of Predominant Handedness during the Self-Assembly of Tetrakis(4-sulfonatophenyl)porphyrin (TPPS) with Achiral Ionic Liquid

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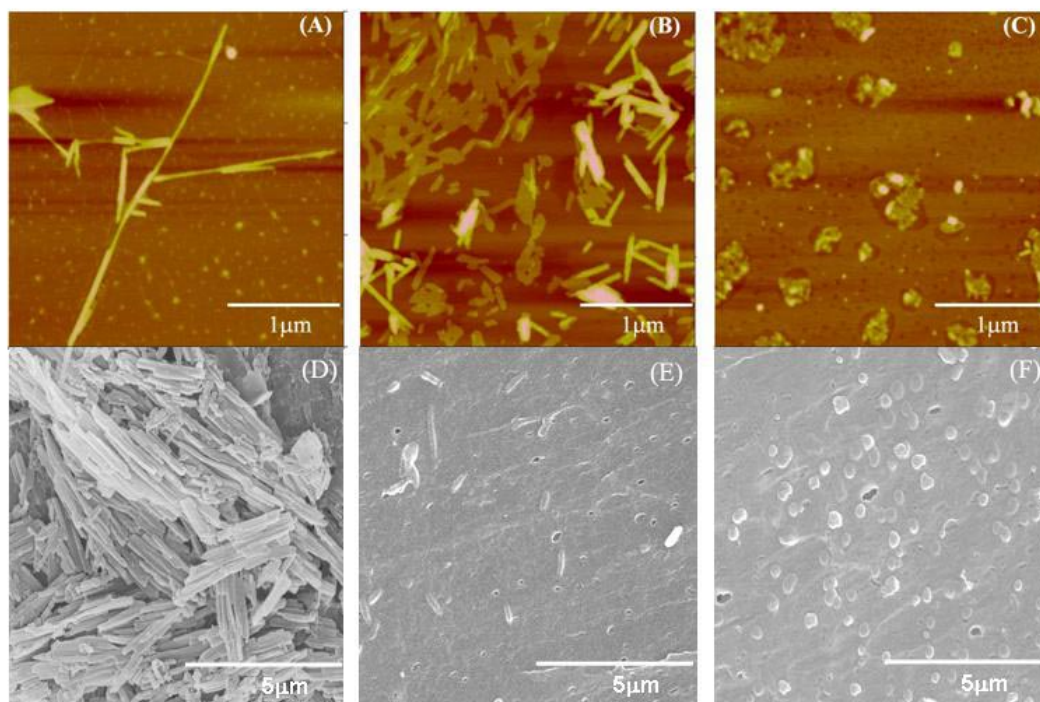


Figure S1 The AFM image and SEM of TPPS assemblies in the presence of C₂mimBF₄ (A),(D), C₄mimBF₄ (B),(E) and C₆mimBF₄ (C),(F).

For the measurement of AFM and SEM, the mixed solutions of TPPS with IL were kept in the dark for 24h to allow the equilibration. A droplet of the TPPS/mimBF₄ mixture was added onto a mica surface and silicon slide, respectively for AFM and SEM measurements. The AFM height image was recorded on a Digital Instrument Nanoscope IIIa Multimode system (Santa Barbara, CA) with a silicon cantilever using the tapping mode and image was obtained without any image

processing except flattening. SEM measurements were carried out on Hitachi S-4300 at 15 kV and 10 mA.

The different alkyl chain length can affect the morphologies of the aggregates, as shown in the Fig.S1. For the TPPS cast on the mica and silicon surface, only irregular dots can be observed. When 0.04M C_2mimBF_4 was added into TPPS solution, some long nanorods with the length about 1 μm and width about several nanometers can be detected. With the increase of side chain length to four, the length of nanorod decreased to several hundred nanometers. When the side chain length increased to six, only some dotted domains appeared. This is in constant with the UV and CD spectra, indicating C_2mimBF_4 is the most effective in promoting the TPPS to form J aggregates and chiral assemblies.