

Supporting Information for

How does a Supramolecular Polymeric Nanowire Form in Solution?

Ting Lei,^a Zi-Hao Guo,^a Cui Zheng,^b Yue Cao,^a Dehai Liang,^{b} and Jian Pei^{a*}*

^a *Beijing National Laboratory for Molecular Sciences (BNLMS), the Key Laboratory of Bioorganic and Molecular Engineering of the Ministry of Education, College of Chemistry and Molecular Engineering, Peking University.*

^b *The Key Laboratory of Polymer Chemistry and Physics of the Ministry of Education, College of Chemistry and Molecular Engineering, Peking University, Beijing 100871, China.*

jianpei@pku.edu.cn

1. Experimental Details

Dynamic light scattering experiments (DLS) were performed on a Brookhaven Instrument equipped with a BI-200SM goniometer. A solid-state laser (CNI Changchun GXL-III, 532 nm, 100 mW) operating at 532 nm was used as light source. Intensity autocorrelation functions $G^{(2)}(\tau)$ in the self-beating mode were measured using a BI-TurboCorr digital correlator. The electric field time correlation function $g^{(1)}(\tau)$ was obtained from the following equation:

$$G^{(2)}(\tau) = A \left[1 + \beta |g^{(1)}(\tau)|^2 \right]$$

where A is the measured baseline, β is a coherence factor, and τ is the delay time. By a Laplace inversion program, CONTIN, we got Γ distribution, which was transformed into diffusion coefficient distribution and further into the hydrodynamic radius distribution by $\Gamma = Dq^2$ and $D = k_B T / 6\pi\eta R_h$, respectively, where Γ , D , q , k_B , T , η , R_h were line width, diffusion coefficient, scattering vector, Boltzmann constant, absolute temperature, viscosity of the solvent, and hydrodynamic radius, respectively. The **1-C12** was refluxed in THF for 10 min at a concentration of about 1×10^{-4} mol/L (see the discussion part). The THF solution was then filtered through a filter (Millipore, 0.2 μm , PTFE) to remove dust, and put into the refractive bath on the DLS equipment to start DLS measurement immediately.

Scanning electron microscopy (SEM) images were obtained by a cold field emission scanning electron microscope (FESEM, Hitachi S-4800) operated at an accelerating voltage of 1.0 kV. All the samples were prepared by directly drop-casting the nanowires suspensions on a silicon wafer. Transmission electron microscopy (TEM) images were obtained by a transmission electron microscope (FEI Tecnai G² S-TWIN20) operated at accelerating voltage of 200 kV. Samples were prepared by directly drop-cast the nanowires suspensions on a grid covered with a thin carbon support film. Polarized optical microscopy (POM) was operated with a Leica DMLS fluorescence optical microscope. Atomic force microscopy (AFM) studies were performed with a Nanoscope IIIa microscope (Digital Instruments). All experiments were carried out in tapping mode at ambient temperature. A silicon nitride cantilever

was used with a resonance frequency around 300 kHz. The samples were prepared by directly spin-cast the nanowires suspensions on mica substrate. X-ray diffraction (XRD) was recorded on a D/Max-RA high power rotating anode 12 kw X-ray diffractometer (Cu K α). Molecular modeling was performed using ChemBio3D Ultra (version 11.0) software available from CambridgeSoft. Energy was minimized using the Merck Molecular Force Field 94 (MMFF94) (Convergence criteria: atomic root mean square force 0.001 kcal/mol).

2. Fig. S1-S3

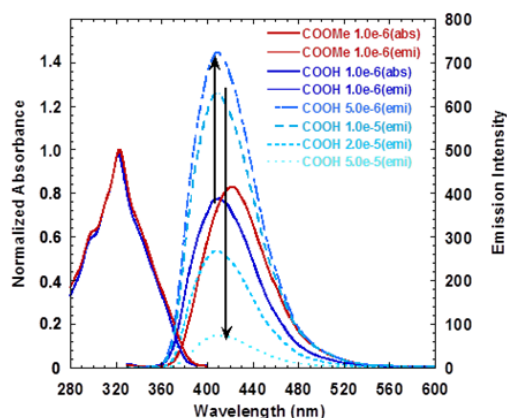


Fig. S1 Concentration-dependent UV-*vis* and PL spectra of **1-C12**. No obvious change was observed in UV-*vis* spectra after increasing the concentration (blue line). After changing the methoxyl groups (red line) to hydroxyl groups, the absorption still kept almost unchanged. This means that the hydrogen-bonding process cannot affect the UV-*vis* spectra of the molecule. For PL spectra, only a small blue-shift was observed after changing the methoxyl groups (red line) to hydroxyl groups. Changing the concentration of the monomer only changes the PL intensities.

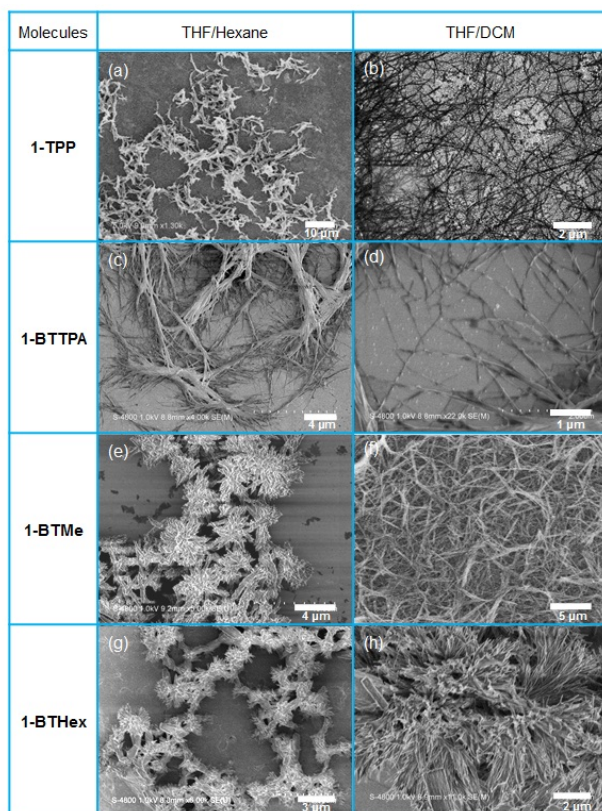


Fig. S2 SEM images of the morphologies formed by (a, b) **1-TPP**; (c, d) **1-BTTPA**; (e, f) **1-BTMe**; (g, h) **1-BTHex** in THF at 0.5 mg/mL by using hexane (left column) or using DCM (right column) as the poor solvent.

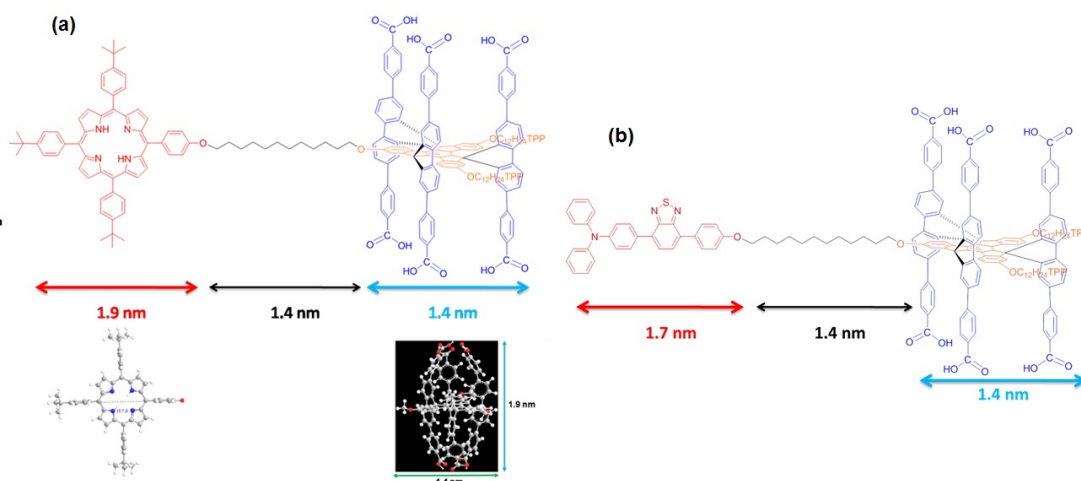


Fig. S3 Estimation of the size of (a) **1-TPP** and (b) **1-BTTPA** via molecular modeling. (molecular models were minimized using MMFF94 force field).