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Supporting Information

Designing large-plane conjugated copolymer for the high-yield sorting of semiconducting single-walled carbon nanotubes

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1. The selective dispersion of s-SWNTs with PFPXX: We dissolved PFPXX (3mg) in 6 ml toluene and then added SWNT powder (1.5 mg) into the solution. The solution was ultrasonicated with a tip-top ultrasonic dispergator (Misonix XL2000) for 2 h at 4 W, and then was centrifugated at 20000 g for 2 h to remove the large bundles and insoluble materials. The supernatant was collected for spectroscopic characterization and the fabrication of the TFTs.

2. The fabrication of PFPXX-dispersed SWNT based TFTs: The heavily doped Si wafer and the 300 nm SiO_2 were served as the gate electrode and gate dielectric layer of the TFTs, respectively. The source and drain electrodes were 50 nm Au/Ti, which were patterned to form an interdigitated channel (L = 20 μm, W = 200×3 μm). All the substrates were cleaned by acetone, isopropanol and deionized water, respectively. The substrates were dipped in the PFPXX-sorted SWNT dispersion diluted to 20 times about 8 h and then were blown with dry nitrogen gas and baked in an oven at 150°C for 1 h. The electronic transport characteristics of the s-SWNT based TFTs were measured using an Agilent E5270B semiconductor parameter analyzer under the air atmosphere.

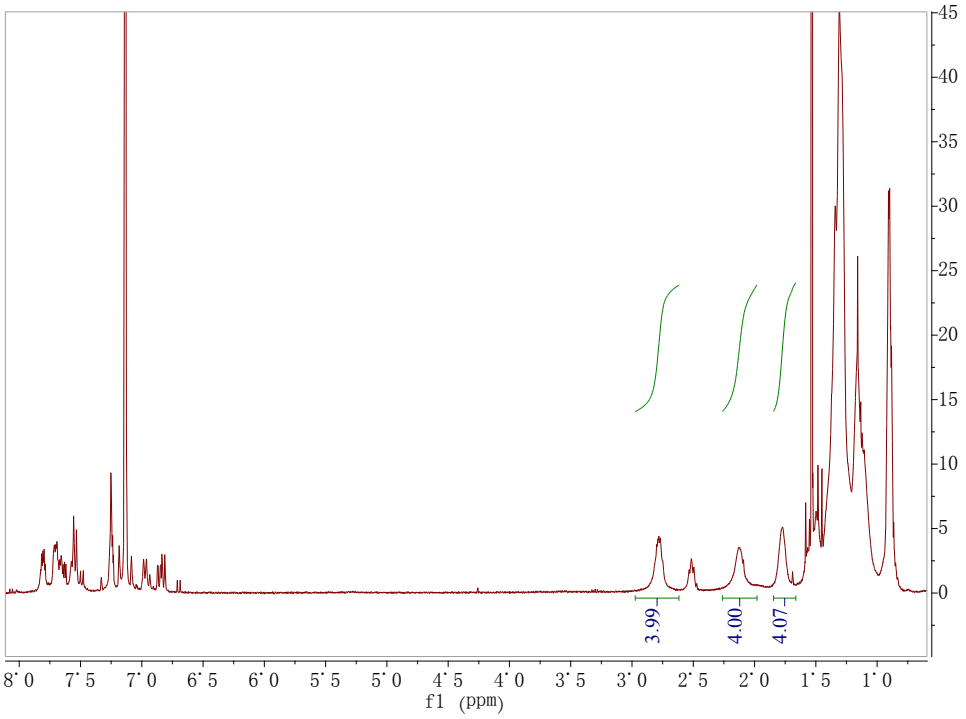

Figure S1. The ^{1}H NMR spectrum of PFPXX.

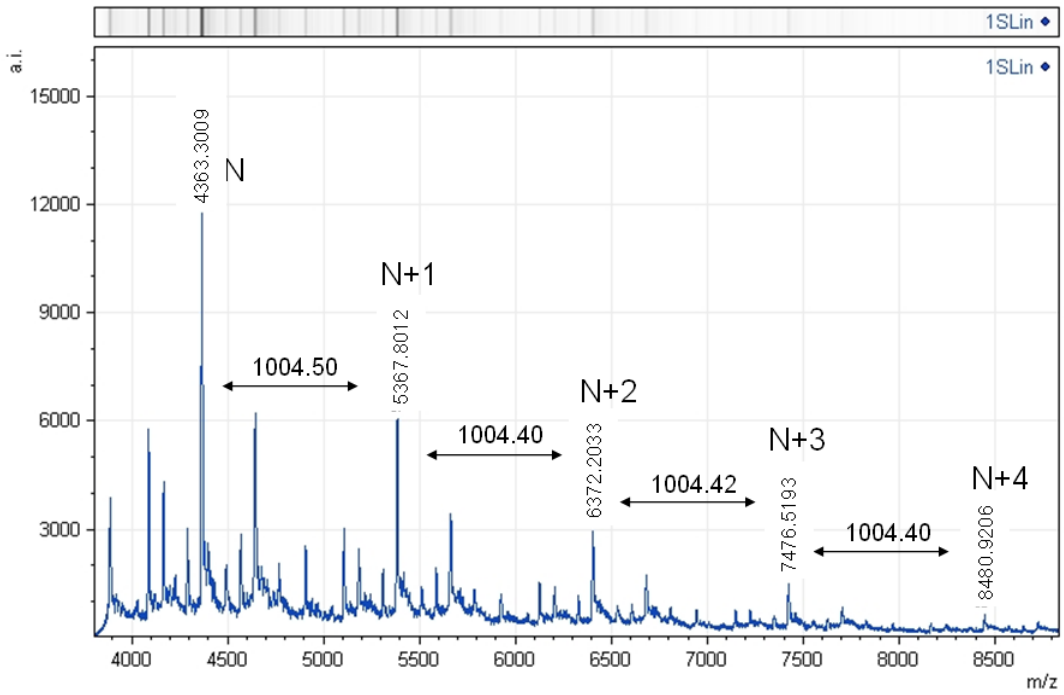

Figure S2. The Maldi-TOF-MS spectrum of PFPXX.

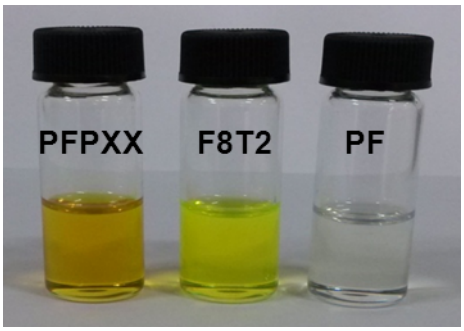

Figure S3. The photograph of the pure PFPXX, F8T2 and PF solutions.

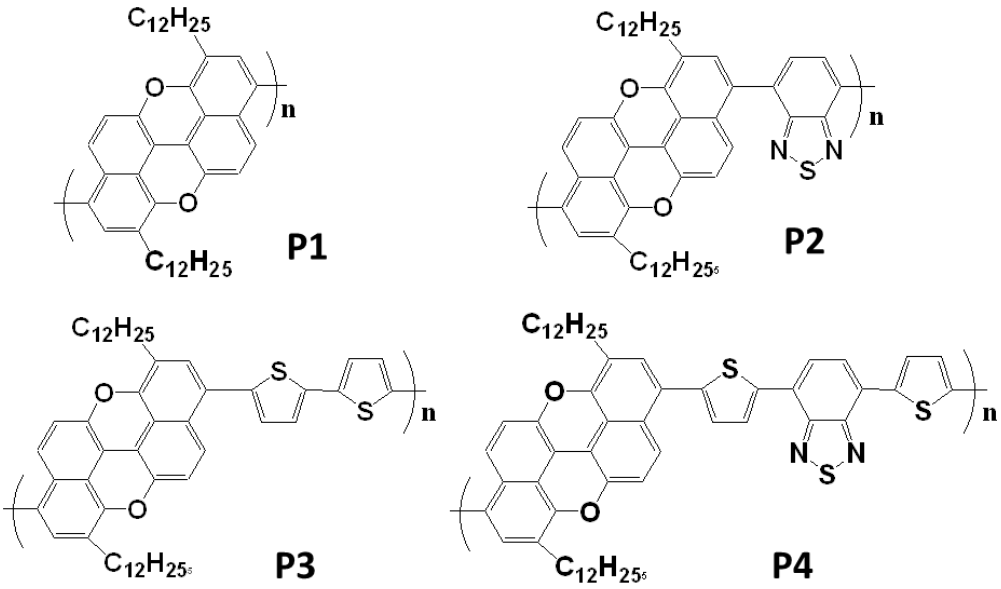

Figure S4. Structures of other designed peri-xanthenoxanthene-based conjugated polymers in the present study.

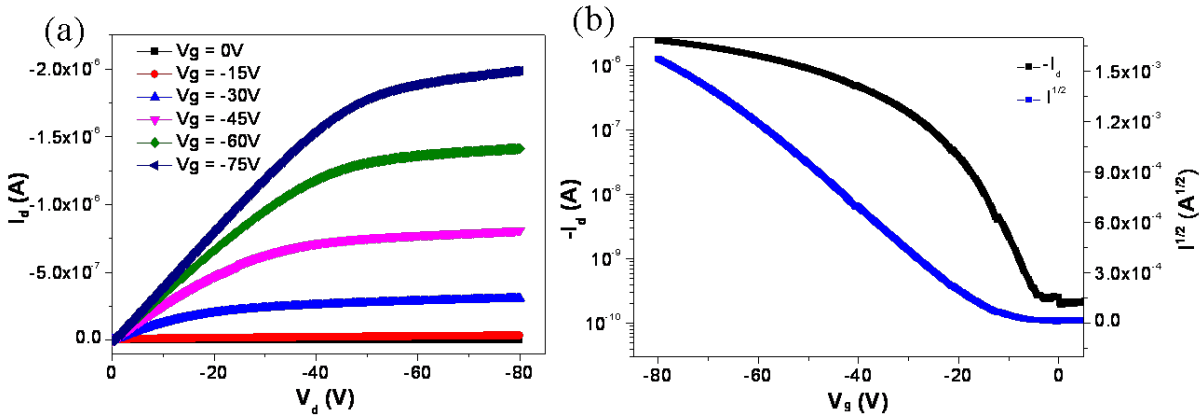

Figure S5. The output (a) and transfer (b) plots of a pure PFPXX-based TFT.