

Supporting Information

Hydrophobic Cross-linked Nanoparticles Comprised of Polystyrene and Poly(thiophene-diketopyrrolopyrrole) Segments for Nonvolatile Memory Applications

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Table S1. Optical band gaps and HOMO/LUMO levels of PDPP-PS copolymers.

sample	Band gap (eV)	HOMO (eV)	LUMO (eV)
PDPP-PS-1	1.21	-5.53	-4.31
PDPP-PS-2	1.21	-5.58	-4.37
PDPP-PS-3	1.22	-5.55	-4.33
PDPP-PS-4	1.25	-5.54	-4.30
PDPP-PS-5	1.24	-5.53	-4.30
PDPP-PS-6	1.29	-5.55	-4.25

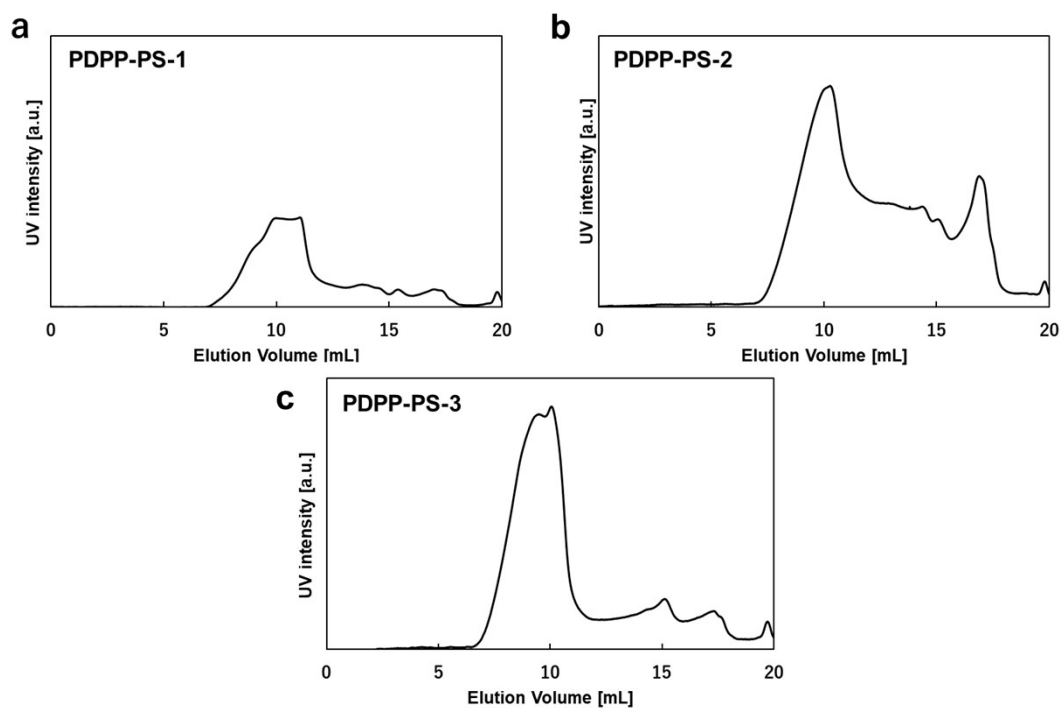


Figure S1. SEC UV traces of (a) PDPP-PS-1, (b) PDPP-PS-2, and (c) PDPP-PS-3.

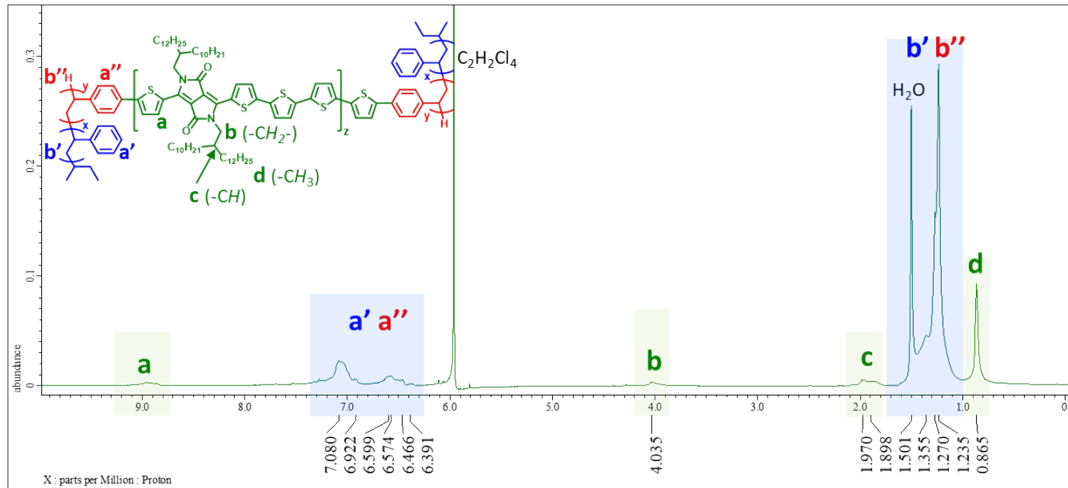


Figure S2. ^1H NMR spectrum of PDPP-PS-1.

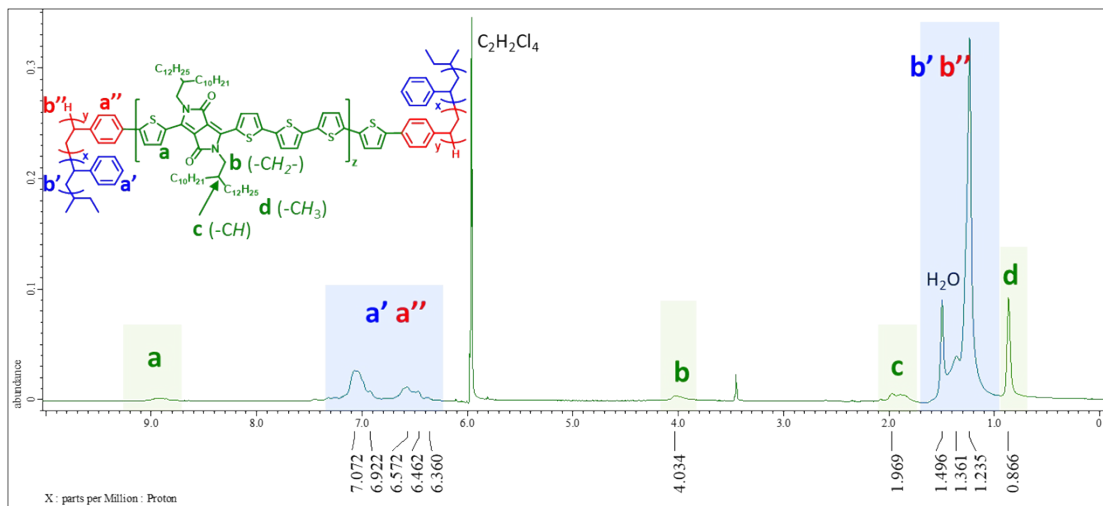


Figure S3. ^1H NMR spectrum of PDPP-PS-2.

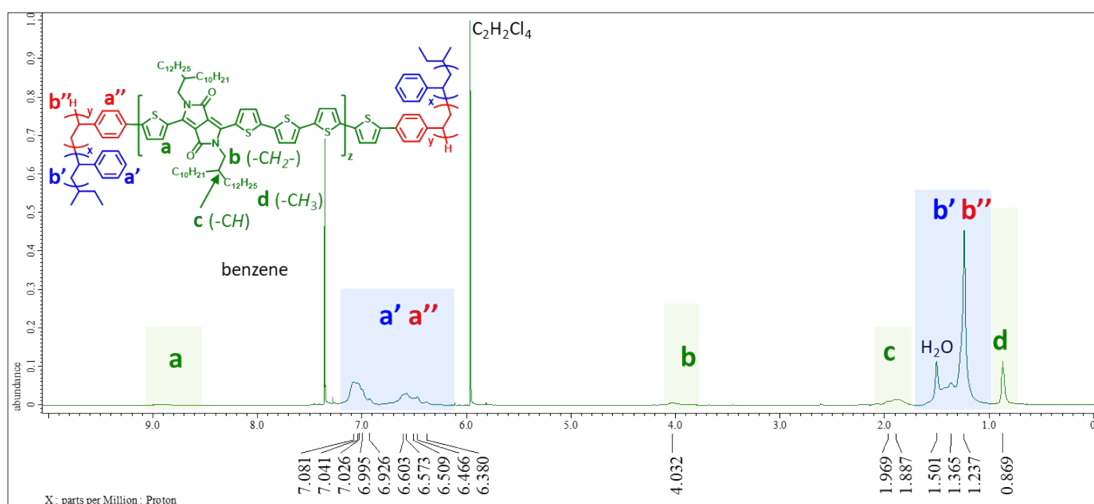


Figure S4. ^1H NMR spectrum of PDPP-PS-3.

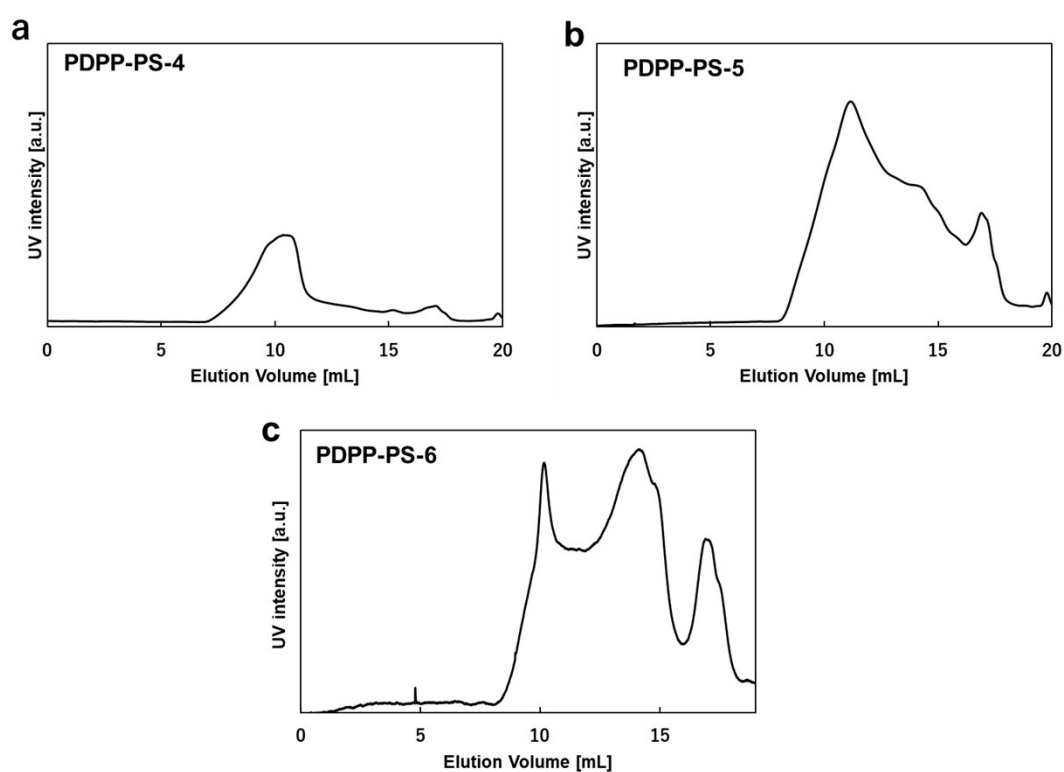


Figure S5. SEC UV traces of (a) PDPP-PS-4, (b) PDPP-PS-5, and (c) PDPP-PS-6.

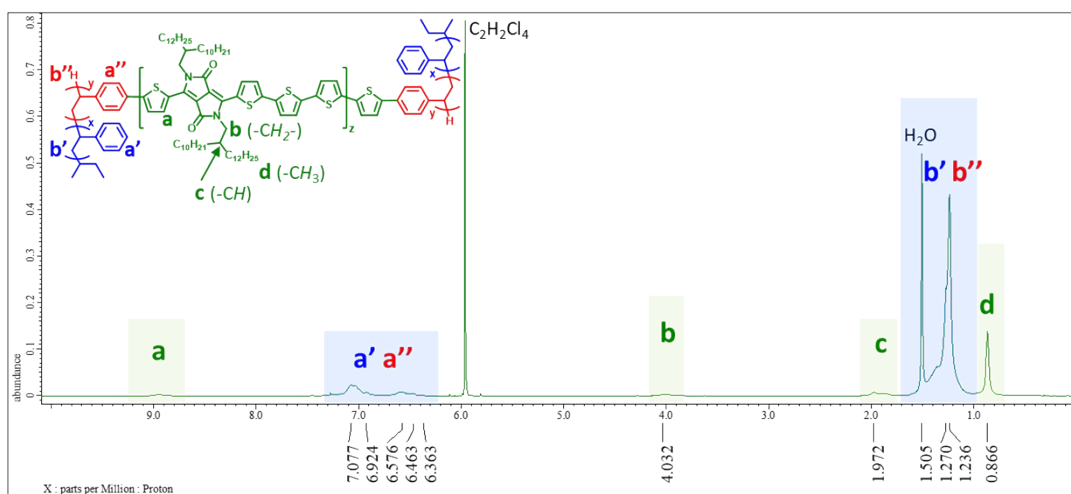


Figure S6. ^1H NMR spectrum of PDPP-PS-4.

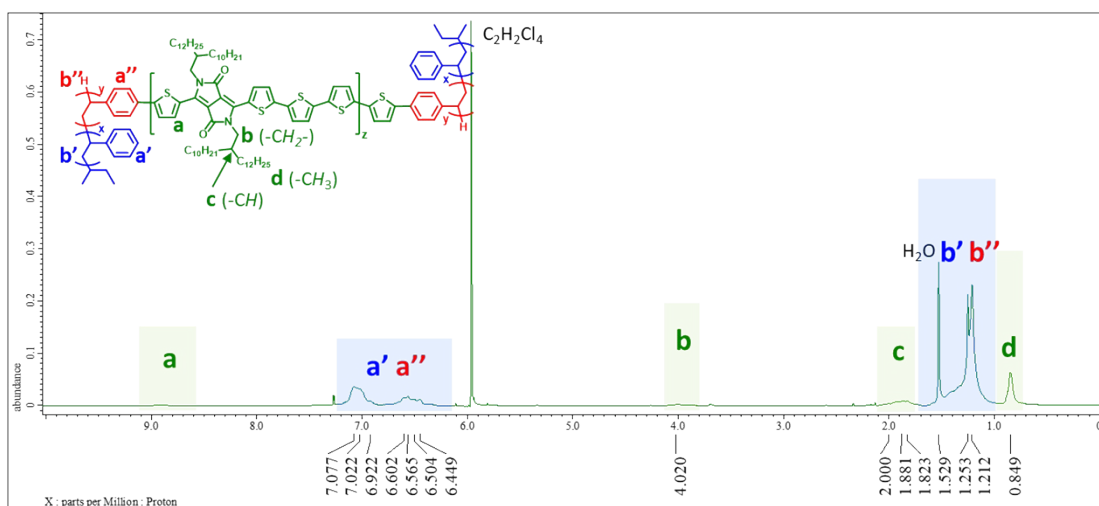


Figure S7. ^1H NMR spectrum of PDPP-PS-5.

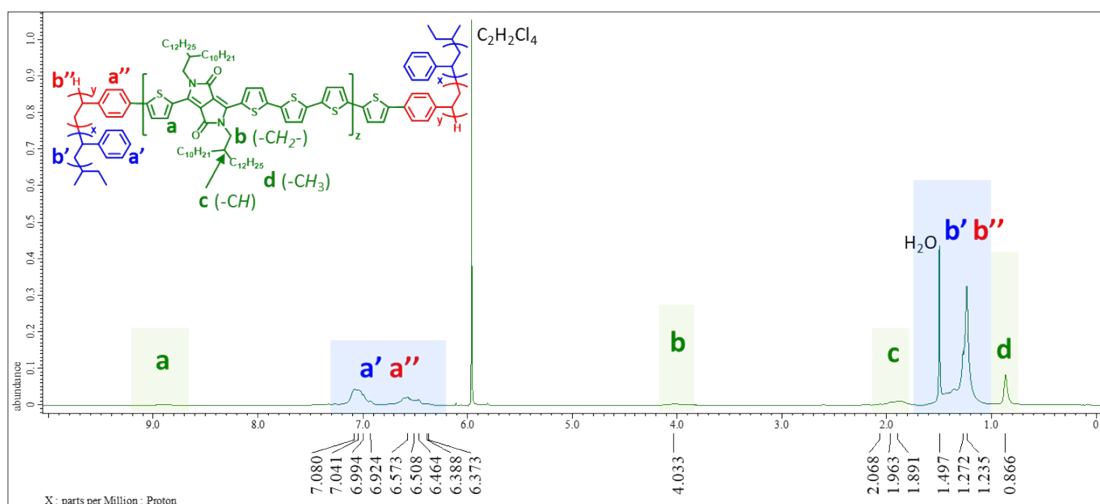


Figure S8. ^1H NMR spectrum of PDPP-PS-6.

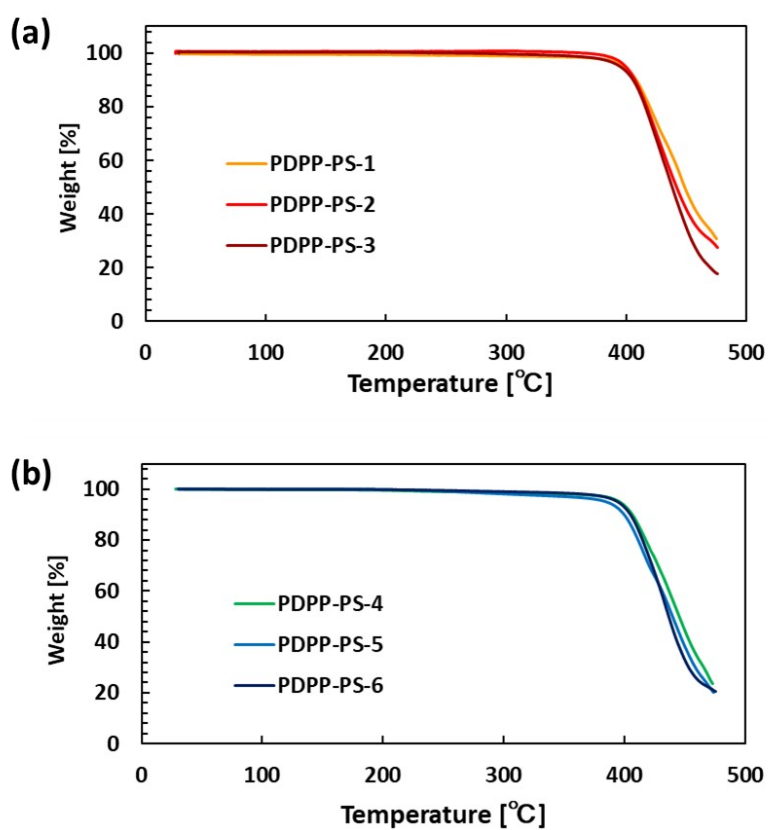


Figure S9. TGA thermograms of (a) PDPP-PS-1, PDPP-PS-2, and PDPP-PS-3, and (b) PDPP-PS-4, PDPP-PS-5, and PDPP-PS-6.

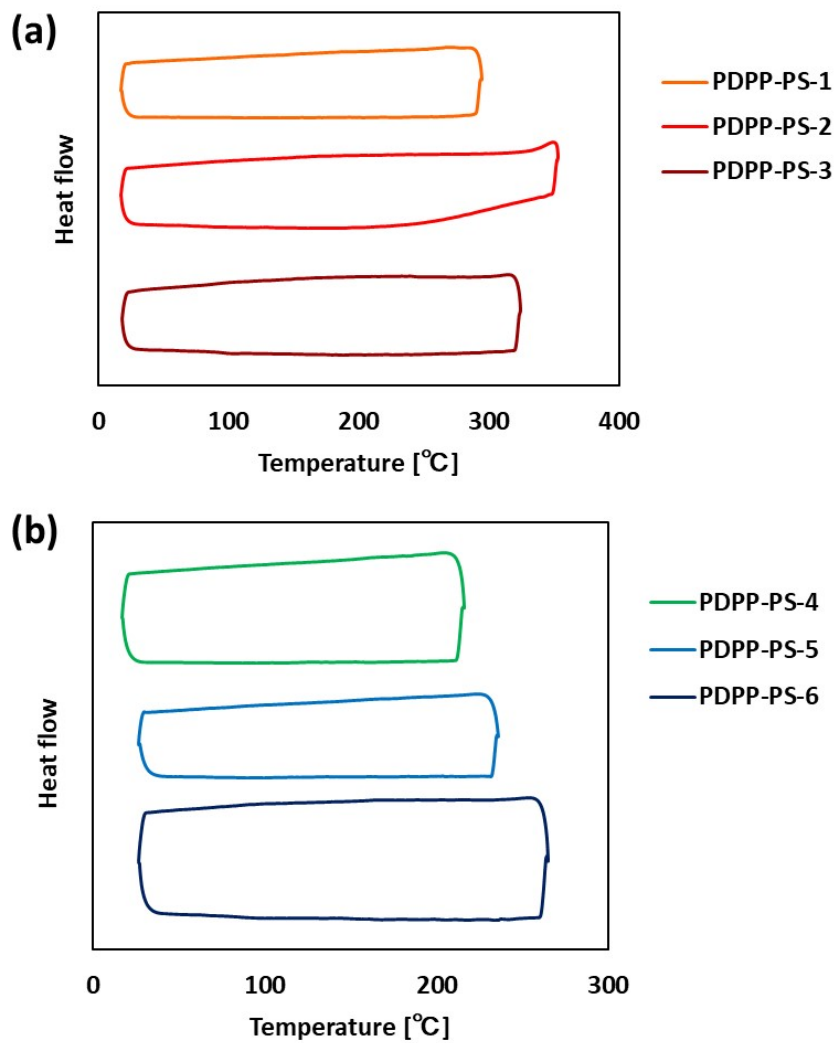


Figure S10. DSC thermograms (1st cooling/2nd heating scans) of (a) **PDPP-PS-1**, **PDPP-PS-2**, and **PDPP-PS-3**, and (b) **PDPP-PS-4**, **PDPP-PS-5**, and **PDPP-PS-6** measured at a heating/cooling rate of 10 °C/min.

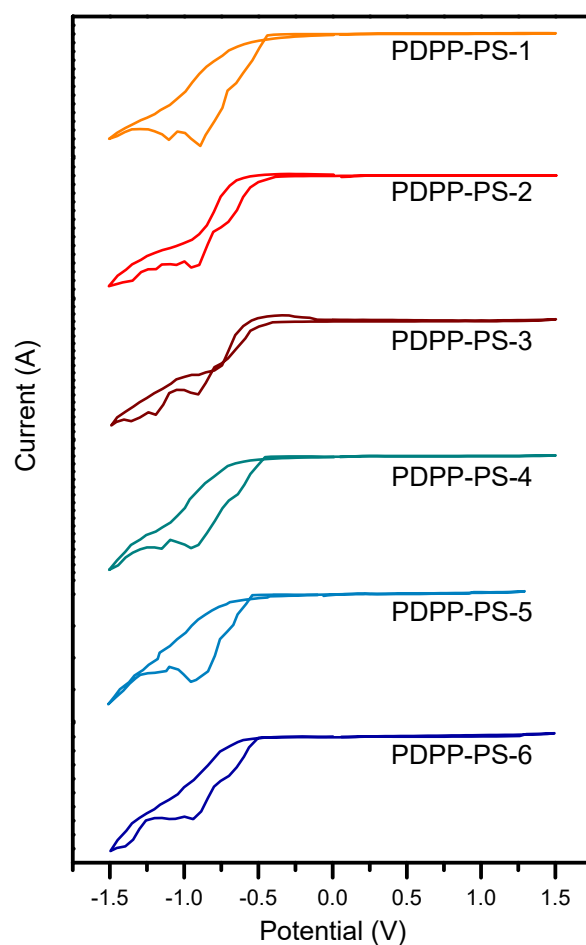


Figure S11. Cyclic voltammetry curves of the PDPP-PS copolymers.

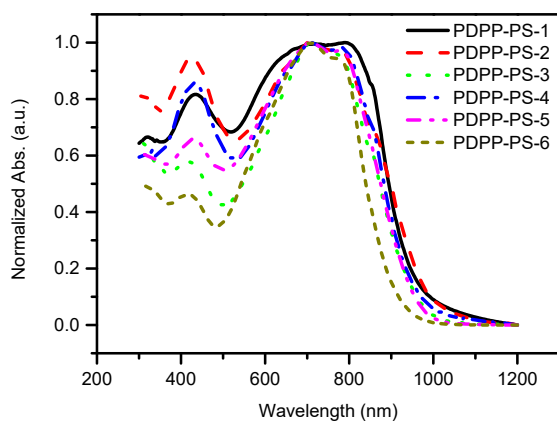


Figure S12. UV-vis spectra of the polymer thin films based on the PDPP-PS copolymers.

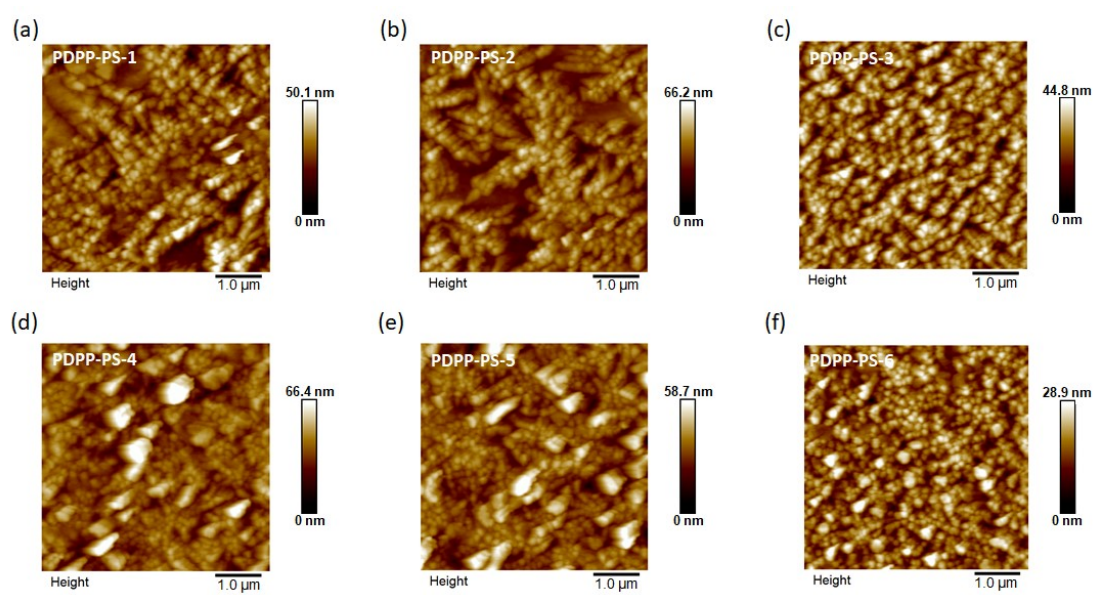


Figure S13. AFM topographic images of pentacene on different polymer surfaces: (a) PDPP-PS-1, (b) PDPP-PS-2, (c) PDPP-PS-3, (d) PDPP-PS-4, (e) PDPP-PS-5, and (f) PDPP-PS-6) on the size of 5 μm × 5 μm.

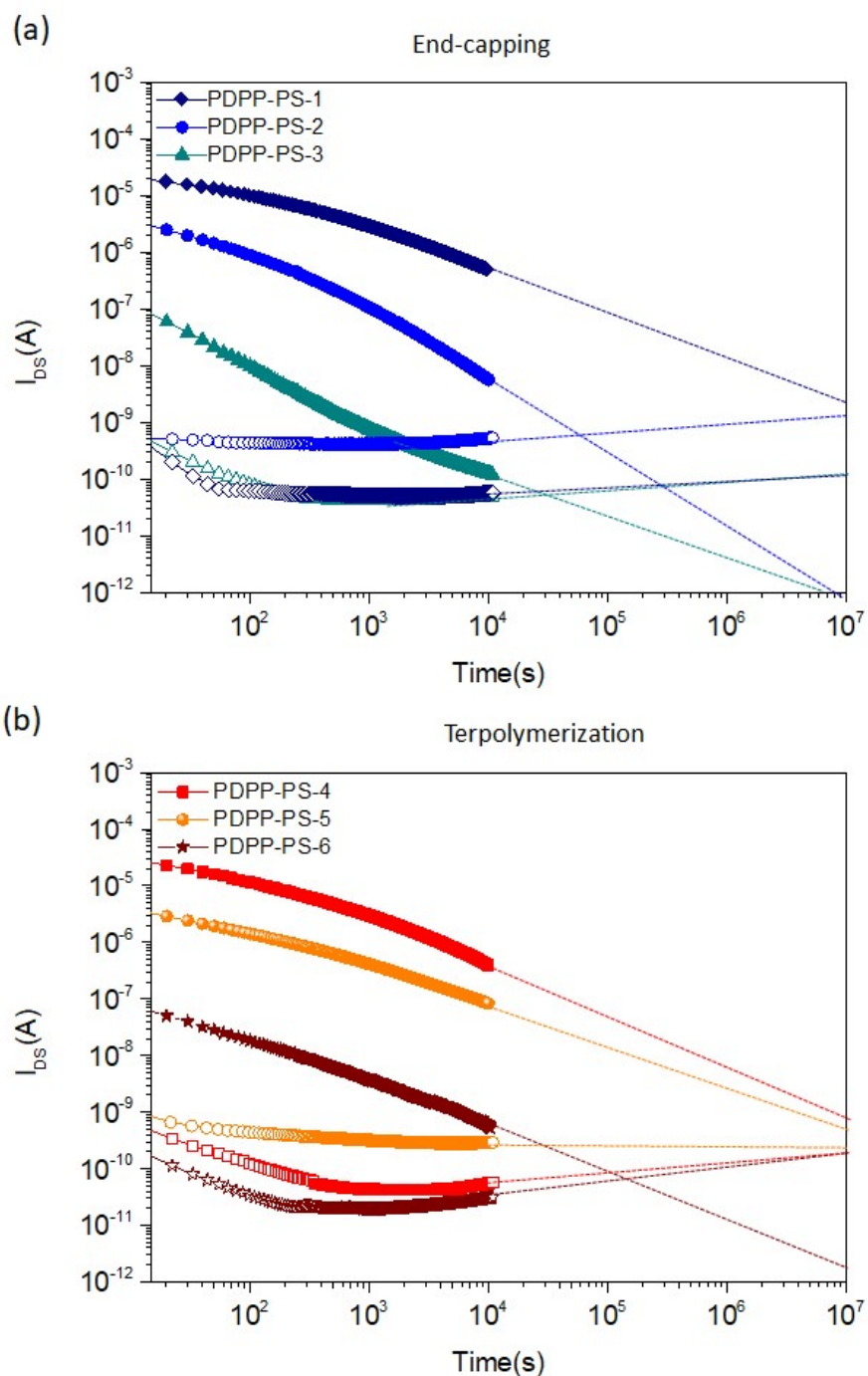


Figure S14. The currents at ON and OFF states of the (a) end-capping and (b) terpolymerization PDPP-PS devices were measured at $V_g = 0$ V, respectively. The charge retention time is estimated by the extrapolation of each ON and OFF curves.

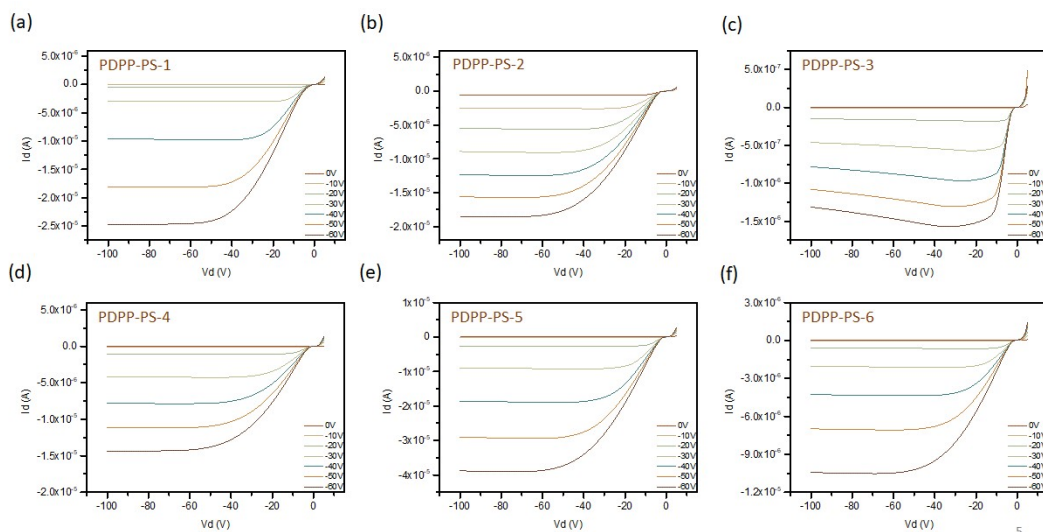


Figure S15. Output curves of pentacene OFETs based on PDPP-PS/SiO₂ dielectrics: (a) PDPP-PS-1, (b) PDPP-PS-2, (c) PDPP-PS-3, (d) PDPP-PS-4, (e) PDPP-PS-5, and (f) PDPP-PS-6), respectively.

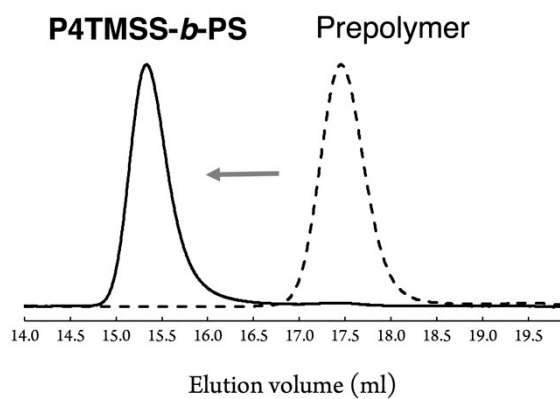


Figure S16. SEC UV traces of (a) P4TMSS (1st block) and (b) PS-*b*-P4TMSS (eluent: THF, 40 °C),^[30] Copyright: 2019, Wiley-VCH.

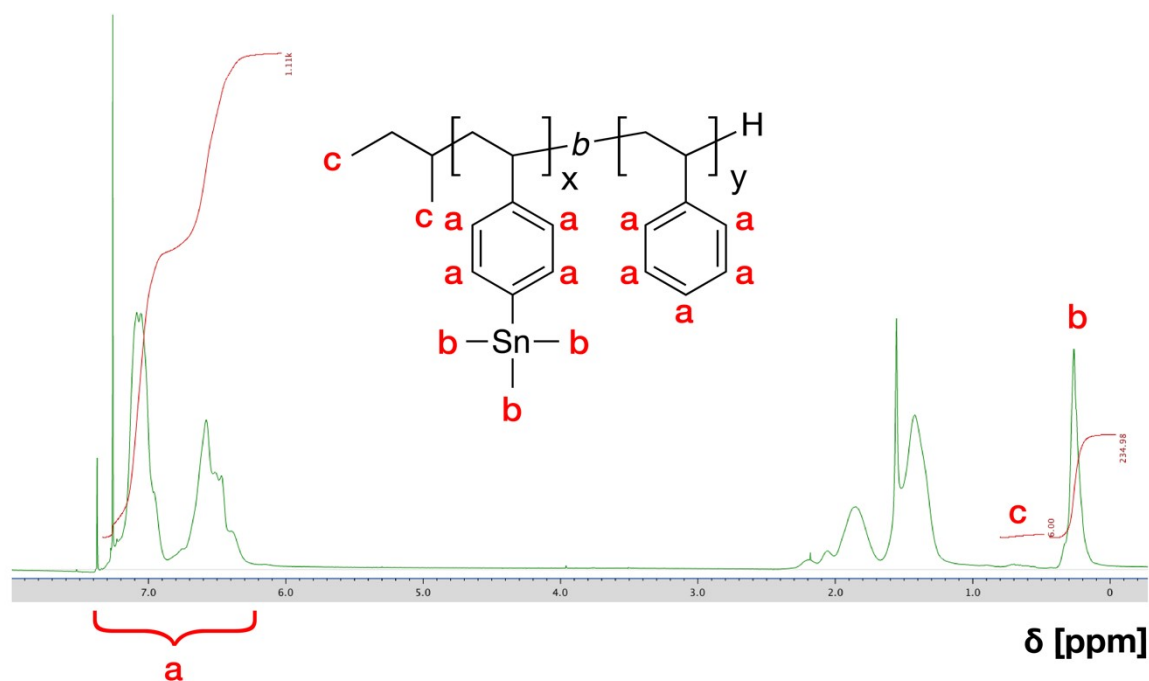


Figure S17. ^1H NMR spectrum of PS-*b*-P4TMSS,^[30] Copyright: 2019, Wiley-VCH.

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