

Electronic Supplementary Information

Thienoisindigo-based Low-Band Gap Polymer for Organic Electronic Devices

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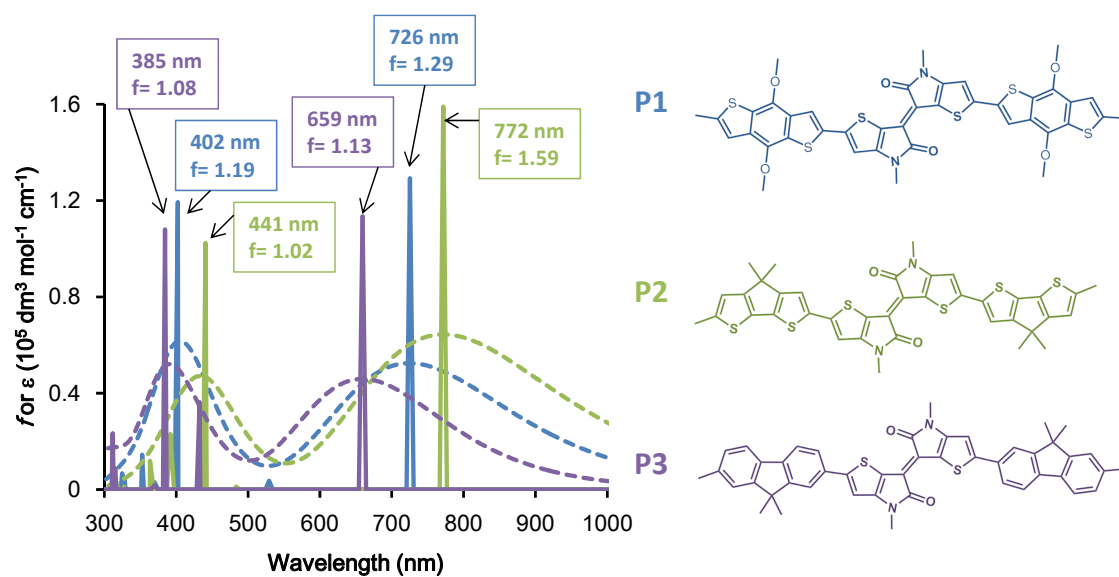


Figure S1. Absorption features of P1-3 obtained from DFT calculation. The solid lines represent oscillator strength. The dotted lines were reconstructed by applying Gaussian function to each oscillator strength.

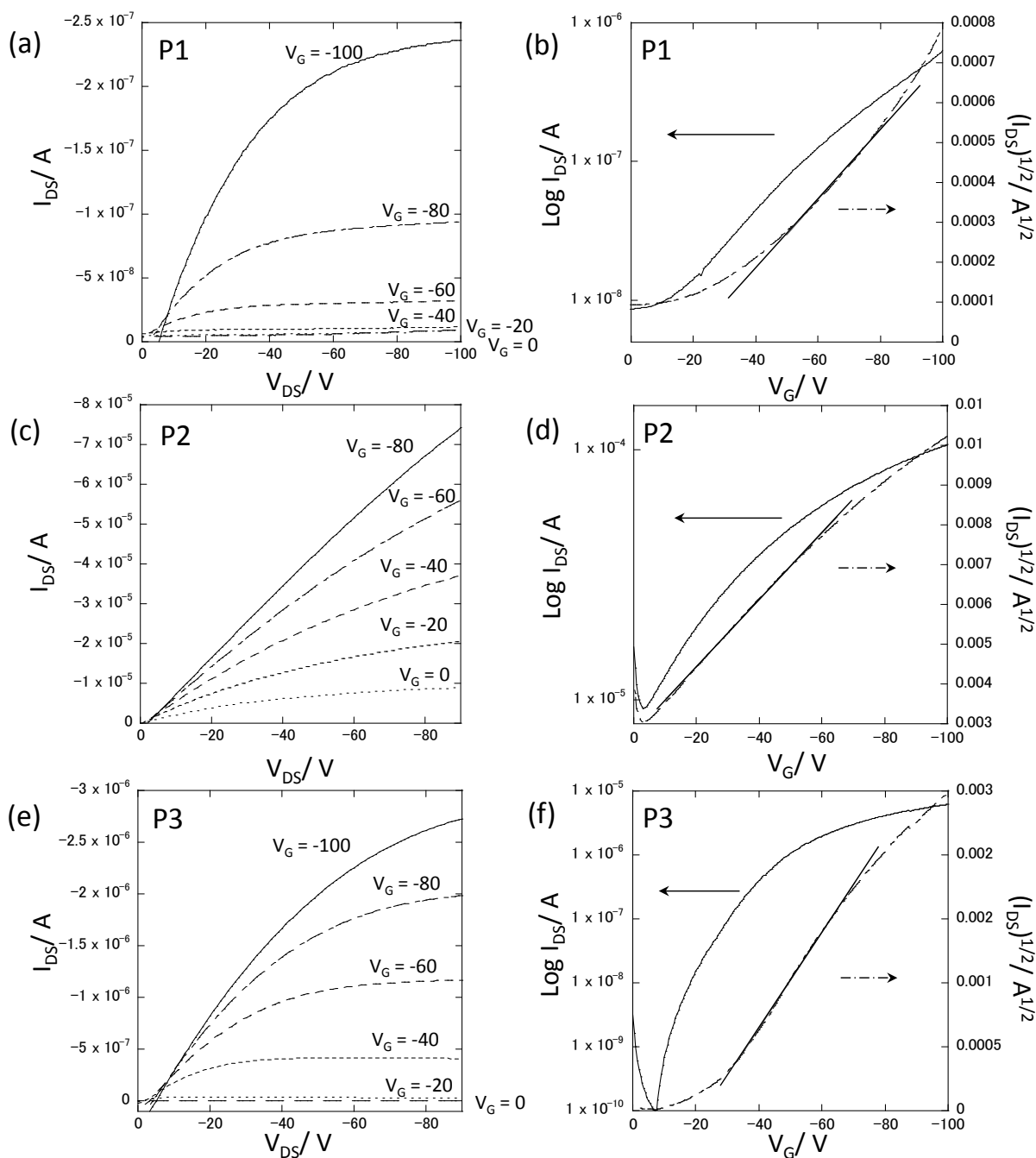


Figure S2. FET current-voltage characteristics of (a)(b) P1, (c)(d) P2, and (e)(f) P3 copolymer (a),(c), and (e) are output curves at different gate voltages (0 to -100 V or -80 V); (b),(d), and (f) are transfer curves at $V_{DS} = -100$ V for P1 and P3, -80 V for P2. The channel length: L were 100, 20, and 20 μm for P1, P2, and P3, respectively; the channel width: W was 3 mm, and the film thicknesses were 68 ~ 100 nm. The capacitance: C_i was 17.3 nF cm^{-2} . The measurements were carried out at room temperature. The hole mobilities of 0.34×10^{-3} , 5.3×10^{-3} , and $1.1 \times 10^{-3} \text{ cm}^2 \text{ V}^{-1} \text{ s}^{-1}$ were obtained for P1, P2, and P3, respectively, from the slopes of square-root of the drain current vs. V_G .

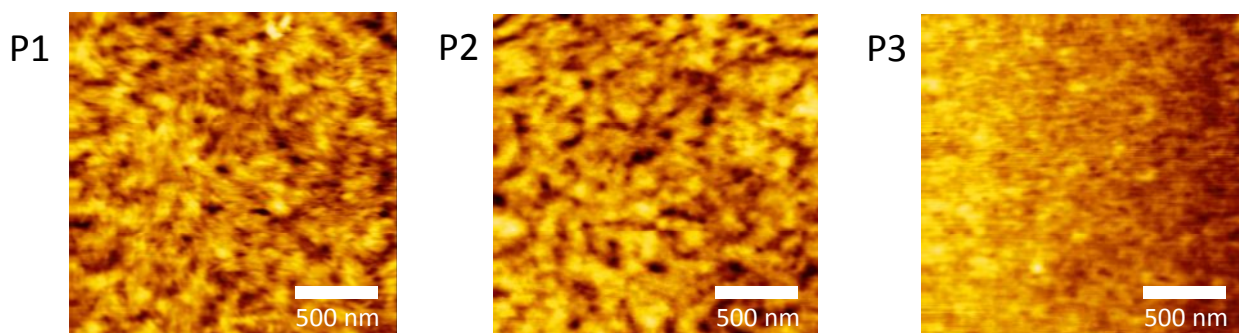


Figure S3. AFM micrographs of P1, P2, and P3. The sample films were prepared by spin-casting from chloroform solution for P1 and P3, chlorobenzene solution for P2, then dried under vacuum. Films of P1 and P3 were no thermal annealing, that of P2 was thermal annealed at 160 °C for 10 min. All images are $2 \times 2 \mu\text{m}$ scale. The surface roughness are (P1) 1.4 nm, (P2) 1.0 nm, and (P3) 0.47 nm.

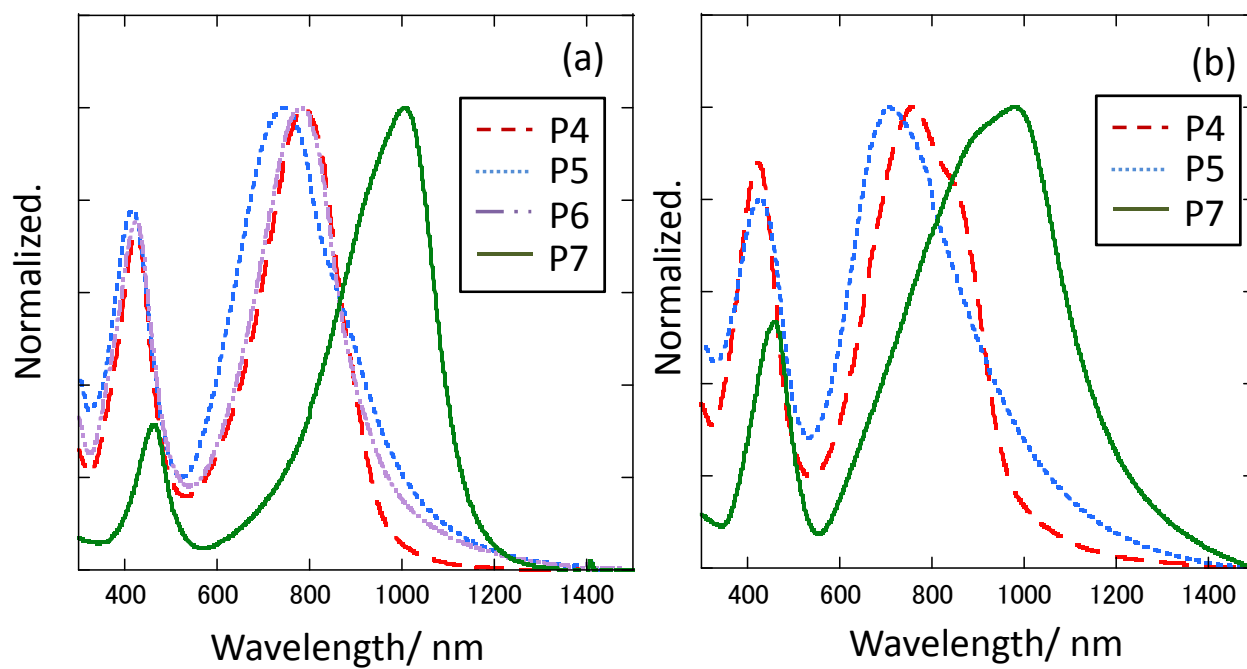


Figure S4. (a) Normalized electronic absorption spectra of P4 (red dashed line), P5 (blue dotted line), P6 (purple chain line) and P7 (green solid line) in chloroform at room temperature. (b) Normalized electronic absorption spectra of P4, P5, and P7 films drop-casted from chloroform solution.

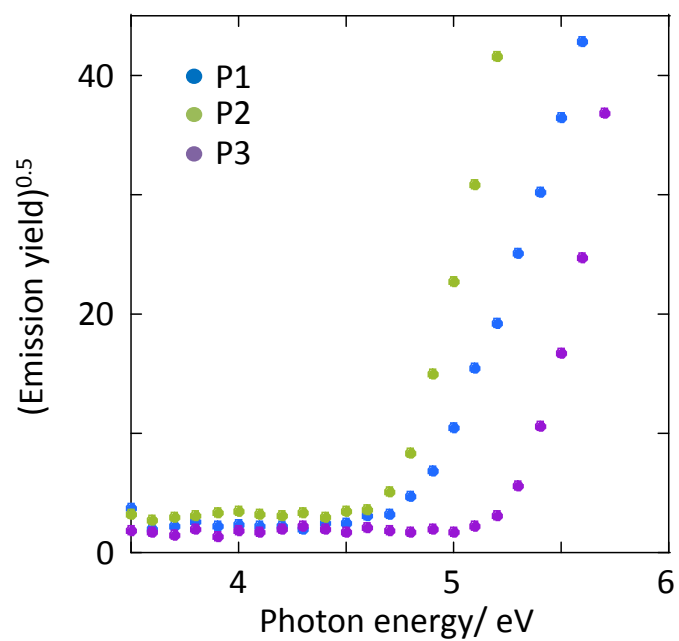


Figure S5. Photon energy profile for drop-casted films of P1 (blue), P2 (green), and P3 (purple) measured by UV photoelectron spectroscopy.