**Supporting Information**

# Selective Wet-Etching of Polymer/Fullerene Blend Films for Surface- and Nanoscale Morphology-Controlled Organic Transistors and Sensitivity-Enhanced Gas Sensors

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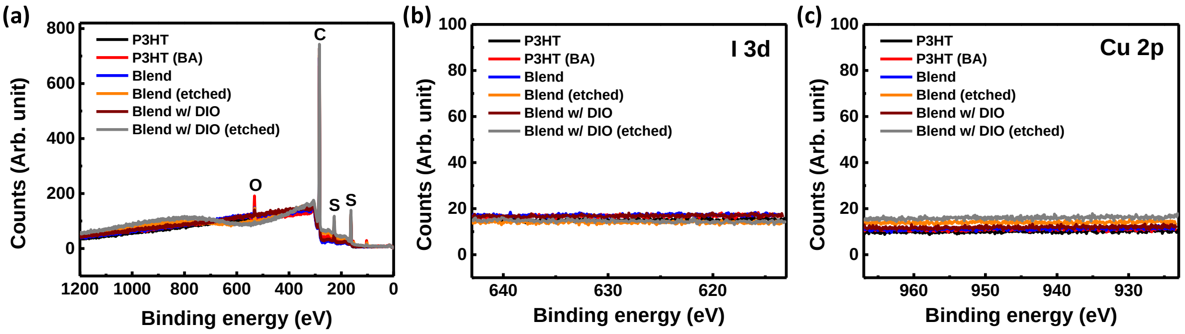
**Figure S1.** XPS results on the thin polymer and blend films: (a) Survey scans. (b) High-resolution scans for Iodine (I3d). (c) High-resolution scans for copper (Cu2p). There is no evidence of a trace amount of iodide and copper components.

**Figure S2.** UV/Vis absorption of polymer and blend films under different processing and light-exposure conditions.

**Figure S3.** Peak intensity changes of UV/Vis absorption of polymer and blend films under different processing and light-exposure conditions.

**Figure S4.** (a) Device-to-device variations of 10 OTFTs based on P3HT. (b) Ten consecutive scans of a single P3HT-based OTFTs. Device testing conditions: W/L=10 and $V_D$= –100 V.

**Figure S5.** Transfer curves of OTFTs based on a PCBM-washed films from a P3HT:PCBM blend with DIO, tested in nitrogen-filled chamber and in ambient air. The field-effect mobility values in nitrogen and in air are 0.0097 $cm^2/Vs$ and 0.0093 $cm^2/Vs$, respectively. The device was also exposed to ambient laboratory conditions for multiple times for chamber-to-chamber transfer. Device testing conditions: W/L=20 and $V_D$= –60 V.



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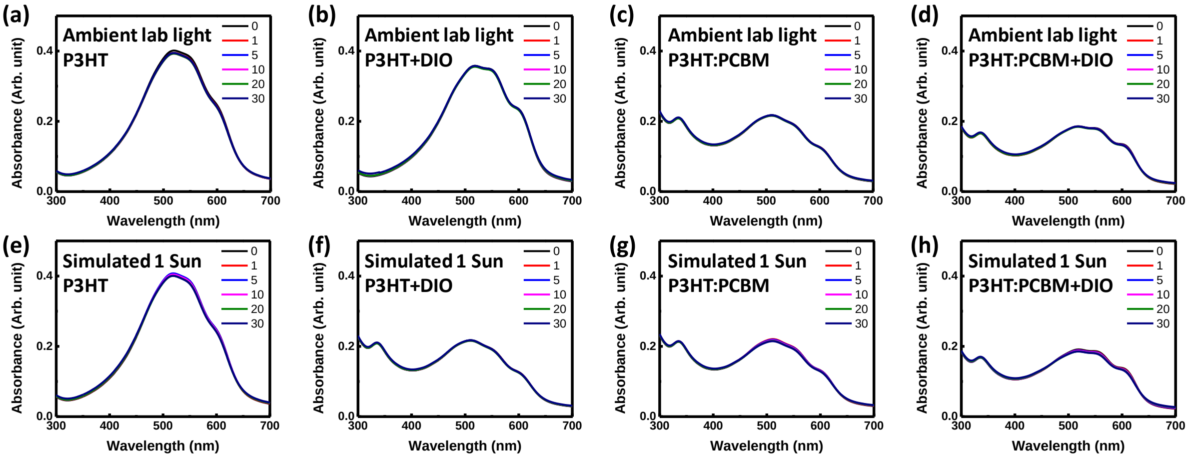


**Figure S2.** UV/Vis absorption of polymer and blend films under different processing and light-exposure conditions.

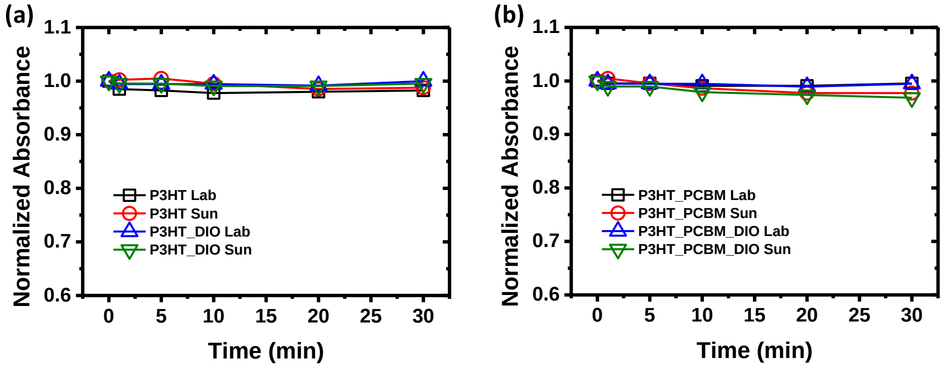
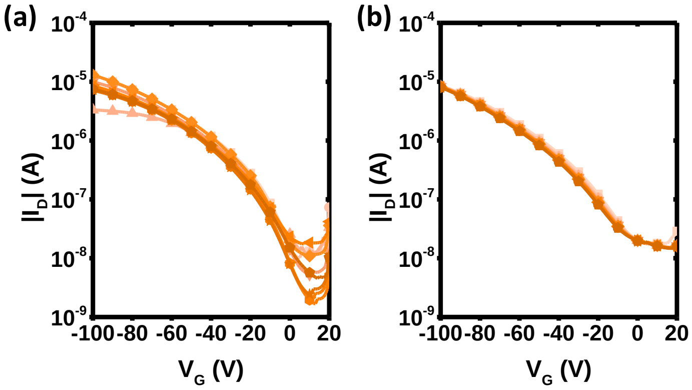


**Figure S3.** Peak intensity changes of UV/Vis absorption of polymer and blend films under different processing and light-exposure conditions.



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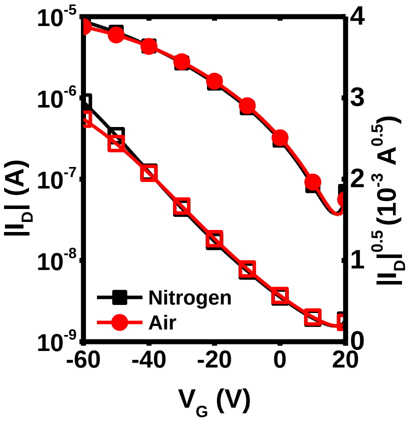

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