

## Electronic Supplementary Information

# **Conjugated Polymer/Paraffin Blends for Organic Field-Effect Transistors with High Environmental Stability**

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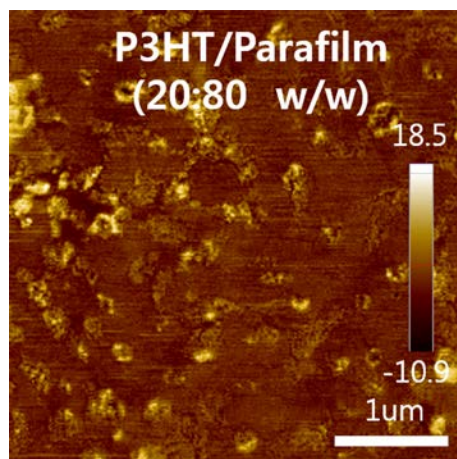
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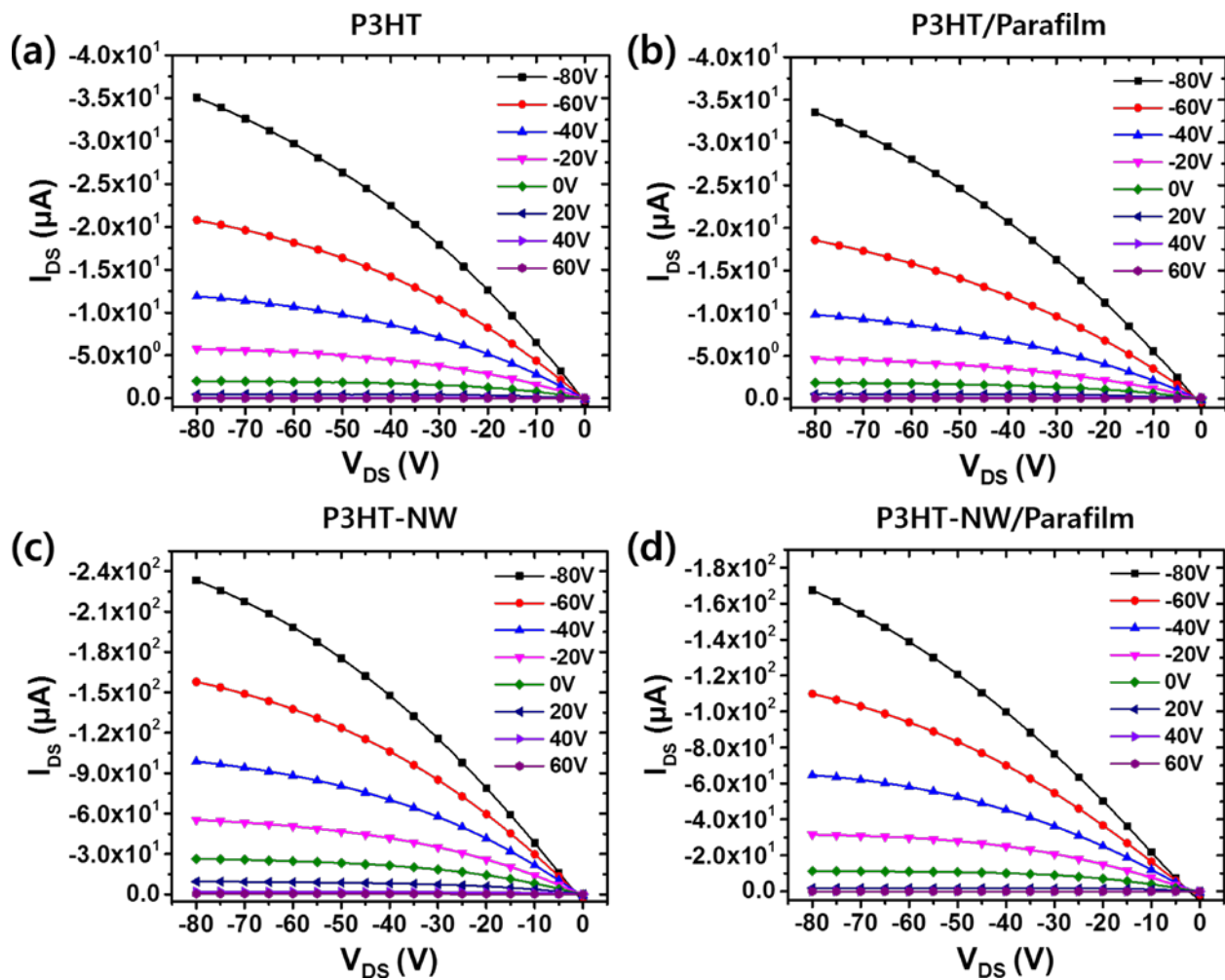
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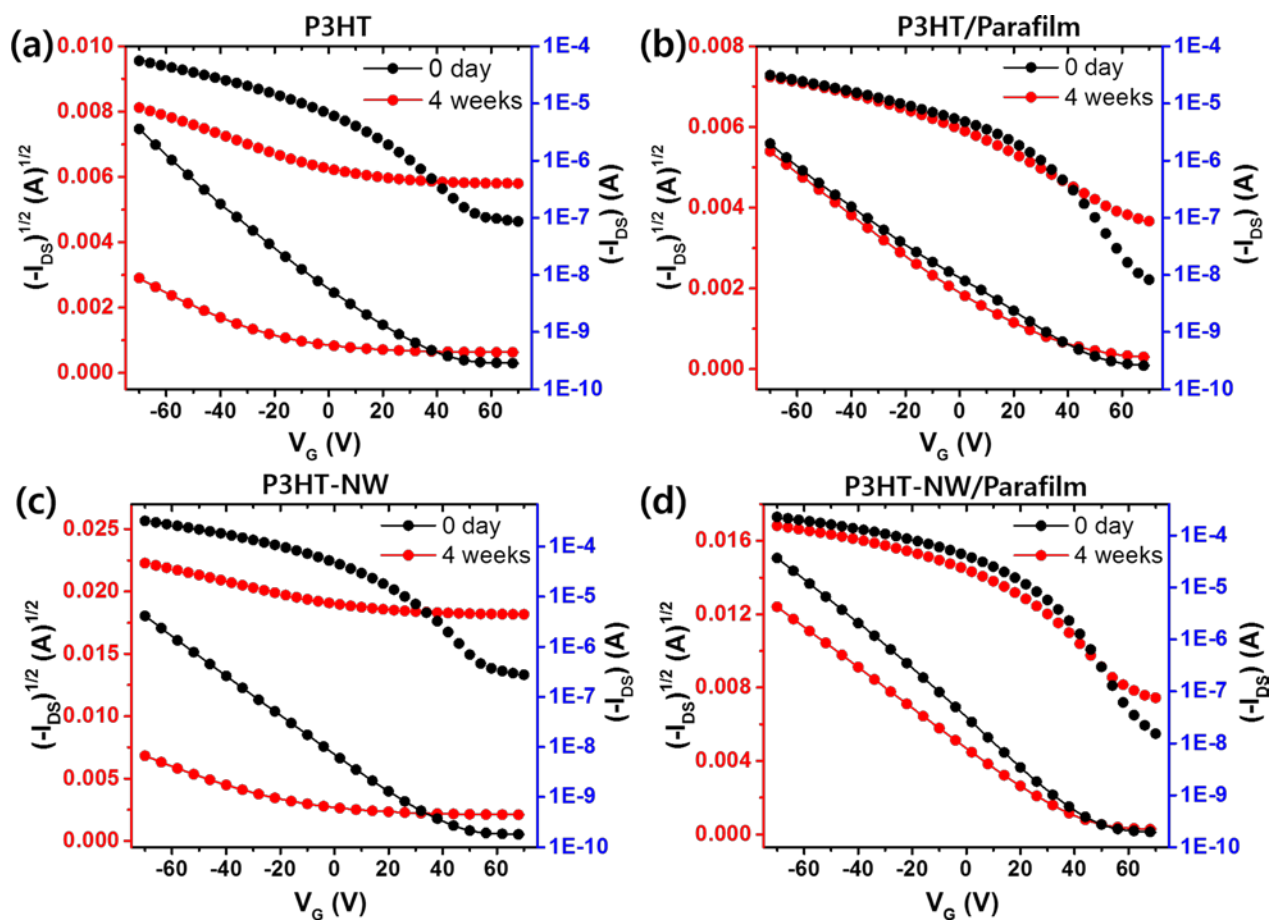
**ESI Fig. S1** Photographs of (a) pure P3HT (left), P3HT/Parafilm (middle), and P3HT-NW/Parafilm blend solutions (right) and (b) the corresponding films spin-coated on glass substrates.



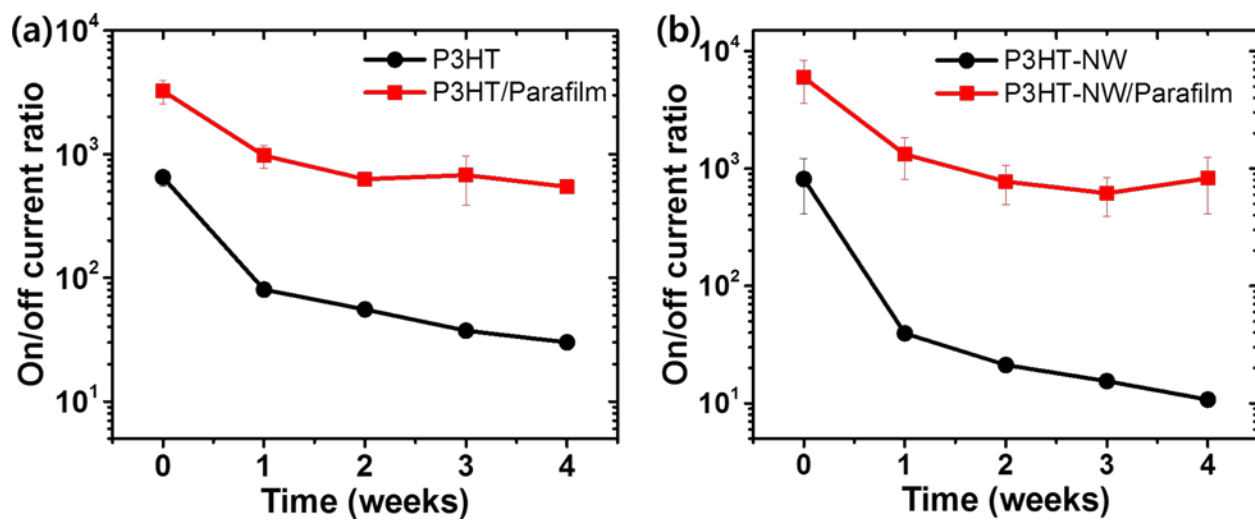
**ESI Fig. S2** AFM image of spin-coated P3HT/Parafilm (20:80) blend film.



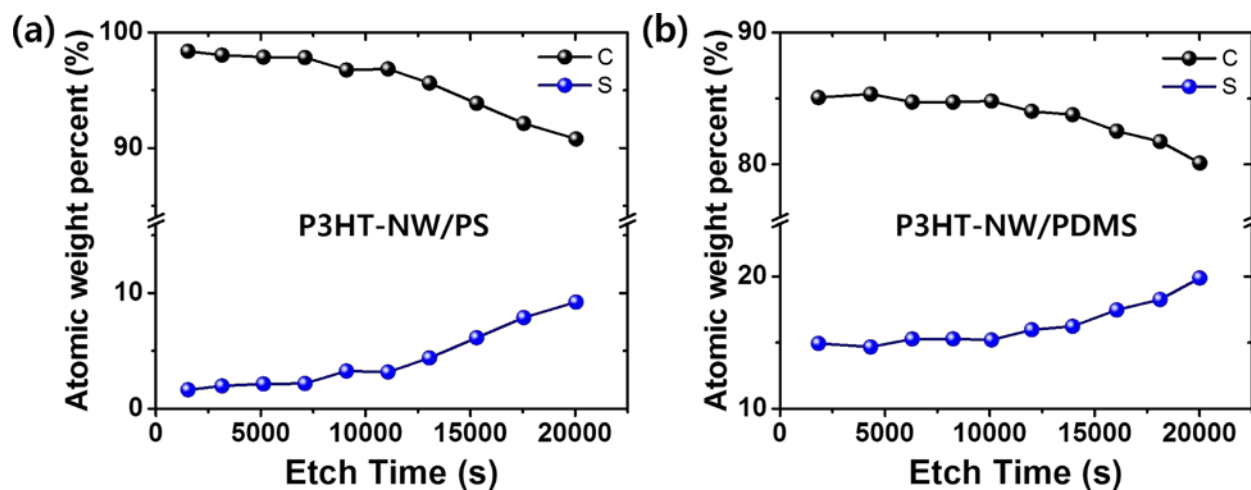
**ESI Fig. S3** Output curves of devices based on (a) P3HT, (b) P3HT/Parafilm, (c) P3HT-NW, and (d) P3HT-NW/Parafilm blend films. All films were spin-coated from the corresponding solution.



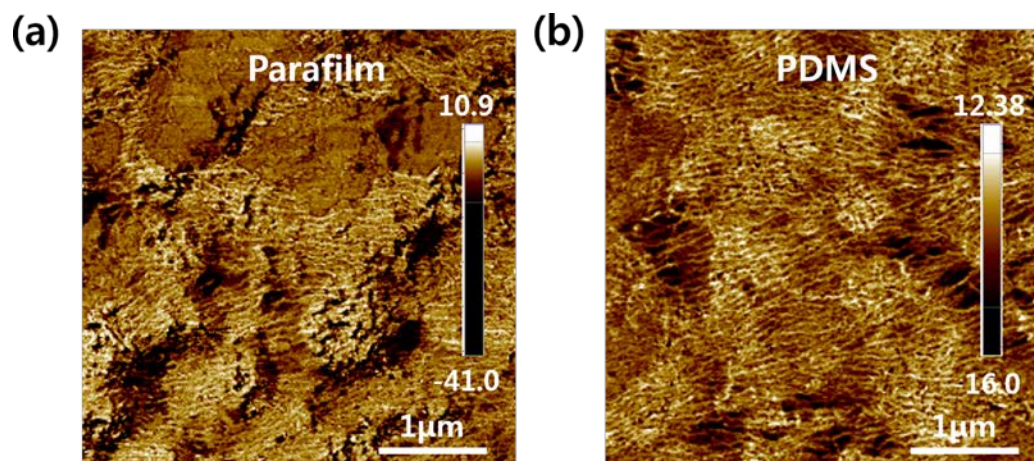
**ESI Fig. S4** Transfer characteristics of devices based on (a) P3HT, (b) P3HT/Parafilm, (c) P3HT-NW, and (d) P3HT-NW/Parafilm films before and after exposure to air for 4 weeks. All films were spin-coated from the corresponding solutions.



**ESI Fig. S5** Comparison of average on/off current ratio of the devices based on spin-coated (a) P3HT and P3HT/Parafilm blend films and (b) P3HT NW and P3HT-NW/Parafilm blend films as a function of exposure time to air.

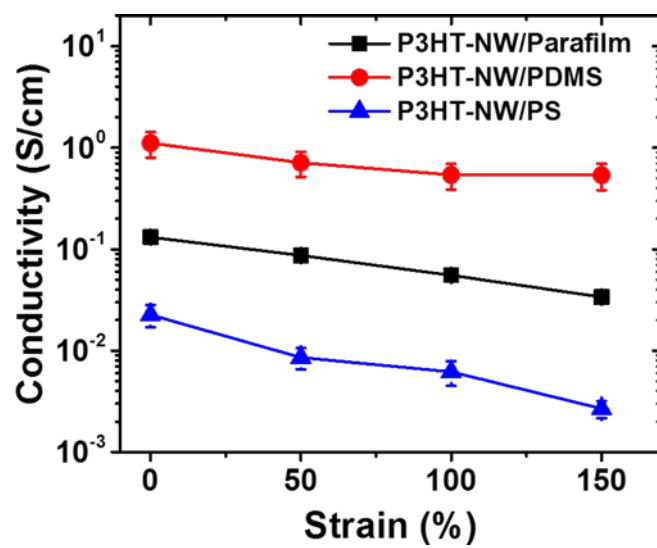


**ESI Fig. S6** XPS depth profiles of spin-coated (a) P3HT-NW/PS and (b) P3HT-NW/PDMS blend films. The carbon (C) and sulfur (S) atomic weight percent were measured during the etching process.

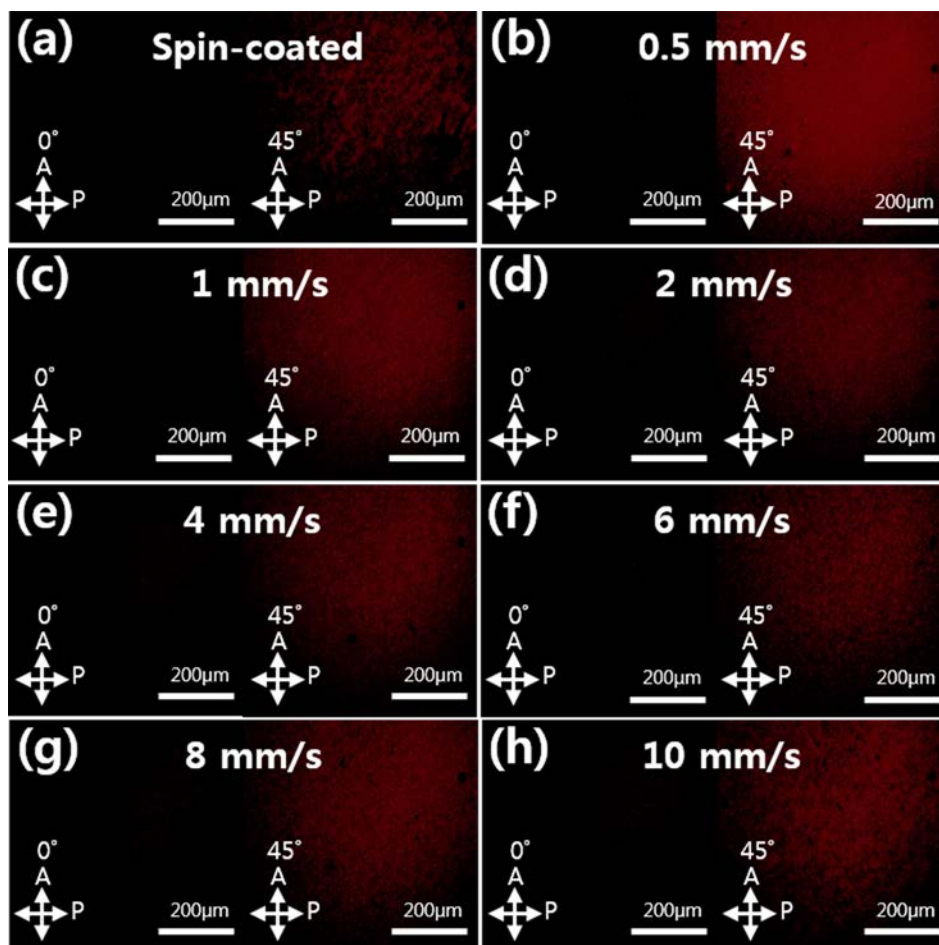


**ESI Fig. S7** AFM images of the bottom surface of (a) P3HT-NW/Parafilm and (b) P3HT-NW/PDMS blend films.

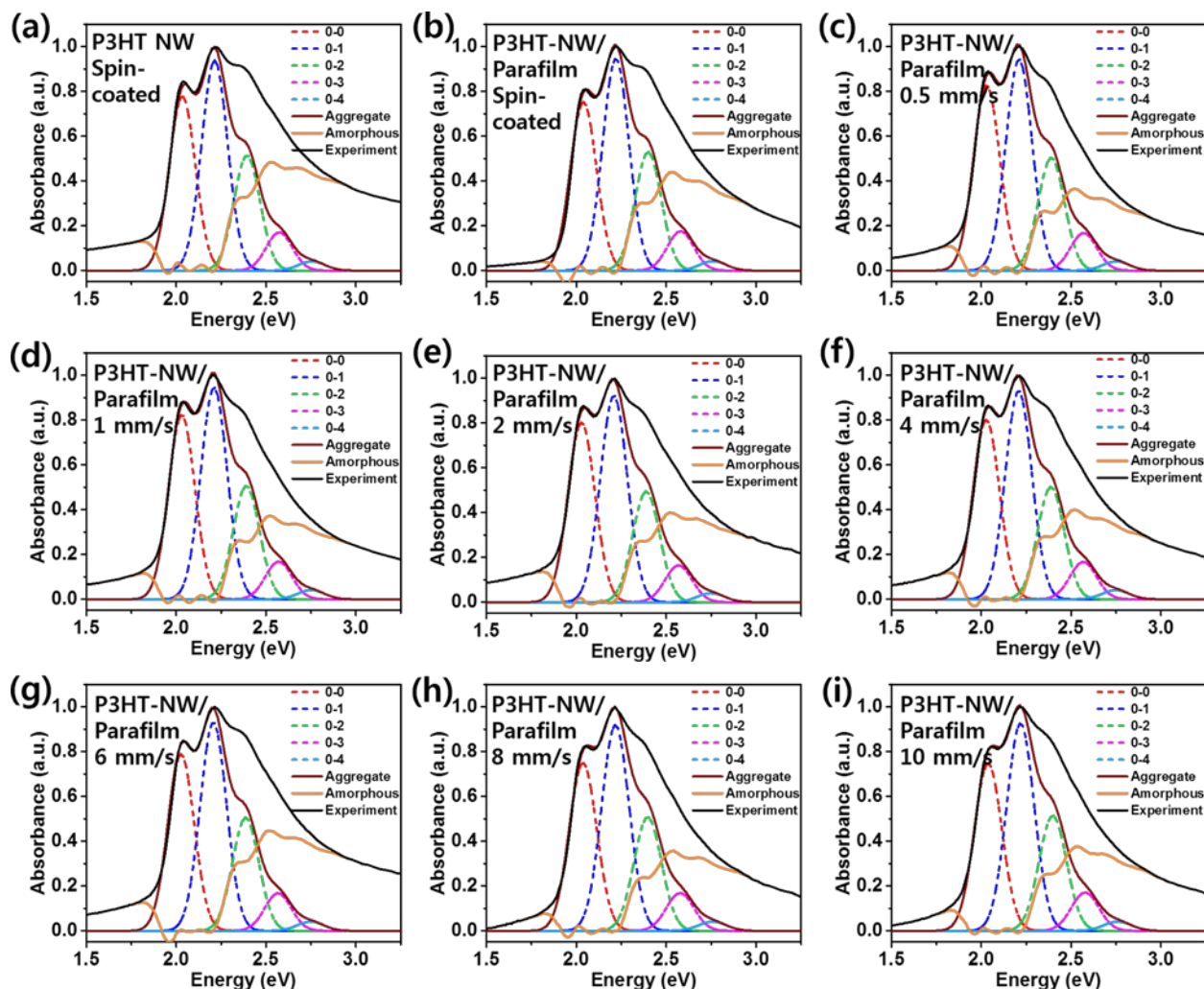




**ESI Fig. S8** Conductivity of P3HT-NW/PS, P3HT-NW/PDMS, and P3HT-NW/Parafilm blend films at different strains.



**ESI Fig. S9** POM images of P3HT-NW/paraffin blend films (a) spin-coated and shear-coated at (b) 0.5, (c) 1, (d) 2, (e) 4, (f) 6, (g) 8, and (h) 10 mm/s. **P** and **A** indicate the axes of the microscope polarizer and the light vibration plane, respectively.



**ESI Fig. S10** Absorption spectra of (a) spin-coated P3HT-NW film and P3HT-NW/Parafilm blend films: (b) spin-coated and shear-coated at (c) 0.5, (d) 1, (e) 2, (f) 4, (g) 6, (h) 8, and (i) 10 mm/s. Maroon and orange solid lines show the absorption spectra of P3HT aggregates and amorphous P3HT chains, respectively. The black lines are the experimental absorption spectra.