Supporting Information

Alignment and Charge Transport of One-Dimensional Conjugated Polymer Nanowires in Insulating Polymer Blends

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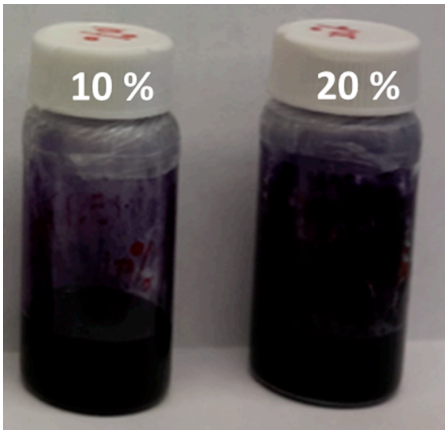

Figure S1. Photo image of 20 mL vials containing P3HT/PS (20/80) blend solutions in $CHCl_3$/dioxane solvent mixtures with 10 and 20 % dioxane, respectively. The corresponding solutions were prepared via an aging at room temperature for 3 days.

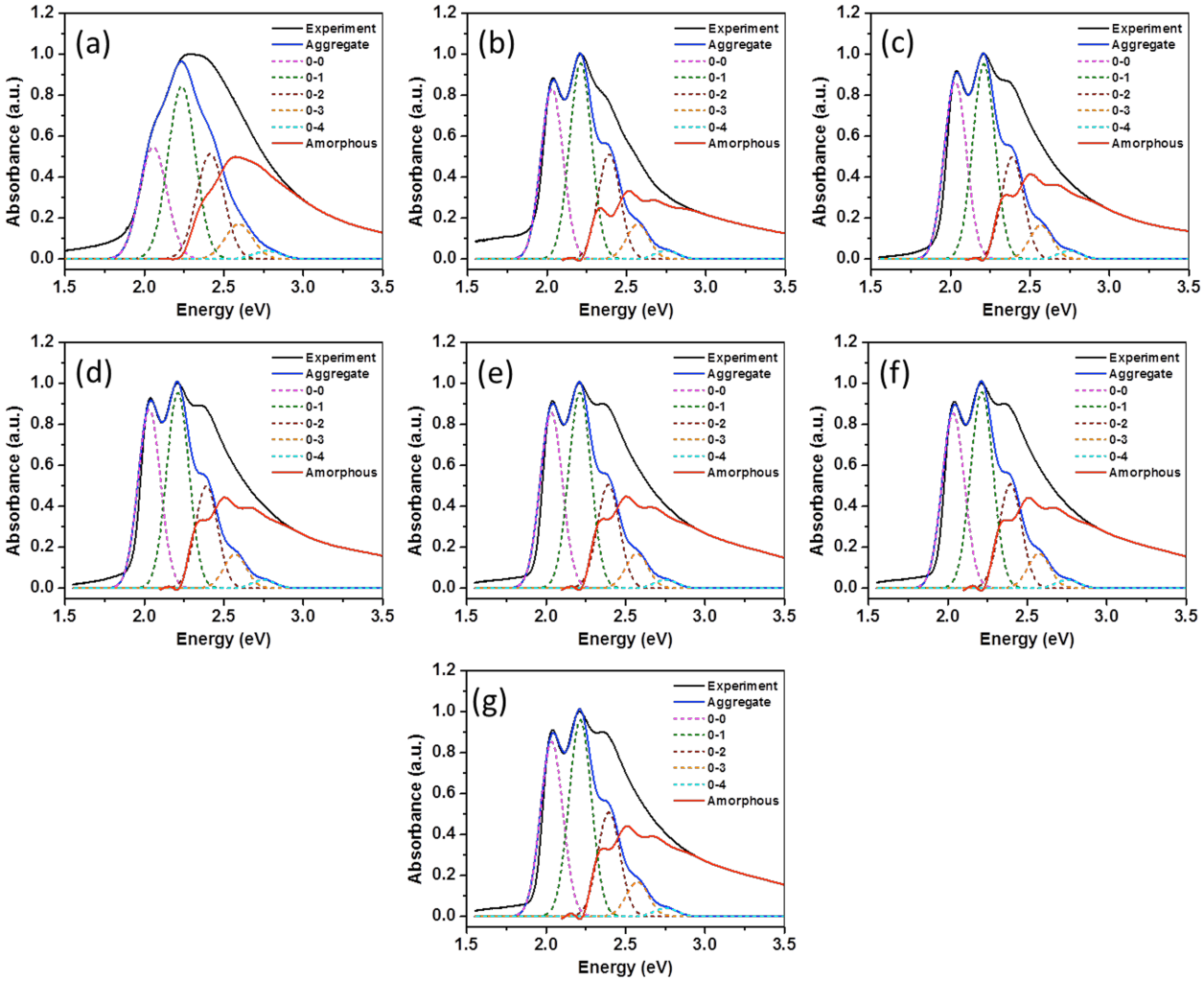

Figure S2. Absorption spectra of (a) pristine P3HT thin film spin-coated from non-aged $CHCl_3$ solution, (b) P3HT/PS (20/80) blend film spin-coated from an aged $CHCl_3$/dioxane (93/7) solution, and P3HT/PS (20/80) blend films shear-coated at (c) 0.5, (d) 1.5, (e) 2.0, (f) 3.0, and (g) 4.0 mm/s, respectively from the corresponding solution. The blue lines indicate the spectra of aggregates and the red lines indicate the absorption spectra associated with amorphous P3HT chains in the respective films. The black lines depict the experimental absorption spectra.

The Figure S2 shows the absorption spectra of spin-coated pristine P3HT film and shear-coated P3HT/PS blend films. The calculation of the relative proportion of amorphous and aggregated P3HT regions for each sample was performed, following the procedures in prior reports[1,2]

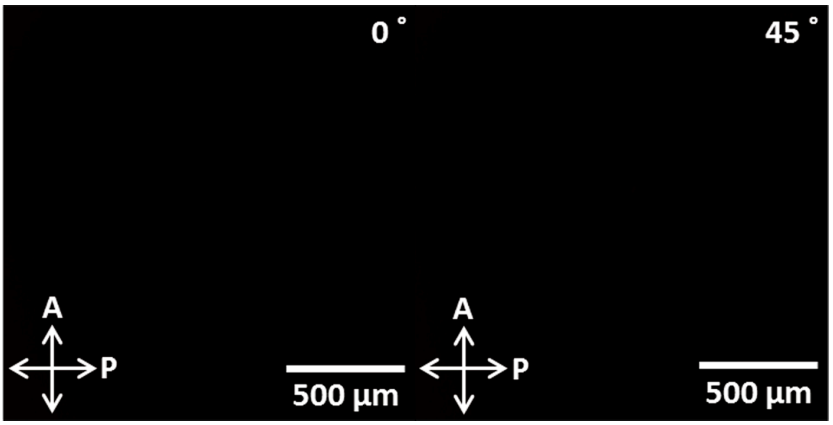

Figure S3. Polarized optical microscopy images of pristine P3HT/PS (20/80) blend film shear-coated from non-aged $CHCl_3$ solution. Shear coating was conducted at a speed of 1.0 mm/s. P and A indicate the axes of the microscope polarizer and of the light vibration plane, respectively.

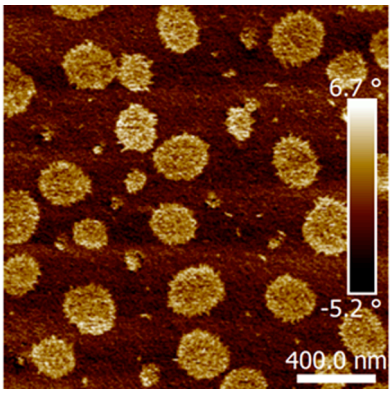

Figure S4. AFM phase image of pristine P3HT/PS (20/80) blend film spin-coated from non-aged $CHCl_3$ solution.

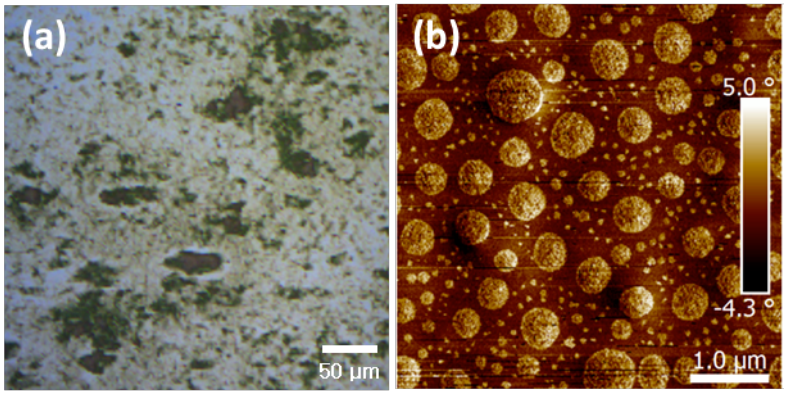

Figure S5. (a) Optical micrograph image of pure P3HT film shear-coated from an aged $CHCl_3$/dioxane (93/7) solution at a speed of 1.0 mm/s and (b) AFM image of pristine P3HT/PS (30/70) blend film shear-coated from non-aged $CHCl_3$ solution.

REFERENCES

(1) Clark, J.; Chang, J. F.; Spano, F. C.; Friend, R. H.; Silva, C. Determining Exciton Bandwidth and Film Microstructure in Polythiophene Films Using linear Absorption Spectroscopy. Appl. Phys. Lett. 2009, 94, 163306.

(2) Zhao, K.; Khan, H. U.; Li, R. P.; Su, Y. S.; Amassian, A. Entanglement of Conjugated Polymer Chains Influences Molecular Self-Assembly and Carrier Transport. *Adv*. *Funct*. *Mater*. **2013**, *23*, 6024-6035.