Supporting Information

Poly(3-butylthiophene) Nanowires Inducing Crystallization of Poly(3-hexylthiophene) for Enhanced Photovoltaic Performance

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Table S1. The composition of the ternary blend solution.

P3BT-nw content (wt%)	PCBM (40 mg/mL)	P3HT (40 mg/mL)	P3BT-nw (2 mg/mL; 10 mg/mL)	ODCB
0	0.2 mL	0.2 mL	0	0.400 mL
3	0.2 mL	0.194 mL	2 mg/mL, 0.12 mL	0.286 mL
7	0.2 mL	0.186 mL	2 mg/mL, 0.28 mL	0.134 mL
10	0.2 mL	0.180 mL	2 mg/mL, 0.40 mL	0.020 mL
25	0.2 mL	0.150 mL	10 mg/mL, 0.20 mL	0.250 mL
50	0.2 mL	0.100 mL	10 mg/mL, 0.40 mL	0.100 mL

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The DSC samples were prepared by the followed steps. First, the P3HT solution (10 mg/mL) and P3BT-nw suspension (1 mg/mL; 10 mg/mL) were prepared in ODCB in bottles. Second, the P3HT solution and P3BT-nw suspension of different volume were mixed as illustrated in **Table S2**. Finally, the samples were dried in vacuum prior to the DSC analysis.

Table S2. The composition of the P3HT:P3BT-nw blends using for the DSC measurement.

P3BT-nw content (wt%)	P3HT (10 mg/mL)	P3BT-nw (1 mg/mL; 10 mg/mL)	ODCB
0	0.5 mL	0	0.50 mL
3	0.5 mL	1 mg/mL, 0.15 mL	0.35 mL
7	0.5 mL	1 mg/mL, 0.35 mL	0.15 mL
10	0.5 mL	1 mg/mL, 0.50 mL	0 mL
25	0.5 mL	10 mg/mL, 0.125 mL	0.375 mL
50	0.5 mL	10 mg/mL, 0.25 mL	0.25 mL
100	0 mL	10 mg/mL, 0.50 mL	0.50 mL

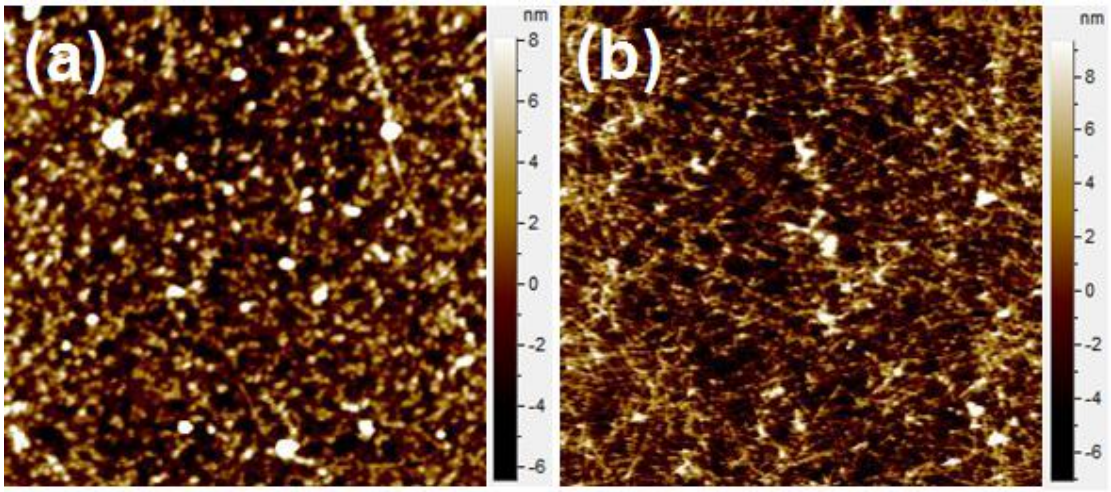

Figure S1. AFM topography images (5×5 μm) of P3BT film (a, b) and P3BT-nw film (c, d), respectively.

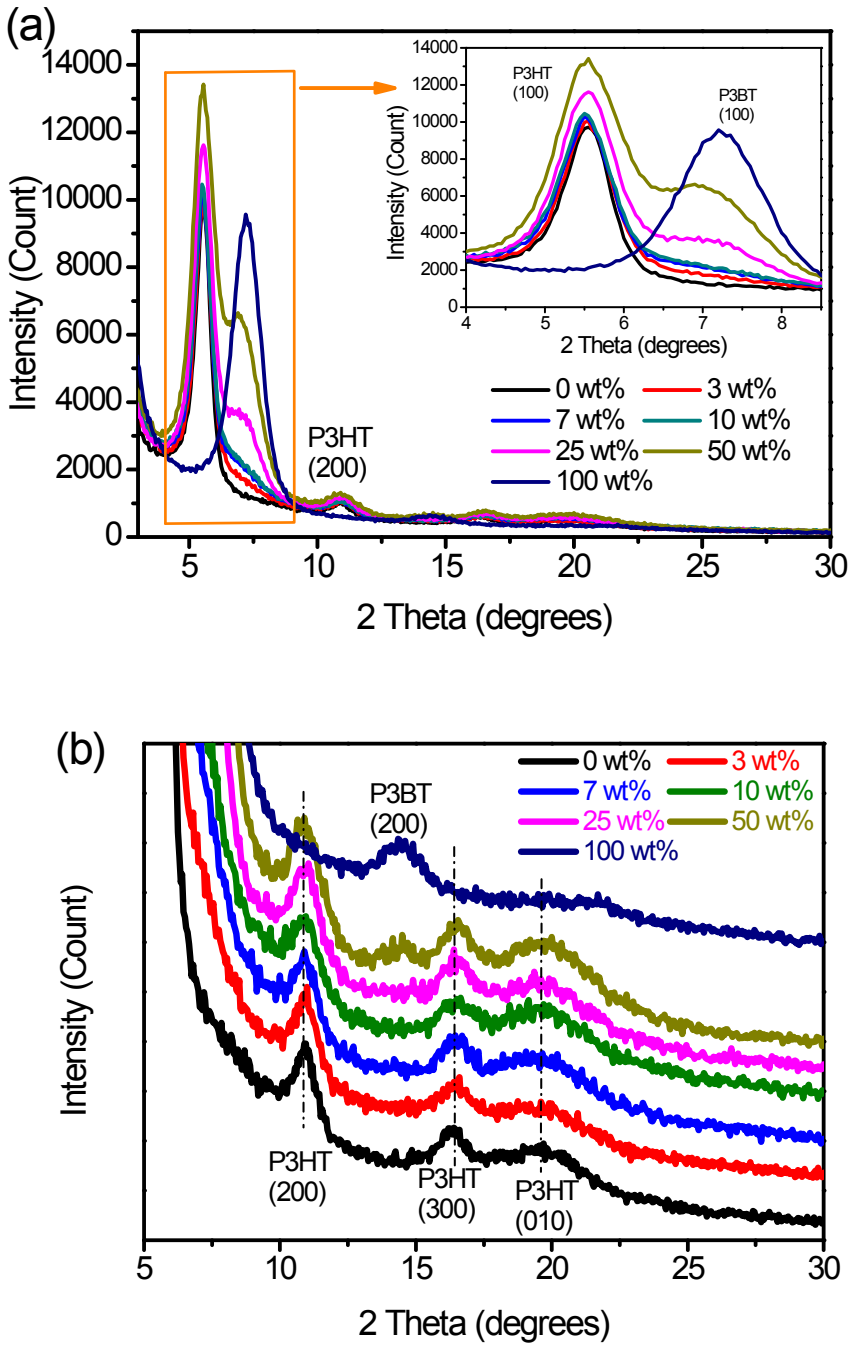

Figure S2. GIXRD (a) and enlarged GIXRD (b) of P3HT:P3BT-nw blends at different weight percentage of P3BT-nw.

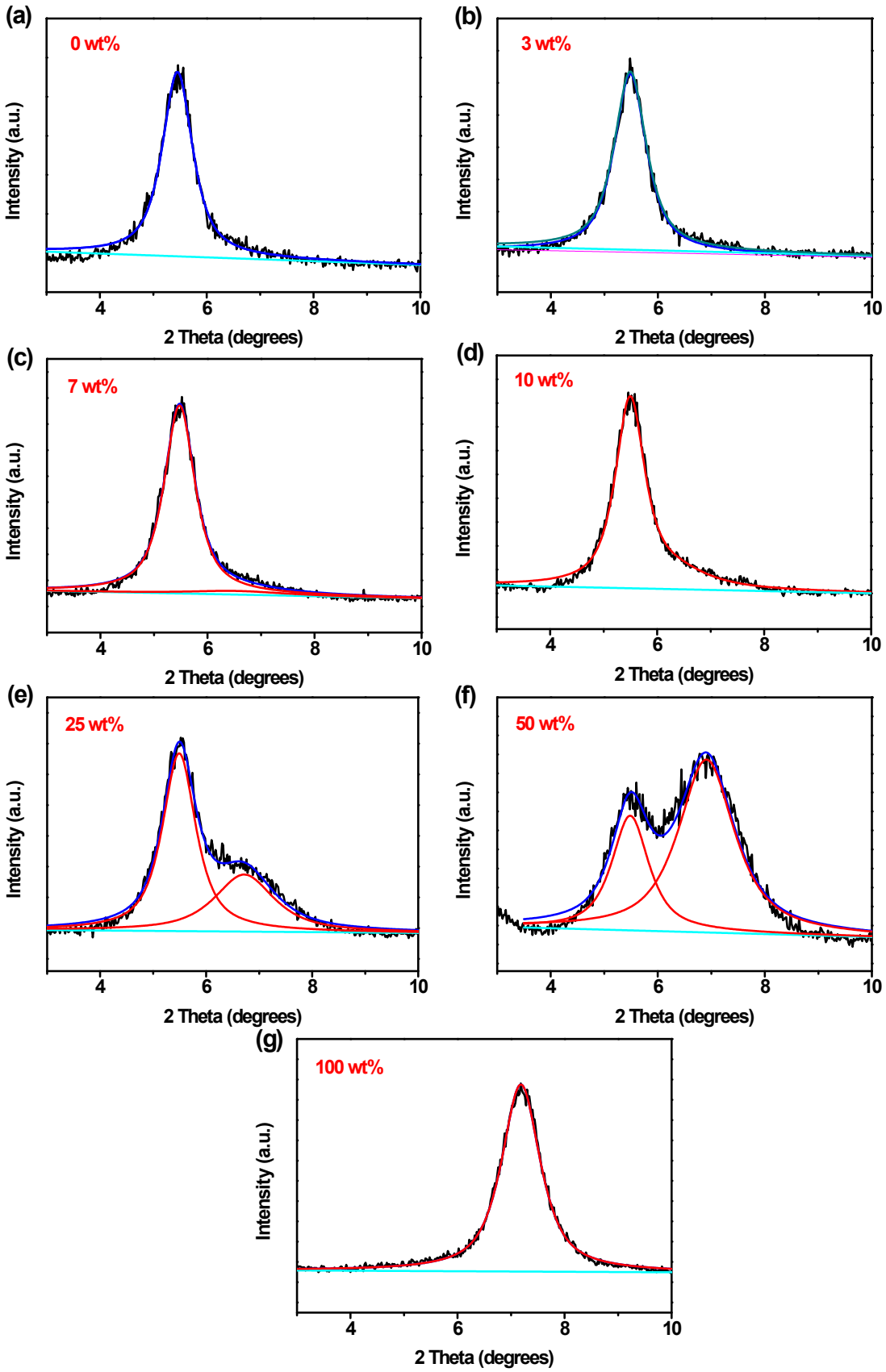

Figure S3. Fitted peaks of XRD of P3HT:P3BT-nw blends at different weight percentage of P3BT-nw.

Table S3. Parameters of P3HT:P3BT-nw blends at different weight percentage of P3BT-nw by fitting XRD diffraction peaks.

P3BT content	0 wt%	3 wt%	7 wt%	10 wt%	25 wt%	50 wt%	100 wt%
$2\theta^1$(°)	5.46	5.48	5.48	5.50	5.50	5.50	
$d_{lamella}{}^1$(nm)	1.617	1.611	1.611	1.605	1.605	1.605	
FWHM[1](nm)	0.69	0.70	0.71	0.73	0.75	0.83	
CCL[1](nm)	9.10	8.97	8.85	8.60	8.37	7.57	
Area[1]	472.2	562.0	753.9	762.6	639.8	366.8	
$2\theta^2$(°)					6.72	6.92	7.18
$d_{lamella}{}^2$(nm)					1.314	1.276	1.230
FWHM[2](nm)					1.34	1.25	0.86
CCL[2](nm)					4.69	5.02	7.30
Area[2]					365.4	835.0	1172

[1] P3HT.

[2] P3BT.

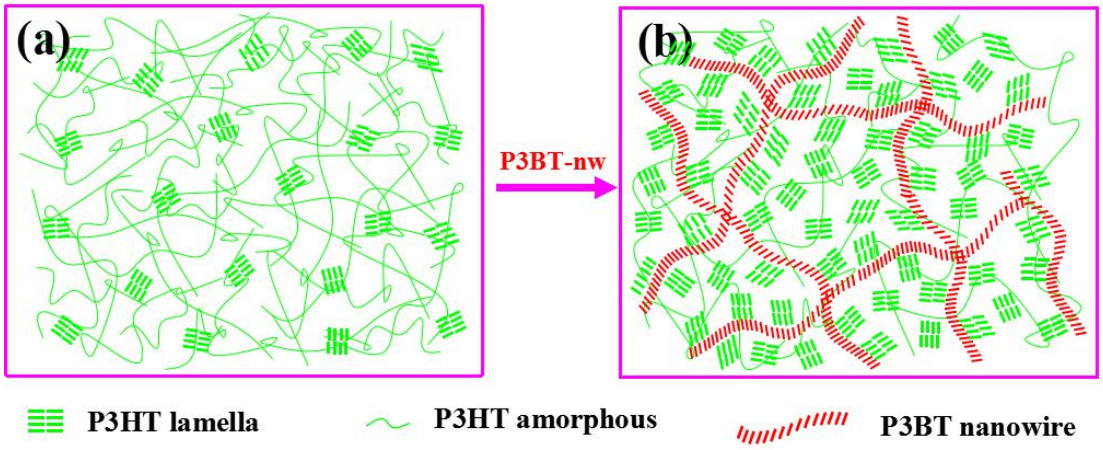

Figure S4. Schematic illustration of the morphology of (a) P3HT and (b) P3HT:P3BT-nw binary blend films.

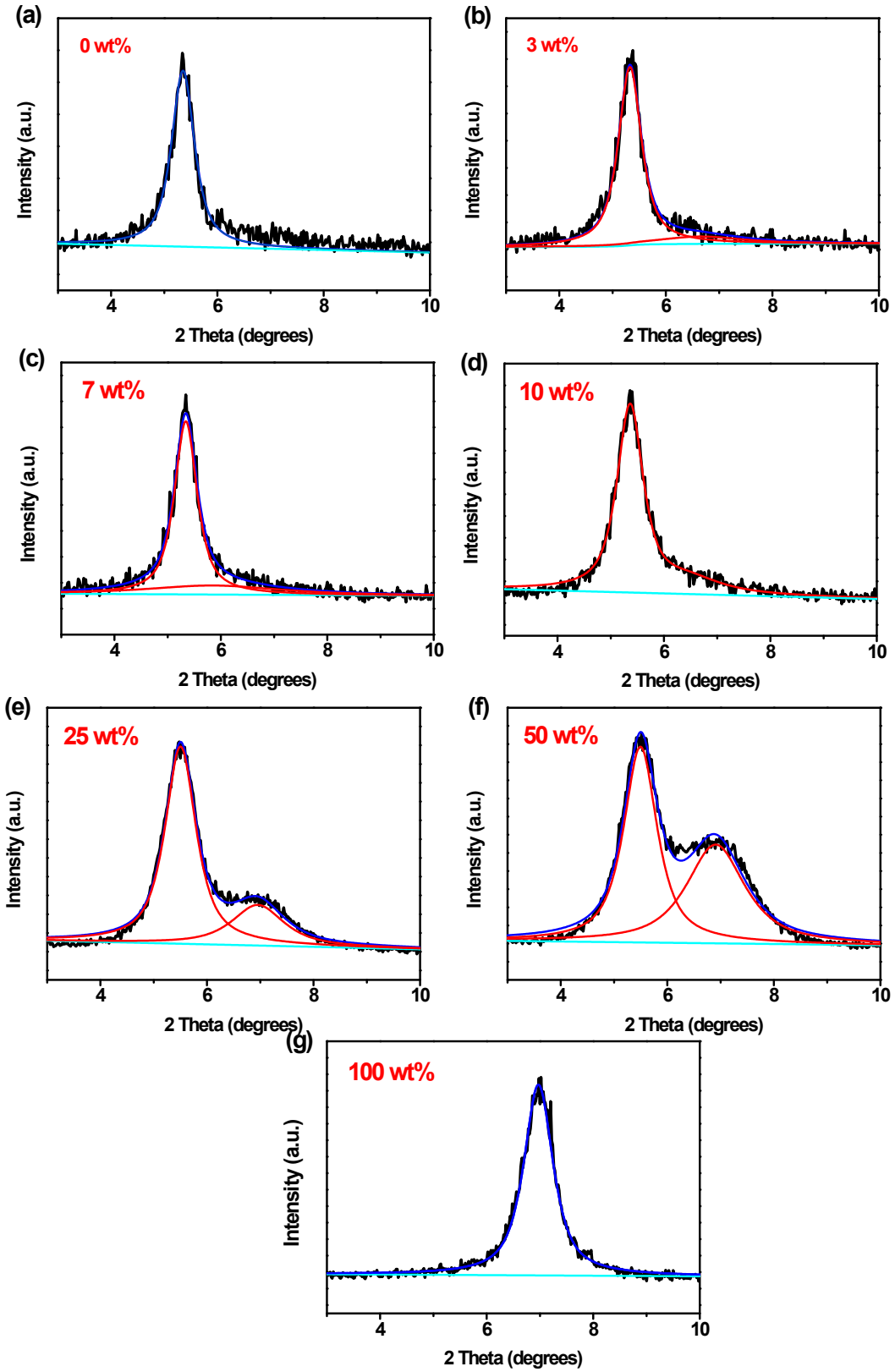

Figure S5. Fitted peaks of XRD of P3HT:P3BT-nw:PCBM blends at different weight percentage of P3BT-nw.

Table S4. Parameters of P3HT:P3BT-nw:PCBM blends at different weight percentage of P3BT-nw by fitting XRD diffraction peaks.

P3BT content	0 wt%	3 wt%	7 wt%	10 wt%	25 wt%	50 wt%	100 wt%
$2\theta_1$(°)	5.34	5.34	5.34	5.36	5.50	5.50	
$d_{lamella1}$(nm)	1.653	1.653	1.653	1.647	1.605	1.605	
$FWHM_1$(nm)	0.51	0.51	0.52	0.59	0.69	0.75	
CCL_1(nm)	12.3	12.3	12.1	10.6	9.10	8.37	
$Area_1$	418.5	514.9	542.0	737.7	1070	1188	
$2\theta_2$(°)					6.96	6.96	6.98
$d_{lamella2}$(nm)					1.269	1.269	1.265
$FWHM_2$(nm)					1.16	1.30	0.66
CCL_2(nm)					5.41	4.83	9.52
$Area_2$					368.9	1042	1116

[1] P3HT.

[2] P3BT.

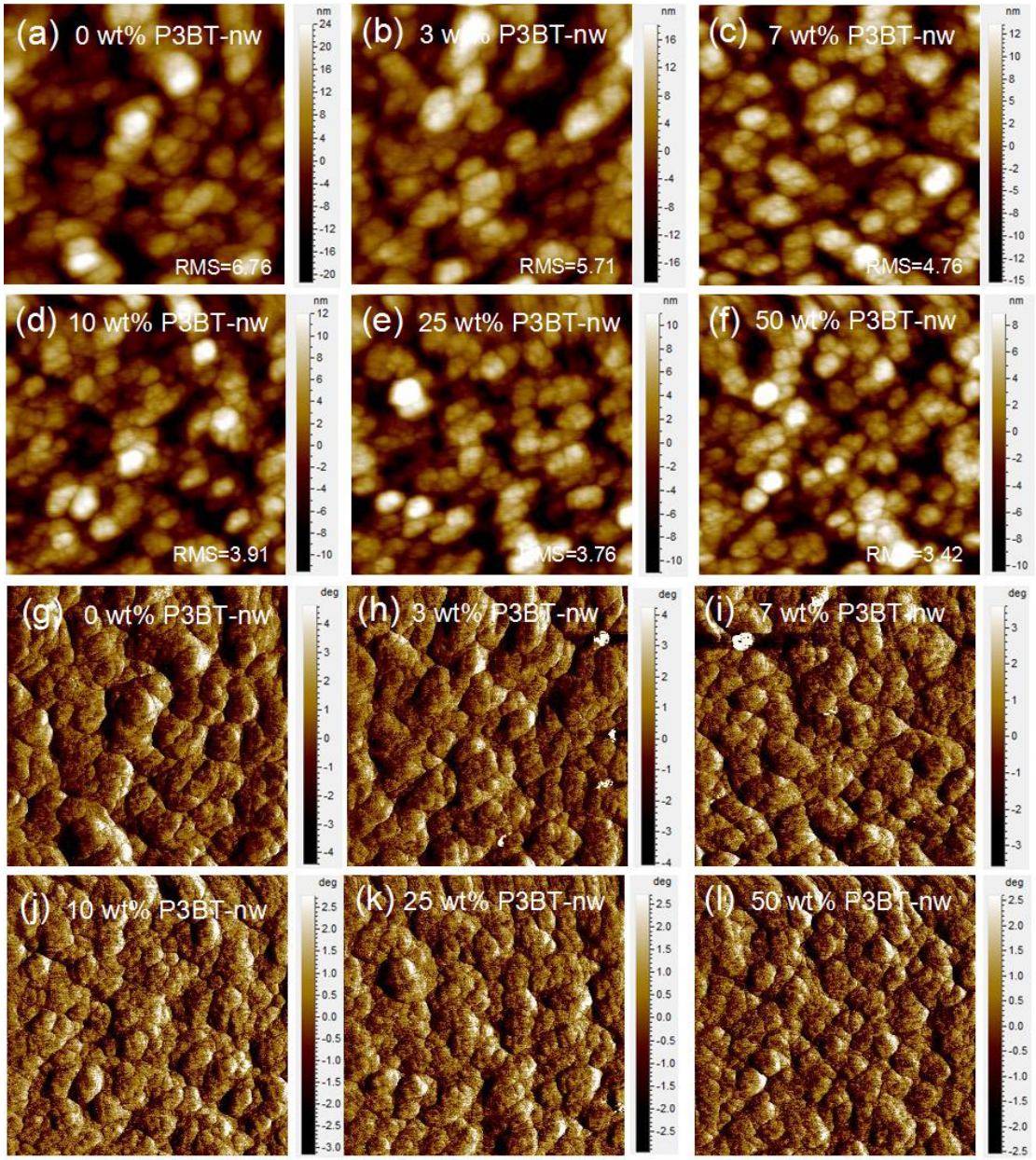

Figure S6. AFM topography images (5×5 μm) and phase images of P3HT:PCBM films with various weight percentage of P3BT-nw (a, g) 0 wt%, (b, h) 3 wt%, (c, i) 7 wt%), (d, j) 10 wt%, (e, k) 25 wt%, (f, l) 50 wt%, respectively.

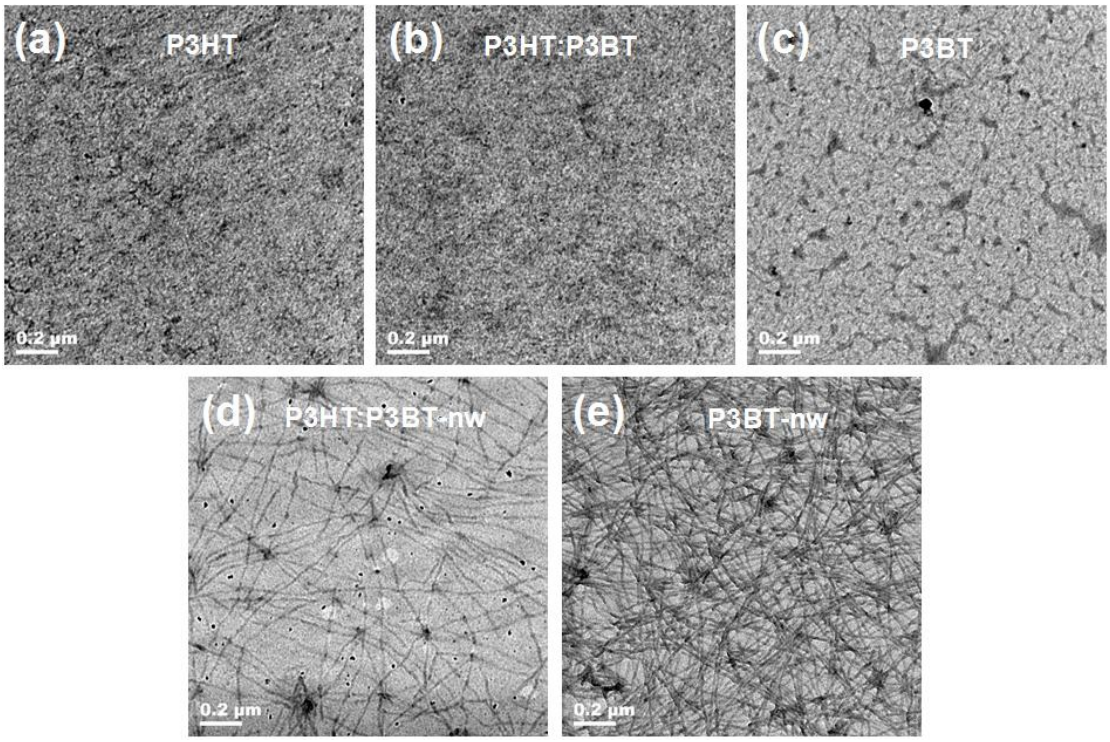

Figure S7. TEM images of pristine (a) P3HT, (b) P3HT:P3BT blend containing 7 wt% P3BT, (c) P3BT, (d) P3HT:P3BT-nw blend containing 7 wt% P3BT-nw and (e) P3BT-nw films.