

Electronic Supplementary Information (ESI)

Controlling the concentration gradient in sequentially deposited bilayer organic solar cells via rubbing and annealing

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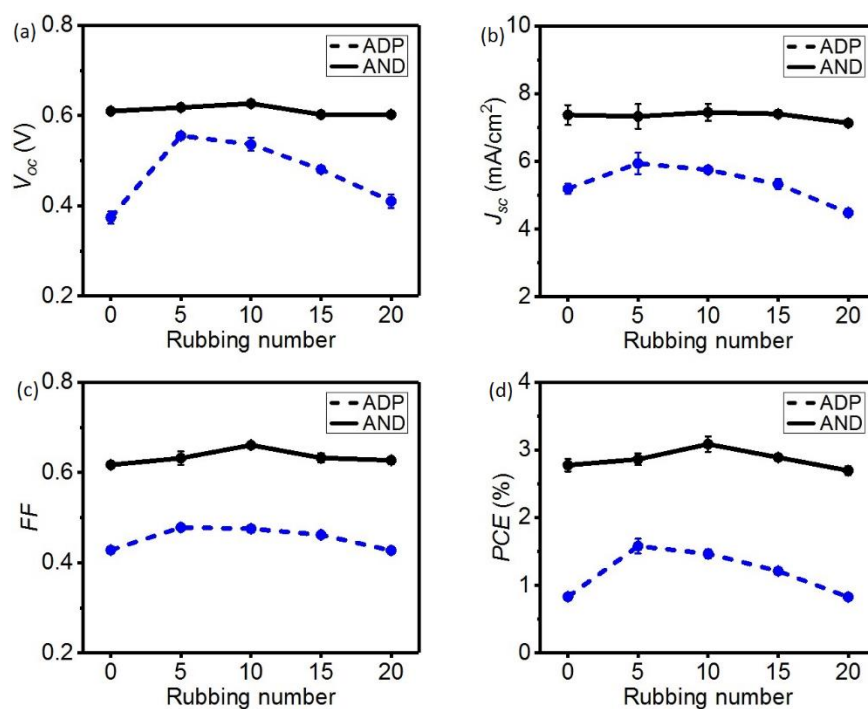


Figure S1: (a) V_{oc} , (b) J_{sc} , (c) FF and (d) PCE of ADP and AND P3HT/PCBM devices with different rubbing times.

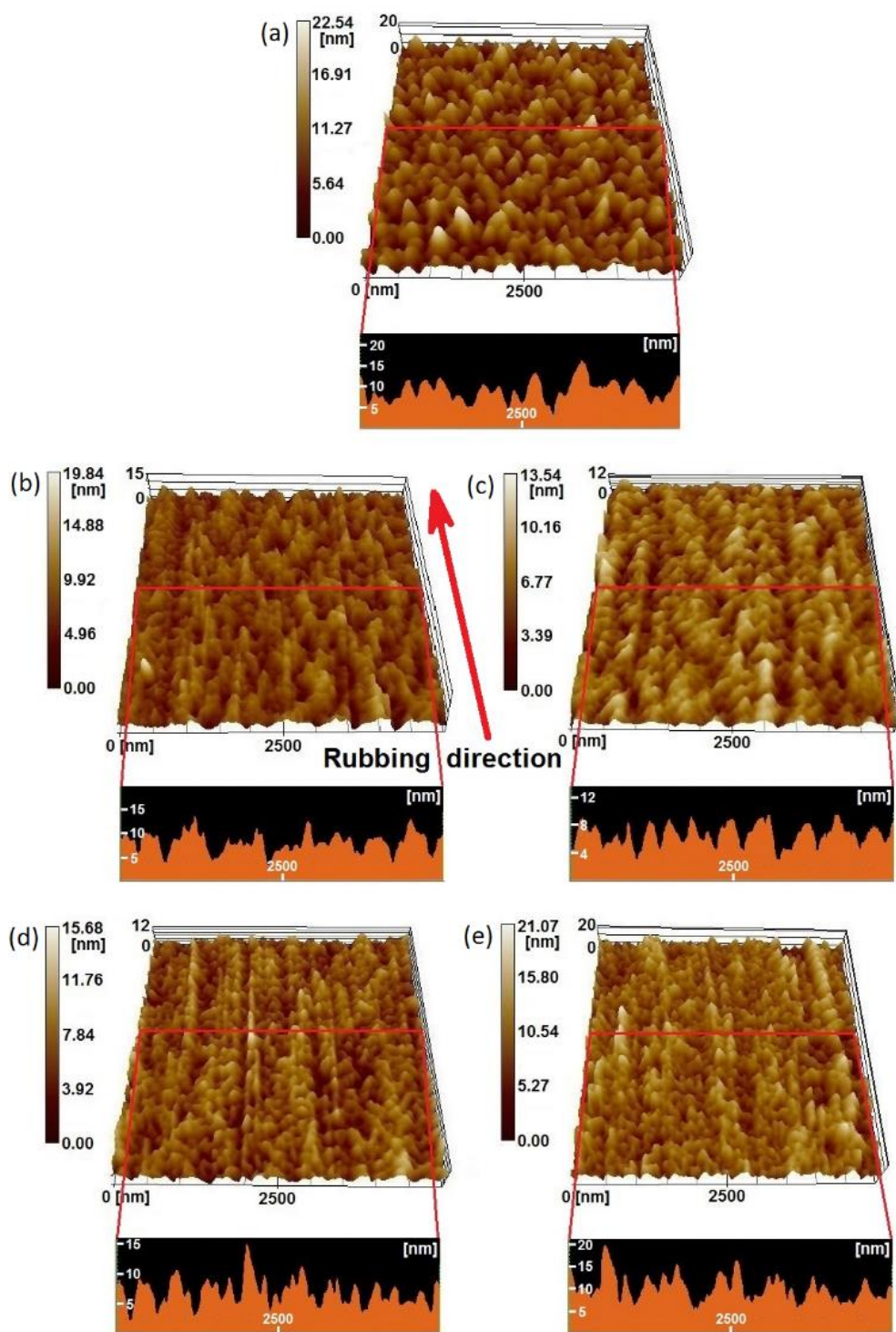


Figure S2: AFM

P3HT films corresponding to (a) 0, (b) 5, (c) 10, (d) 15 and (e) 20 times rubbing. Each image corresponds to an area of $5\ \mu\text{m} \times 5\ \mu\text{m}$.

images of ADP

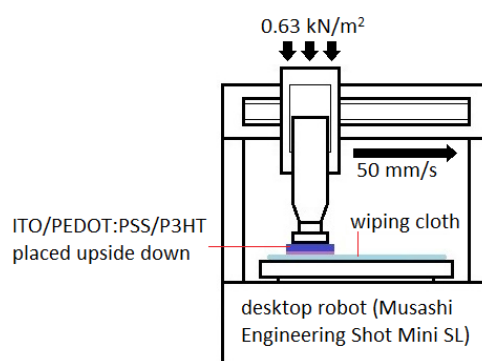


Figure S3: The schematic diagram of auto-rubbing technique.

Table S1. Average PV characteristics of unrubbed, 10 times hand-rubbed and 10 times machine-rubbed ADP P3HT/PCBM devices.

Rubbing number	Method	V_{oc} (V)	J_{sc} (mA/cm ²)	FF	PCE (%)	PCE enhancement ^a
0	-	0.37±0.01	5.19±0.14	0.43±0.01	0.83±0.03	100%
10	Hand	0.54±0.01	5.75±0.08	0.48±0.01	1.47±0.07	176%
10	Machine	0.56±0.01	5.46±0.28	0.48±0.01	1.46±0.03	176%

^a PCE enhancement with respect to the PCE of unrubbed devices