

Electronic Supplemental Information for:

Oleamide as a self-assembled cathode buffer layer for polymer solar cells: the role of the terminal group on the function of the surfactant

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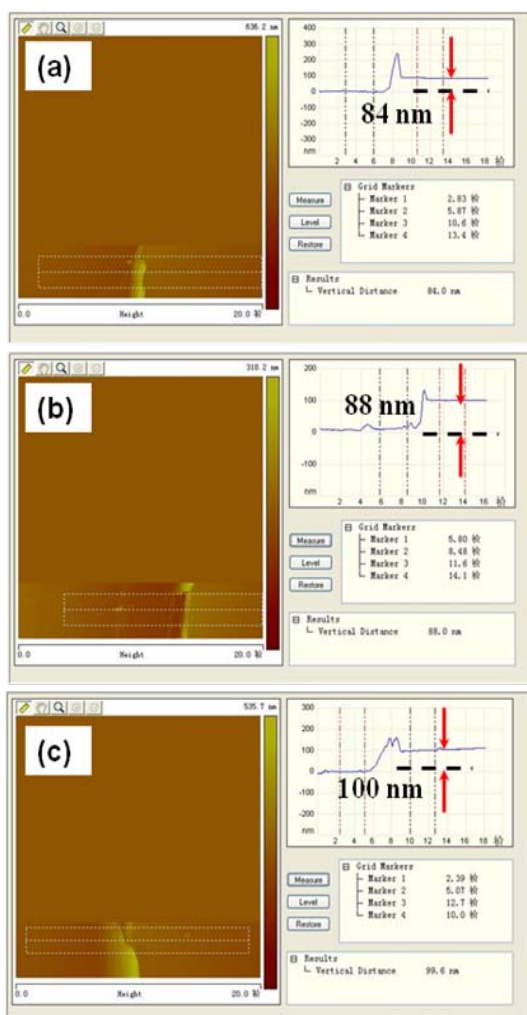


Figure S1. AFM height images (10 μm × 10 μm) of P3HT:PCBM films without oleamide (a) and with oleamide CBL of 2.5 wt% (b) and 5 wt% doping in P3HT:PCBM layer. The measurements were carried out by using a sharp blade to generate ~10 μm wide cuts in the layer and the depth profile of the terrace of the cut is shown in the right. The thicknesses of the oleamide CBL on the top of the P3HT:PCBM active layer were directly by subtracting the sum thickness of the P3HT:PCBM/oleamide bilayers with that of the single P3HT:PCBM layer.

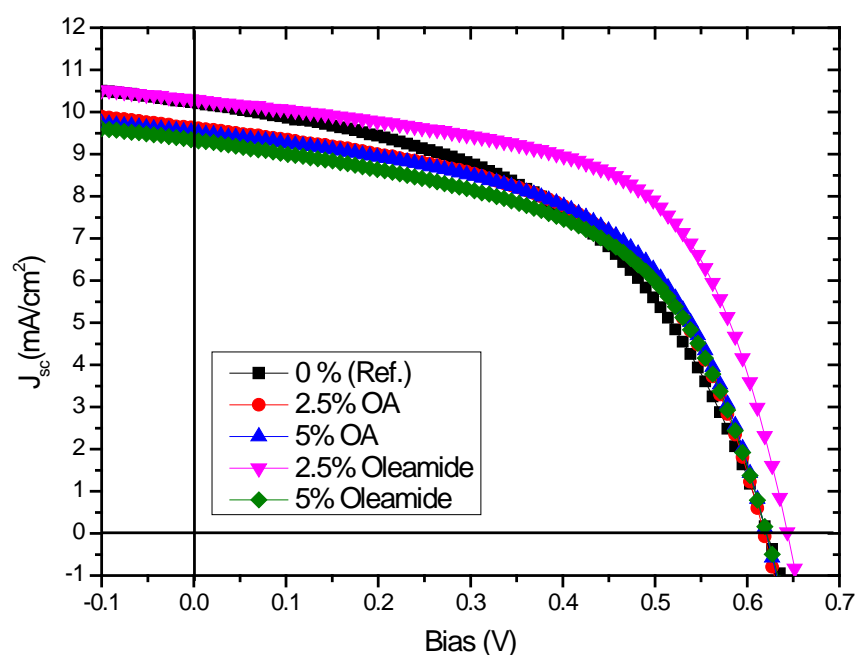


Figure S2. J-V curves of the OA-incorporated of P3HT:PCBM devices after thermal annealing with different OA doping ratios (2.5%, 5%) and without OA (0%). For comparison, J-V curves of the oleamide-incorporated P3HT:PCBM devices after thermal annealing with the oleamide doping ratios of 2.5% and 5% are also shown (copied from Fig. 1).

Table S1. Device parameters of ITO/PEDOT:PSS/P3HT:PCBM/Al BHJ-PSCs after thermal annealing with different OA doping ratios (2.5%, 5%) and without OA (0%). For comparison, the parameters of the oleamide-incorporated P3HT:PCBM devices after thermal annealing with the oleamide doping ratios of 2.5% and 5% are also shown (copied from Table 1).

Composition of photoactive layer ^a	Doping ratio of additive ^b		V _{oc} (V)	J _{sc} (mA/cm ²)	FF (%)	PCE (%)	ΔPCE ^c	R _s (Ω·cm ²)	R _{sh} (Ω·cm ²)
0:1:0.8 (ref.)	0%		0.62	10.21	49	3.09	-	15.1	297
0.045:1:0.8	OA	2.5%	0.62	9.62	54	3.20	4%	11.9	351
0.090:1:0.8		5%	0.62	9.51	55	3.23	4.5%	11.6	385
0.045:1:0.8	oleamide	2.5%	0.64	10.29	60	3.94	28%	9.6	409
0.090:1:0.8		5%	0.62	9.32	54	3.11	1%	12.6	318

^[a] OA:P3HT:PCBM = X mg : 1mg : 0.8mg, X =0, 0.045, and 0.090.

^[b] Doping ratio OA (wt%) = X/(1+0.8).

^[c] ΔPCE is the enhancement of PCE relative to the reference P3HT:PCBM BHJ-PSCs.