

## Supplementary Information

### Effect of Molecular Weight of Additives on the Conductivity of PEDOT:PSS and Efficiency for ITO-free Organic Solar Cells

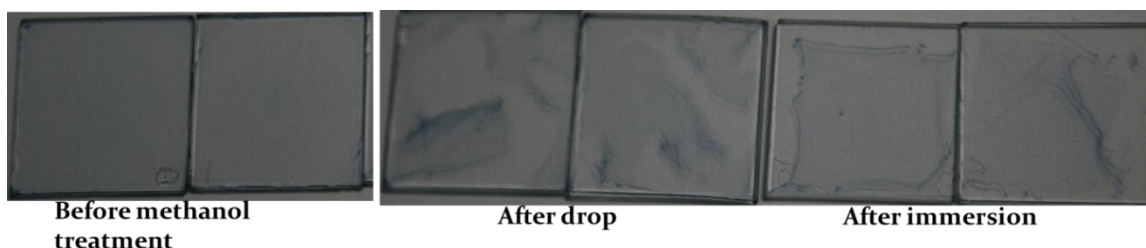
Desalegn Alemu,<sup>a,b,c</sup> Pen-Cheng Wang<sup>c</sup> and Chih-Wei Chu<sup>\*b,d</sup>

<sup>a</sup>Nanoscience and Technology Program, Taiwan International Graduate Program, Academia Sinica, Taipei 115, Taiwan

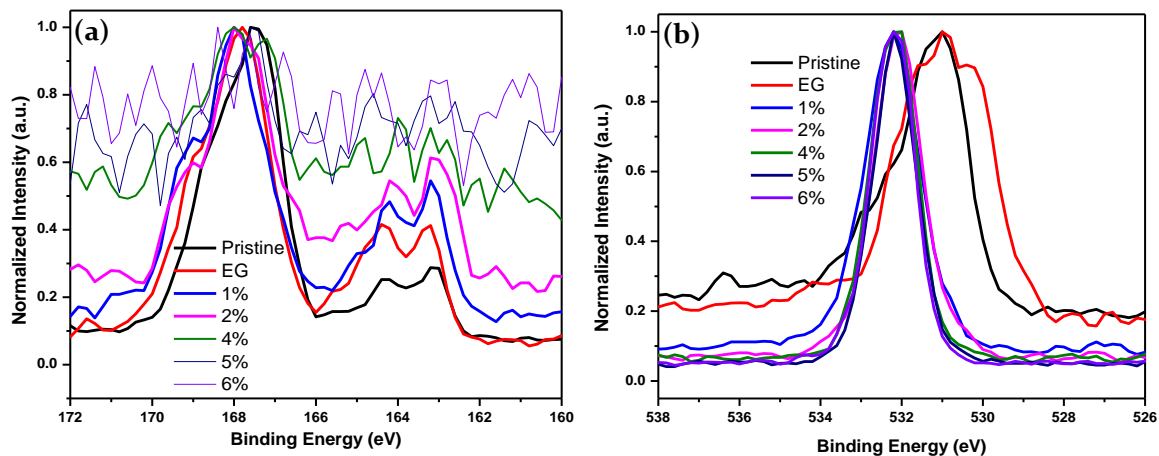
<sup>b</sup>Research Center for Applied Sciences, Academia Sinica, Taipei 115, Taiwan, Fax: 886-2-27896680 Tel: 886-2-27898000 ext 70 E-mail: [gchu@gate.sinica.edu.tw](mailto:gchu@gate.sinica.edu.tw)

<sup>c</sup>Department of Engineering and Systems Science, National Tsing Hua University, Hsinchu 30013, Taiwan

<sup>d</sup>Department of Photonics, National Chiao Tung University, Hsinchu 300, Taiwan



**Fig. S1** PEDOT:PSS film prepared using 2% PEG400 additive before and after film treatment with methanol by dropping methanol on the film or immersing the film in methanol after annealing



**Fig. S2** XPS spectra of pristine PEDOT:PSS and PEDOT:PSS films treated with 6% EG and different concentration PEG400. (The numbers indicate the concentration of PEG400) (a) S(2p), (b) O(1s) core-level spectra.

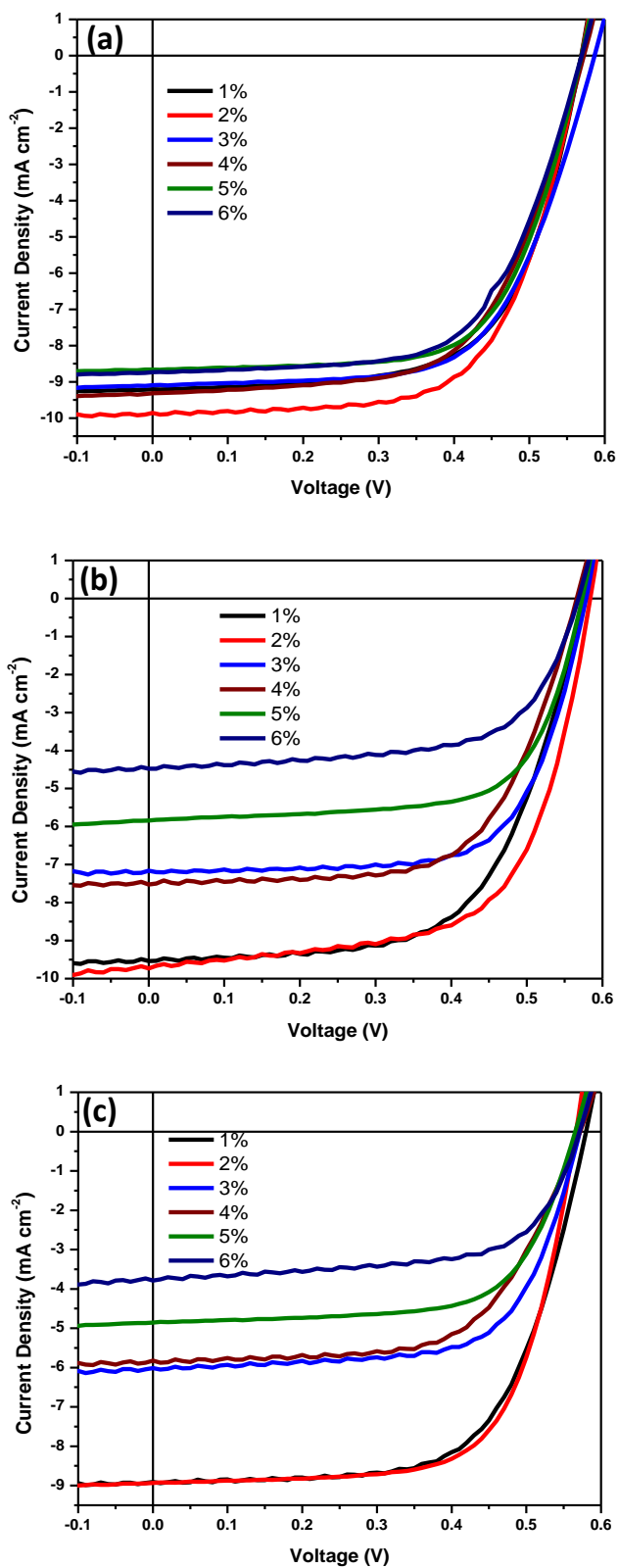


Fig. S3 *J-V* curves of OSCs with PEDOT:PSS anodes treated using different concentration PEG: (a) PEG200, (b) PEG300 and (c) PEG400.

**Table S1** Photovoltaic performances of OSC devices with PEDOT:PSS treated with different concentration PEG200 extracted from Fig. S3a.

PEG Conc.	$J_{SC}$ (mA $cm^{-2}$ )	$V_{OC}$ (V)	FF (%)	PCE (%)
1	9.21	0.58	63.84	3.41
2	9.86	0.58	63.13	3.61
3	9.1	0.59	62.95	3.38
4	9.32	0.58	61.55	3.27
5	8.66	0.58	64.70	3.25
6	8.73	0.58	61.62	3.12

**Table S2** Photovoltaic performances of OSC devices with PEDOT:PSS treated with different concentration PEG300 extracted from Fig. S3b.

PEG Conc.	$J_{SC}$ (mA $cm^{-2}$ )	$V_{OC}$ (V)	FF (%)	PCE (%)
1	9.54	0.58	61.09	3.38
2	9.73	0.58	63.44	3.58
3	7.16	0.58	68.87	2.86
4	7.52	0.58	62.36	2.72
5	5.84	0.58	67.02	2.27
6	4.48	0.57	63.44	1.62

**Table S3** Photovoltaic performances of OSC devices with PEDOT:PSS treated with different concentration PEG400 extracted from Fig. S3c.

PEG Conc.	$J_{SC}$ (mA $cm^{-2}$ )	$V_{OC}$ (V)	FF (%)	PCE (%)
1	8.91	0.58	64.44	3.33
2	8.93	0.58	66.42	3.44
3	6.01	0.58	65.98	2.30
4	5.82	0.58	61.91	2.09
5	4.83	0.58	65.68	1.84
6	3.79	0.57	63.42	1.37