Electronic Supplementary Information

Easy-accessible fullerenol as cathode buffer layer for inverted organic photovoltaic devices

Ning Wang[a], Liang Sun[a], Xiaona Zhang[b], Xichang Bao[a],

Wei Zheng*[,b], Renqiang Yang*[,a]

[a]CAS Key Laboratory of Bio-based Materials, Qingdao Institute of Bioenergy and Bioprocess Technology, Chinese Academy of Sciences, Qingdao 266101, China. Fax: +86-532-80662778. Tel: +86-532-80662700. E-mail: yangrq@qibebt.ac.cn

[b]College of Materials Science and Engineering, Harbin University of Science and Technology, Harbin 150080, China. E-mail: zhengwei1972@qq.com

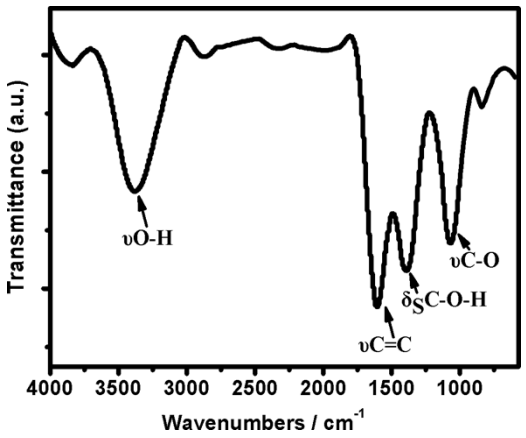

Fig. S1 FT-IR spectrum of fullerenol product

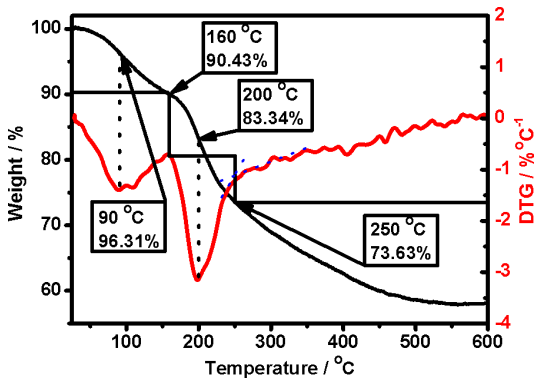

Fig. S2 TGA curve and the differential thermo-gravimetric (DTG) curve for the fullerenol product.

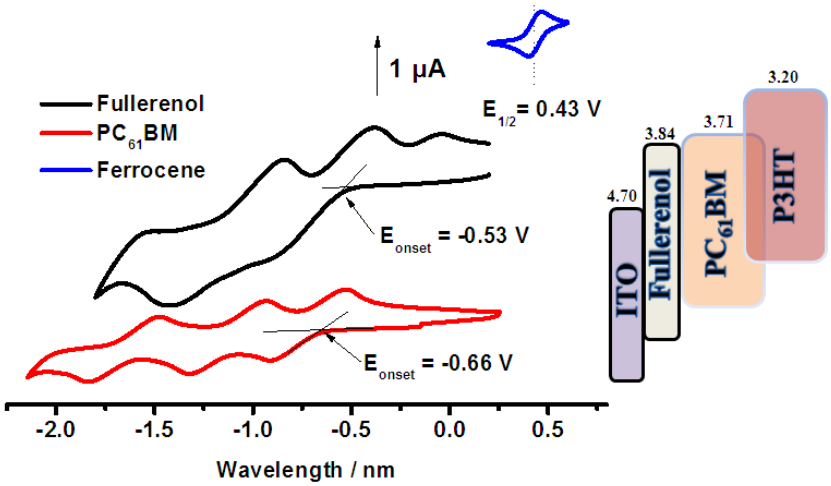

Fig. S3 Cyclic voltammograms of fullerenol and $PC_{61}BM$ as thin films.

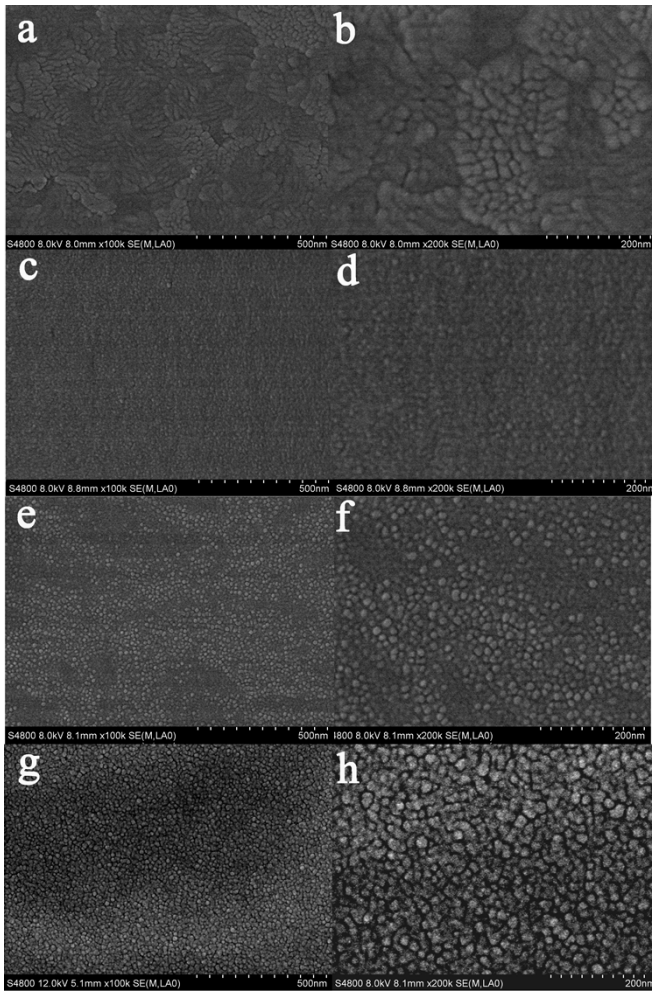

Fig. S4 FE-SEM images of ITO glass in large scale (a) and small scale (b); FE-SEM images of fullerenol-coated ITO glass annealed at 25 ^{o}C in large scale (c) and small scale (d); FE-SEM images of fullerenol-coated ITO glass annealed at 160 ^{o}C in large

scale (e) and small scale (f).; FE-SEM images of ZnO coated ITO glass in large scale (g) and small scale (h).

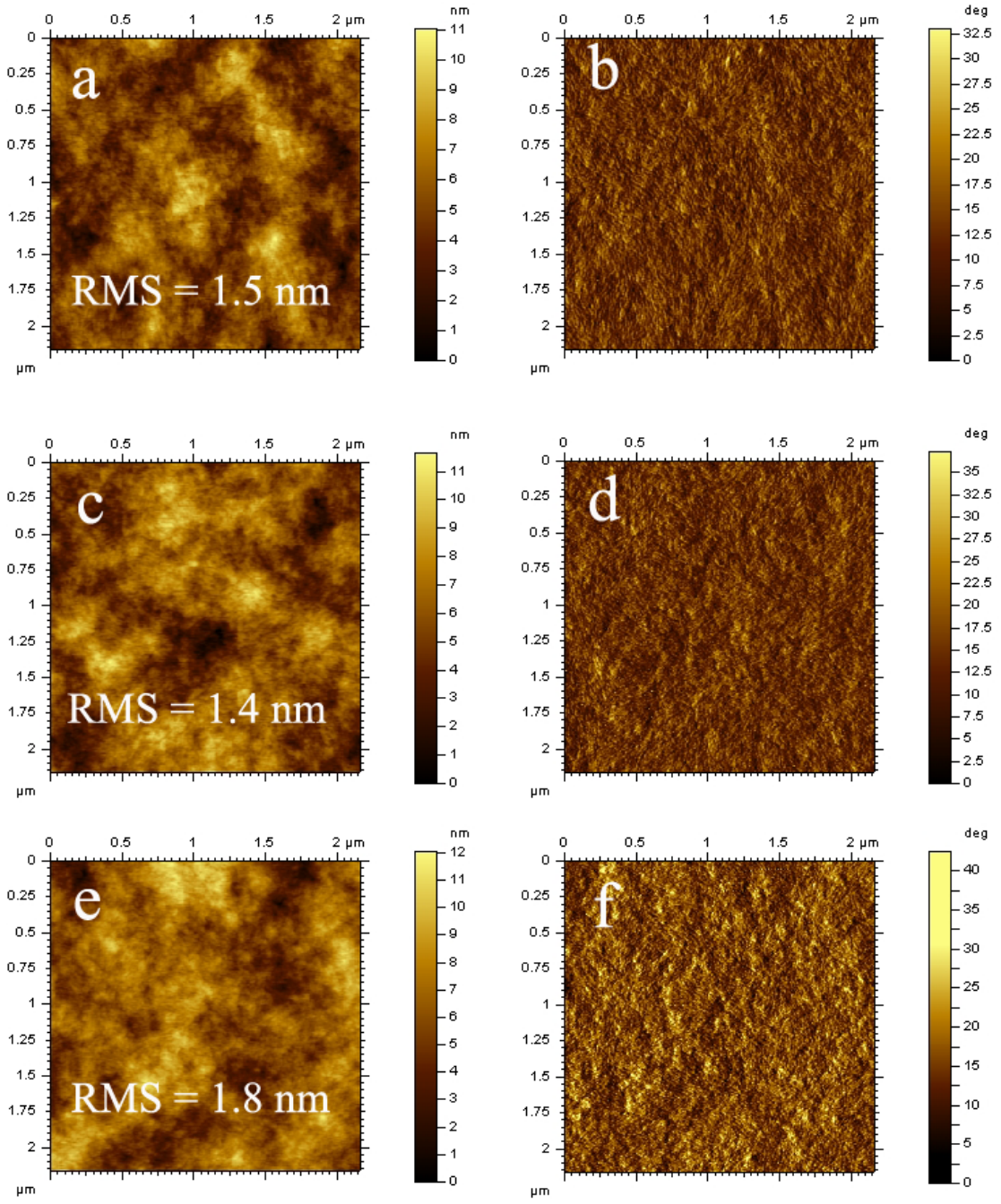

Fig. S5 AFM height and phase images of the blend films of P3HT/$PC_{61}BM$ on bare ITO glass (a, b), ITO glass coated with ZnO (c, d) and fullerenol (e, f). The fullerenol film was annealing at 160 ^{o}C.

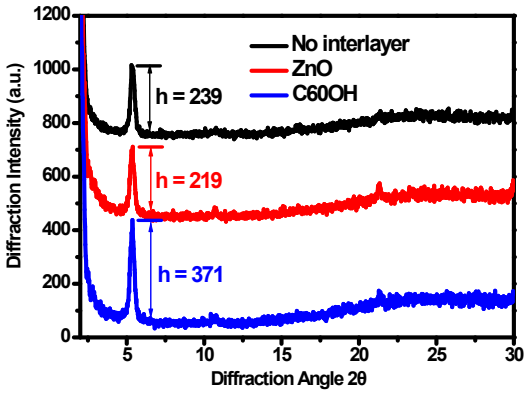

Fig. S6 XRD spectra of the blend films of P3HT/$PC_{61}BM$ on bare ITO glass (black line), ITO glass coated with ZnO (red line) and C60OH (blue line). The h values in the graph represented the diffraction intensity of the blend films.

Table S1. Elemental analysis, secondary bond water content and average structure of the fullerenol product.

average structure	element analysis (%)[a]	water content (wt %)[b]
$C_{60}(OH)_{16}$ •$6H_2O$	C, 67.95; H, 2.60	9.57
	(C,65.46; H, 2.56)	(9.82)

[a]Values in parentheses are calculated data.

[b]Water content was determined by thermogravimetric analysis.