Supporting Information for

Solution-Processed Transparent Conducting Electrodes for Flexible Organic Solar Cells with 16.61% Efficiency

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Supplementary Figures

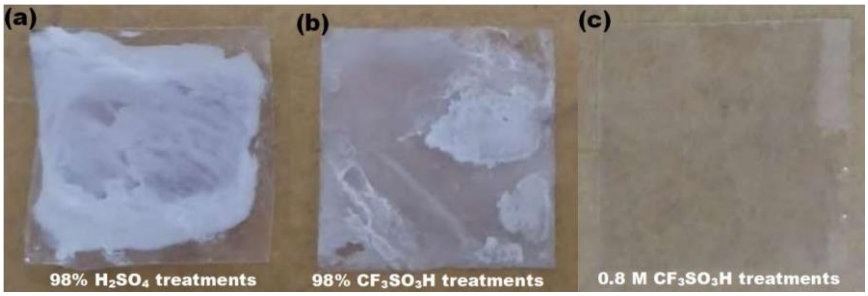

Fig. S1 Images of PET plastic substrates with (**a**) 98 wt% H_2SO_4 treatments at R.T. (**b**) 98 wt% CF_3SO_3H treatments at R.T. (**c**) low-concentration (0.8 M) CF_3SO_3H treatments at 50 °C. The underlying PET substrates were damaged by the 98 wt% H_2SO_4 and 98 wt% CF_3SO_3H treatments.

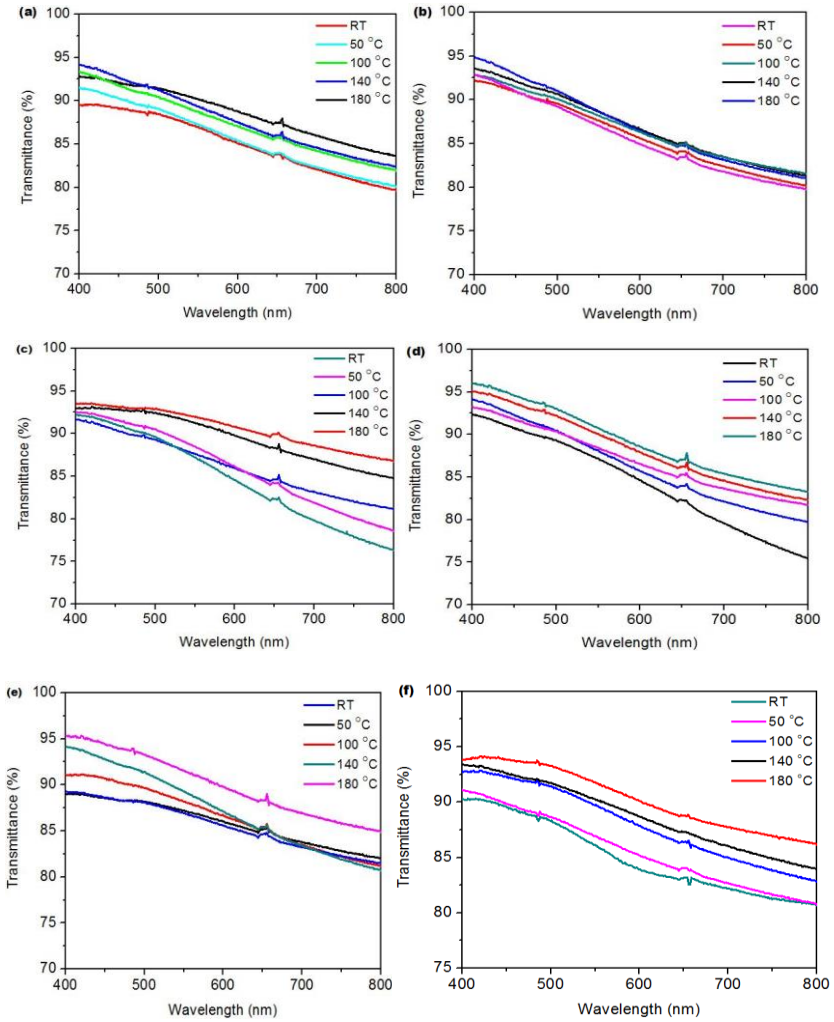

Fig. S2 Optical transparencies of the PEDOT:PSS films with the CF_3SO_3H treatments: (**a**) 0.1 M; (**b**) 0.3 M; (**c**) 0.8 M; (**d**) 2.0 M: (**e**) 4.0 M; and (**f**) 6.0 M

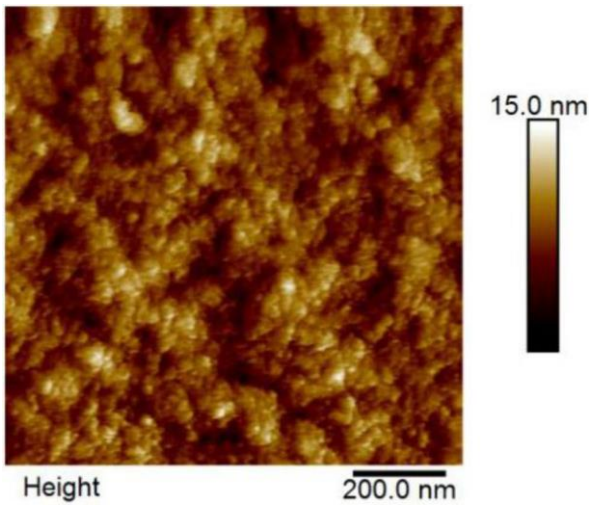

Fig. S3 Morphology of the PEDOT:PSS films with 6 vol% DMSO treatments

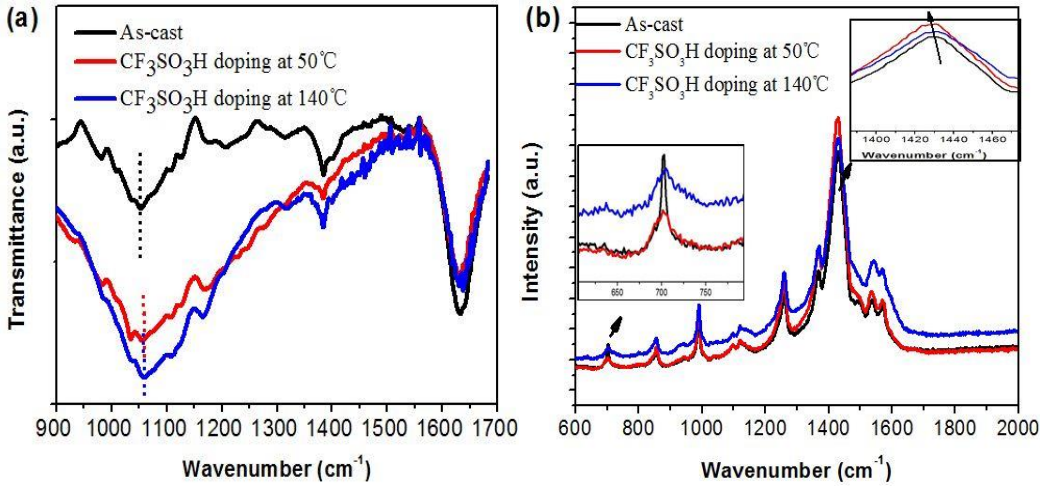

Fig. S4 FTIR (**a**) and Raman spectra (**b**) of the as-cast polymeric films and the PEDOT:PSS films with CF_3SO_3H doping treatments at 50 and 140 °C, respectively

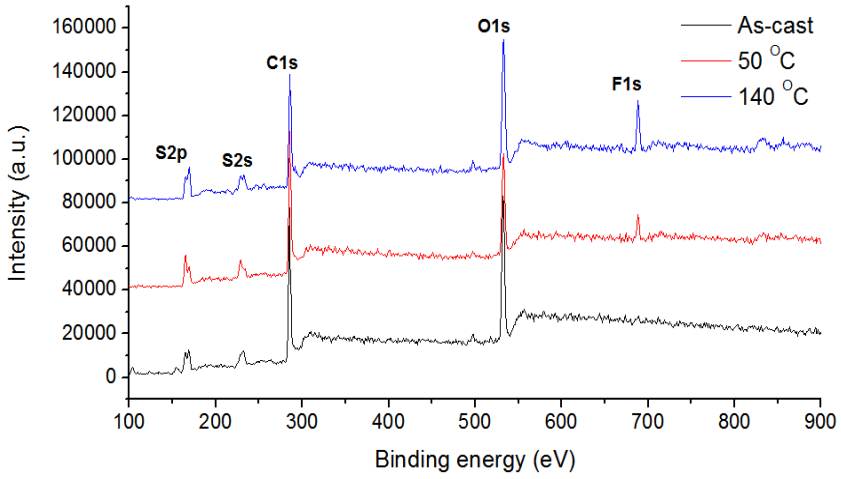

Fig. S5 XPS of the as-cast polymeric films and the PEDOT:PSS films with CF_3SO_3H doping treatments at 50 °C and 140 °C

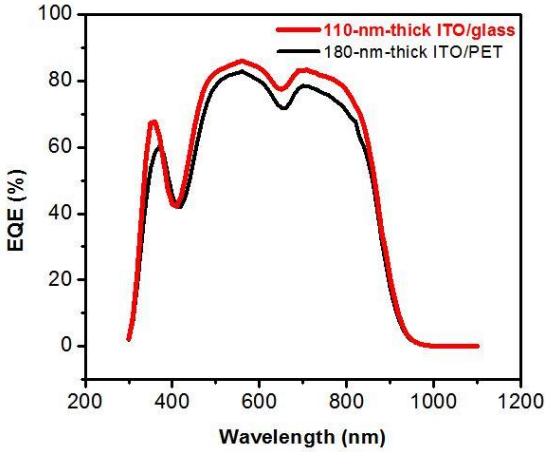

Fig. S6 EQE spectra of the control OSCs fabricated on the 110-nm-thick ITO electrodes on glass substrates and the flexible OSCs fabricated on the 180-nm-thick ITO electrodes on PET substrates

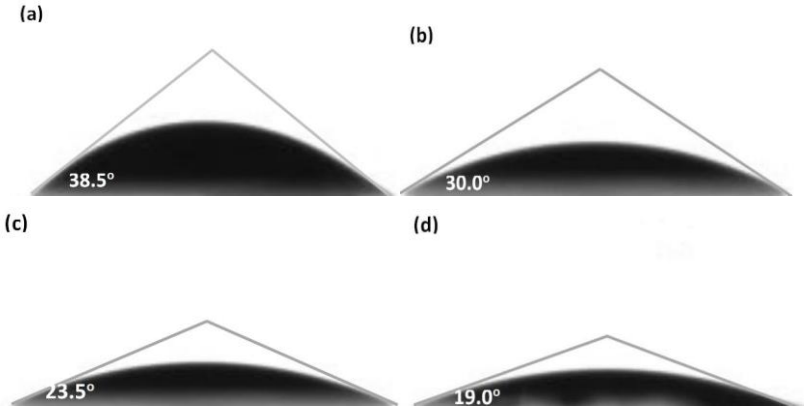

Fig. S7 Wettability characteristics of PEDOT:PSS (P VP AI4083) droplets on the surfaces of these films (PH1000): (**a**) as-cast; (**b**) 99.5 wt% CH_3SO_3H doing at 140 °C; (**c**) 8.0 M CH_3SO_3H doping at r.t.; and (**d**) 0.8 M CF_3SO_3H doping at 50 °C

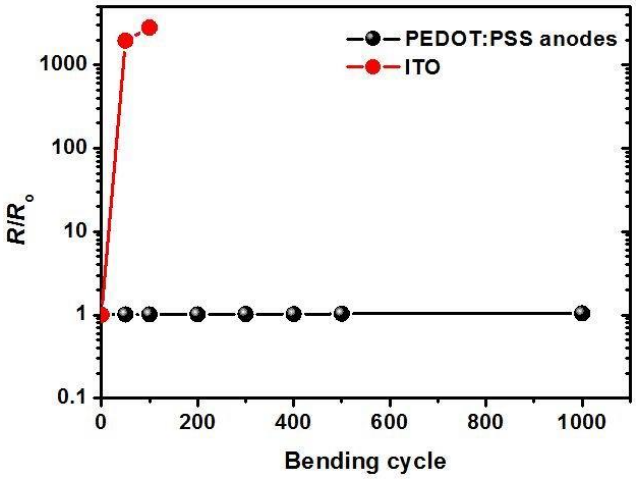

Fig. S8 R/R_o of the 0.8 M CF_3SO_3H-doped PEDOT:PSS (75 nm)/PET substrates and the (180 nm) ITO/PET substrates as a function of bending cycles at *r* of 1.5 mm