Electronic Supplementary Material (ESI) for RSC Advances.

SUPPORTING INFORMATION

Identification of the Local Electrical Properties of Crystalline and Amorphous Domains in Electrochemically Doped Conjugated Polymer Thin Films

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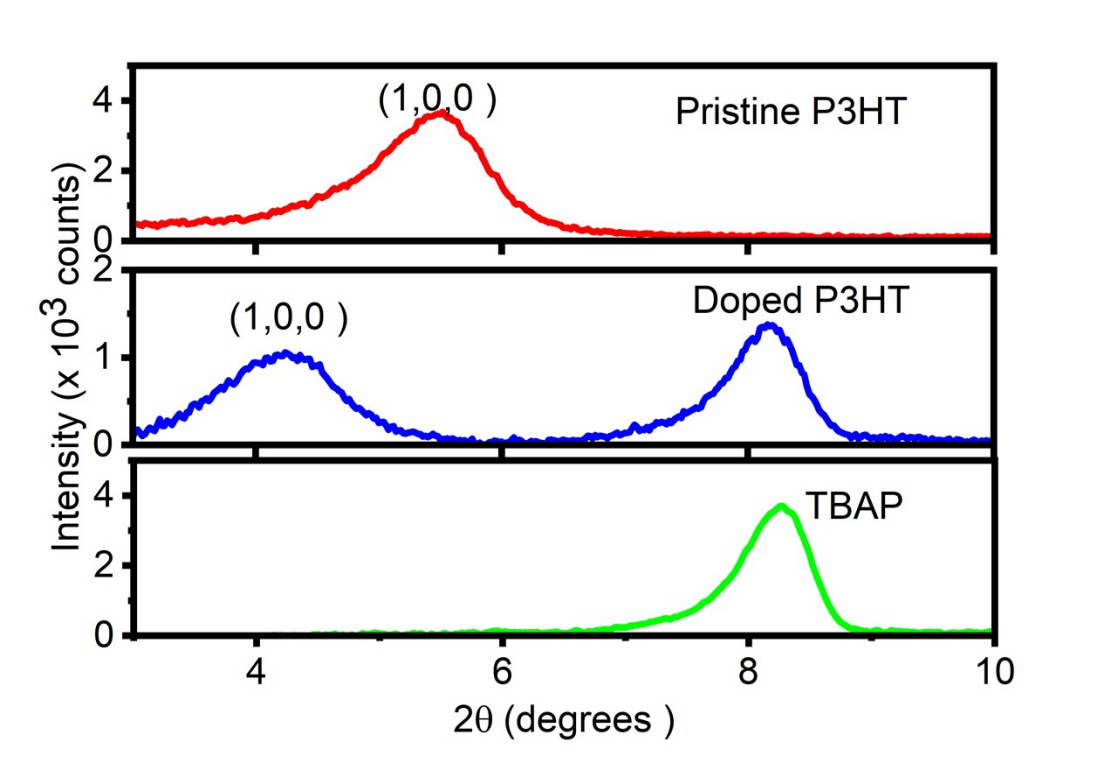

Figure S1. Magnified graph of GIWAXS data, shown in Figure 2d, that emphasizes on the decrease of intensity and peak width of the (1,0,0) of P3HT upon electrochemical doping. The data also clearly shows the presence of the TBAP dopant peak in the doped P3HT film.

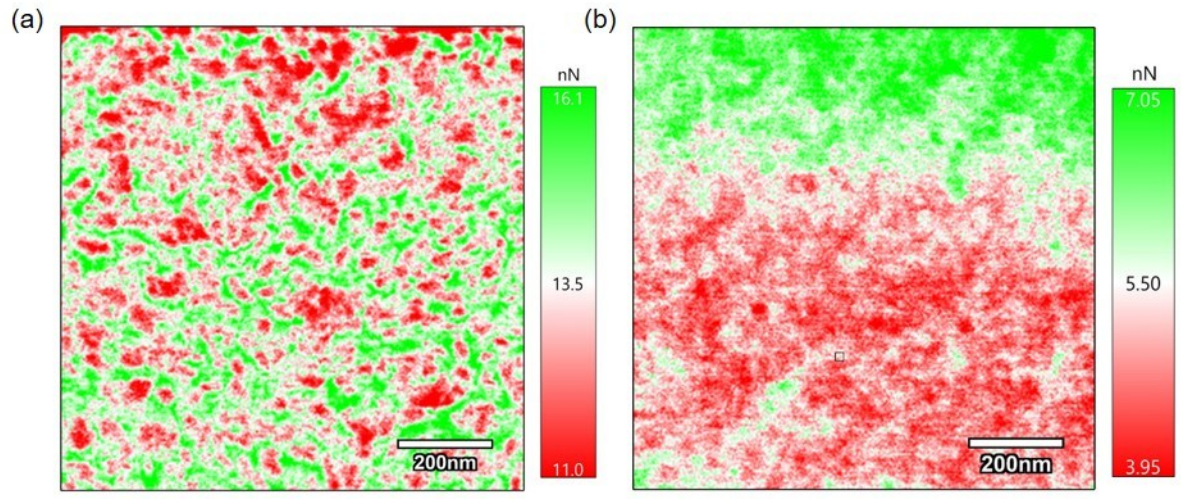

Figure S2. (a), (b) Adhesion maps of pristine and doped P3HT, respectively recorded in FFM mode.

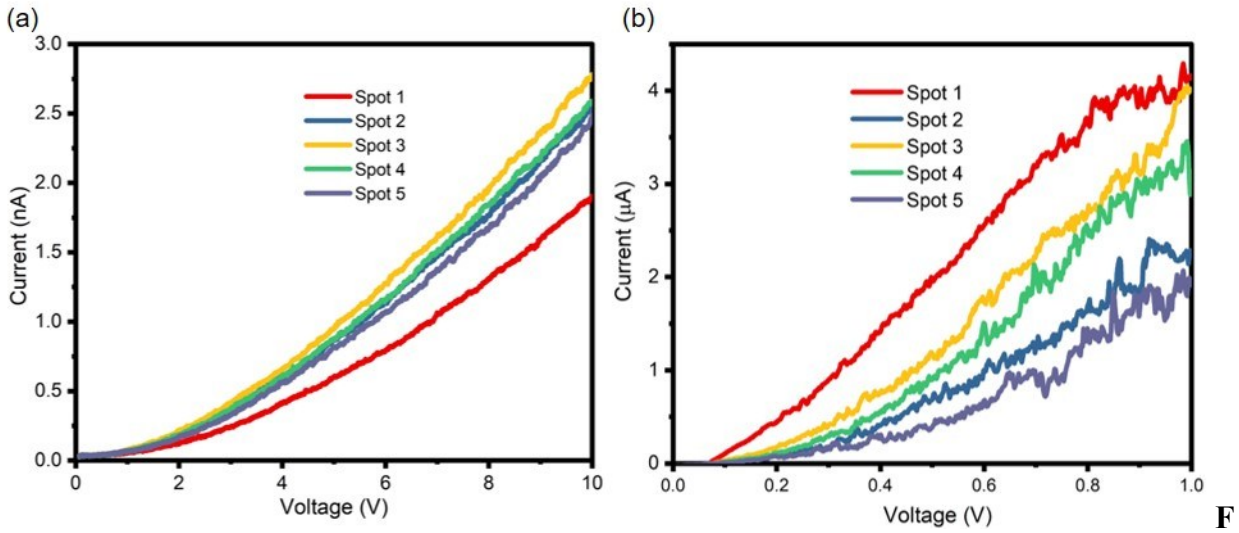

Figure S3. (a), (b) I-V curves recorded at different locations on the surface of pristine and doped P3HT, respectively. Lower voltages were applied for doped P3HT as the current values approached closer to the limit of the detector (10 μA). Doped films exhibited significantly increased conductivity (by ~ 4 orders of magnitude). (The different locations on the surface were labelled as Spot 1, Spot 2, Spot 3, Spot 4, Spot 5.)

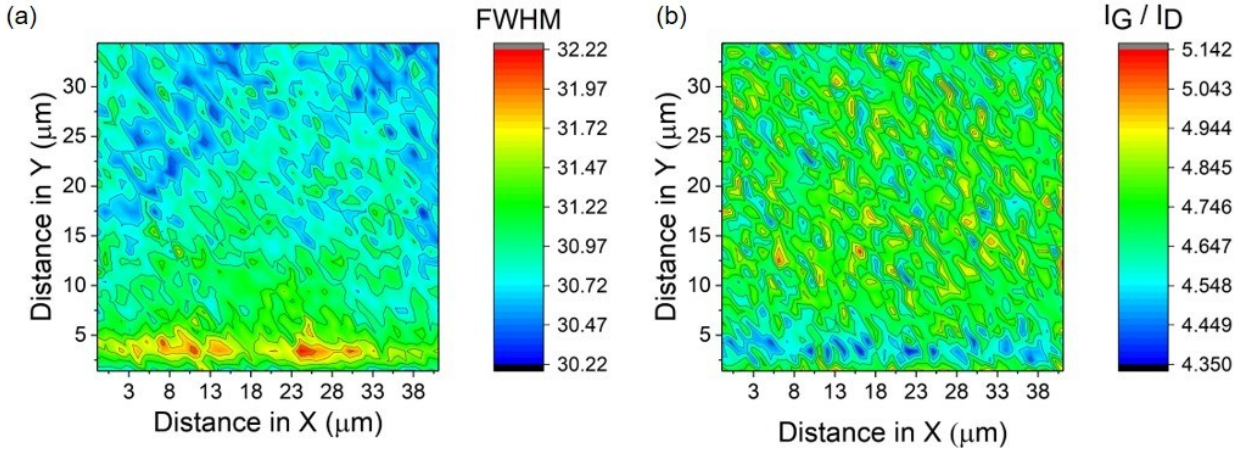

Figure S4. (a) Plot of FWHM across the mapped area of a doped P3HT film. (b) Plot of the ratio of the intensity of G band to the intensity of the D band across the mapped area of the doped film.

Raman mapping performed for pristine P3HT films yielded lower FWHMs as compared to the doped ones, which is in line with the Raman spectra shown in Fig. 6a, 6b. The range of FWHM is also much smaller for pristine films (~2) compared to that of doped films (~ 8.5). The plot of the ratios of intensities of G band to the intensity of D band across the mapped area, for pristine films gave higher values overall compared to the doped ones. There is also no significant correlation observed between the two plots for pristine P3HT films.

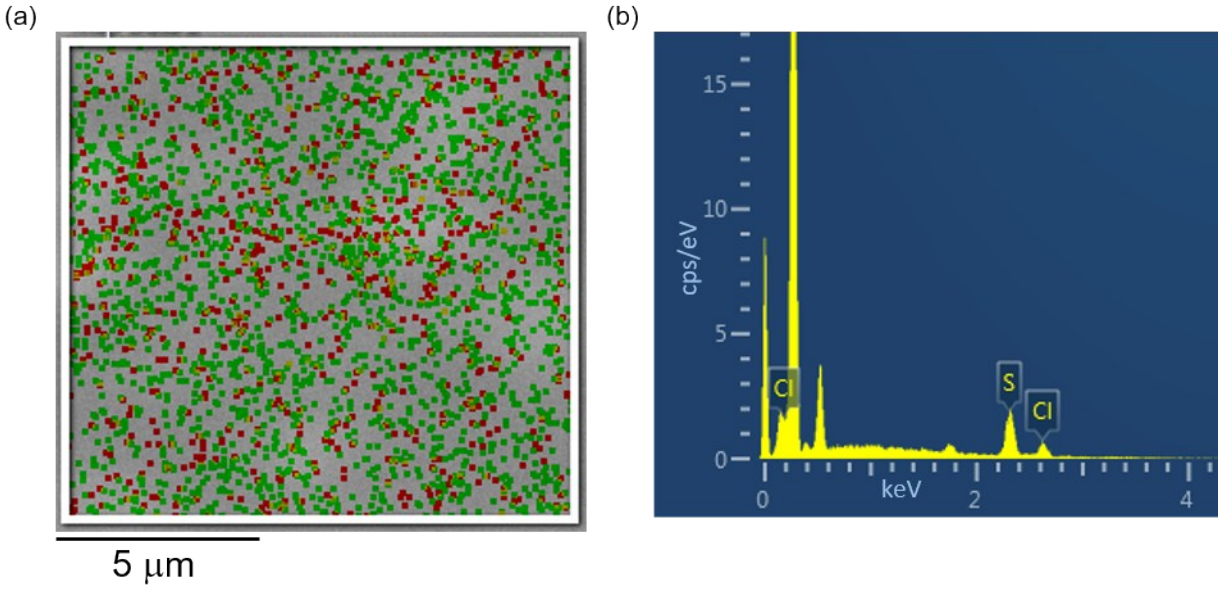

Figure S5. (a) Elemental compositional map of sulfur (green) and chlorine (red) of a dedoped P3HT thin film. (b) EDS spectrum of a dedoped P3HT thin film.