Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Enhancement of hole mobility in Hybrid Titanium Dioxide/Poly(3-hexylthiophene) Nanocomposites by Employing an Oligothiophene dye as Interface Modifier

Supporting Information

Figure 1: Absorption spectra of all dye solutions and different thickness P3HT alone films.

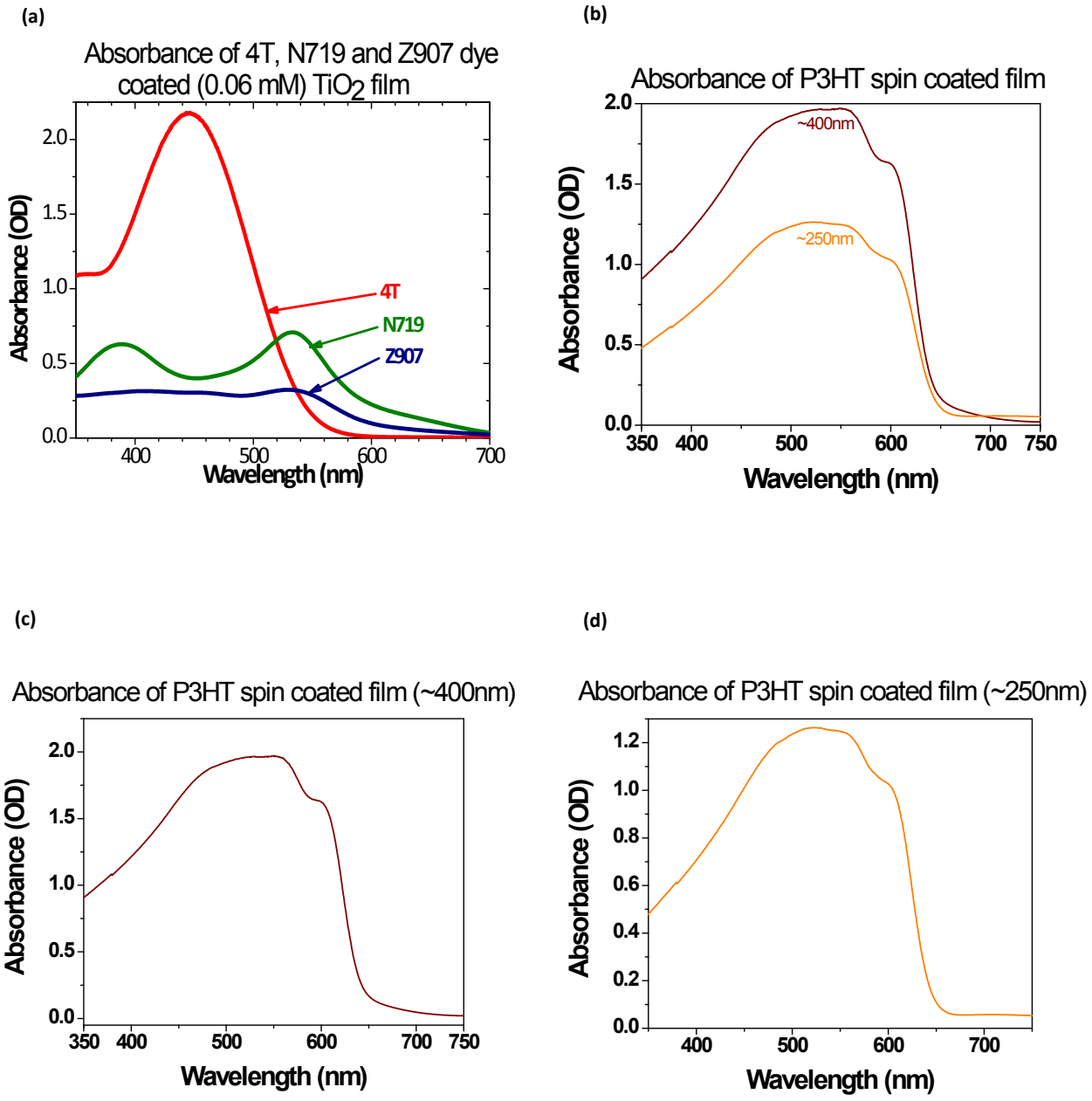
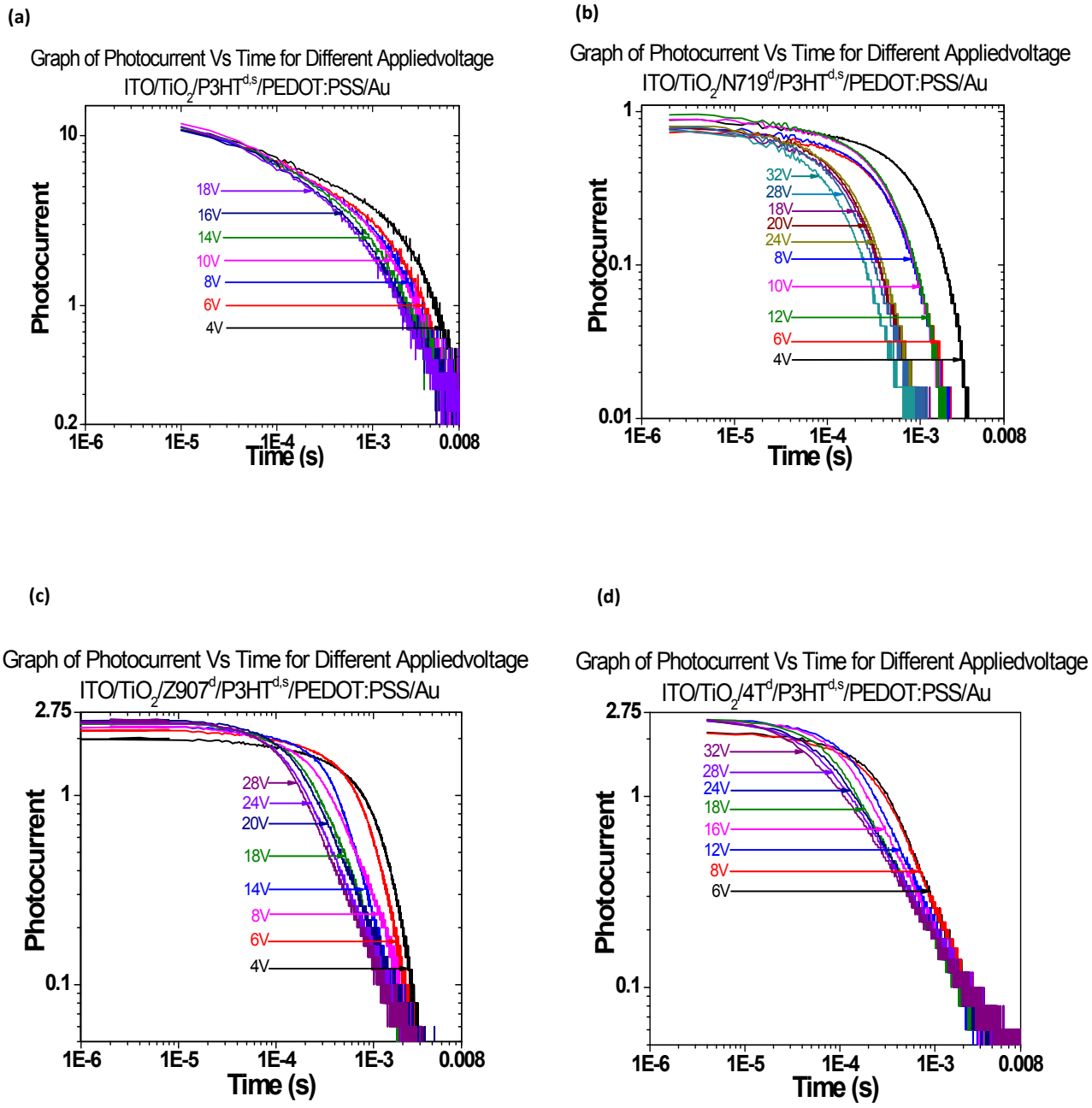


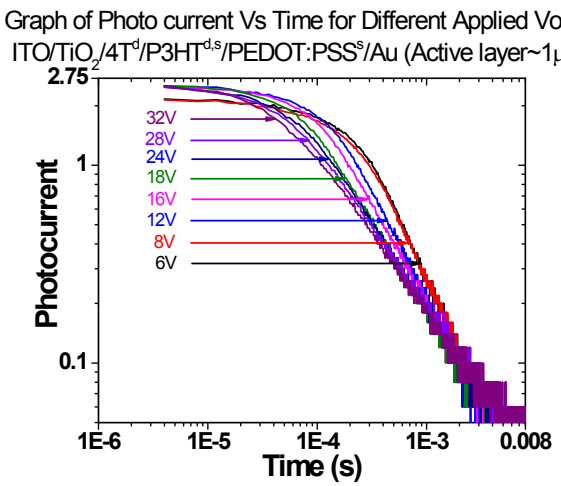
Figure 2: TOF Traces for control and dye treated films



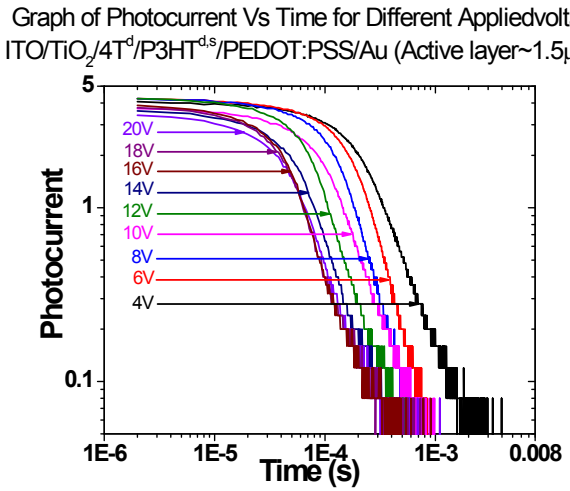
Note: Magnitude variation found in the photocurrent between the control and dye treated samples arises due to the different resistance values used in the experiment in order to obtain smooth knees for the particular devices. However this variation will not affect the value of the hole mobility.

Figure 3: Transients for different thickness of 4T treated films

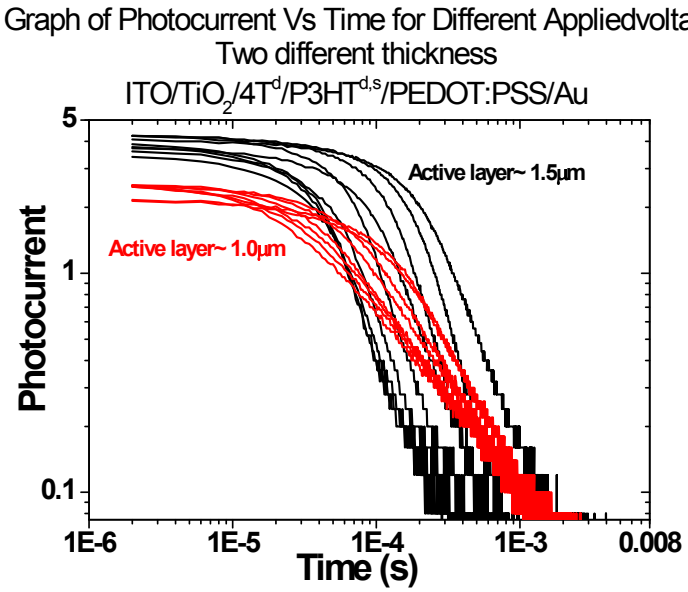
(a)



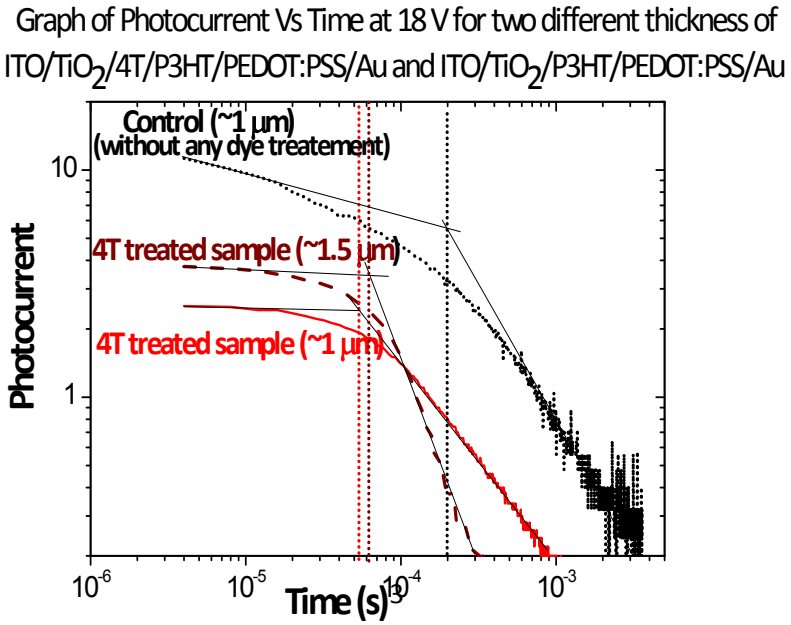
(b)



(c)



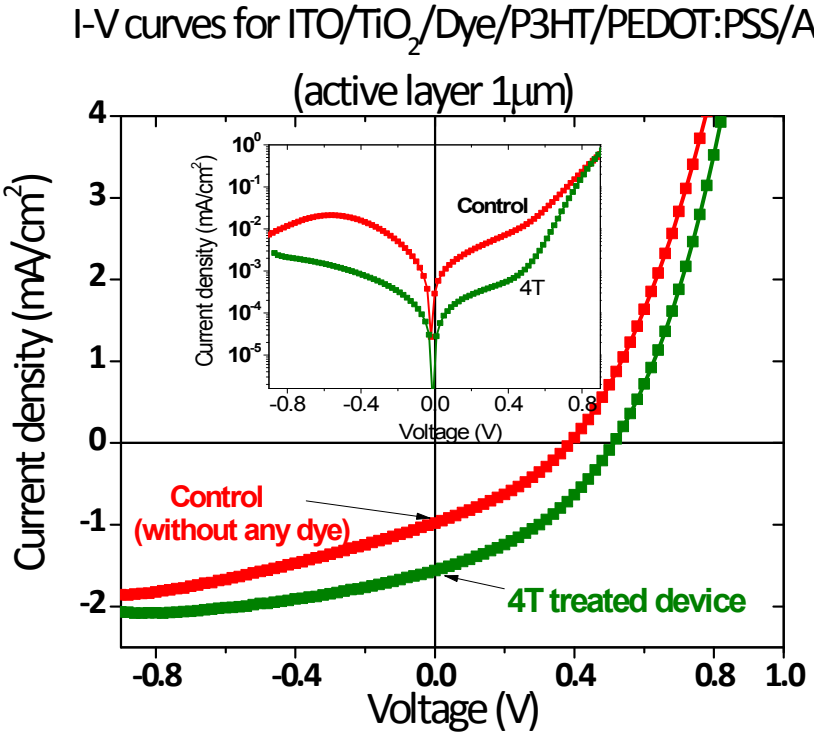
(d)



Note: Magnitude variation found in the photocurrent between the control and 4T treated samples arises due to the different resistance values used in the experiment in order to obtain smooth knees for the particular devices. However this variation will not affect the value of the hole mobility.

Figure 4. JV curves for Thick and Thin samples under 80 mW/cm^2

(a): Thick TiO_2/Dye/P3HT (~ 1 μm) samples used in TOF measurement



(b): Thin TiO_2/Dye/P3HT (~300 nm) samples

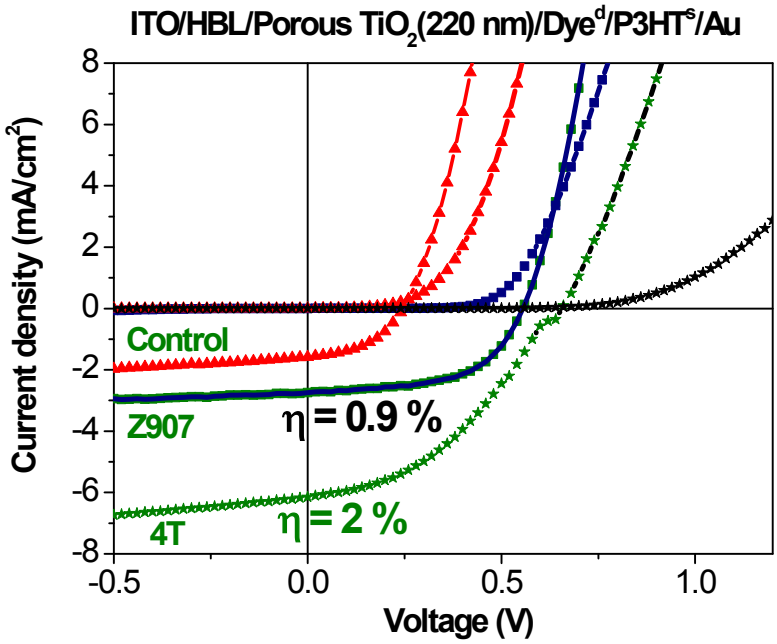
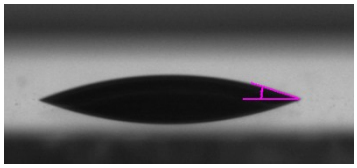
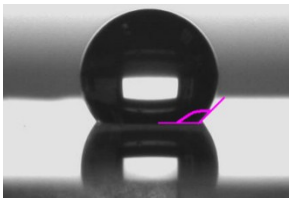


Figure 5: Contact angle of a water drop on TiO_2 surface



On TiO_2 colloidal film



On dye coated TiO_2 colloidal film

The above figures for contact angle measurement clearly show that the surface of the TiO_2 colloidal film becomes less hydrophilic and, therefore, more compatible to the polymer after dye coating. The larger contact angle after dye coating shows that the surface energy of the TiO_2 film has changed.