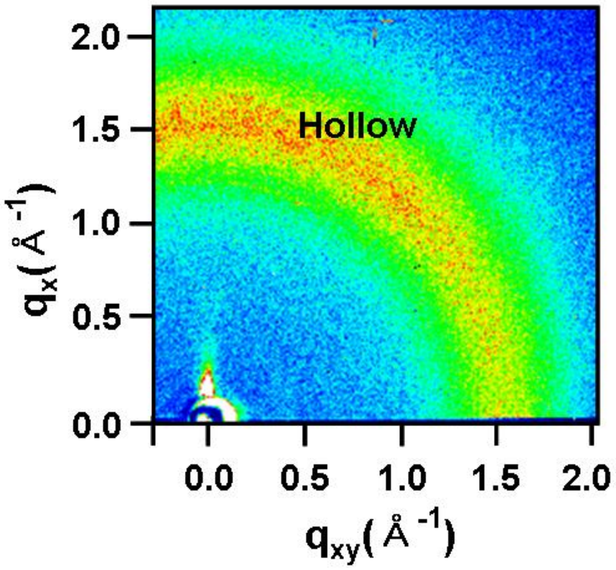
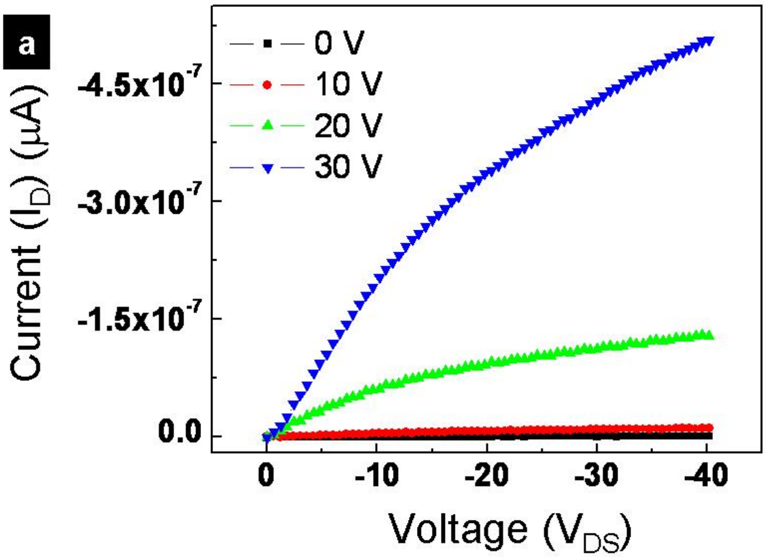
Supplementary material (ESI) for Journal of Materials Chemistry

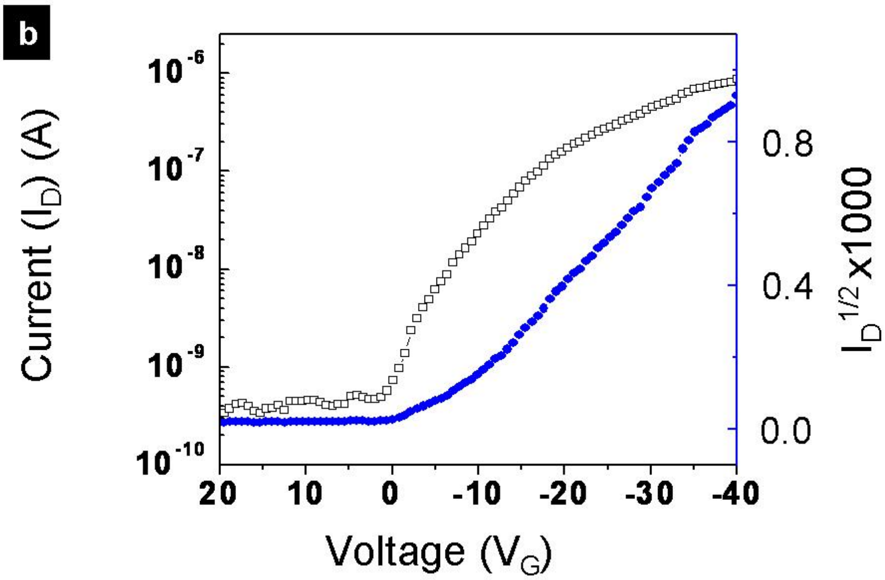
Supplementary Information

S1. Grazing Incidence Wide angle X-ray Scattering (GIWAXS) of the P3HT film as cast and patterned shows the characteristic halo resulting from the amorphous state in the spin cast P3HT thin film.



S2. (a) Output characteristic and (b) Transfer characteristic (black line) and linear plot of $I_D^{1/2}$ as a function of V_G (blue line) of the device with a P3HT thin film the patterned by PEPTP on unmodified SiO_2 gate dielectric. The device exhibits linear/saturation behavior at operating voltages ranging 0 to 40V and typical p-type drain current modulation under negative gate voltage. The field-effect mobility is 0.02 cm^2/Vs and the On-Off ratio is approximately 10^3 with the subthreshold swing of 4.10 mV/decade, as summarized in Table 2.


a
0 V
10 V
20 V
30 V
Current (I_D) (μA)
-4.5x10^{-7}
-3.0x10^{-7}
-1.5x10^{-7}
0.0
0
-10
-20
-30
-40
Voltage (V_{DS})


b
Current (I_D) (A)
10^{-6}
10^{-7}
10^{-8}
10^{-9}
10^{-10}
$I_D^{1/2}$x1000
0.8
0.4
0.0
20
10
0
-10
-20
-30
-40
Voltage (V_G)