

Table 2.3. Summary of solar cell characteristics for the homopolymers (Data were collected by Mr. William Potscavage Jr. in the Kippelen group).

Polymer	V_{OC} (mV)	J_{SC} (mA/cm ²)	FF	PCE(%)
P3HT: C11PDI HP (1 : 1)	603 ± 28	1.8 ± 0.1	0.31 ± 0.01	0.38 ± 0.02
P3HT: C7PDI HP (1 : 1)	619 ± 3	0.85 ± 0.02	0.31 ± 0.01	0.20 ± 0.01
P3HT: N-PDI HP (1 : 1)	441 ± 13	0.20 ± 0.01	0.32 ± 0.01	0.04 ± 0.01

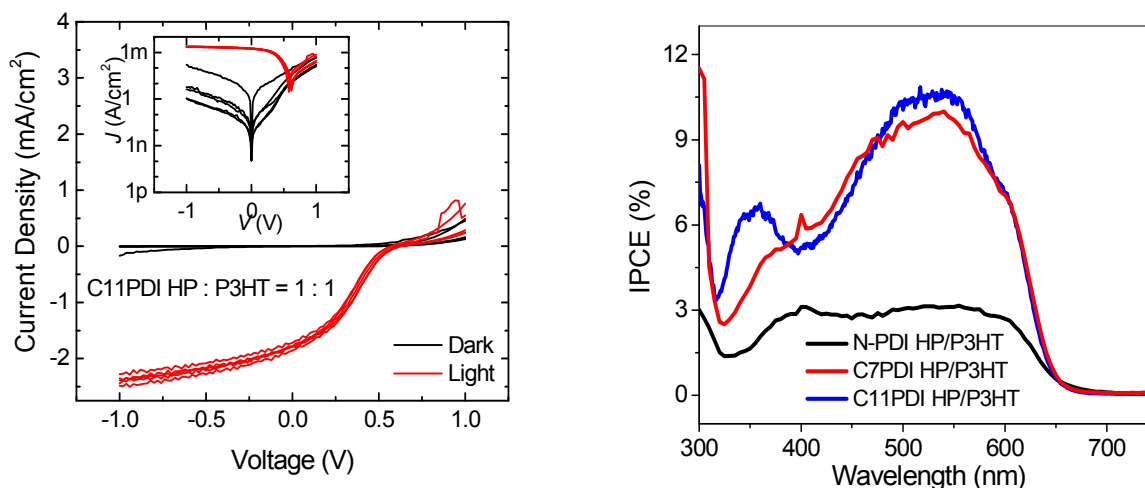


Figure 2.13. The I - V characteristics of the solar cells for P3HT:C11PDI HP blend and IPCE curves for the HP/P3HT blends (Figures were adapted from Mr. William Potscavage Jr. in the Kippelen group).

2.8 Morphology studies of the P3HT/PDI HP blends

Recently, Kelvin probe force microscopy⁵⁷ (KPFM) has been extensively employed to characterize organic transistors⁵⁸ and solar cells.⁵⁹ KPFM is a contactless atomic force microscope (AFM) technique that measures the height variations on the sample surface while employing the electrostatic force between sample and tip to yield electric surface potential (SP) images. The SP images of a sample can, to a first