

MORPHOLOGICAL INVESTIGATION OF A NEW SERIES OF π -CONJUGATED POLYMERS FOR PHOTOVOLTAIC APPLICATION.

Evan Lafalce, Patrick Togli, Cheng Zhang, Nick Johnson, Dennis Bowen, Xiaomei Jiang, Dept. of Applied Physics, University of South Florida, 4202 E. Fowler Ave ISA 4070, Tampa, FL, 33620.

A new series of π -conjugated polymer with controlled regioregularity, namely the poly(3-dodecylthienylenevinylene) (PDDTV) has been synthesized for the purposes of serving as electron donor in organic photovoltaic devices. We present a morphological study of neat polymer films along with films blended with Phenyl-C61-butyric acid methyl ester (PCBM). In particular, we examine the bulk crystallinity by Grazing incidence angle X-ray diffraction (GIXRD), as a function of film casting and thermal annealing conditions to determine if PDDTV:PCBM forms bulk-heterojunction morphologies ideal for solar energy conversion. The results were correlated with surface morphologies measured by atomic force microscopy (AFM) and scanning electron microscopy (SEM).