UV-vis and Transport Characterization of Degradation in Polymer Blend Photovoltaics ¹ EMILEE SENA, JUSTIN PEEL, SHREYA NATHAN, DEVIN WESENBERG, MARIANNE WALLIS, THORSTEINN ADALSTEINSSON, BRIAN MCNELIS, RICHARD BARBER, Santa Clara University — Organic photovoltaic cells are prepared using an active layer containing a functionalized C60 molecule, [6-6]-phenyl C61 butyric acid octadecyl ester (PCBOD); and a conjugated polymer, poly(3-hexylthiophene) (P3HT). PCBOD functions as an electron acceptor in conjunction with P3HT, the electron donor. Both current-voltage (IV) transport data of solar cells and spectroscopic absorption data of the corresponding active layer are collected at regular time intervals for periods up to several days. IV data show changes in power conversion efficiency which are strongly dependent on device preparation (stoichiometry, annealing, etc.). Ultraviolet and visible light absorption exhibits similar time dependence. Recent results show that annealing the active layer up to 200 °C substantially improves device performance. Further spectroscopic studies, such as Carbon-13 NMR spectroscopy, are ongoing.

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