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**The effect of interfaces on charge transport and recombination in polymeric solar cells** RONALD OSTERBACKA, SIMON SANDEN, QIAN XU[1], OSKAR SANDBERG, MATHIAS NYMAN, JAN-HENRIK SMATT[2], Abo Akademi University, GYTIS JUSKA[3], Vilnius University — Charge-carrier transport and recombination in hybrid TiO2/P3HT:PCBM bulk-heterojunction solar cells (BHSCs) have been measured using photo-CELIV. We have fabricated hybrid devices in the form of indium tin oxide/titanium dioxide/P3HT:PCBM/Cu) to clarify the impact of the $TiO_2$/P3HT:PCBM interface on the charge transport using the charge extraction by linearly increasing voltage (CELIV) technique. We found that a large equilibrium charge reservoir is accumulated at negative offsets at the $TiO_2$/P3HT:PCBM interface leading to space charge limited extraction current (SCLC) transients. We show analytically the SCLC transient response and compare the experimental data to calculated SCLC in a linearly increasing voltage. The theoretical calculations indicate that the large charge reservoir at negative offset voltages is due to thermally generated charges combined with poor hole extraction at the ITO/$TiO_2$ contact, due to the hole blocking character of TiO2. In this presentation we will discuss how interfaces, both metal-organic but also organic-organic interfaces affect charge carrier transport and recombination measurements.

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