

Abstract Submitted  
for the CAL13 Meeting of  
The American Physical Society

**Effect of glycerol doping of PEDOT:PSS on solar cell characteristics** EMMA LEWIS, BHASKAR MANTHA, RICHARD BARBER, Santa Clara University — We have performed resistivity measurements of poly[3,4-ethylenedioxythiophene]: poly[styrenesulfonate] (PEDOT:PSS) films with varying concentrations of glycerol. Resistivity is seen to decrease exponentially from roughly  $3 \times 10^{-2} \Omega\text{-m}$  for pure PEDOT:PSS to  $3 \times 10^{-4} \Omega\text{-m}$  for  $35 \text{ mg/cm}^3$  glycerol in PEDOT:PSS. Beyond this concentration adding glycerol does not significantly change resistivity. Bulk heterojunction P3HT/PCBM solar cells using these variously doped PEDOT:PSS layers as electrodes were studied to characterize the effects on efficiency and lifetime. Although our data display significant scatter, lowering the resistance of the PEDOT:PSS layers results in lower device resistance and higher efficiency as expected. We also note that the lifetime of the devices tends to be reduced as the glycerol content of PEDOT:PSS is increased. Many devices show an initial increase in efficiency followed by a roughly exponential decay. This effect is explained based on concomitant changes in the zero bias conductance of the samples under dark conditions.

Richard Barber  
Santa Clara University

Date submitted: 04 Oct 2013

Electronic form version 1.4