

Abstract Submitted
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Impact of SWCNT characteristics and processing on the performance of nanotube-silicon solar cells JOHN M. HARRIS, NDSU, ROBERT J. HEADRICK, Rice University, MATTHEW R. SEMLER, NDSU, MATTEO PASQUALI, Rice University, JEFFREY A. FAGAN, NIST, ERIK K. HOBBIE, NDSU — Single-wall carbon nanotubes (SWCNTs) sorted by length, electronic type and chirality are used to understand the influence of SWCNT characteristics on the performance of SWCNT-silicon solar cells. Solution-processed SWCNT films are deposited on n-doped silicon substrates and p-doped to yield photovoltaic devices that are competitive in terms of photo-conversion efficiency, fill factor and open-circuit voltage. The temperature dependence of the dark-current and the transient reverse-bias recovery technique are used to clarify the nature of the devices as a function of SWCNT type and chirality as well as device manufacturing method, where the latter ranges from the vacuum filtration of aqueous colloidal suspensions to the flow-deposition of super-acid solutions.

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