

Fabrication and characterization of hybrid solar cells based on semiconducting single-walled carbon nanotubes

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Recently, hybrid solar cells used single-walled carbon nanotubes (SWNTs) and the organic materials [1], and the hybrid solar cells based on semiconducting SWNTs (s-SWNT)/Si heterojunctions [2] was reported. In the former case, the SWNTs were used as a conducting component on the organic solar cells, in the latter case, the SWNTs were employed as charge separator, transporter, and light absorber component on the s-SWNT/Si heterojunction hybrid solar cells. However, these hybrid solar cells used the SWNTs were indicated low conversion efficiency (~1.7%).

In this study, we fabricated the s-SWNT/organic hybrid solar cells. S-SWNT/N-type Si heterojunction hybrid solar cells and TTF or TMTSF@SWNT/P-type Si heterojunction hybrid solar cells were also fabricated. The s-SWNTs were prepared by separation of metal and semiconducting SWNTs using agarose gel method [3]. The structure of the s-SWNTs/organic hybrid solar cells were ITO-coated glass /PEDOT-PSS/s-SWNTs/PCBM/Al. PEDOT-PSS and PCBM layer was fabricated using spin-coating, and Al layer was prepared by vapor deposition. We were compared drop-cast with spray method for preparing of the s-SWNTs layer. Both the *J-V* curve and the impedance measurement both dark and under illumination up to simulated air mass 1.5 global(AM1.5G)conditions were carried out in an inert gas atmosphere glovebox.

The detail results will be presented in the conference.

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