Effect of MWNT/PEDOT:PSS Composition on Conductive Film Properties and application of MWNT/PEDOT:PSS films as a counter electrode of dye sensitized solar cell

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The MWNT/PEDOT:PSS solutions of different concentration were prepared without oxidation process of MWNT. And using these solutions, the conductive films was spin coated at room temperature and 5000rpm, then dried in vacuum oven at 150oC for 1hour. The The effect of MWNT/PEDOT:PSS composition on film properties including atomic composition, work function, transparency and resistivity were characterized using XPS, UPS, 4-point probe, UV-vis-spectroscopy. Because MWNT/PEDOT:PSS films have high conductivity, surface area and catalyst activity, we fabricated dye sensitized solar cell (DSSC) using MWNT/PEDOT:PSS as a catalyst electrode and the catalyst activity of MWNT/PEDOT:PSS films was compared to Pt catalyst layer. As increase of MWNT in PEDOT:PSS solution, the catalyst activity was improved and the DSSC with MWNT/PEDOT:PSS catalyst electrode ,which was prepared using 0.3g in PEDOT/water solution, shows highest efficiency of 6.0 % (comparable to DSSC with Pt catalyst electrode: 7.1%).