Supporting Information

Experimental section

Fluorine-doped tin oxide was obtained from Nippon Sheet Glass Co.; Japan. polyethylene naphthalate was obtained from Peccell Co.; Japan. Titanium dioxide slurry (DHS-TPP3 and DHS-TPP200; Hydrothermal TiO_2; dispersion phase of terpinol) and powder (DHS-SN1760-500) were obtained from Dalian Heptachroma Solartech Co.; Ltd.

The working mechanism for a dye-sensitized solar cell may be briefly described as below: dye molecules are excited by absorbing photons and inject electrons into the conduction band of TiO_2; electrons move along the external circuit and arrive at the carbon nanotube (CNT) film, where I^{3-} ions are reduced to I^- ions; dye molecules are finally regenerated by the I^- ions to complete a cycle. CNTs had been widely studied to catalyze the reduction reaction of I^{3-} ions, and the aligned CNT film with a high electrical conductivity further improves the catalysis, so the resulting cells are expected to show high performances.

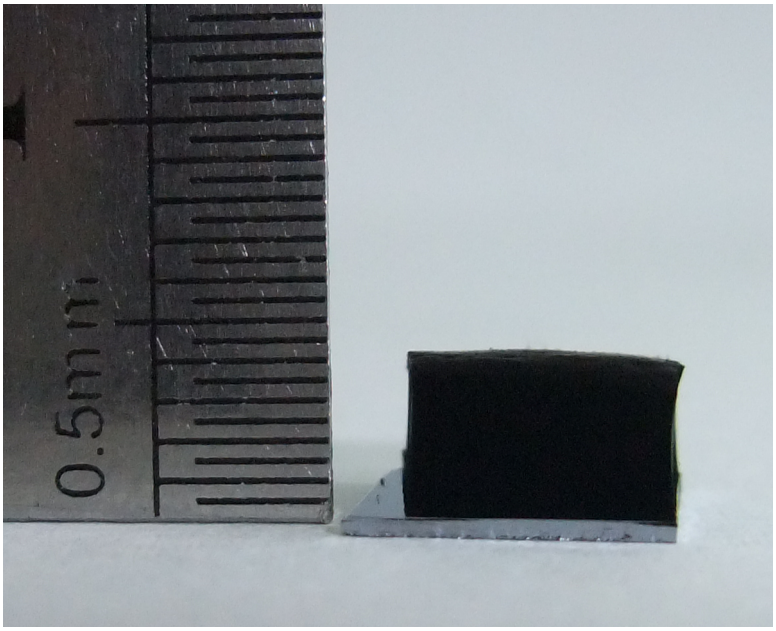

Figure S1. Photograph of a MWCNT array synthesized by chemical vapor deposition.

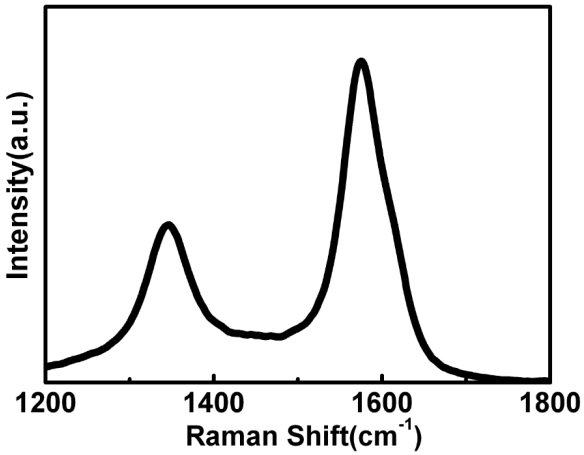

Figure S2. Raman spectrum of a CNT film.

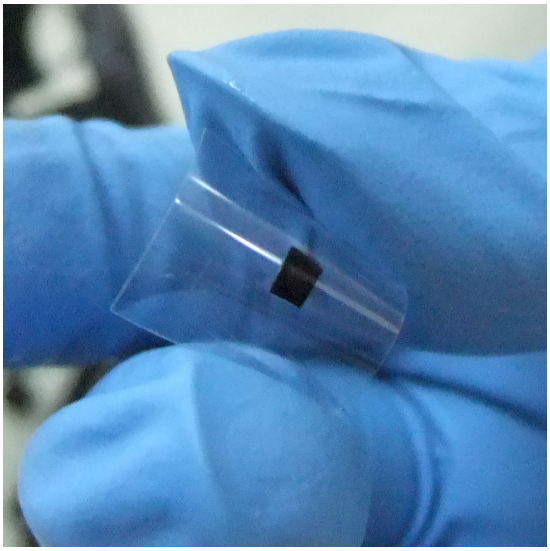

Figure S3. Photograph of a flexible MWCNT film.

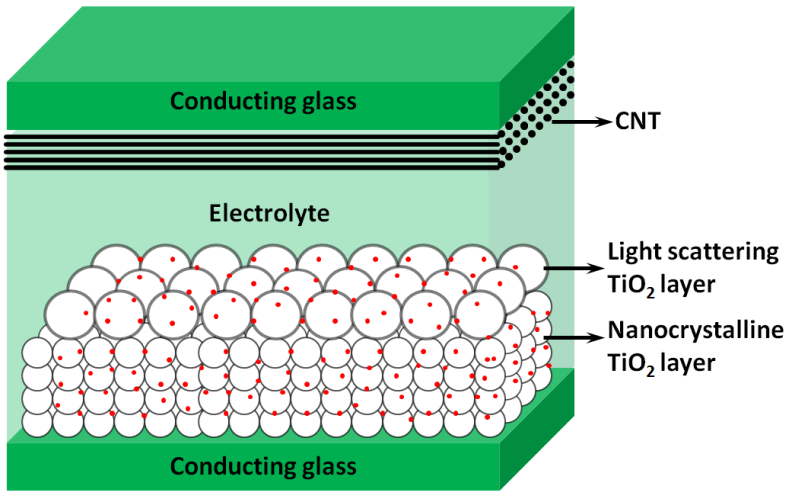

Figure S4. Schematic diagram of a dye-sensitized solar cell by using the MWCNT film as counter electrode.

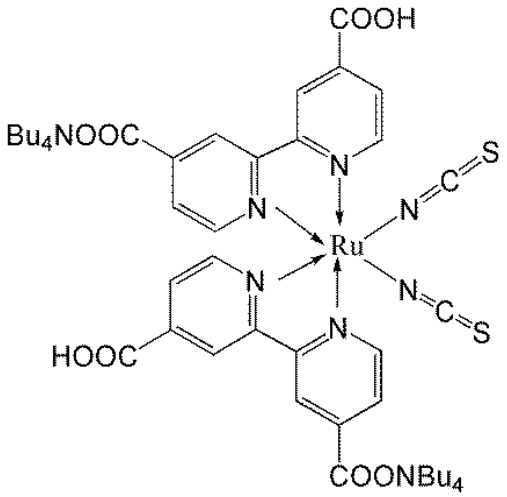

Figure S5. Chemical structure of N719.

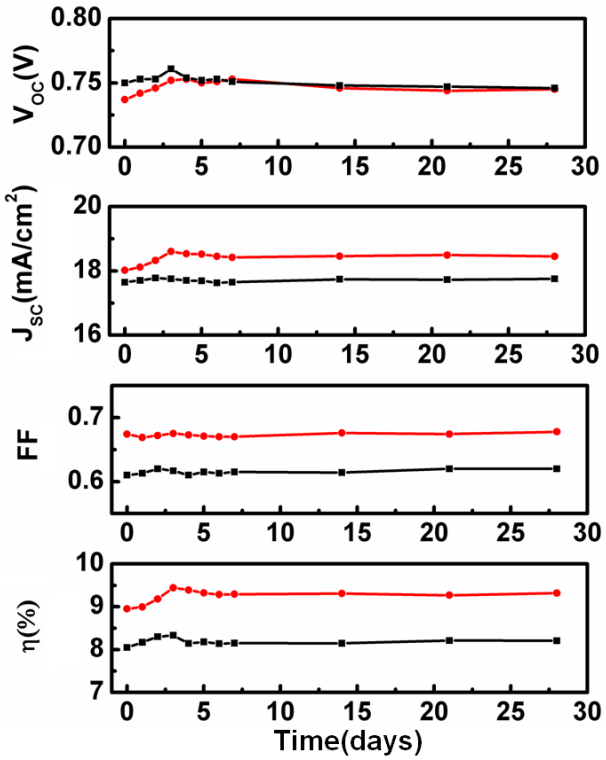

Figure S6. Evolution of photovoltaic parameters with the MWCNT film (red line) and platinum (black line) as counter electrode. The used MWCNT film with thickness of 4 μm and MWCNT number density and 2×10^{11} cm^{-2} was prepared from an array with height of 1.5 mm.