† Electronic Supplementary Information (ESI) available: [details of any supplementary information available should be included here]. See DOI: 10.1039/b000000x/

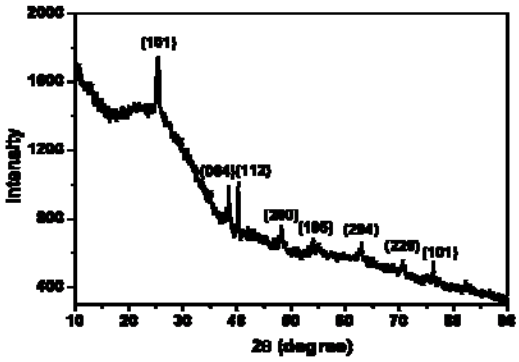

Fig.S1 XRD characteristic of the annealed TiO_2 film after calcination in a muffle furnace at 400°C for 40 min. The XRD spectrum shows an anatase structure (the peak at the 25.3° scattering angle can be indexed to the (101) plane of the anatase TiO_2).

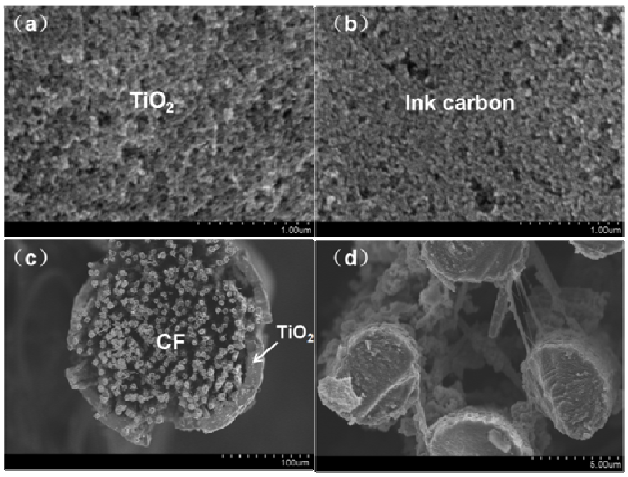

Fig.S2 (a) The morphology of the TiO_2 layer shows a porous and interconnected nanoparticle structure. (b) Morphology of the ink carbon layer coating on the surface of CE under higher resolution. (c) A complete cross-section view of the CF/TiO_2 photoanode. (d) SEM image of carbon fiber monofilaments connected by TiO_2 clusters in the core of the CF/TiO_2 photoanode.

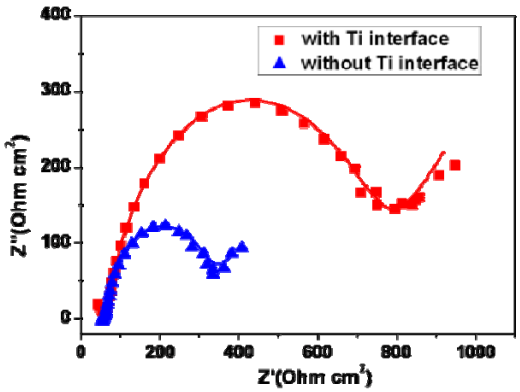

Fig.S3 EIS curves of fiber-shaped DSSCs based on the CF/TiO_2 photoanode with ($D_{CF/Ti/TiO2}$) or without ($D_{CF/TiO2}$) Ti interface layer. EIS were measured using a Solartron 1250 frequency analyzer under dark conditions and 0.3 V forward bias. The perturbation voltage was 10 mV and the frequency range was from 65.5 kHz to 50 mHz. The recombination resistance (R_{re}) at the working electrode /electrolyte interface can characterize the degree of recombination, corresponding to the diameter of the second semicircle in the plot. Higher R_{re} value means it is more difficult for the electrons in the TiO_2 film to recombine with oxidative species in the electrolyte. The R_{re} for $D_{CF/Ti/TiO2}$ and $D_{CF/TiO2}$ are 655 and 248.6 Ω cm^2, respectively.

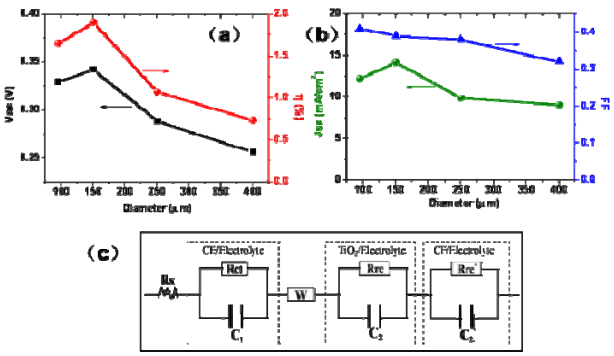

Fig.S4 (a) Change in the power conversion efficiency (η) and open-circuit voltage (V_{oc}) and (b) fill factor (FF) and short-circuit current density (J_{sc}) as the photoanode diameter increases from 95 to 400 μm. (c) Equivalent circuit of the all-carbon electrode-based fiber-shaped DSSCs based on the CF/TiO_2 photoanode with different diameters. From left to right—R_s: serial resistance; R_{ct}: charge transfer resistance of the CE/electrolyte interface; C_1: capacitance of the counter electrode; R_{re}: recombination resistance of the TiO_2/electrolyte interface; C_2: capacitance of the TiO_2 surface; R_{re}': recombination resistance of the carbon fiber/electrolyte interface in photoanode; C_2': capacitance of the CF surface; and W: diffusion resistance of the electrolyte.