ADVANCED ENERGY MATERIALS

Supporting Information

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Novel Wearable Energy Devices Based on Aligned Carbon Nanotube Fiber Textiles

*Shaowu Pan, Huijuan Lin, Jue Deng, Peining Chen, Xuli Chen, Zhibin Yang, and Huisheng Peng**

Supporting Informaition

Supporting Video

Video S1. The supercapacitor textile was used to lighten up a red light emission diode.

Experimental section

CNT arrays were synthesized by chemical vapor deposition in a tube furnace. Ethylene served as carbon source with a flowing rate of 90 sccm. A mixture of H_2 (30 sccm) and Ar (400 sccm) were used as carrying gas. The catalyst was composed of Fe (1.2 nm)/Al_2O_3 (3 nm) on silicon wafer. The reaction was carried out at 740 ℃ for 10 min.

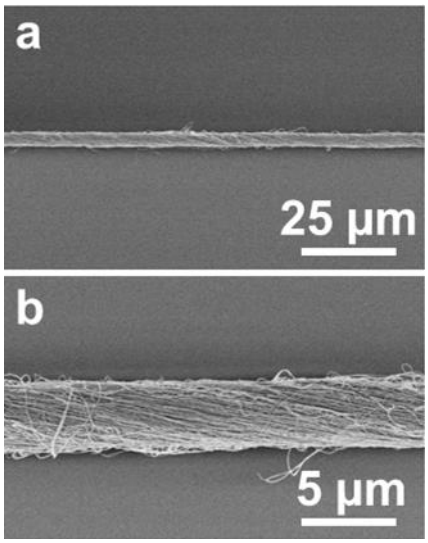

Figure S1. a, **b**. SEM images of a CNT fiber at low and high magnifications, respectively.

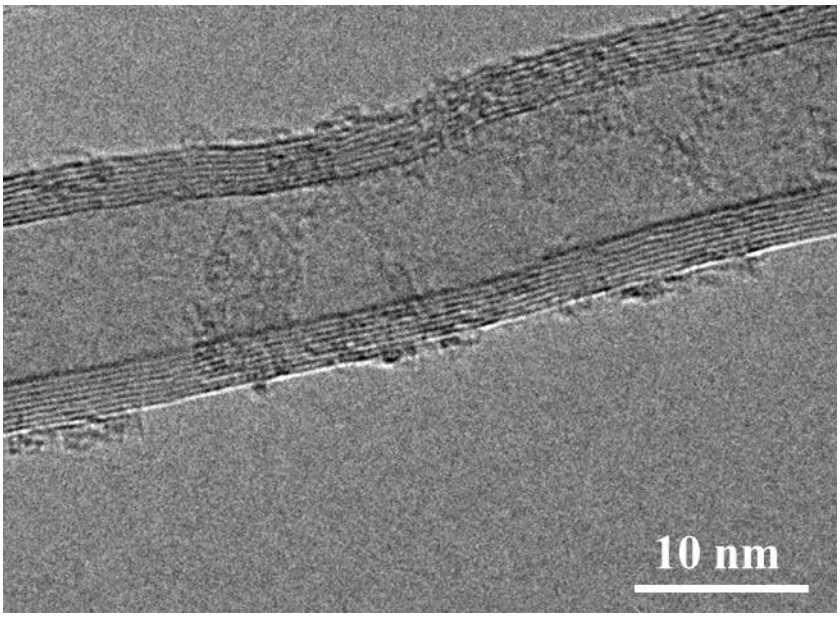

Figure S2. High resolution transmission electron microscopy image of a CNT with a multi-walled structure.

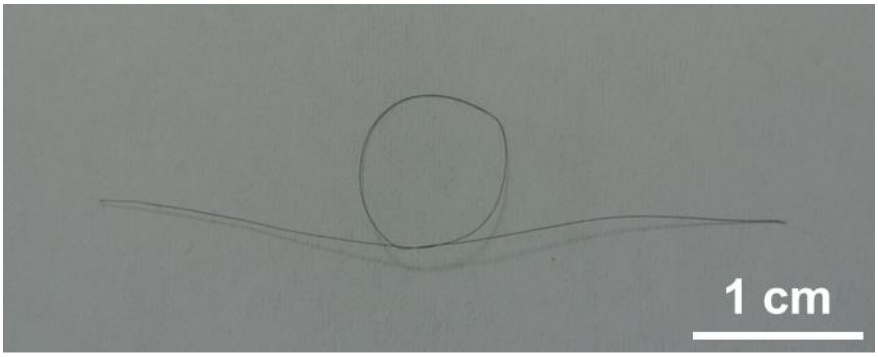

Figure S3. Photograph of a CNT fiber being made into a knot.

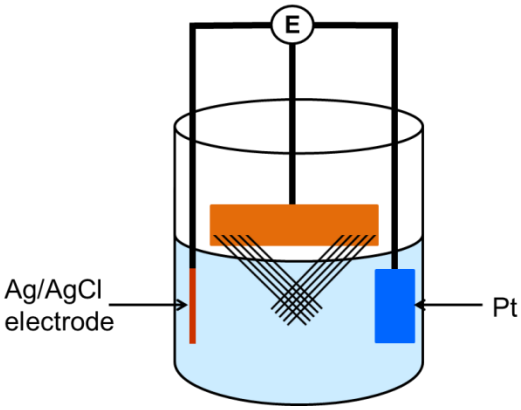

Figure S4. Experiment setup for the synthesis of CNT/PAN composite fiber-based textile through electrochemical polymerization.

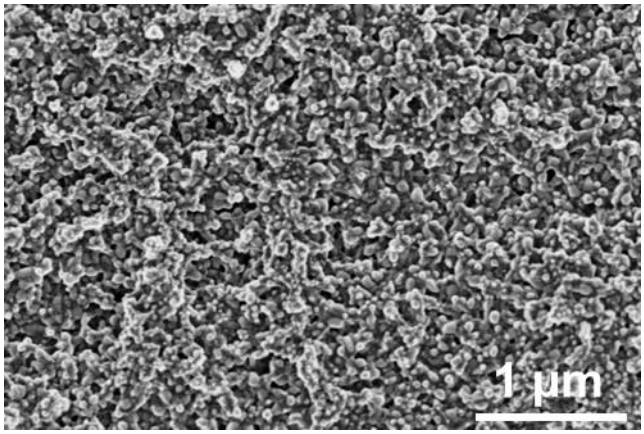

Figure S5. SEM image of an aligned CNT/PANI composite with PANI weight percentage of 60%.

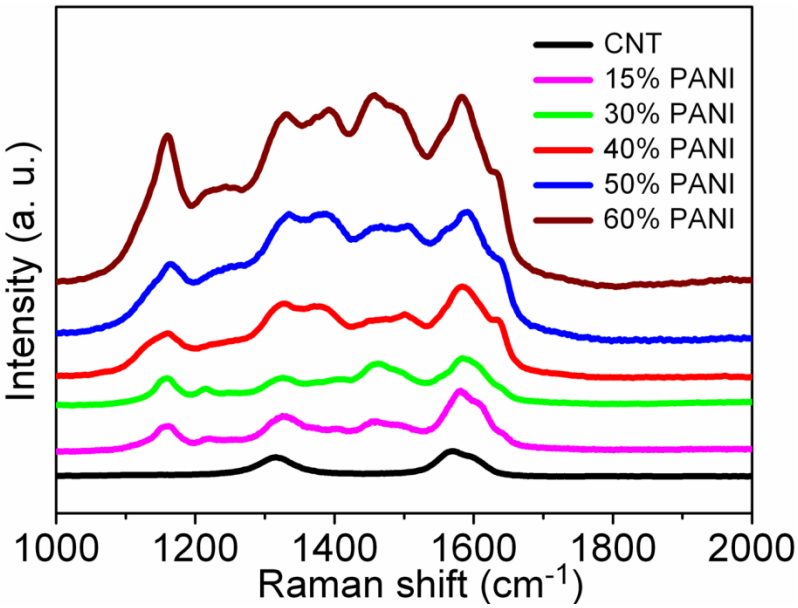

Figure S6. Raman spectra of bare CNT fiber-based textile and CNT/PANI composite fiber-based textiles with different PANI weight percentages.

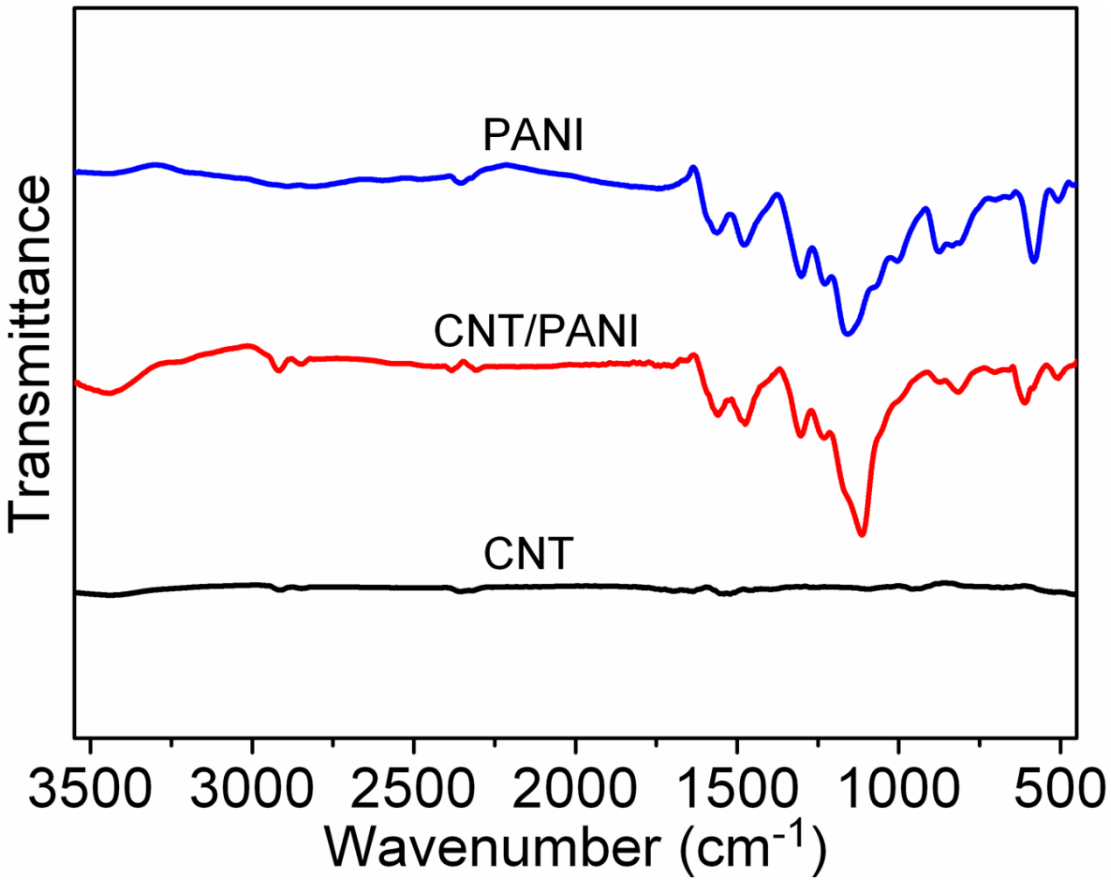

Figure S7. Fourier transform infrared spectra of CNT, PANI and CNT/PANI composite.

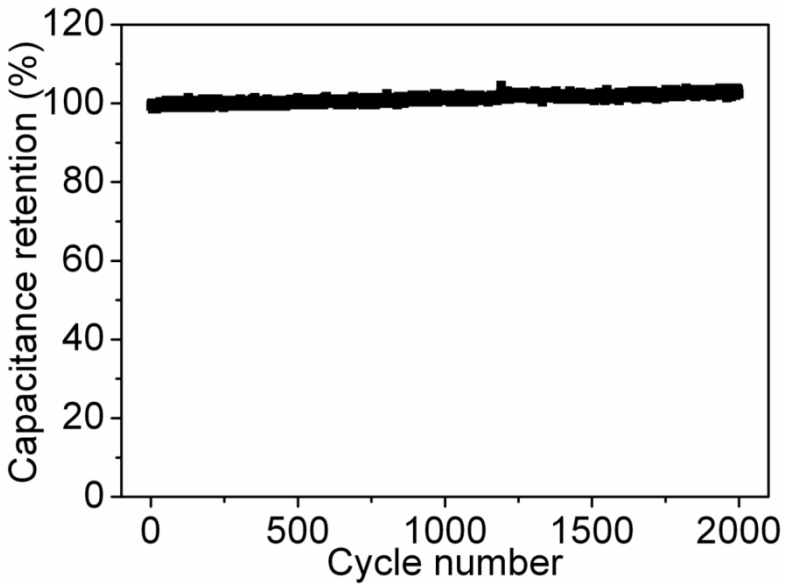

Figure S8. Dependence of specific capacitance of bare CNT fiber-based textile on cycle number at current density of 1 A g^{-1}.

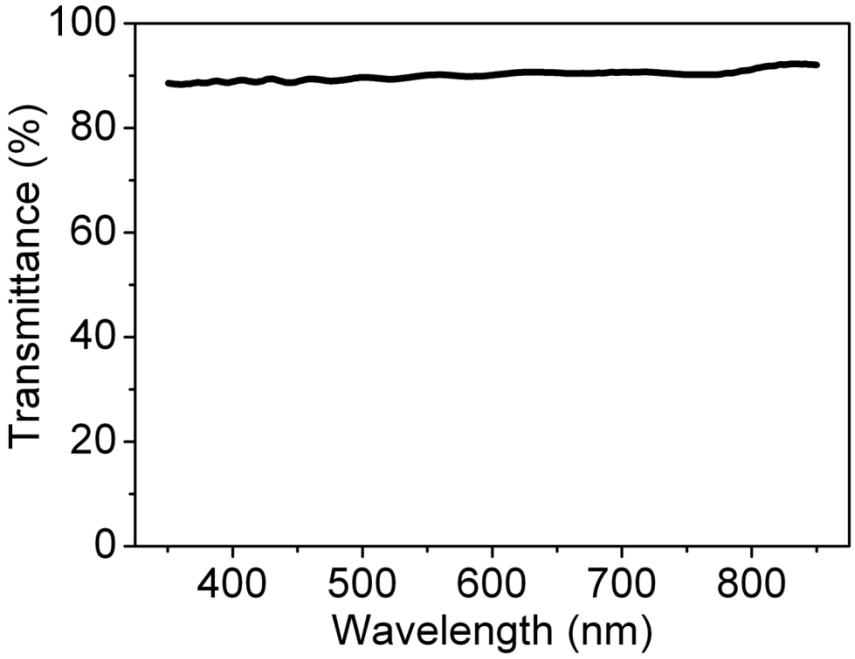

Figure S9. UV-vis spectrum of the supercapacitor textile.

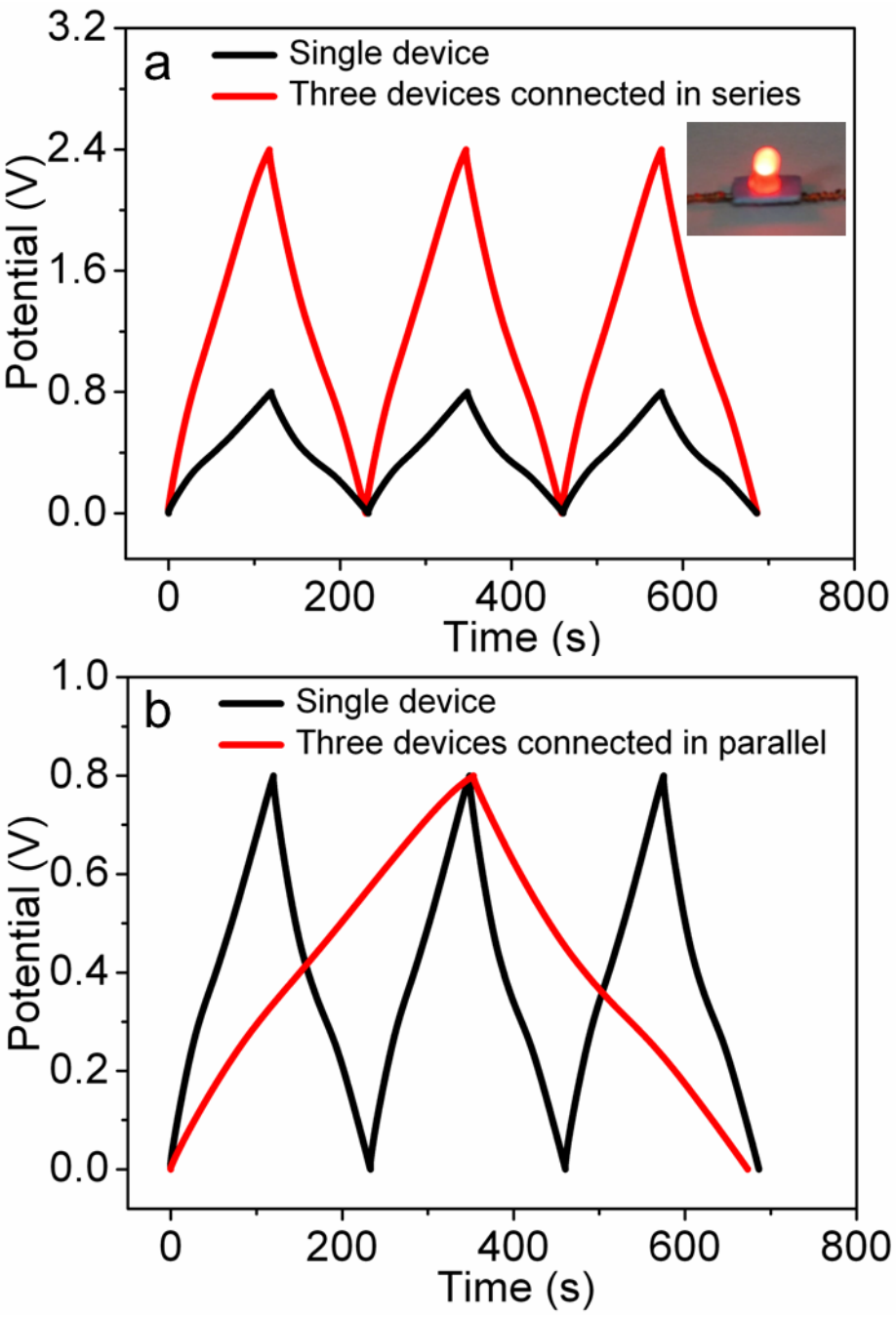

Figure S10. Galvanostatic charge/discharge curves of three supercapacitors being connected in series (**a**) and parallel (**b**). The inserted image at **a** showed a red light emitting diode being powered by the supercapacitor. A single supercapacitor is shown for a comparison under the same condition.

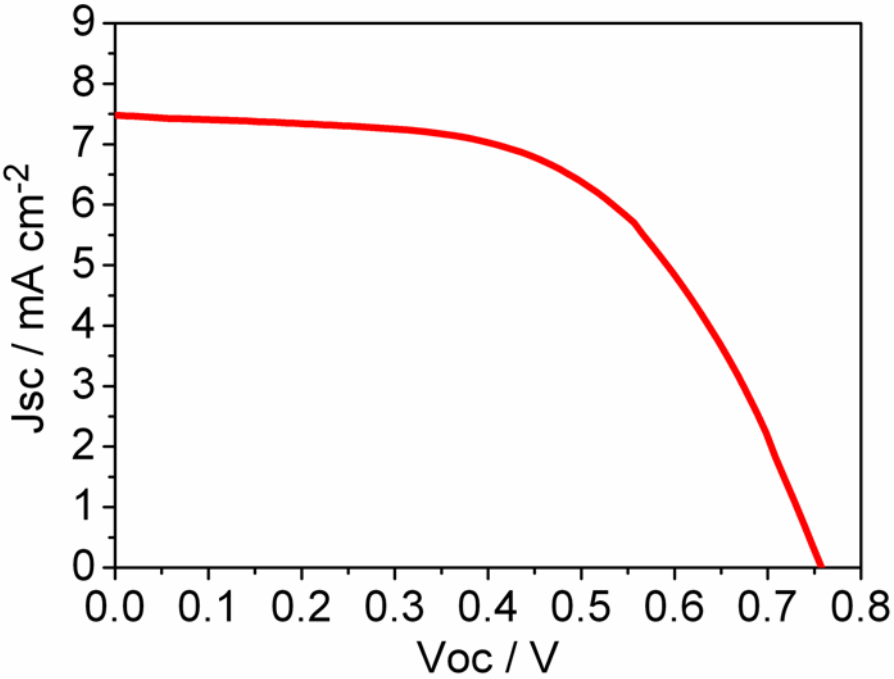

Figure S11. J-V curve of the PC part based on the liquid electrolyte.

Figure S12. Photograph of liquid (left) and gel (right) electrolytes used in the PC part.

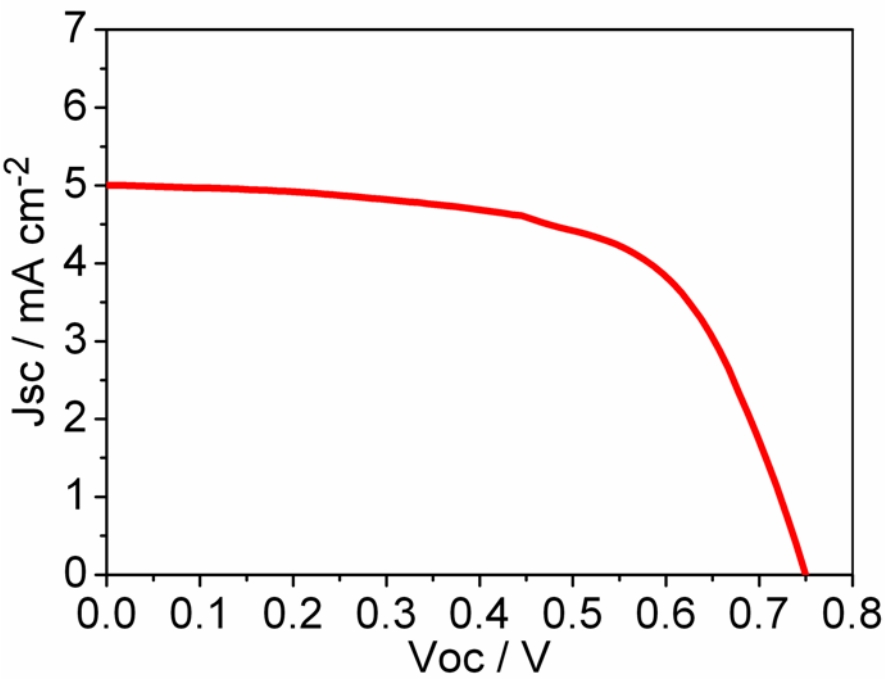

Figure S13. J-V curve of the PC part based on the gel electrolyte.

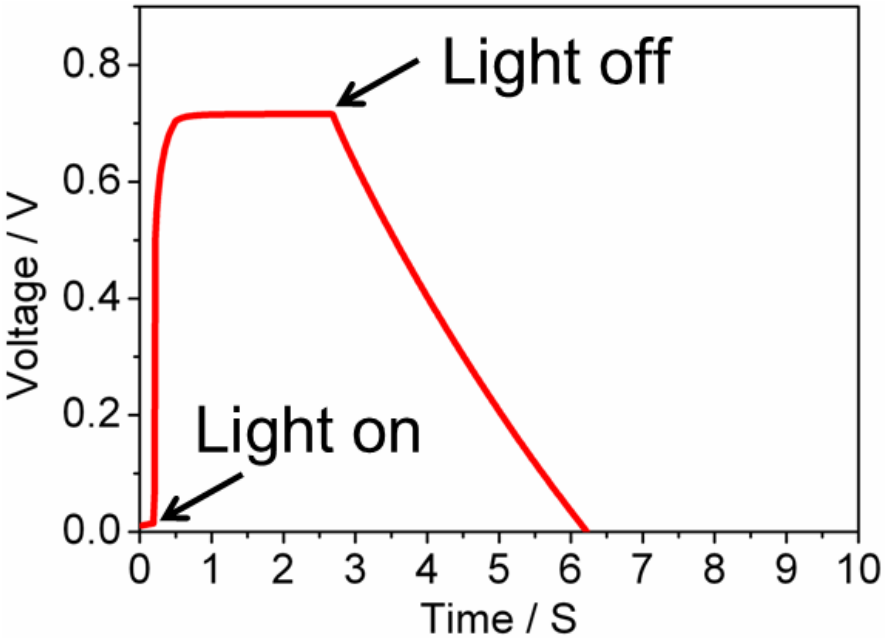

Figure S14. Typical photocharging and galvanostatic discharging curve for the integrated energy textile based on the liquid electrolyte and bare aligned CNT fiber-based textile electrode.

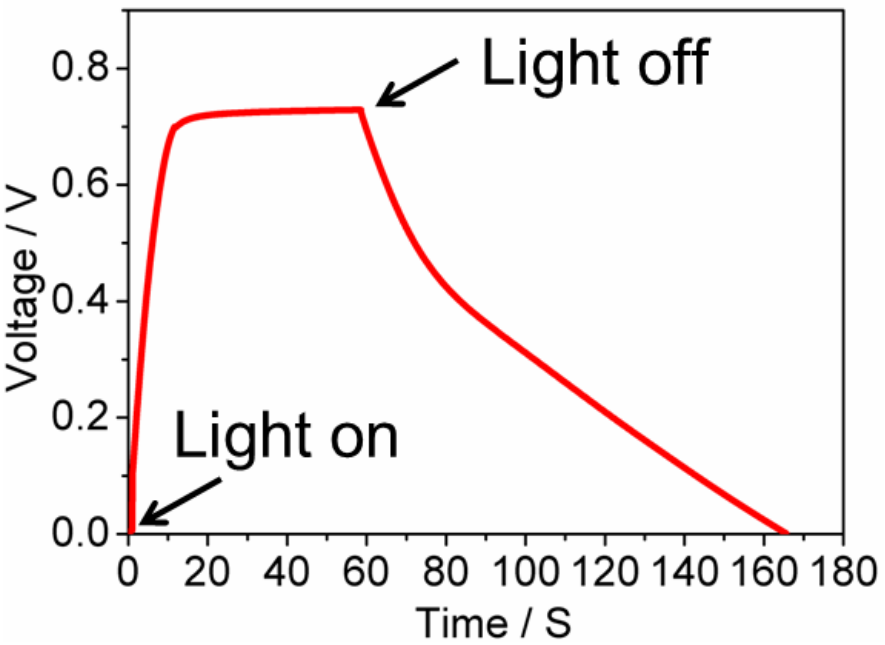

Figure S15. Typical photocharging and galvanostatic discharging curve for the integrated energy textile based on the liquid electrolyte and aligned CNT/PANI composite fiber-based textile electrode.