

Supportting Information For

**Cellulose nanofibers/Multi-Walled Carbon Nanotube nanohybrid aerogel
for all solid-state flexible supercapacitors**

All the electrochemical characters of supercapacitors are calculated as follows,

The gravimetric capacitance:

$$C_g = 4(\int idV)/(v \times m \times V) \quad \text{or} \quad C_g = 4I \times \Delta t / (\Delta V \times m)$$

The area capacitance:

$$C_s = (\int idV)/(v \times S \times V)$$

The coulombic efficiency

$$\eta = \Delta t_d / \Delta t_c \times 100\%$$

The specific capacitance of supercapacitor devices:

$$C_{spe} = I \times \Delta t / (\Delta V \times m)$$

$$E = (1/2) C_{spe} \times V_{IR}^2$$

$$P = V_{IR}^2 / (4m \times R_{ESR})$$

Where I is the applied current, Δt is the discharged time, Δt_d is the discharge time, Δt_c is the charge time, ΔV is the discharged potential, m is the total mass of two symmetrical electrodes, V_{IR} is voltage after IR drop, v is the voltage scan rate, V is the cell voltage, and S is the area of the supercapacitor.

Characterization of cellulose nanofibers

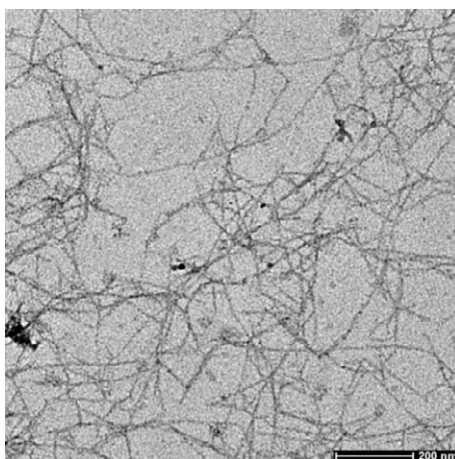


Fig.S1 TEM image of cellulose nanofiber samples

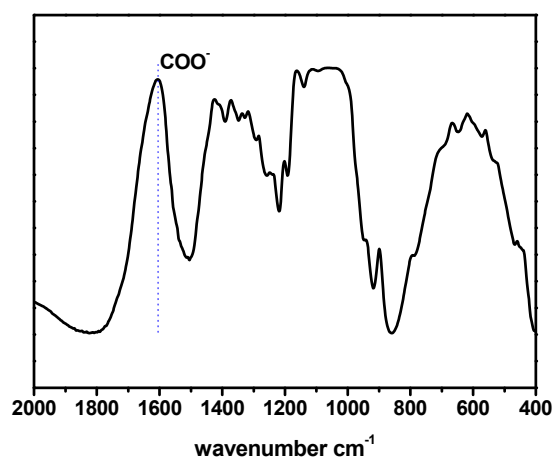


Fig.S2 FT-IR spectra of cellulose nanofiber samples

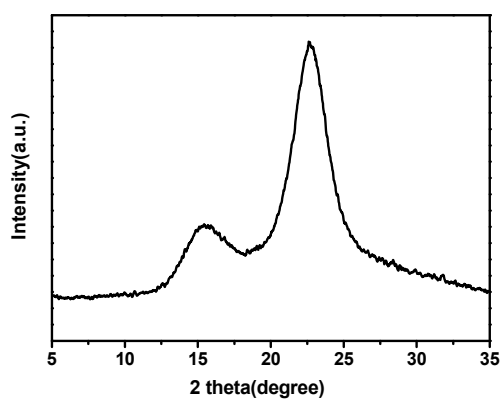


Fig.S3 XRD spectra of cellulose nanofiber samples



Fig.S4 Optical images of the aqueous dispersion of CNFs/MWCNTs (50%)
suspension

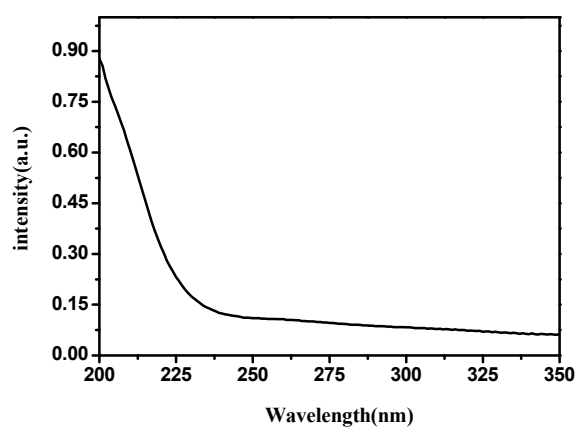
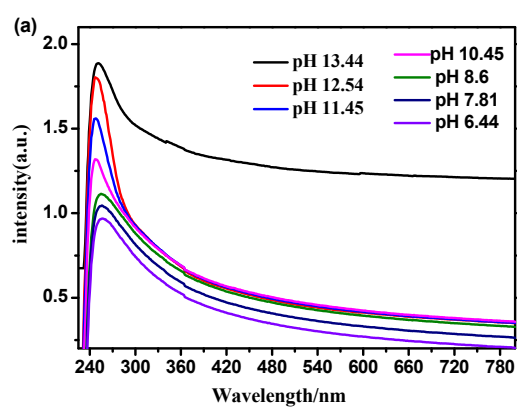


Fig.S5 UV/vis absorbance spectra of CNFs suspension



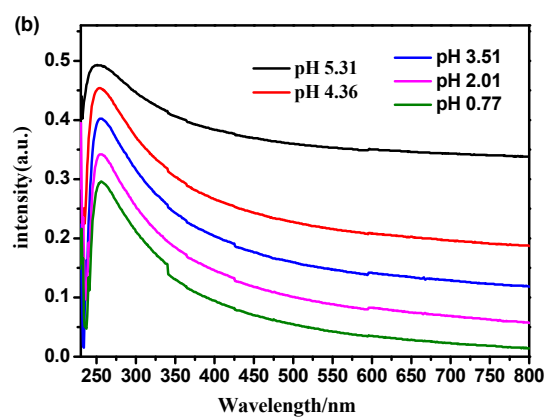


Fig.S6 UV/vis absorbance spectra of CNFs/ MWCNTs suspension at different pH



Fig.S7 Photograph of CNFs/ MWCNTs (50%) hydrogel



Fig.S8 Photograph of CNFs/ MWCNTs (50%) aerogel

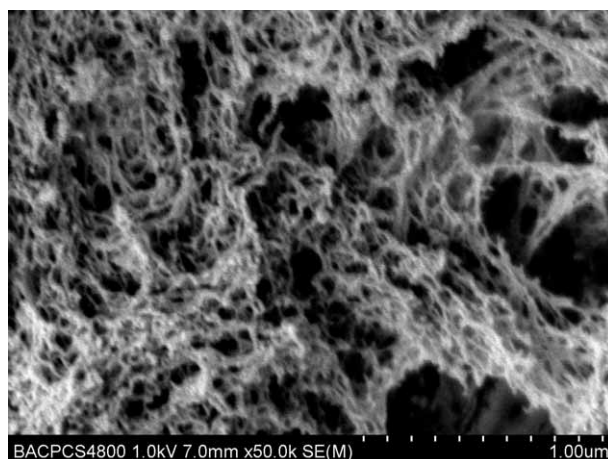


Fig.S9 SEM image of CNFs aerogel



Fig.S10 Demonstration of the flexibility of CNFs/ MWCNTs (50%) aerogel film

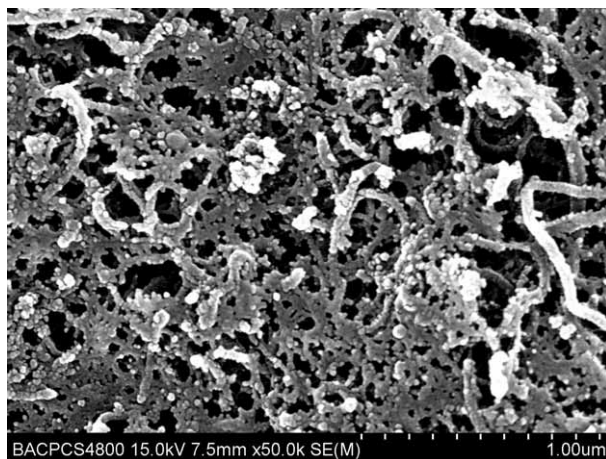


Fig.S11 SEM image of CNFs/MWCNTs (50%) hybrid aerogel film

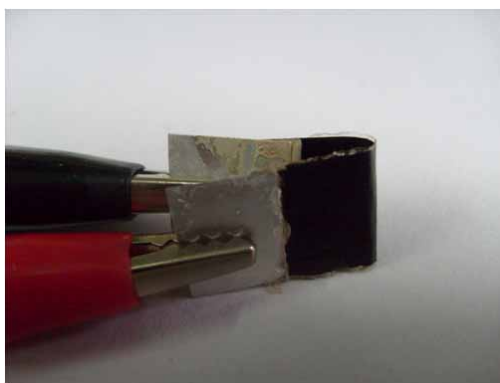


Fig.S12 Photograph of A-SCs

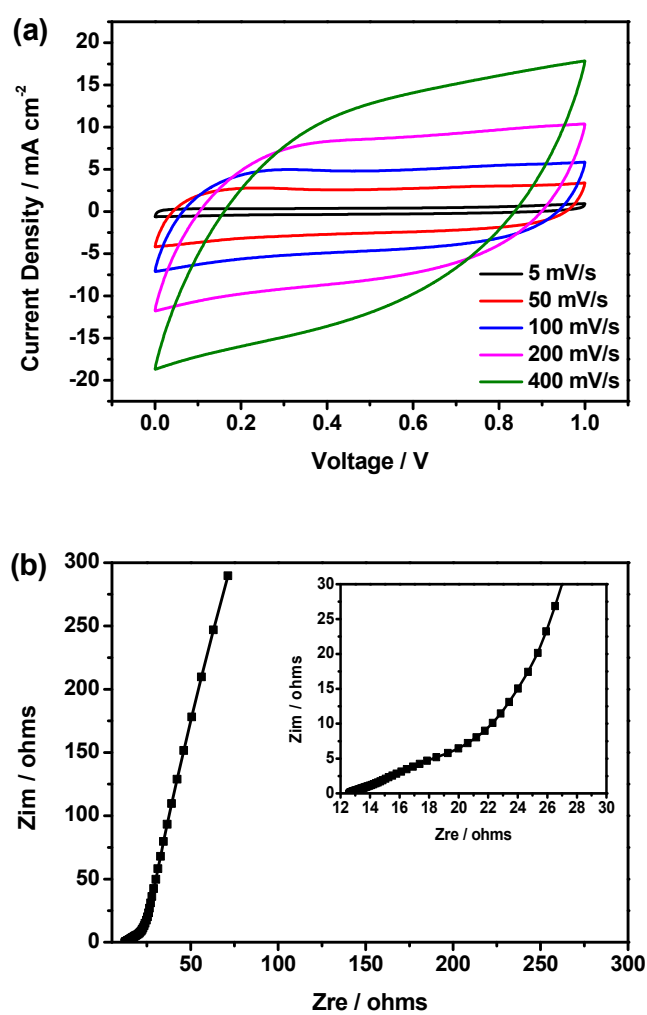


Fig.S13 (a) CV curves at different scan rates, (b) Nyquist impedance plots of the

A-SCs (2)



Fig.S14 Three A-SCs connected in series can illumine a LED light

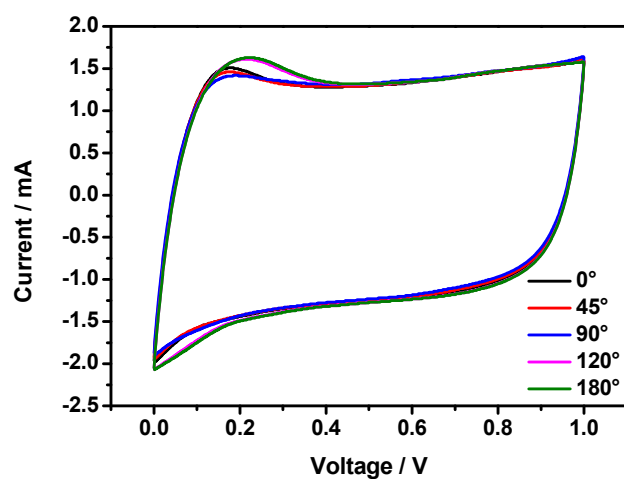


Fig.S15 CV curves of A-SCs under different bending angles at scan rate of 100 mV

s^{-1}