Supporting Information

Co_3O_4 nanowires on flexible carbon fabric as a binder free electrode for all solid state symmetric supercapacitor

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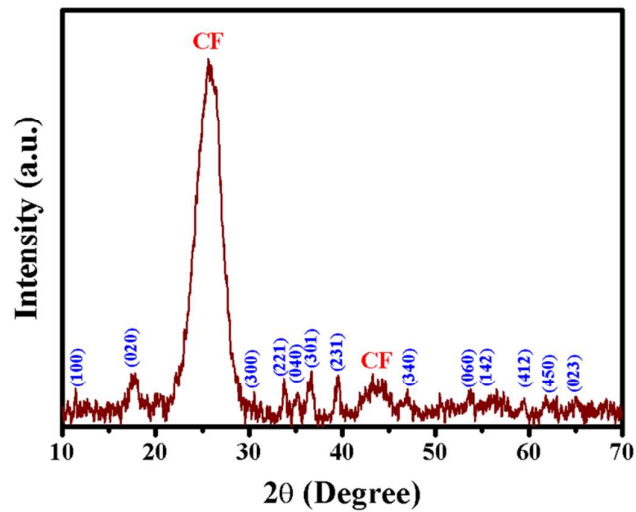
Fax: +91 33 2414 6007

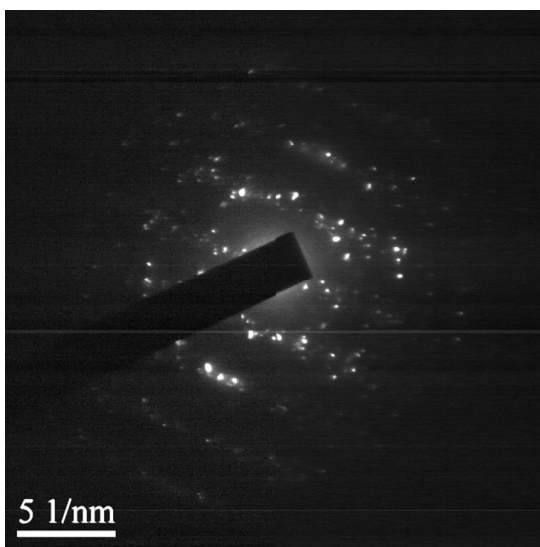Figure S1: XRD pattern of the Cobalt-hydroxide-carbonate on carbon fabric.

Figure S2: SAED pattern of the Cobalt-hydroxide-carbonate, clearly indicate the polycrystalline nature.
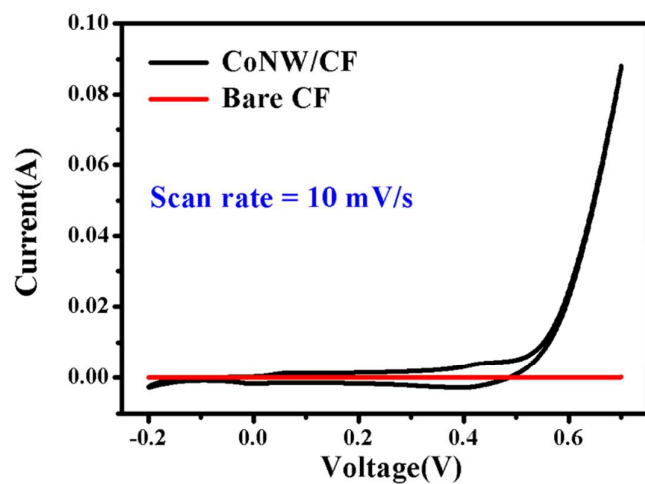
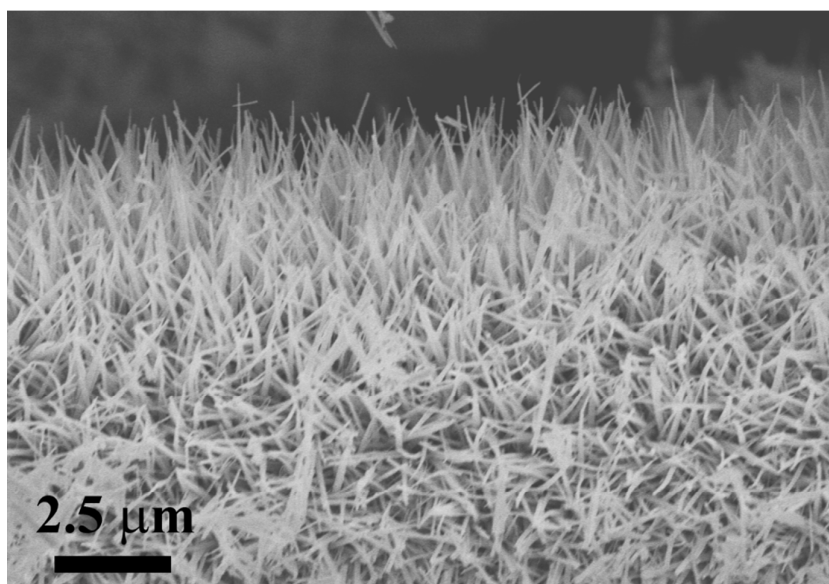Figure S3: Cyclic Voltammetry curve of CoNW/CF electrode and bare carbon fabric at scan rate 10 mV/sec.

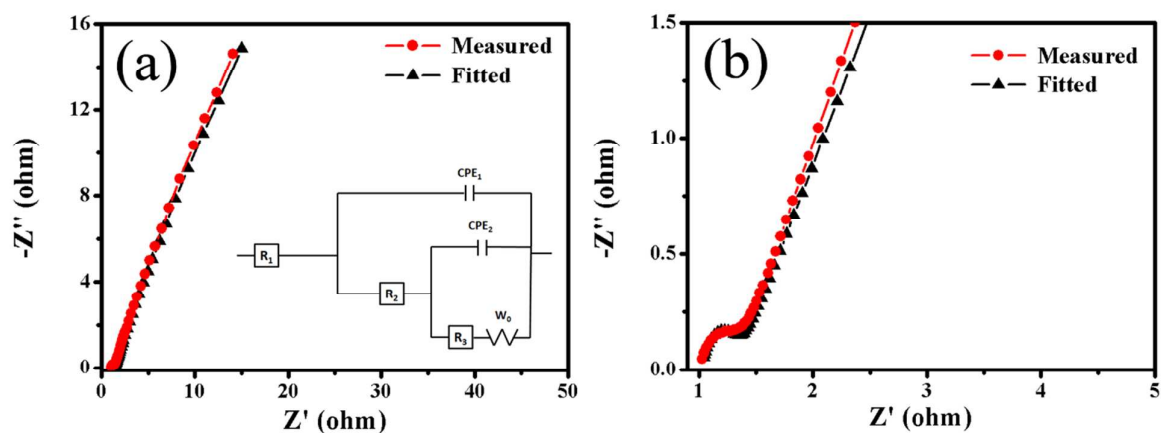Figure S4: FESEM image of CoNW/CF electrode after 2000 cycles.

Figure S5: (a) Nyquist plot of CoNW/CF electrode in three electrode system with 3M KOH aqueous electrolyte with fitted curve. Inset is the electrical equivalent circuit used to fit the experimental data of CoNW/CF electrode. (b) Semicircle at the high frequency region.
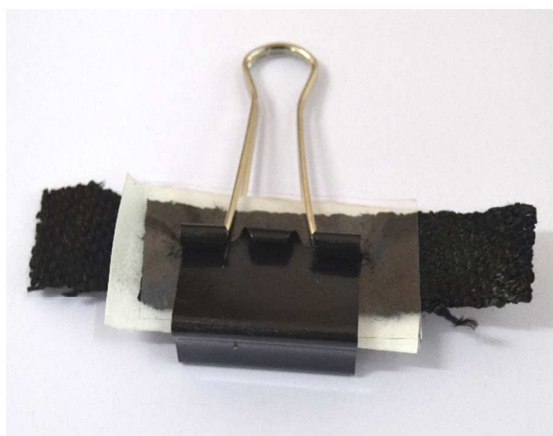

Figure S6: Digital image of the SSC device made of by two CoNW/CF electrodes, separated with PVA/KOH gel electrolyte and filter paper. Photograph courtesy of 'Promita Howli'. Copyright 2017.
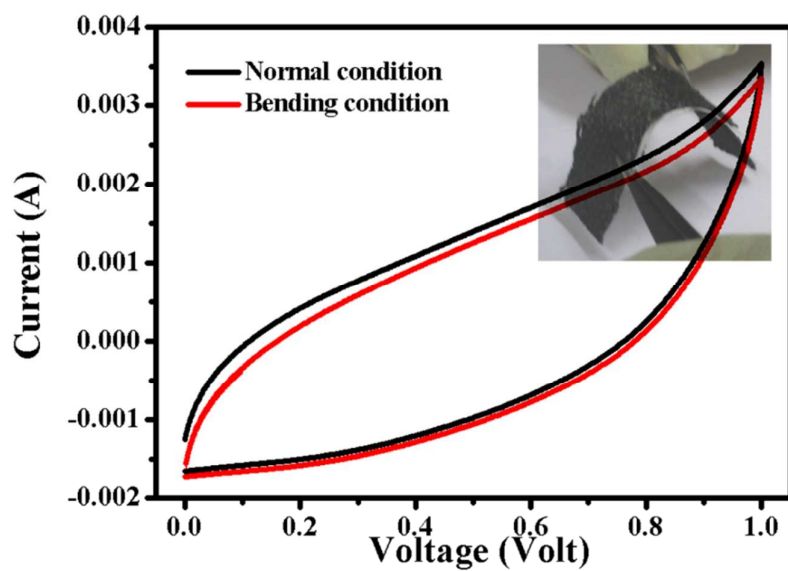
Figure S7: Cyclic voltammetry curve of SSC device at normal condition and bending condition at scan rate 50 mV/s.
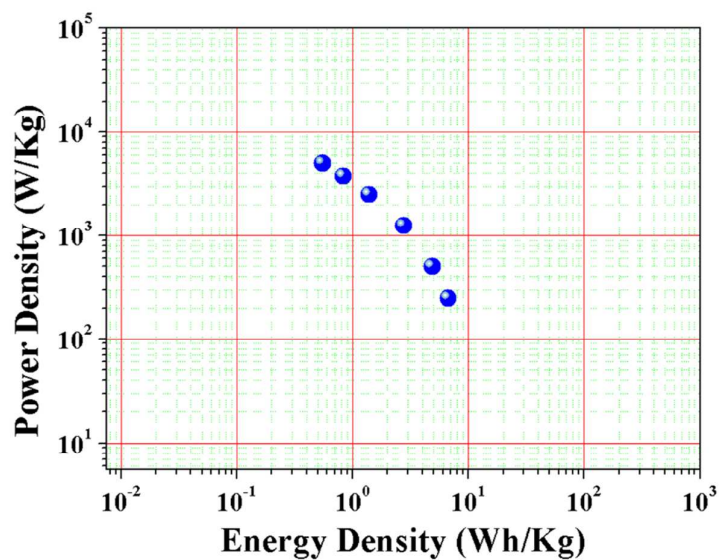

Figure S8: Gravimetric ragone plot of the SSC device.

Formulae and calculations:

Calculation of Volumetric capacitance of SSC device:

$C_V = (I \times \Delta t) / (v \times \Delta V)$ (in mF cm^{-3})   (when I is in mA)

v (in cm^3) is the effective volume of SSC device.

Volumetric (E_V, P_V) energy and power densities of SSC:

$E_V = C_V \times (\Delta V)^2 / 7.2$ (in mWh cm^{-3})

$P_V = E_V \times 3600 / \Delta t$ (in mW cm^{-3})

In all the calculations, ΔV and Δt are in volt and second respectively.

Gravimetric (E_S, P_S) energy and power densities of SSC:

$E_S = C_S \times (\Delta V)^2 / 7.2$ (in Wh kg^{-1})

$P_S = E_S \times 3600 / \Delta t$ (in W kg^{-1})

Where $C_S = (I \times \Delta t) / (m \times \Delta V)$ (in F g^{-1})   (when I is in mA and m is in mg)

 is gravimetric capacitance of SSC device.