Supporting Information

Cobalt Oxide Nanoparticles Embedded in Flexible Carbon Nanofibers: Attractive Material for Supercapacitors Electrodes and CO_2 Adsorption

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Notes: The authors declare no competing financial interest.

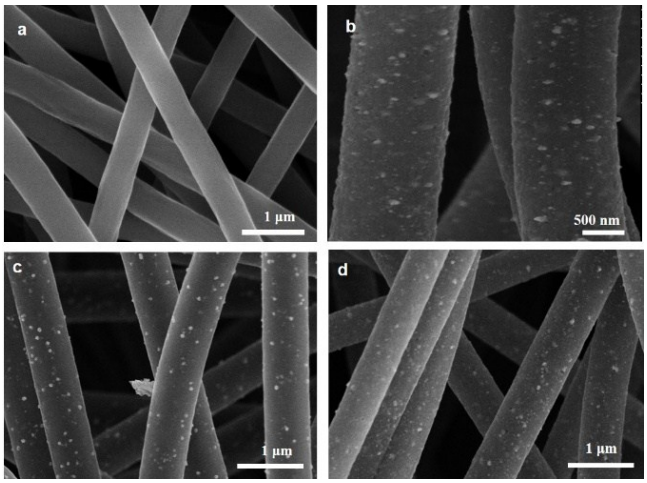


Fig. S1 FE-SEM images of CNFs derived from precursor fibers with different salts contents of (a) 0, (b) 2, (c) 3, and (d) 4 wt.%.

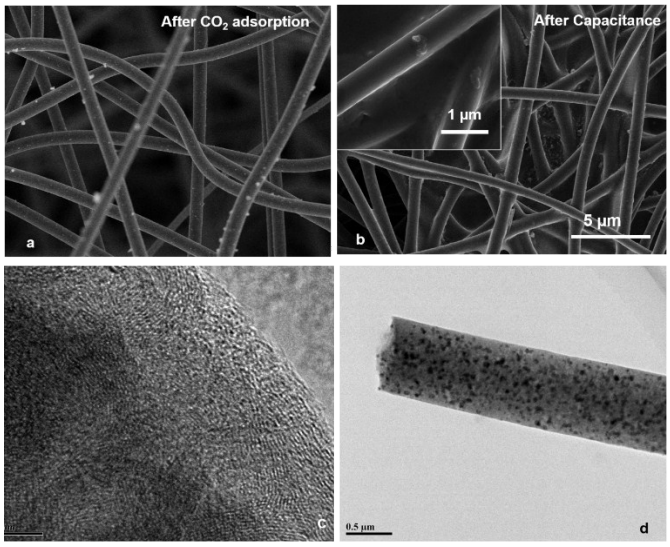


Fig. S2 FE-SEM and HR-TEM images of CNFs with optimized salts content after measuring supercapacitance and CO_2 adsorption.

FE-SEM and HR-TEM images show no significant change on morphology and internal structure after measuring properties of optimized samples after supercapacitance and CO_2 adsorption performance.

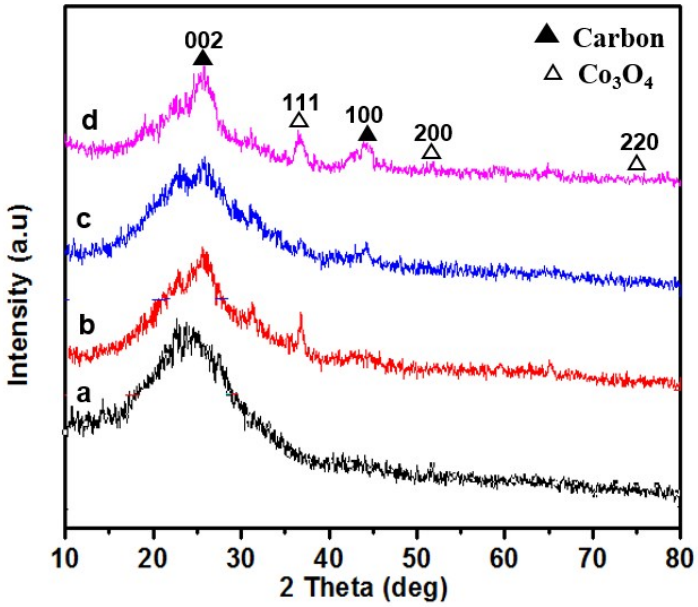


Fig. S3 Representative XRD patterns of CNFs derived from precursor fibers with salts contents of (a) 0, (b) 2, (c) 3, and (b) 4 wt.%.

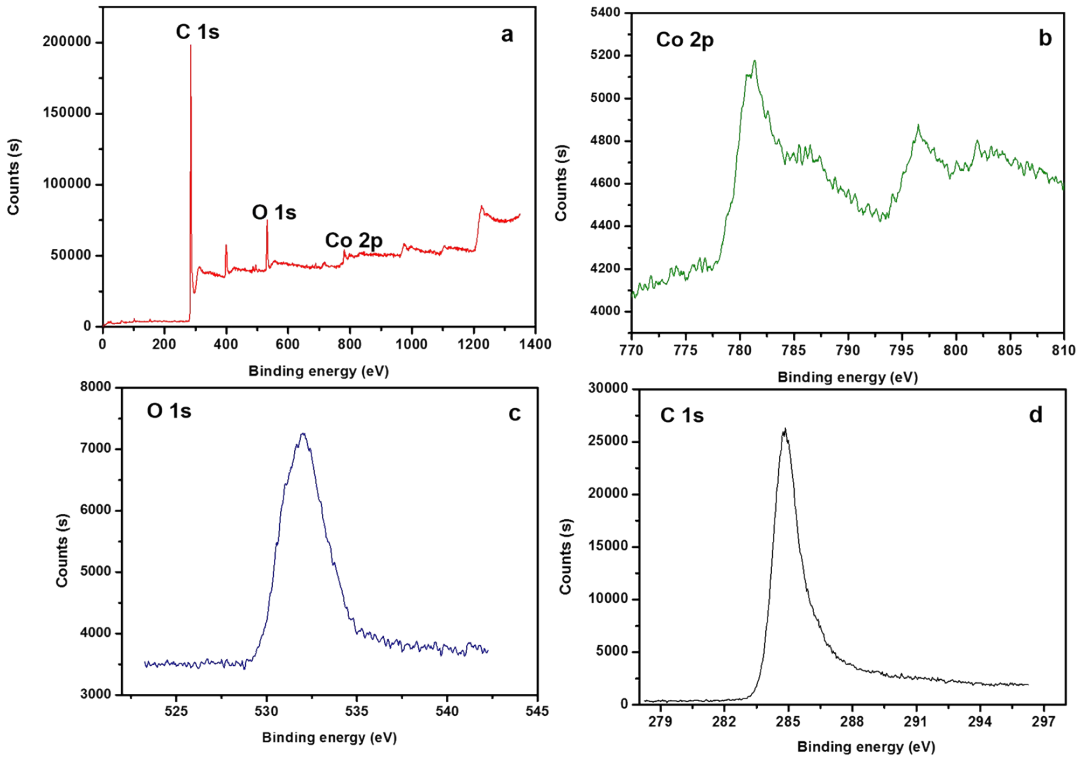


Fig. S4 High-resolution XPS spectra of (a) CNF-Co-4, (b) Co 2p, (c) O 1s, and, (d) O 1s.

S5. Preparation of PVA/H_2SO_4 Gel Electrolytes

Typically, the PVA/H_2SO_4 solution was prepared by blending PVA with 30 ml water and then add H_2SO_4 then mixed solution and put in oil bath at 85 °C for 3 h with stirring and after that on 85°C without stirring at weight ratio of 1:1. This mixed solution were then put for the evaporation of water.

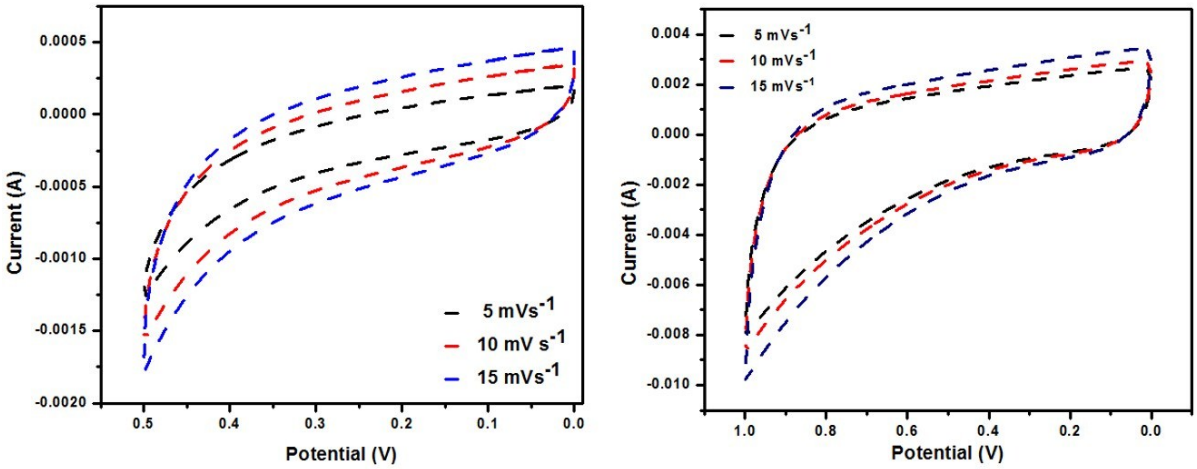


Fig. S6 Cyclic voltammetry of CNFs derived from precursor fibers with 2 and 3% salts content

As seen from the CV curves of the CNFs-Co-2 the electrochemical response current at a scan rate of 5,10 and 15 mV^{-1}, suggest the SC of the membrane itself shows SC of 380, 298, and 236 F g^{-1} .

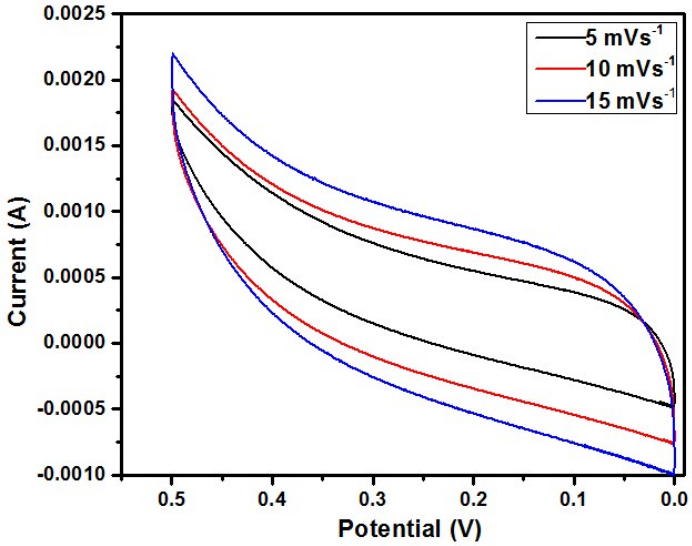
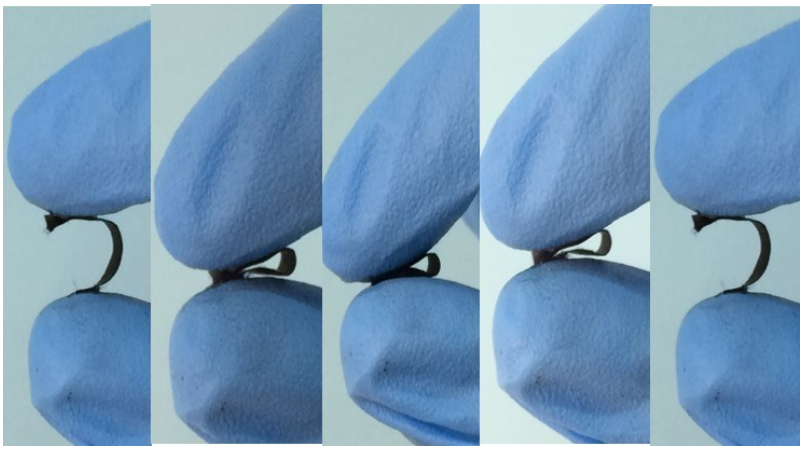


Fig. S7 Cyclic voltammetry of CNFs derived from precursor fibers with 0% salts content.

As seen from the CV curves of the CNFs film (**Fig. S4**), the little electrochemical response current and the small areas integrated below the zero-current line, even at a scan rate of 5 mV^{-1} at 0.5 Ag^{-1}, suggest the low SC of the pure CNFs membrane itself. Pure CNFs shows 183, 98, and 67 F/g at 5, 10 and 15 mVs^{-1}.



Movie#1. Movie images presenting the robust flexibility of CNFs-Co-2 membranes (see movie).

Movie# 2. Movie of pure CNFs.