Supporting Information

Cotton Textile Enabled, All-Solid-State Flexible Supercapacitors

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Calculations
1. Specific capacitances derived from cyclic voltammetry (CV) tests were calculated from Equation 1 as follows:

\[ C_{sp} = \frac{1}{mv(V_c - V_a)} \int_{V_a}^{V_c} I(V)dV \] (1)

where \( C_{sp} \) (F/g), \( m \) (g), \( \nu \) (V/s), \( V_c \) and \( V_a \) (V), and \( I \) (A) are the specific capacitance, the mass of the active material, scan rate, high and low potential limit during the CV tests, and the instant current on the CV curves, respectively.

2. Specific capacitances derived from galvanostatic (GV) tests were calculated from Equation 2 as follows:

\[ C_{sp} = \frac{It}{(\Delta V)m} \] (2)

where \( C_{sp} \) (F/g), \( I \) (A), \( t \) (s), \( m \) (g) and \( V \) (V) are the specific capacitance, the discharge current, the discharge time, the mass of the active material, and the total potential window, respectively.

3. Energy density (E) and power (P) density derived from GV tests were calculated from the following equations:

\[ E = \frac{1}{2} CV^2 \] (3)

\[ P = \frac{E}{t} \] (4)

where \( E \) (Wh/kg), \( C \) (F/g), \( V \) (V), \( P \) (W/kg) and \( t \) (s) are the energy density, specific capacitance, potential window, power density, and discharge time, respectively.

4. For the constructed asymmetric and symmetric capacitors, specific capacitances derived from cyclic voltammetry (CV) tests were calculated from Equation 5 as follows:
\[ C_{sp} = \frac{1}{mv(V_c - V_a)} \int_{V_a}^{V_c} I(V) dV \]  

(5)

where \( C_{sp} \) (F/g), \( m \) (g), \( \nu \) (V/s), \( V_c \) and \( V_a \) (V), and \( I \) (A) are the specific capacitance, the total mass of the active material, scan rate, high and low potential limit during the CV tests, and the instant current on CV curves, respectively.

The specific capacitance derived from GV tests was calculated from Equation 6 as follows:

\[ C_{sp} = 4C = \frac{4I t}{(\Delta V)m} \]  

(6)

where \( C_{sp} \) (F/g), \( I \) (A), \( t \) (s), \( m \) (g) and \( V \) (V) are the specific capacitance, the discharge current, the discharge time, the total mass of the active material, and the total potential window, respectively.
Fig. S1 EDS spectrum and element mapping images of C, O, Co and Ni elements of NiCo$_2$O$_4$ nanowire/ACT.
Fig. S2 (a) Cyclic voltammetry (CV) curves of ACT at different scan rates in 6 M KOH aqueous solution; (b) Specific capacitances of ACT at different scan rates derived from the CV curves; (c) CV curves of NiCo$_2$O$_4$ nanowire/ACT at different scan rates in 6 M KOH aqueous solution. (d) Specific capacitances of NiCo$_2$O$_4$ nanowire/ACT derived from the CV curves.
Fig. S3 (a) CV curves of NiCo$_2$O$_4$@NiCo$_2$O$_4$/ACT at different scan rates in 6 M KOH aqueous solution; (b) Galvanostatic (GV) constant-current charge/discharge curves of NiCo$_2$O$_4$@NiCo$_2$O$_4$/ACT in 6 M KOH aqueous solution at different current densities; (c) Specific capacitances of NiCo$_2$O$_4$@NiCo$_2$O$_4$/ACT in 6 M KOH aqueous solution at different current densities; (d) Nyquist plots of electrochemical impedance spectra of NiCo$_2$O$_4$@NiCo$_2$O$_4$/ACT in 6 M KOH aqueous solution in the frequency range of 100 kHz to 0.05Hz.
Fig. S4 (a) Comparative CV curves of ACT, NiCo$_2$O$_4$ nanowire/ACT and NiCo$_2$O$_4$@NiCo$_2$O$_4$/ACT at a scan rate of 25 mV/s in 6 M KOH aqueous solution; (b) Comparative Nyquist plots of electrochemical impedance spectra of ACT, NiCo$_2$O$_4$ nanowire/ACT and NiCo$_2$O$_4$@NiCo$_2$O$_4$/ACT in 6 M KOH aqueous solution within the frequency range from 100 kHz to 0.05 Hz.
**Fig. S5** Cycling performance of NiCo$_2$O$_4$@NiCo$_2$O$_4$/ACT in 6 M KOH aqueous solution at a current density of 20 mA/cm$^2$, inset is a part of the charge/discharge curve of NiCo$_2$O$_4$@NiCo$_2$O$_4$/ACT during the GV constant-current test.