Supporting Information

Direct Growth of Ultrathin $NiCo_2O_4$/NiO Nanosheets on SiC Nanowires as a Free-Standing Advanced Electrode for High-Performance Asymmetric Supercapacitors

Jian Zhao,[†] Zhenjiang Li,[*,†] Meng Zhang,[†] Alan Meng,[*,‡] and Qingdang Li[§]

[†]*Key Laboratory of Polymer Material Advanced Manufacturing Technology of Shandong Provincial, Qingdao University of Science and Technology, 99 Songling Road, Qingdao 266061, Shandong, P. R. China.*

[‡]*State Key Laboratory Base of Eco-chemical Engineering, College of Chemistry and Molecular Engineering, Qingdao University of Science and Technology, 53 Zhengzhou Road, Qingdao 266042, Shandong, P. R. China.*

[§]*College of Sino-German Science and Technology, Qingdao University of Science and Technology, 99 Songling Road, Qingdao 266061, Shandong, P.R.China.*

Corresponding Author

*****E-mail: zjli126@126.com

*****E-mail: mengalan@126.com

Calculations:

(1) The specific capacitances of the SiC NWs @$NiCo_2O_4$/NiO NSs on CC electrode calculated from GV curves are obtained according to the following equation:

$$C = \frac{I\Delta t}{m\Delta V}$$

where I is the discharge current, Δt is the discharge time in GV test, m is the active material mass, and ΔV is the voltage window.

(2) The specific capacitance of the SiC NWs@$NiCo_2O_4$/NiO NSs on CC // AC on NF asymmetric supercapacitor (ASC) device can be got in accordance with the following equation:

$$C_{\mathrm{dev}ice} = \frac{I\Delta t}{M\Delta V}$$

Herein, I is the discharge current, Δt is the discharge time in GV test, M is the total mass of both positive and negative electrodes, and ΔV is the voltage window of the device.

(3) Methods to calculate the energy and power density of the ASC device:

$$E = \frac{1}{2} C_{\mathrm{dev}ice} \Delta V^2 ; \quad P = \frac{E}{t}$$

Here, C_{device} is the specific capacitance of the device, ΔV is the potential window, and t is the discharge time.

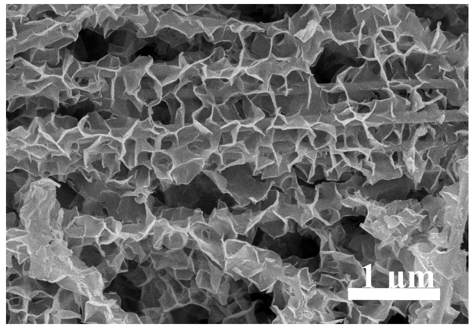

Figure S1. SEM image of the Ni-Co precursor

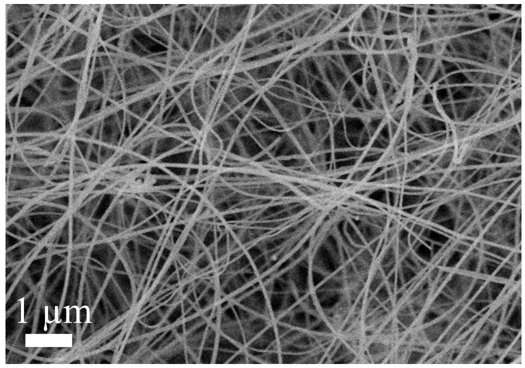

Figure S2. Low-magnification SEM image of the SiC NWs

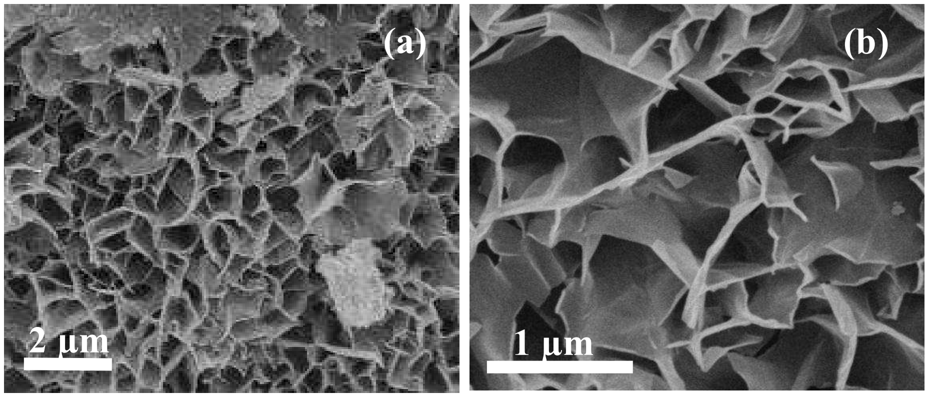

Figure S3. (a) Low-magnification and (b) high-magnification SEM images of the pure $NiCo_2O_4/NiO$ NSs

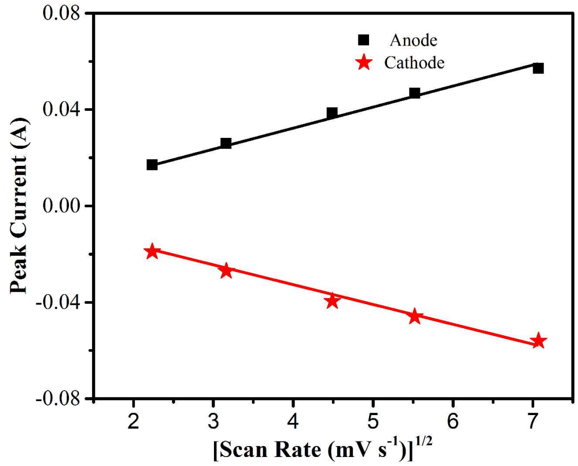

Figure S4. The relationship between peak current and the square root of scan rates for the SiC NWs@$NiCo_2O_4$/NiO NSs

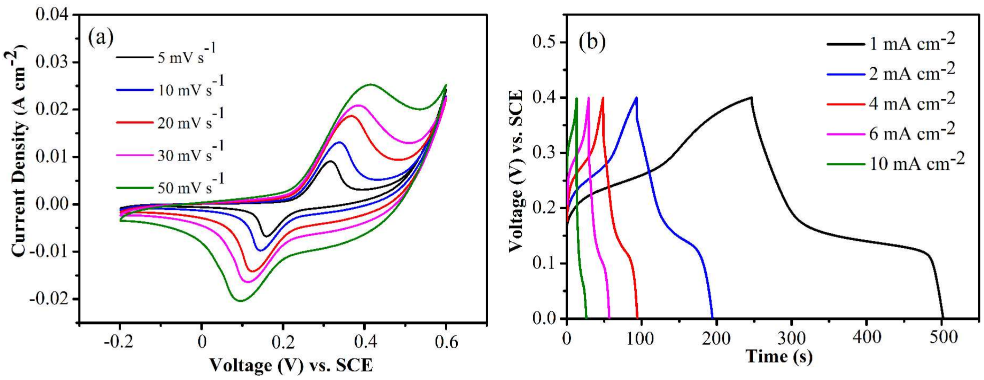

Figure S5. (a) CV curves and (b) GV curves of the $NiCo_2O_4$/NiO NSs

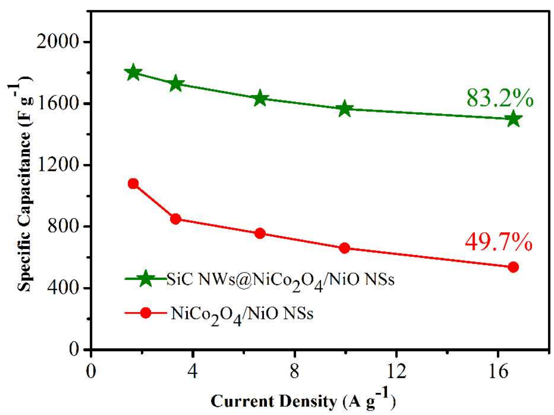

Figure S6. Specific capacitance as a function of specific measurement value of the current

Table S1. Comparison of the electrochemical properties of the as-fabricated SiC NWs@$NiCo_2O_4$/NiO NSs with the reported ones

Material	Fabrication method	capacitance (F g^{-1}) at low current density	capacitance (F g^{-1}) at high current density	Reference
CNT/$NiCo_2O_4$ core/shell	Electrochemical deposition	694 (1 A g^{-1})	591 (10 A g^{-1})	S1
Cu/CuOxNW@$NiCo_2O_4$ NSs	Hydrothermal and calcination	578 (1 A g^{-1}	462 (10 A g^{-1})	S2
RGO/CNT/NiO composites	Hydrothermal and calcination	1180 (1 A g^{-1})	840 (10 A g^{-1})	S3
$NiCo_2O_4$ NWs	Hydrothermal and calcination	401 (1 A g^{-1})	300 (8 A g^{-1})	S4
$NiCo_2O_4$–RGO	Self-assembly and thermal treatment	835 (1 A g^{-1})	617 (16 A g^{-1})	S5
NiO nanoflower	a sol-gel method	480 (0.5 A g^{-1})	252 **(**5 A g^{-1}**)**	S6
SWCNT@$NiCo_2O_4$ core-shell	Hydrothermal and sintering	1642 (0.5 A g^{-1})	1100 (10 A g^{-1}**)**	S7
$NiCo_2O_4$@$NiCo_2O_4$ core/shell	Hydrothermal and chemical deposition	900 (1 A g^{-1})	675 (20 A g^{-1})	S8
CNS/$NiCo_2O_4$ core-shell	Hydrothermal and calcination	1420 (1 A g^{-1})	1022 (10 A g^{-1})	S9
CNT films@Ni-Co oxide	Electrodeposition	No data	569 (10 mA cm^{-2})	S10
SiC NWs@$NiCo_2O_4$/NiO NSs	Hydrothermal and calcination	1801 (1 mA cm^{-2}) or 1801 (~1.67 A g^{-1})	1499 (10 mA cm^{-2}) or 1499 (~16.67 A g^{-1})	In this work

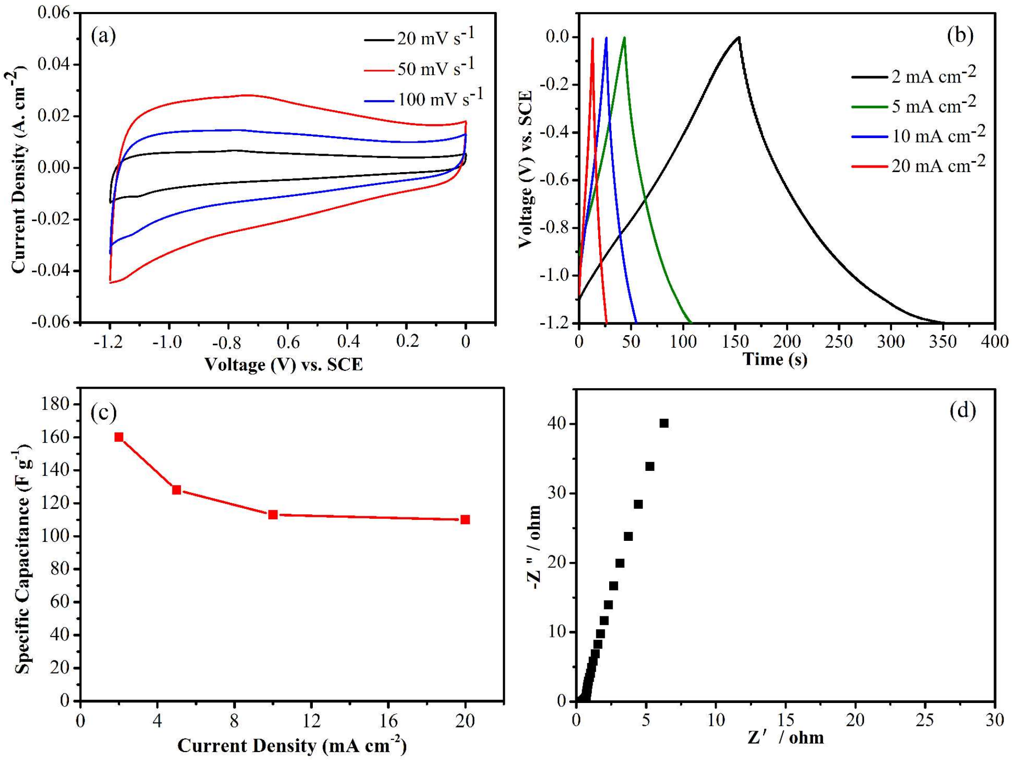

Figure S7. (a) CV and (b) GV curves of activated carbon (AC) on NF; (c) specific capacitance calculated from the GV curves as a function of current density; (d) EIS of activated carbon (AC) on NF

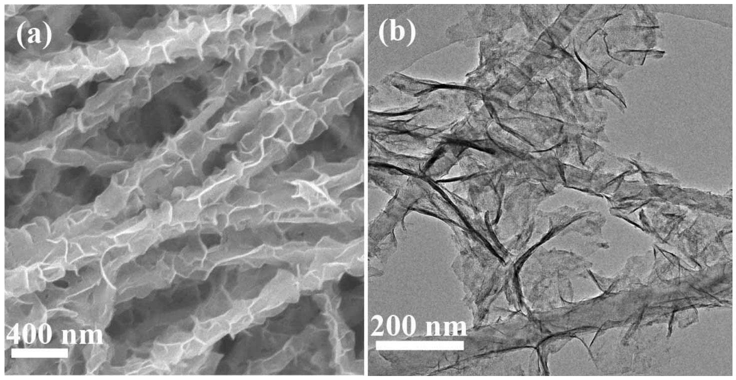

Figure S8. SEM (a) and TEM (b) images of the SiC NWs@$NiCo_2O_4$/NiO NSs after 2000 cycles at 20 mA cm^{-2}.

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