

ADVANCED MATERIALS

Supporting Information

for *Adv. Mater.*, DOI: 10.1002/adma. 201304319

Twisted Aligned Carbon Nanotube/Silicon Composite Fiber
Anode for Flexible Wire-Shaped Lithium-Ion Battery

*Huijuan Lin, Wei Weng, Jing Ren, Longbin Qiu, Zhitao
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and Huisheng Peng**

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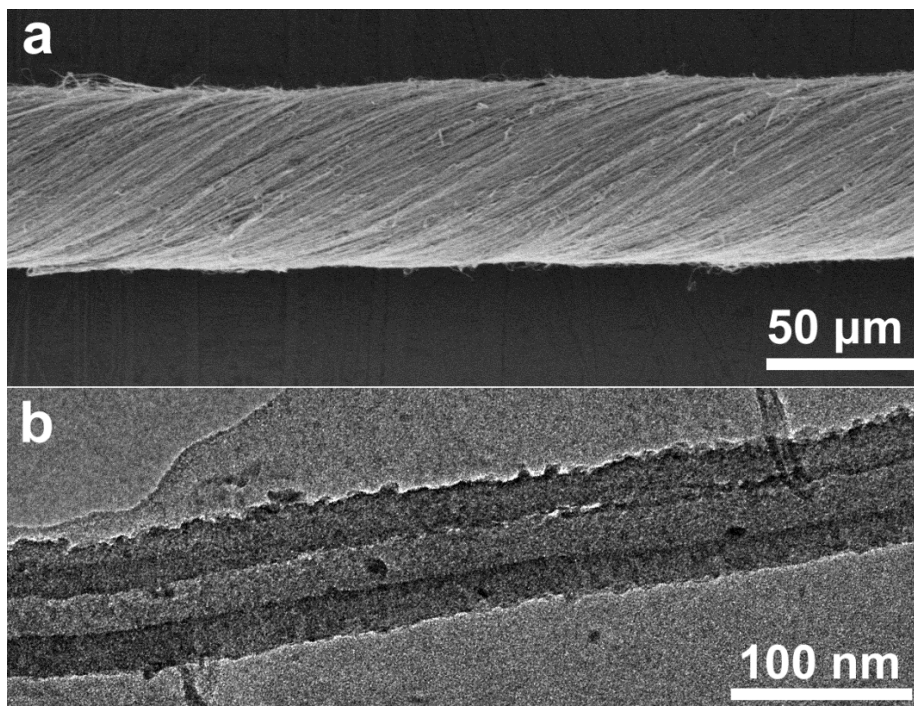


Figure S1. Structure characterization of the aligned MWCNT/Si composite fiber with a Si weight percentage of 38.1% by SEM (a) and HRTEM (b).

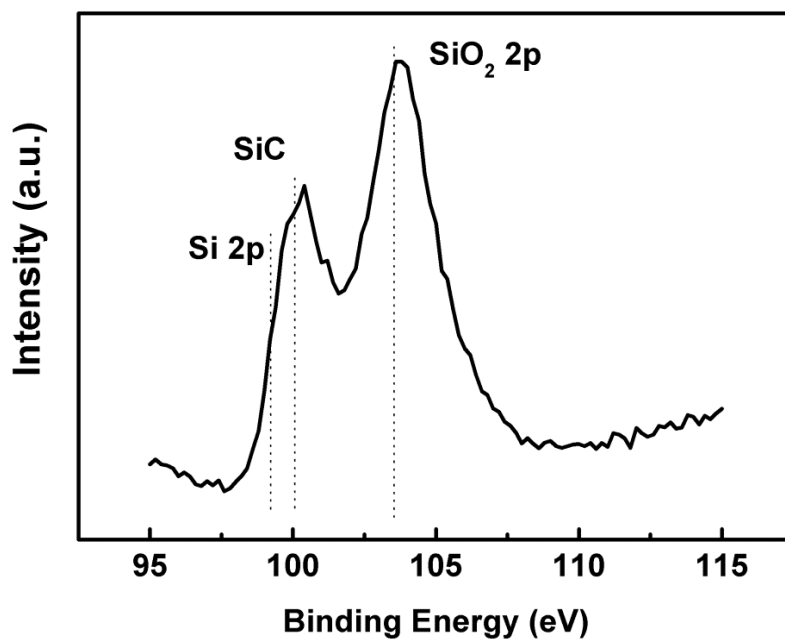


Figure S2. Si peaks in a typical X-ray photoelectron spectroscopy curve of the aligned MWCNT/Si composite fiber. Three Si phases were observed, i.e., SiO₂ 2p (~103 eV), SiC 2p (~100 eV), and Si 2p (~99 eV).

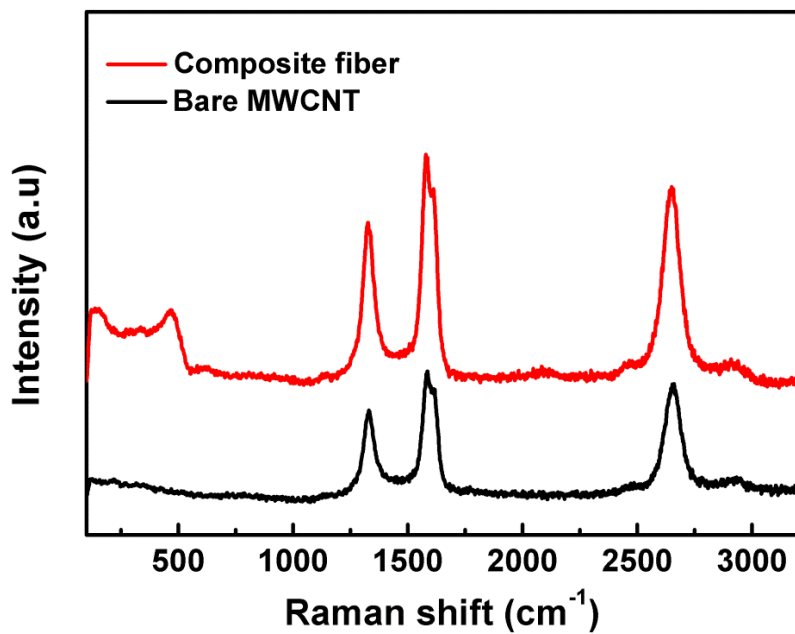


Figure S3. Raman spectra of the aligned bare MWCNT and MWCNT/Si composite fibers with Si weight percentage of 38.1%.

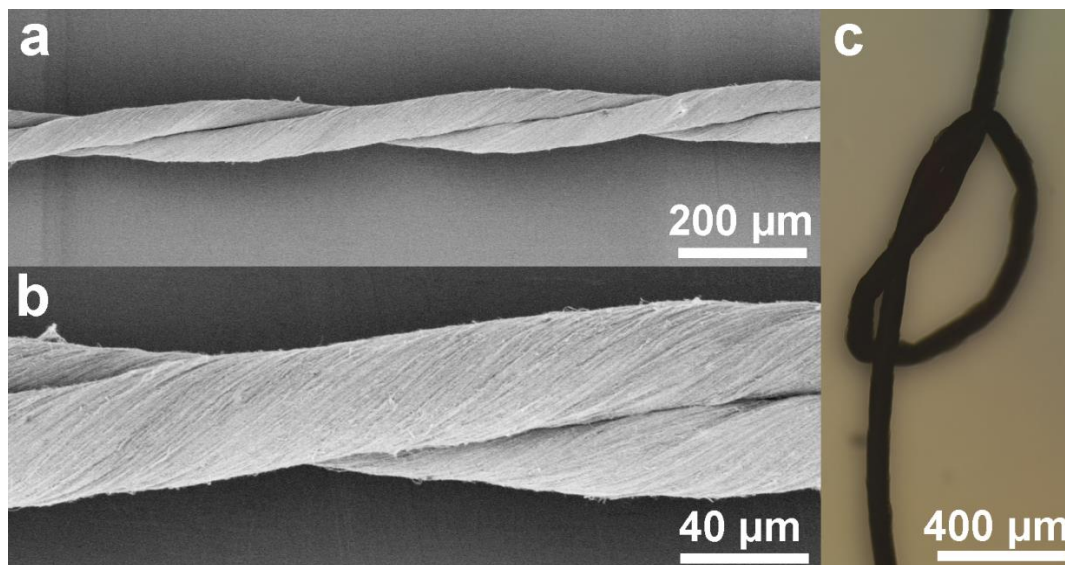


Figure S4. a and b. SEM images of a twisted structure from two aligned MWCNT/Si composite fibers at low and high magnifications, respectively. c. Photograph of an aligned MWCNT/Si composite fiber being made into a knot.

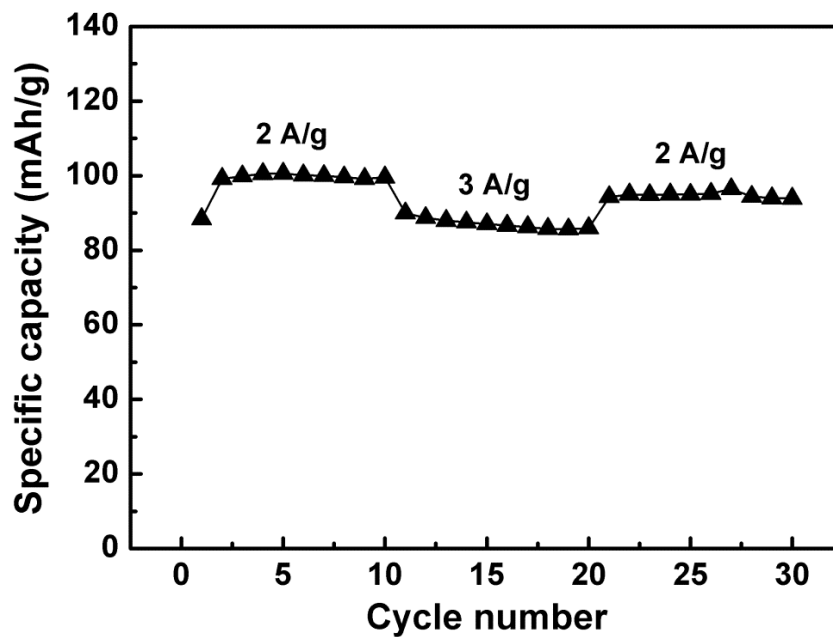


Figure S5. Dependence of specific capacity on current density for bare MWCNT fiber.

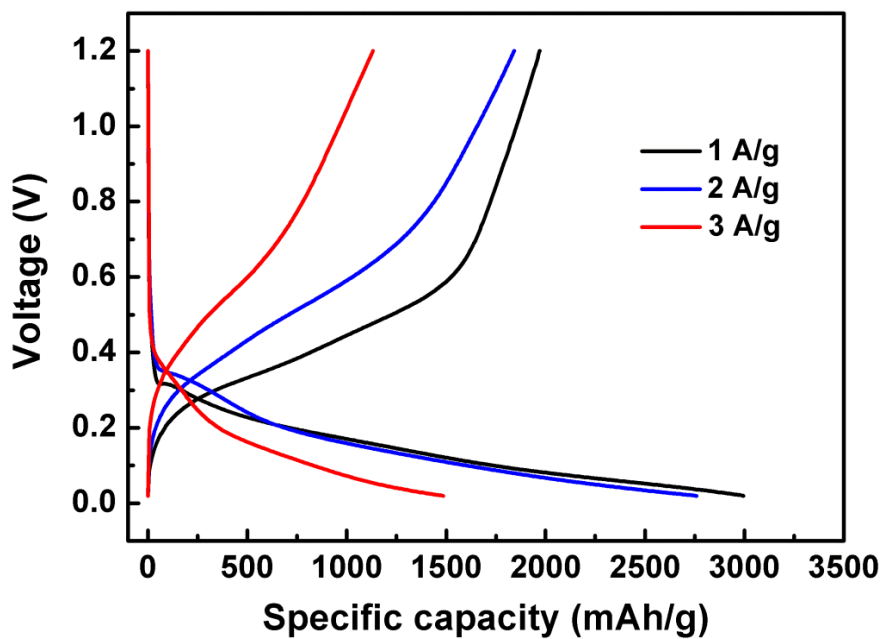


Figure S6. Charge and discharge curves of the aligned MWCNT/Si composite fibers with Si weight percentage of 38.1% at different current densities.

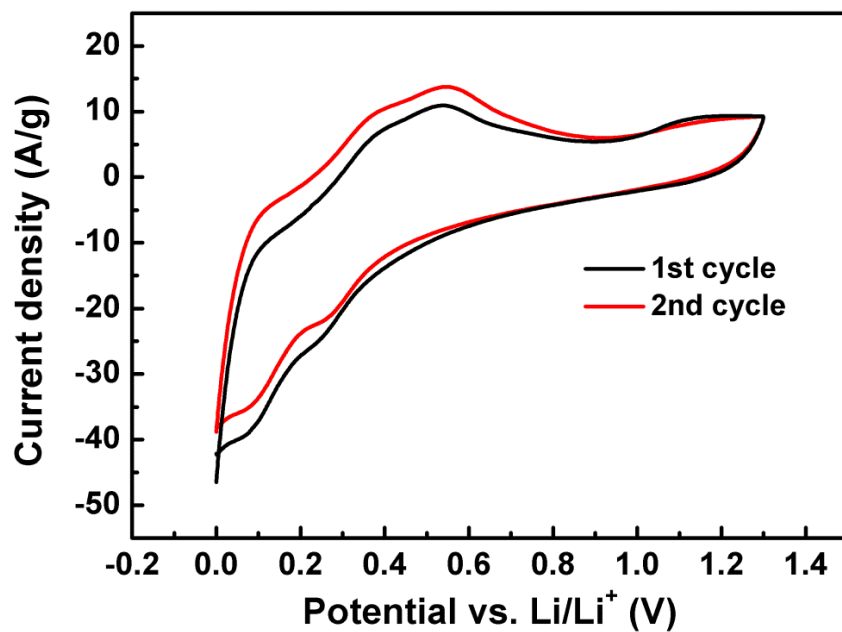


Figure S7. CV curves of an aligned MWCNT/Si composite fiber with a Si weight percentage of 38.1 % at a scan rate of 2 mV s^{-1} .

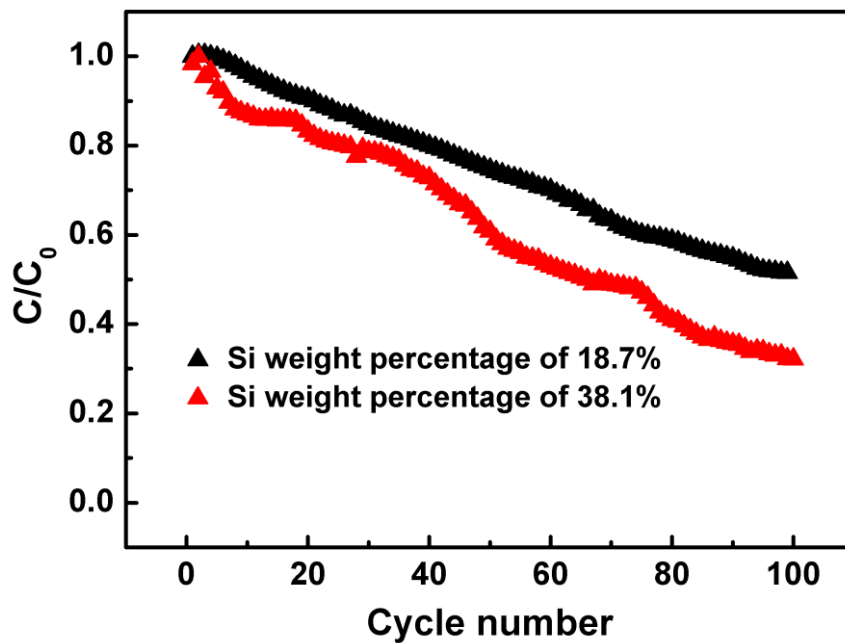


Figure S8. Dependence of the specific capacity on cycle number for composite fibers with Si weight percentages of 18.7% and 38.1% at 1 A/g. C_0 and C correspond to the specific capacities at the first and following cycle, respectively.

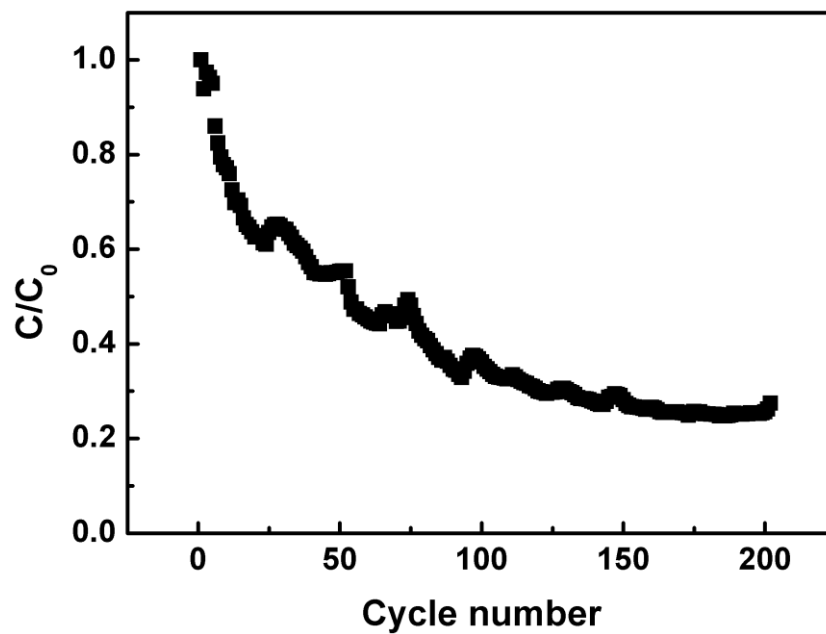


Figure S9. Dependence of the specific capacity on cycle number for composite fibers with Si weight percentages of 38.1% at 2 A/g. C_0 and C correspond to the specific capacities at the first and following cycle, respectively.

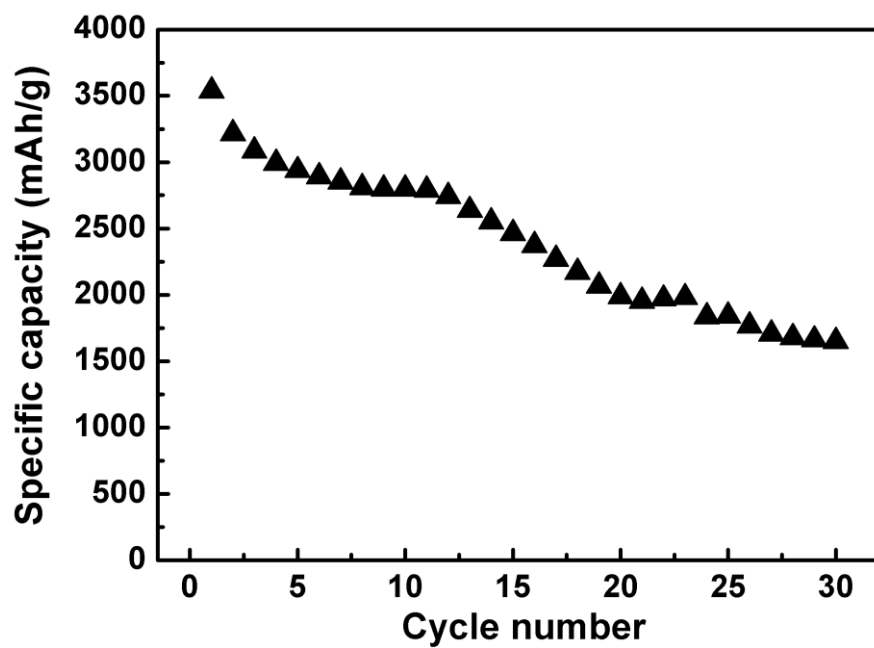


Figure S10. Cyclic performance of Si (100 nm) deposited on copper foil at a rate of 0.6C.

The calculation of specific capacity was based on the mass of Si.

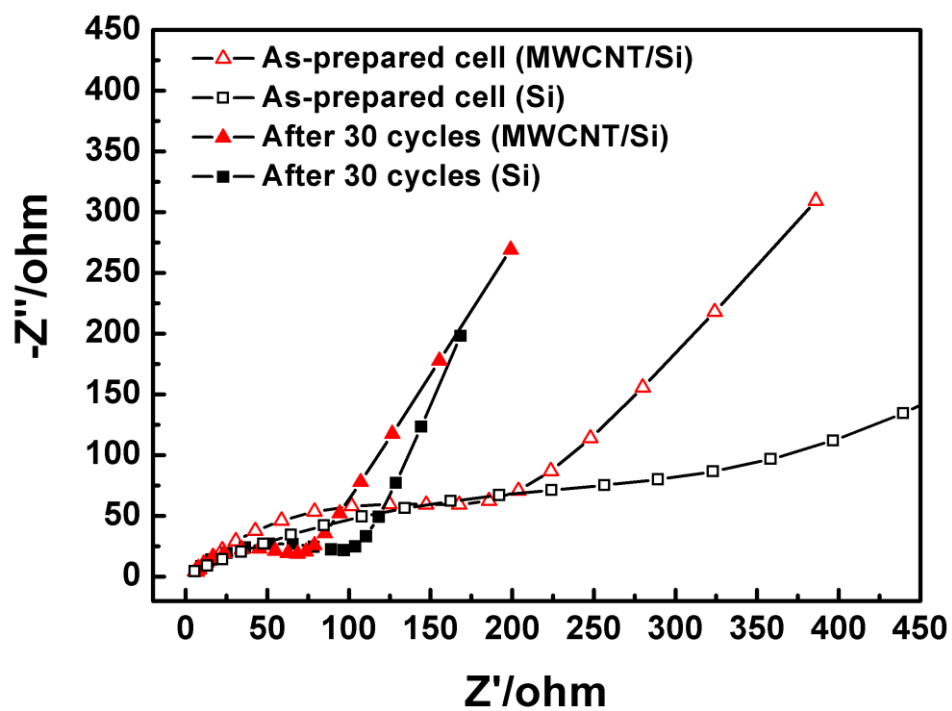


Figure S11. Electrochemical impedance spectra of the MWCNT/Si composite and Si.