

Supporting Information

Glancing Angle Deposition of Large-Scale Helical Si@Cu₃Si Nanorod Arrays for High-Performance Anodes in Rechargeable Li-Ion Batteries

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Table S1 The double layer capacitance (C_{dl}) and the relative surface areas of the helical Si hierarchical nanostructures.

Samples	Capacitance ($\mu\text{F cm}^{-3}$)	Relative Surface area
Si-3	0.112	1
Si-9	0.121	1.08
Si-12	0.178	1.59
Si-48	0.208	1.86

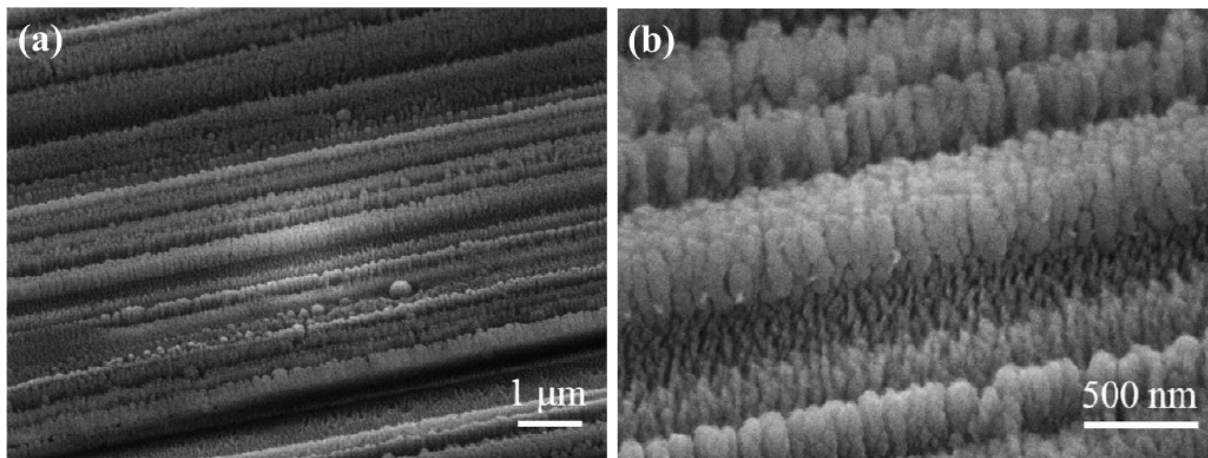


Figure S1 SEM images of the Si hierarchical nanostructures on the Cu foil.

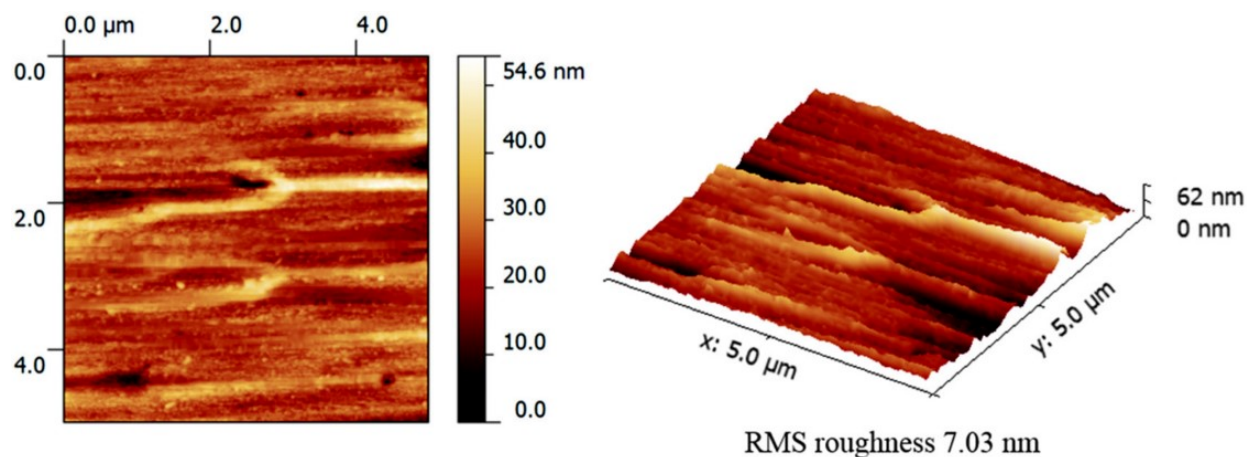


Figure S2 Surface roughness of the stainless steel

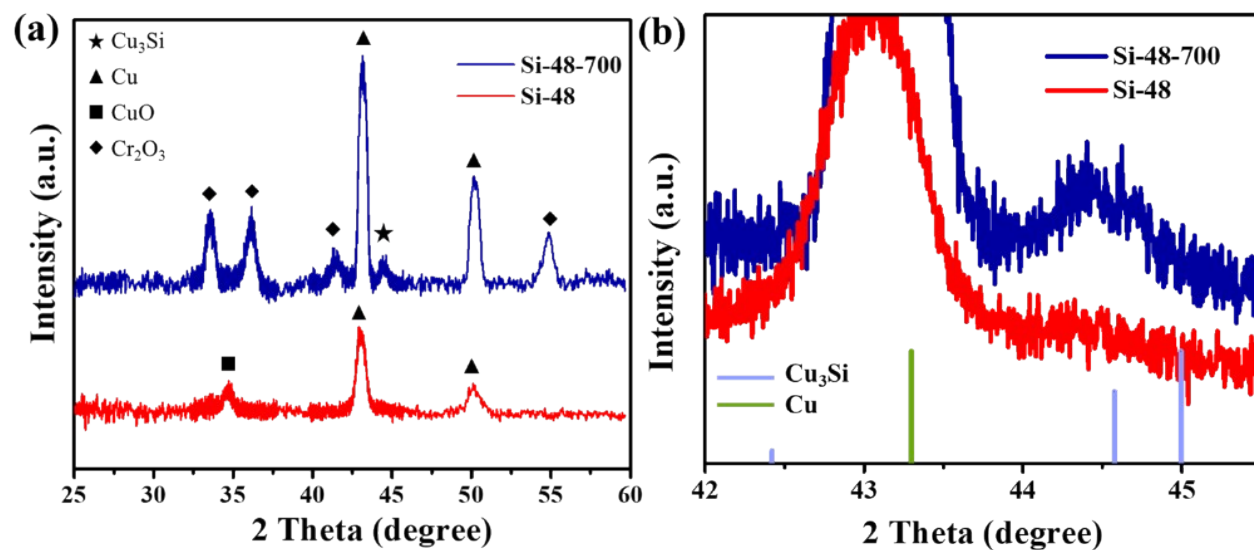


Figure S3 (a) XRD patterns and (b) enlarged XRD patterns ranging from 42° to 45.5° of Si-48 and Si-48-700 via synchrotron radiation X-ray diffraction techniques. The XRD peaks have been indexed according to JCPDS no. 51-0916 (Cu_3Si), no.03-1018 (Cu), no.045-937 (CuO), no.38-1479 (Cr_2O_3). Actually, Cu could easily oxide in air condition, so there was a peak located at 35.5° and corresponding to the crystalline planes of Cu (002). Moreover, Cr in the stainless steel segregated on the surface and formed into Cr_2O_3 after annealing.

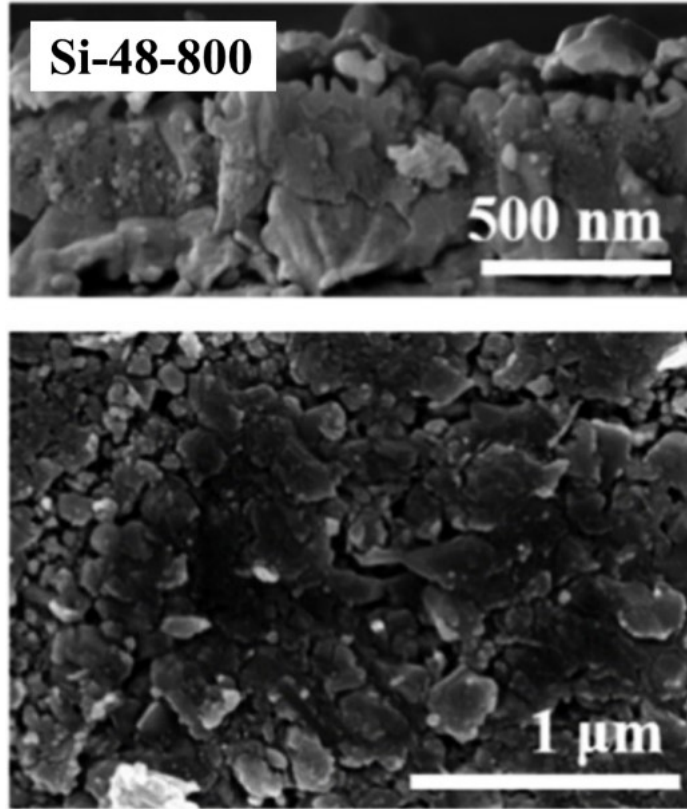


Figure S4 SEM images of the Si-48-800 materials.

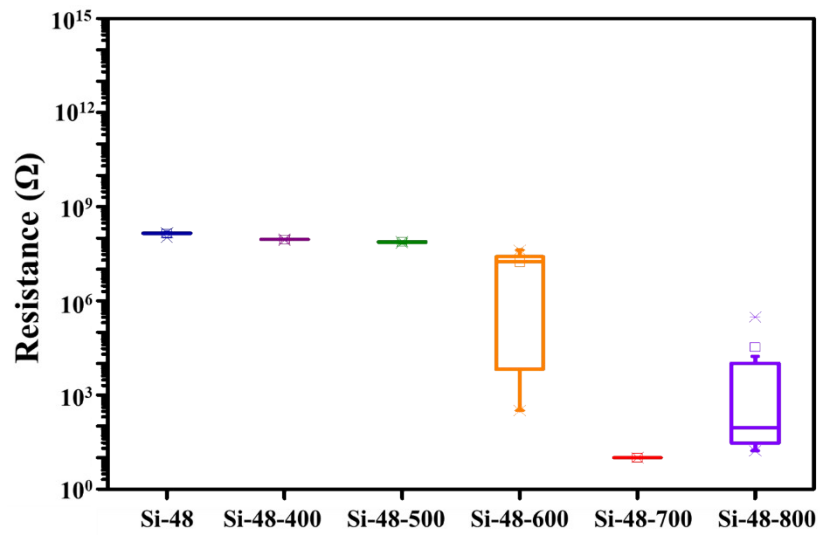


Figure S5 Resistance of the as-prepared Si-based materials.

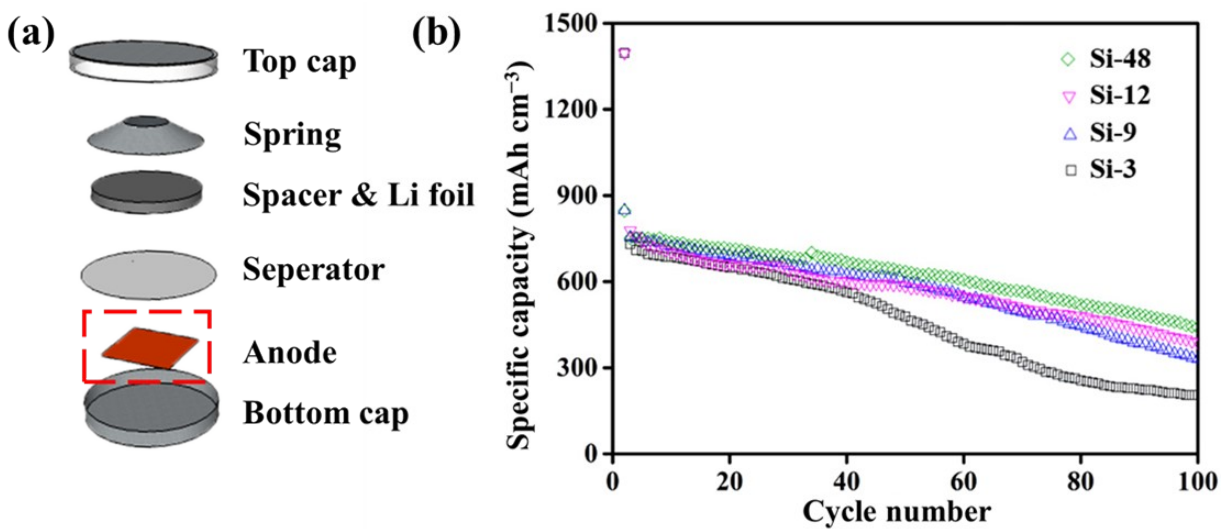


Figure S6 (a) A coin-cell type battery. (b) Discharge capacity of the hierarchical Si materials at a rate of 0.25 C.

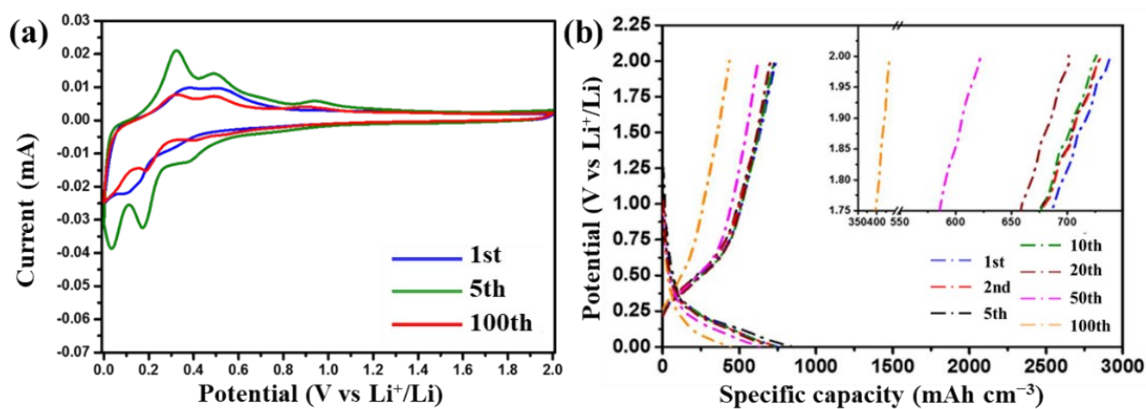


Figure S7 (a) CV curves of the intrinsic Si-48 materials at a scan rate of 0.1 mV s^{-1} . (b) Charge-discharge curves of the intrinsic Si-48 materials at a rate of 0.25 C.

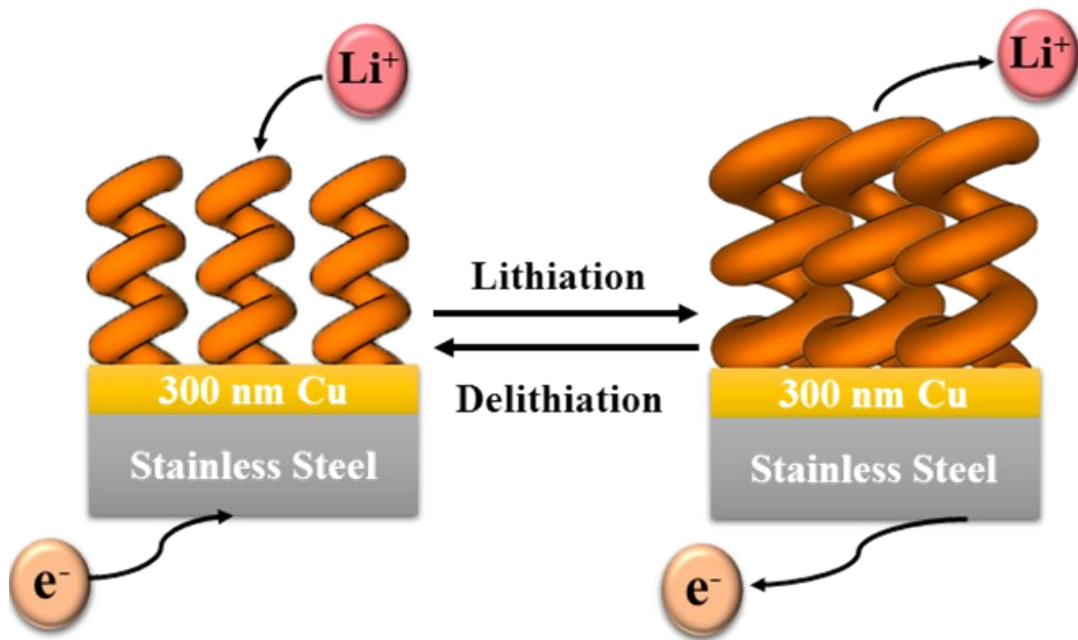


Figure S8 Illustration of Si-based electrode during charge and discharge process.

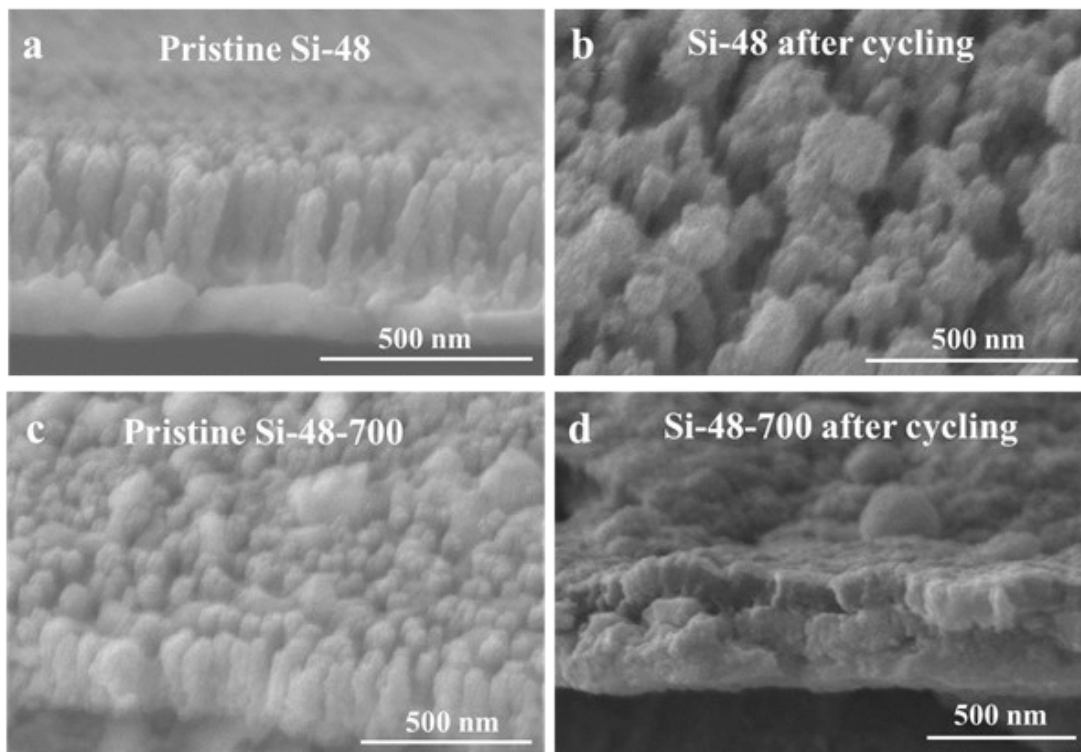


Figure S9 SEM images of Si-48 and Si-48-700 anodes before and after cycling.