

Electronic Supplementary Material

A carbon nanofiber network for stable lithium metal anodes with high Coulombic efficiency and long cycle life

Anyi Zhang¹, Xin Fang¹, Chenfei Shen¹, Yihang Liu², and Chongwu Zhou^{1,2} (✉)

¹ Mork Family Department of Chemical Engineering and Materials Science, University of Southern California, Los Angeles 90089, USA

² Ming Hsieh Department of Electrical Engineering, University of Southern California, Los Angeles 90089, USA

Supporting information to DOI 10.1007/s12274-016-1219-2

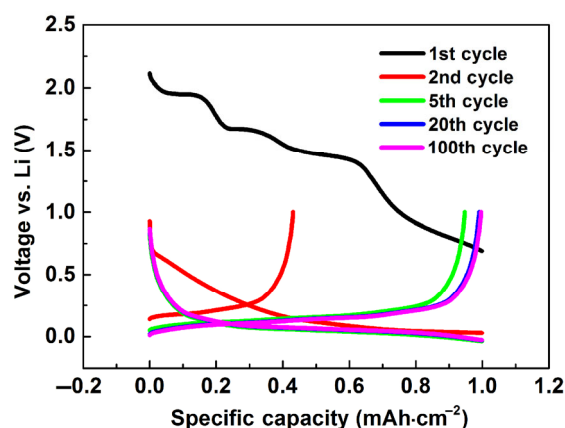


Figure S1 The voltage profiles of the 1st, 2nd, 5th, 20th, and 100th Li plating/stripping process on a Cu + CNF electrode at a current density of 1 mA·cm⁻².

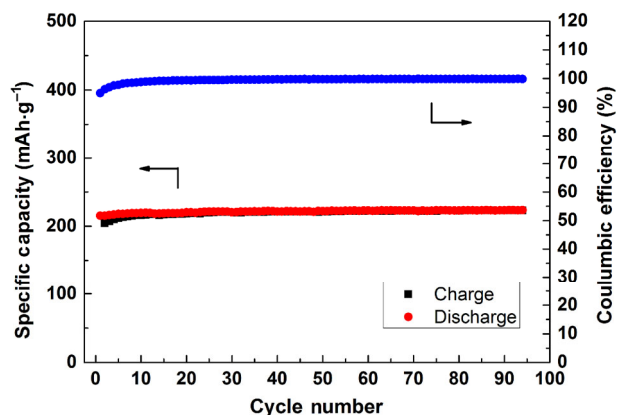


Figure S2 Electrochemical performance of CNF tested as anode in voltage range of 0.01–1.0 V.

Address correspondence to chongwuz@usc.edu

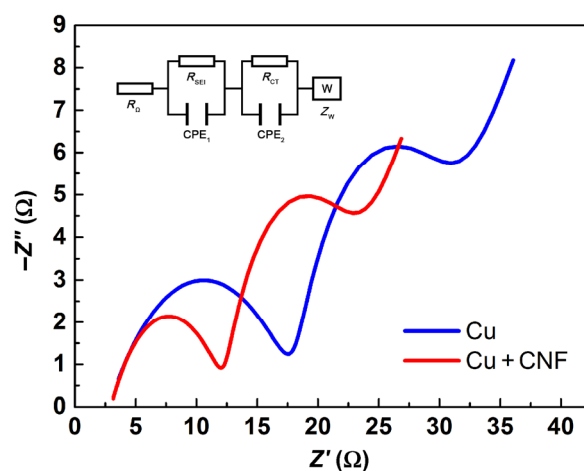


Figure S3 Simulated Nyquist plots of Cu and Cu + CNF electrodes after the 50th plating process. The equivalent circuit used in the simulation is shown above. R_{Ω} represents the resistance of electrodes and electrolyte. R_{SEI} represents the resistance of SEI layers. R_{CT} represent the resistance of charge transfer. Z_W represents Warburg impedance, which is related to diffusion. CPE represents constant phase element.

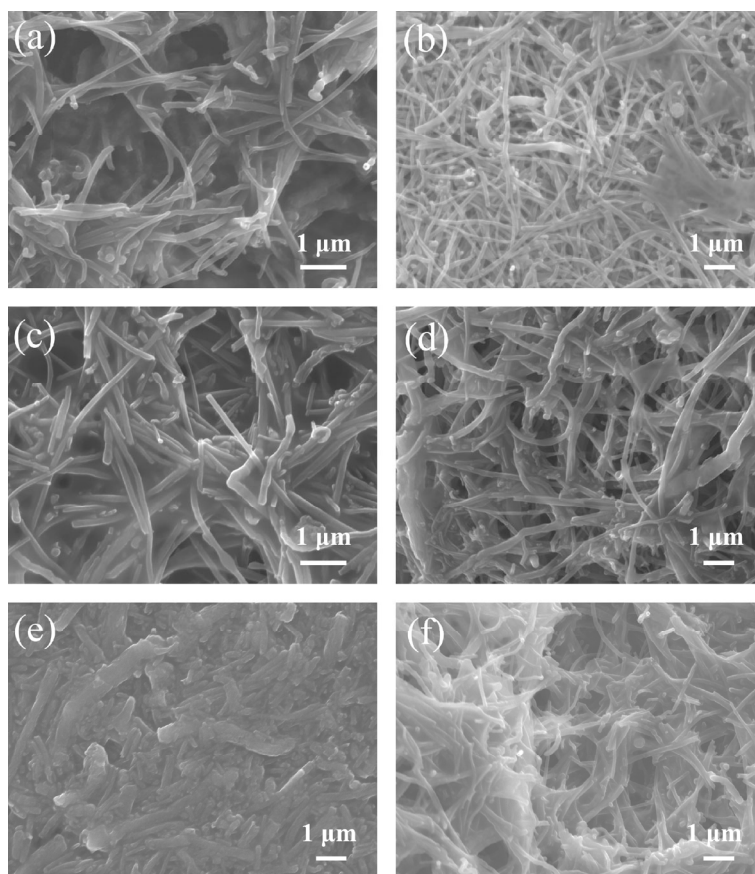


Figure S4 High magnification SEM images of Cu + CNF electrodes after (a) the 1st plating process, (b) the 1st stripping process, (c) the 5th plating process, (d) the 5th stripping process, (e) the 10th plating process, and (f) the 10th stripping process.

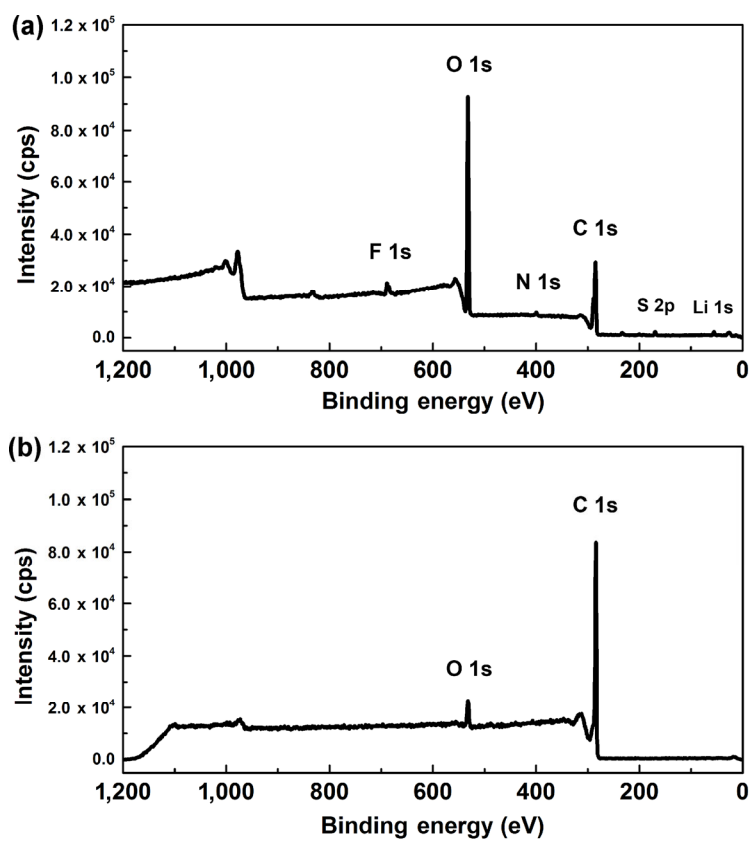


Figure S5 The high energy resolution XPS spectra of the Cu + CNF electrodes (a) after cycling and (b) before cycling.