Supporting Information

Weavable High-Capacity Electrodes

Chuan-Fu Sun[a], Hongli Zhu[b], Edward B. Baker III[a], Morihiro Okada[a,c], Jiayu Wan[b], Adrian Ghemes[c], Yoku Inoue[d], Liangbing Hu[b,*], and YuHuang Wang[a,*]

[a]*Department of Chemistry and Biochemistry, University of Maryland, College Park, MD 20742, USA*
[b]*Department of Materials Science and Engineering, University of Maryland, College Park, MD 20742, USA*
[c]*Research Institute of Electronics, Shizuoka University, 3-5-1 Johoku, Hamamatsu 432-8011, Japan*
[d]*Department of Electrical and Electronic Engineering, Shizuoka University, 3-5-1 Johoku, Hamamatsu 432-8561, Japan*

[*]Corresponding author: Tel.: +1-301-405-3368; *E-mail address:* yhw@umd.edu (Y.H. Wang). Tel.: +1-301-405-9303; *E-mail address:* binghu@umd.edu (L. Hu)

Figure S1-S4

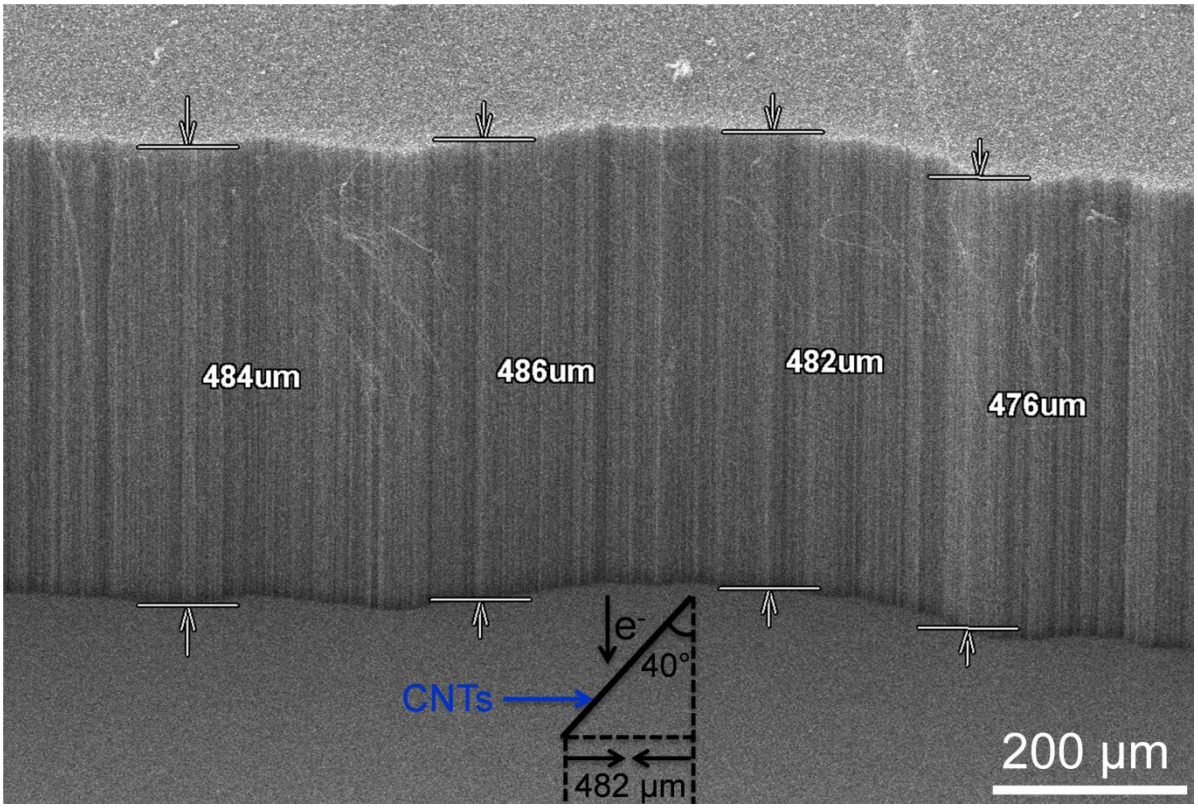


Figure S1 SEM image of the vertically aligned MWCNT array at a rotation angle of 40°. The average length of the CNTs is around 750 μm (482/cos40°).

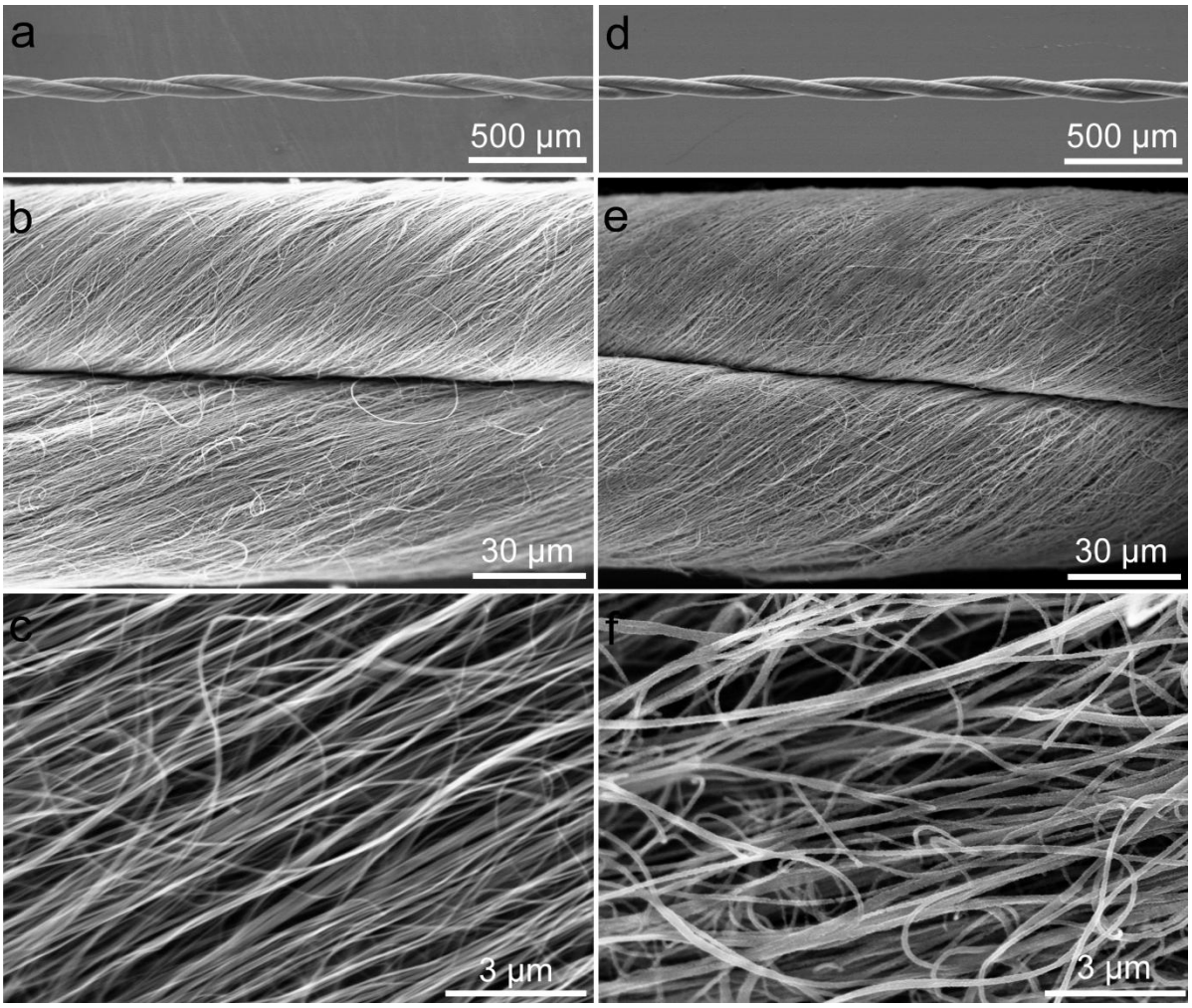


Figure S2 Low and high resolution SEM images show the porous structures of CNT yarn (a-c) and CNT@*α*-Si composite yarn (d-f).

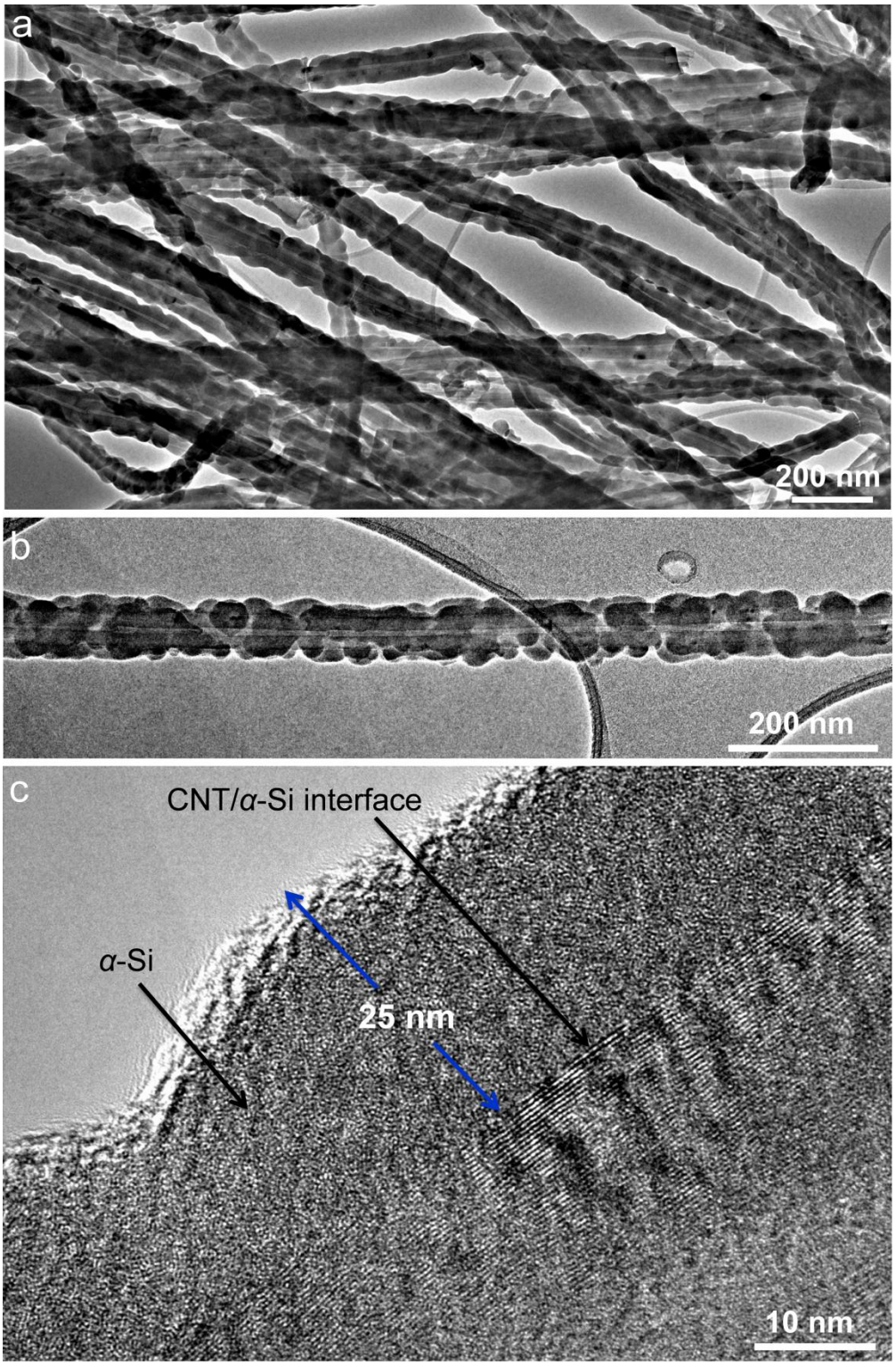


Figure S3 (a,b) TEM images demonstrate the typical CNT@*α*-Si composite yarn structures. (c) HRTEM image clearly shows the CNT-core, *α*-Si-shell and CNT/*α*-Si interface.

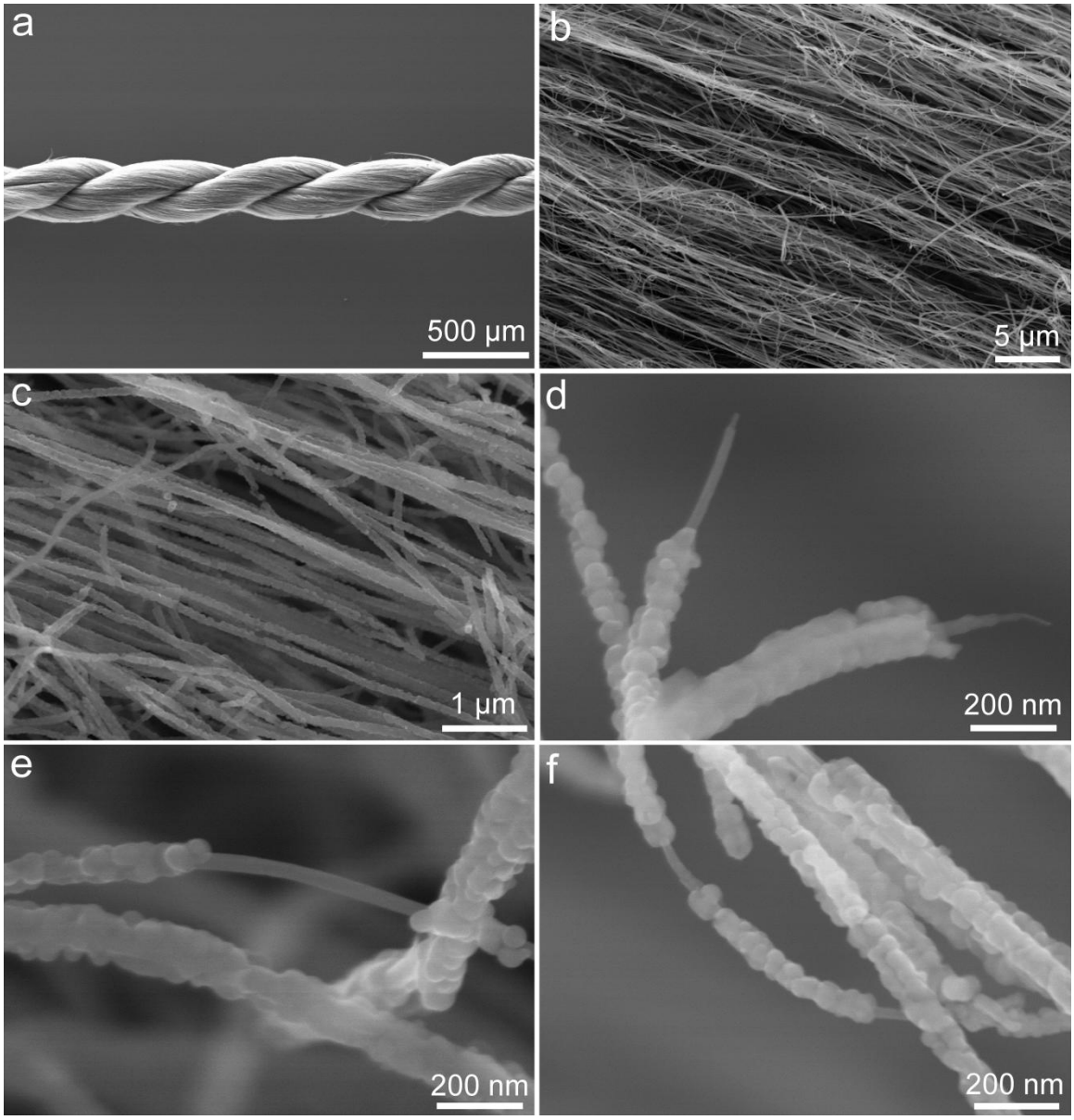


Figure S4 (a-f) SEM images of CNT@*α*-Si yarn that was deposited with Si first and then twisted. The Si-coated CNT thin film can be only slowly and gingerly twisted in a limited degree, and the delamination of *α*-Si from the CNTs was observed in such yarns (d-f). Such CNT@*α*-Si yarns exhibit very low tensile strengths and tensile fracture occurred even under gentle stretching.