

Supplementary Information

**Ultrathin electrochemical layer tailoring of lithiophilic materials  
on 3D hierarchical configuration for lithium metal battery:  
Sn/Cu<sub>6</sub>Sn<sub>5</sub>@Cu<sub>2+1</sub>O nanowires on Cu foam**

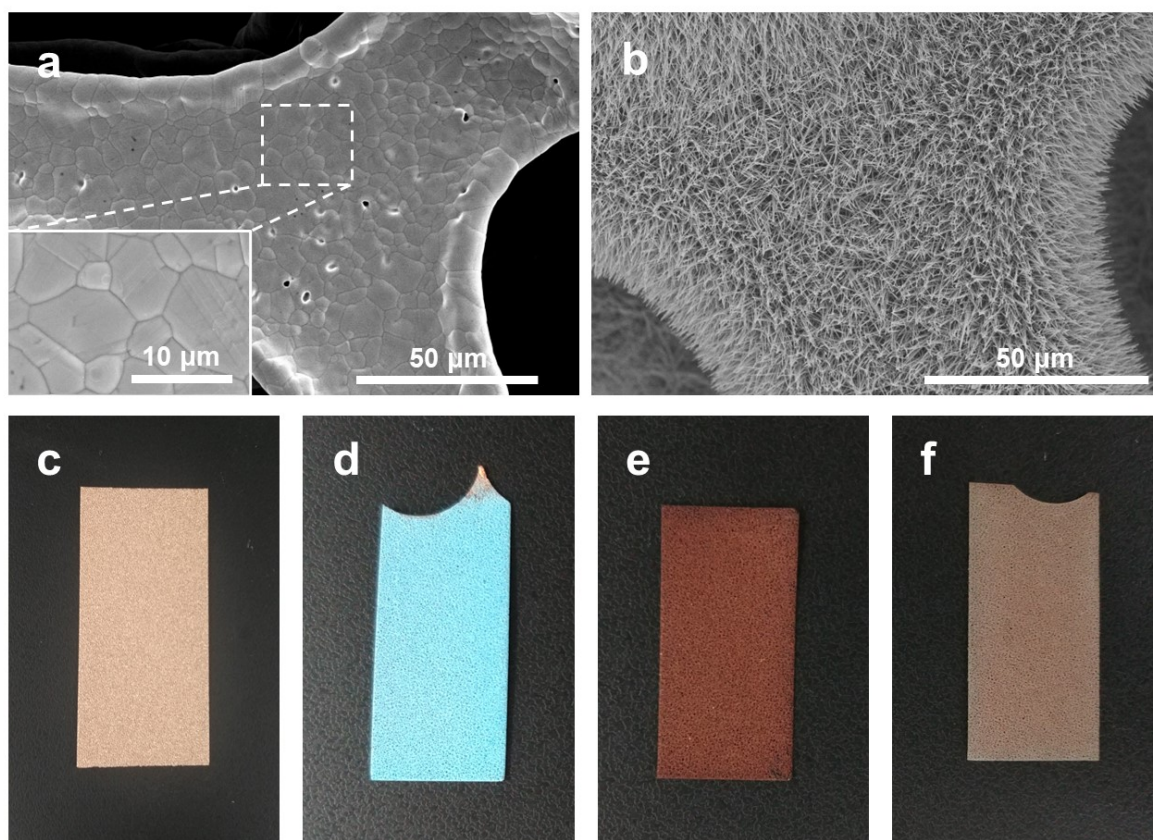
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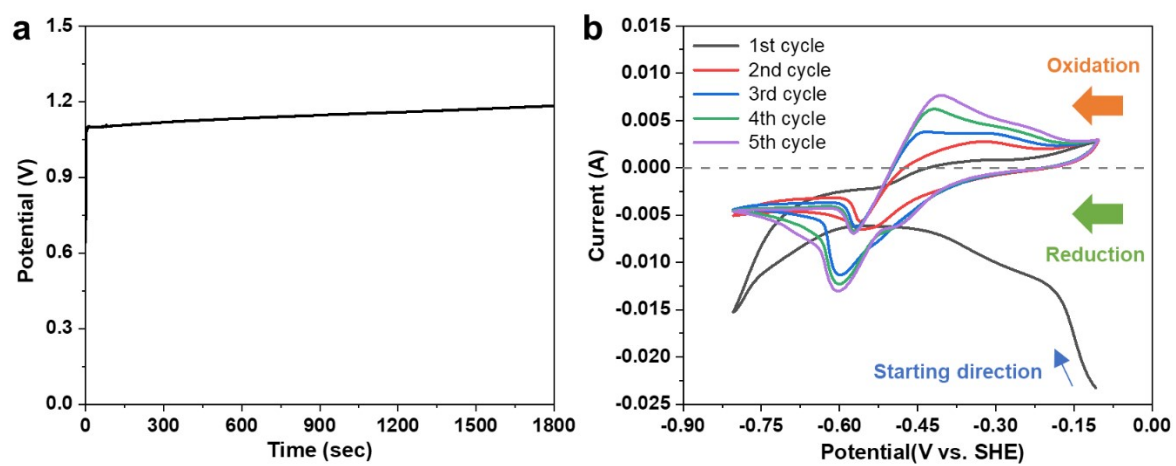
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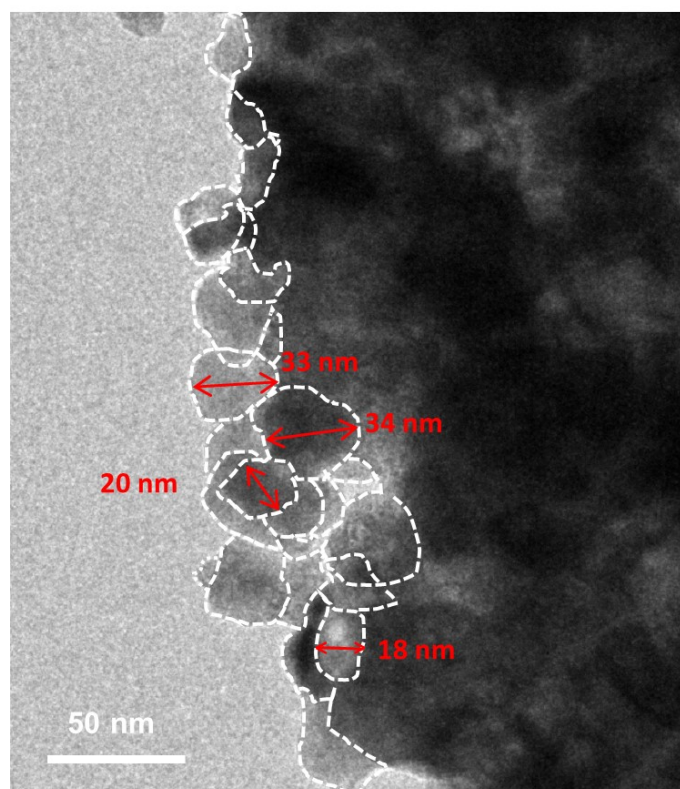
e-mail: yongtaekim@inha.ac.kr, jinsub@inha.ac.kr



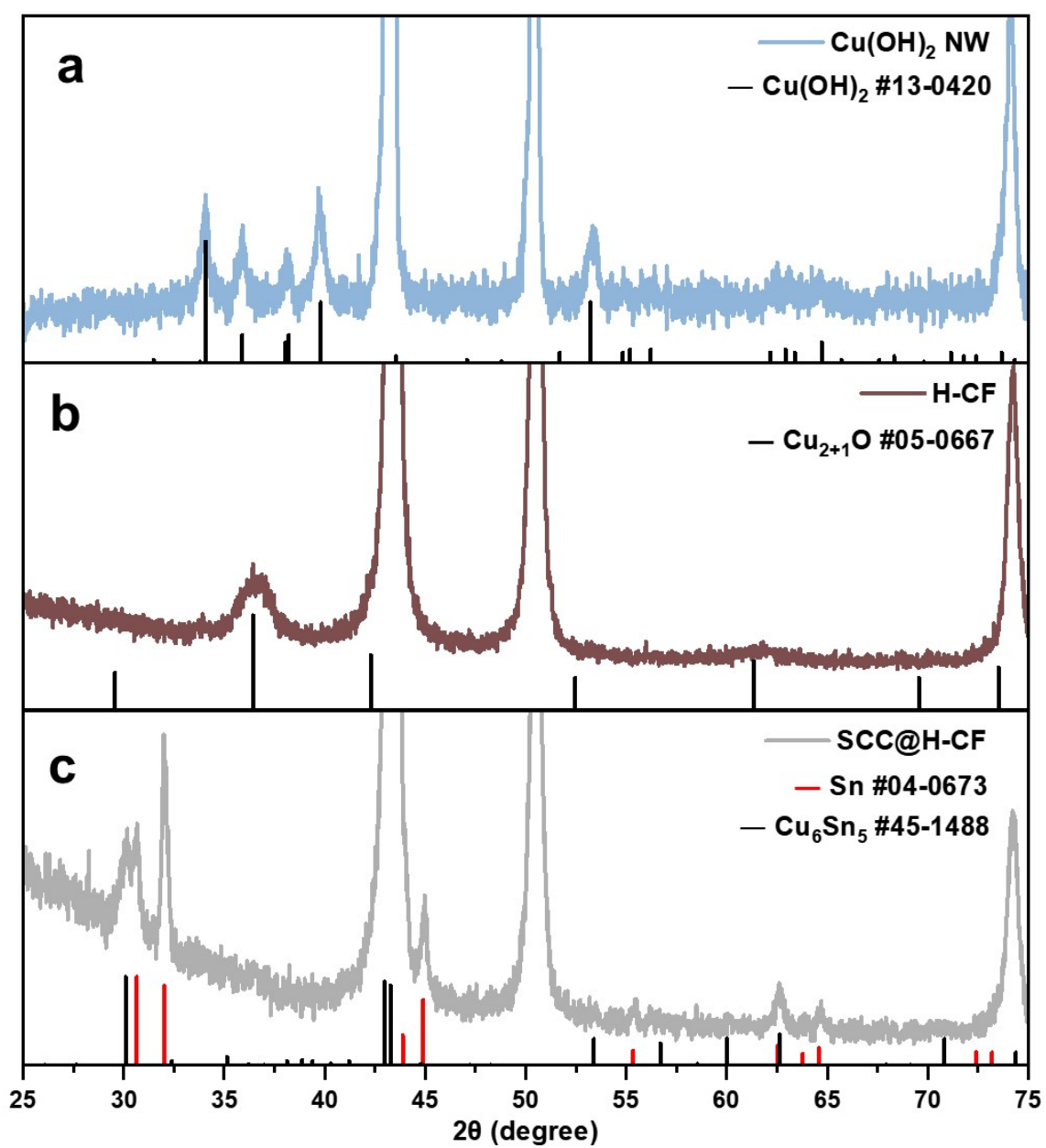
**Figure S1.** (a) SEM images of bare CF (inset of the enlarged view). (b) Low-magnification SEM image after anodization and the photographs of (c) bare CF, (d)  $\text{Cu}(\text{OH})_2$  NW, (e) H-CF, and (f) SCC@H-CF.



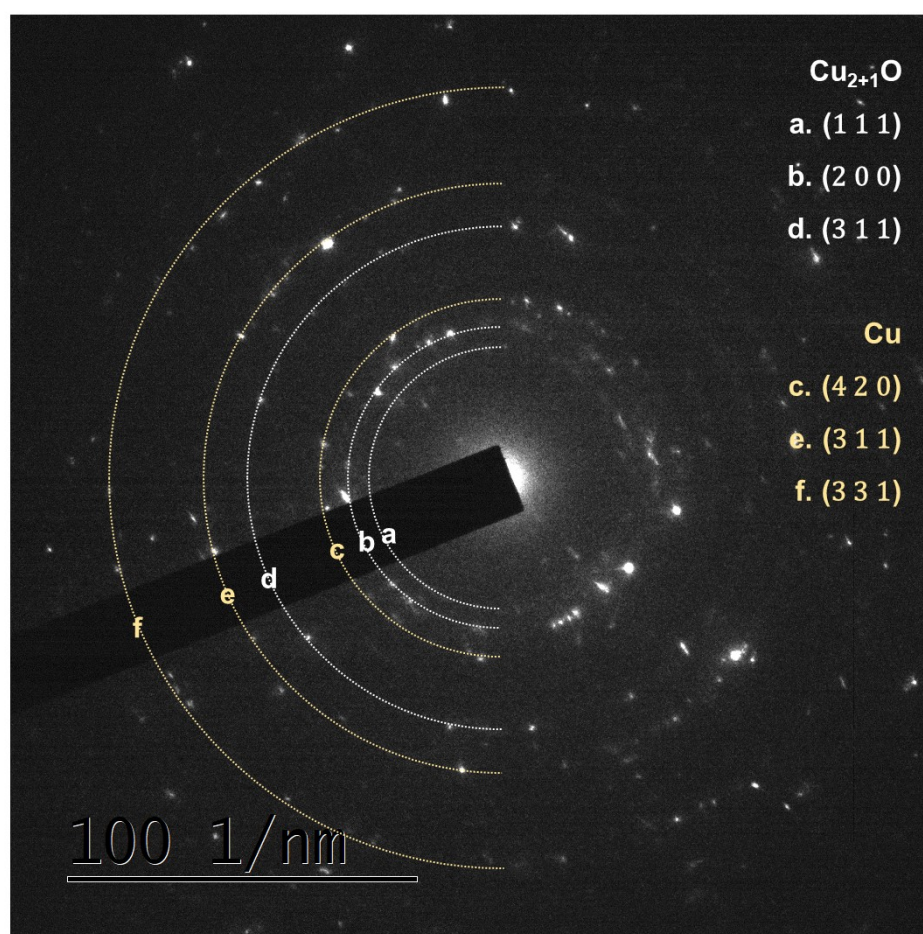
**Figure S2.** (a) Voltage–time transient during anodization under constant current density. (b) Cyclic Voltammetry for the deposition of Sn on H-CF.



**Figure S3.** TEM image showing the size of the  $\text{Cu}_6\text{Sn}_5/\text{Sn}$  alloy composite particles from SCC@H-CF.

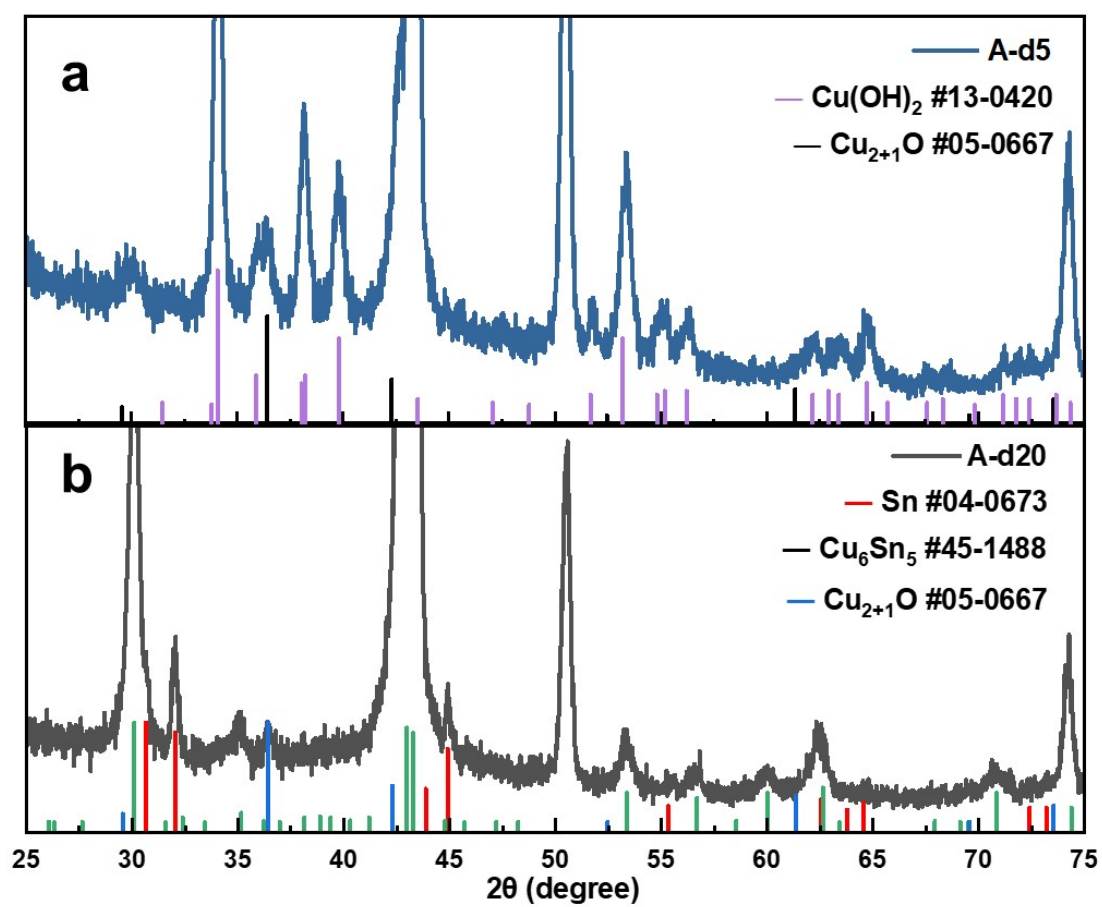


**Figure S4.** Enlarged XRD results for  $\text{Cu(OH)}_2$  NW, H-CF, and SCC@H-CF.

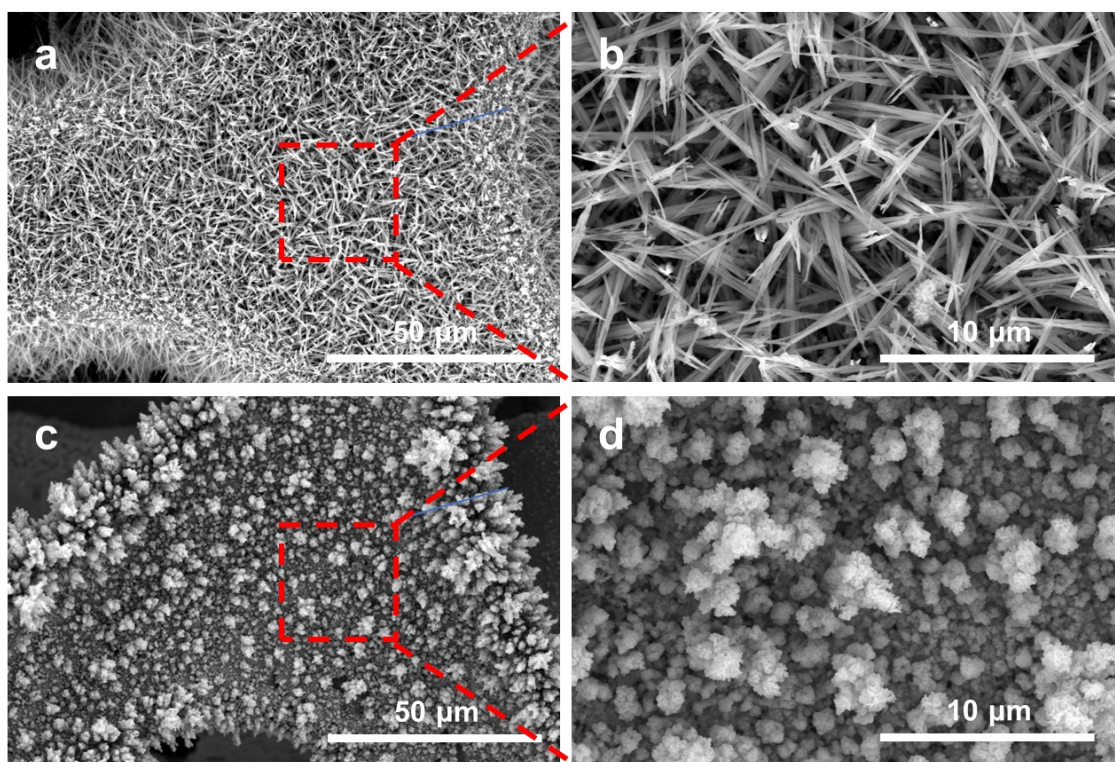


**Figure S5.** SAED pattern of H-CF.



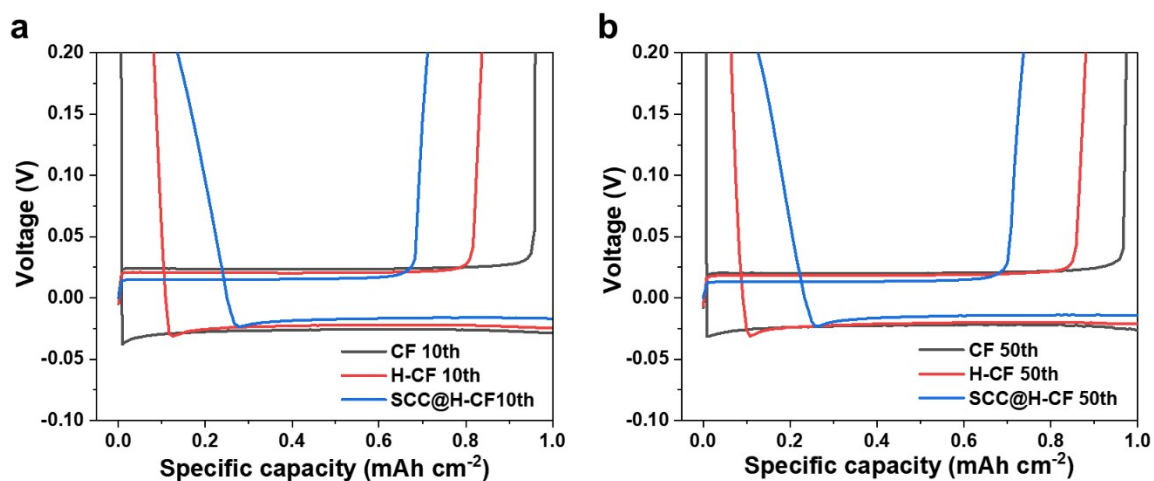


**Figure S6.** Enlarged XRD results of (a) A-d5 and (b) A-d20.

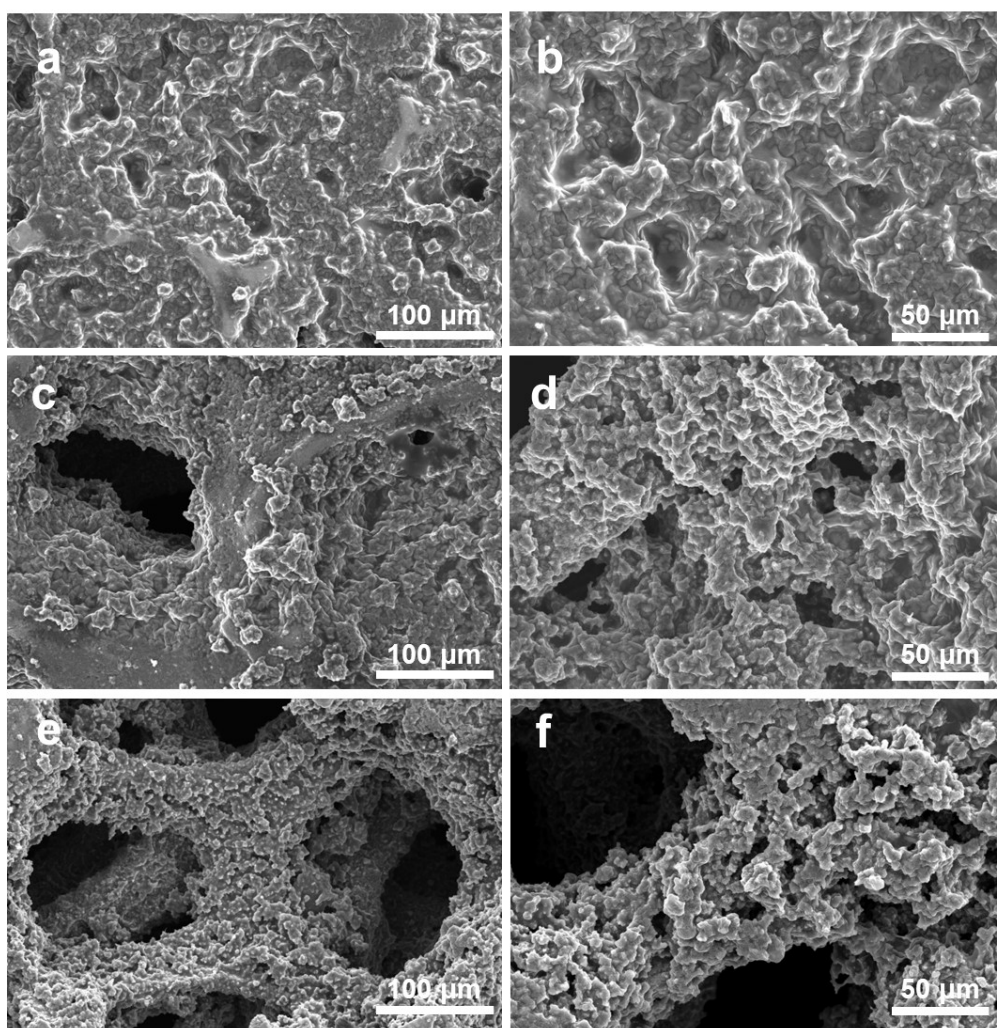


**Figure S7.** SEM images of (a–b) A-d5 and (c–d) A-d20 after CV deposition.

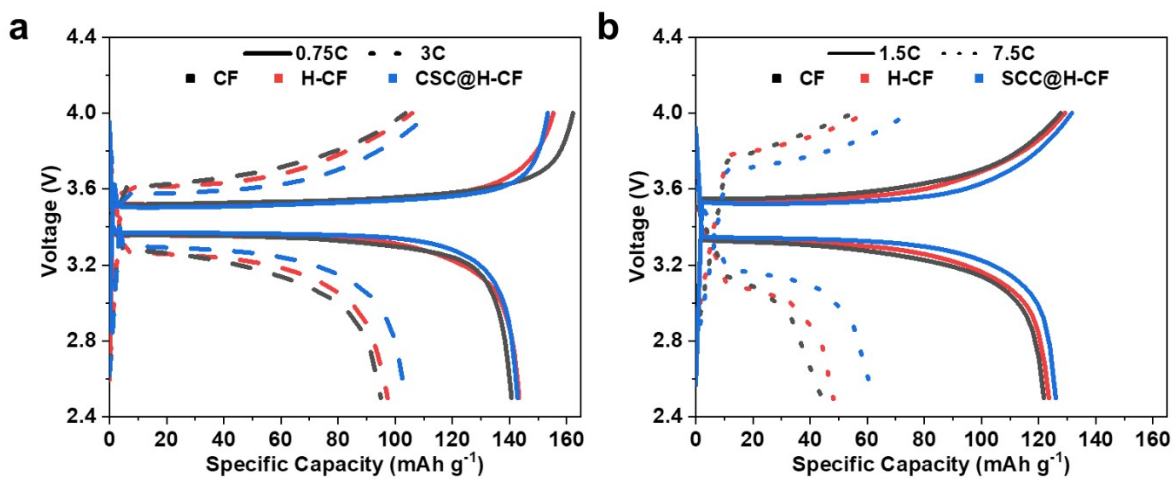




**Figure S8.** Charge/discharge profiles of CF, H-CF, and SCC@H-CF electrodes at (a) 10th and (b) 50th cycles at a current density of 1 mA cm<sup>-2</sup> with a capacity of 1 mAh cm<sup>-2</sup>.



**Figure S9.** SEM images of (a-b) CF, (c-d) H-CF, and (e-f) SCC@H-CF with capacity of 1 mAh cm<sup>-2</sup> at 1 mA cm<sup>-2</sup> after stripping at 30 cycles.



**Figure S10.** Galvanostatic charge/discharge profiles of the SCC@H-CF || LFP full cell at (a) 0.75, 3 C, and (b) 1.5, 7.5 C.

**Table S1.** Voltage hysteresis values of the electrodes after a specific number of cycles.

<b>Samples</b>	<b>SCC@H-CF</b>	<b>H-CF</b>	<b>CF</b>
<b>1<sup>st</sup> cycle</b>	6.0 mV	7.1 mV	8.4 mV
<b>10<sup>th</sup> cycle</b>	3.3 mV	4.3 mV	5.0 mV
<b>100<sup>th</sup> cycle</b>	3.1 mV	4.1 mV	4.9 mV

**Table S2.** Internal resistance of the electrodes after a specific number of cycles.

<b>Samples</b>	<b>SCC@H-CF</b>	<b>H-CF</b>	<b>CF</b>
<b>1<sup>st</sup> cycle</b>	7.29 $\Omega$	11.41 $\Omega$	20.50 $\Omega$
<b>50<sup>th</sup> cycle</b>	1.33 $\Omega$	1.45 $\Omega$	4.90 $\Omega$