* Supporting information

Petal-Shaped SnO2 Free-Standing Electrode with Electrically Conducting Layers via Plasma-Activated Nitrogen Doping Process for High Performance Lithium Ion Batteries

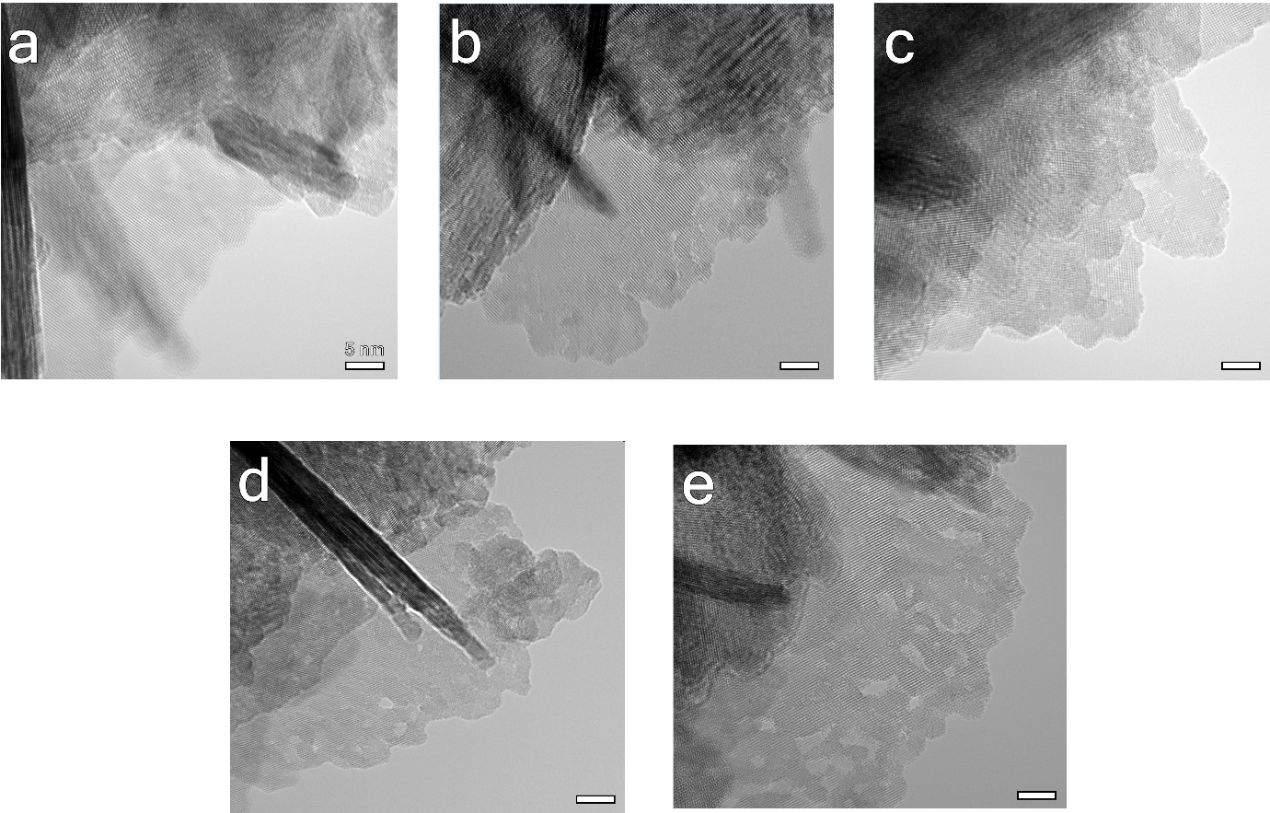
Hyun-Jin Shina,c, Tae Hyun Kim a,c , Saleem Abbas a, Jinhan Cho c, and Heung Yong Ha\*,a,b

a Center for Energy Storage Research, Korea Institute of Science and Technology (KIST), 14-gil 5, Hwarang-ro, Seongbuk-gu, Seoul 02792, Republic of Korea.

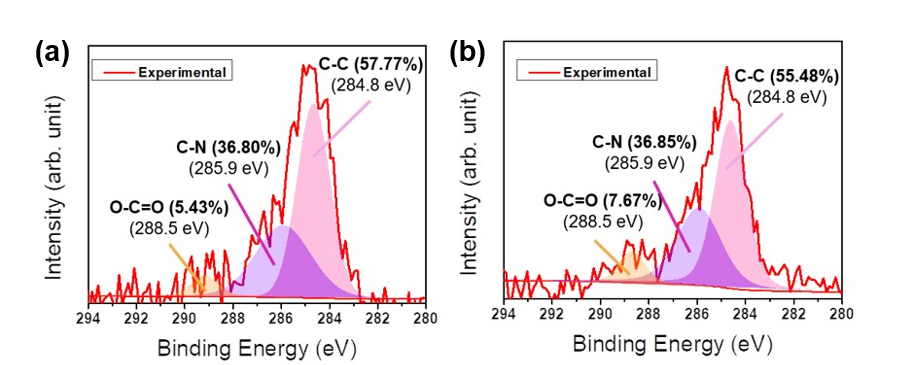
b Department of Energy and Environmental Engineering, Korea University of Science & Technology (UST), 217 Gajeong-ro, Yuseong-gu, Daejeon 34113, Republic of Korea.

c Department of Chemical and Biological Engineering, Korea University, 145 Anam-ro, Seongbuk-gu, Seoul 02841, Republic of Korea.

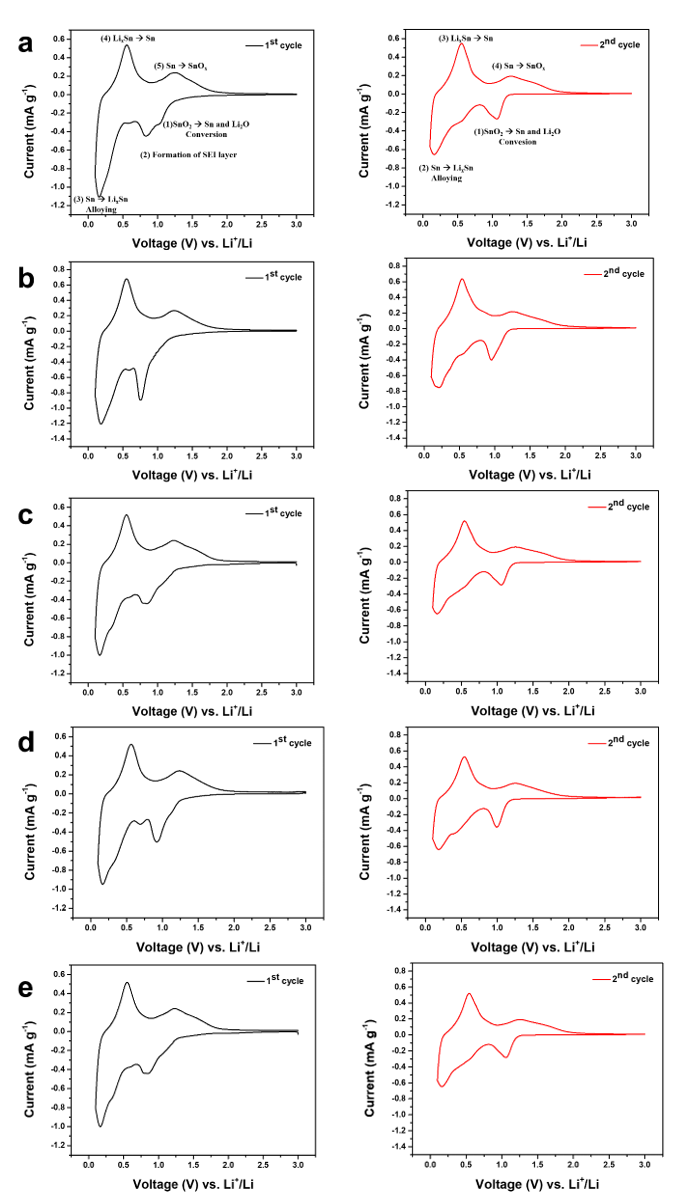
\*Corresponding Author Email: [hyha@kist.re.kr](mailto:hyha@kist.re.kr)



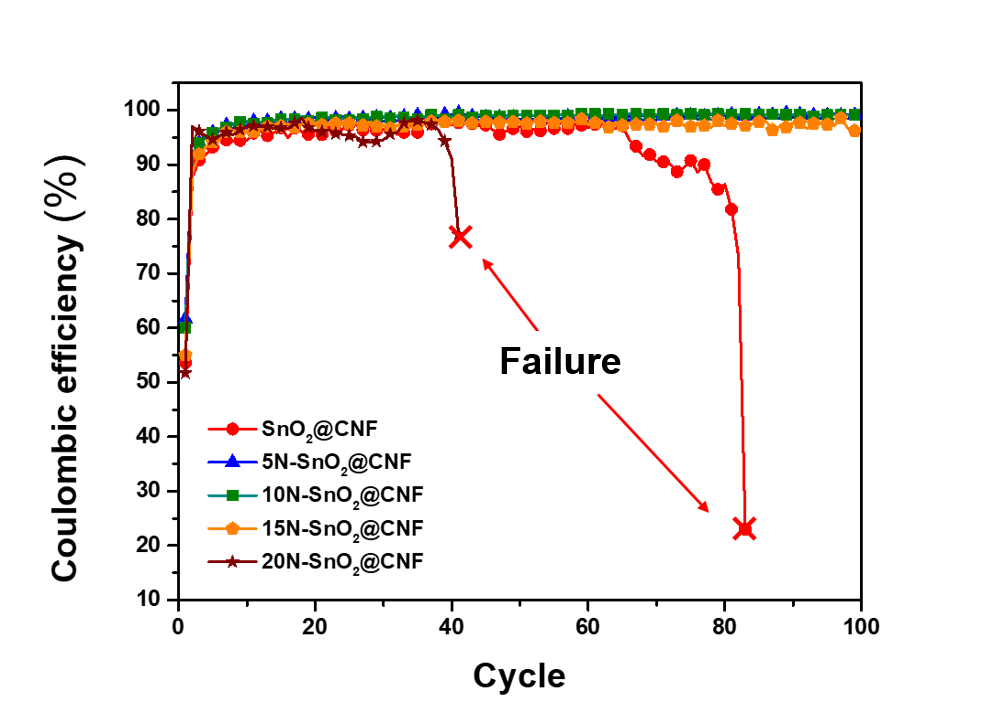
**Fig. S1.** HR-TEM images of the SnO2 materials before and after ammonia plasma treatment: (a) pristine, (b) 5N-, (c) 10N-, (d) 15N-, and (e) 20N-SnO2@CNF.



**Fig. S2.** C1s peaks on XPS spectra for SnO2@CNF materials: (a) SnO2@CNF and (b) 20N-SnO2@CNF.



**Fig. S3.** The first and the second CV profiles for the anode materials at 0.1 mV s-1: (a) pristine, (b) 5N-, (c) 10N-, (d) 15N-, and (e) 20N-SnO2@CNF.



**Fig. S4.** Changes in Coulombic efficiencies in long-term cycle tests with various anode materials at 0.1 A g-1.

< **Table S1.** Coulombic efficiencies of the anode materials at 0.1 A g-1 >

|  |  |  |
| --- | --- | --- |
| **Sample** | **First cycle** | **100 cycle** |
| SnO2@CNF | 53.6% | X |
| 5N-SnO2@CNF | 61.7% | 99.3% |
| 10N-SnO2@CNF | 62.0% | 99.3% |
| 15N-SnO2@CNF | 55.0% | 96.1% |
| 20N-SnO2@CNF | 51.7% | X |