Supporting Information

One-step synthesis of uniformly distributed SiO_x-C composites as stable anodes for lithium-ion battery

*Siyu Chen ‡, Yanan Xu ‡, Hongbin Du**

Figure S1. TG analysis of the gel precursor in nitrogen atmosphere.

Figure S2. N_2 adsorption-desorption isotherms of SiO_x-C@CNTs.

Figure S3. Charge and discharge profiles of (a) SiO_x-C@CNTs-800 and (b) SiO_x-C@CNTs-1000.

Figure S4. (a) Charge-discharge and (b) CV profiles of carbon material in SiO_x-C@CNTs-900 (HF etching to remove SiO_x).

Figure S5. PXRD profiles of (a) SiO_x-C@CNTs-800 and (b) SiO_x-C@CNTs-1000.

Figure S6. SEM images of (a) SiO_x-C@CNTs-800, (b) SiO_x-C@CNTs-900, and (c) SiO_x-C@CNTs-1000. The used electrodes were cycled at a current density of 2 A g^{-1} for 200 times.

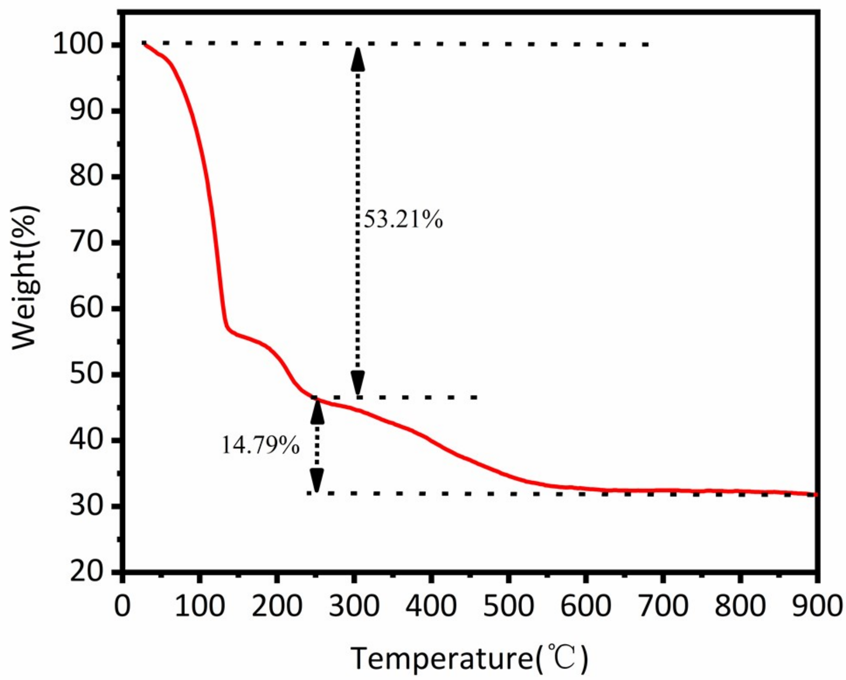
Figure S7. GITT profiles of the SiO_x-C electrode.

Figure S8. The charge-discharge voltage profiles of the $LiCoO_2$ || SiO_x-C@CNTs full cell at 0.1 C.

Figure S9. The charge-discharge voltage profiles of the $LiCoO_2$ || SiO_x-C@CNTs full cell at 1 C.

Table S1. Electrochemical performance of the recently-reported SiO_x-based anodes for half LIBs.

Table S2. Cycle stability of the recently-reported SiO_x-based anode materials in full lithium-ion batteries.



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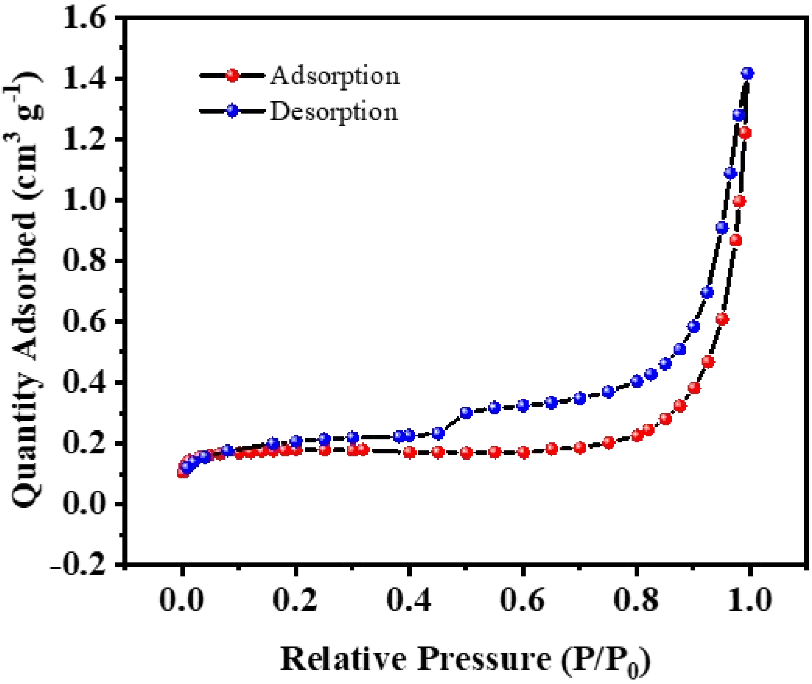

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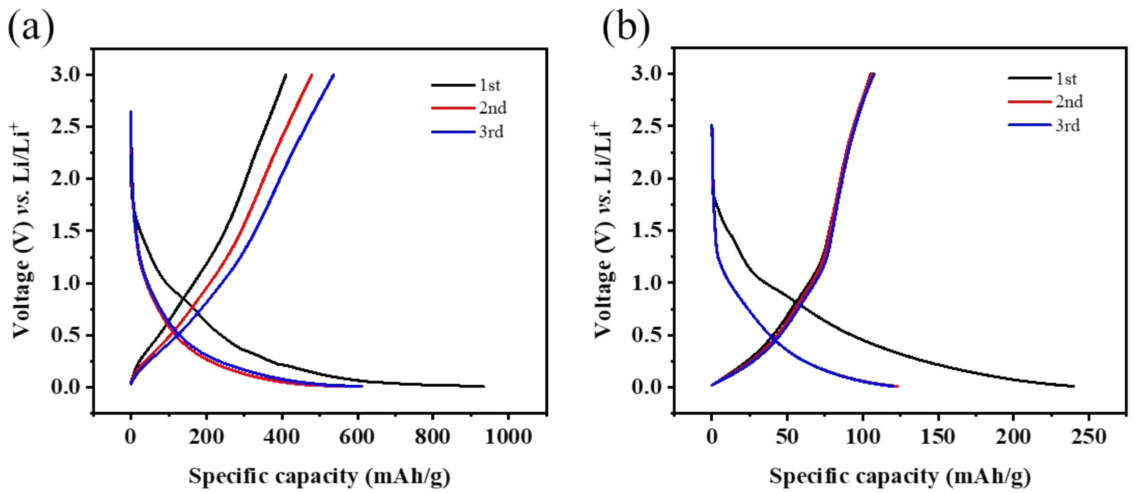
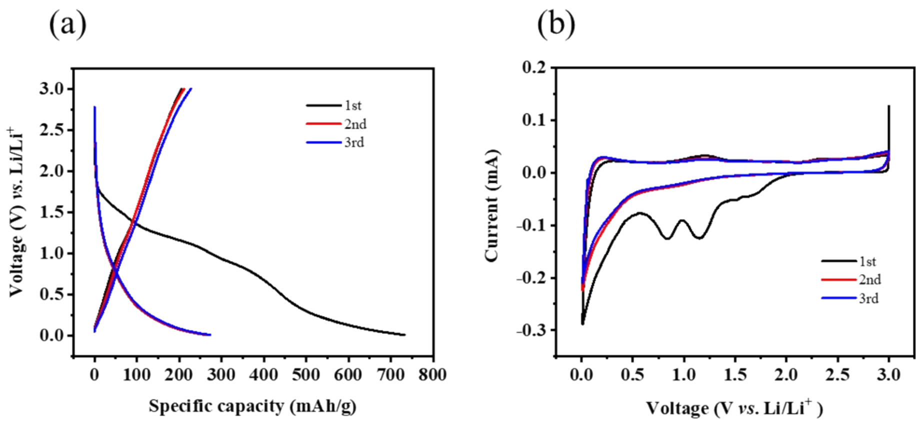


Figure S3. Charge and discharge profiles of (a) SiO_x-C@CNTs-800 and (b) SiO_x-C@CNTs-1000.



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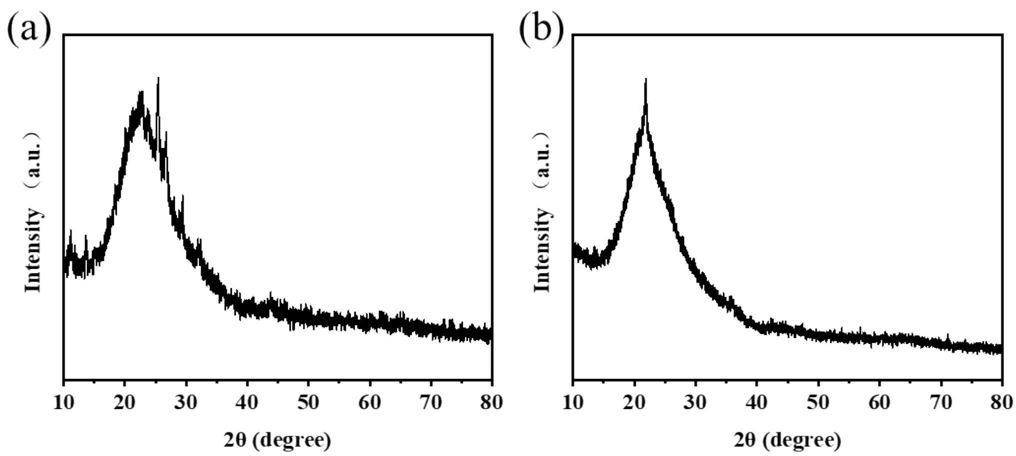

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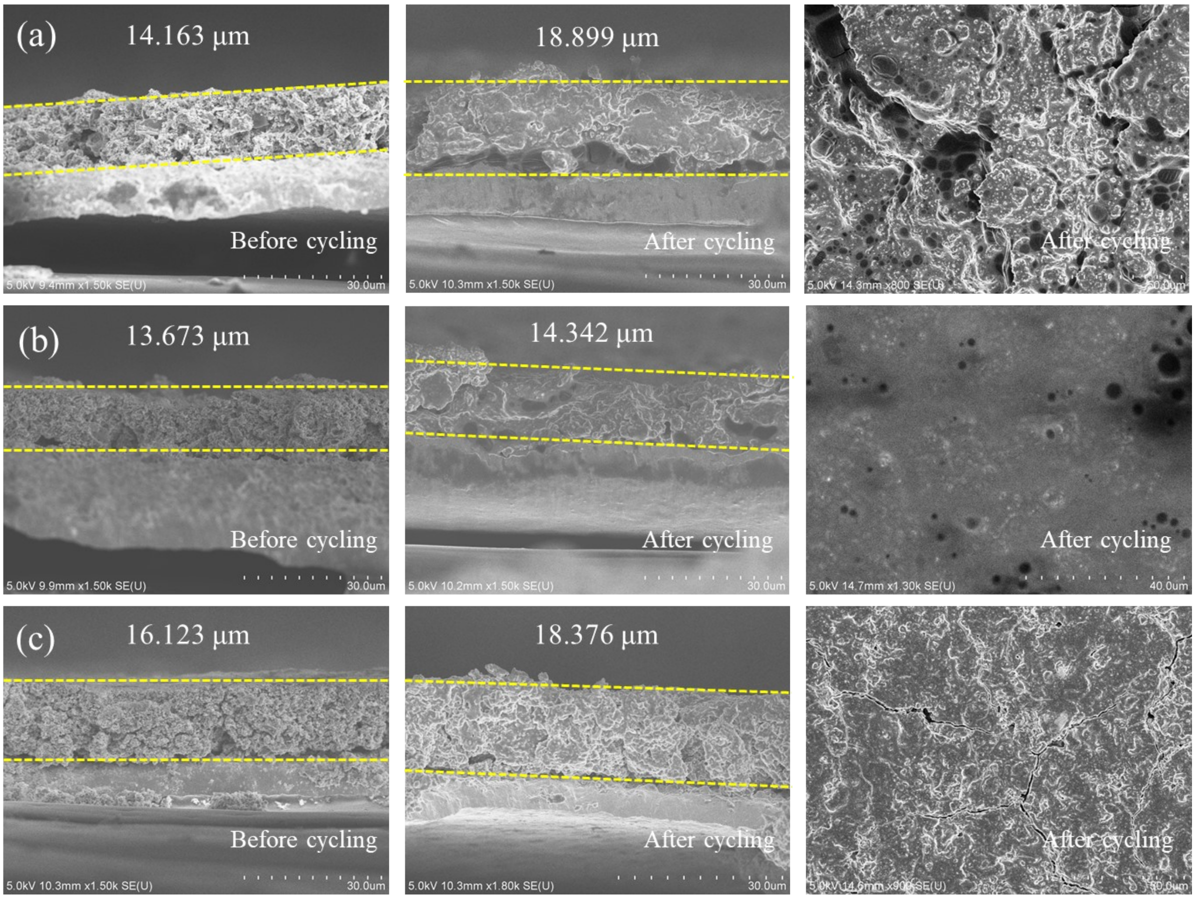

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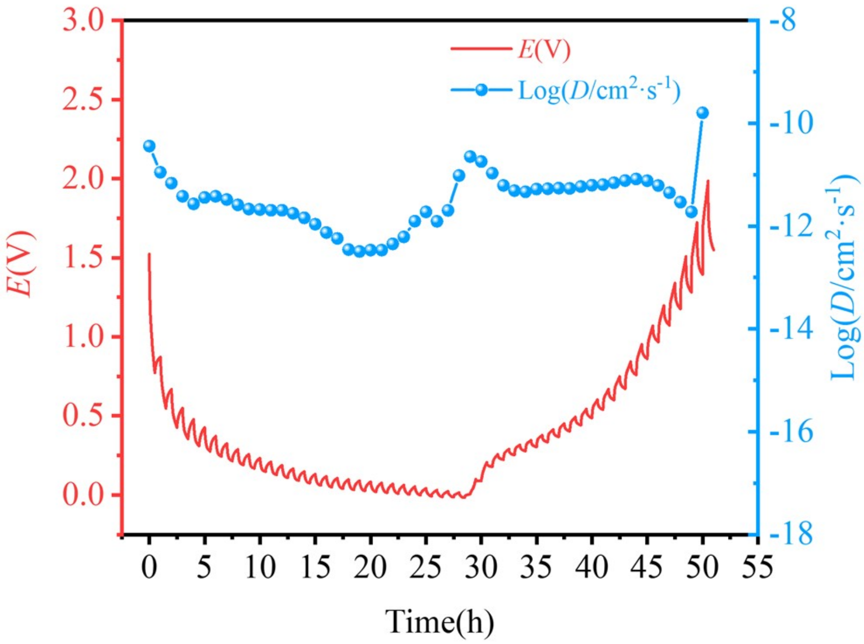

Figure S7. GITT profiles of the SiO_x-C electrode.

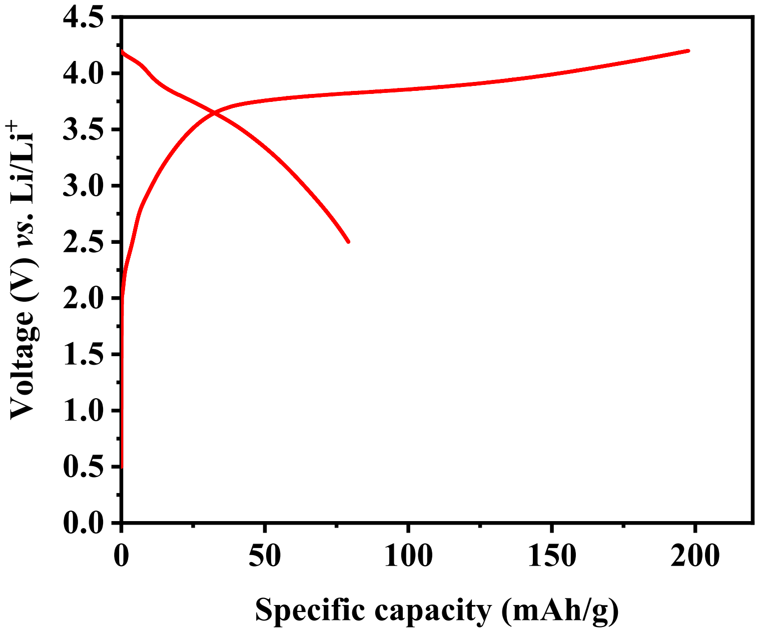

Figure S8. The charge-discharge voltage profiles of the $LiCoO_2$ || SiO_x-C@CNTs-900 full cell at 0.1 C.

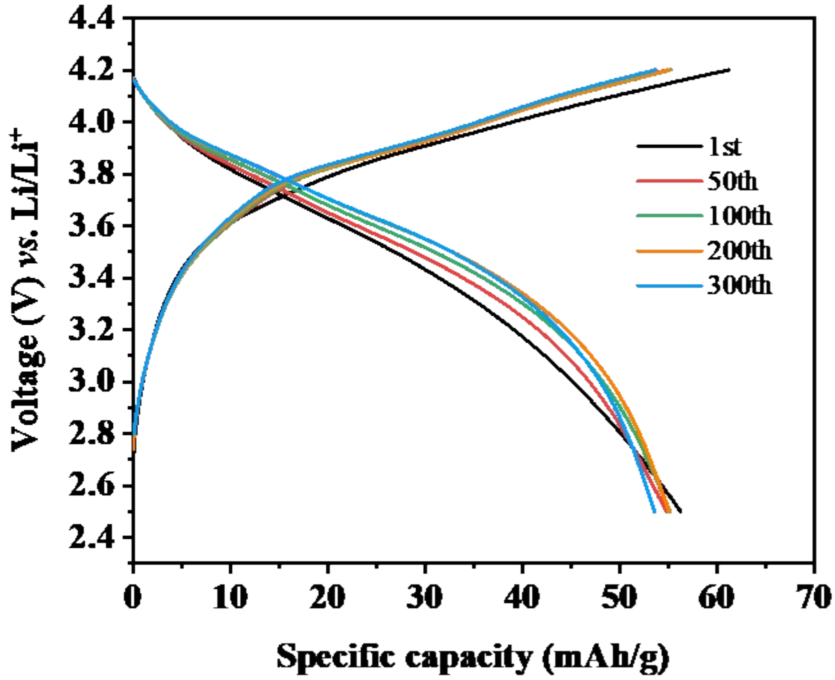

Figure S9. The charge-discharge voltage profiles of the $LiCoO_2$ || SiO_x-C@CNTs-900 full cell at 1 C.

Table S1. Electrochemical performance of the recently-reported SiO_x-based anodes for half LIBs.

Samples	Specific capacities (at 0.1 A g^{-1})	Cycle life	References
SiO_x-C@CNTs-900	848 mA h g^{-1}	84.0% after 1500 cycles at 2 A g^{-1}	***This work***
D-SiO_x-M	1381 mA h g^{-1}	86.0% after 300 cycles at 0.75 A g^{-1}	[1]
SiO/1D-C/a-C	1204 mA h g^{-1}	82.1% after 250 cycles at 0.1 A g^{-1}	[2]
SiO@C-L	1100 mA h g^{-1}	85% after 700 cycles at 1 A g^{-1}	[3]
SiO@TiO_2/CNF	1244 mA h g^{-1}	82% after 200 cycles at 0.2 A g^{-1}	[4]
pSiO_x@pC	717.4 mA h g^{-1}	No decay after 300 cycles at 1 A g^{-1}	[5]
pC–SiO_x	1032 mA h g^{-1}	No decay after 150 cycles at 0.5 A g^{-1}	[6]
SiO–0.3$LiBH_4$	1186 mA h g^{-1}	81% after 100 cycles at 0.1 A g^{-1}	[7]

Table S2. Cycle stability of the recently-reported SiO_x-based anode materials in full lithium-ion batteries.

Samples	Cycle life	References
SiO_x-C@CNTs-900	95.3% after 300 cycles at 1 C	***This work***
LiBp–SiO_x/C@G	93.3% after 100 cycles at 0.2 C	[8]
pre-SiOC/C	Not mentioned after 90 cycles at 0.5 C	[9]
SCB-500	84.0% after 100 cycles at 0.1 C	[10]
SiO_x@C@CoO	85.9% after 200 cycles at 0.5 C	[11]
SiO@C/CNS	Not mentioned after 50 cycles at 1 C	[12]
SiO_x/NCS	Not mentioned after 100 cycles at 1.5 C	[13]
SiO_x@NC	90.2% after 100 cycles at 0.2 C	[14]

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