Supplementary information for:

Nanometer-scale Sn Coatings Improve the Performance of Silicon Nanowire LIB Anodes

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Table S1. Composition (in at.%) of as-prepared materials, obtained from XPS spectra shown in Figure S2.

Material	C	O	Si	Sn
SiNWs	12.18	24.08	63.74	-
1Sn/SiNWs	23.01	42.51	17.52	16.96
3Sn/SiNWs	20.87	44.57	8.49	26.07
5Sn/SiNWs	27.55	38.70	5.35	28.40

Table S2. Resistance values obtained from fitting the EIS results presented in Figure 4(e) and 4(f) using the equivalent circuits shown in Figure S3(a) and S3(b) for as-synthesized and cycled data, respectively.

	SiNWs	1Sn/SiNWs	3Sn/SiNWs	5Sn/SiNWs
As-synthesized electrodes				
R_{es} (Ω)	2.2 ± 0.69%	3.9 ± 1.07%	2.8 ± 0.73%	2.6 ± 0.39%
R_{ct} (Ω)	396.4 ± 0.91%	131.7 ± 1.37%	201.3 ± 0.35%	66.7 ± 0.34%
Post-100 cycles electrodes (equivalent circuit shown in Figure S3(a))				
R_{es} (Ω)	9.7 ± 0.49%	8.6 ± 2.1%	5.0 ± 1.95%	9.5 ± 1.90%
R_{ct} (Ω)	62.6 ± 1.64%	40.7 ± 1.86%	27.9 ± 0.77%	59.0 ± 1.02%
Post-100 cycles electrodes (equivalent circuit shown in Figure S3(b))				
R_{es} (Ω)	9.0 ± 0.66%	7.3 ± 0.32%	4.9 ± 1.24%	8.9 ± 0.28%
R_{f} (Ω)	22.9 ± 6.96%	26.6 ± 1.51%	27.8 ± 0.52%	11.4 ± 6.19%
R_{ct} (Ω)	59.7 ± 5.78%	7.8 ± 3.36%	2.9 ± 7.96%	47.0 ± 2.45%

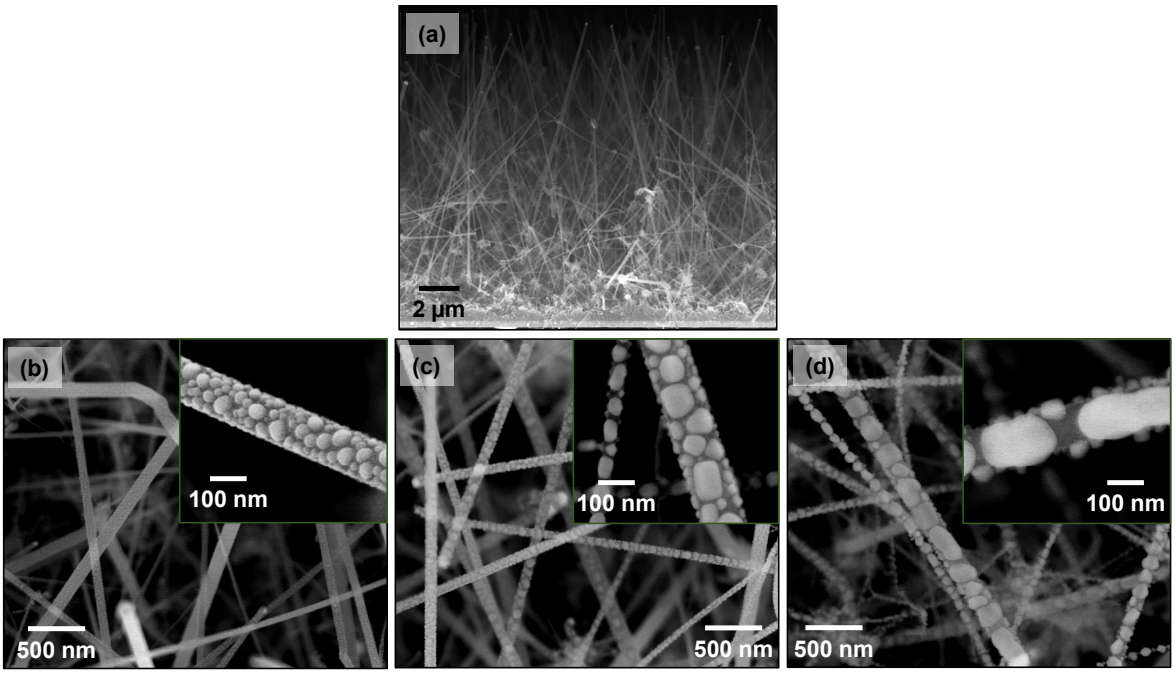

Figure S1. (a) Low magnification cross-sectional SEM micrograph of the as-grown uncoated SiNWs. Plan-view SEM images of the as-synthesized nanowires with high magnification inserts. (b) 1Sn/SiNWs, (c) 3Sn/SiNWs, and (d) 5Sn/SiNWs.

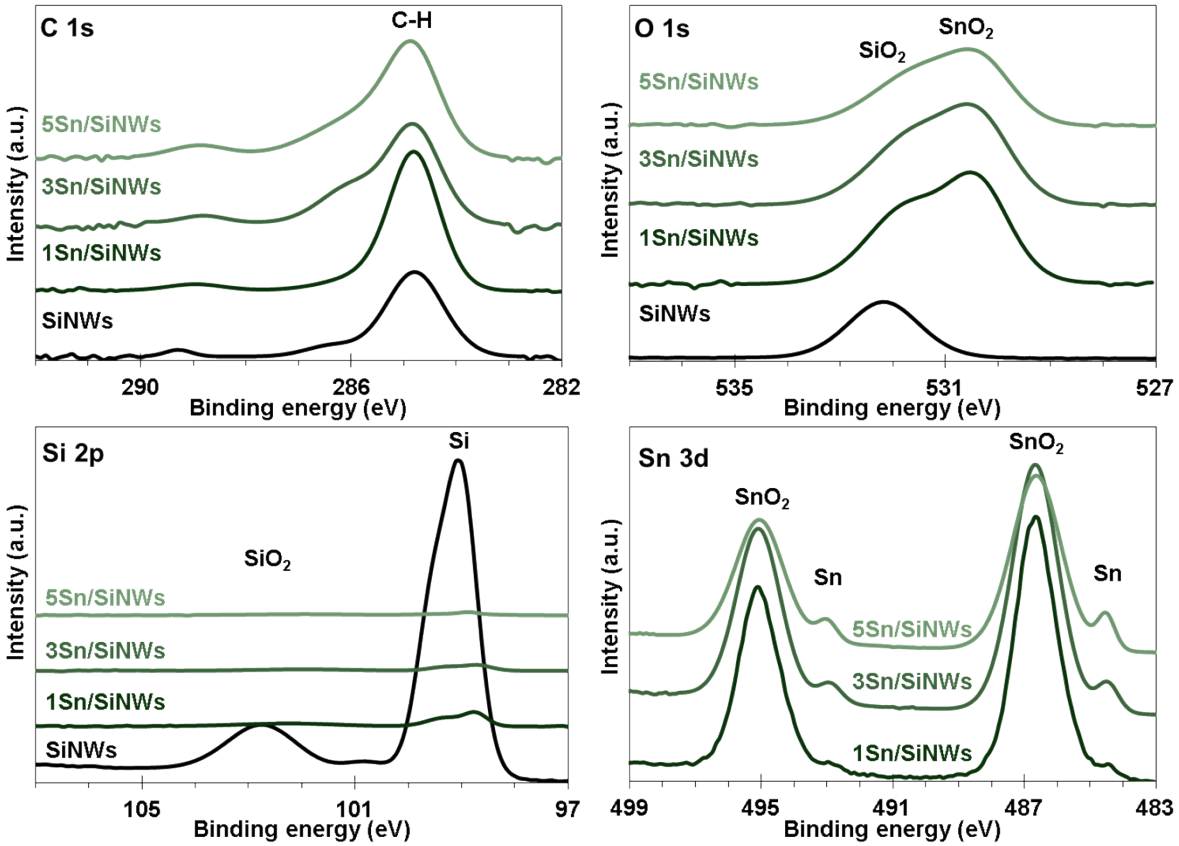

Figure S2. C 1s, O 1s ,Si 2p, and Sn 3d XPS spectra for as-prepared SiNWs, 1Sn/SiNWs, 3Sn/SiNWs, and 5Sn/SiNWs.

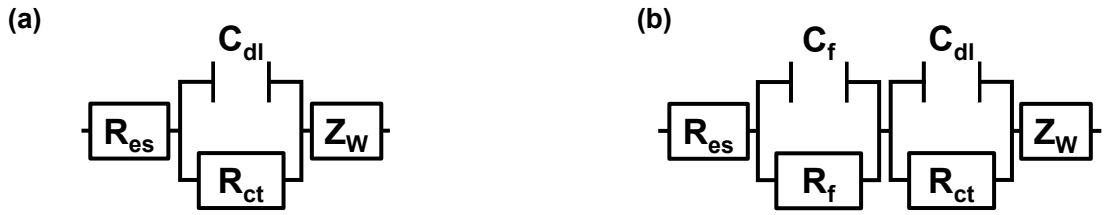

Figure S3. Equivalent circuits used for fitting impedance spectra of (a) as-synthesized bare and coated SiNWs, and (b) post-100 cycles (at 0.1C) bare and coated SiNWs.

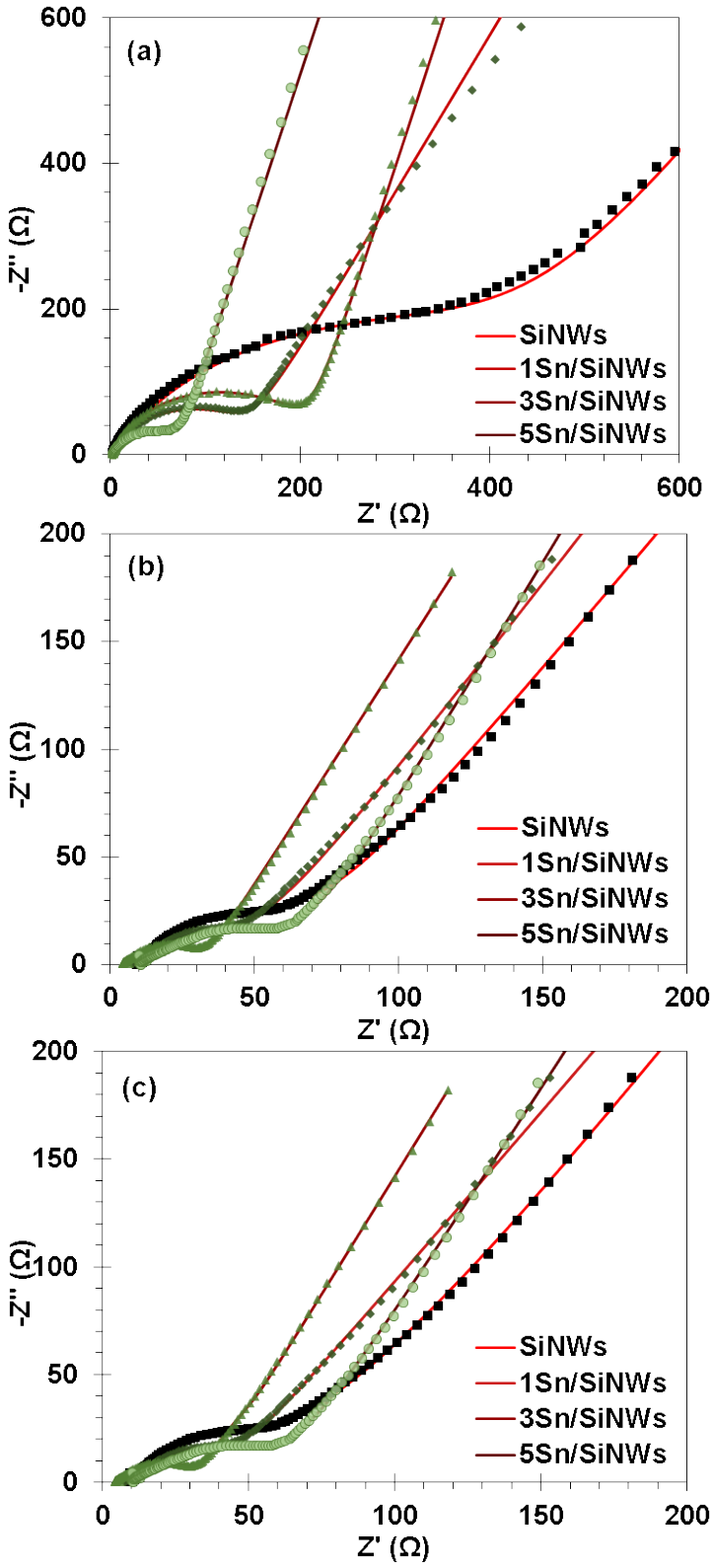

Figure S4. The measured and modeled EIS plots for (a) as-synthesized and (b,c) post 100 cycles at 0.1C anode materials. Modeled data obtained from using the equivalent circuit shown in (a,b) Figure S3(a) and (c) Figure S3(b).

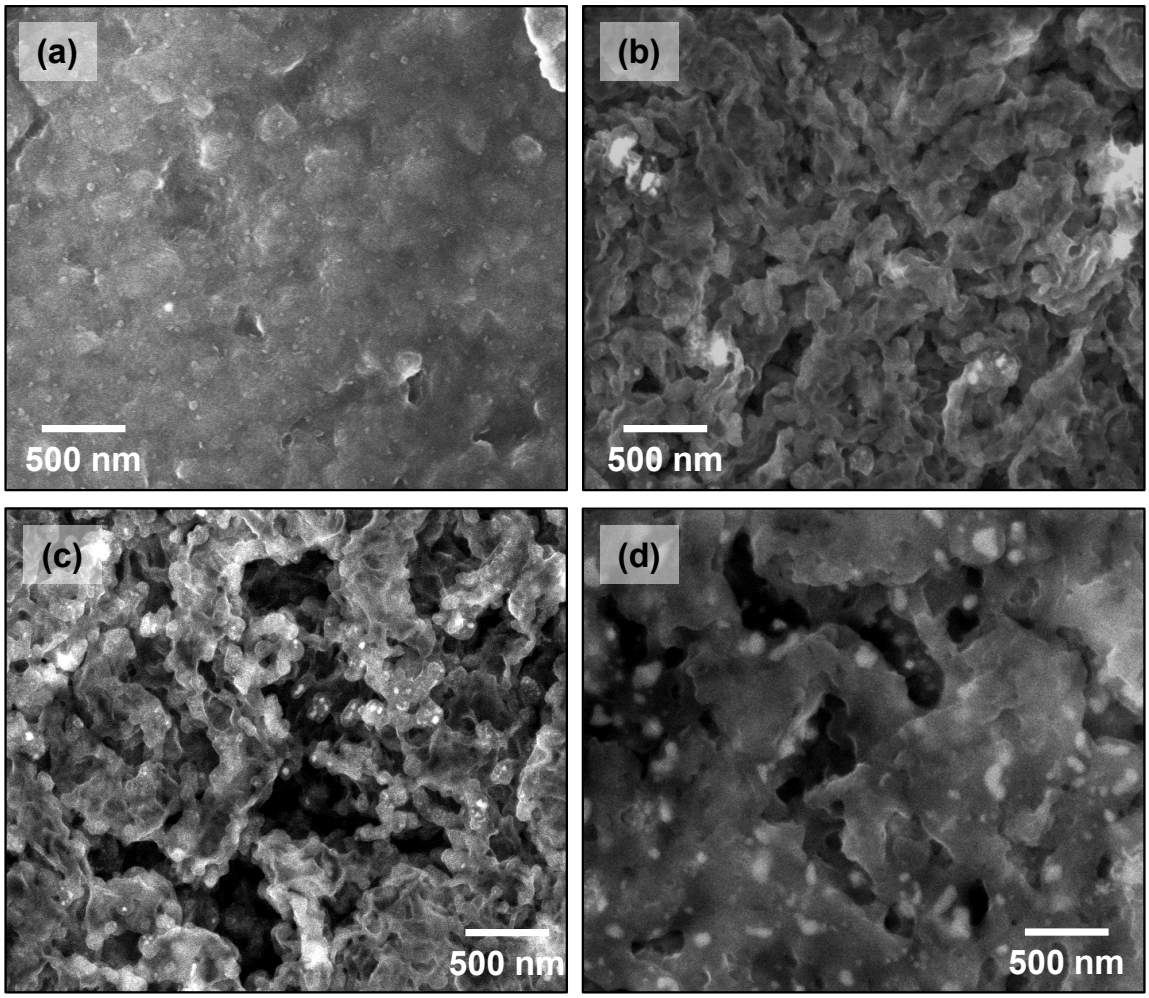

Figure S5. Plan-view SEM micrographs of (a) SiNWs, (b) 1Sn/SiNWs, (c) 3Sn/SiNWs, and (d) 5Sn/SiNWs anode materials after 100 cycles at 0.1C.