Supporting Information for

Engineering SnS_2 Nanosheet Assemblies for Enhanced Electrochemical Lithium and Sodium Ion Storage

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Table S1. Electrochemical performances of SnS_2-based materials previously reported for lithium-ion batteries.

Materials	Specific capacities	Cycle life	Reference
c-SnS_2 NSA	**1200 mAh g^{-1} at 0.2A g^{-1}** **620 mAh g^{-1} at 10 A g^{-1}**	**99.5% after 300 cycles at 1 A g^{-1}**	**This study**
SnS_2/SnO	998 mAh g^{-1} at 0.2 A g^{-1} 760 mAh g^{-1} at 0.8 A g^{-1}	66 % after 200 cycles at 0.2 A g^{-1}	J. Mater. Chem. A 2017, **5,** 512
SnS_2–NGS	1407 mAh g^{-1} at 0.2 A g^{-1} 200 mAh g^{-1} at 10 A g^{-1}	73% after 150 cycles at 0.8 A g^{-1}	J. Mater. Chem. A 2016, **4,** 10719
SnS_2@RGO	1278 mAh g^{-1} at 0.065 A g^{-1} 415 mAh g^{-1} at 3.2 A g^{-1}	81% after 200 cycles at 0. 065 A g^{-1}	J. Mater. Chem. A 2013, **1,** 8658
SnS_2 NRGO	562 mAh g^{-1} at 0.2 A g^{-1} 402 mAh g^{-1} at 2 A g^{-1}	97 % after 200 cycles at 0.2 A g^{-1}	ACS Nano 2016, **10,** 10778
SnS_2/S/C	875 mAh g^{-1} at 0.84 A g^{-1} 200 mAh g^{-1} at 8.4 A g^{-1}	75 % after 300 cycles at 0.84 A g^{-1}	ACS Appl. Mater. Interfaces 2016, **8**, 19550
CC-VN@SnS_2	819 mAh g^{-1} at 0.65 A g^{-1} 349 mAh g^{-1} at 13 A g^{-1}	97 % after 100 cycles at 0.65 A g^{-1}	ACS Appl. Mater. Interfaces 2015, **7**, 23205
SnS_2/g-C_3N_4/ rGO	1284 mAh g^{-1} at 0.1 A g^{-1} 396 mAh g^{-1} at 2 A g^{-1}	100 % after 276 cycles at 0.1 A g^{-1}	RSC Adv. 2017, **7**, 3125
SnS_2/G-As	656 mAh g^{-1} at 0.05 A g^{-1} 240 mAh g^{-1} at 1 A g^{-1}	55 % after 30 cycles at 0.05 A g^{-1}	J. Power Sources 2013, **237**, 178

Table S2. Electrochemical performances of SnS_2-based materials previously reported for sodium-ion batteries.

Materials	Specific capacities	Cycle life	Reference
c-SnS_2 NSA	**600 mAh g^{-1} at 0.5A g^{-1}** **140 mAh g^{-1} at 5 A g^{-1}**	**71% after 100 cycles at 0.5 A g^{-1}**	**This study**
SnS_2 NGS	608 mAh g^{-1} at 0.2A g^{-1} 148 mAh g^{-1} at 10 A g^{-1}	74% after 100 cycles at 0.2 A g^{-1}	J. Mater. Chem. A 2016, **4**, 10719
SnS_2/GO	610 mAh g^{-1} at 0.05A g^{-1} 320 mAh g^{-1} at 2 A g^{-1}	99.6 % after 150 cycles at 0.05 A g^{-1}	J. Mater. Chem. A 2014, **2**, 8431
SnS_2/rGO	469 mAh g^{-1} at 0.8A g^{-1} 337 mAh g^{-1} at 12.8 A g^{-1}	61 % after 1000 cycles at 0.8A g^{-1}	Adv. Funct. Mater. 2015, **25**, 481
SnS_2/G	650 mAh g^{-1} at 0.2 A g^{-1} 326 mAh g^{-1} at 4 A g^{-1}	94 % after 300 cycles at 0.2 A g^{-1}	Nanoscale 2015, **7**, 1325
SnS_2/RGO	630 mAh g^{-1} at 0.2 A g^{-1} 544 mAh g^{-1} at 2 A g^{-1}	95 % after 400 cycles at 1 A g^{-1}	Adv. Mater. 2014, **26**, 3854
B-SnS_2	900 mAh g^{-1} at 0.2 A g^{-1} 400 mAh g^{-1} at 10 A g^{-1}	99 % after 40 cycles at 1 A g^{-1}	ACS Nano 2016, **10**, 10211
SnS_2 NWA	576 mAh g^{-1} at 0.5 A g^{-1} 370 mAh g^{-1} at 5 A g^{-1}	64 % after 100 cycles at 0.5 A g^{-1}	ACS Appl. Mater. Interfaces 2017, **10**, 1021
SnS_2/C	660 mAh g^{-1} at 0.05 A g^{-1} 360 mAh g^{-1} at 1 A g^{-1}	86 % after 100 cycles at 0.05 A g^{-1}	ACS Appl. Mater. Interfaces 2015, **7**, 11476
FL-SnS_2/RGO	843 mAh g^{-1} at 0.1A g^{-1} 335 mAh g^{-1} at 8.4 A g^{-1}	98 % after 100 cycles at 0.1 A g^{-1}	J. Phys. Chem. 2017, **121**, 3261

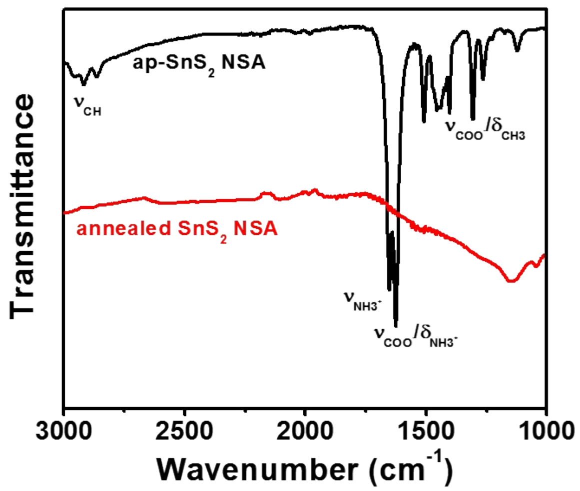

Figure S1. FT-IR spectrum of as-prepared and annealed SnS_2 NSA.

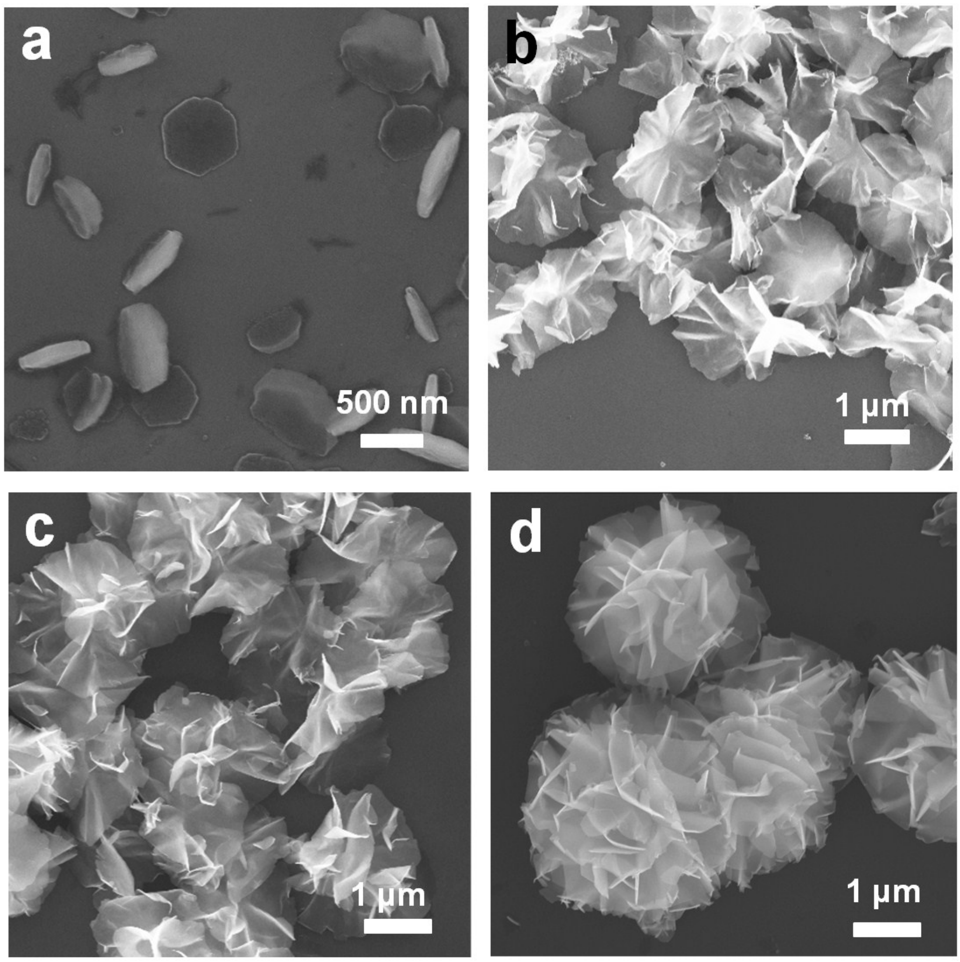

Figure S2. SEM images of products collected after the solvothermal reaction at 180℃ for (a) 1 h, (b) 2 h, (c) 4 h and (d) 6 h.

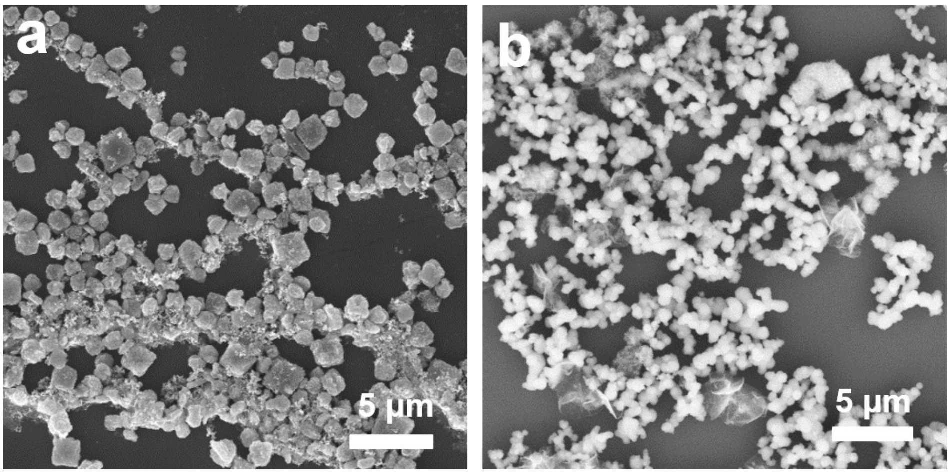

Figure S3. SEM images of products prepared using (a) water and (b) ethanol as the reaction solvent under otherwise identical conditions.

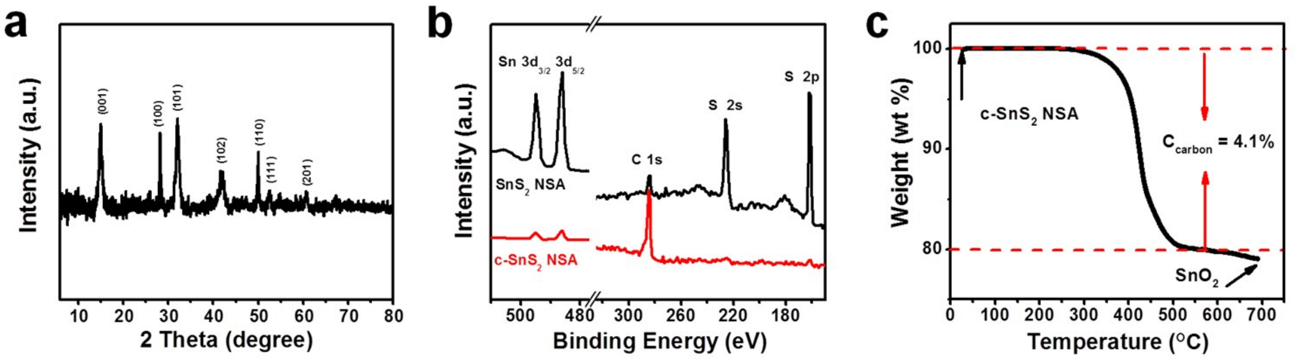

Figure S4. (a) XRD pattern of c-SnS_2 NSA. (b) XPS spectra of c-SnS_2 NSA and SnS_2 NSA. (c) TGA curve of c-SnS_2 NSA in air.

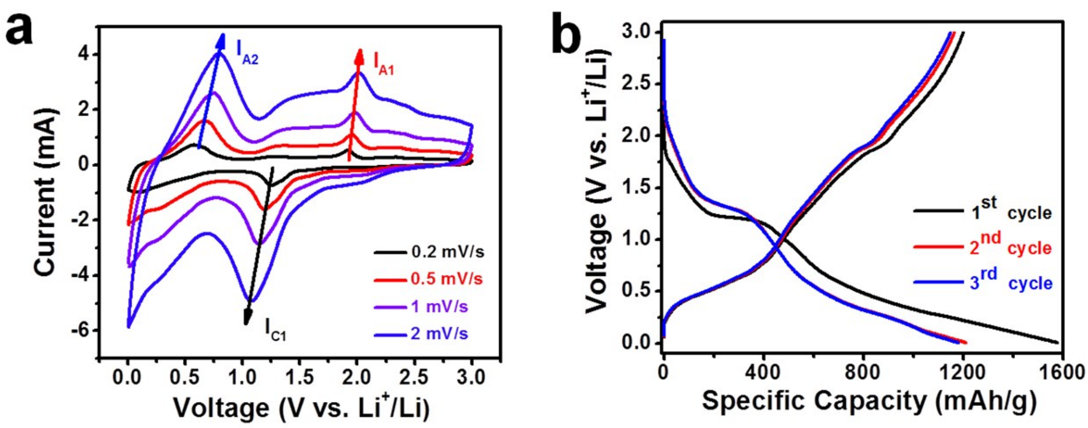

Figure S5. (a) CV curves of c-SnS_2 NSA at diffident scan rates as indicated. (b) Galvanostatic charge and discharge curves of c-SnS_2 NSA at 200 mA g^{-1} for the first three cycles.

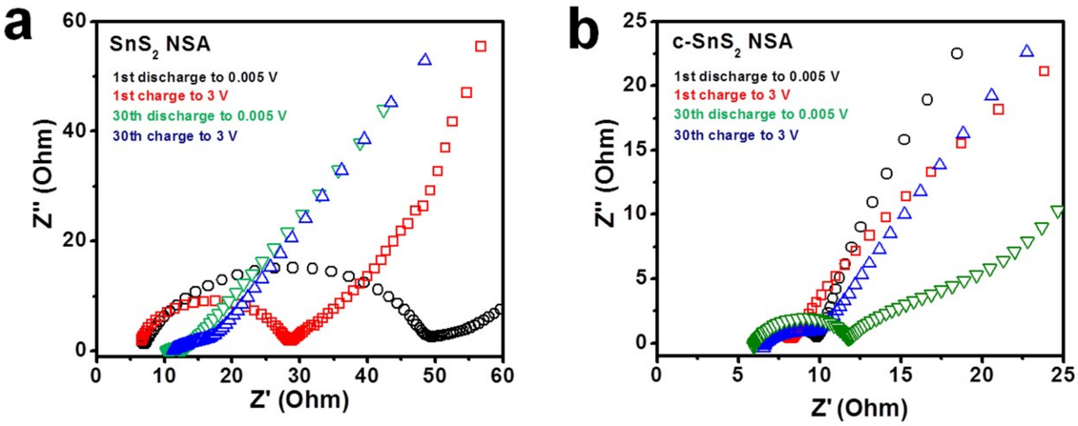

Figure S6. Electrochemical impedance spectroscopy (EIS) analysis of (a) SnS_2 NSA and (b) c-SnS_2 NSA at the 1st and 30th cycles. c-SnS_2 NSA consistently showed smaller charge transfer resistance.

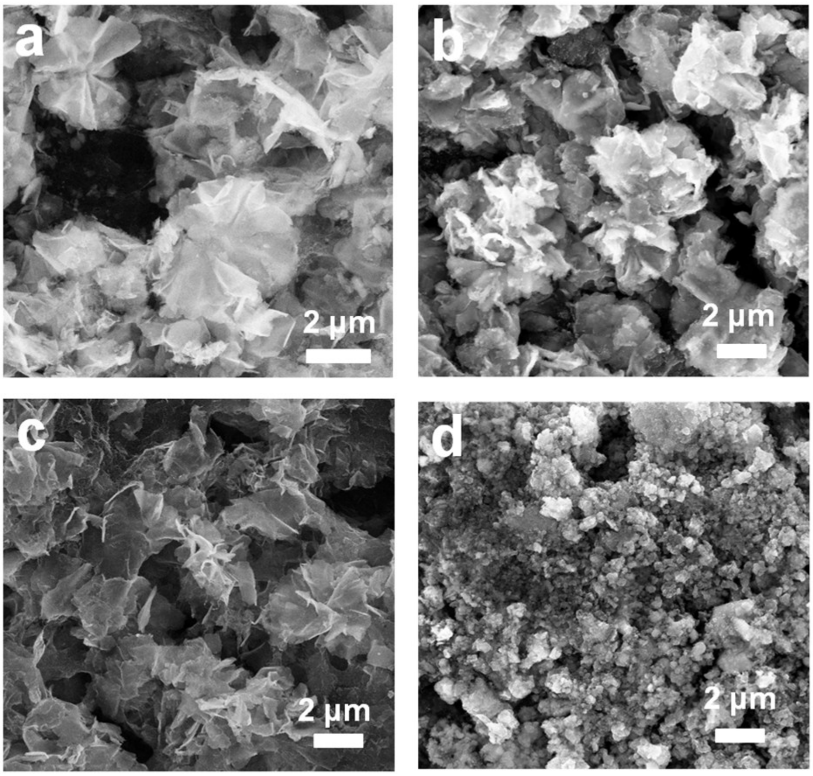

Figure S7. SEM images of (a,b) c-SnS_2 NSA and (c,d) SnS_2 NSA before (a,c) and after (b,d) cycling. c-SnS_2 NSA was obviously more resistant to pulverization.

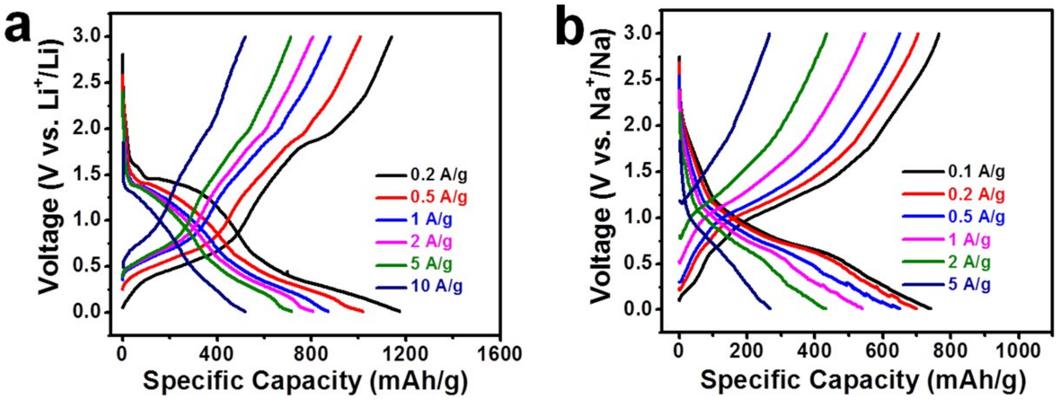

Figure S8. Galvanostatic charge and discharge voltage profiles of c-SnS_2 NSA for (a) LIBs and (b) SIBs under different specific currents as noted.