Electronic Supplementary Material (ESI) for Materials Chemistry Frontiers.

Supplementary Information

Dense SnS_2 Nanoplates Vertically Anchored on Graphene Aerogel for Pseudocapacitive Sodium Storage

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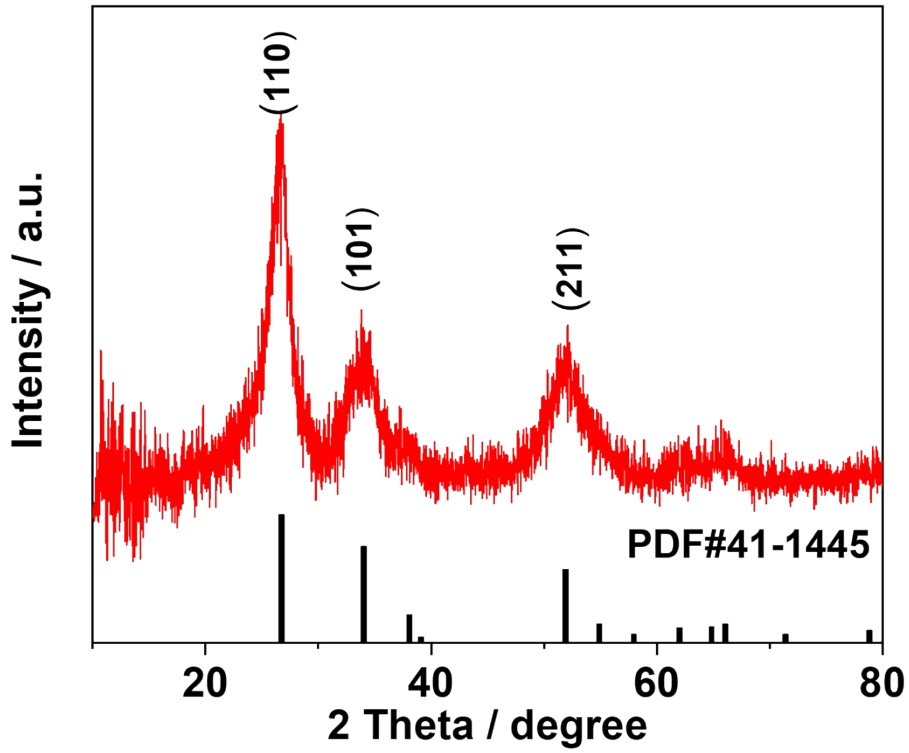

Figure S1. XRD pattern of the SnO_2@GA precursor.

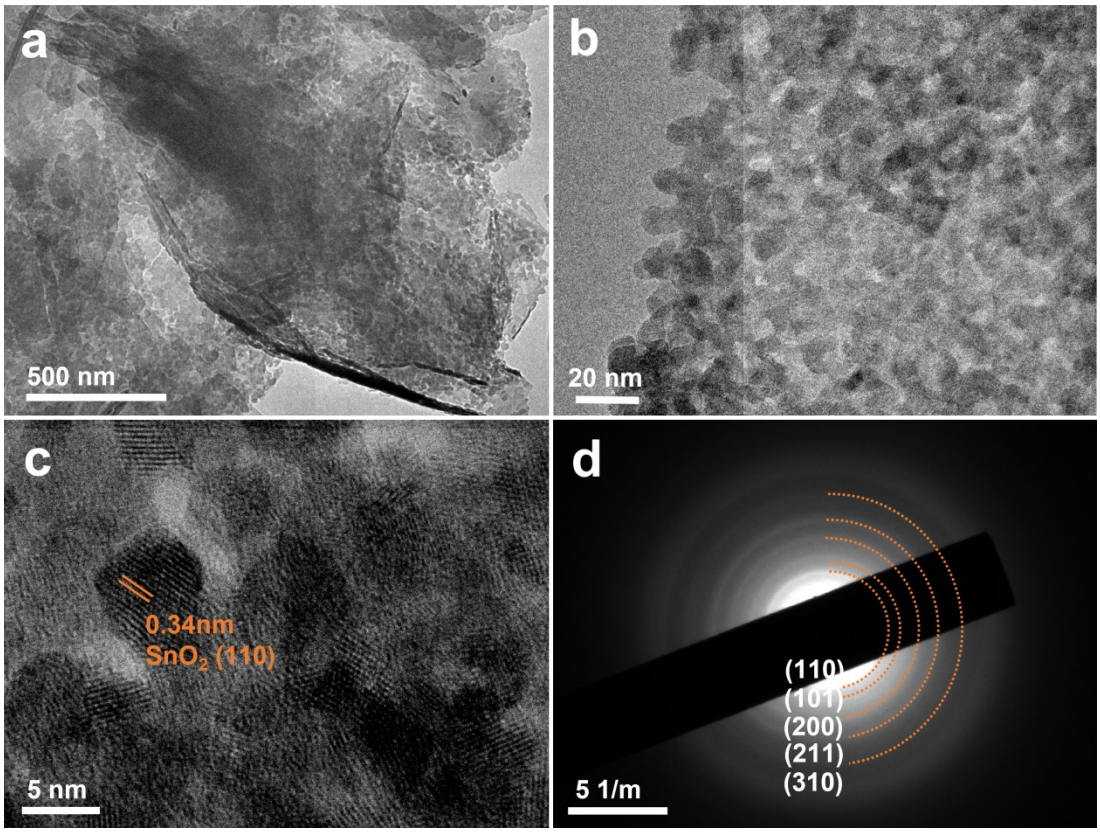

Figure S2. (a, b) TEM and (c) HRTEM images of SnO_2@GA. (d) SAED pattern of the SnO_2@GA precursor.

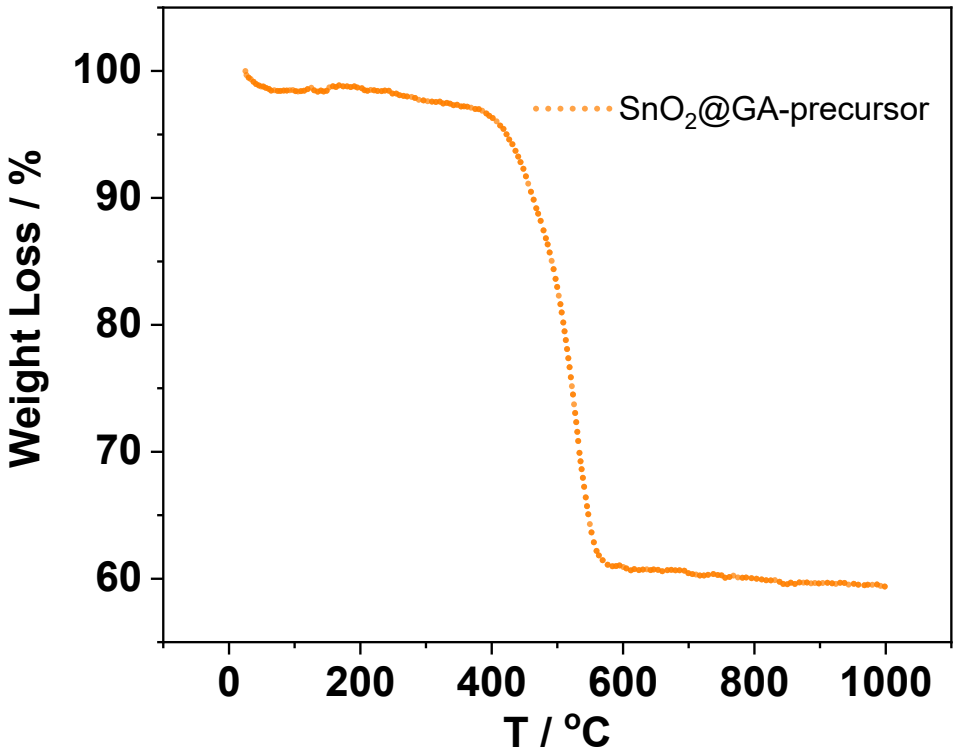

Figure S3. Thermogravimetric analysis (TGA) curve of SnO_2@GA, which indicates that the graphene content is around ~37 wt%.

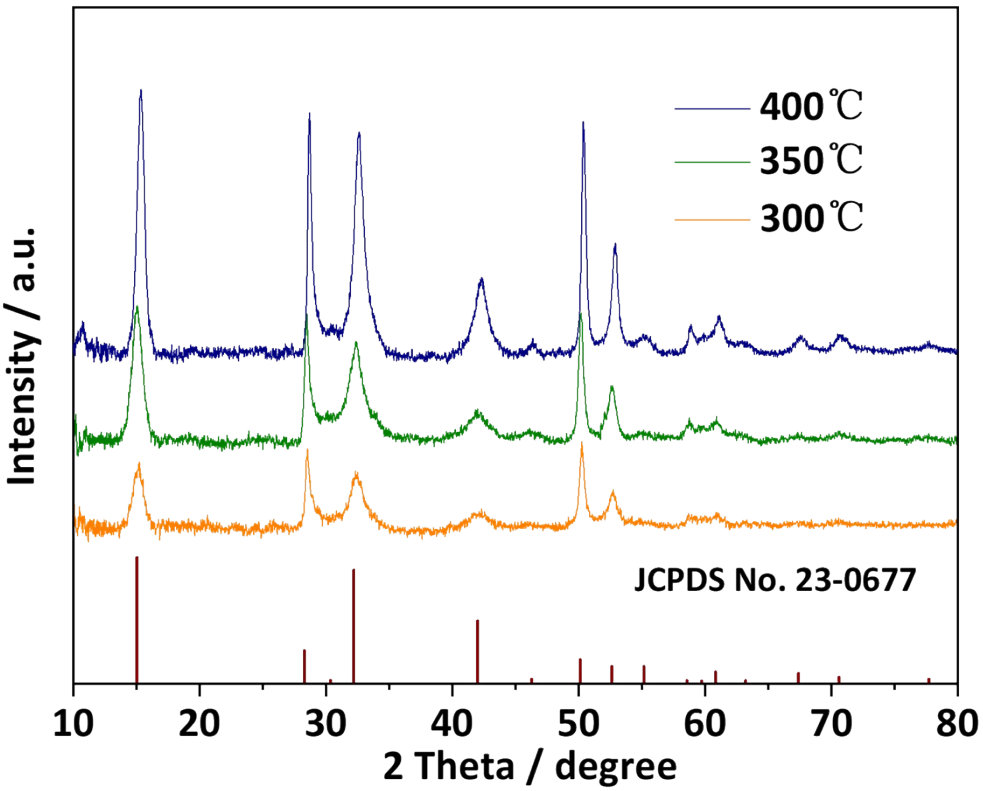

Figure S4. XRD patterns of the derived products after sulfurizing at 300 °C, 350 °C, 400 °C for 4 h.

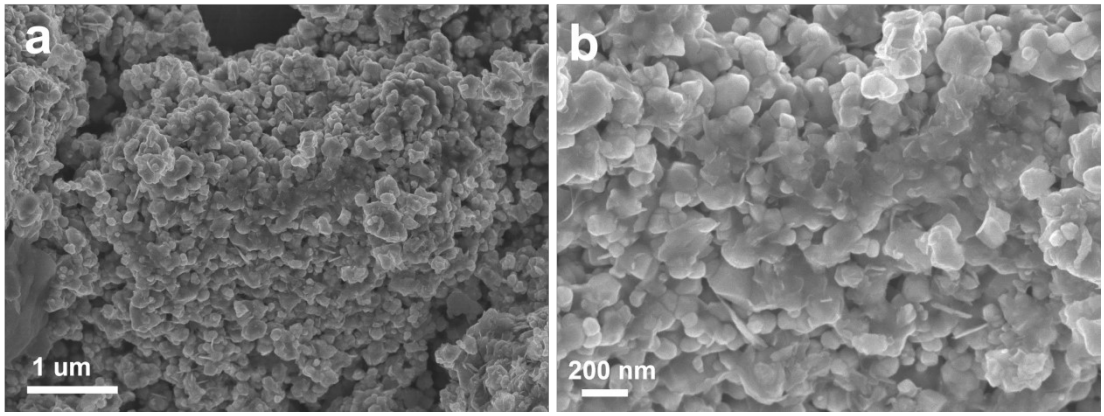

Figure S5. (a) Low-magnification and (b) high-magnification SEM images of the as-prepared SnS_2.

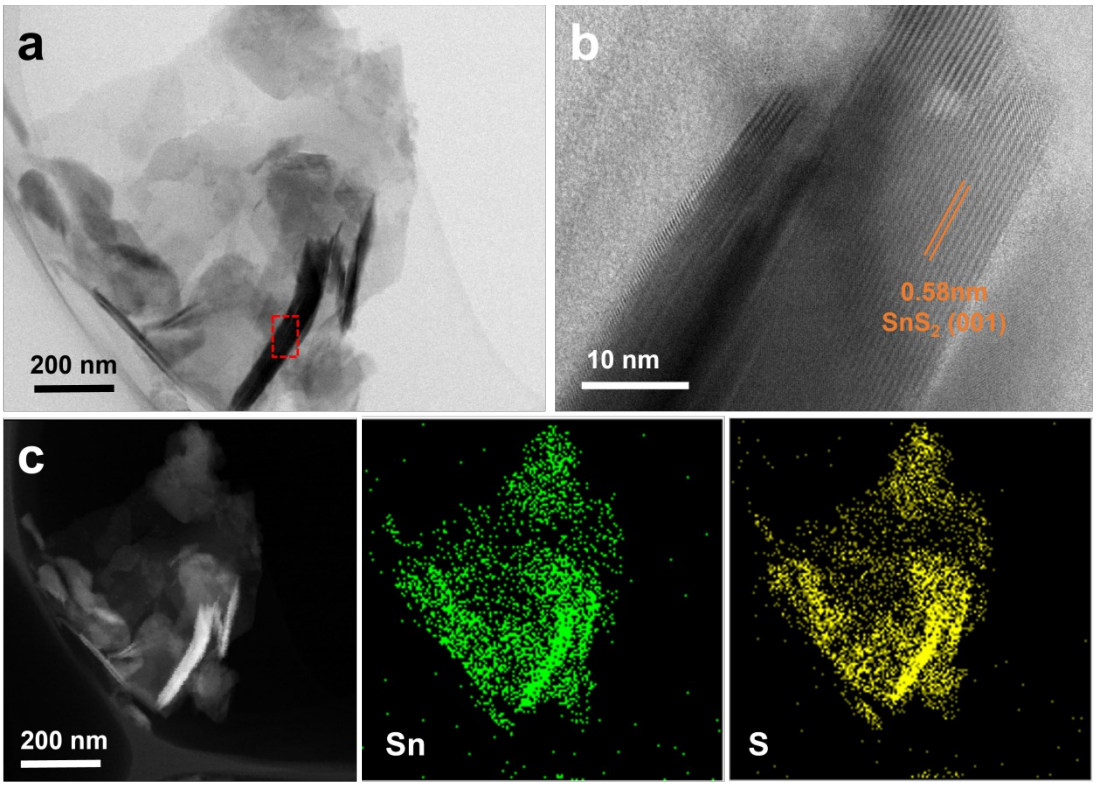

Figure S6. (a) TEM, (b) HRTEM and (c) EDS mapping images of the as-prepared SnS_2.

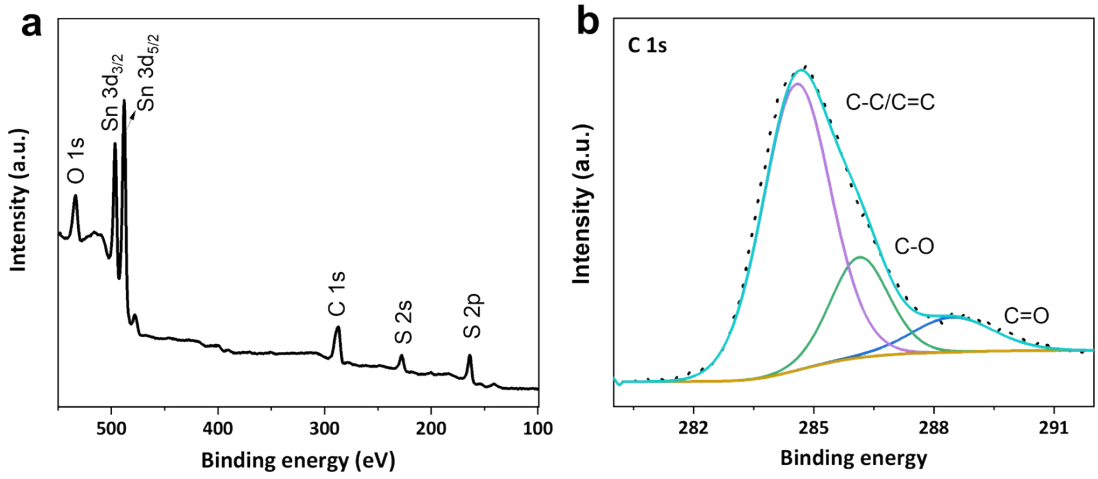

Figure S7. (a) Typical XPS survey spectrum and (b) the corresponding C 1s XPS spectrum of SnS_2@GA.

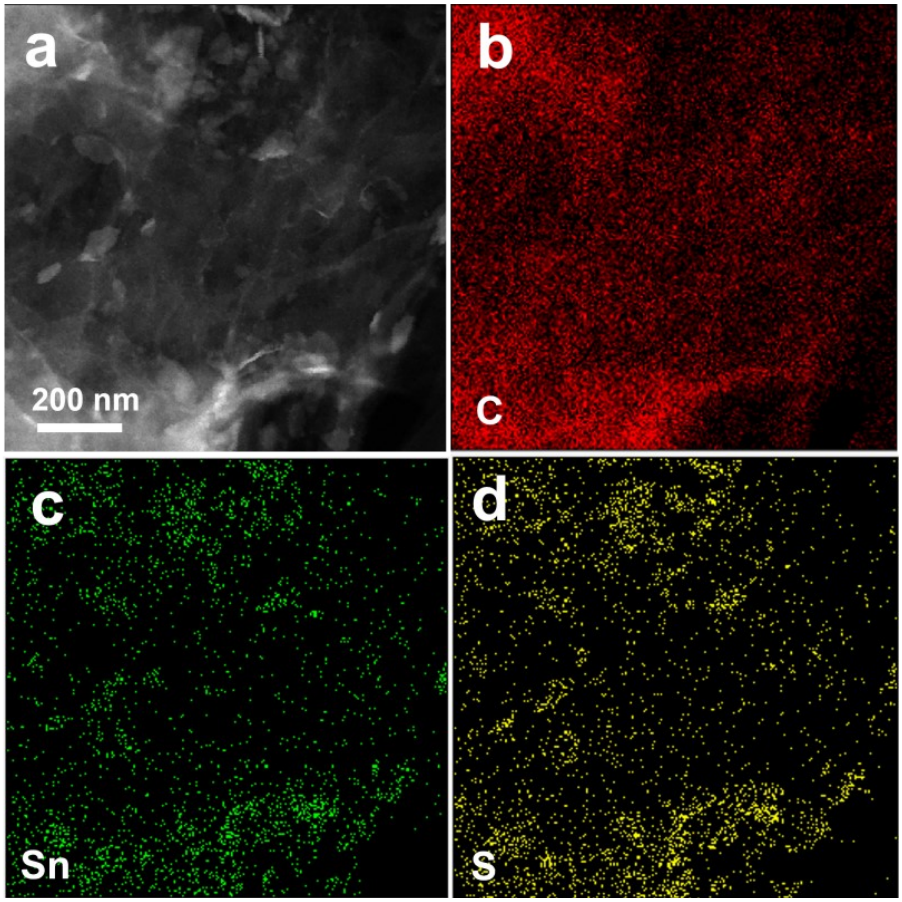

Figure S8. (a) STEM image and the corresponding (b) C, (c) Sn and (d) S elemental mapping results of SnS_2@GA composite.

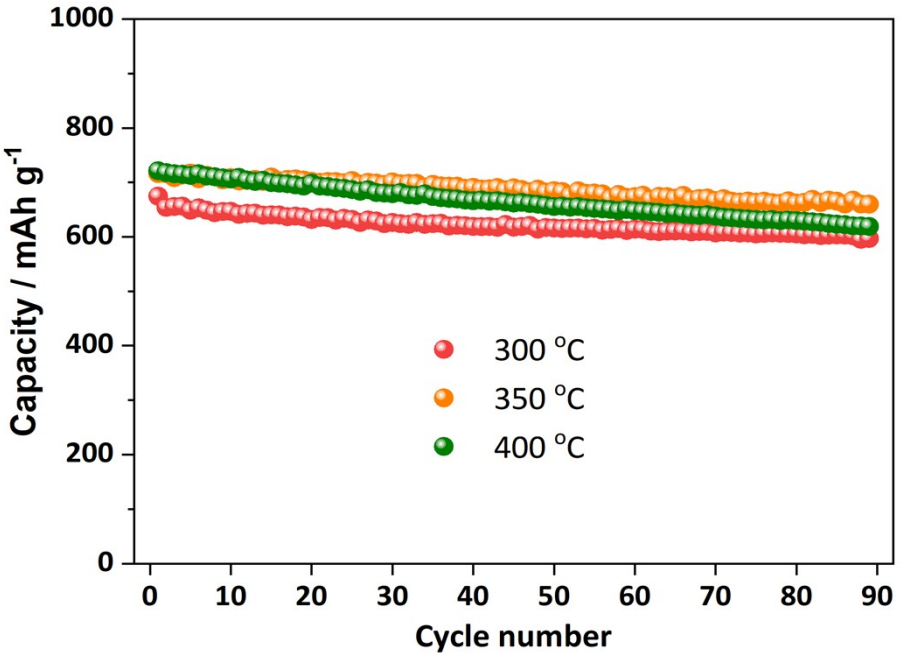

Figure S9. Cycling performance of the derived products sulfurizing under different temperatures at a current density of 200 mA·g^{-1}.

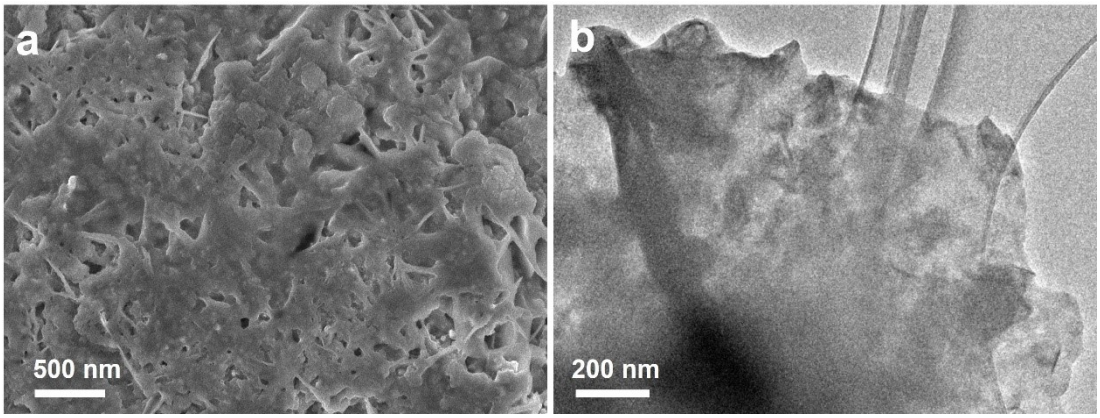

Figure S10. (a) SEM and TEM images of the post-cycled SnS_2@GA composite electrode after 150 cycles at 0.2 A g^{-1}.

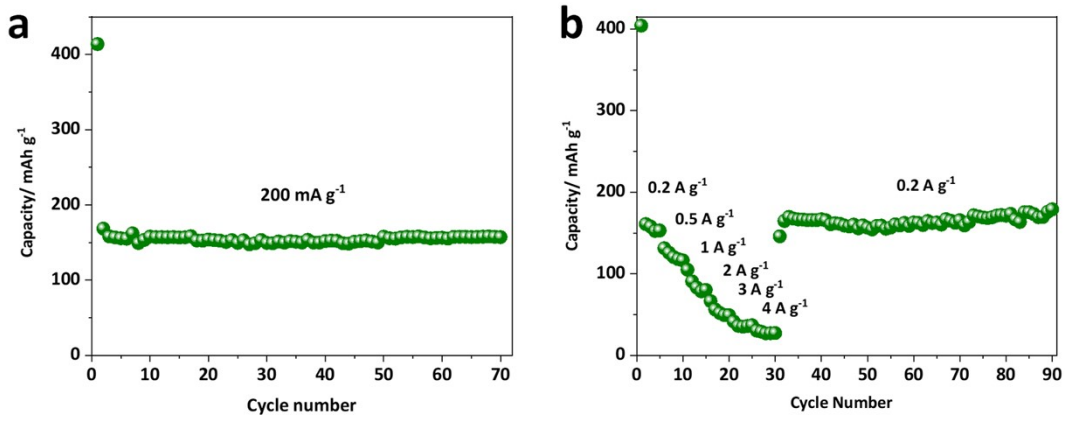

Figure S11. (a) Cycling and (b) rate performance of the GA electrode.

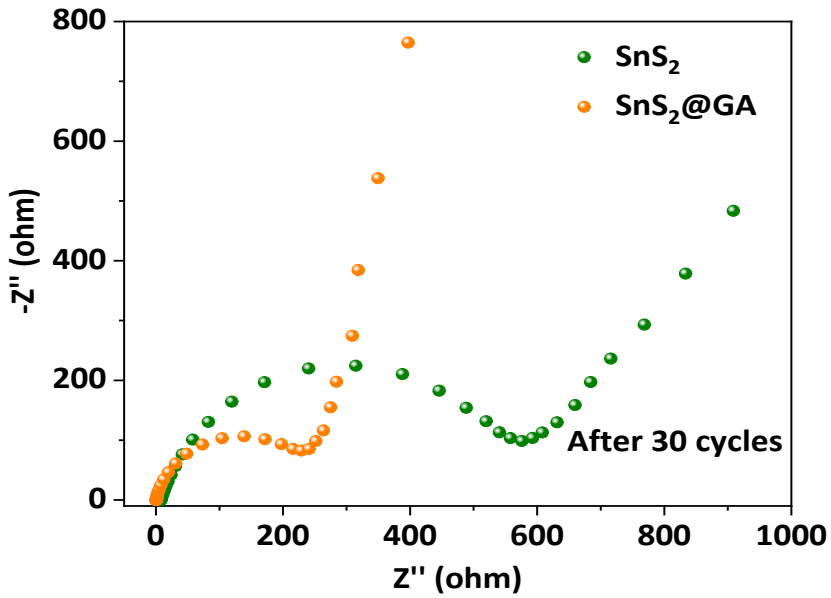

Figure S12. Nyquist plots of the SnS_2@GA and SnS_2 anodes after one cycle.

Table S1. Comparison of electrochemical performance of the SnS_2@GA and some previously reported similar composites in sodium-ion batteries.

Materials	Rate performance	Cycling performance	Ref.
SnS_2@N-doped Carbon Box	362 mAh g^{-1} at 5 A g^{-1}	295 mAh g^{-1} at 2 A g^{-1} after 500 cycles	[22]
SnS_2/RGO	544 mAh g^{-1} at 2 A g^{-1}	500 mAh g^{-1} at 1 A g^{-1} after 400 cycles	[24]
SnS_2/EDA-functionalized RGO	278 mAh g^{-1} at 4.2 A g^{-1}	360 mAh g^{-1} at 0.75 A g^{-1} after 1,000 cycles	[25]
3D Gr@SnS_2/SnS@C	288.5 mAh g^{-1} at 5 A g^{-1}	305 mAh g^{-1} at 1 A g^{-1} after 200 cycles	[27]
SnS_2 QDs/Ti_3C_2	~165 mAh g^{-1} at 2 A g^{-1}	345.3 mAh g^{-1} at 0.1 A g^{-1} after 600 cycles	[29]
SnS_2/N-doped graphene	364 mAh g^{-1} at 5 A g^{-1}	453 mAh g^{-1} at 0.5 A g^{-1} after 200 cycles	[34]
SnS_2/graphene	463 mAh g^{-1} at 0.64 A g^{-1}	670 mAh g^{-1} at 0.02 A g^{-1} after 60 cycles	[51]
SnS_2@GA	492 mAh g^{-1} at 4 A g^{-1}	437 mAh g^{-1} at 2 A g^{-1} after 1,000 cycles	This work