Electronic Supplementary Information

Low-content SnO_2 nanodots on N-doped graphene: lattice-confinement preparation and high-performance lithium/sodium storage

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Figure S1

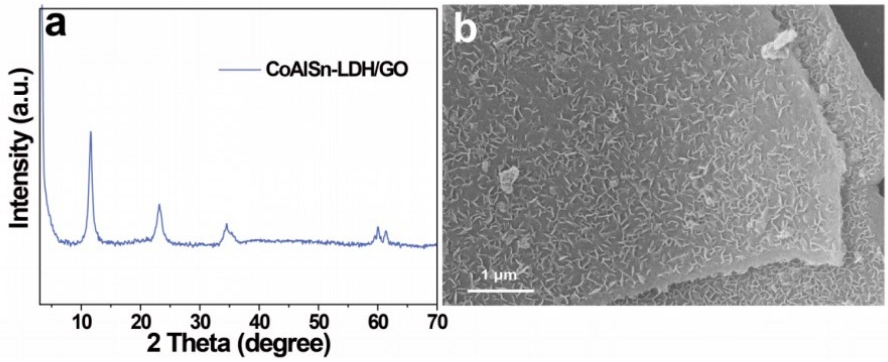
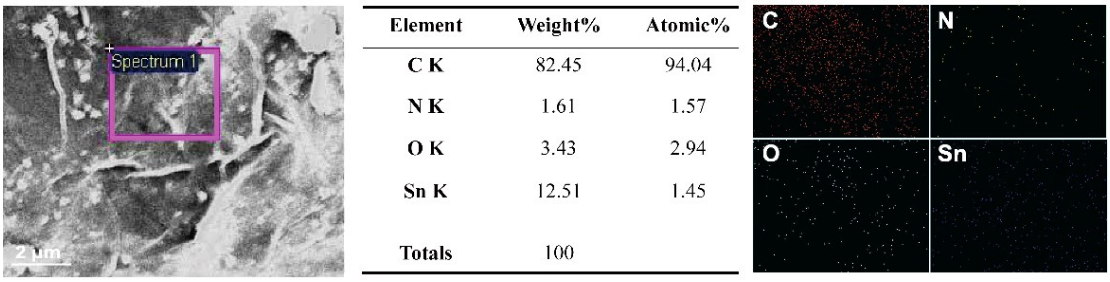


Figure S1. (a) XRD spectrum of CoAlSn-LDH/GO precursor, (b) SEM image of CoAlSn-LDH/GO precursor.

Figure S2



Element	Weight%	Atomic%
C K	82.45	94.04
N K	1.61	1.57
O K	3.43	2.94
Sn K	12.51	1.45
Totals	100	

Figure S2. The SEM/EDS element mapping of SnO_2@N-rGO.

Figure S3

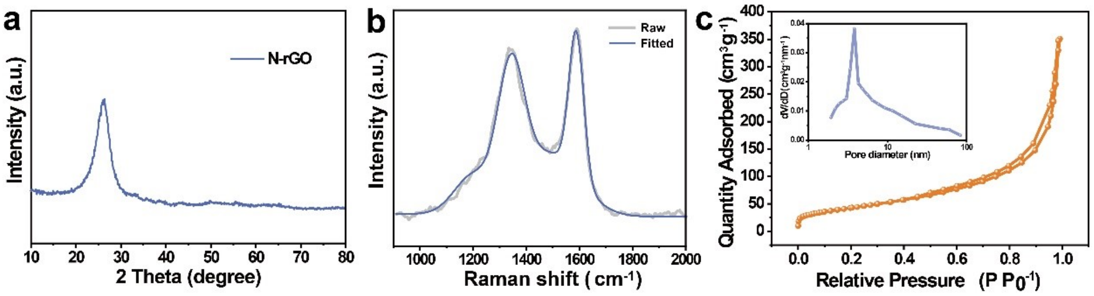


Figure S3. The N-rGO counterpart prepared for comparison: (a) XRD pattern, and (b) Raman spectrum, and (c) N_2 adsorption/desorption isotherm curve (Insert shows a mesoporous size distribution).

Figure S4

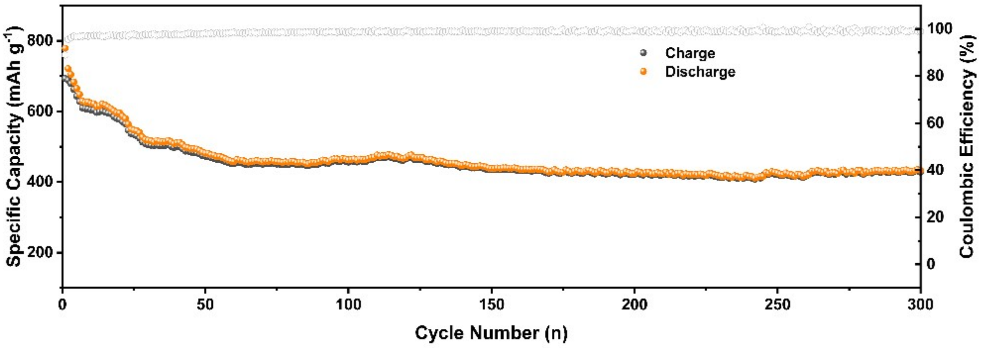


Figure S4. Long-cycling performance of SnO_2@N-rGO at 2000 mA g^{-1} for LIBs.

Figure S5

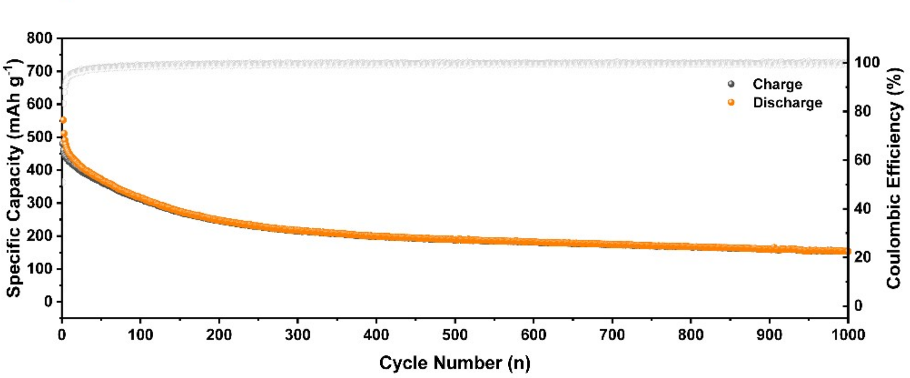


Figure S5. Long-cycling performance of SnO_2@N-rGO at 2000 mA g^{-1} for SIBs.

Figure S6

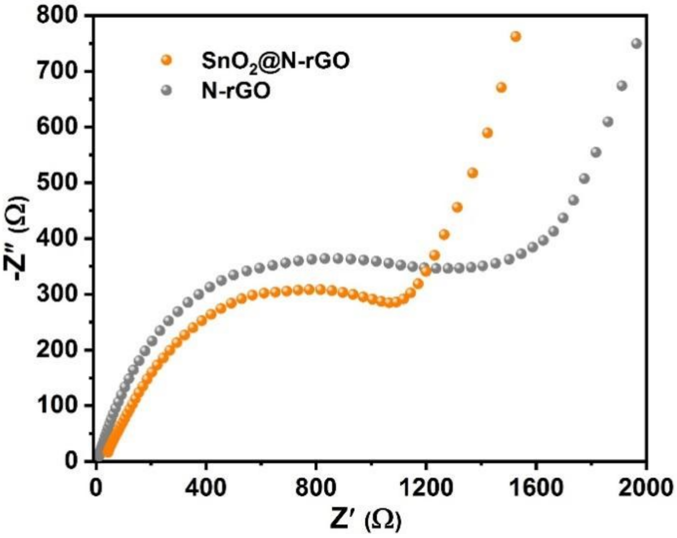


Figure S6. Comparison of EIS between the SnO_2@N-rGO composite and the N-rGO counterpart for SIBs.

Figure S7

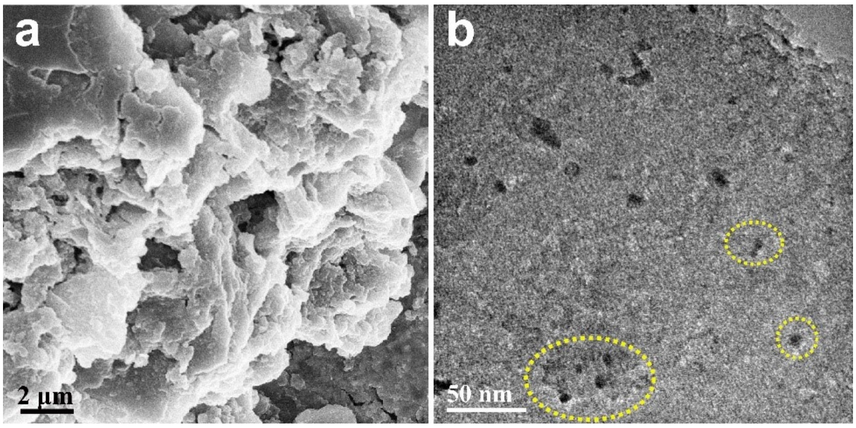


Figure S7. (a) SEM and (b) TEM image of the post-cycled SnO_2@N-rGO electrode after 100 cycles at 0.1 A g^{-1} for SIBs, without significant aggregation or volume expansion, as marked by the dotted line circles.

Table S1.

Comparison of cycling performance between SnO_2@N-rGO and the reported SnO_2-based anode nanomaterials for LIBs.

SnO_2-based materials	**Current density /mA g^{-1}**	**Specific capacity /mAh g^{-1}**	**Cycles**	**References**
SnO_2/carbon@-void@carbon (SnO_2: 45.3 wt%)	500	866	200	1
SnO_2 NPs	1000	887	1000	2
SnO_2/graphene (SnO_2: 54 wt%)	100	1420	90	3
SnO_2/GNP (SnO_2: 80 wt%)	100	745	100	4
SnO_2/MXenes	100	904.1	1000	5
NC@SnO_2 (SnO_2: 67.81wt%)	1000	750	100	6
SnO_2@P@GO (SnO_2: 82.18 wt%)	100	550	200	7
SnO_2@C (SnO_2: 91.77 wt%)	50	725	200	8
SnO_2@CNFs (SnO_2: 18.1 wt%)	50	380.4	100	9
SnO_2@N-rGO (SnO_2: 17.9 wt%)	100	1146.2	100	**This work**
	2000	428.5	300	

Table S2.

Comparison of cycling performance between SnO_2@N-rGO and the reported SnO_2-based anode nanomaterials for SIBs.

SnO_2-based materials	**Current density /mA g^{-1}**	**Specific capacity /mAh g^{-1}**	**Cycles**	**References**
NBT/C@SnO_2 NFs	200	420.7	500	10
SnO_2-NG (SnO_2: 50 wt%)	50	409.6	100	11
SnO_2@NC (SnO_2: 55.5 wt%)	1000	212.6	3000	12
SnO_2/rGO (SnO_2: 90.71 wt%)	200	204	1500	13
SnO_2/CNT (SnO_2: 72 wt%)	100	630.4	100	14
SnO_{2-x}/C nanofibers (SnO_2: 54 wt%)	1000	565	2000	15
N-C@SnO_2 (SnO_2: 67.81 wt%)	100	270	100	6
SnO_2/graphene (SnO_2: 54 wt%)	200	650	90	3
PCNF@SnO2@C (SnO_2: 38.5 wt%)	50	374	100	16
SnO_2-PC (SnO_2: 74.47 wt%)	100	280.1	250	17
SnO_2@NC-rGO (SnO_2: 17.9 wt%)	100	387	100	**This work**
	2000	150	1000	

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