Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supporting Information

Design and synthesis Few-layer Molybdenum Oxide Selenide Encapsulated in 3D interconnected nitrogen-doped carbon Anode Toward High-Performance sodium storage

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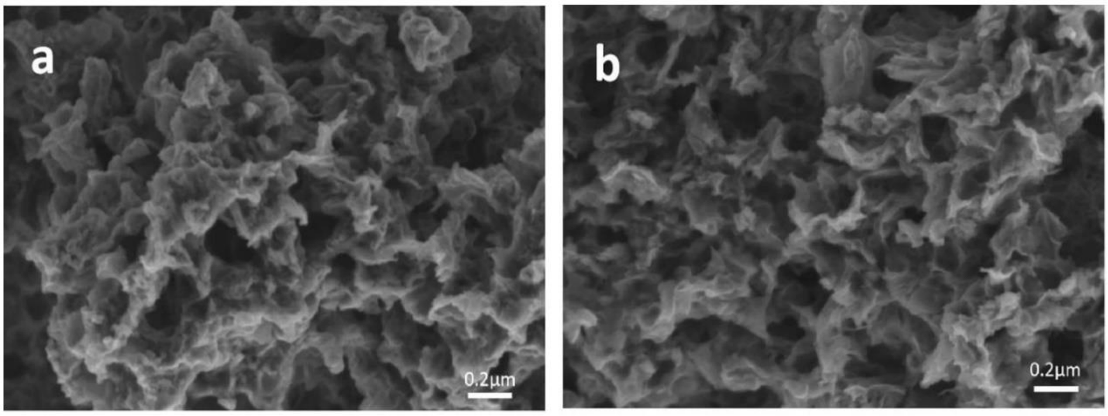

Fig. S1 SEM images of (a) MoO_3-NC and (b) $MoSe_2$-NC.

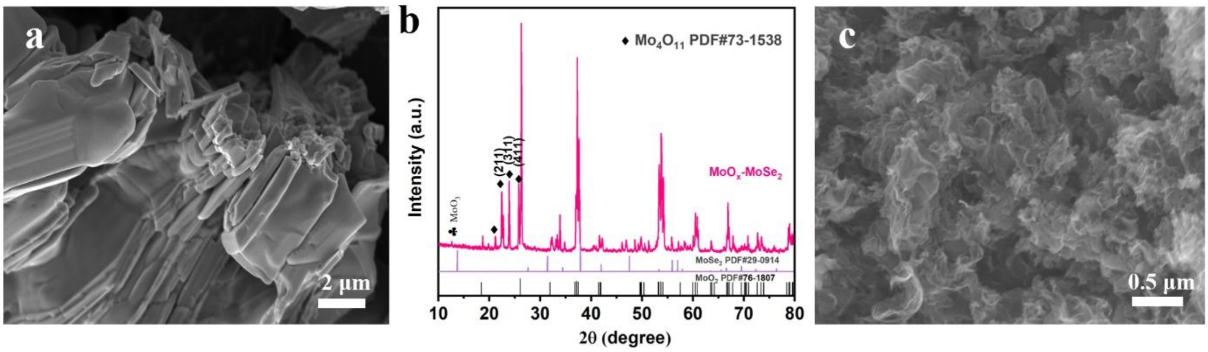

Fig. S2 SEM images of (a) MoO_x-$MoSe_2$ and (b) NC.

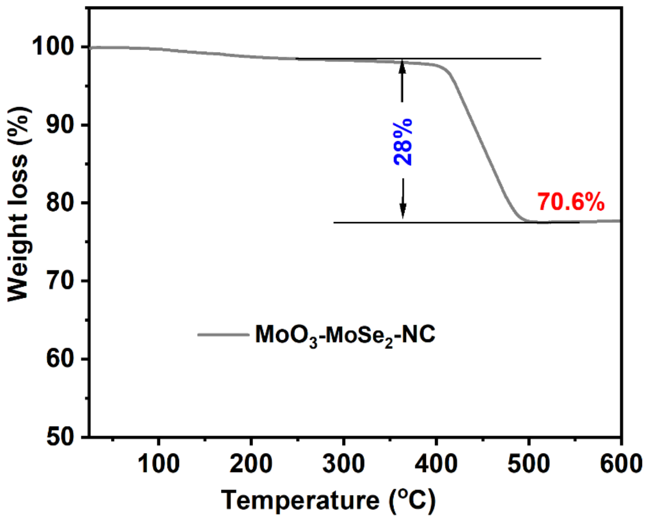

Fig. S3 TGA curves of MoO_3-$MoSe_2$-NC.

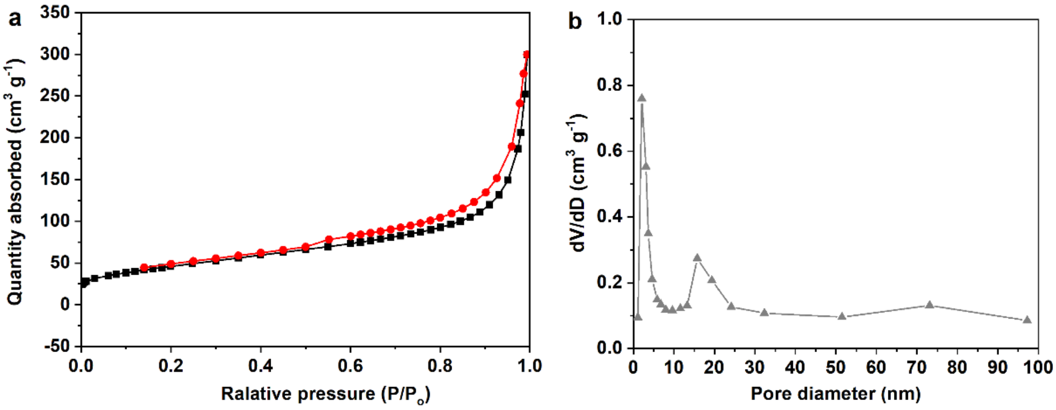

Fig. S4 (a) N_2 adsorption-desorption isotherms and (b) the pore-size distribution plot of the TGA curves of MoO_3-$MoSe_2$-NC.

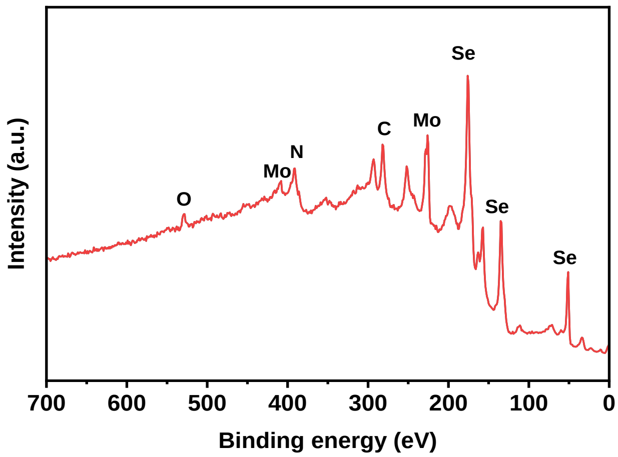

Fig. S5 XPS survey of MoO_3-$MoSe_2$-NC.

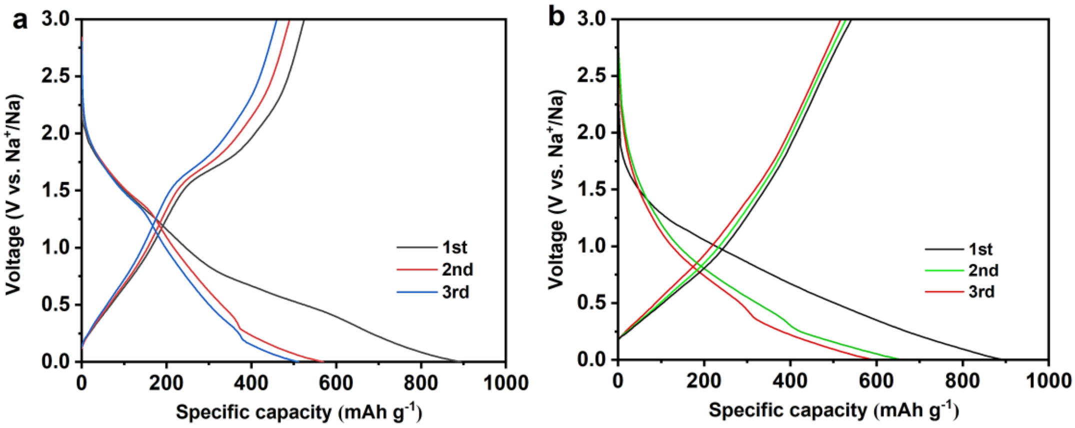

Fig. S6 Galvanostatic discharge/charge curves of (a) $MoSe_2$-NC and (b) MoO_3-NC, respectively.

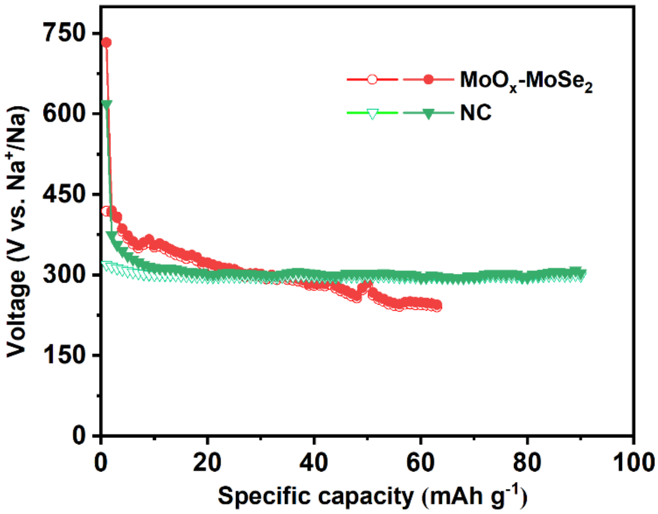

Fig. S7 Cycle performance of MoO_x-$MoSe_2$ and NC at 0.1 A g^{-1}.

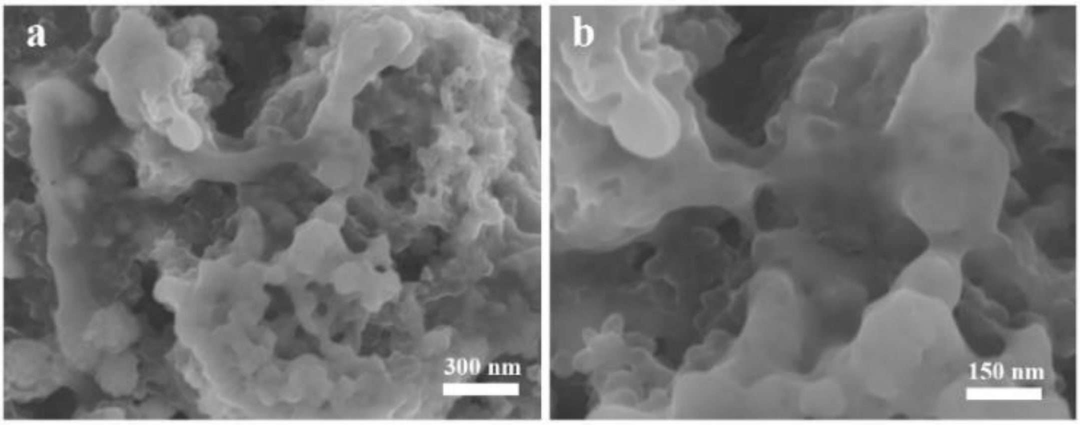

Fig. S8 (a, b) SEM images of MoO_3-$MoSe_2$-NC sample after 100 cycles for SIBs.

Table S1 Performance comparison between MoO_3-$MoSe_2$-NC anode and the reported anode materials for SIBs

Samples	Cycle performance (mAh g^{-1})/number	Current density ($A\ g^{-1}$)	Ref.
MoO_3-$MoSe_2$-NC	**551/150** **368/600**	**0.1** **1**	**This work**
MoO_2/$MoSe_2$-graphene	404 (rate capability) 340/300	0.1 0.5	*Energy Storage Materials, 2018, 12, 241-251*
$MoSe_2$ nanoparticles	374/100	0.5	*J. Alloys. Compds. 2022, 922, 166306*
$MoSe_2$@C HNS	458/200	0.5	*Inorg. Chem. Front., 2020,7, 1691-1698*
$MoSe_2$@NPC/rGO	340/500	0.5	*J. Power Sources, 2020, 476, 228660*
TiO_2@MoO_2-C	210/500	1	*Adv. Energy Mater. 2017, 7(15), 1602880*
MoO_2/$MoSe_2$@NPC	382/200	0.1	*ACS Appl. Mater. Interfaces 2022, 14, 32, 36592–36601*

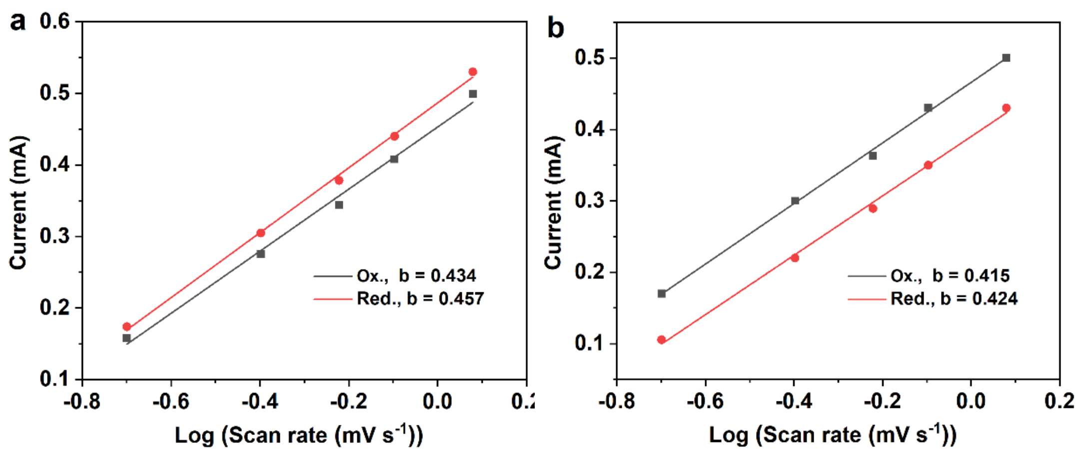

Fig. S9 Linear relation between I_p and $v^{1/2}$ of the (a) MoO_3-$MoSe_2$-NC and (b) $MoSe_2$-NC anodes for SIBs, respectively.

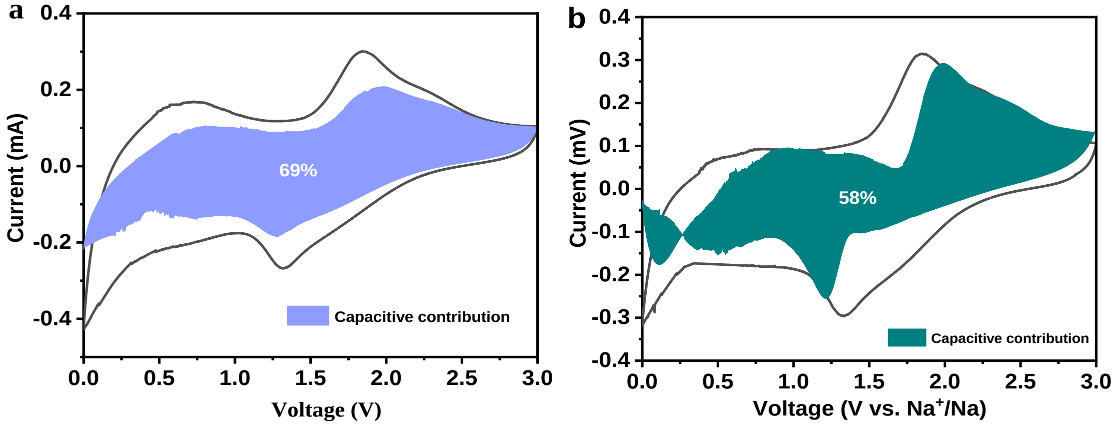

Fig. S10 Separation of the capacitive and diffusion currents at a scan rate of 0.6 mV s^{-1} of the (a) MoO_3-$MoSe_2$-NC and (b) $MoSe_2$-NC anodes for SIBs, respectively.

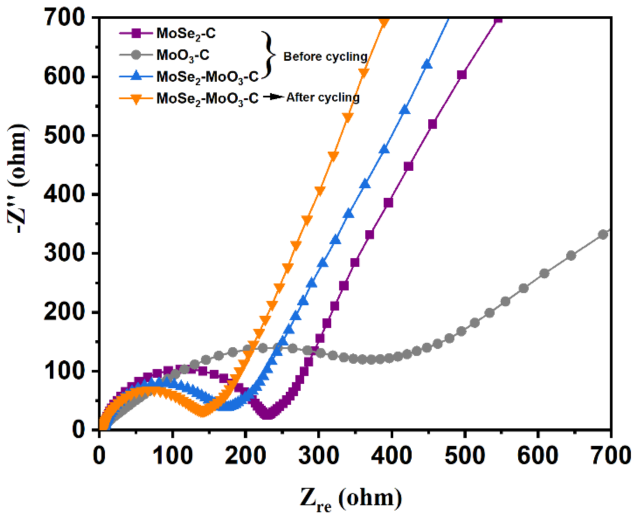

Fig. S11 Nyquist plots of MoO_3-$MoSe_2$-NC, $MoSe_2$-NC, and MoO_3-NC anodes before and after cycling.