Supplementary Materials

A superior lithium-ion capacitor based on ultrafine MnO/dual N-doped carbon anode and porous carbon cathode

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Supplementary Figures and Tables

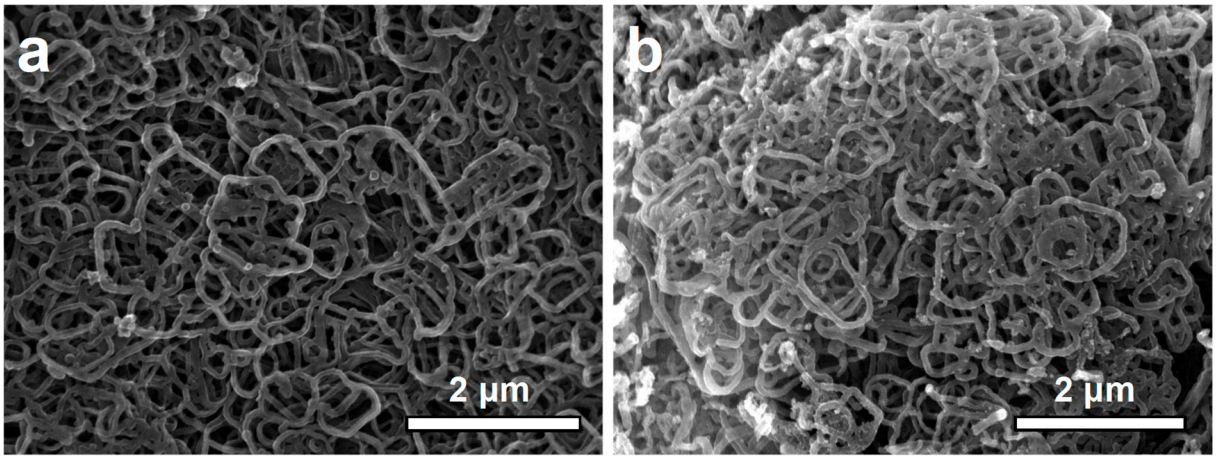

Figure S1. SEM images of (a) PPy and (b) MnO/DNC at different magnification.

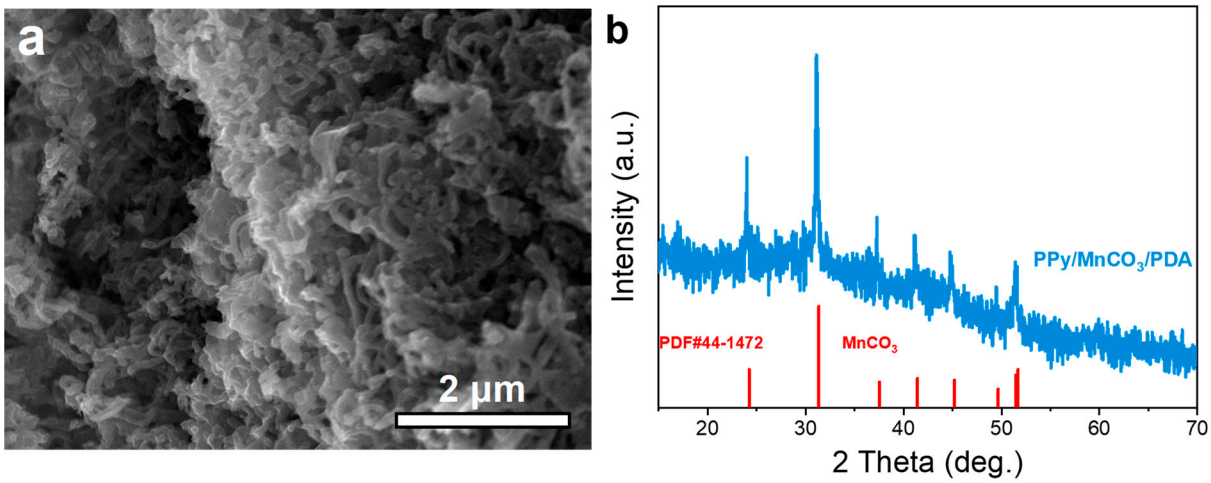

Figure S2. (a) SEM image and (b) XRD pattern of PPy/$MnCO_3$/PDA.

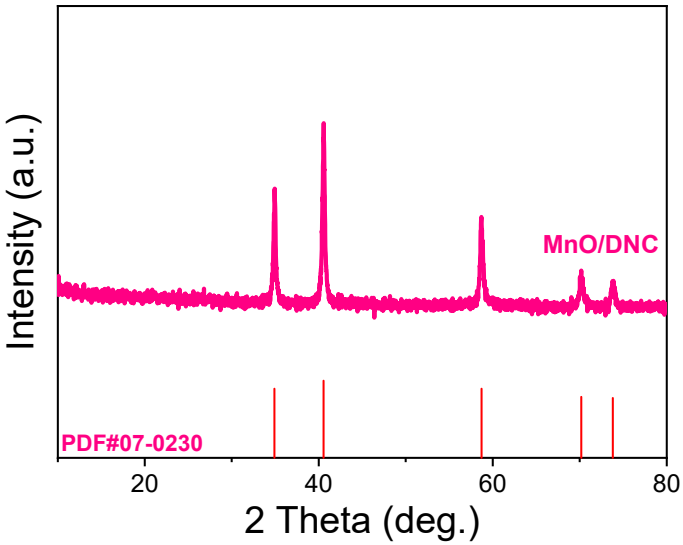

Figure S3. XRD pattern of MnO/DNC.

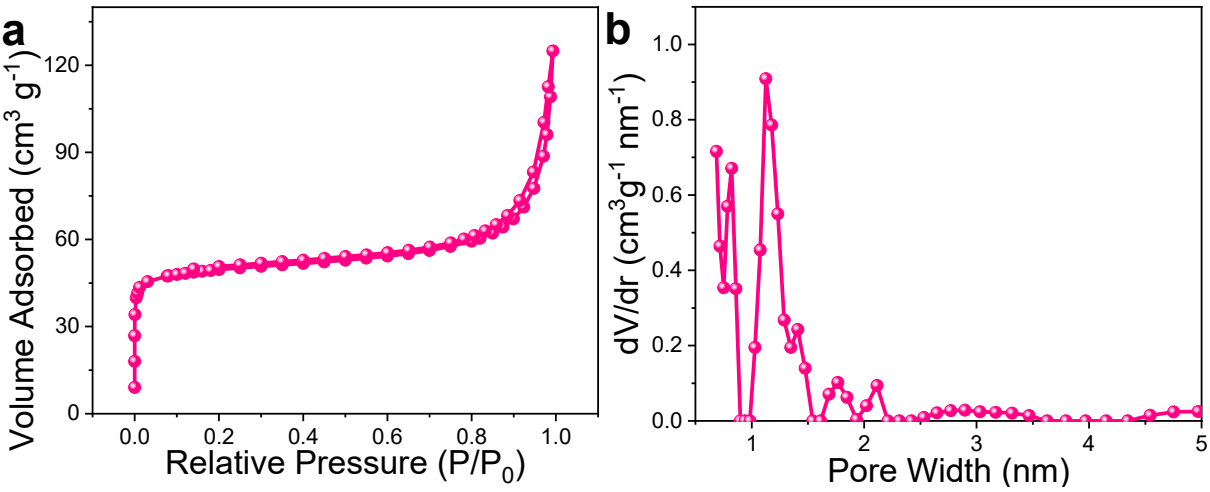

Figure S4. (a) BET curve and (b) the corresponding pore-size distribution of MnO/DNC.

Table S1. The comparison of present work with other reported MnO-based anodes.

Sample	Rate performance	Current density (A g^{-1})	Cycle number	Capacity retention (mAh g^{-1})	Ref.
MnO/DNC	406mAh g^{-1} (@2 A g^{-1}) /179 mAh g^{-1} (@10 A g^{-1})	0.1/2	100/500	682(95%) /393(97%)	**This work**
MnO/C aerogel	601 mAh g^{-1} (@2 A g^{-1})	0.2	140	1177(150%)	[S1]
MnO@C nanoplates	770 mAh g^{-1} (@0.2 A g^{-1})	0.2	30	563(73%)	[S2]
MnO@C microsheres	238 mAh g^{-1} (@0.8 A g^{-1})	0.1	100	525(82%)	[S3]
MnO/NC nanorods	49 mAh g^{-1} (@5 A g^{-1})	1	600	570	[S4]
MnO-Cu-CNT /graphene	432 mAh g^{-1} (@3.2 A g^{-1})	0.1	50	857(110%)	[S5]
Fusiform MnO particles	203 mAh g^{-1} (@2 A g^{-1})	0.1	100	747	[S6]
MnO/C nanowires	315 mAh g^{-1} (@2 A g^{-1})	1	600	480	[S7]
MnO@C nanofibers	328 mAh g^{-1} (@4 A g^{-1})	0.5	200	156%	[S8]

Table S2. Fitted impedance parameters and equivalent circuit.

Sample	R_s (Ω)	R_{ct} (Ω)
NC	0.7	51.2
MnO/DNC	1.9	71.6

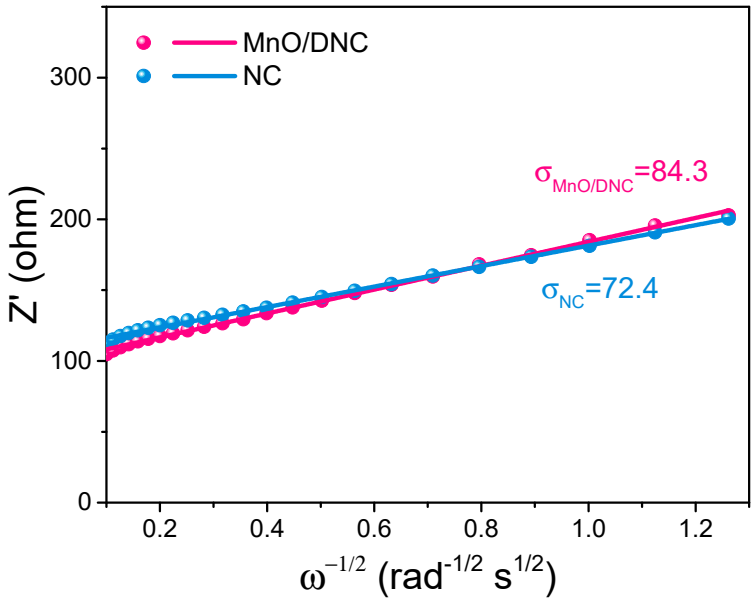

Figure S5. The linear relationship between Z′and the $\omega^{-1/2}$ of NC and MnO/DNC.

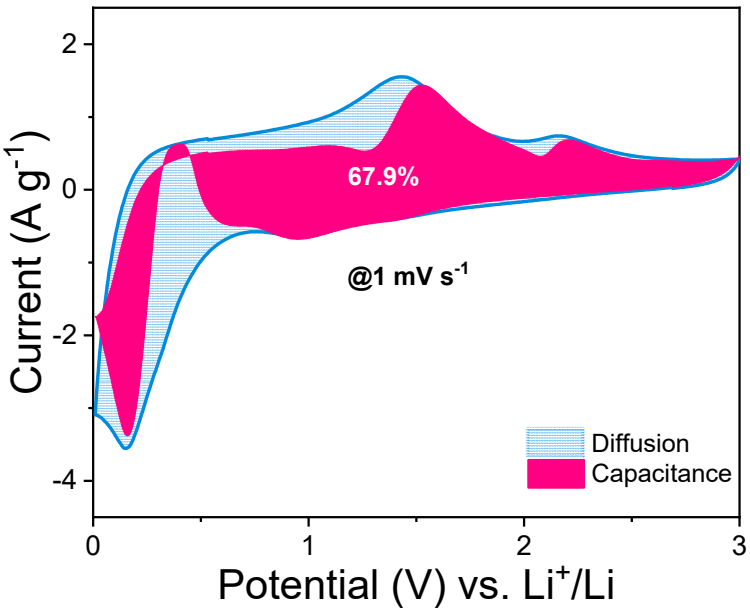

Figure S6. Capacitive contribution (pink region) of the MnO/DNC electrode at 1 mV s^{-1}.

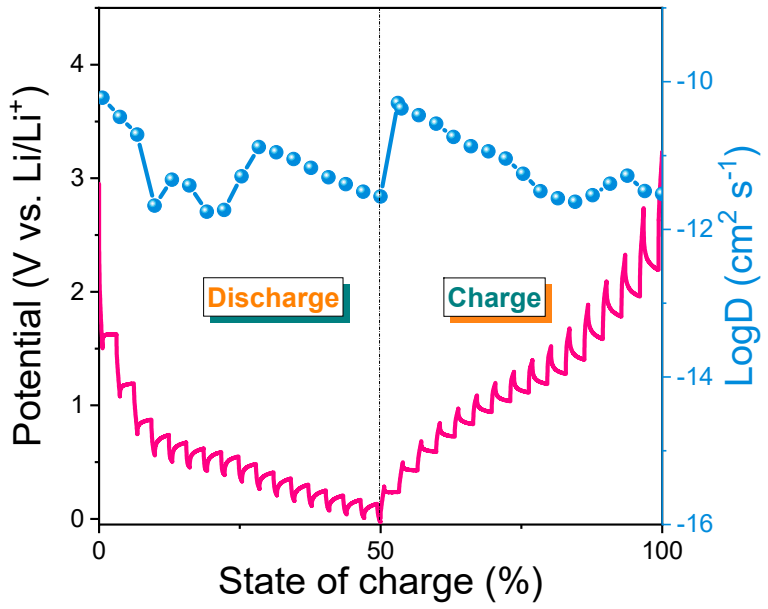

Figure S7. GITT curve and calculated D_{Li^+} of MnO/DNC.

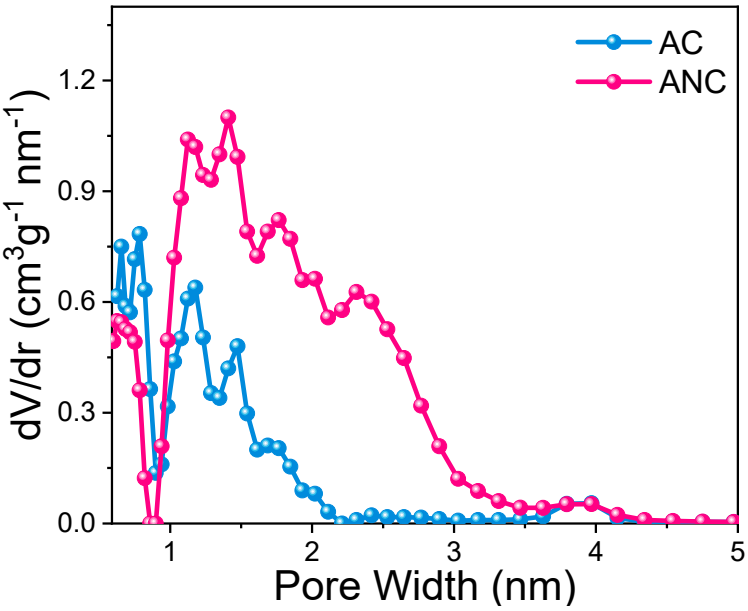

Figure S8. The corresponding pore-size distribution of AC and ANC.

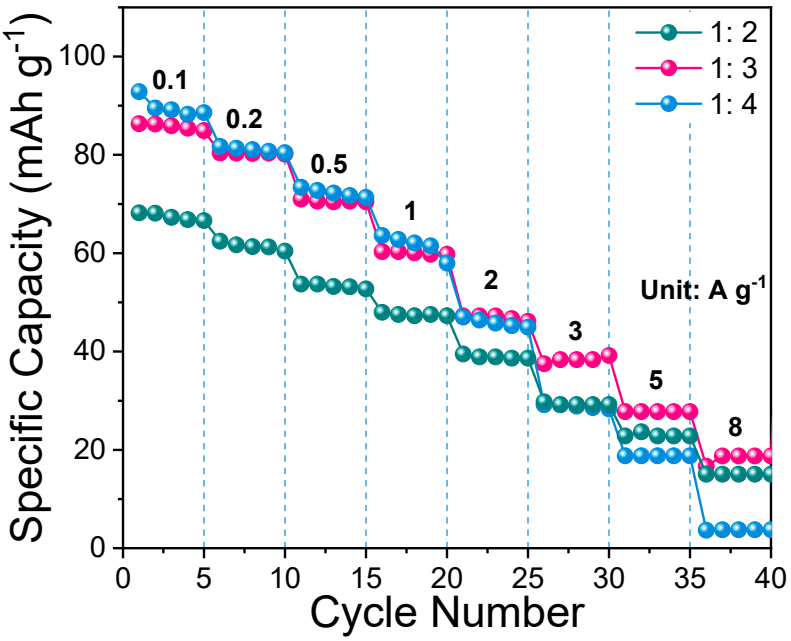

Figure S9. Rate capabilities of MnO/DNC//ANC LICs with different mass ratios

Reference

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