

Electronic Supplementary Material

Porous nitrogen-doped carbon/MnO coaxial nanotubes as an efficient sulfur host for lithium sulfur batteries

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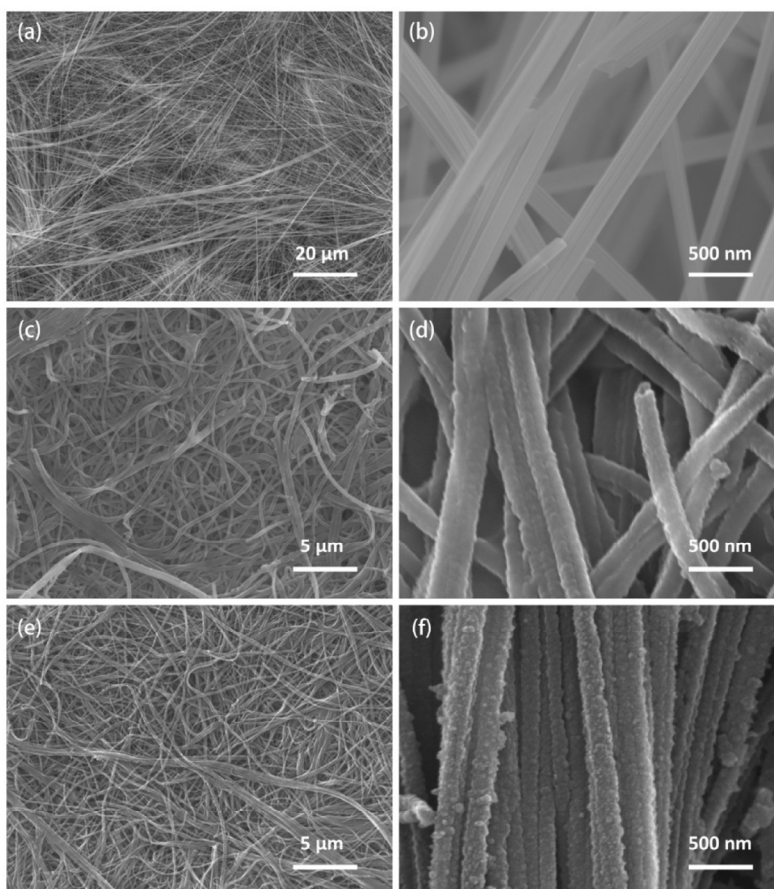


Figure S1 FESEM images of (a-b) MnO₂ nanowires, (c-d) MnO₂@PPy, (e-f) MnO@NC.

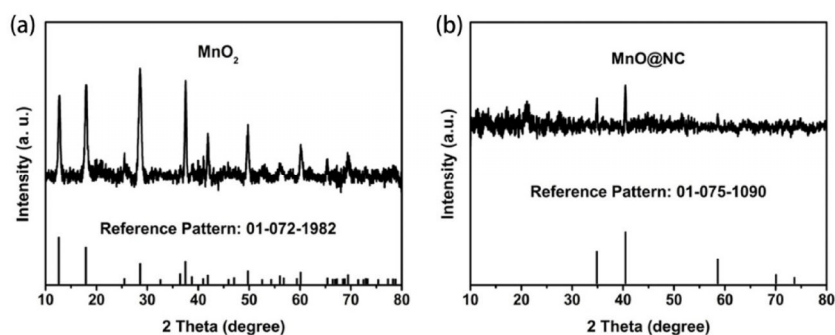


Figure S2 XRD patterns of (a) MnO₂ nanowires, (b) MnO@NC.

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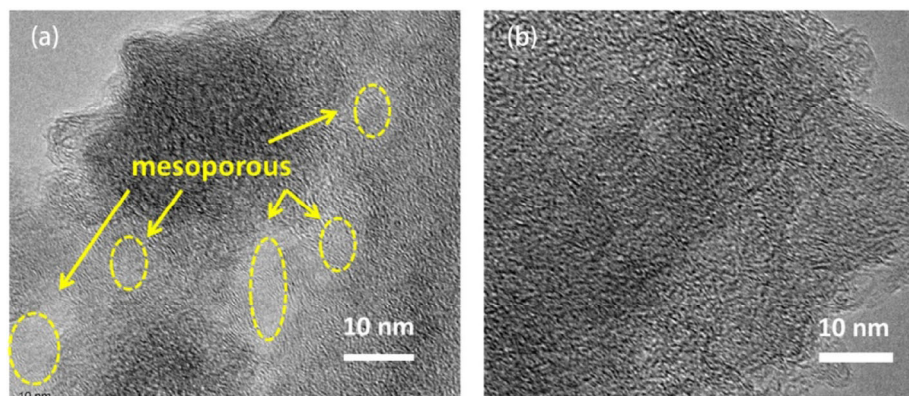


Figure S3 HRTEM images of different areas on the carbon shells of MnO@PNC: (a) mesoporous area, (b) microporous area.

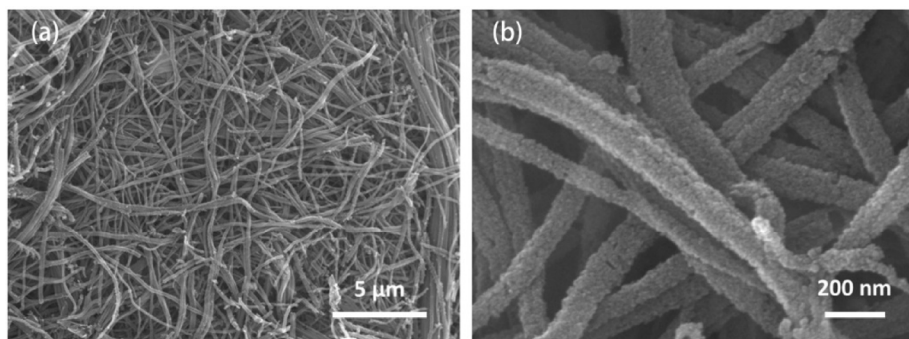


Figure S4 FESEM images of MnO@PNC: (a) low magnification, (b) high magnification.

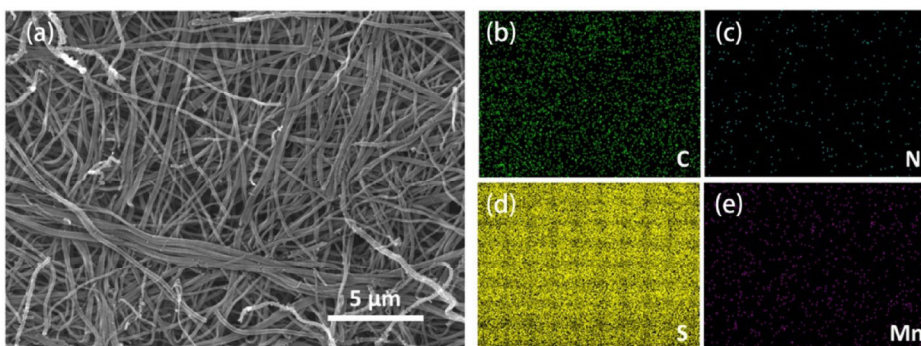


Figure S5 FESEM images of (a) MnO@PNC-S and the corresponding element mappings (b) C element, (c) N element, (d) S element, (e) Mn element.

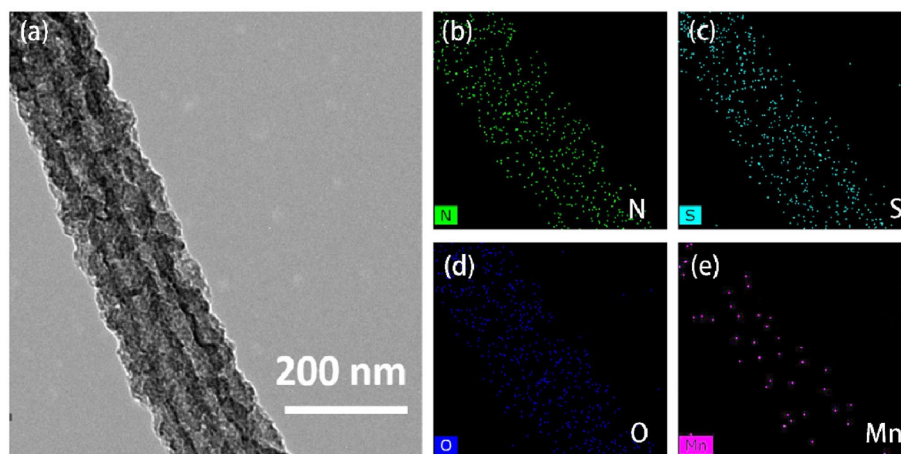


Figure S6 TEM images of (a) MnO@PNC-S and the corresponding element mappings (b) N element, (c) S element, (d) O element, (e) Mn element.

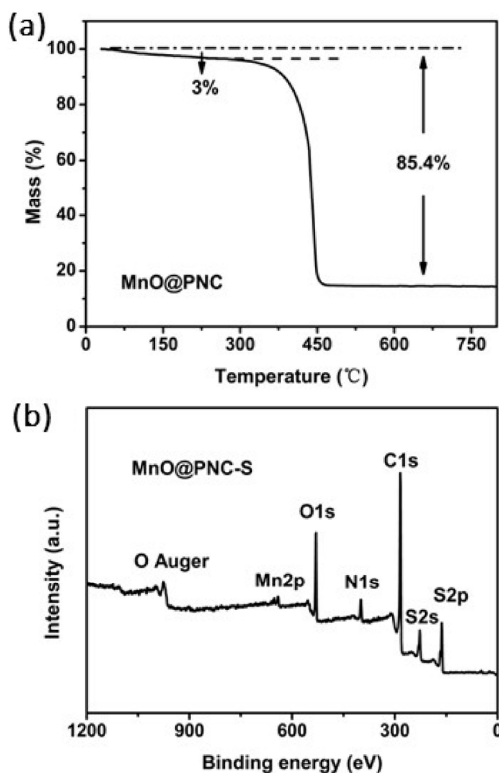


Figure S7 (a) TGA curve of MnO@PNC in Air; (b) the full XPS spectrum of MnO@PNC.

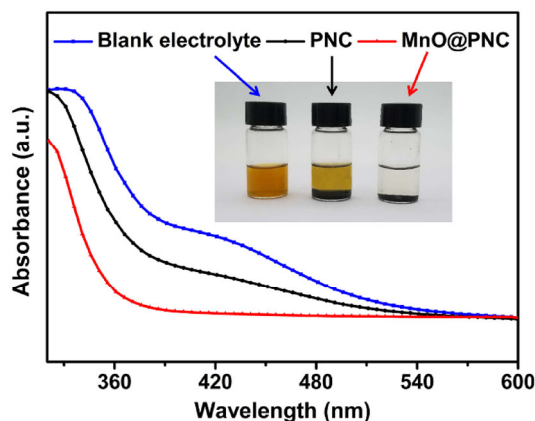


Figure S8 Ultraviolet/visible adsorption spectra of a Li_2S_6 solution before and after the addition of PNC and MnO@PNC. Inset image shows a photograph of a Li_2S_6 solution before and 2.0 h after the addition of PNC and MnO@PNC.

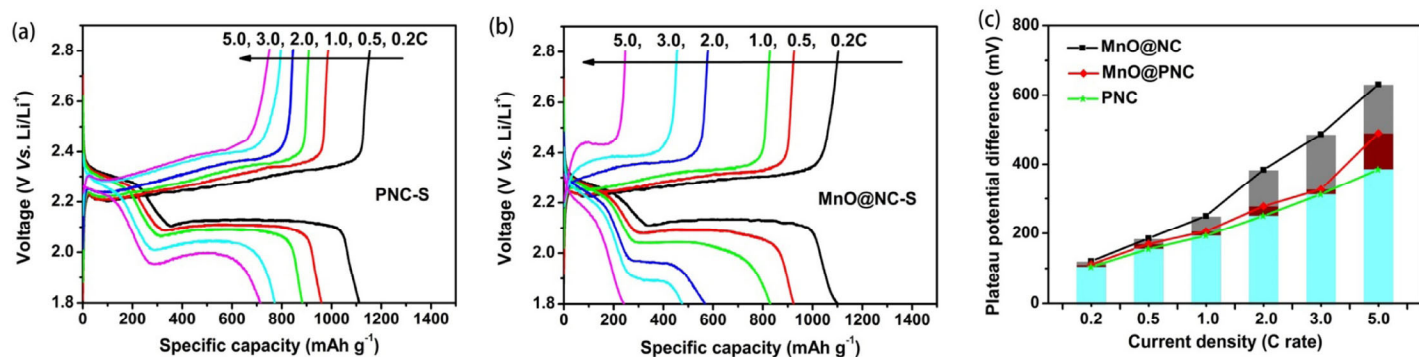


Figure S9 (a-b) Voltage profiles of the cathodes cycled between 1.8 - 2.8 V under increasing C-rates: (a) PNC-S cathode, (b) MnO@NC-S cathode; (c) comparison of the potential difference between the charge and discharge plateaus at different current densities.

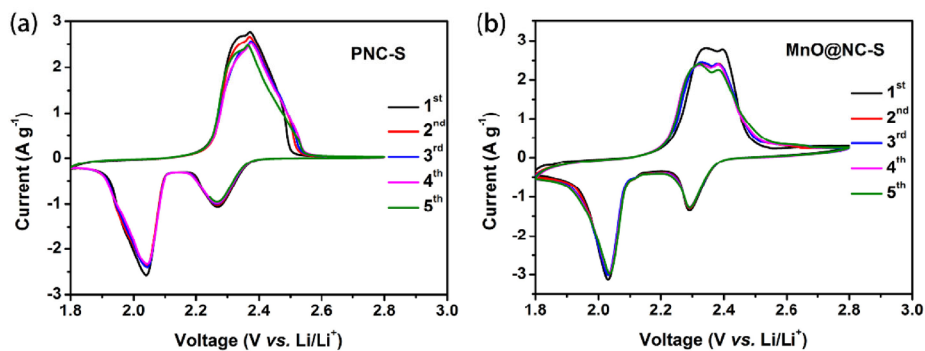


Figure S10 CV curves of the as-prepared cathodes for different cycles: (a) PNC-S cathode, (b) MnO@NC-S cathode.

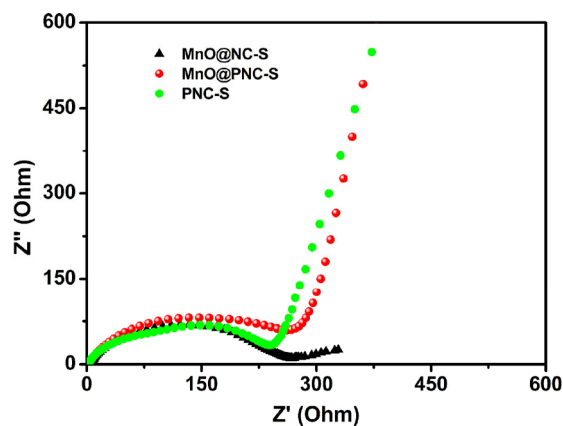


Figure S11 The EIS profiles of MnO@NC-S, MnO@PNC-S and PNC-S cathodes before cycling

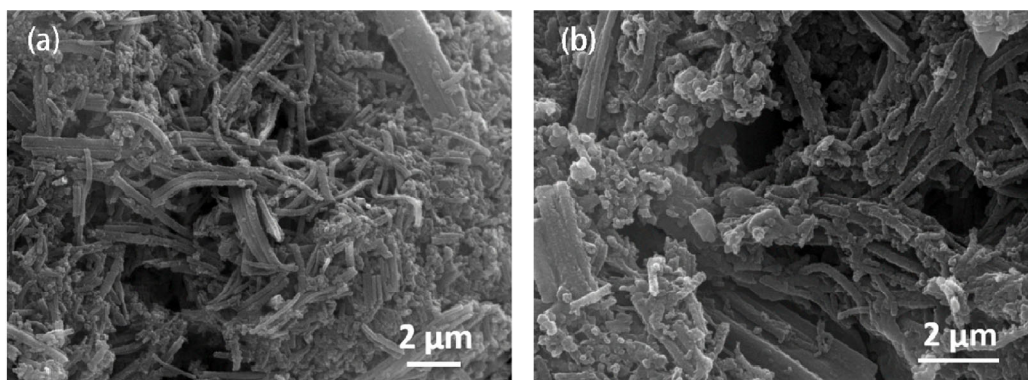


Figure S12 The SEM images of MnO@PNC-S electrode: (a) before, (b) after cycling at 1.0 C for 520 cycles.

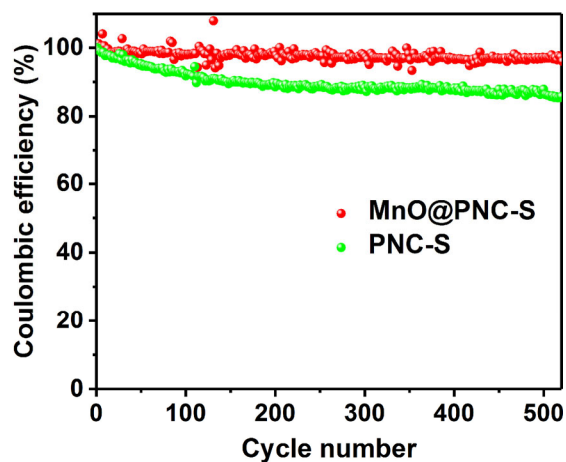


Figure S13 The Coulombic efficiency of MnO@PNC-S and PNC-S at 1.0 C for 520 cycles.

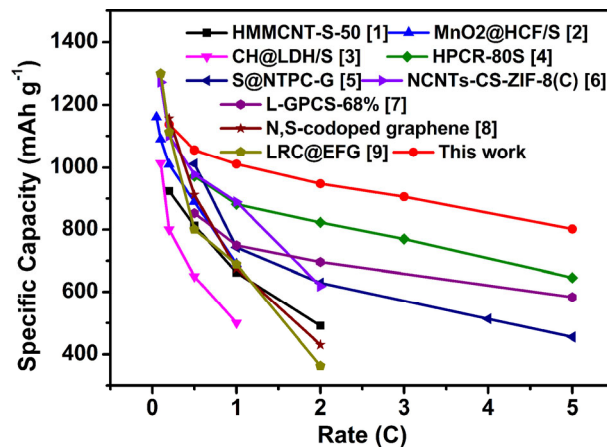


Figure S14 Comparison of rate capabilities between different sulfur cathodes taken from the latest literatures.

Table S1 Comparison of the cyclic performance for different sulfur cathodes taken from latest literatures.

Material	Initial discharge capacity (mAh·g ⁻¹)	Rate (C)	Cycle numbers	Reversible discharge capacity (mAh·g ⁻¹)	Sulfur content in composite (wt.%)	Areal sulfur loading (mg·cm ⁻²)	Ref.
HMMCNT-S-50	696	1.0 ^a	160	558	50	1.0	1
MnO ₂ @HCF/S	900	0.5	300	662	71	3.5	2
CH@LDH/S	747	0.5	100	491	75	3.0	3
HPCR-80S	972	1.0	300	700	78.9	1.5	4
S@NTPC-G	799	1.0	150	511	62	0.4	5
NCNTs-CS-ZIF-8 (C)	889	1.0	700	564	70	1.5	6
N, S-codoped graphene sponge	1200	0.2	500	550	N.A	4.6	7
L-GPCS-68%	885	0.5	100	620	68	0.7	8
LRC@EFG	1215	0.2	200	950	72.3	3.6	9
G/SWCNT-S	928	1.0	100	530	60	N.A.	10
S@MPC-DHS	800	1.0	500	540	65	0.9	11
UZ.CNTs - S	1302	0.2	60	707	51	N.A.	12
S/G-DBD	963	0.5	500	619	70	1.6	13
MnO@PNC-S	1015	1.0	520	832	75	3.0	This work

^a1.0 C = 1,673 mAh·g⁻¹.

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