Supporting Information

Construction of electrical "highway" to significantly enhance the redox kinetics of normal hierarchical structured materials of MnO

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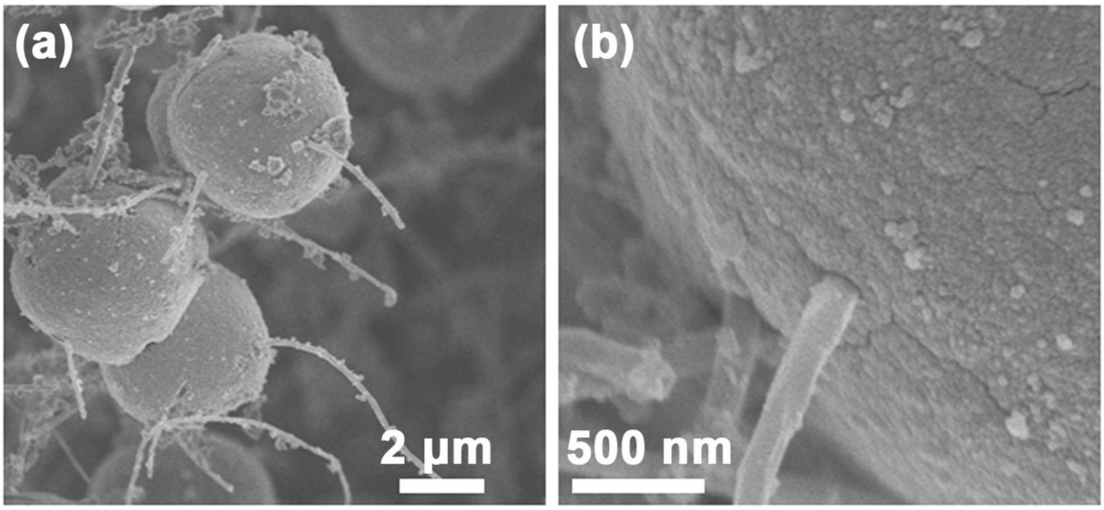


Figure S1. The SEM images of M_xO_y/HCNFs under different magnifications.

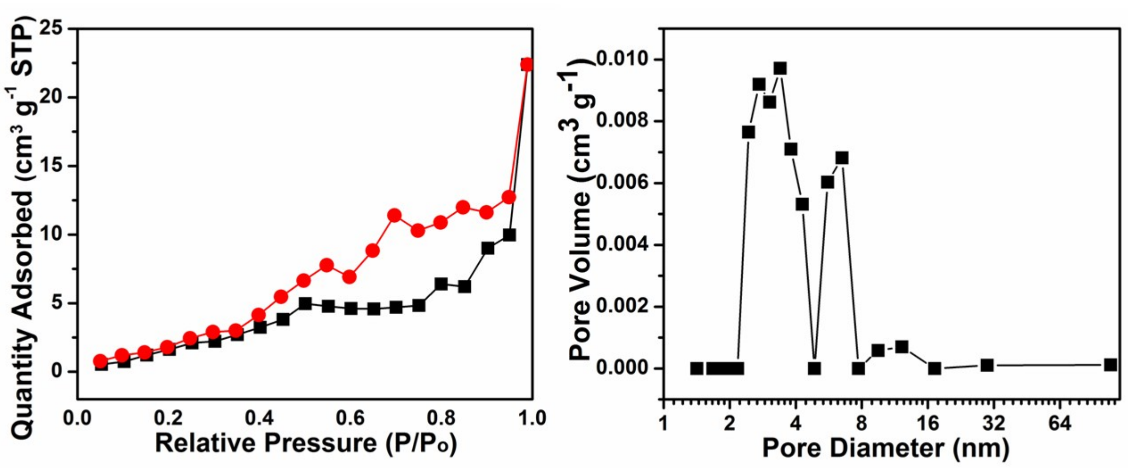


Figure S2. N_2 adsorption–desorption isotherm and its pore size distribution of the prepared MnO/HCNFs.

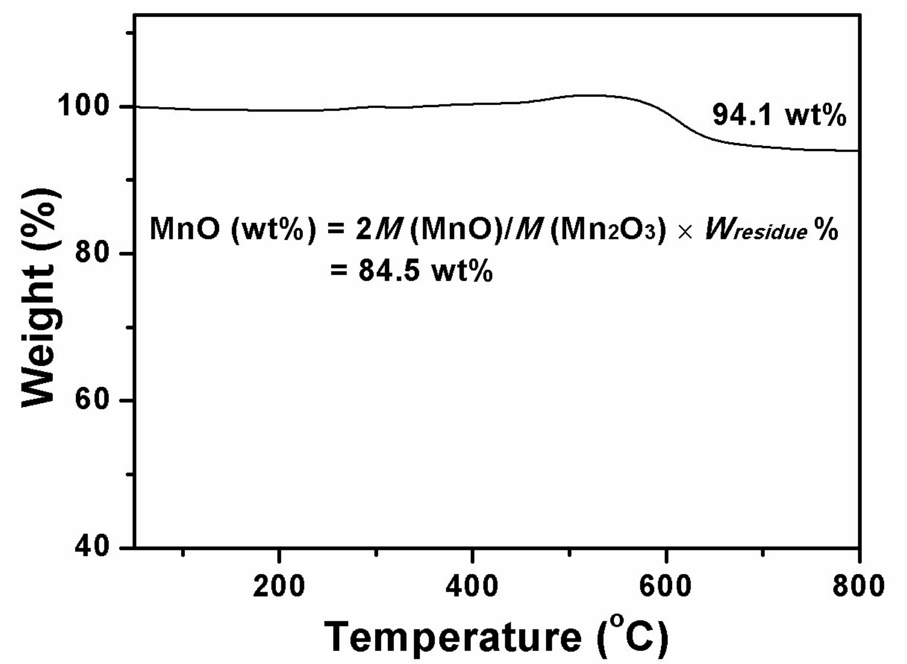


Figure S3. TG curve of the prepared MnO/HCNFs under air atmosphere. According to the analysis, the HCNFs content in the MnO/HCNFs composite is calculated to be 15.5 wt%.

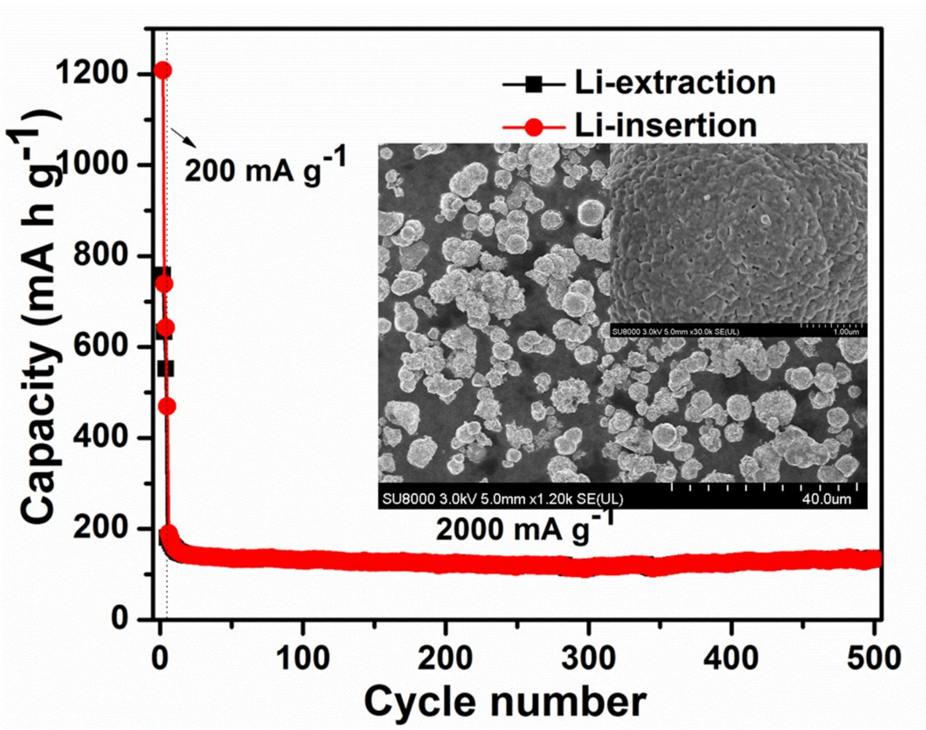


Figure S4. Cycling performance of pristine MnO micro-nanospheres prepared by the same method without adding HCNFs at 2000 mA g^{-1}.

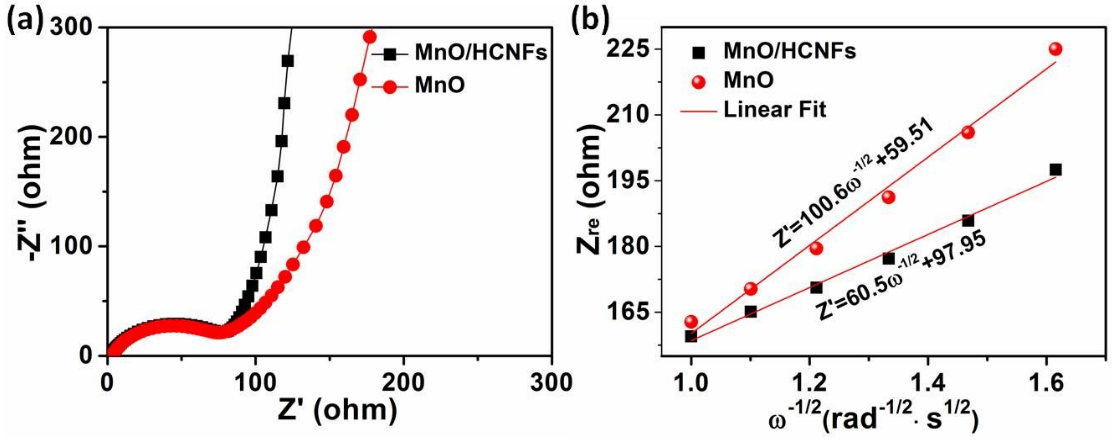
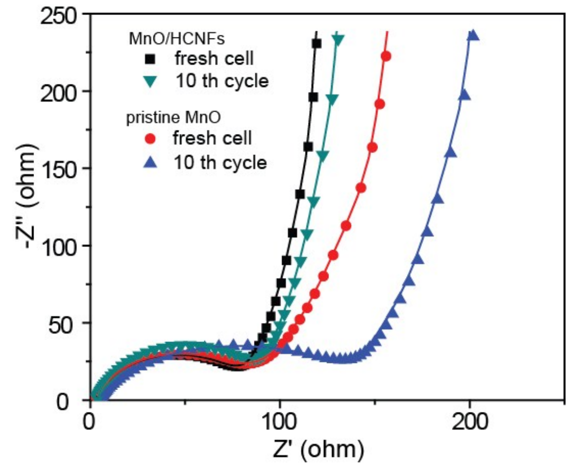
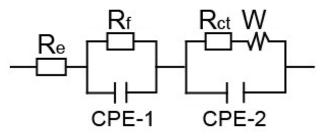


Figure S5. (a) Nyquist plots for the fresh cell of MnO/HCNFs and the MnO control. (b) The corresponding relationship between real resistance and frequencies, the slope of the fitting line can be adopted to calculate the ion diffusion coefficient.





Sample		R_e (Ω)	R_f (Ω)	R_{ct} (Ω)
MnO/HCNFs	fresh	4.05	14.35	70.16
	10 th	4.26	18.57	80.59
pristine MnO	fresh	4.05	20.79	75.48
	10 th	3.98	34.95	116.36

Figure S6. Nyquist plots and fitting results of MnO/HCNFs and pristine MnO electrodes before and after the 10th discharge–charge cycle in the voltage range of 0.005-2.9 V.

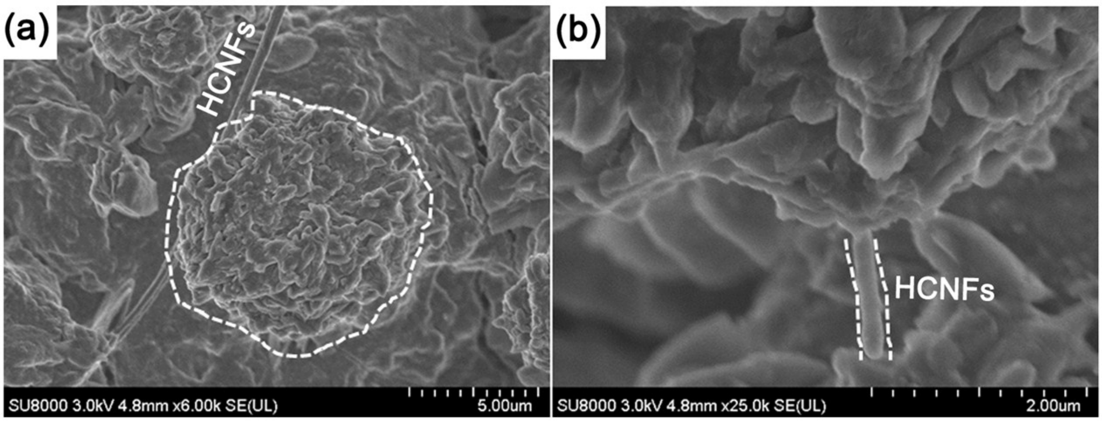


Figure S7. SEM images of the MnO/HCNFs composite after 100 cycles at 200 mA g^{-1} under different magnifications.

Table S1 The comparison of Li-storage performance related to key parameters in the practical application in this work with other state-of-the-art works in the literatures.

Materials	Reversible capacity (mAh g^{-1})	Current density (mA g^{-1})	Cycle number	Ref.
MnO/HCNFs	1093.4 987.6	200 2000	300 800	This work
$Cu_{3.8}Ni$/MnO nanoparticles	460	1600	200	1
MnO@C nanowire	970	100	100	2
	~750	1000	200	
Porous MnO/C-N	513	300	400	3
RGO–MnO–RGO Sandwich Nanostructure	1155.7	1000	200	4
	1269.2	2000	500	
MnO/Carbon Nanopeapods	1119	500	200	5
	525	2000	1000	
MnO nanowire/graphene composite	930	500	500	6
GNs/MnO nanowires	815.3	100	200	7
MnO nanoparticle/carbon nanofiber	655	500	280	8
Carbon-coated MnO microparticulate	~500	100	100	9

References

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