Electronic Supplementary Material (ESI) for RSC Advances.

Electronic Supplementary Information

$NiO@MnO_2$ Core-Shell Composite Microtube Arrays for High-Performance Lithium Ion Batteries

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Supplementary Figures

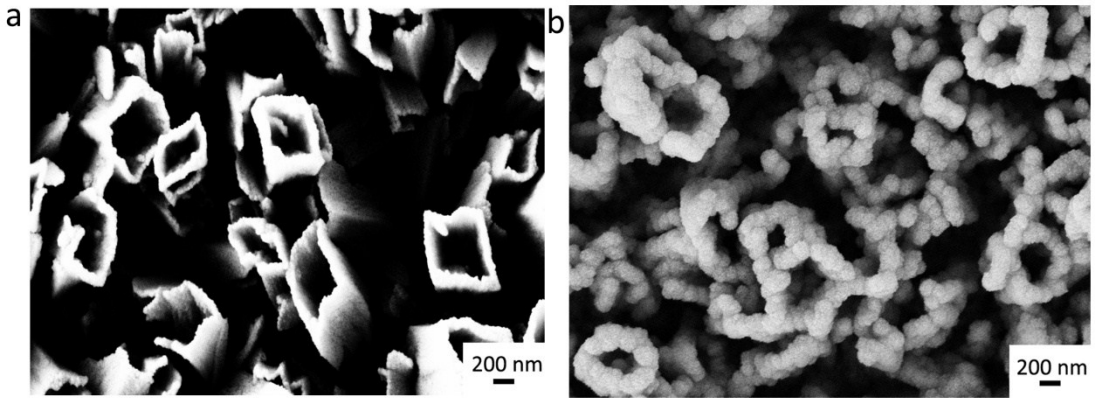

Figure S1 SEM images of the NiO@MnO_2 microtube array films obtained by different electrodeposition times for MnO_2. (a) 10 s, (b) 90 s.

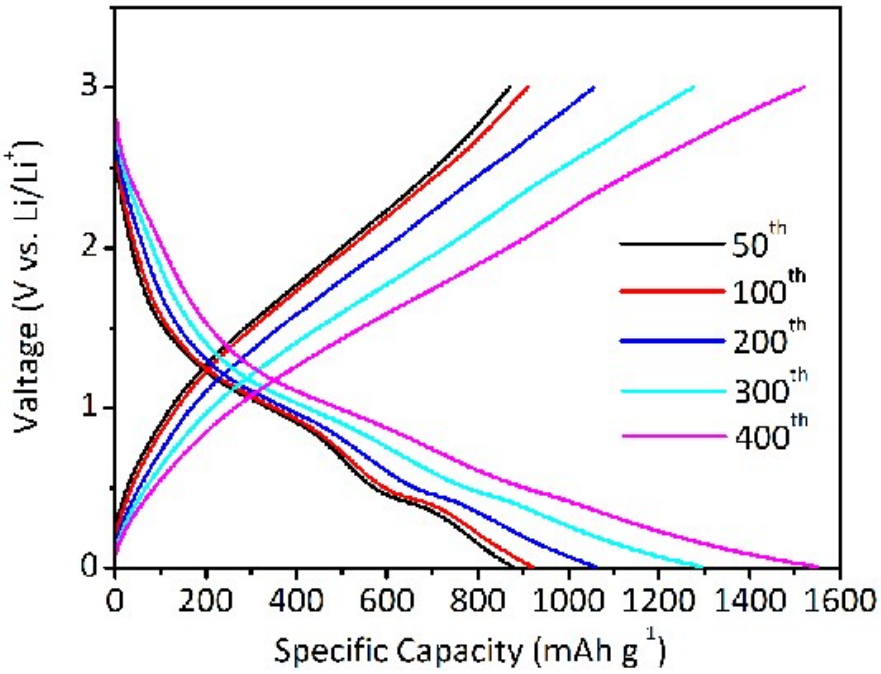

Figure S2 Selected galvanostatic charge-discharge profiles of the NiO@MnO_2 core-shell composite microtube array electrode at a current density of 0.53 A g^{-1}.

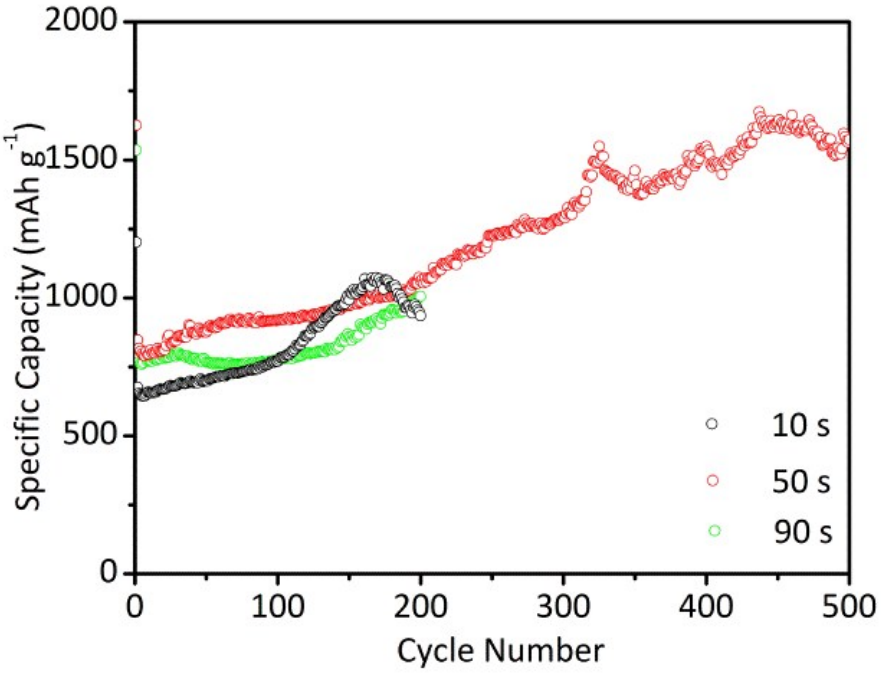

Figure S3 Cycle performances at a current density of 0.53 A g^{-1} of the NiO@MnO_2 microtube array film electrodes obtained by different electrodeposition times for MnO_2.

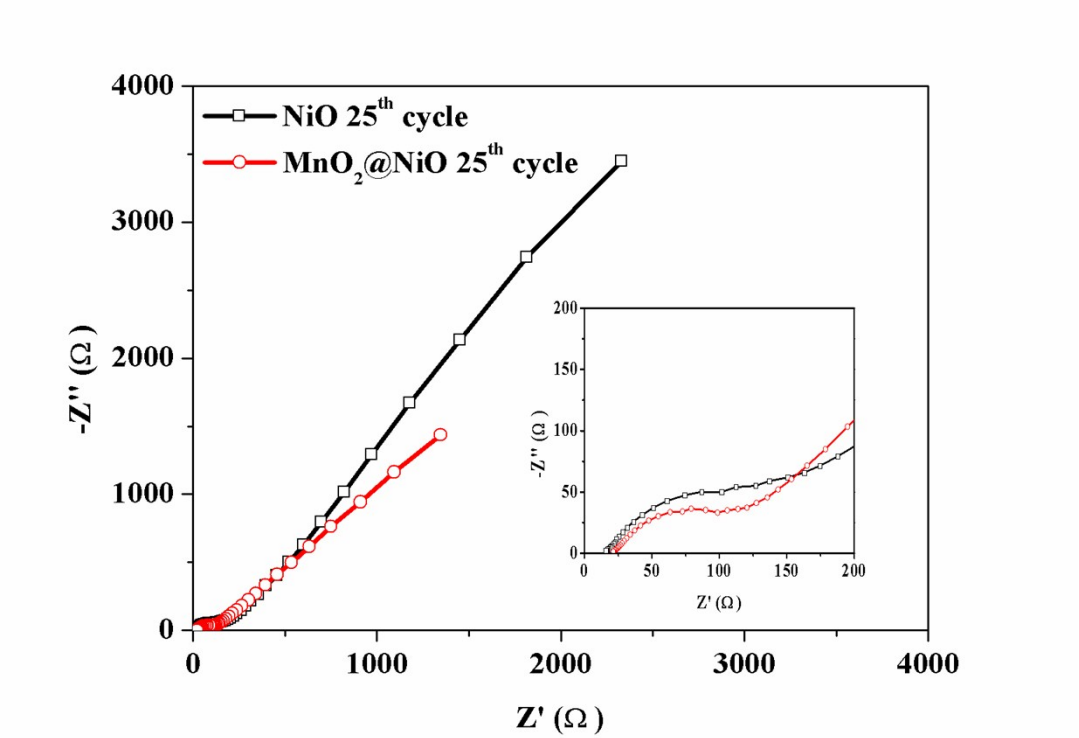

Figure S4 Nyquist plots of the NiO and NiO@MnO_2 microtube array electrodes at open circuit state after 25 cycles at a current density of 0.53 A g^{-1}. The inset is the magnified Nyquist plots in the high frequency region.

Supplementary Table

Table S1 A rough lithium storage performance comparison of the NiO@MnO_2 composite in this work and other binary transition metal oxides in the recently reported references

Material	Capacity / rate	Cycle performance Final capacity / cycle number / rate
NiO@MnO_2 microtube arrays (this work)	850 mAh g^{-1} / 0.38 A g^{-1} 610 mAh g^{-1} / 3.9 A g^{-1} 510 mAh g^{-1} / 5.1 A g^{-1}	1573 mAh g^{-1} / 500 / 0.53 A g^{-1}
MnO_2@NiO nanorods[1]	420 mAh g^{-1} / 4.0 A g^{-1}	939 mAh g^{-1} / 200 /1.0 A g^{-1}
NiO@MnO_2 nanosheets arrays[2]	1115 mAh g^{-1} / 0.5 C 950 mAh g^{-1} / 2.0 C	1000 mAh g^{-1} / 160 / 0.2 A g^{-1}
$Ni(OH)_2$@MnO_2 caterpillar arrays[3]	940 mAh g^{-1} / 1.0 A g^{-1}	1210 mAh g^{-1} / 80 / 0.2 A g^{-1}
Co_3O_4@MnO_2 nanoconch arrays[4]	553 mAh g^{-1} / 0.48 A g^{-1}, 387 mAh g^{-1} / 0.96A g^{-1}	750 mAh g^{-1} / 100 / 0.12 A g^{-1}

References

1. N. Wang, Y. Zhai, X. Ma and Y. T. Qian, *RSC Adv.*, 2015, **5**, 61148-61154.
2. X. Shang, X. Li, H. Yue, S. Xue, Z. Liu, X. Hou and D. He, *Mater. Lett.*, 2015, 157, 7-10.
3. T. Wu and K. Liang, *RSC Adv.*, 2016, **6**, 15541-15548.
4. K. Qiu, H. Yan, De. Zhang, Y. Lu, J. Cheng, M. Lu, C. Wang, Y. Zhang, X. Liu and Y. Luo, *J. Solid State Electrochem.*, 2015, **19**, 391-401.