Electronic Supplementary Material (ESI) for Dalton Transactions.

Supporting Information

Heterojunction structured $MnCO_3$@NiO composites and their enhanced electrochemical performance

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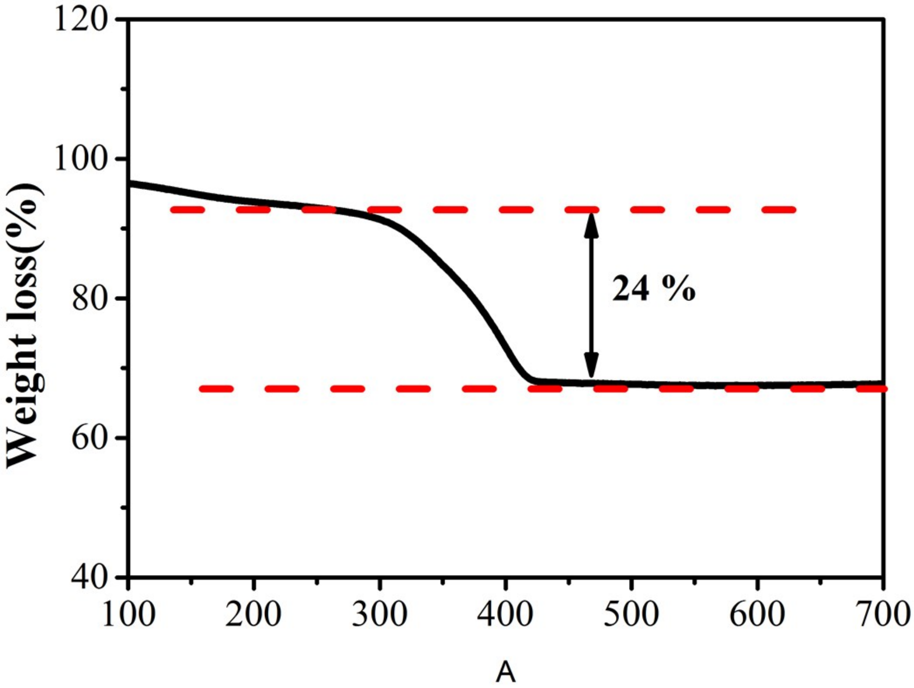

Fig. S1. TG image of $MnCO_3$@NiO.

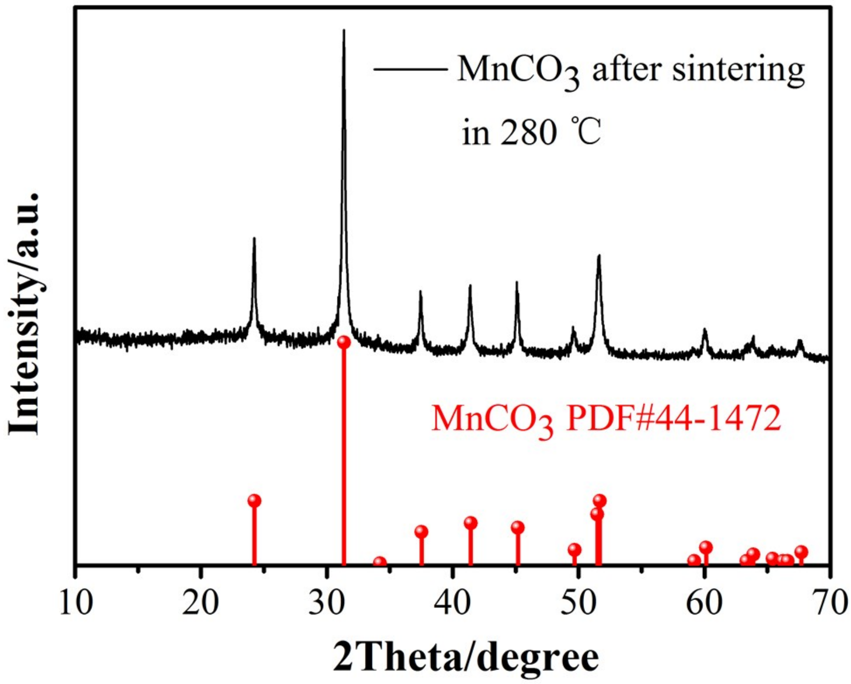

Fig. S2. XRD patterns of pristine $MnCO_3$ after sintering in 280 ℃ for 3 h.

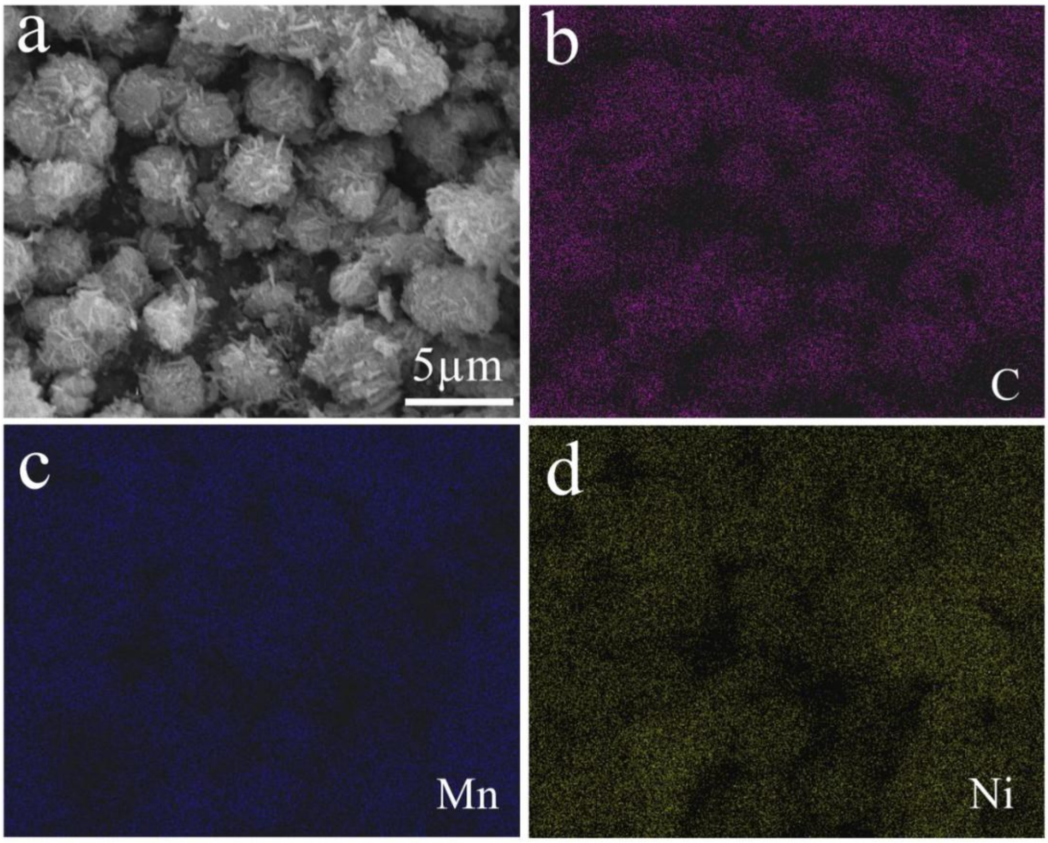

Fig. S3. (a) SEM image of $MnCO_3$@NiO, (b),(c),(d) respectively represented C, Mn, Ni element, derived from (a).

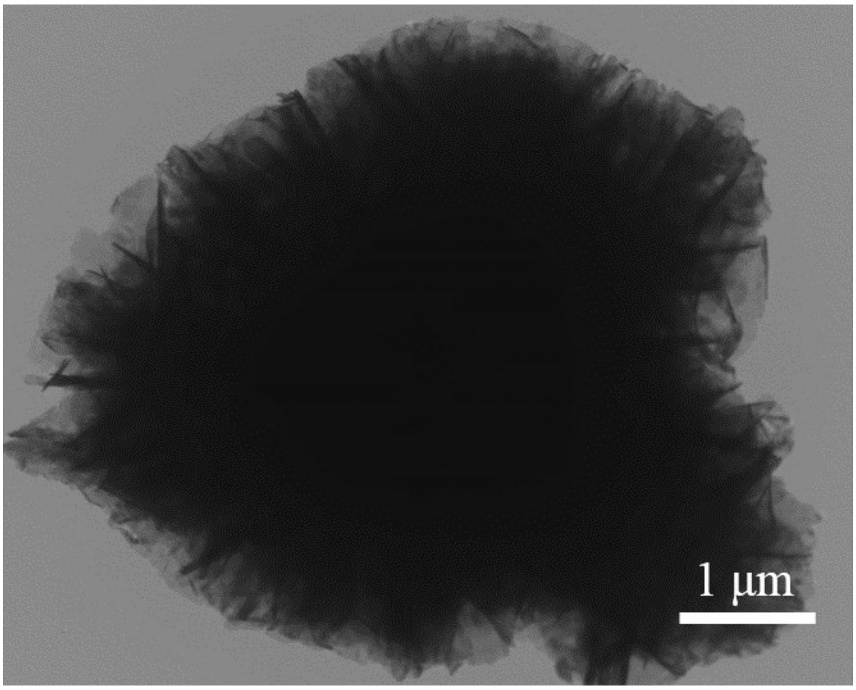

Fig. S4. TEM image of $MnCO_3$@NiO.

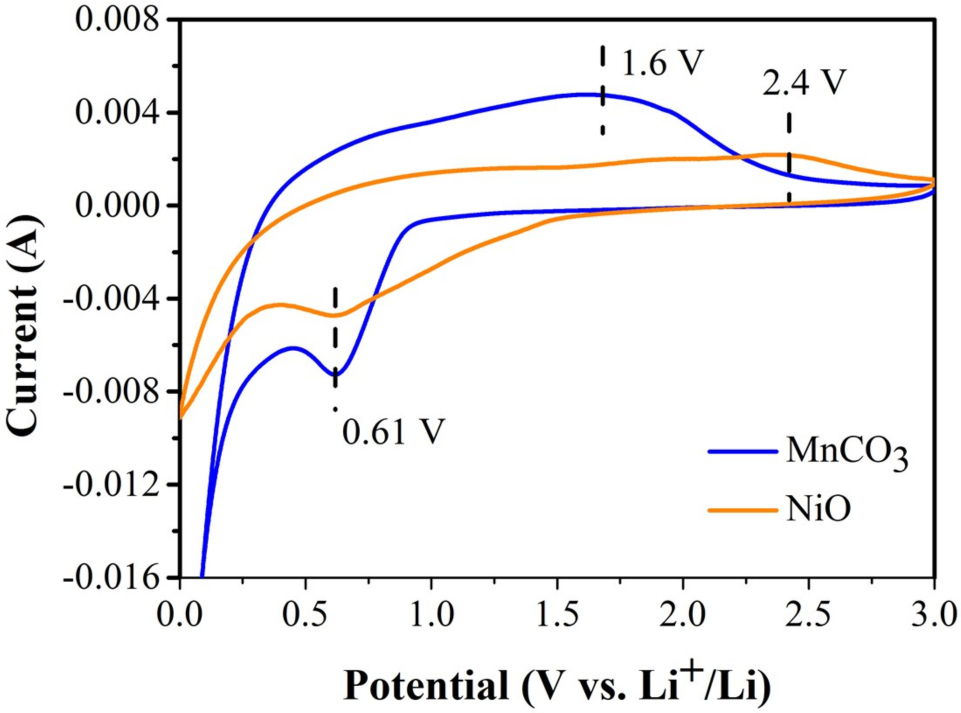

Fig. S5. The CV curves at the scanning rate of 0.01 mV s^{-1} of $MnCO_3$ and NiO, respectively.

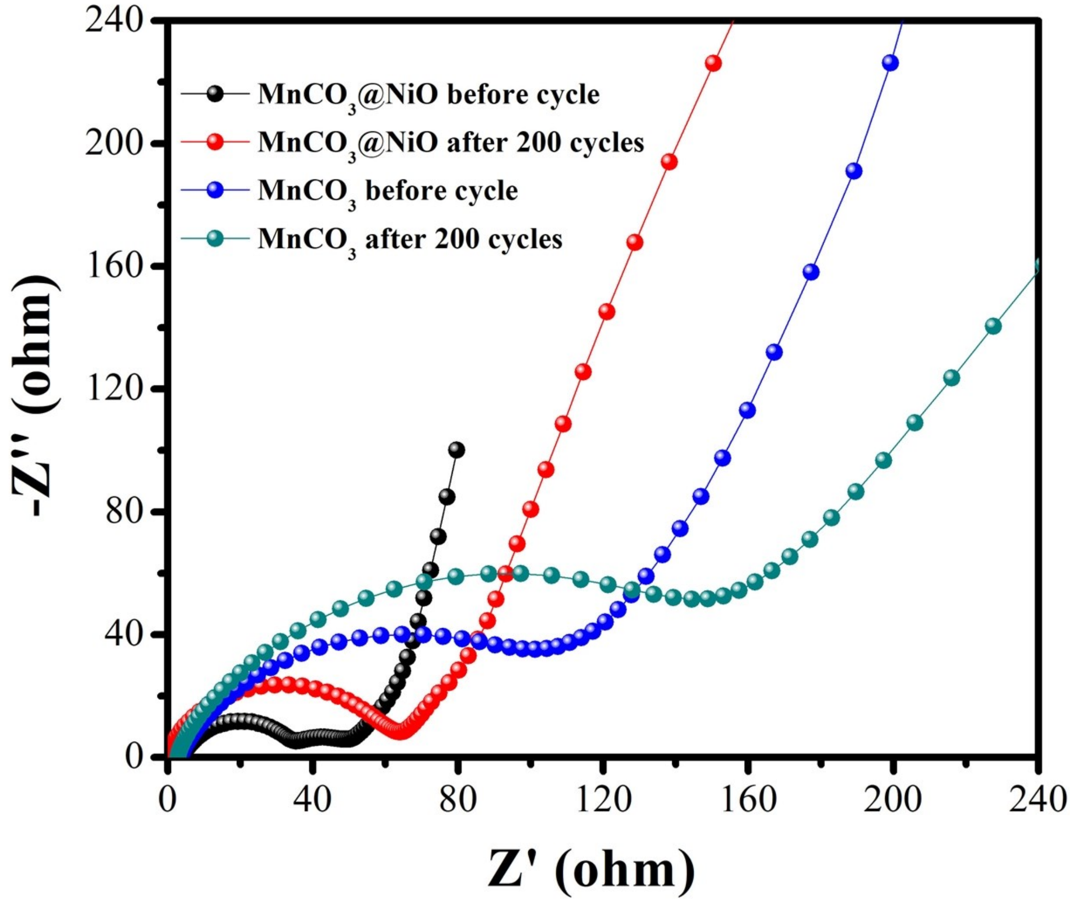

Fig. S6. Nyquist plots of the AC impedance spectra for $MnCO_3$ and $MnCO_3$@NiO.

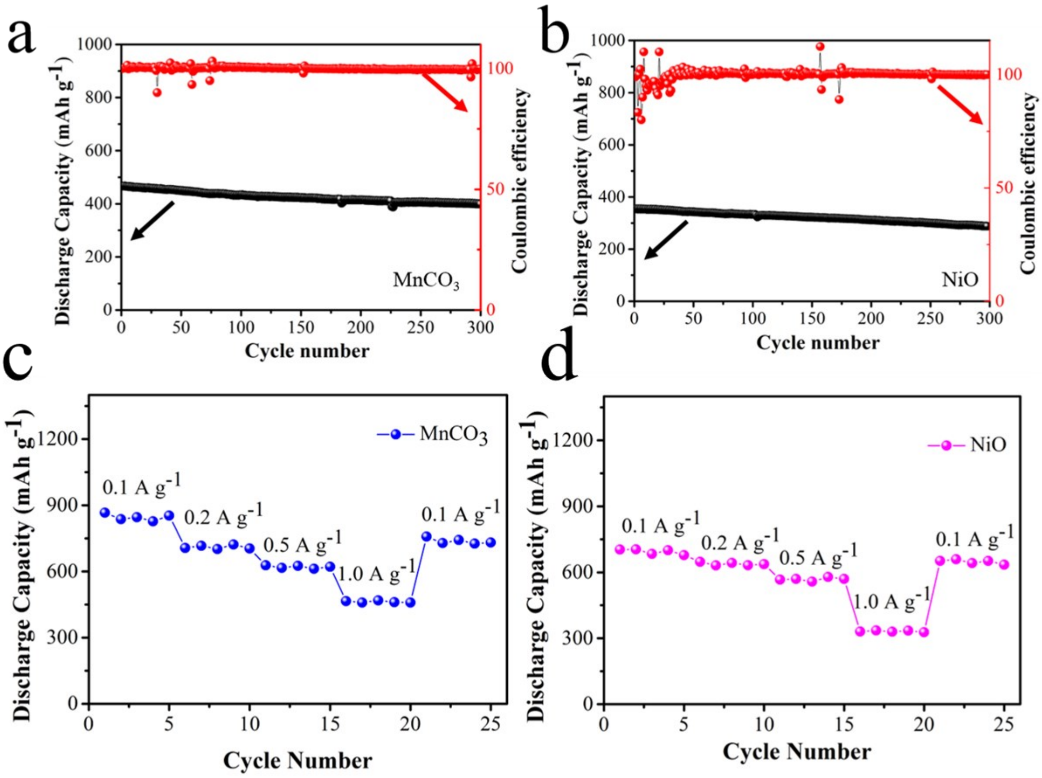

Fig. S7. The discharge capacity and the coulombic efficiency of the (a) $MnCO_3$ and (b) NiO at 1.0 A g^{-1}. The rate performance of (c) $MnCO_3$ and (d) NiO.

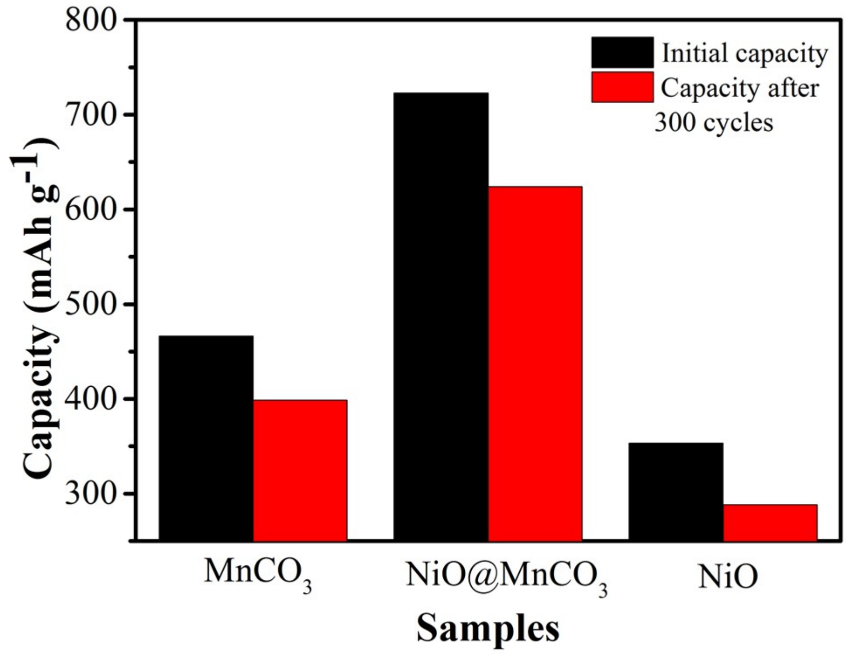

Fig. S8. The capacities of three samples in this work at 1.0 A g^{-1} rate.

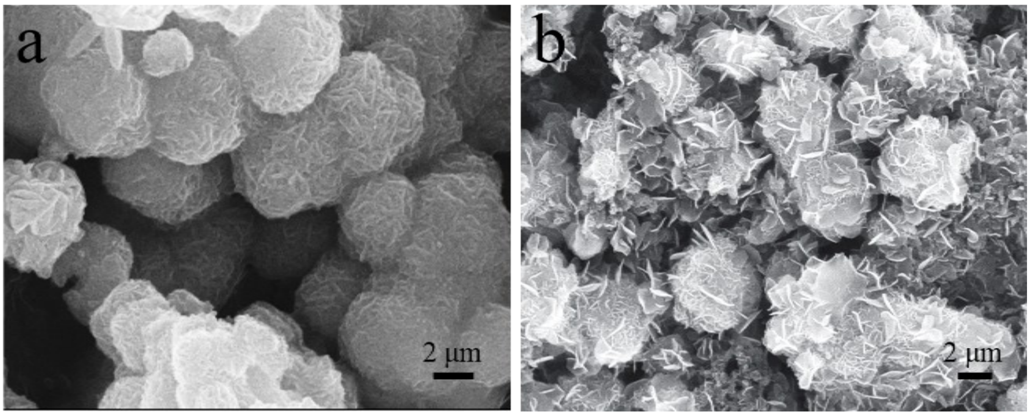

Fig.S9. FESEM images of $MnCO_3$@NiO in an electrode (a) before cycling and (b) after cycling at 1.0 A g^{-1} over 300 cycles.

Tab. S1 The EDX results of the C,Mn and Ni element of the obtained $MnCO_3$@NiO.

Element	***Wt%***	***At%***
CK	10.52	36.62
MnK	48.29	36.66
NiK	41.19	12.54
Matrix	Correction	ZAF

Tab. S2 Compare the obtained $MnCO_3$@NiO with the reported $MnCO_3$ and NiO as the anode for LIBs.

Composites	Current density (C/mA g^{-1})	Cycle number	Specific capacity (mAh g^{-1})	Ref.
$MnCO_3$ flower	0.2 C	200	384	1
$MnCO_3$ spheres	100 mA g^{-1}	100	656	2
$MnCO_3$ microdumbbells	0.5 C	100	775	3
NiO nano octahedron	359 mA g^{-1}	200	793	4
NiO nanofiber	80 mA g^{-1}	100	784	5
NiO nanowall array	500 mA g^{-1}	50	564	6
NiO nanowalls	0.1 C	50	844	7
NiO nanorods	100 mA g^{-1}	60	700	8
NiO nanoflowers	0.1 C	50	552	9
NiO nanospheres	100 mA g^{-1}	60	518	10
$MnCO_3$@NiO	100 mA g^{-1}	300	900	Our work

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