Supporting Information

Interfacial Superassembly of Grape-like MnO-Ni@C Frameworks for Superior Lithium Storage

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Contents

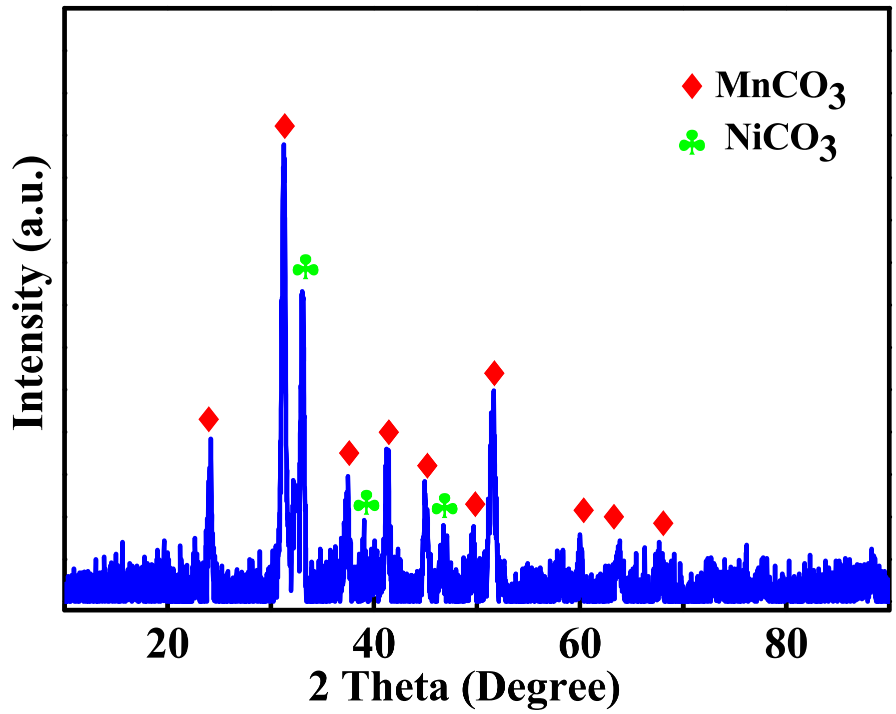

Figure S1. XRD pattern of MCO_3.

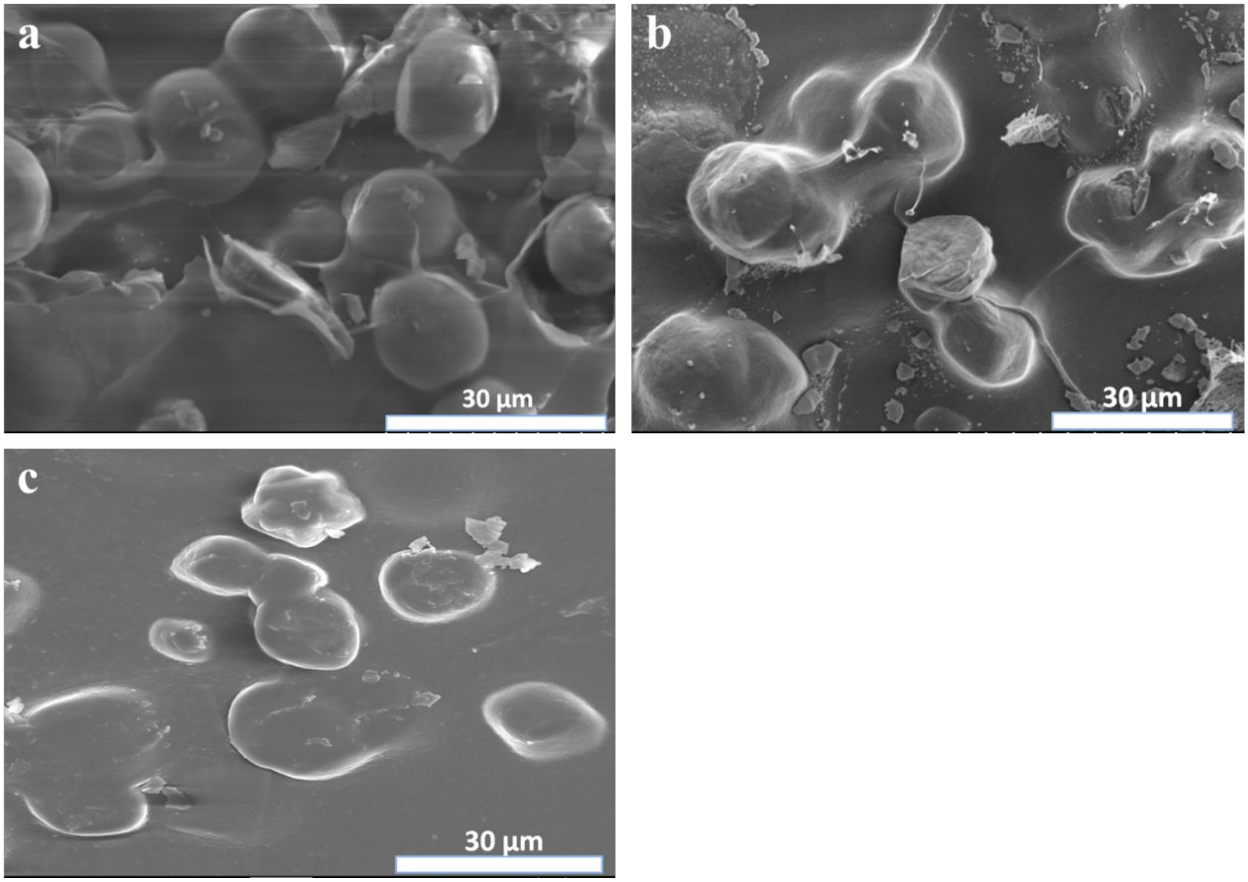

Figure S2. SEM images of MCO_3/ager gel matrix precursor: 5% (a); 10% (b) and 15% Ni (c).

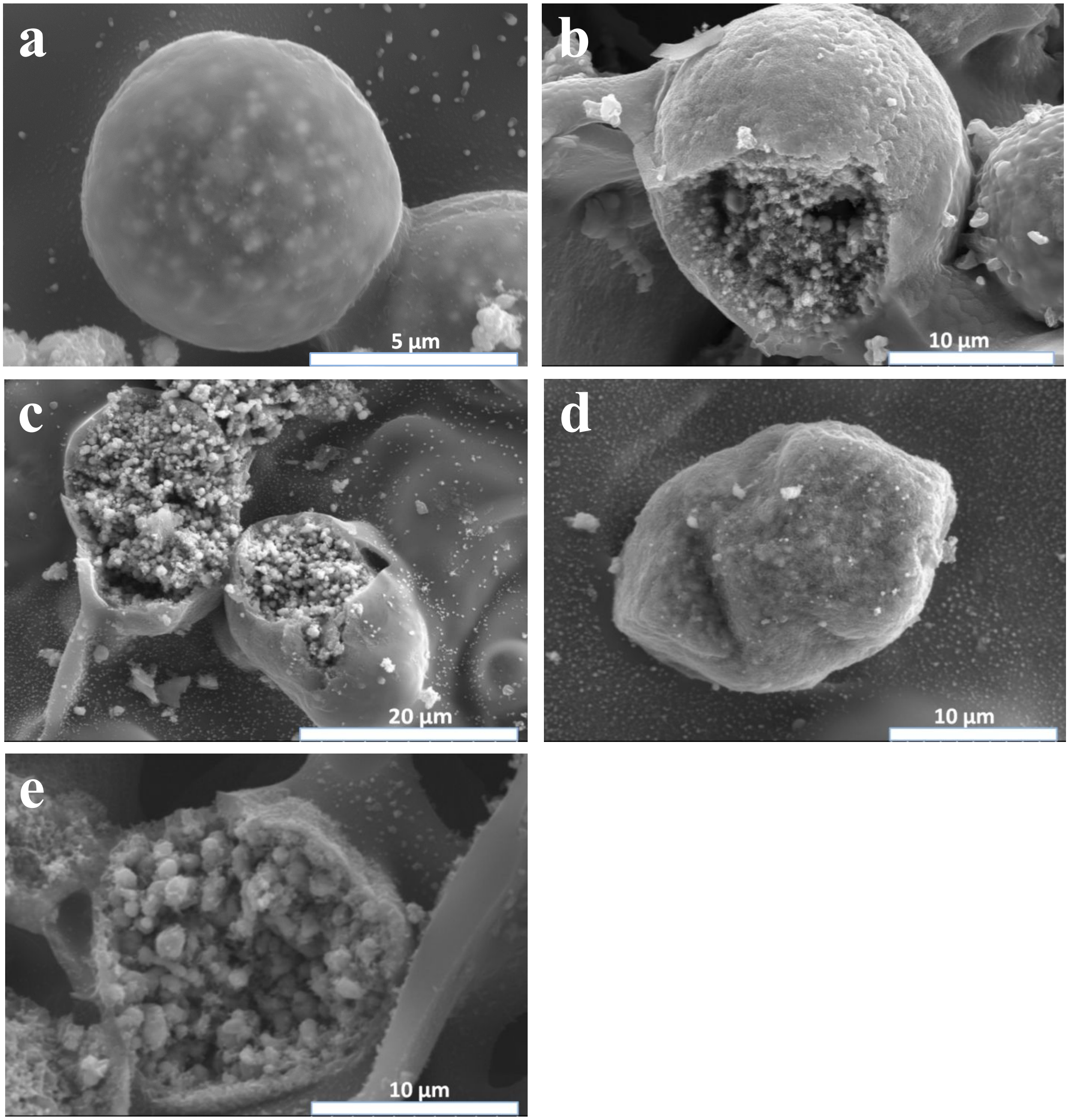

Figure S3. SEM images of MnO-Ni5@C (a, b), MnO-Ni10 (c) and MnO-Ni15@C (d, e).

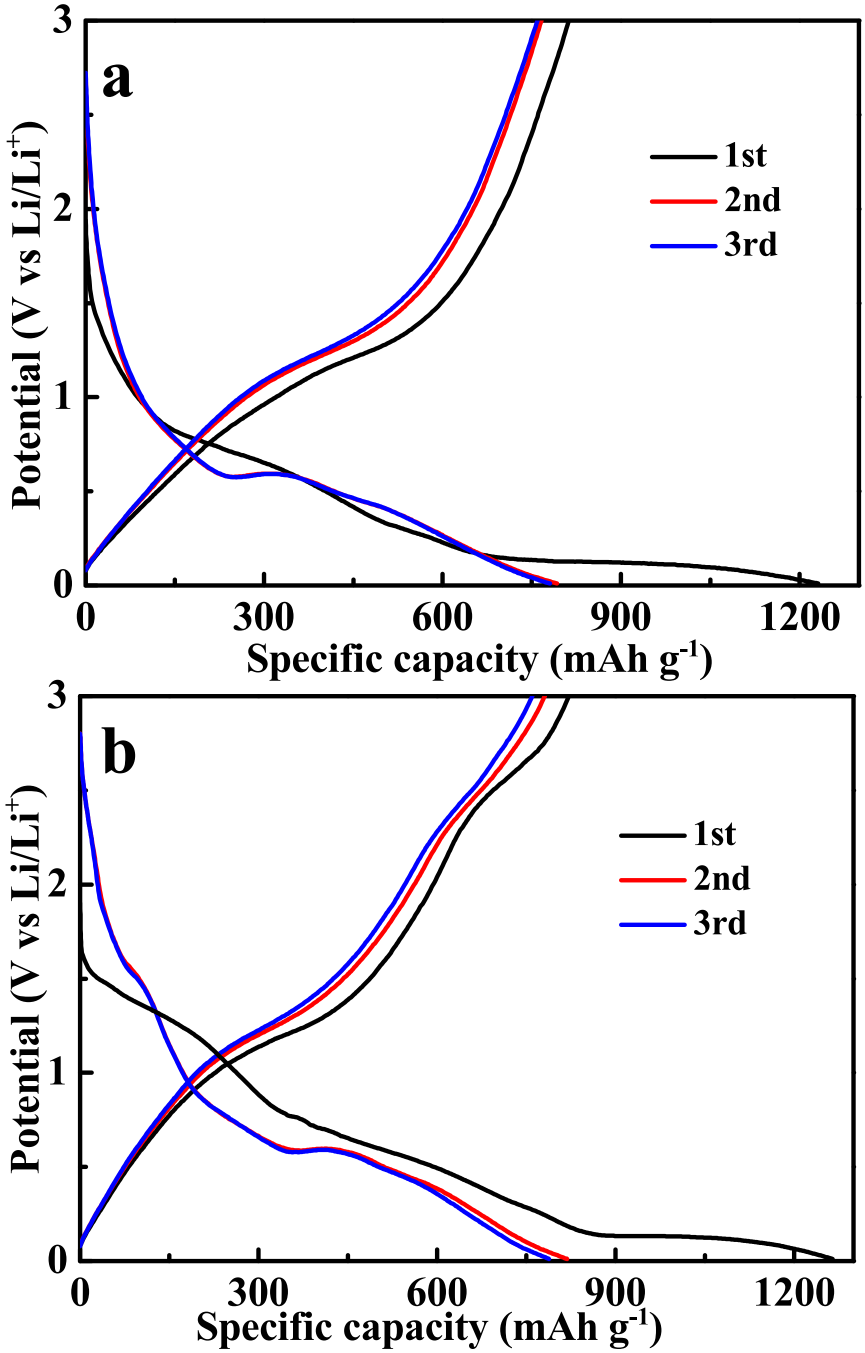

Figure S4. Charge-discharge profiles of MnO-Ni5@C (a) and MnO-Ni15@C (b) electrodes at the current density of 0.1 A g^{-1}.

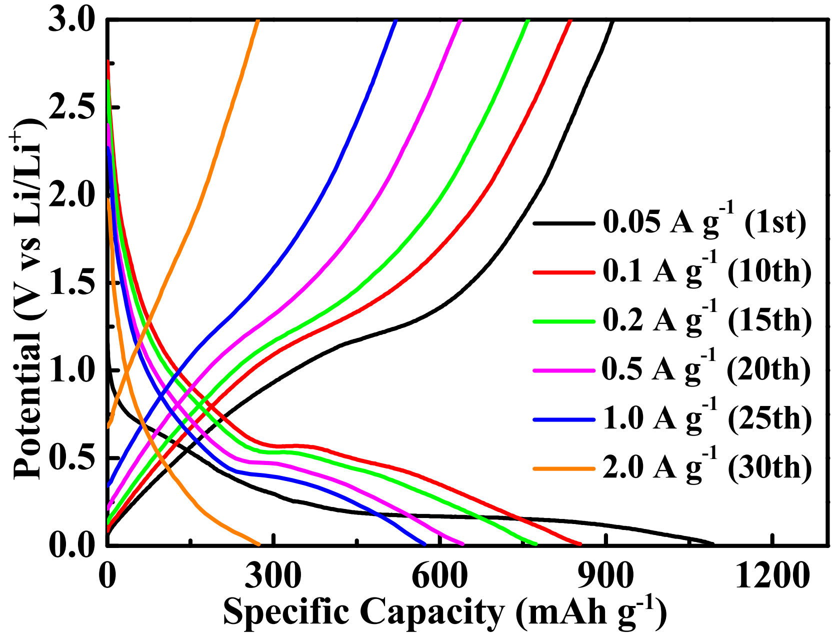

Figure S5. Charge-discharge profiles of MnO-Ni10@C electrodes at different current densities.

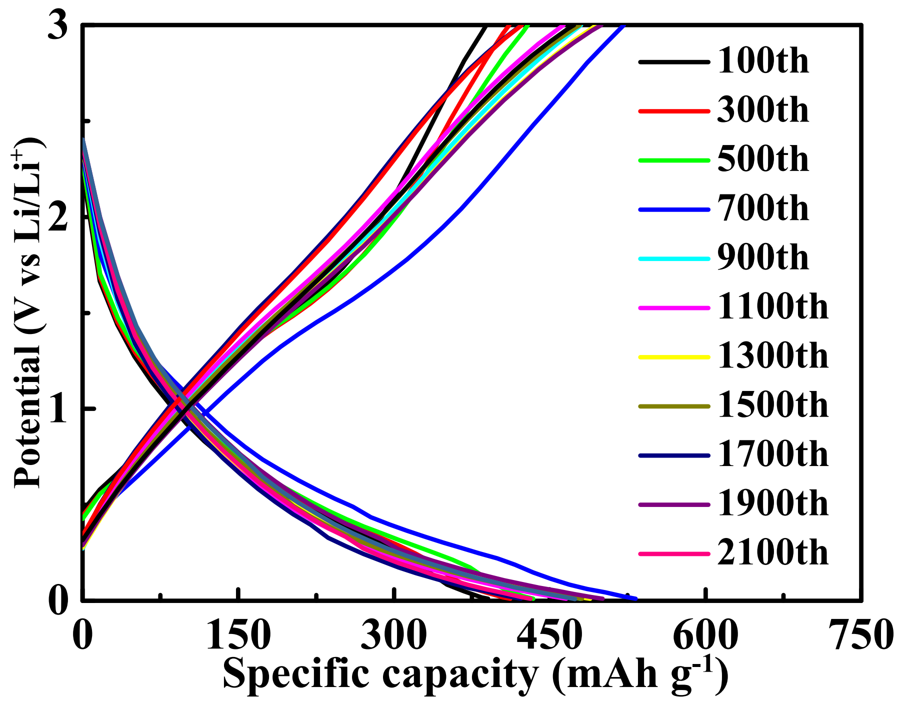

Figure S6. The corresponding selected charge-discharge profiles of MnO-Ni10@C at 1.0 A g^{-1} for a ultralong cycle life of 2100 cycles.

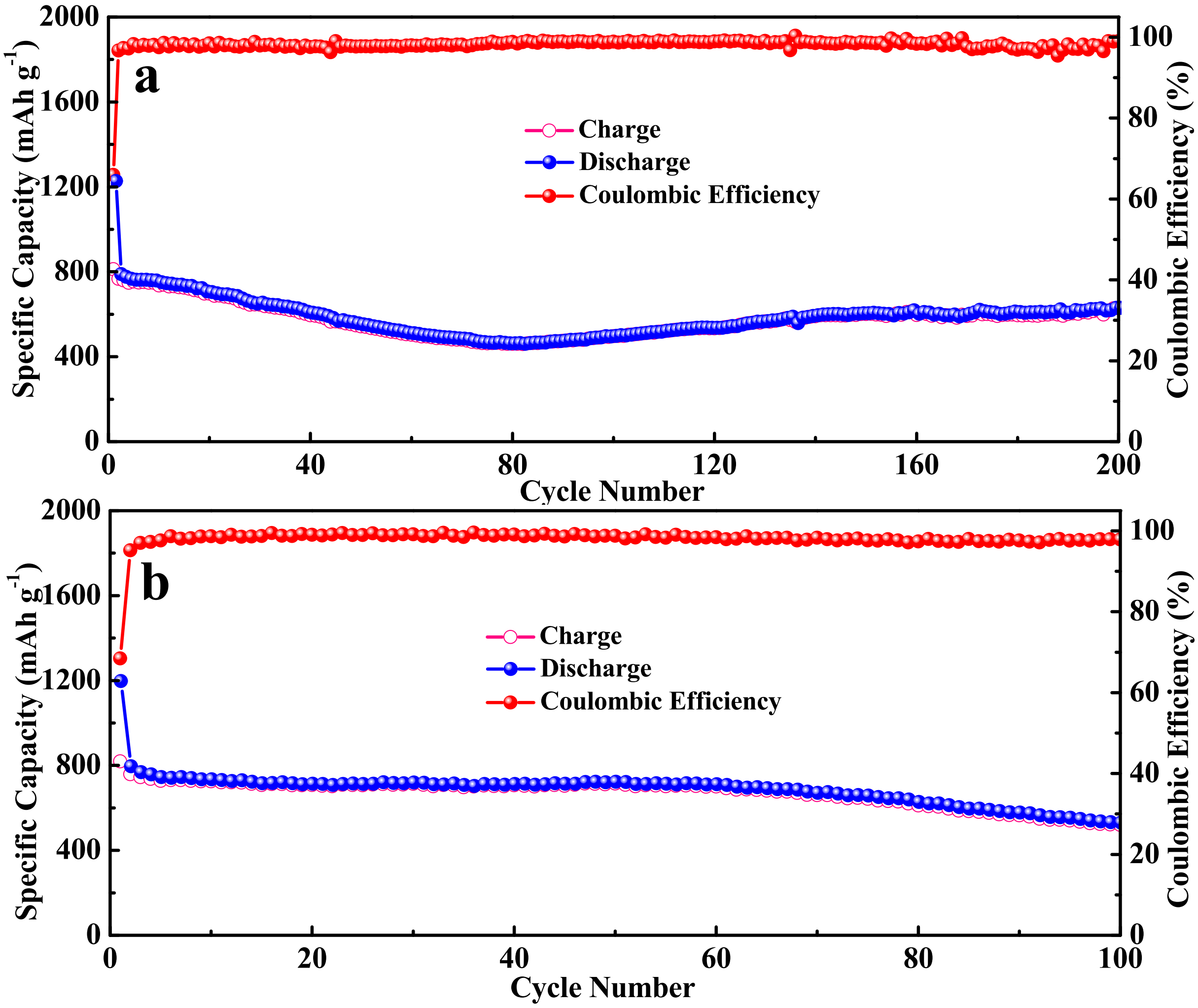

Figure S7. Cycling performance and coulombic efficiency of MnO-Ni5@C (a) and MnO-Ni15@C (b) electrodes at current density of 0.1 A g^{-1}.

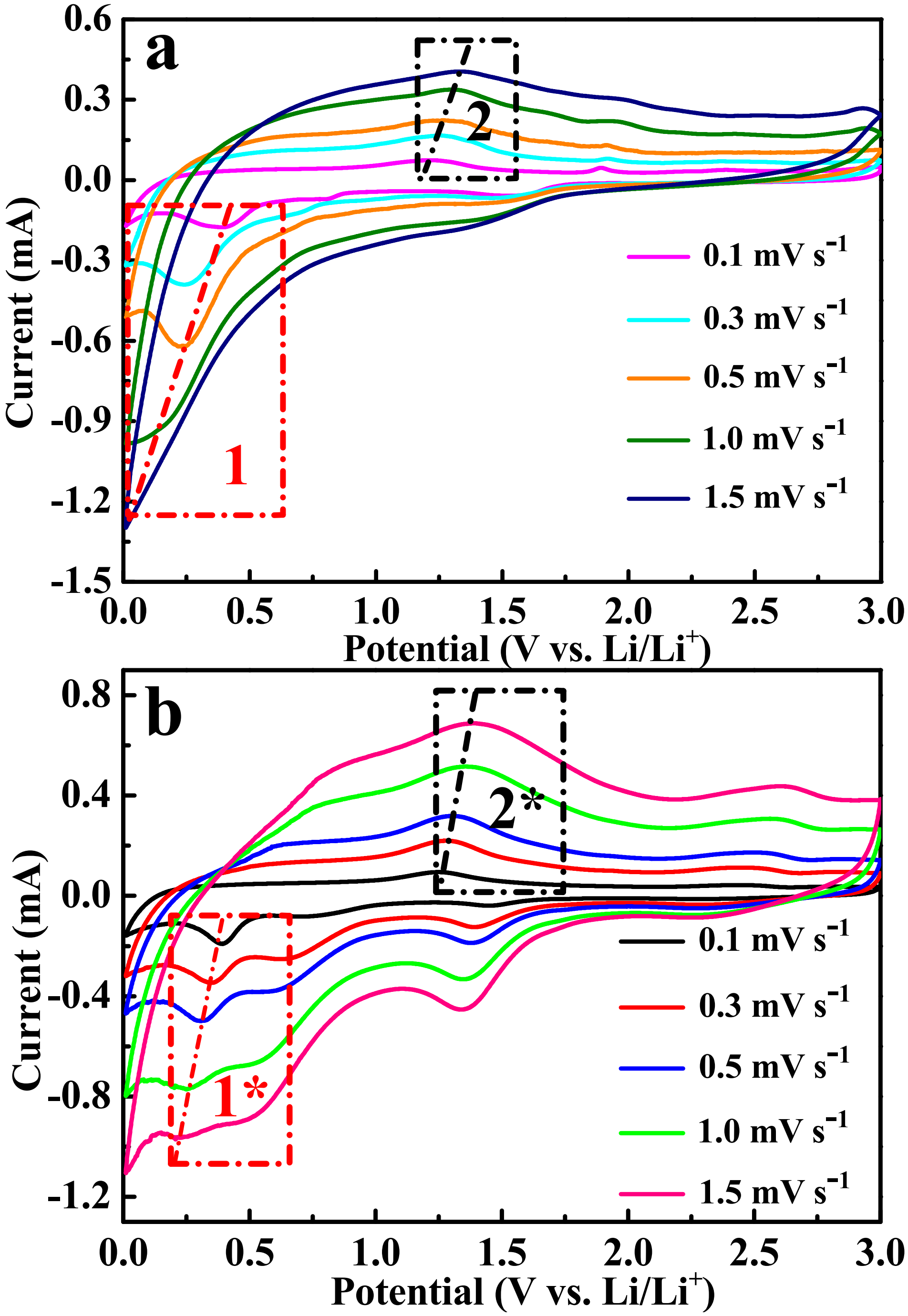

Figure S8. CV curves at differet scan rates from 0.1-1.5 mV s^{-1} of MnO-Ni0@C (a) and MnO-Ni10@C (b) electrodes.

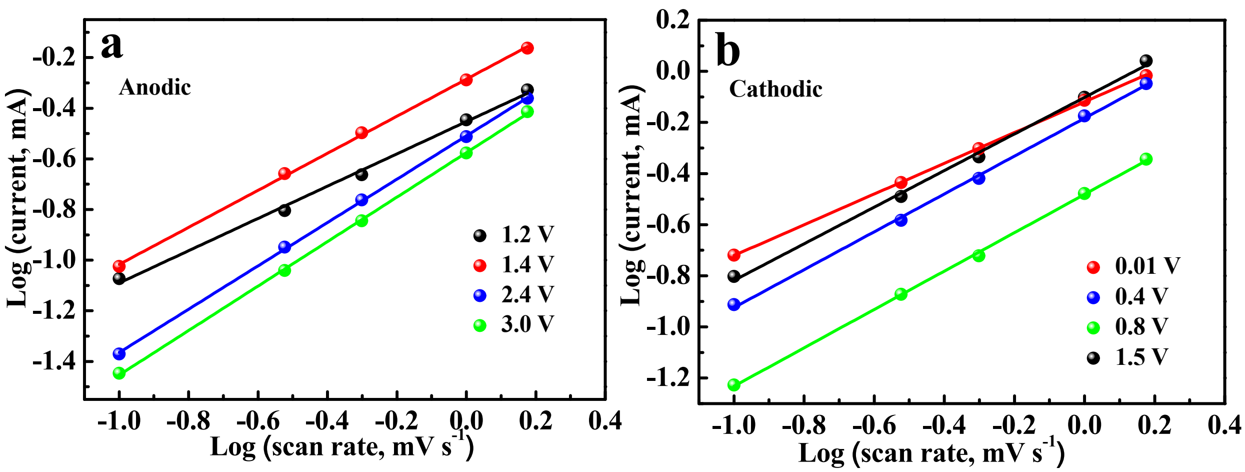

Figure S9. Current responses plotted against different scan rates of MnO-Ni10@C electrodes at different potentials for anodic scans (a) and cathodic scans (b).

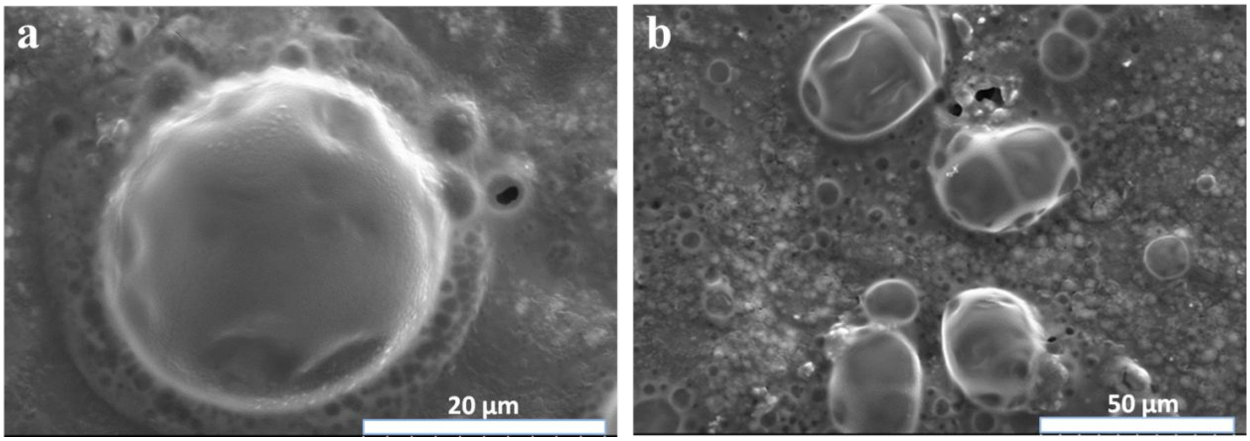

Figure S10. SEM images of MnO-Ni5@C (a) and MnO-Ni15@C (b) electrodes after 200 and 100 cycles, respectively.

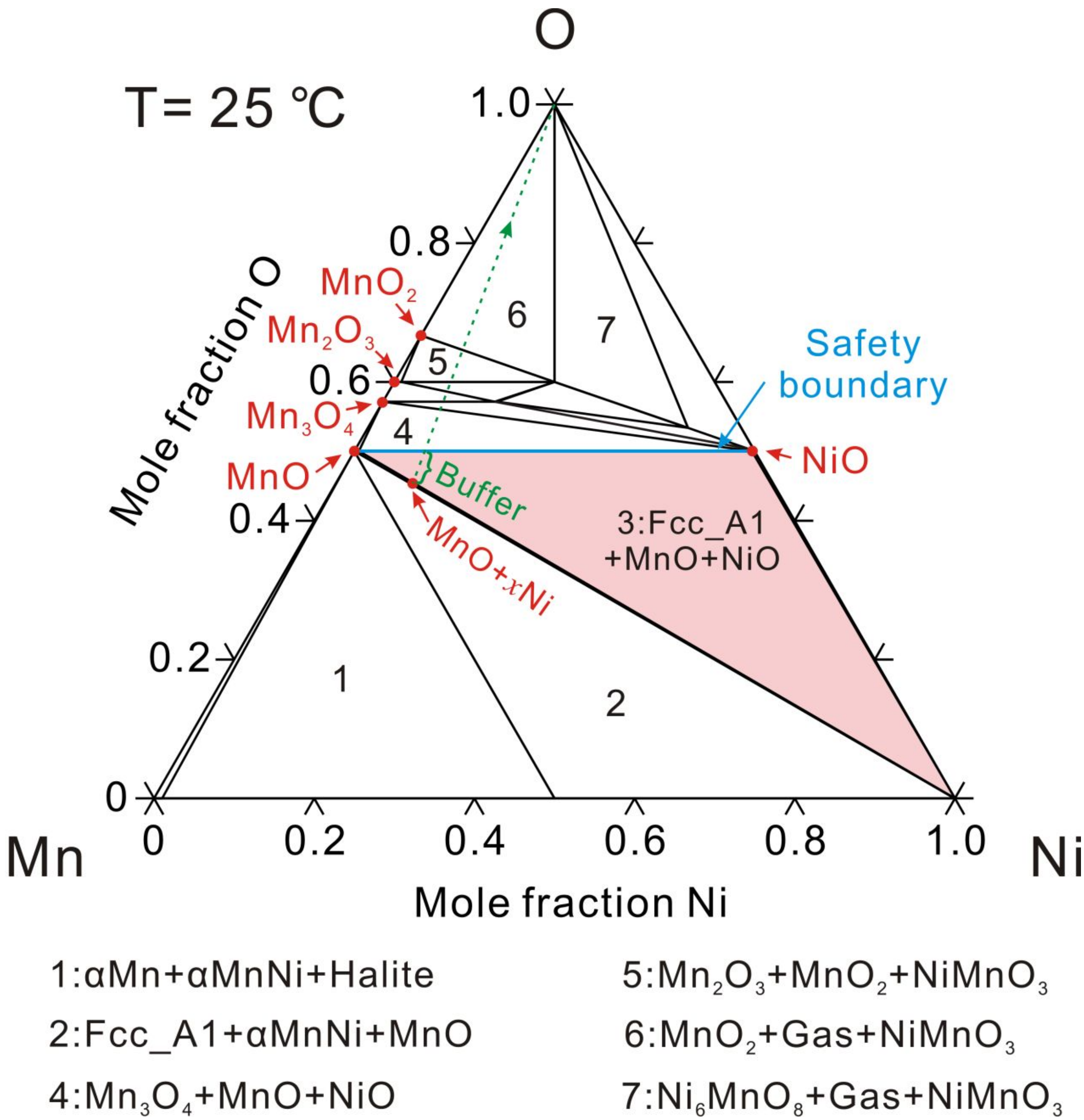

Figure S11. The calculated room temperature phase diagram of Ni-Mn-O system. The dashed line is the oxidation direction of the MnO+xNi alloys.

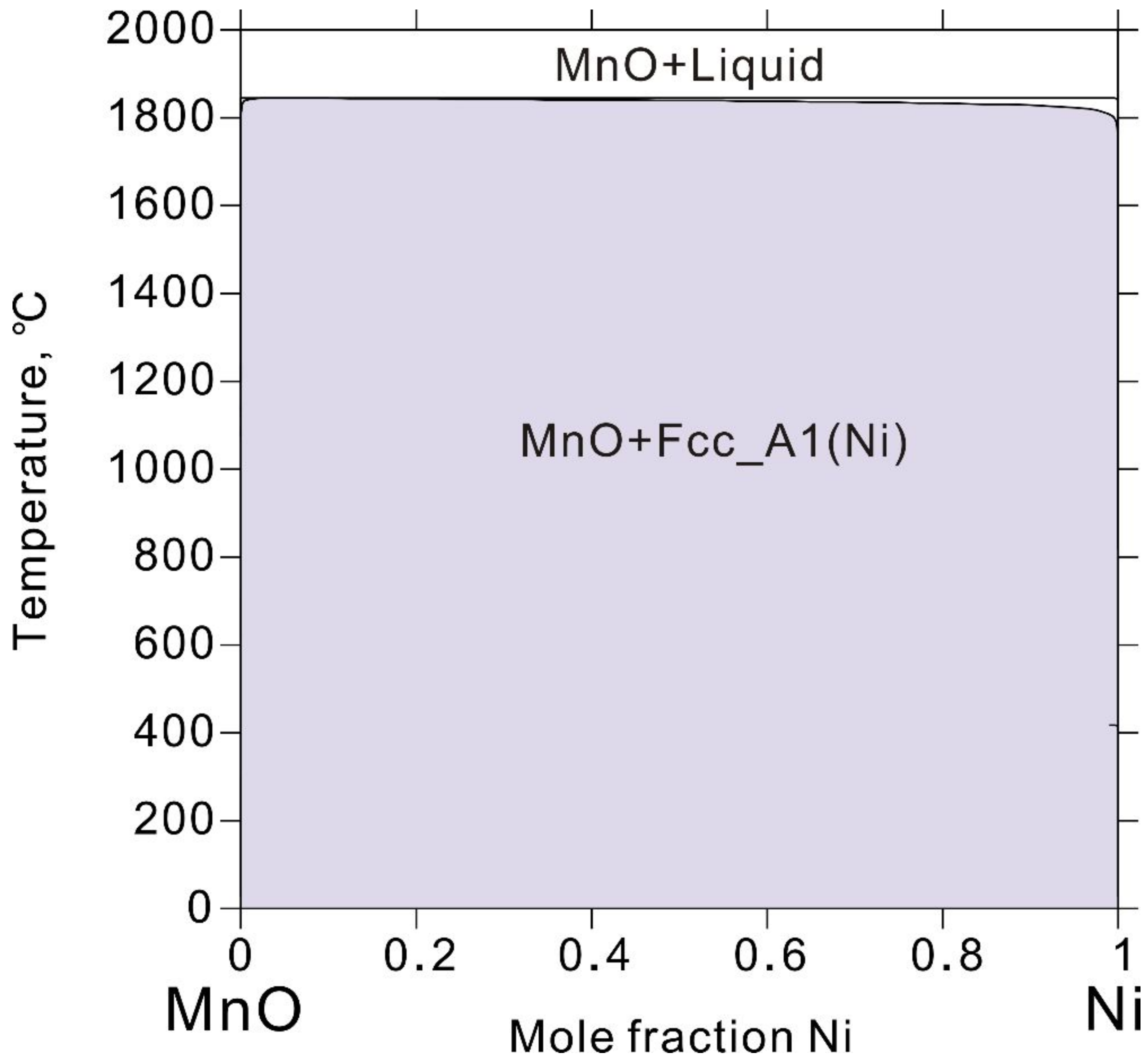

Figure S12. Calculated MnO-Ni vertical section of the Ni-Mn-O system.

Table S1. Comparisons of the electrochemical performance of the transition metal oxides electrodes.

MnO-based Materials	Current Density [A g^{-1}]	Cycle Numbers	Initial Value (the 2^{th} cycle) [mAh g^{-1}]	Crest Value [mAh g^{-1}]	Retention of Discharge Capacity	References
$MnO@Mn_3O_4$	0.2	300	748	1300	173.79%	1
MnO/C-N	0.5	500	582	783	134.53%	2
CNT/Co_3O_4	0.1	100	900	1200	133.33%	3
Co_3O_4	1.0	1000	762	1910	250.65%	4
MnO@Graphene	0.2	100	805	1202	149.32%	5
RGO-MnO-RGO	2.0	500	600	1269.2	211.53%	6
MnO/carbon matrix	0.1	100	760	952	125.26%	7
MnO/C	1.0	1000	890	1212	136.18%	8
MnO/N-Doped C	0.1	200	1231.1	1699	138%	9
MnO /Carbon	0.5	170	420	1467.	349.29%	10
MnO Nanoparticles	5.0	5000	825	939	113.82%	11
MnO/C nanowires	0.1	100	635	832	131.02%	12
MnO on Graphene	0.2	150	890.7	2014.1	226.13%	13
Nano-MnO/C	0.1	200	895	1082	120.89%	14
MnO@C Nanowires	0.5	200	650	801	123.23%	15
MnO/Carbon	0.5	300	735	1453	197.69%	16
MnO@C	0.1	270	673	1450.5	215.53%	17
MnO/N-doped C	0.5	100	795	982	123.52%	18
This work	0.1	200	**820**	**832**	**101.46%**	

Notes and references

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