Electronic Supplementary Material (ESI) for RSC Advances.

Ni/Mn ratio and morphology-dependent crystallographic facet structure and electrochemical properties of high-voltage spinel $LiNi_{0.5}Mn_{1.5}O_4$ cathode material

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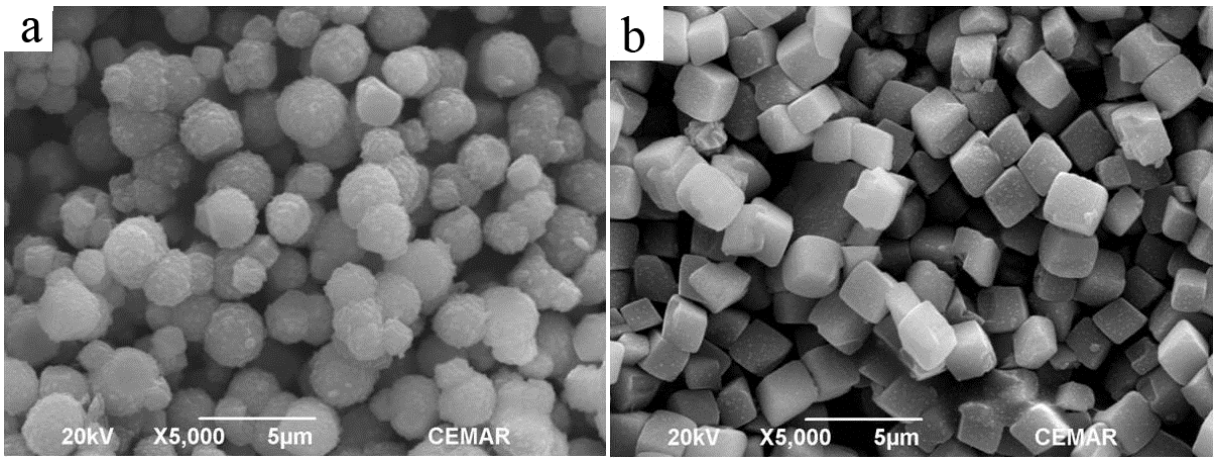
Figure captions


a
20kV X5,000 5μm CEMAR
b
20kV X5,000 5μm CEMAR

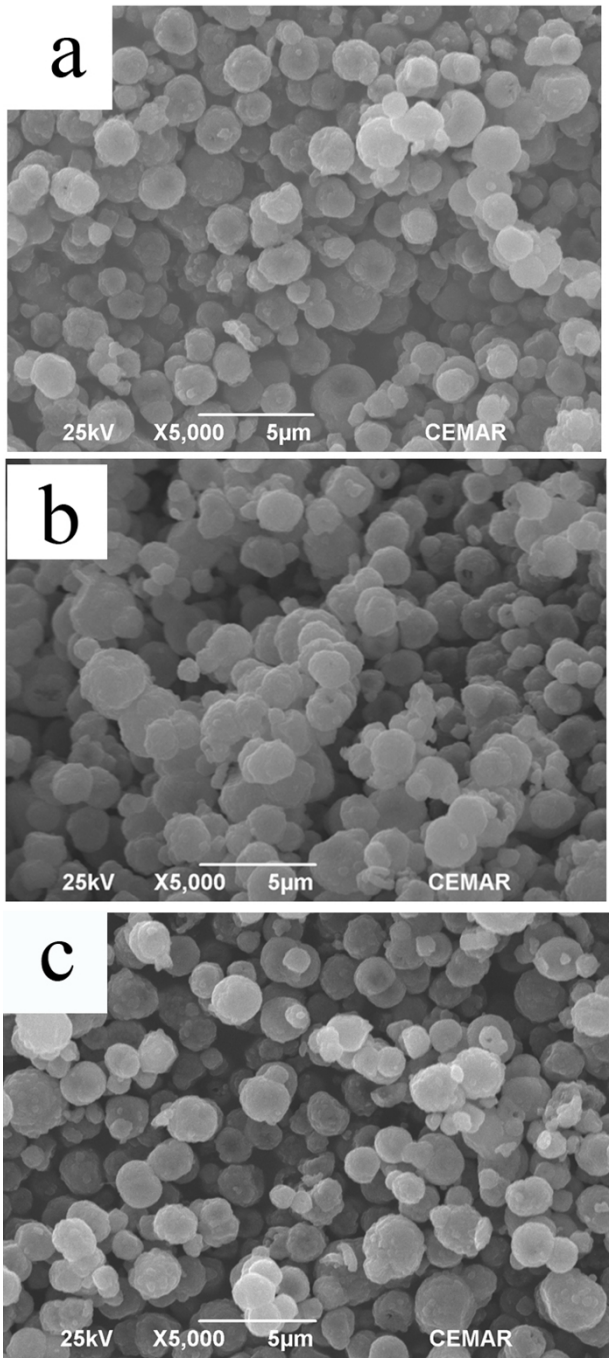

a
25kV X5,000 5μm CEMAR
b
25kV X5,000 5μm CEMAR
c
25kV X5,000 5μm CEMAR

Fig. S3

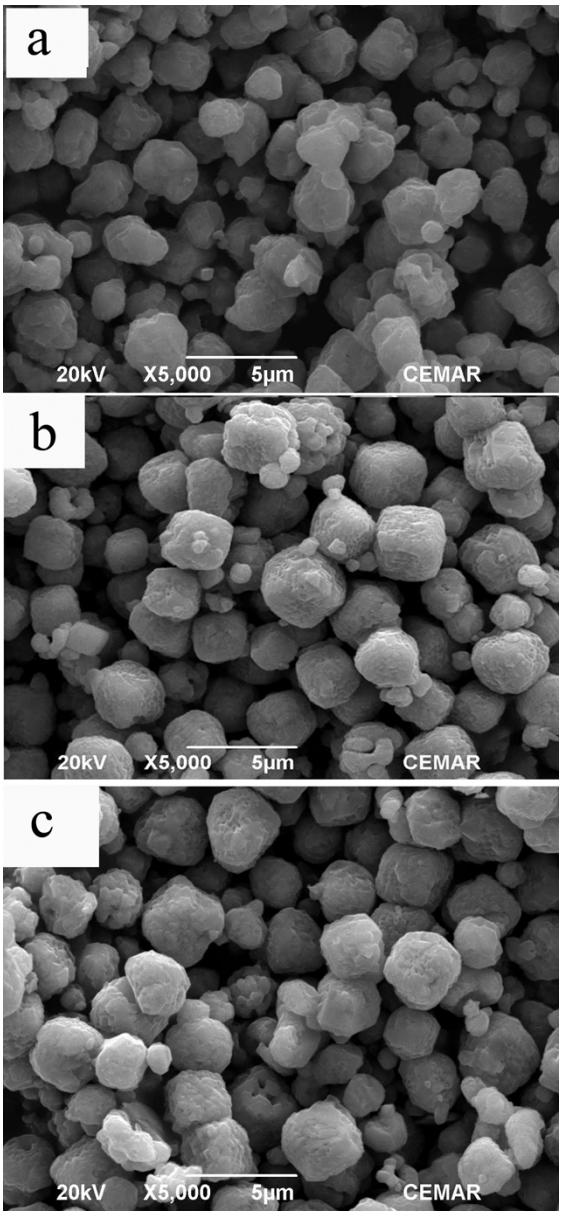

a
20kV X5,000 5µm CEMAR
b
20kV X5,000 5µm CEMAR
c
20kV X5,000 5µm CEMAR

Fig. S4

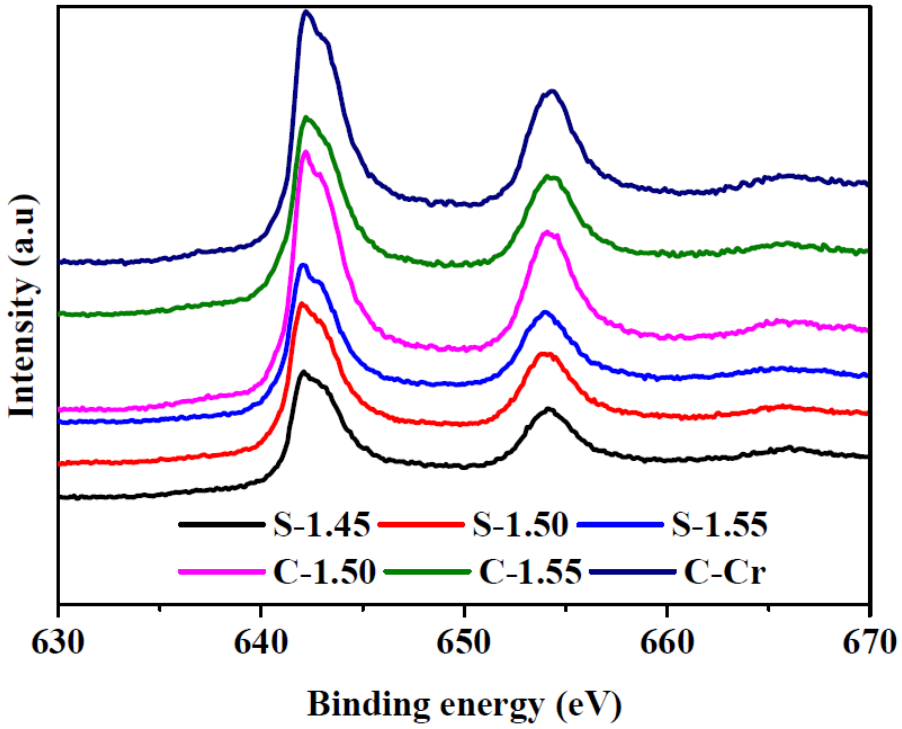

Intensity (a.u)
S-1.45
S-1.50
S-1.55
C-1.50
C-1.55
C-Cr
630
640
650
660
670
Binding energy (eV)

Fig. S5

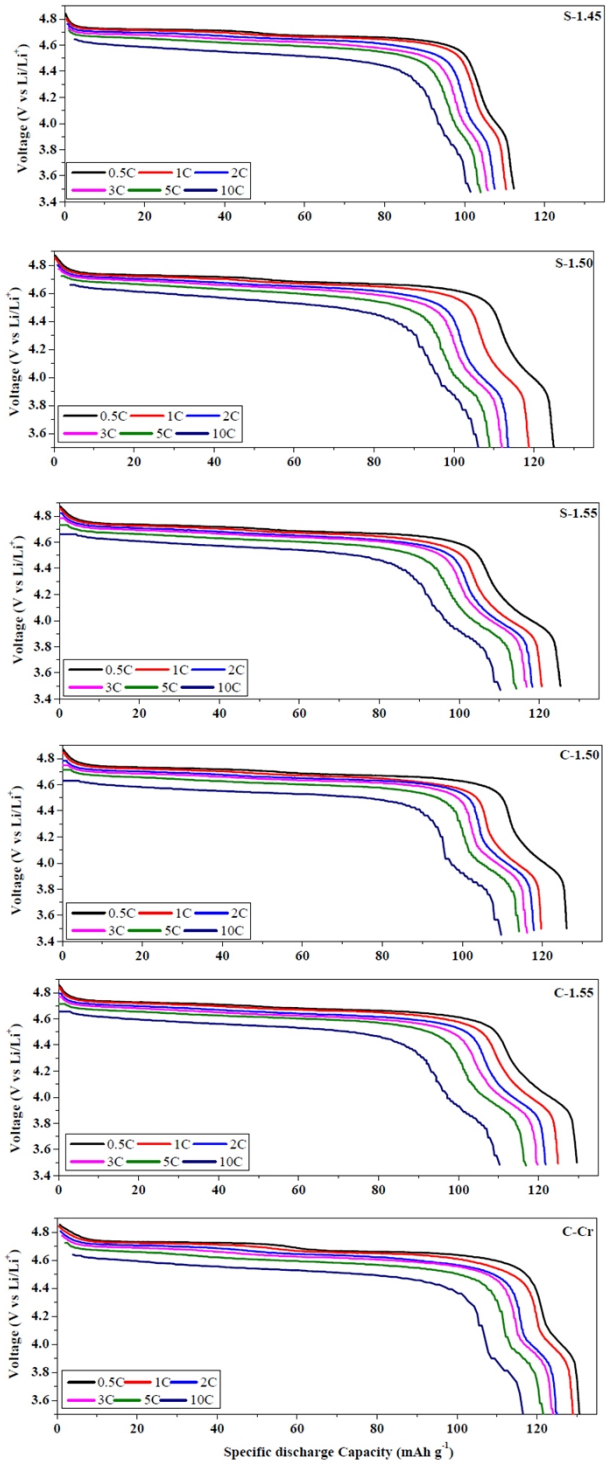

S-1.45
S-1.50
S-1.55
C-1.50
C-1.55
C-Cr
Voltage (V vs Li/Li+)
Specific discharge Capacity (mAh g-1)
0.5C
1C
2C
3C
5C
10C

Fig. S6

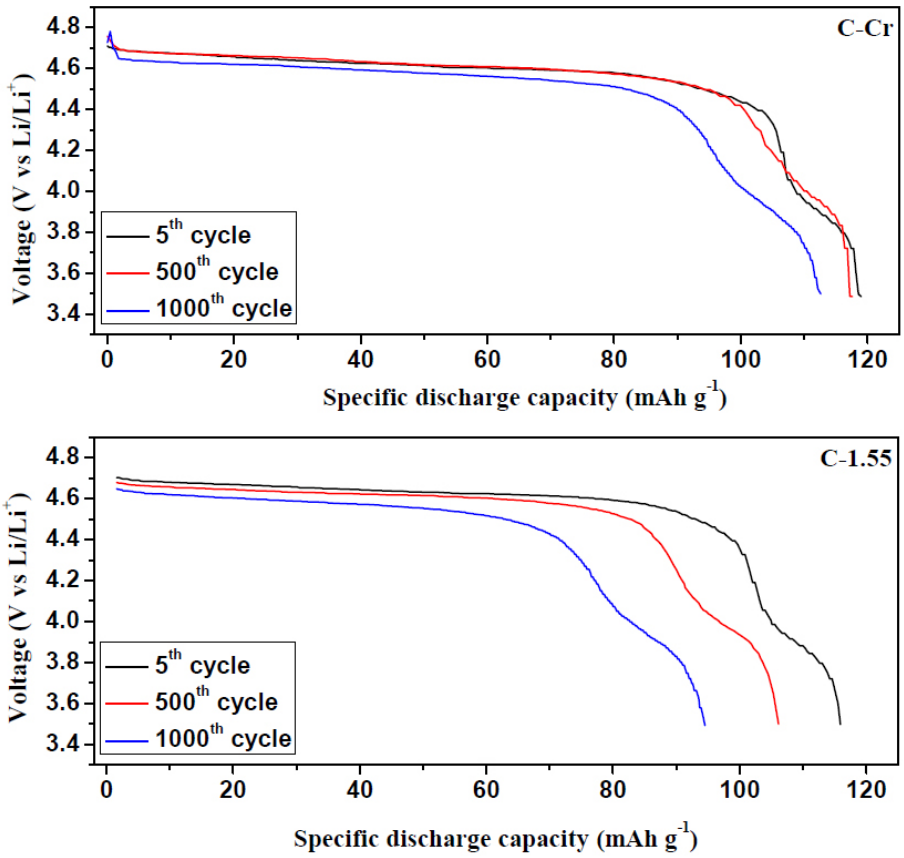

C-Cr
Voltage (V vs Li/Li+)
Specific discharge capacity (mAh g-1)
5th cycle
500th cycle
1000th cycle
C-1.55
Voltage (V vs Li/Li+)
Specific discharge capacity (mAh g-1)
5th cycle
500th cycle
1000th cycle

Figure S7

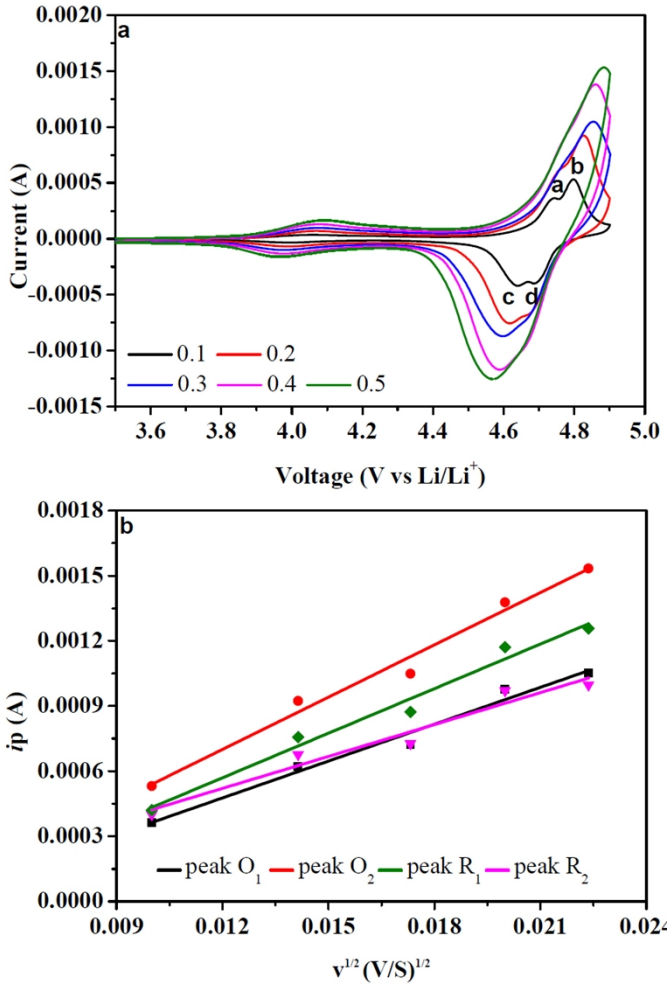
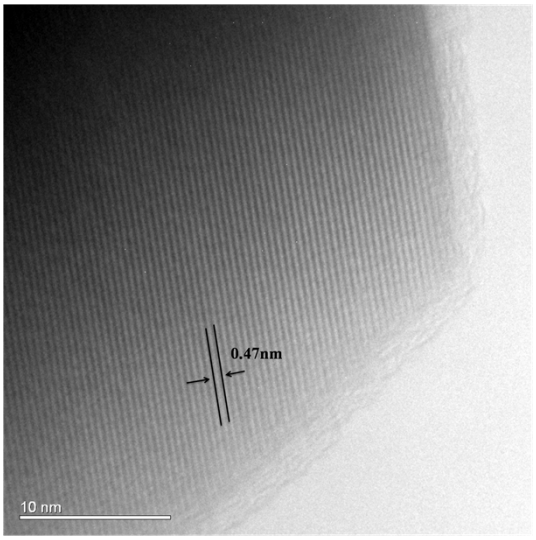

a
Current (A)
Voltage (V vs Li/Li+)
0.1
0.2
0.3
0.4
0.5
b
ip (A)
peak O1
peak O2
peak R1
peak R2
v1/2 (V/S)1/2

Figure S8.



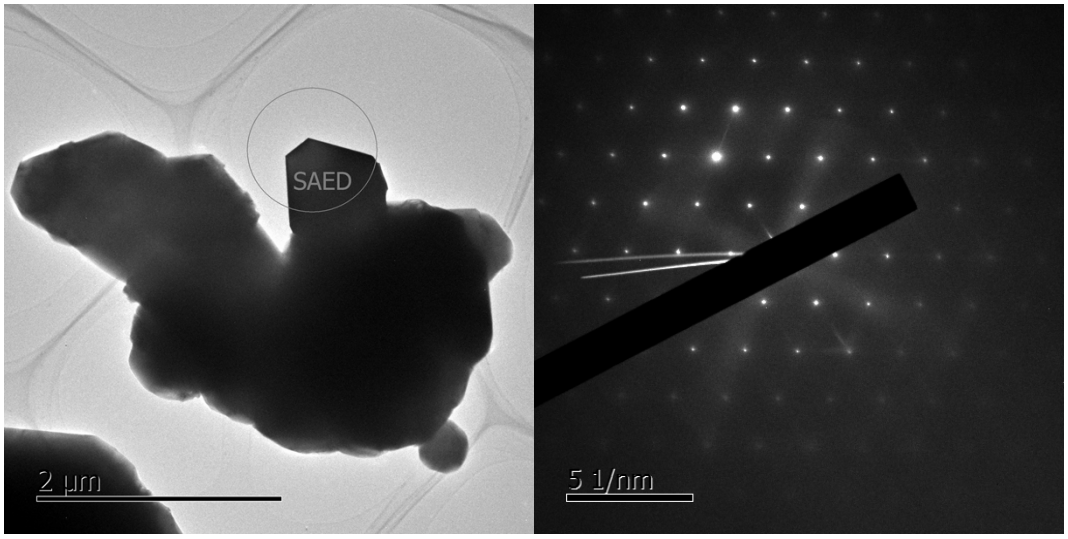


Figure S9

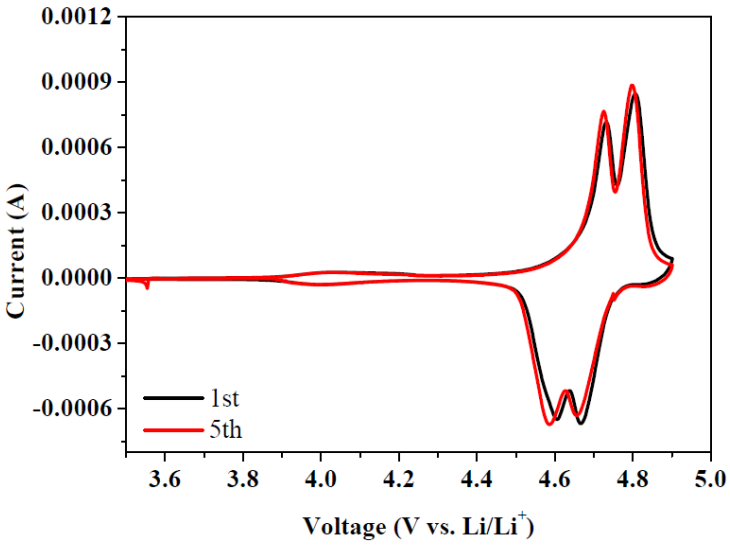

0.0012
0.0009
0.0006
0.0003
0.0000
-0.0003
-0.0006
Current (A)
1st
5th
3.6
3.8
4.0
4.2
4.4
4.6
4.8
5.0
Voltage (V vs. Li/Li+)

Table S1

Scanning rate (mv/s)	Potential (V)					
	E_{O1}	E_{O2}	E_{R1}	E_{R2}	ΔE_1	ΔE_2
0.1	4.745	4.799	4.640	4.686	0.105	0.113
0.2	4.759	4.827	4.620	4.671	0.139	0.156
0.3	4.780	4.853	4.594	4.663	0.186	0.190
0.4	4.786	4.859	4.588	4.659	0.198	0.200
0.5	4.796	4.879	4.577	4.650	0.219	0.229
D_{Li^+}($\times 10^{-11}$ cm^2/s)	3.305	6.653	4.834	2.477		

[a] E_O: anodic peak potential, E_R: cathodic peak potential, ΔE: the separation between E_O and E_R. The subscript numbers 1 and 2 denote the redox couple at lower and higher potential, respectively.