Supplementary Information (SI) for Journal of Materials Chemistry A.
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A well-designed P2-$Na_{0.67}Mn_{0.85}Al_{0.05}Zn_{0.1}O_2$ cathode for superior sodium-ion battery

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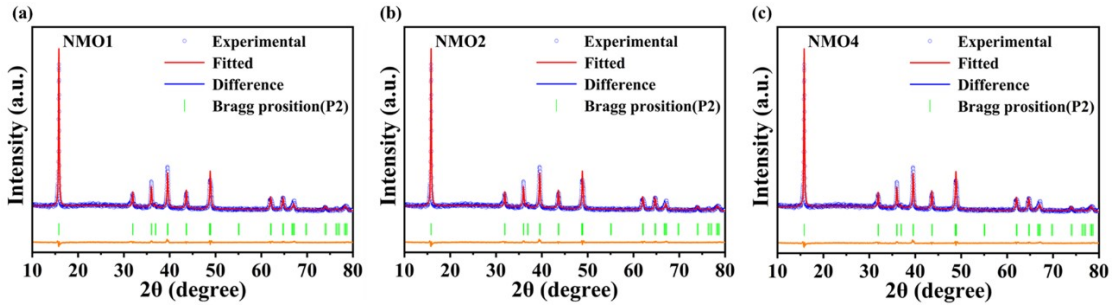

Fig. S1. XRD patterns; Rietveld refinement of (a) NMO1, (b) NMO2, and (c) NMO4.

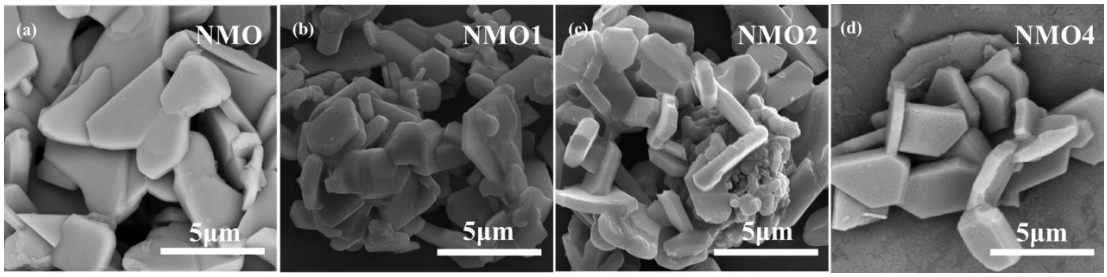

Fig. S2. SEM; (a) NMO, (b) NMO1, (c) NMO2, and (d) NMO4.

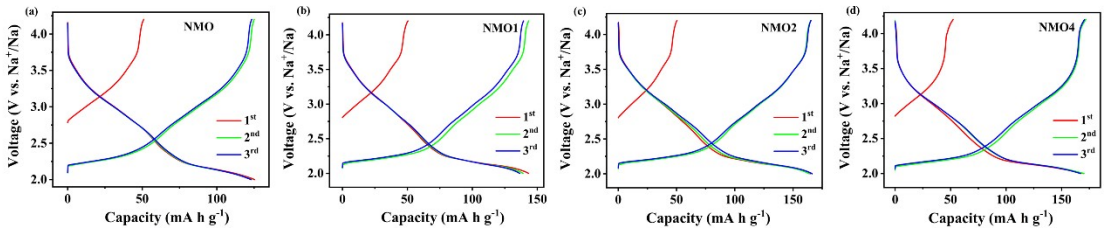

Fig. S3. 0.1C cycle of (a) NMO, (b)NMO1, (c)NMO2, and (d) NMO4.

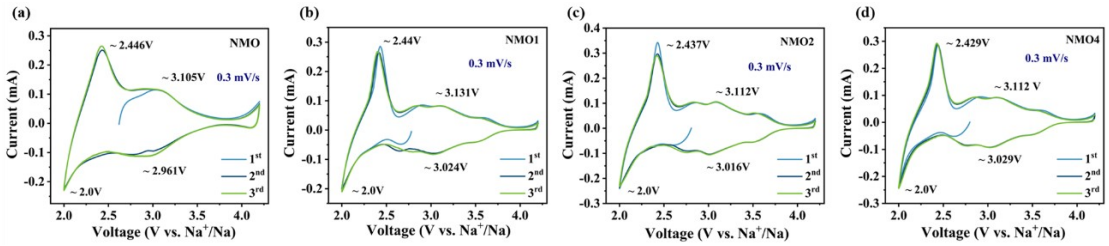

Fig. S4. Multi-sweep CVs of (a) NMO, (b)NMO1, (c)NMO2, and (d) NMO4.

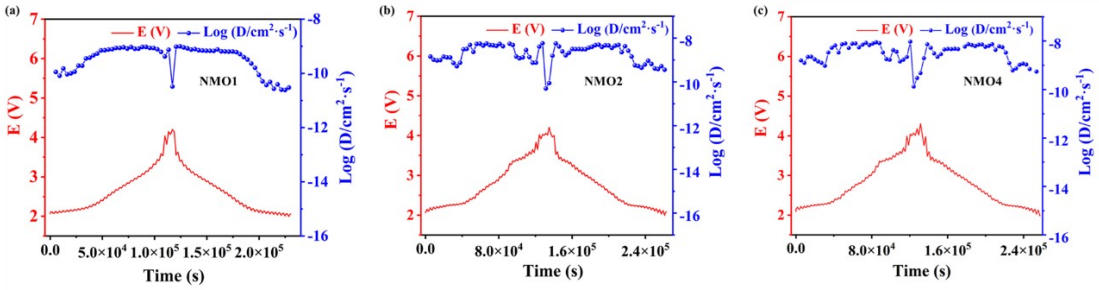

Fig. S5. GITT and corresponding D_{Na^+} (a-c) for NMO1, NMO2, and NMO4.

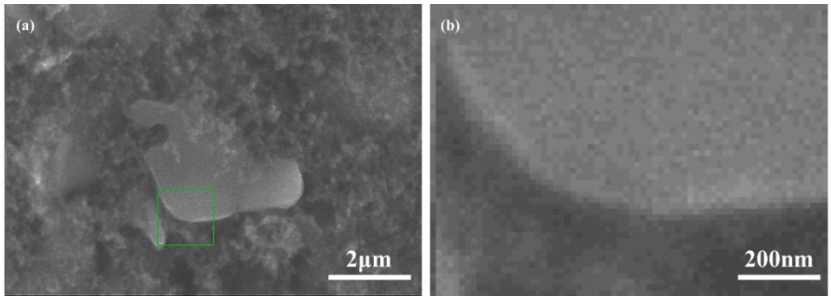

Fig. S6. Area of the selected SEM image of NMO3 after 600 cycles.

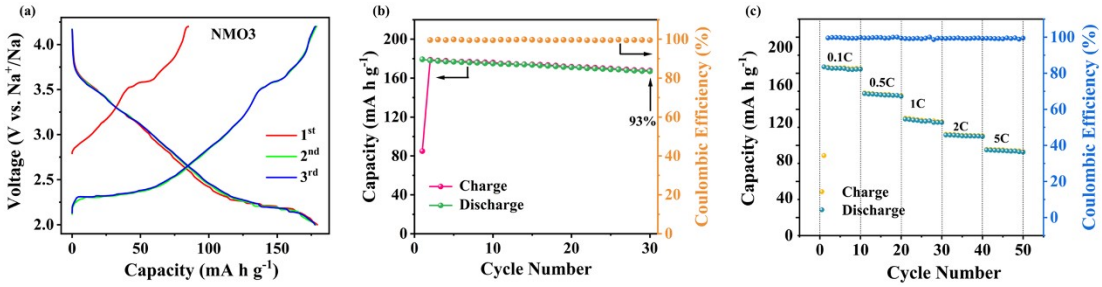

Fig. S7. Charge-discharge curves of NMO3 with higher loading of 5 mg/cm^2 at 0.1 C (a); Cycling at 0.1 C (b); Rate performance from 0.1-5 C (c).

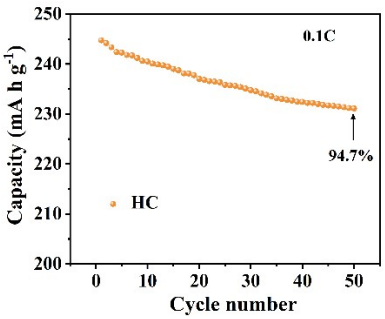

Fig. S8. The cycling performance of HC anode at 0.1C during 50 cycles.

Table S1 Crystallographic parameters of NMO3 refined by the Rietveld method.

Space group P63/mmc					
Lattice	a[Å]	c[Å]	V[Å^3]	R_{wp}(%)	R_p(%)
Hexagonal	2.88002	11.21316	80.54733	6.98	5.04
Atom	Site	*x*	*y*	*z*	
Na_f	2*b*	0	0	0.2500	
Na_e	2*d*	0.6667	0.3333	0.2500	
Al	2*a*	0	0	0	
Mn	2*a*	0	0	0	
Zn	2*a*	0	0	0	
O	4*f*	0.6667	0.3333	0.0875	

Table S2 Crystallographic parameters of NMO refined by the Rietveld method.

Space group P63/mmc					
Lattice	a[Å]	c[Å]	V[Å^3]	R_{wp}(%)	R_p(%)
Hexagonal	2.87390	11.18814	80.025842	8.82	5.43
Atom	Site	*x*	*y*	*z*	
Na_f	2*b*	0	0	0.2500	
Na_e	2*d*	0.6667	0.3333	0.2500	
Mn	2*a*	0	0	0	
O	4*f*	0.6667	0.3333	0.0875	

Table S3 Crystallographic parameters of NMO1 refined by the Rietveld method.

Space group P63/mmc					
Lattice	a[Å]	c[Å]	V[Å^3]	R_{wp}(%)	R_p(%)
Hexagonal	2.87869	11.20614	80.42185	8.12	6.07
Atom	Site	*x*	*y*	*z*	
Na_f	2*b*	0	0	0.2500	
Na_e	2*d*	0.6667	0.3333	0.2500	
Al	2*a*	0	0	0	

Mn	2*a*	0	0	0
Zn	2*a*	0	0	0
O	4*f*	0.6667	0.3333	0.0875

Table S4 Crystallographic parameters of NMO2 refined by the Rietveld method.

Space group P63/mmc					
Lattice	a[Å]	c[Å]	V[Å^3]	R_{wp}(%)	R_p(%)
Hexagonal	2.87940	11.20100	80.42507	7.76	5.80
Atom	Site	*x*	*y*	*z*	
Na_f	2*b*	0	0	0.2500	
Na_e	2*d*	0.6667	0.3333	0.2500	
Al	2*a*	0	0	0	
Mn	2*a*	0	0	0	
Zn	2*a*	0	0	0	
O	4*f*	0.6667	0.3333	0.0875	

Table S5 Crystallographic parameters of NMO4 refined by the Rietveld method.

Space group P63/mmc					
Lattice	a[Å]	c[Å]	V[Å^3]	R_{wp}(%)	R_p(%)
Hexagonal	2.88082	11.20709	80.54642	6.47	5.23
Atom	Site	*x*	*y*	*z*	
Na_f	2*b*	0	0	0.2500	
Na_e	2*d*	0.6667	0.3333	0.2500	
Al	2*a*	0	0	0	
Mn	2*a*	0	0	0	
Zn	2*a*	0	0	0	
O	4*f*	0.6667	0.3333	0.0875	