

# Supplementary Information for “Improvement of Cyclic Stability of $\text{Na}_{0.67}\text{Mn}_{0.8}\text{Ni}_{0.1}\text{Co}_{0.1}\text{O}_2$ via Suppressing Lattice Variation”

Zhongmin Ren(任重民)<sup>1</sup>, Muqin Wang(王木钦)<sup>1,3\*</sup>, Shuaishuai Chen(陈帅帅)<sup>2</sup>,

Lei Ding(丁雷)<sup>2</sup>, Hua Li(李华)<sup>1</sup>, Jian Liu(刘健)<sup>1</sup>, Jieyun Zheng(郑杰允)<sup>4\*</sup>,

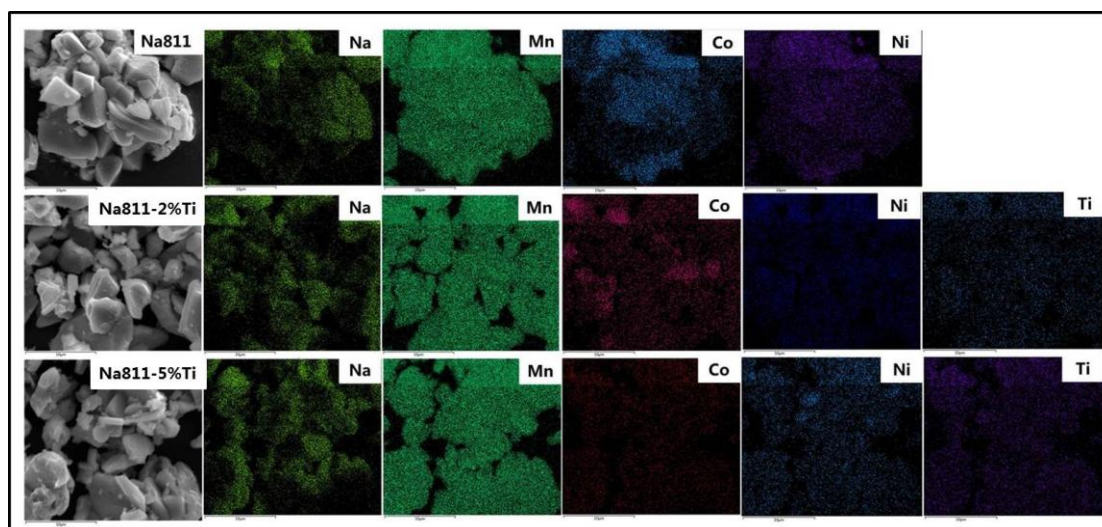
Zhihong Liu(刘志宏)<sup>1</sup>, Deyu Wang(王德宇)<sup>1,2\*</sup>, Mingkui Wang(王鸣魁)<sup>3c</sup>

1 Key Laboratory of Optoelectronic Chemical Materials and Devices, School of Chemical and Environmental Engineering, Jiangnan University, Wuhan 430056, China.

2 Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, Ningbo 315201, China.

3 Huazhong University of Science & Technology, Wuhan 430074, China

4 Institute of Physics, Chinese Academy of Science, Beijing 10080, China



**Fig. S1.** SEM and EDS images of Na811, Na811-2% Ti, Na811-5% Ti.

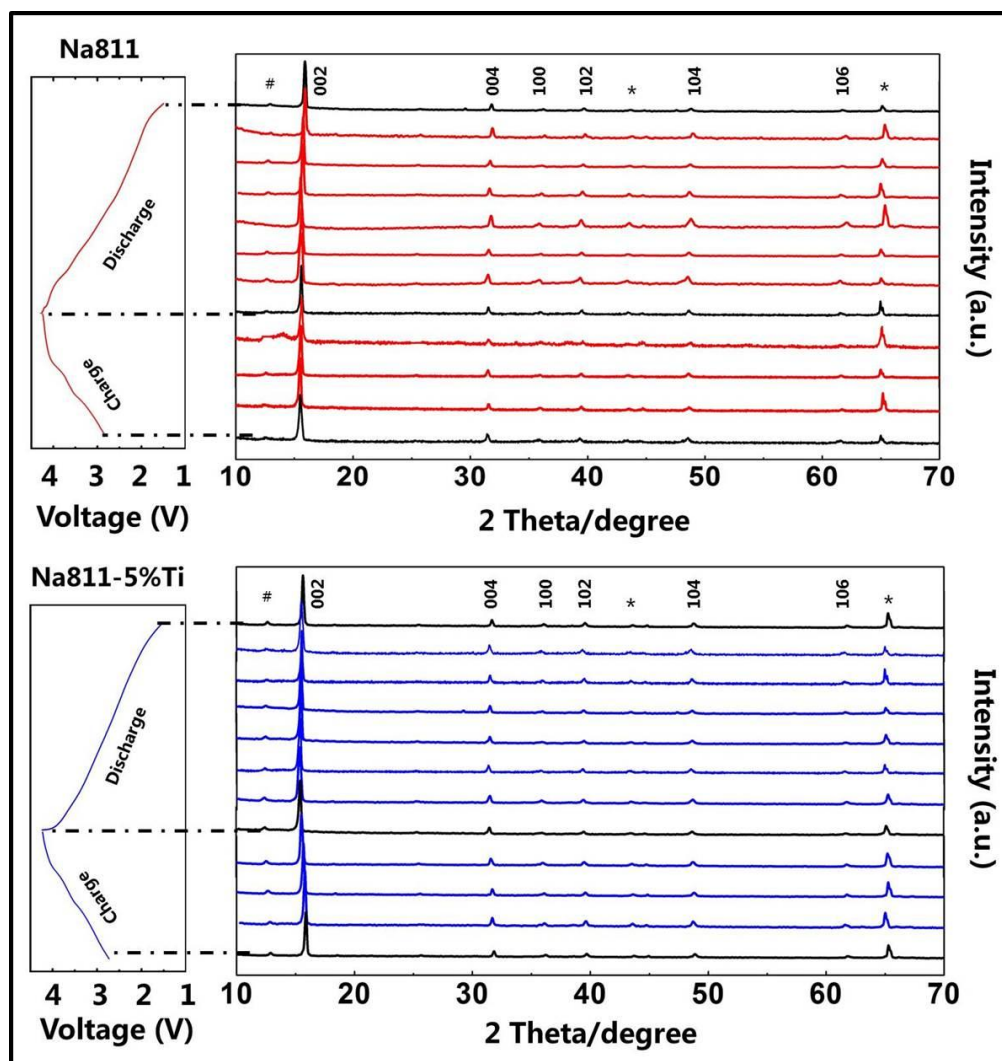
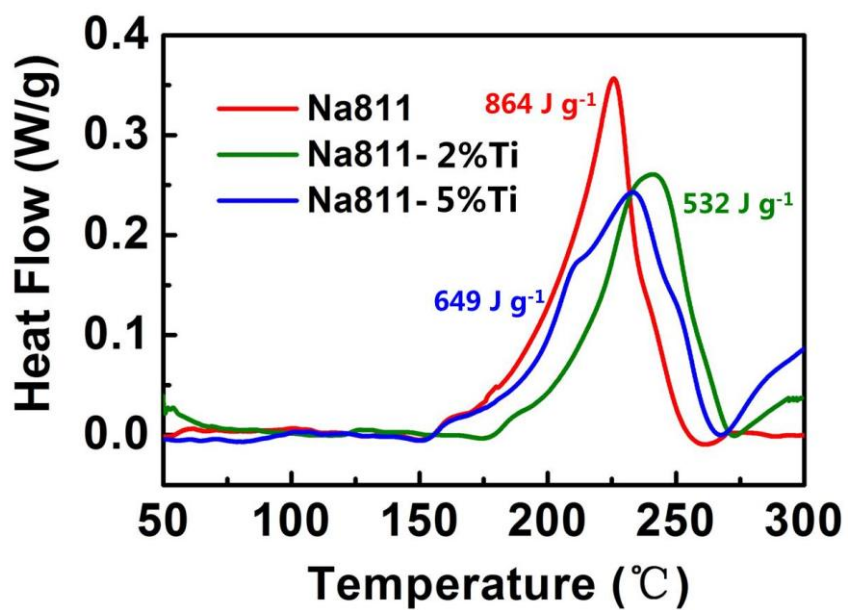
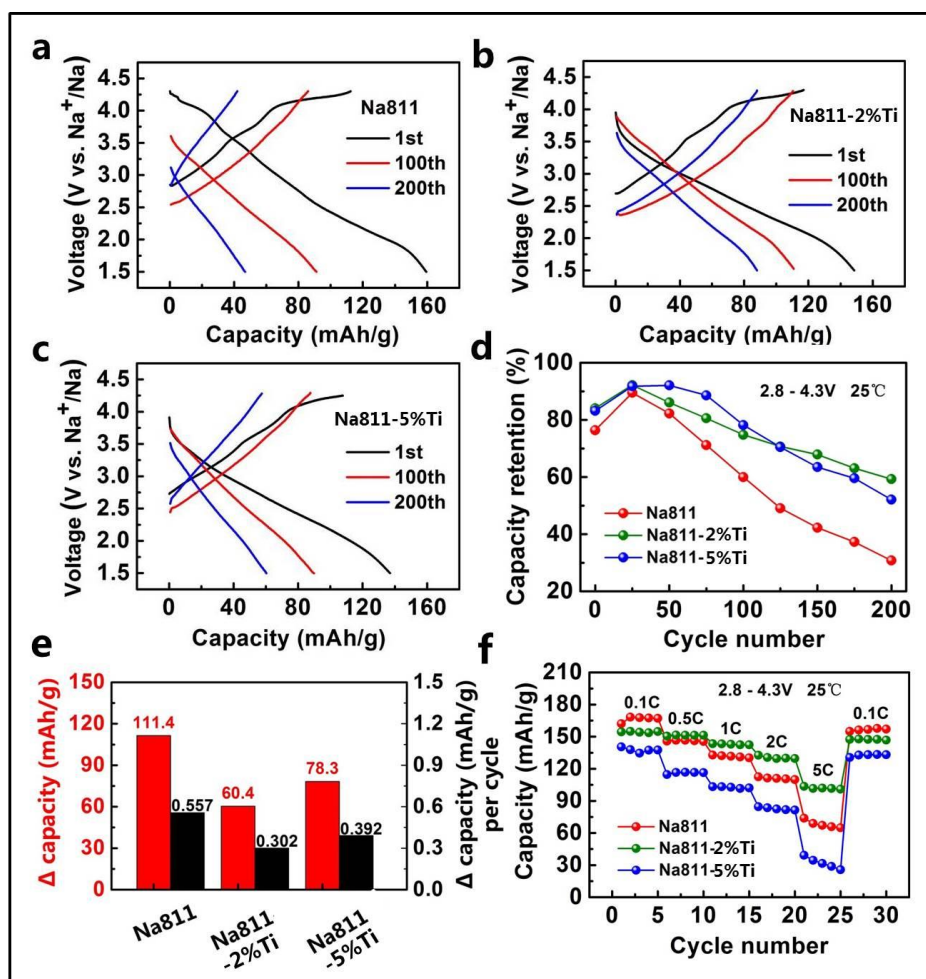


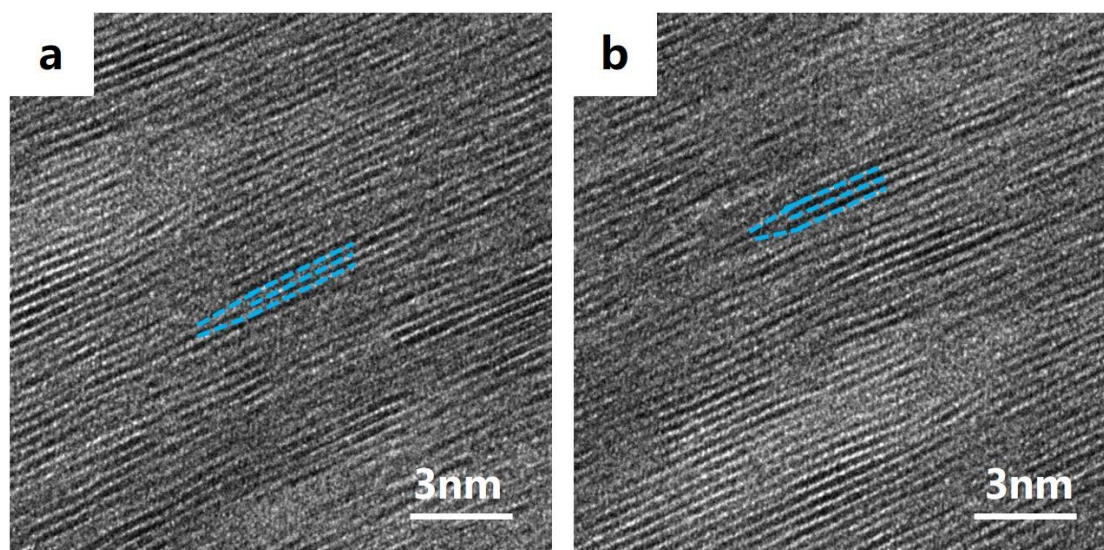
Fig. S2. *In-situ* XRD characterization of Na811 & Na811-5%Ti.



**Fig. S3.** DSC of Na811, Na811-2%Ti, Na811-5%Ti.



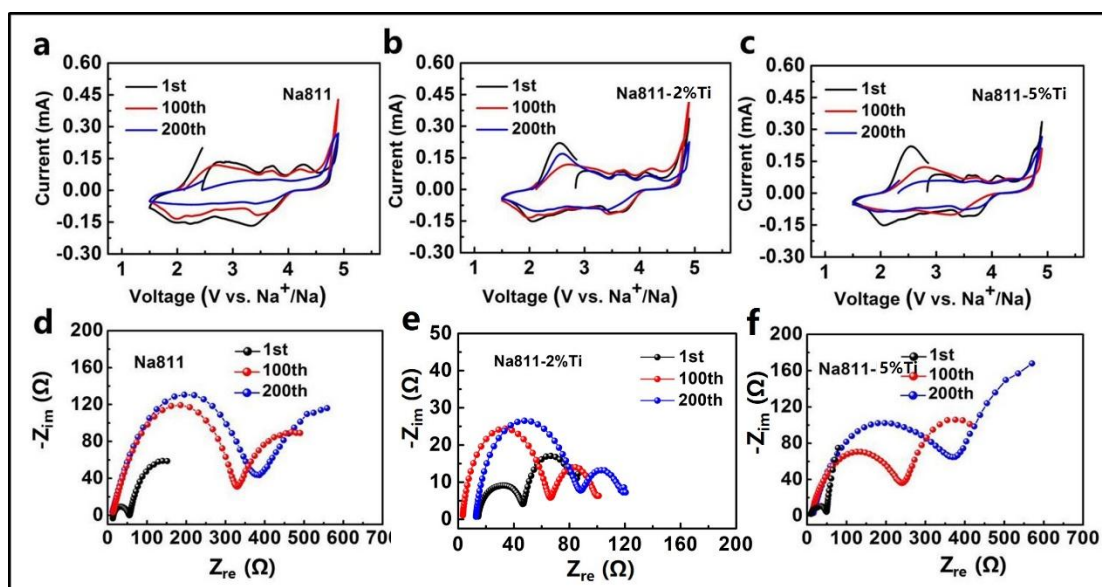
**Fig. S4.** Charge and discharge profiles at selected cycles at 0.1C (1<sup>st</sup>) and 0.5C (100<sup>th</sup> & 200<sup>th</sup>): a) Na811, b) Na811-2%Ti, c) Na811-5%Ti; All samples: d) capacity retention, d) Δ capacity & Δ capacity per cycle during cycling, f) rate performance.



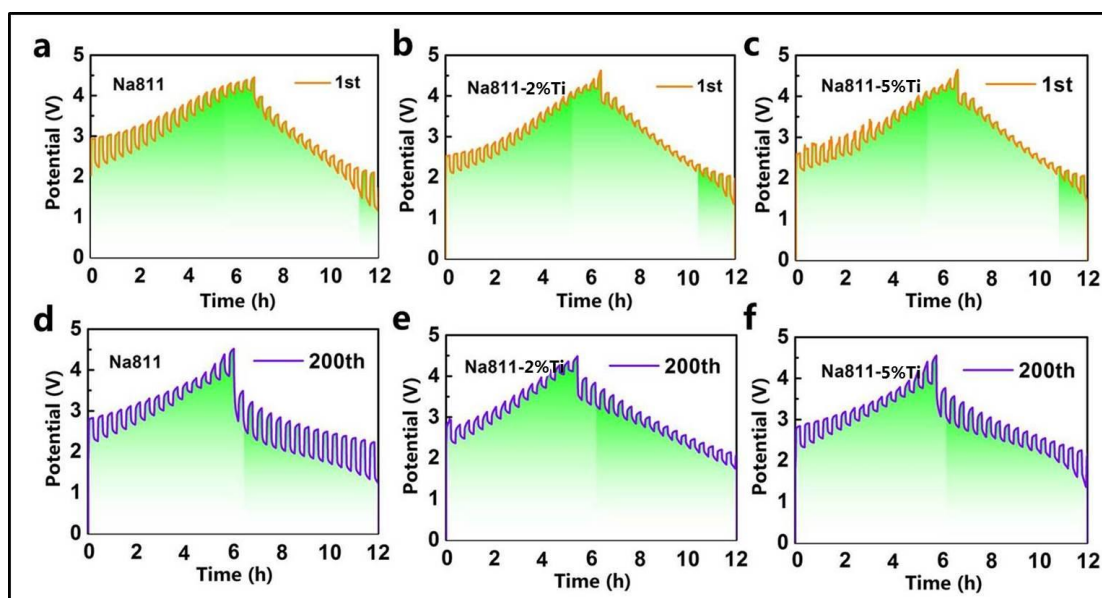
**Fig. S5.** The dislocation for Na811 and Na811-5%Ti after 100 charge/discharge cycles, measured



at the current rate of 0.5C.



**Fig. S6.** Cyclic voltammograms (at scanning rate of  $0.1 \text{ mV s}^{-1}$ ) and EIS spectra of 1<sup>st</sup>, 100<sup>th</sup> & 200<sup>th</sup> for the samples: a, d) Na811, b, e) Na811-2%Ti, c, f) Na811-5%Ti.



**Fig. S7.** The GITT of 1<sup>st</sup> and 200<sup>th</sup> for the samples: a, d) Na811, b, e) Na811-2%Ti, c, f) Na811-5%Ti.

**Table S1.** Crystallographic parameters of synthesized P2-Na<sub>0.67</sub>Ni<sub>0.1</sub>Co<sub>0.1</sub>Mn<sub>0.8</sub>O<sub>2</sub> (Na811) refined by the Rietveld method.

Space group		P63/mmc [194]			
Atom	site	X	Y	Z	Occ.
Na <sub>f</sub>	2b	0	0	0.25	0.2436
Na <sub>e</sub>	2d	0.3333	0.6667	0.25	0.4264
Ni	2a	0	0	0	0.1000
Co	2a	0	0	0	0.1000
Mn	2a	0	0	0	0.8000
O	4f	0.6667	0.3333	0.0855	1.0000
a=2.87285 Å		c=11.28654 Å	V=80.7553Å <sup>3</sup>	Rp=1.97%	Rwp=4.17%

**Table S2.** Crystallographic parameters of synthesized P2-Na<sub>0.67</sub>Ni<sub>0.08</sub>Co<sub>0.1</sub>Mn<sub>0.8</sub>Ti<sub>0.02</sub>O<sub>2</sub> (Na811-2%Ti) refined by the Rietveld method.

Space group		P63/mmc [194]			
Atom	site	X	Y	Z	Occ.
Na <sub>f</sub>	2b	0	0	0.25	0.2488
Na <sub>e</sub>	2d	0.3333	0.6667	0.25	0.4212
Ni	2a	0	0	0	0.0783
Co	2a	0	0	0	0.1026
Mn	2a	0	0	0	0.7991
Ti	2a	0	0	0	0.0200
O	4f	0.6667	0.3333	0.0733	1.0000
a=2.88061 Å		c=11.28716 Å	V=81.4129Å <sup>3</sup>	Rp=1.61%	Rwp=4.06%

**Table S3.** Crystallographic parameters of synthesized P2-Na<sub>0.67</sub>Ni<sub>0.05</sub>Co<sub>0.1</sub>Mn<sub>0.8</sub>Ti<sub>0.05</sub>O<sub>2</sub> (Na811-5%Ti) refined by the Rietveld method.

Space group		P63/mmc [194]			
Atom	site	X	Y	Z	Occ.
Na <sub>f</sub>	2b	0	0	0.25	0.2246
Na <sub>e</sub>	2d	0.3333	0.6667	0.25	0.4454
Ni	2a	0	0	0	0.0507
Co	2a	0	0	0	0.0999
Mn	2a	0	0	0	0.7994
Ti	2a	0	0	0	0.0500
O	4f	0.6667	0.3333	0.0733	1.0000

a=2.88150 Å    c=11.28938 Å    V=81.8762Å<sup>3</sup>    Rp=1.89%    Rwp=4.12%

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