## **Supporting information**

## Alkali metal bit lithium doping in [Na<sub>0.57</sub>Li<sub>0.1</sub>]Ni<sub>0.1</sub>Co<sub>0.1</sub>Mn<sub>0.8</sub>O<sub>2</sub> boosting a highstability and improved-kinetics cathode for sodium ion battery

Shu Weiping<sup>1</sup>, Zhang Siqiang<sup>1</sup>, Wang Lili<sup>1</sup>\*, Liu Ye<sup>1</sup>, Han Qiang<sup>2</sup>

(1 School of Mathematics, Physics and Statistics, Shanghai University of Engineering Science,

Shanghai, 201620;<sup>2</sup> Office of Science and Development, Shanghai Donghai Vocational and Technical

College, Shanghai, 200241, China)

\*E-mail: llwang@sues.edu.cn (L. Wang)



Fig S1. (a)Ni 2p and (b) Co 2p XPS fitted spectra of [NL]NCM powder.



Fig S2. SEM image of NNCM powder.



**Fig S3.** (a) CV curves of  $Na_{0.67}Ni_{0.1}Co_{0.1}Mn_{0.8}O_2$  for first three cycles at 0.2 mVs<sup>-1</sup> with voltage window between 1.5-4.2V. (b) In the first 3 cycles of the galvanostatic charge-discharge cycle curve of NNCM, which the voltage window is 1.5-4.2V and the current density is 0.2 C.

Table S1 Lattice parameter table		
	a/b	с
NNCM	2.88	11.267
[NL]NCM	2.85	11.200
Rate of change	1.04%	0.6%