

## SUPPLEMENTARY INFORMATION

### **A safe, convenient liquid phase pre-sodiation method for titanium-based SIB materials**

Yang Cao,<sup>‡a</sup> Tianqi Zhang,<sup>‡a</sup> Xingguo Zhong,<sup>a</sup> Tianyou Zhai,<sup>a</sup> Huiqiao Li<sup>\*a</sup>

<sup>a</sup> State Key Laboratory of Material Processing and Die & Mould Technology, School of Materials Science and Engineering, Huazhong University of Science and Technology, Wuhan 430074, P. R. China. E-mail: [hqli@hust.edu.cn](mailto:hqli@hust.edu.cn)

<sup>‡</sup> Y. Cao and T. Q. Zhang contributed equally to this work

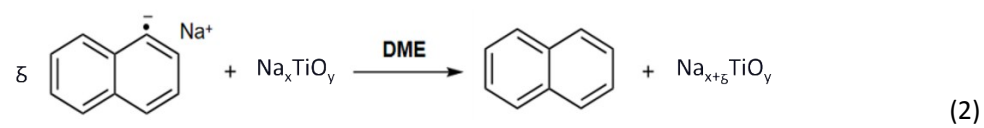
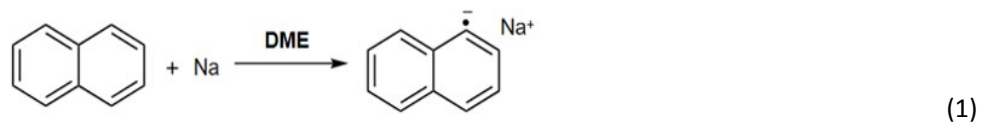
#### Materials synthesis:

$\text{Na}_2\text{Ti}_6\text{O}_{13}$  were synthesized via a hydrothermal method. 20 ml 2.5 M sodium hydroxide was slowly dropped in a mixture solution of 0.68 g tetrabutyl titanate and 20 ml ethylene glycol and stirred for 1.5 h. Then the solution was transferred in a Teflon vessel and placed in autoclave at 200 °C for 10 h. The sample was washed and calcinated at 400 °C for 5 h.

$\text{Na}_2\text{Ti}_3\text{O}_7$  was synthesized through a simple solid-state reaction. The precursors of 6 mmol  $\text{TiO}_2$  (P25, Acros) and 0.222 g anhydrous  $\text{Na}_2\text{CO}_3$  (>99.995%, Aldrich) was mixtured with 10 g NaCl. These mixtures were calcinated at 800 °C for 24 h. Then the as-prepared sample was washed with deionized water and dried at 80 °C.

TiO<sub>2</sub>: P25, purchased from Acros.

**Figure S1.** The chemical process of the dissolution of sodium metal and its sodiation mechanism.



**Figure S2.** (a) Cycle performance at a current of  $100 \text{ mA g}^{-1}$ . (b) Rate discharge capabilities of the pristine and pre-sodiated electrode at the current density of 100, 200, 400, 600, 800, 1000  $\text{mA g}^{-1}$  respectively. (c) Galvanostatic discharge and charge profiles of full cell before and after pre-sodiation. (d) Cycle performance of full cell before and after pre-sodiation with 4M Na-Naph-DME solution.

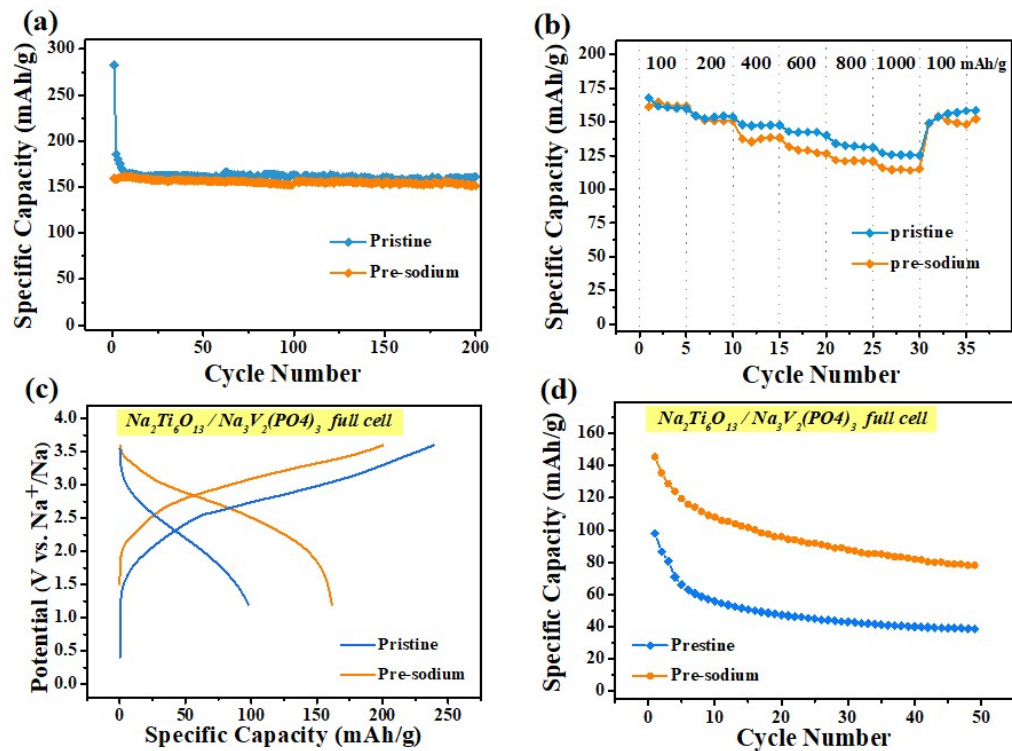


Figure S3. XRD pattern and crystal structure of as prepared  $\text{TiO}_2$  (a, c) and  $\text{Na}_2\text{Ti}_3\text{O}_7$  (b, d) powder. The first galvanostatic discharge and charge profiles of  $\text{TiO}_2$  (e) and  $\text{Na}_2\text{Ti}_6\text{O}_{13}$  (f) before and after pre-sodiation.

