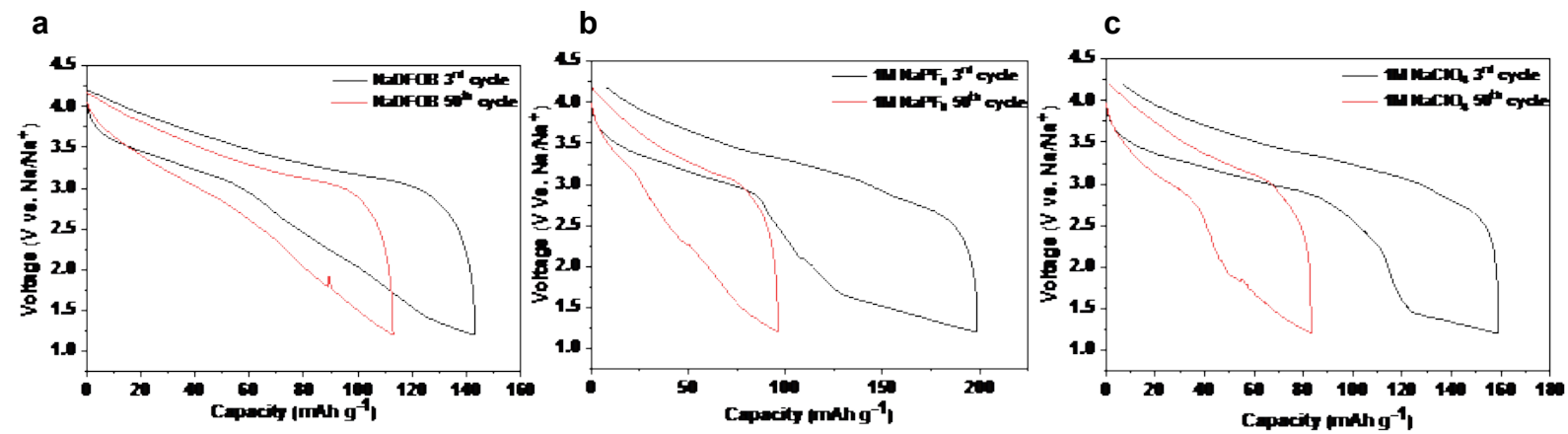
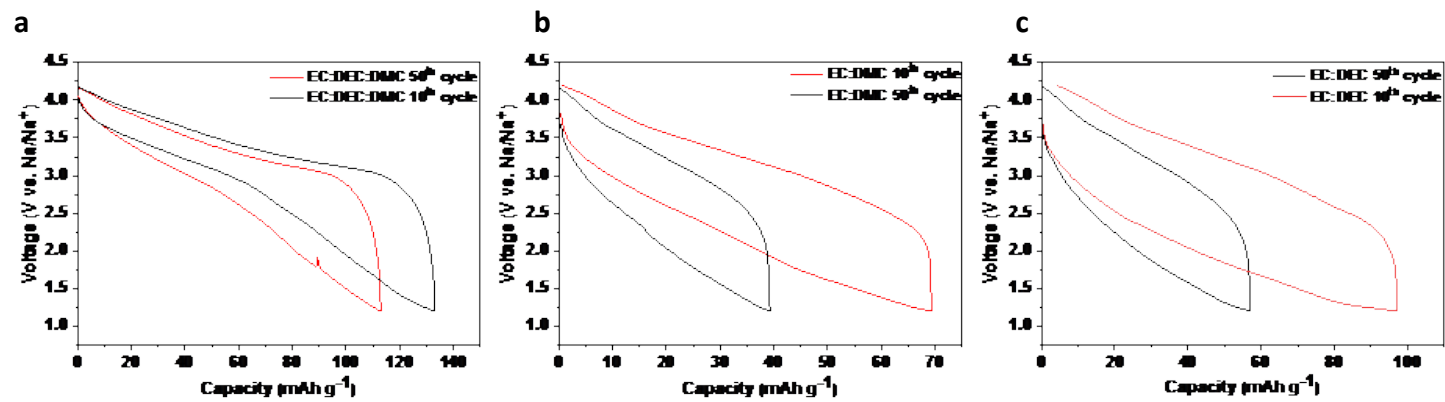


## **Nanoconfined Iron (III) Fluoride Cathode in NaDFOB Electrolyte towards High-Performance Sodium-Ion Batteries**

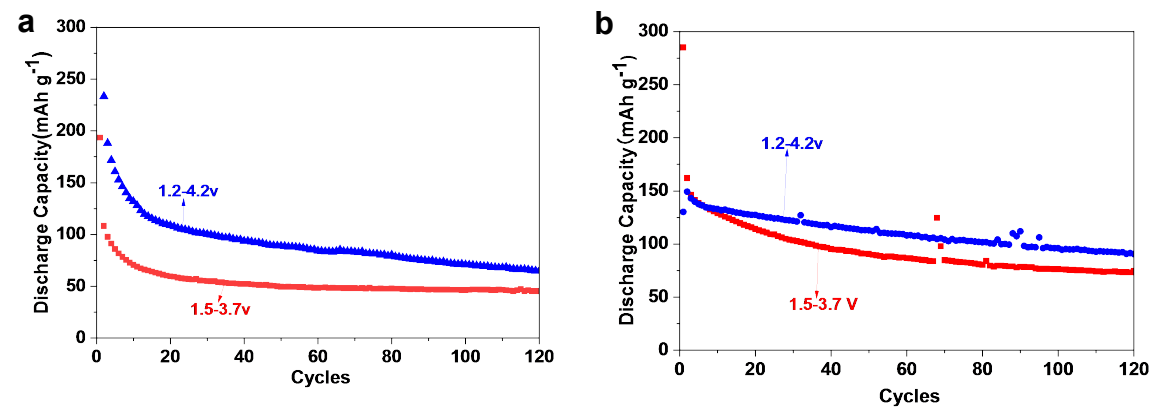
Zifei Sun,<sup>a</sup> Wenbin Fu,<sup>b</sup> Michael. Z. Liu,<sup>b</sup> Peilin Lu,<sup>b</sup> Enbo Zhao,<sup>a</sup> Alexandre Magasinski,<sup>b</sup>  
Mengting Liu,<sup>bc</sup> Shunrui Luo,<sup>bd</sup> Jesse McDaniel<sup>a</sup> and Gleb Yushin<sup>\*b</sup>



**Figure S1.** Capacity comparison between 3<sup>rd</sup> and 50<sup>th</sup> cycle under 1.2-4.2 V for salts dissolved in EC:DEC:DMC=2:1:1. a) 1M NaDFOB b) 1M NaPF<sub>6</sub> c) 1M NaClO<sub>4</sub>



**Figure S2.** Capacity comparison between 10<sup>th</sup> and 50<sup>th</sup> cycle under 1.2-4.2 V for the same salt dissolved in different solvents a) EC:DEC:DMC=2:1:1 b) EC:DEC=1:1 c) EC:DMC=1:1



**Figure S3.** a) discharge capacity for 1M NaDFOB under different voltage ranges b) discharge capacity for 1M NaClO<sub>4</sub> under different voltage ranges

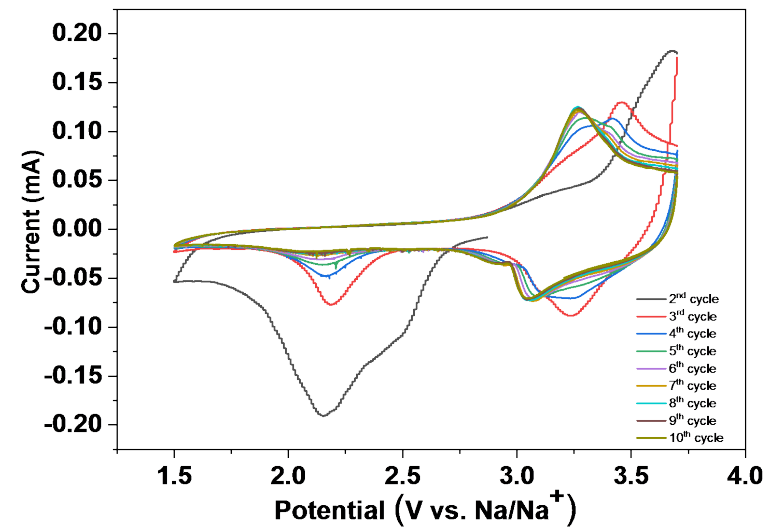
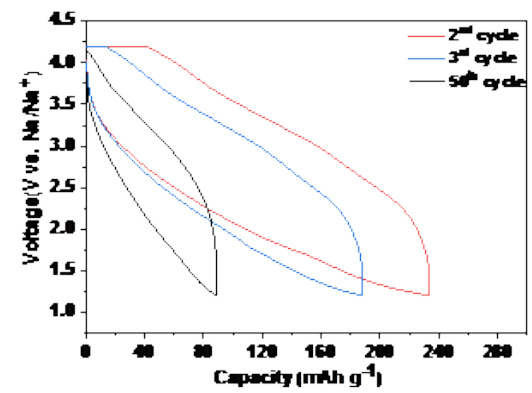
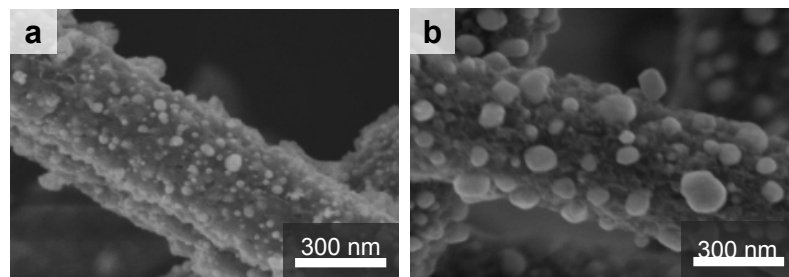


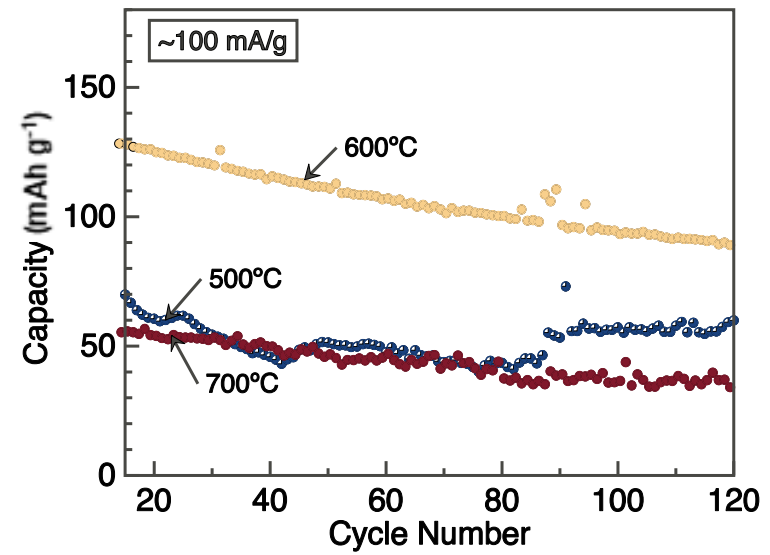
Figure S4. CV diagram of NaDFOB cell under the voltage range of 1.5-3.7 V.



**Figure S5.** Charge/discharge curve for cells under 1.2-4.2v at 2<sup>nd</sup>, 3<sup>rd</sup> and 50<sup>th</sup> cycle using 1M NaClO<sub>4</sub>.

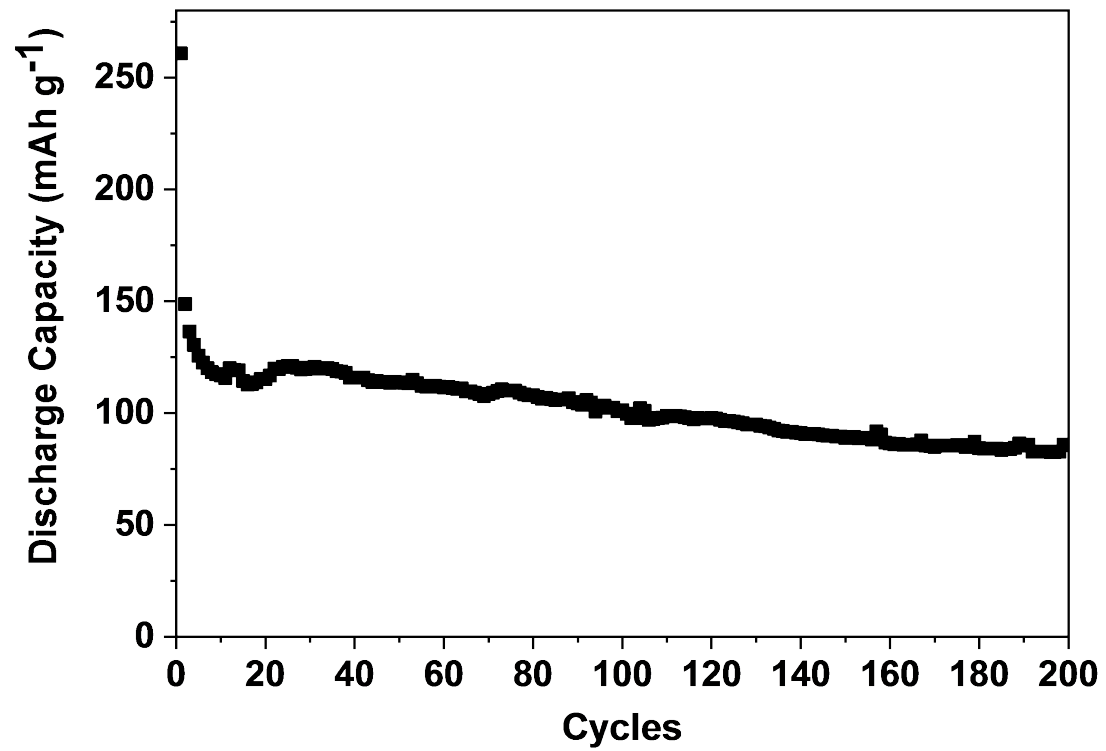


**Figure S6.** SEM of FeF<sub>3</sub>/CNFs using carbonization temperature at a) 500 °C, b) 700 °C.

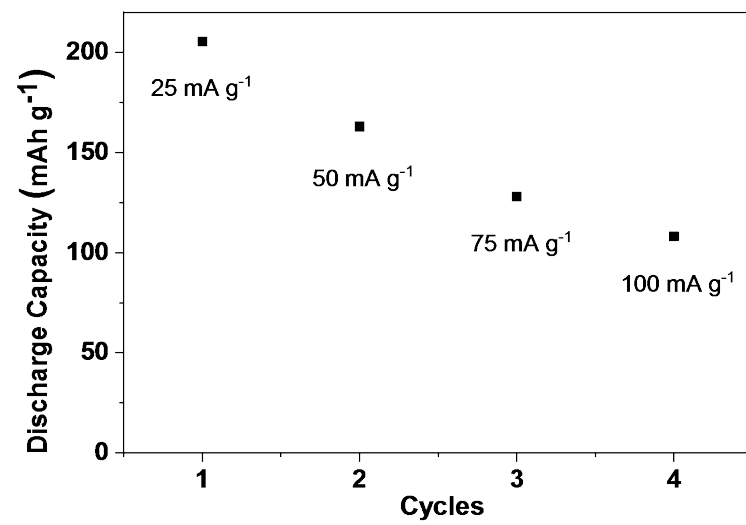


**Figure S7.** Capacity comparison of cathode materials made from different temperature.

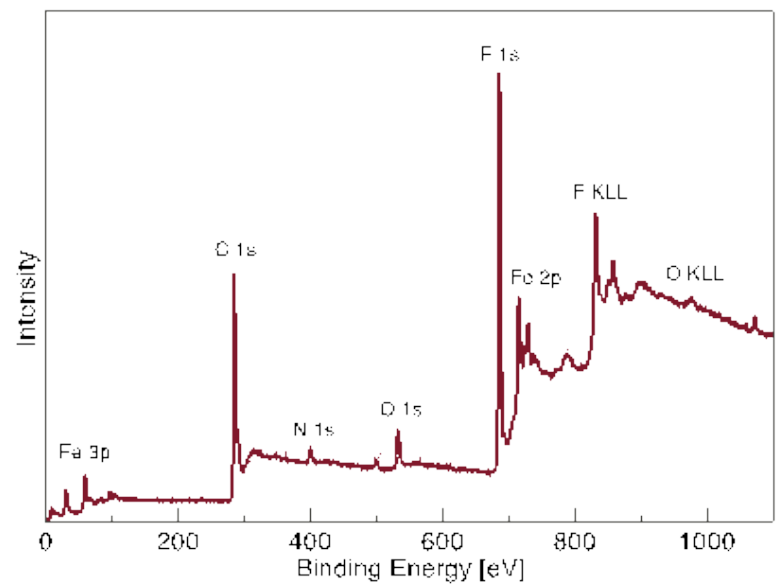




**Figure S8.** Long-term testing at  $100 \text{ mA g}^{-1}$  for NaDFOB cells under the voltage range of 1.2-4.2 V.



**Figure S9.** Rate capacity testing for NaDFOB cells under the voltage range of 1.2-4.2 V.



**Figure S10.** XPS for bare FeF<sub>3</sub>