Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Support Information for

Iron-Based Sodium-Ion Full Batteries

Hualin Ye, Yeyun Wang, Feipeng Zhao, Wenjing Huang, Na Han, Junhua Zhou, Min Zeng, Yanguang Li*

Institute of Functional Nano & Soft Materials (FUNSOM), Soochow University, Suzhou 215123, China

E-mail: yanguang@suda.edu.cn

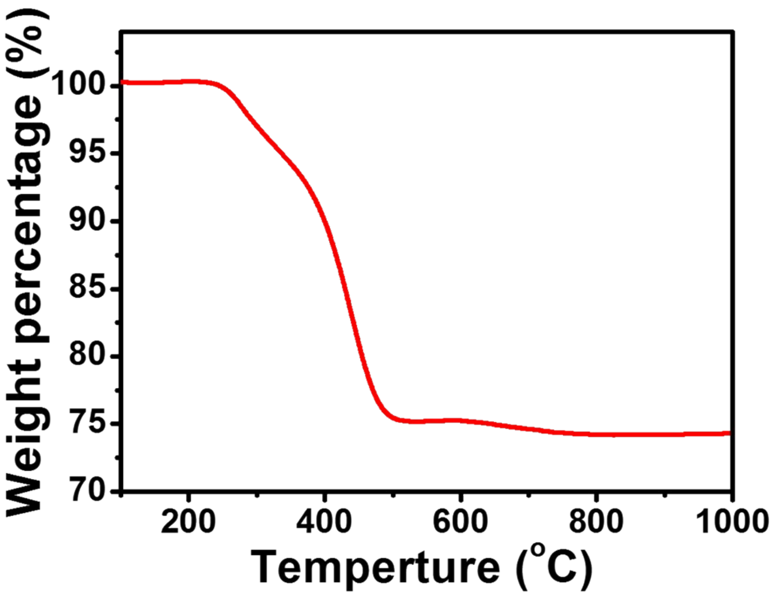

Figure S1. Thermogravimetric (TGA) curve of CNT/FeO_x in air.

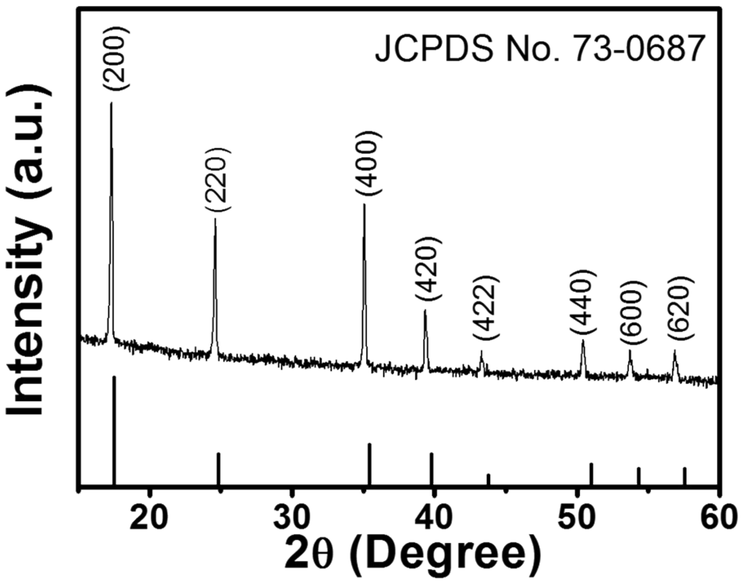

Figure S2. XRD pattern of $Na_xFeFe(CN)_6$ powders.

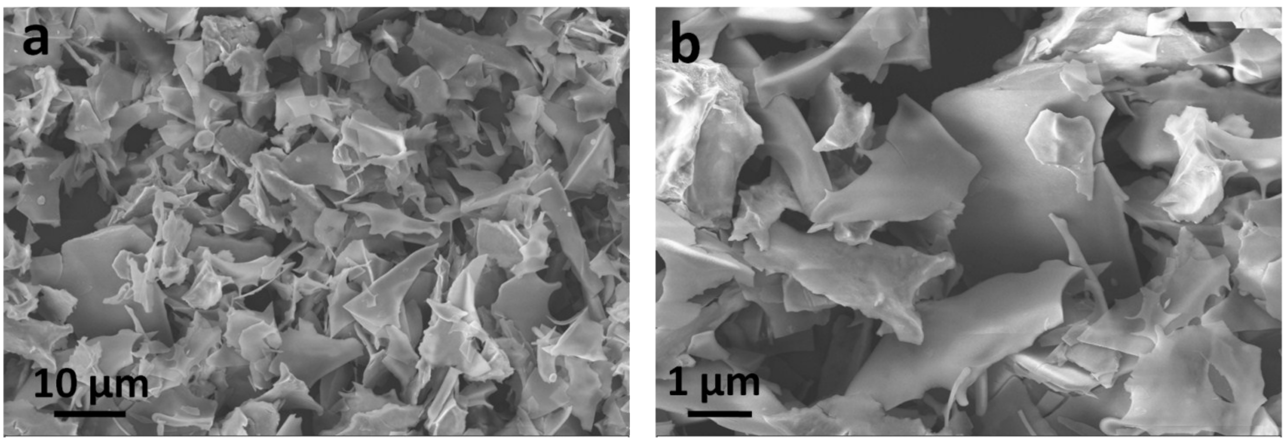

Figure S3. SEM images of FeO_x prepared in the absence of CNTs.

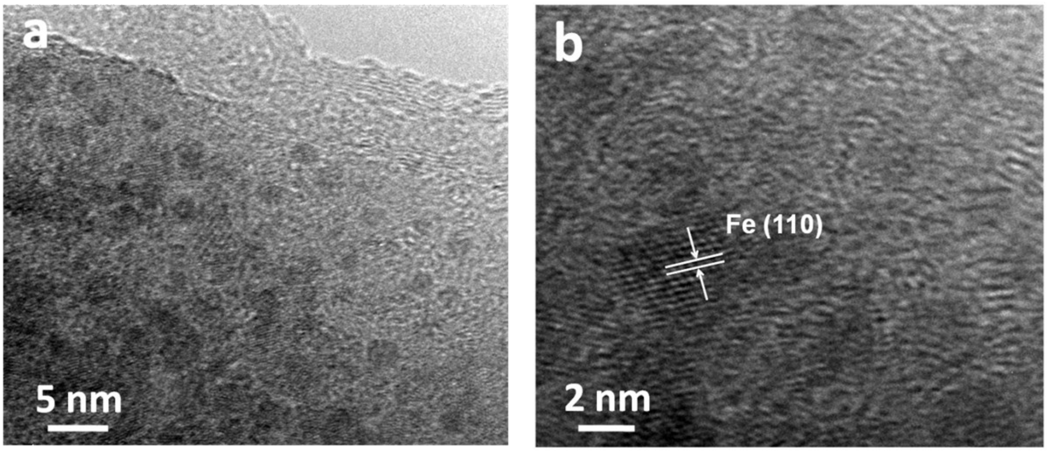

Figure S4. TEM images of CNT/FeO_x hybrid materials after the initial discharge. These dark particles correspond to metallic Fe as the discharge product.

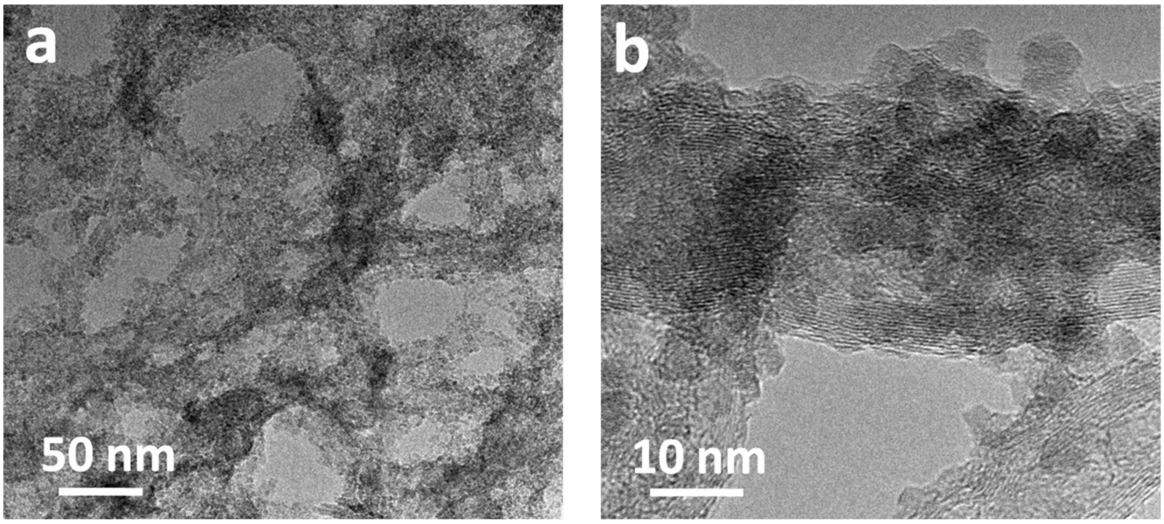

Figure S5. TEM images of CNT/FeO_x after 100 charge/discharge cycles. They suggest the preservation of electrode material integrity even after extended cycling.

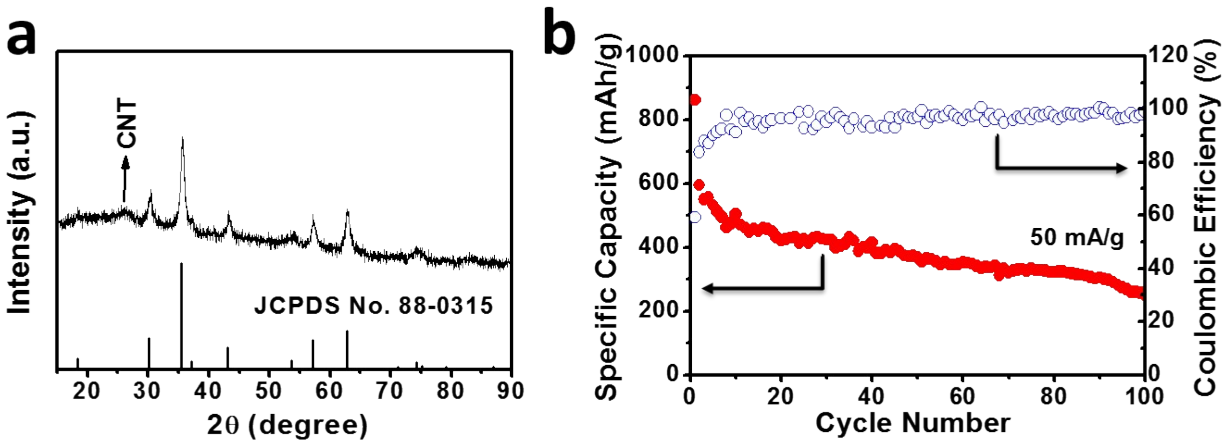

Figure S6. (a) XRD pattern of annealed composite suggesting the formation of Fe_3O_4 phase. (b) Cycling performance and coulombic efficiency of annealed composite at a specific current of 50 mA/g. The material was prepared by annealing as-prepared CNT/FeO_x composite under Ar at 500°C for 2 h.

Table R1. Summary of previous works on Fe_2O_3 or Fe_3O_4 anode materials and Prussian blue (PB) cathode materials for Na-ion batteries.

	Materials	Specific capacity (mAh/g)	Capacity retention (%)	Reference
Prussian blue cathodes	**PB nanocubes**	**120 @25 mA/g**	**100% after 200 cycles@90mA/g**	**Our work**
	PB/C composite	87@9 mA/g	88% after 500 cycles@90 mA/g	*Adv. Energy Mater.*, 2012, 2, 410.
	$Na_{1.63}FeFe(CN)_6$ nanocubes	150@25 mA/g	90% after 200 cycles@25 mA/g	*Nano Res.*, 2014, 8, 117.
	$Na_{1.72}MnFe(CN)_6$ nanocubes	121@6 mA/g	96% after 30 cycles@6 mA/g	*Angew. Chem.,* 2013, 52, 1964.
	$Na_xFeFe(CN)_6$ nanocubes	120@200 mA/g	76% after 100 cycles@200 mA/g	*Nano Energy,* 2015, 12, 386.
Iron oxide anodes	**Amorphous CNT/ FeO_x nanocomposites**	**410@50 mA/g**	**88% after 200 cycles@1 A/g**	**Our work**
	Fe_2O_3 nanoclusters	400@40 mA/g	71% after 60 cycles@130 mA/g	*J. Power Sources,* 2014, 245, 967.
	RGO/Fe_3O_4 nanocomposites	204@40 mA/g	54% after 200 cycles@40 mA/g	*J. Mater. Chem. A,* 2015, 3, 4793.
	γ-Fe2O3@C nanocomposites	737@200 mA/g	98% after 200 cycles@200 mA/g	*Adv. Energy Mater.,* 2015, 5, 1401123.
	α-Fe_2O_3/rGO nanocomposites	310@20 mA/g	76% after 150 cycles@100 mA/g	*J. Power Sources,* 2015, 280, 107.