Electronic Supplementary Material (ESI) for Nanoscale Horizons.

Supporting Information

Achieving high-performance Prussian blue analogue cathode with ultra-stable redox reaction for ammonium ion storage

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Supporting Figures

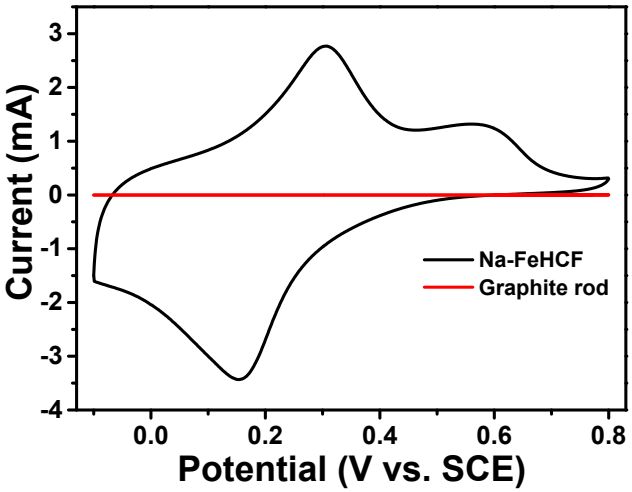

Figure S1. CV comparison of ball-cutting Na-FeHCF electrode and griphite rod (current collector).

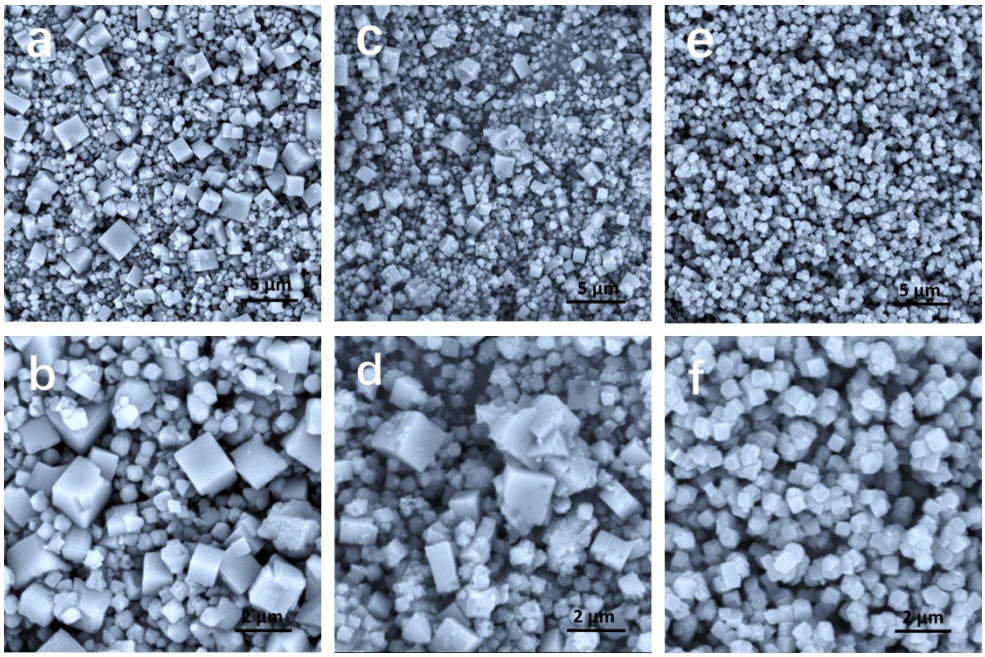

Figure S2. SEM images at different magnification: a,b) Na-FeHCF-0. c,d) Na-FeHCF-400. e,f) Na-FeHCF-800.

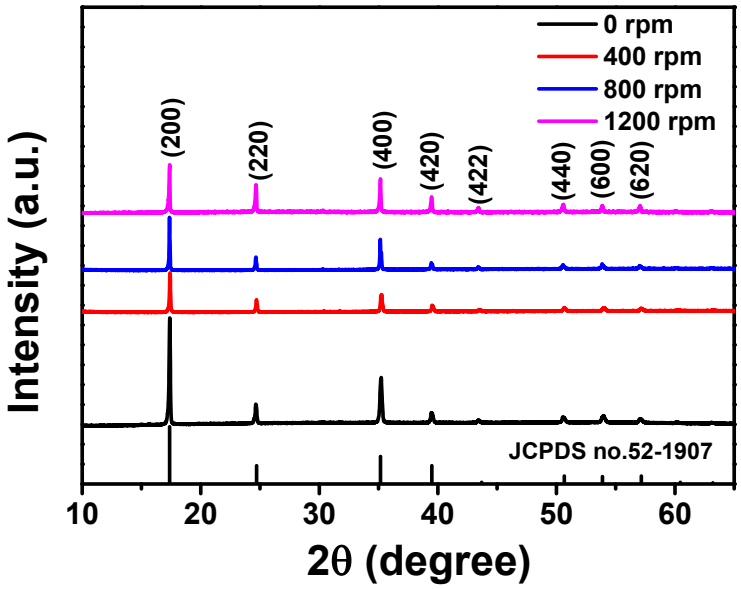

Figure S3. XRD patterns of Na-FeHCFs at various stirring speeds.

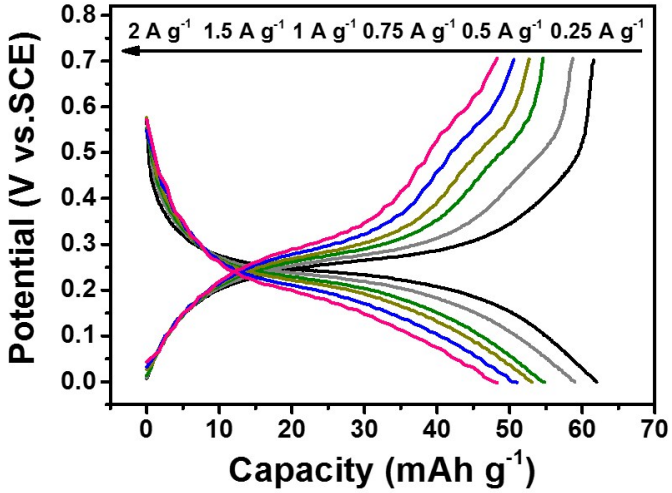

Figure S4. GCD profiles of ball-cutting Na-FeHCF nanocubes electrode at various current density.

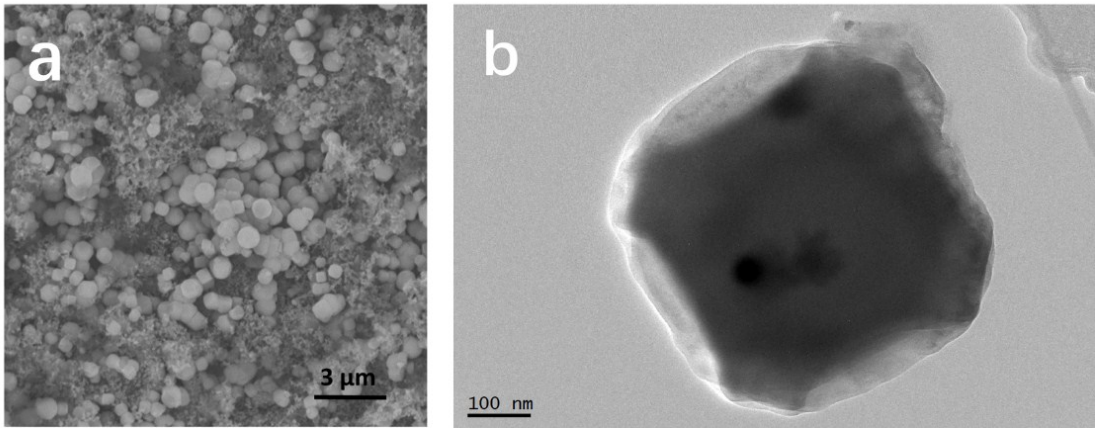

Figure S5. SEM and TEM images of ball-cutting Na-FeHCF electrode after 50000 cycles.

Table S1. Performance comparison of ball-cutting Na-FeHCF nanocubes with some reported cathode for aqueous batteries.

Sample	Charge carriers	Discharge capacity (mAh g^{-1})	Capacity retention	Reference
$K_{0.71}Cu[Fe(CN)_6]_{0.72} \cdot 3.7H_2O$	K^+	59 (50 mA g^{-1}), 40.1 (500 mA g^{-1})	83% after 40000 cycles	1
$Na_3MnTi(PO_4)_3$	Na^+	58.4 (29 mA g^{-1})	N.A.	2
$K_{0.1}Cu[Fe(CN)_6]_{0.7} \cdot 3.6H_2O$	Mg^{2+}	50 (100 mA g^{-1}), 37 (1000 mA g^{-1})	N.A.	3
$K_{0.71}Cu[Fe(CN)_6]_{0.72} \cdot 3.7H_2O$	Zn^{2+}	56 (60 mA g^{-1}), 44 (600 mA g^{-1})	75% after 100 cycles	4
$KCu[Fe(CN)_6] \cdot 8H_2O$	Al^{3+}	62.8 (50 mA g^{-1}), 46.9 (400 mA g^{-1})	54.9% after 1000 cycles	5
$(NH_4)_{1.47}Ni[Fe(CN)_6]_{0.88} \cdot 3.2H_2O$	NH_4^+	60 (150 mA g^{-1}), 22 (1800 mA g^{-1})	74% after 1000 cycles	6
$NaFe^{III}[Fe^{II}(CN)_6] \cdot 2.7H_2O$	**NH_4^+**	**62 (250 mA g^{-1}), 48 (2000 mA g^{-1})**	**109% after 50000 cycles**	**This work**

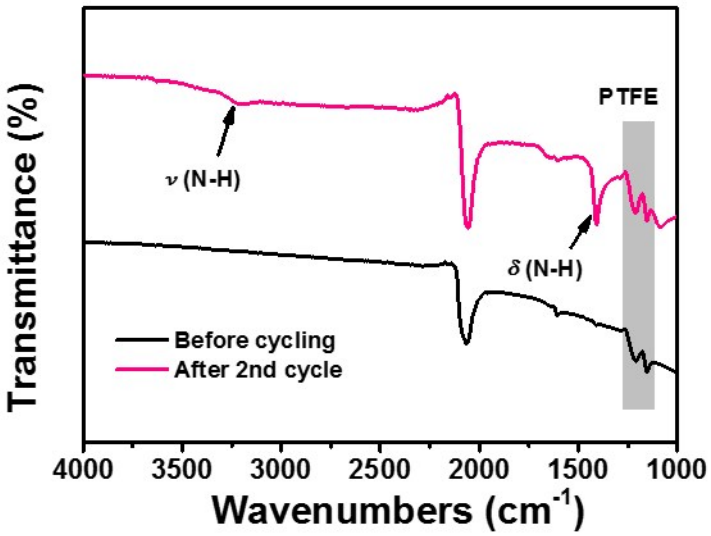

Figure S6. FTIR analysis of ball-cutting Na-FeHCF electrode before cycling and after 2nd cycle.

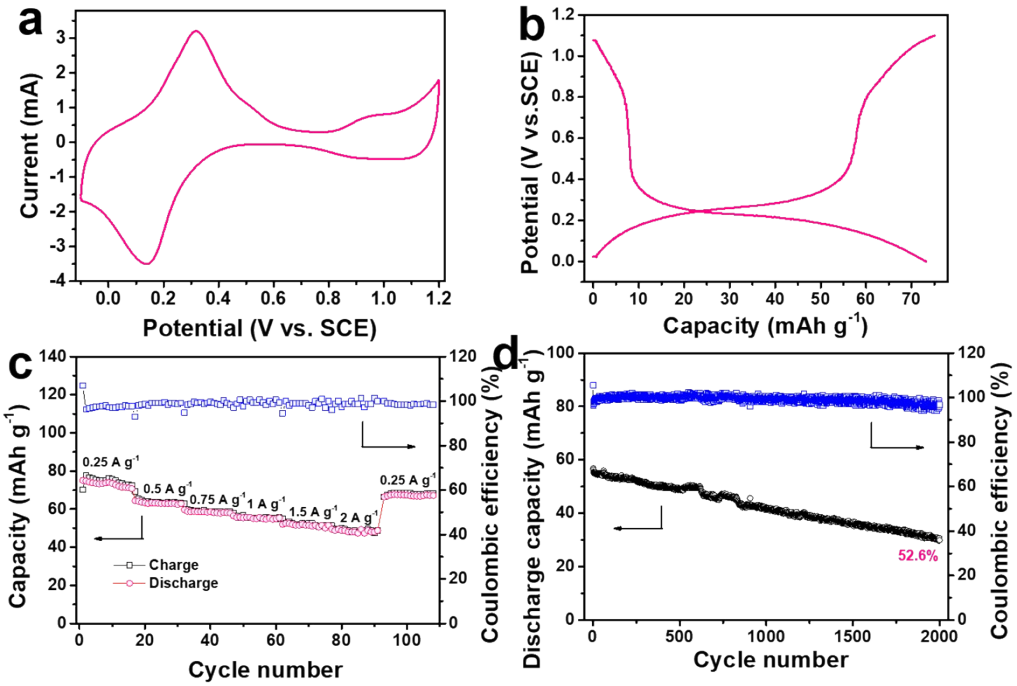

Figure S7. Electrochemical performance of ball-cutting Na-FeHCF electrode for two electrons transferred: a) The CV curve at 5 mV s^{-1}. b) GCD profile at 0.25 A g^{-1}. c) rate performance. d) Long-term cycling performance at 1 A g^{-1}. The mass of active material is 1.1 mg.

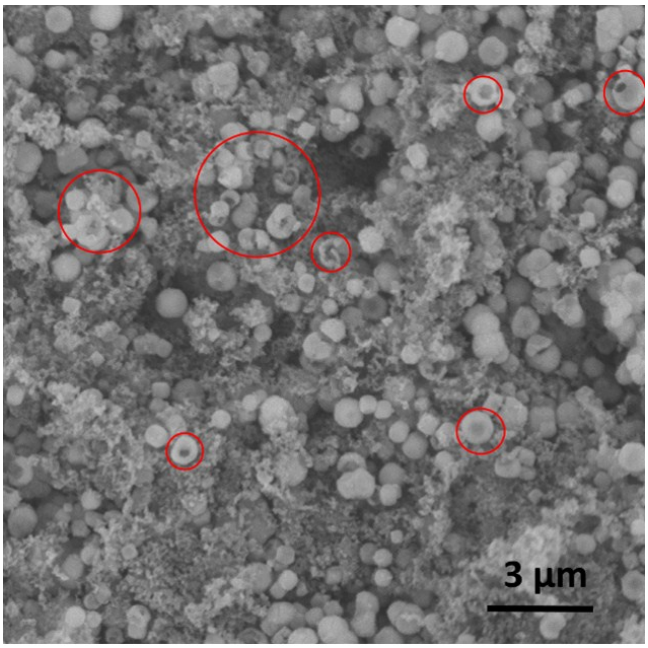

Figure S8. SEM image of ball-cutting Na-FeHCF electrode for two electrons transferred after 2000 cycles.

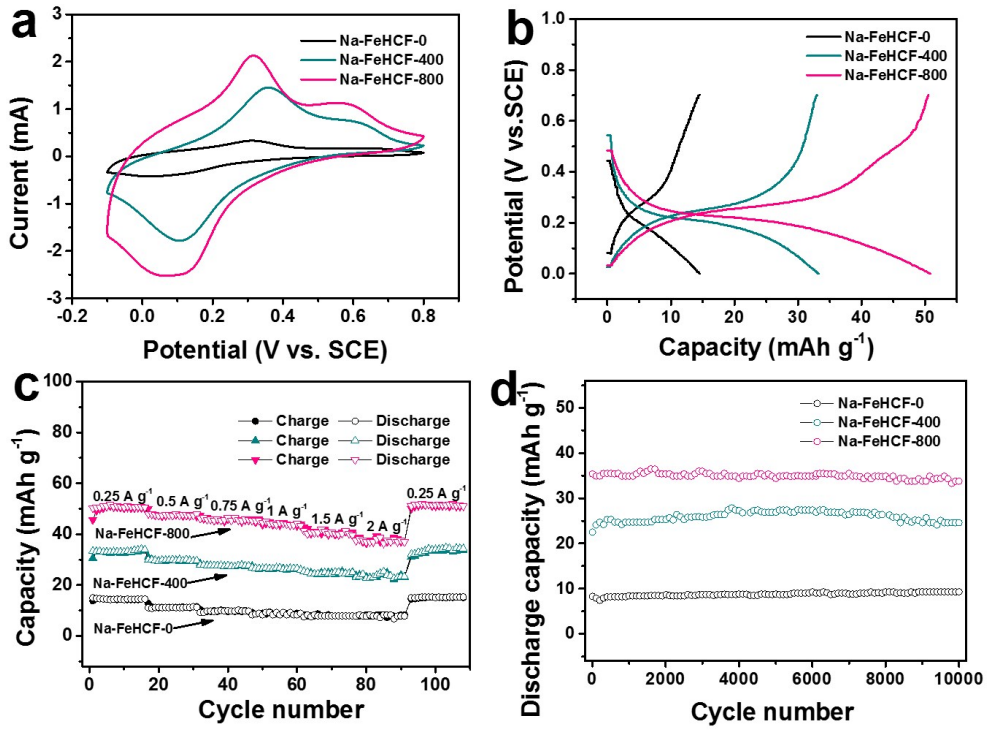

Figure S9. Electrochemical performance of Na-FeHCF-0, Na-FeHCF-400, and Na-FeHCF-800: a) CV curves at 5 mV s^{-1}. b) GCD profiles at 0.25 A g^{-1}. c) rate performance. d) Long-term cycling performance at 2 A g^{-1}.

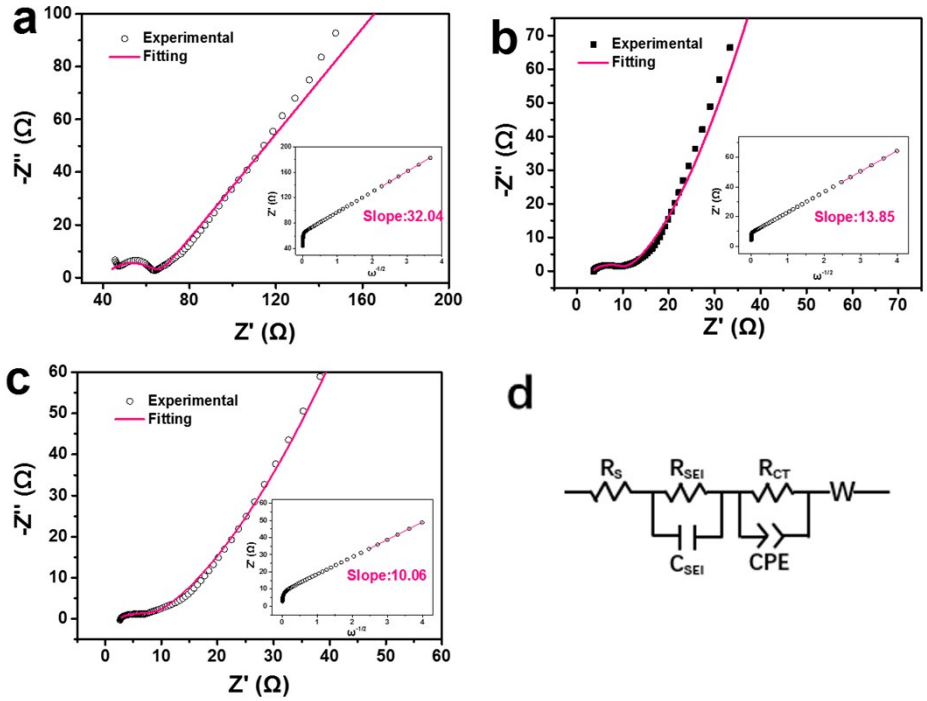

Figure S10. Nyquist and fitting plots: a) Na-FeHCF-0, b) Na-FeHCF-400, and c) Na-FeHCF-800 electrodes (insets are relationships between Z' and angular frequency). d) Corresponding equivalent electric circuit.

References

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