Supplementary Information

Bamboo-structured N-doped CNTs/$FeF_3 \cdot 0.33H_2O$ derived from melamine as a high-performance cathode for Li-ion batteries

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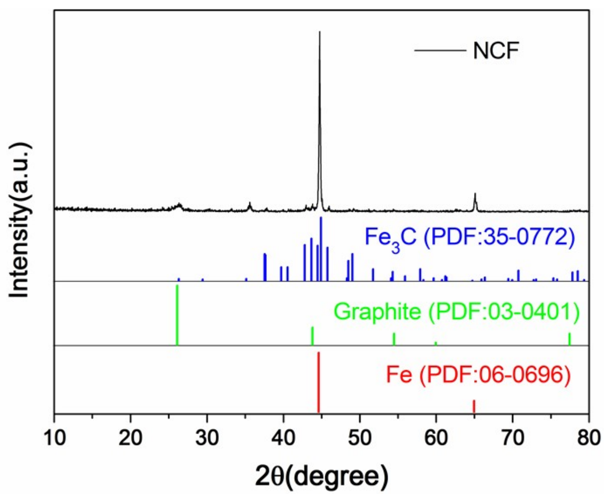

Fig. S1. XRD pattern of NCF

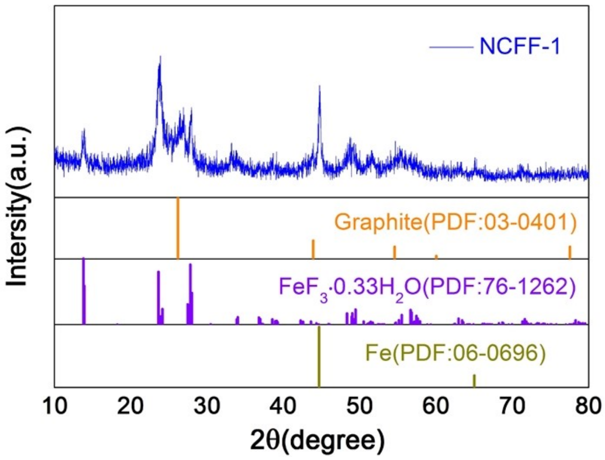

Fig. S2 XRD pattern of NCFF-1

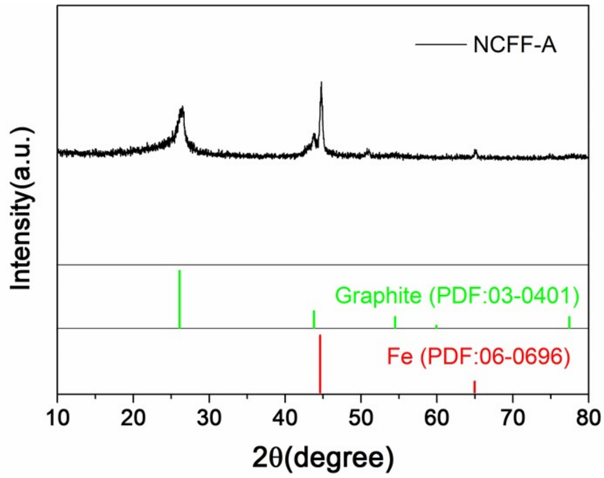

Fig. S3. XRD pattern of NCFF-A

The NCFF sample was washed by dilute nitrite acid to remove the $FeF_3 \cdot 0.33H_2O$ and the NCFF-A was obtained. It can be found that the diffraction peaks of the NCFF-A are similar to NCF, which is composed of CNTs and Fe.

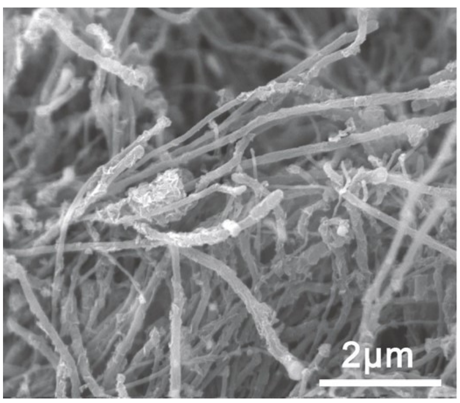

Fig. S4. SEM image of NCF.

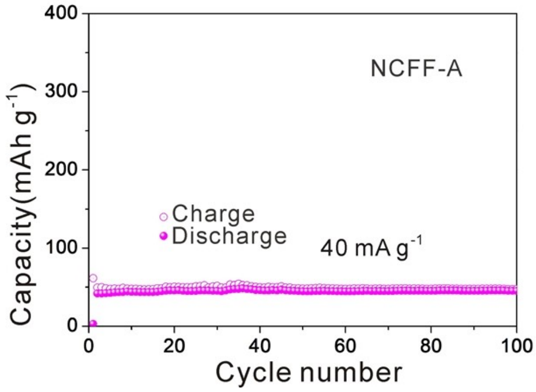

Fig. S5. Cycling performance of NCFF-A

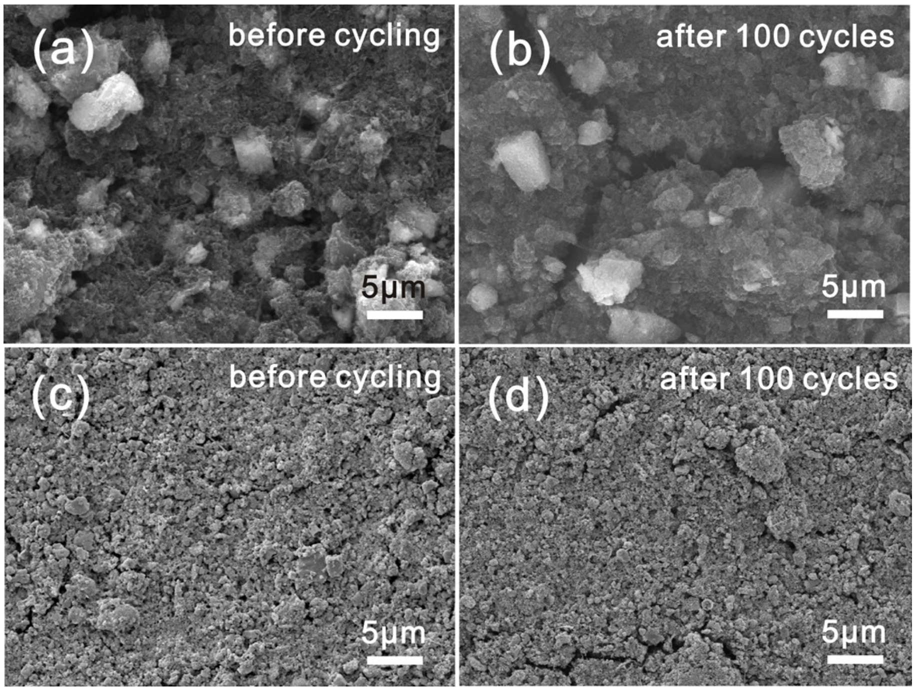

Fig. S6. SEM images of NCFF-1 (a, b) and NCFF (c, d) electrodes surface before cycling and after 100 cycles at 40 mA g^{-1}.

Compared with the NCFF-1 electrode, it can be observed that NCFF electrode has no obvious change after 100 cycles in comparison with fresh electrode, indicating that the structural stability can be maintained by vapor-solid fluoridation.

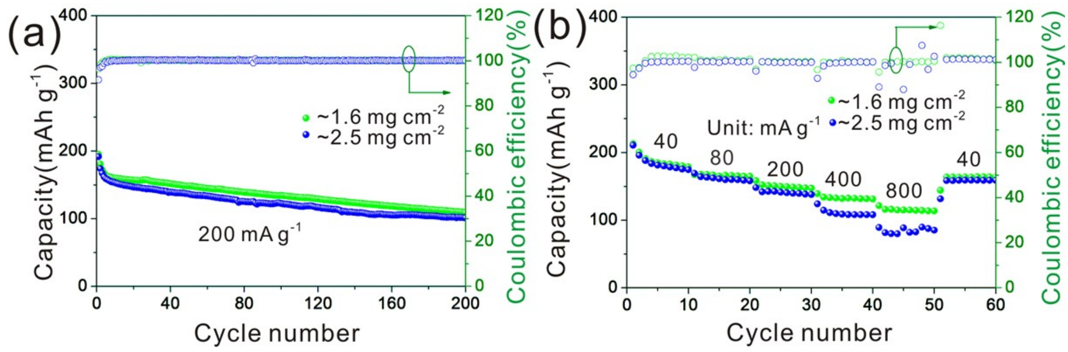

Fig. S7. Cycling performances and rate performances of NCFF for different mass loading.

Table S1. Comparison of electrochemical parameters for $FeF_3·0.33H_2O$ cathode materials reported in the literatures and this work

Sample	Current density(mA g^{-1})	Voltage range(V)	Cycle No.	Discharge capacity(mAh g^{-1})	Ref.
$FeF_3·0.33H_2O$/porous graphene/CNT	200	1.7-4.5	100	120	[1]
$FeF_3·0.33H_2O$/G/CNT	47.4	1.8-4.5	50	193.1	[2]
$FeF_3·0.33H_2O$ nanosheet/GQDs	400	1.7-4.5	1000	96	[3]
$FeF_3·0.33H_2O$@3D porous carbon	200	2.0-4.5	200	148.3	[4]
$FeF_3·0.33H_2O$/porous carbon	200	1.7-4.5	50	162	[5]
$FeF_3·0.33H_2O$/SP single crystal	20	2.0-4.5	100	167	[6]
$FeF_3·0.33H_2O$/rGO	100	1.7-4.5	100	175	[7]
$FeF_3·0.33H_2O$/Ag/SP	23.7	2.0-4.5	50	128.4	[8]
$FeF_3·0.33H_2O$@CNHs	200	1.7-4.5	50	154	[9]
$FeF_3·0.33H_2O$/MCNTs	20	2.0-4.3	50	90.5	[10]
NCFF	40	2.0-4.5	100	160.7	This work

References

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