Supporting Information

Flower-like carbon confined disordered rock-salt $LiVO_2$ anode with sandwich structure for fast-charging and stable lithium storage

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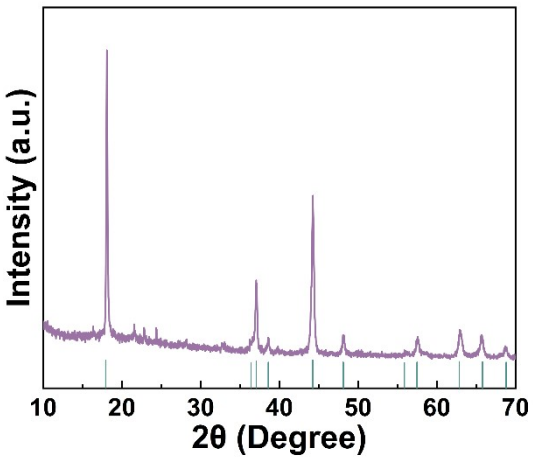

Fig. S1. XRD pattern of $LiVO_2$.

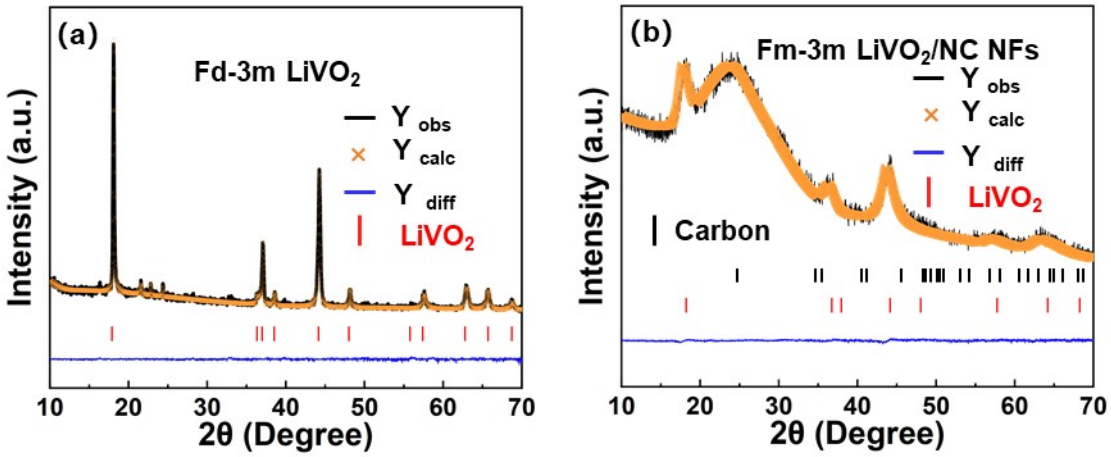

Fig. S2. Rietveld refinement of the XRD patterns for LVO_2 and $LiVO_2$/NC NFs.

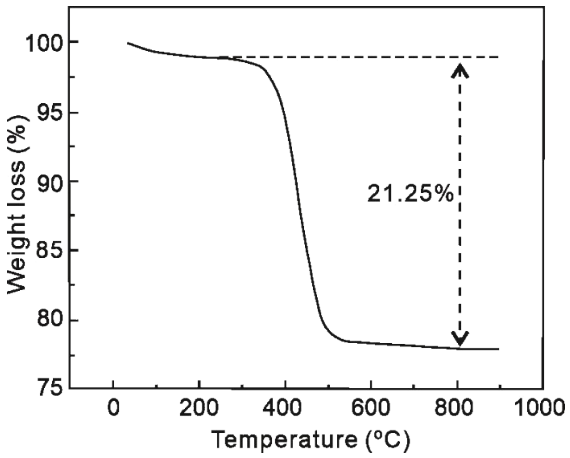

Fig. S3. TG curve of $LiVO_2$/NC NFs.

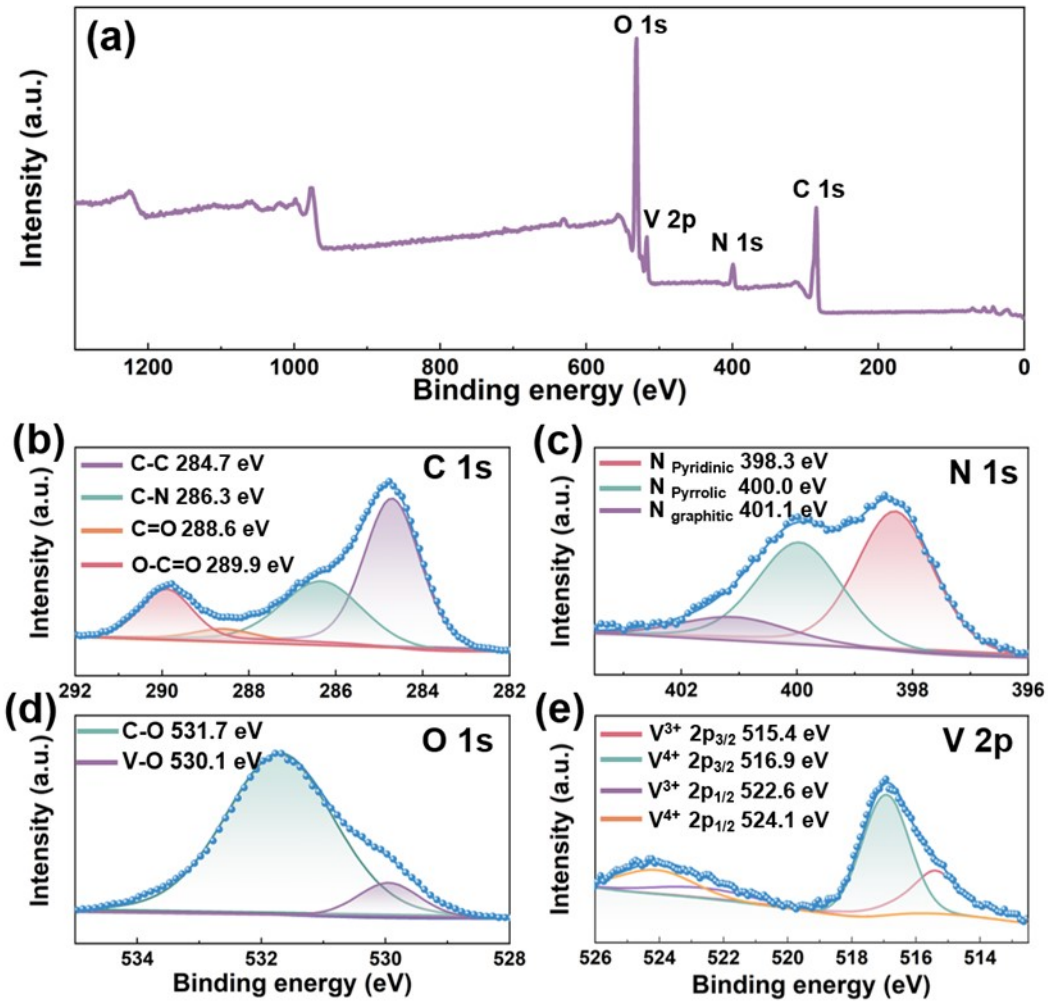

Fig. S4. (a) Survey XPS spectrum of $LiVO_2$/NC NFs, high-resolution XPS spectra of (b) C 1s, (c) N 1s, (d) O 1s and (e) V 2p.

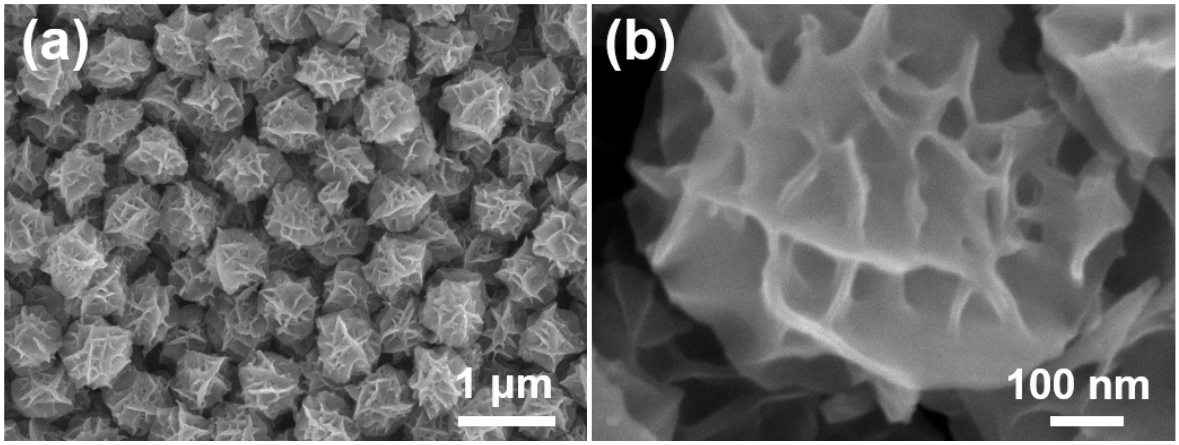

Fig. S5. SEM images of the NC NFs at low (a) and high (b) magnification.

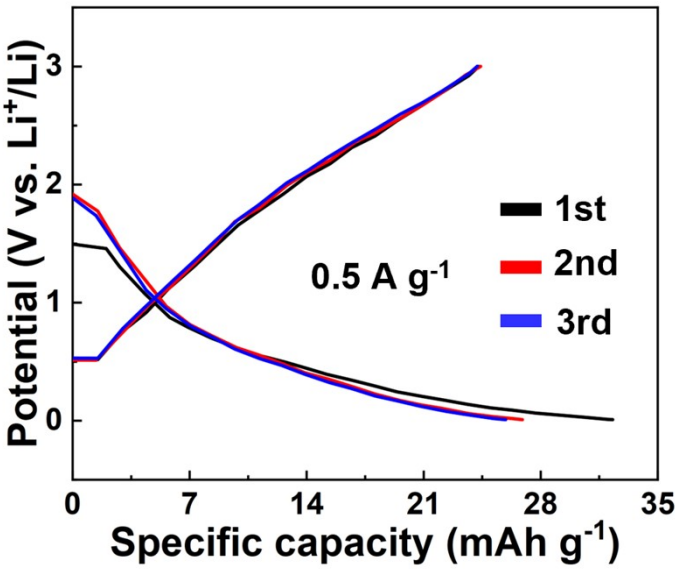

Fig. S6. The charge and discharge curves of pristine $LiVO_2$.

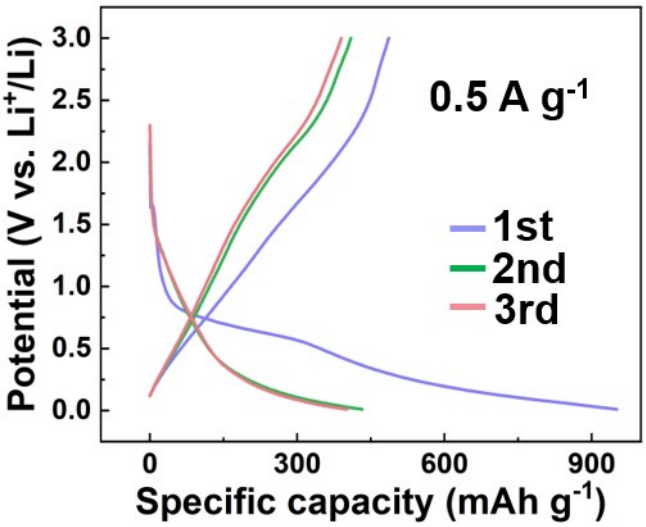

Fig. S7. Initial galvanostatic charge/discharge curves of the NC NFs at 0.5 A g^{-1}.

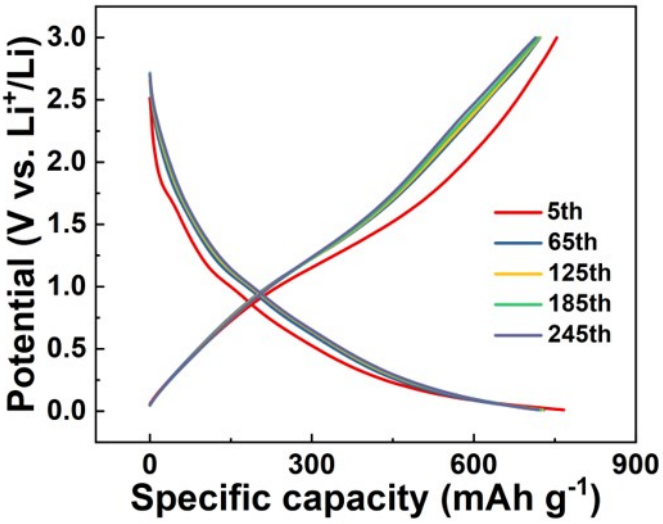

Fig. S8. Representative charge/discharge curves of the $LiVO_2$/NC NFs electrode at a specific current of 0.5 A g^{-1} during the 4 periodic rate tests.

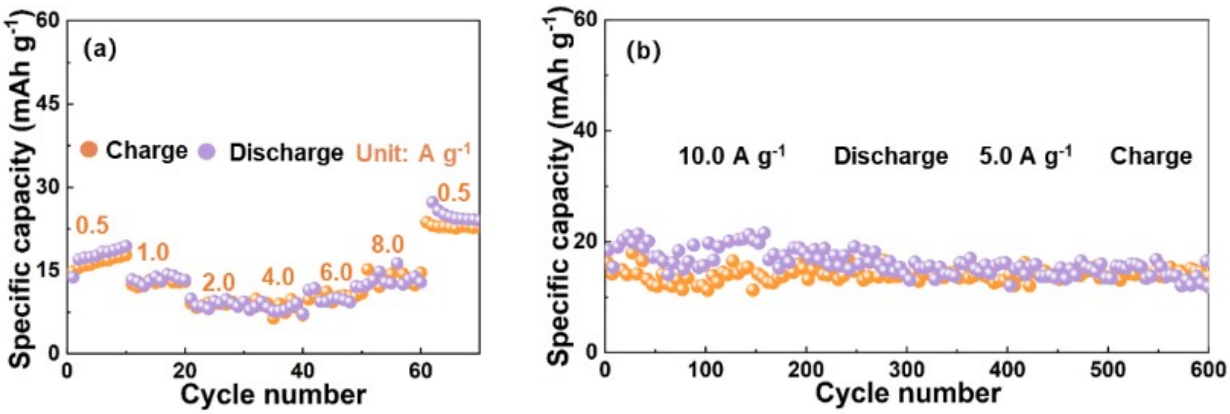

Fig. S9. The electrochemical performance of $LiVO_2$, (a) rate performance at various current densities, (b) long cycling performance at high current density.

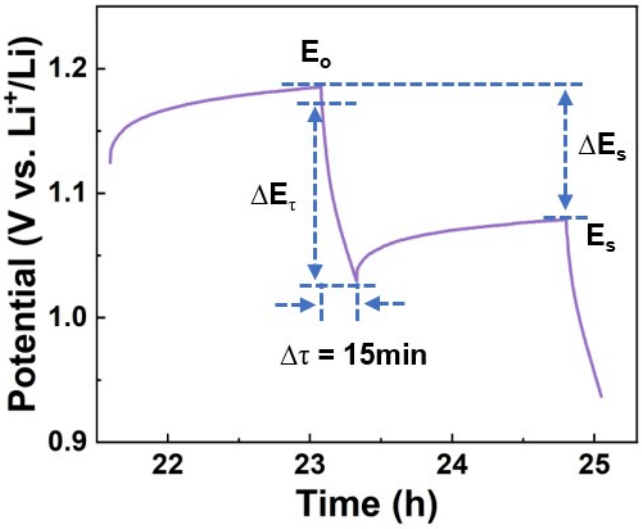

Fig. S10. A single GITT procedure for the $LiVO_2$/NC NFs electrode during the discharge process.

Table S1. Description of the Hamilton's test[1] and its application regarding the R_{Bragg} differences between theFm-3m and Fd-3m refinements.

Hamilton's test		
Aim	**Formula**	**Method**
To define the pertinence of the addition of new parameters in the refinement	Hypothesis dimension: $h = m_a - m_b$ $m_{a,b}$: number of refined parameters in case a or b	1) Calculation of the relation between the R_{Bragg}-factor of both cases 2) Confrontation of this relation and the Hamilton's confidence coefficient
	N number of degrees of freedom: $N = n - h$ n: number of reflections	
	Confidence coefficient: $R_{h,N,\alpha}$ α: level of trust (1, 5, 10%, …)	

Comparison of the 2 refinement models	
a = Fd-3m	
B = Fm-3m	
R_{Bragg} a	7.61
R_{Bragg} b	5.24
R a/b	1.45
ma=	13
mb=	11
h=	2
n=	18
N=	16
$R_{h,N,1\%}$=	1.382
$R_{h,N,5\%}$=	1.295
$R_{h,N,10\%}$=	1.113

Actually, the XRD patterns of $LiVO_2$ and $LiVO_2$/NC NFs are similar. Rietveld refinements were thus undertaken to discriminate both space groups. Results point towards the Fm-3m space group by comparison of the *R* factors (Residual Error of Fit) obtained (5.24% vs. 7.61% for Fd-3m). Following the Hamilton's test, this *R* difference is significant enough to confirm that the disordered rock salt phase was synthesized.

Table S2. Results of refinement of LVO_2 and $LiVO_2$/NC NFs.

Sample	**Space Group**	**α， β， γ**	**a**	**b**	**c**
[2]Reported $LiVO_2$	R-3m	90, 90, 120	2.84066	2.84066	14.81506
$LiVO_2$	Fd-3m	90, 90, 90	8.21719	8.21719	8.21719
$LiVO_2$/NC NFs	Fm-3m	90, 90, 90	4.11435	4.11435	4.11435

Reference:

1. W. C. Hamilton, Acta Cryst., 1965, 18, 502-510.

2. C. Johann, B. Christian H. C. Jin, et al., J. Phys. Chem. C 2020, 124, 3, 2229–2237.