Electronic Supplementary Information

In situ formation of porous $LiCuVO_4/LiVO_3/C$ nanotubes as high-capacity anode material for lithium ion batteries

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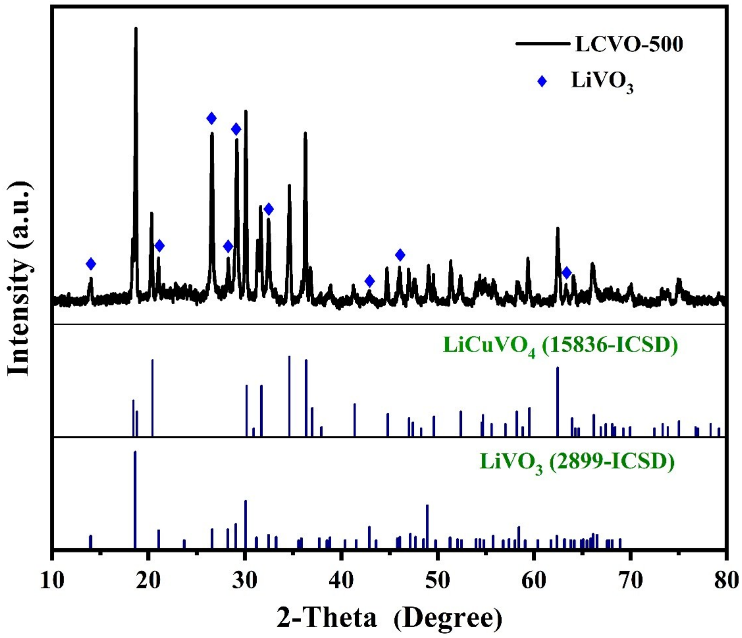

Figure S1 The X-ray diffraction pattern of LCVO-500.

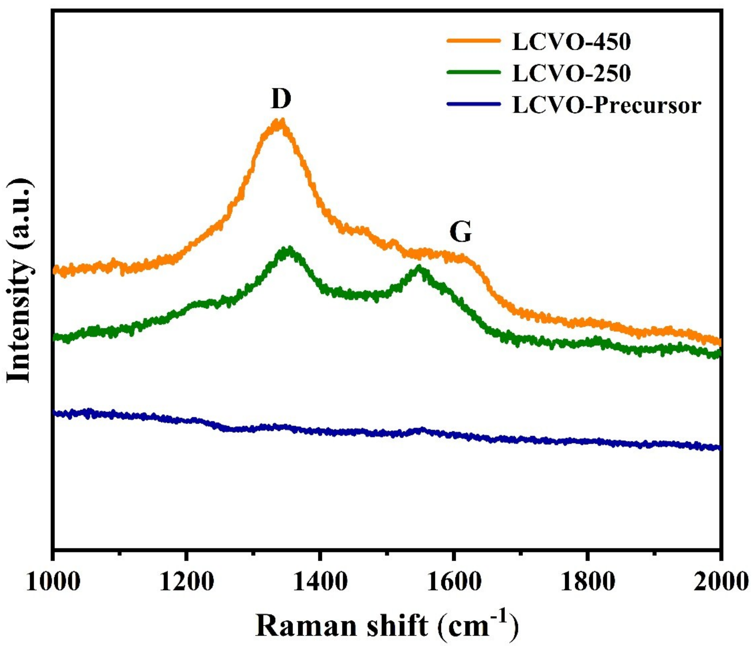

Figure S2. Raman scattering spectra of the LCVO-450, LCVO-250 and LCVO-precursor.

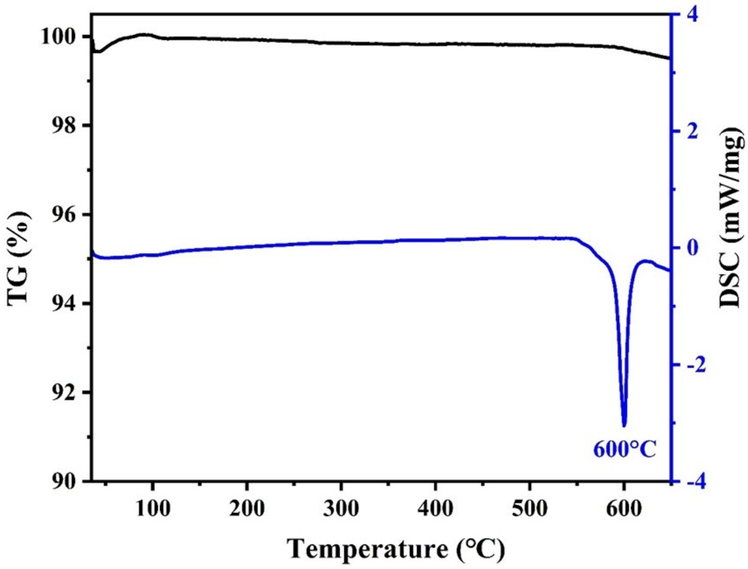

Figure S3. TG/DSC curve of the LCVO-500 annealed from room temperature to 650 ˚C at a temperature ramping rate of 10 ˚C min^{-1} in air.

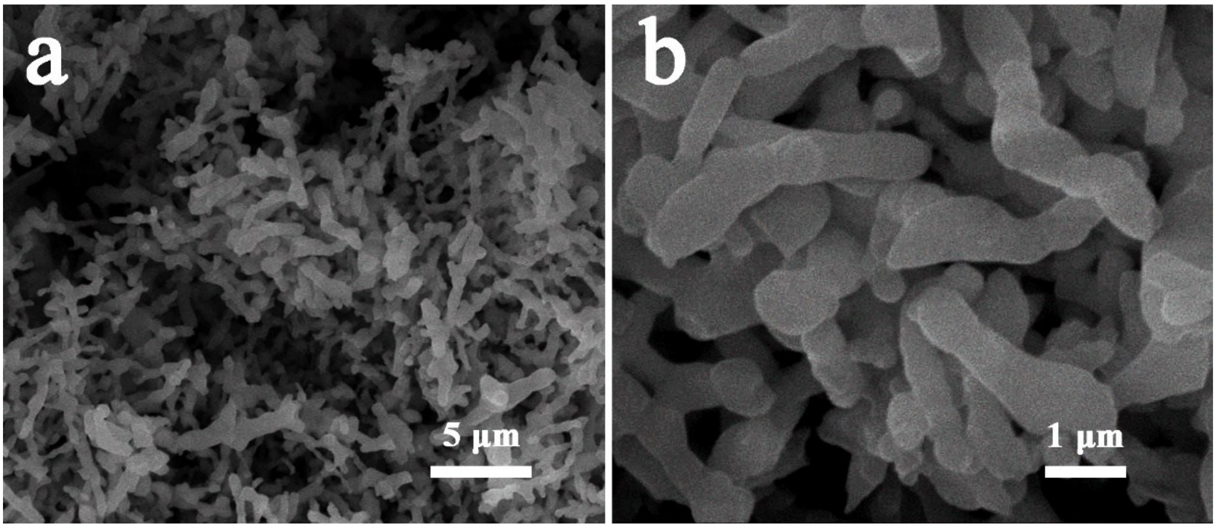

Figure S4. The FESEM images of LCVO-500 at low and high magnifications.

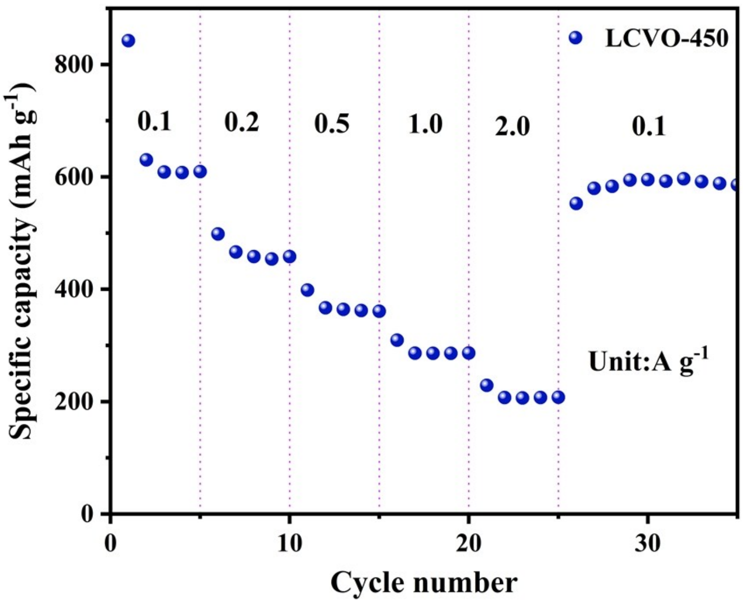

Figure S5. The rate performance of the LCVO-450 electrode with high mass loading (1.32 mg cm^{-2}).

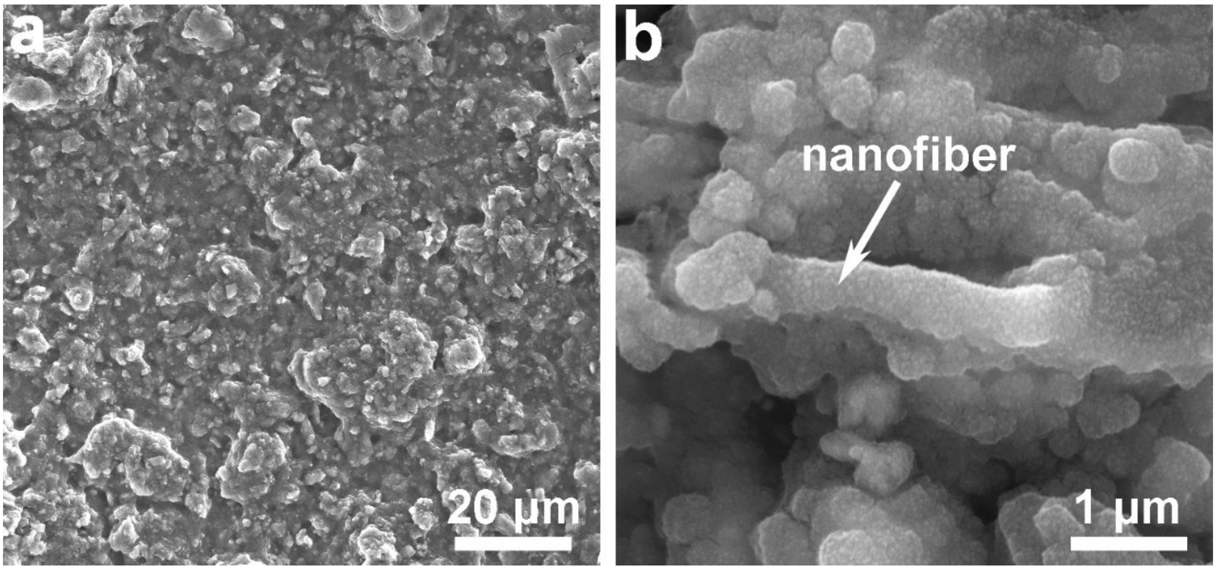

Figure S6. SEM images of (a) LCVO-450 electrode, and (b) LCVO-450 powder after ultrasonic dispersion after rate-capability tests at various current densities from 0.1 to 2 A g^{-1}.

Table S1. Refined unit cell lattice parameters of $LiCuVO_4$ and $LiVO_3$ in $LiCuVO_4/LiVO_3/C$ and the standard data of $LiCuVO_4$ (15836-ICSD) and $LiVO_3$ (2899-ICSD).

sample	Lattice parameters					Phase content	Evaluation parameters		
	a (nm)	b (nm)	c (nm)	β (˚)	V (nm^3)	(wt%)	Rwp (%)	Rp (%)	CHI^2 (%)
$LiCuVO_4$ in LCVO-450	0.5658	0.58087	0.87139	90.0000	0.28637	24.6	9.62	7.56	4.44
$LiCuVO_4$	0.5652	0.58100	0.87500	90.0000	0.28733	—	—	—	—
$LiVO_3$ in LCVO-450	1.0153	0.84377	0.58837	110.4740	0.47223	75.4	9.62	7.56	8.33
$LiVO_3$	1.0158	0.84175	0.58853	110.4800	0.47142	—	—	—	—

Table S2 Electrochemical performance comparison of $LiCuVO_4$, $LiVO_3$ and relevant materials for lithium ion batteries.

Samples	Current density (mA g^{-1})	Cycle number (n)	Capacity (mA h g^{-1})	Initial Capacity (mA h g^{-1})
$LiCuVO_4$ powder[1]	200	50	~400	680
Interconnected $LiCuVO_4$ networks[2]	100	50	~580	875
$LiVO_3$[3]	100	50	~700	1300
Li_3VO_4/C/rGO[4]	50	200	~387	712
Li_3VO_4/C[5]	400	100	~394	570
LCVO-450	100	50	~576	910

References

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