Supporting information

Unveiling the potential of low-strain nanoporous $Li_{0.33}La_{0.55}TiO_3$ nanofibers as a promising anode for Li-ion batteries: Exploring the influence of carbon additives and binders

Mariappan Ganeshbabu[a], Leonid Vasylechko[b], Dharmalingam Kalpana[c], and Ramakrishnan Kalai Selvan[a]

[a]*Energy Storage and Conversion Devices Laboratory,*
Department of Physics, Bharathiar University,
Coimbatore – 641 046, Tamil Nadu, India.
**Email: selvankram@buc.edu.in*

[b]*Semiconductor Electronics Department,*
Lviv Polytechnic National University,
12 Bandera Street, Lviv 79013, Ukraine
**Email: leonid.o.vasylechko@lpnu.ua*

[c]*CSIR-Central Electrochemical Research Institute – Madras Unit,*
CSIR-Madras Complex,
Chennai, 600113, Tamil Nadu, India

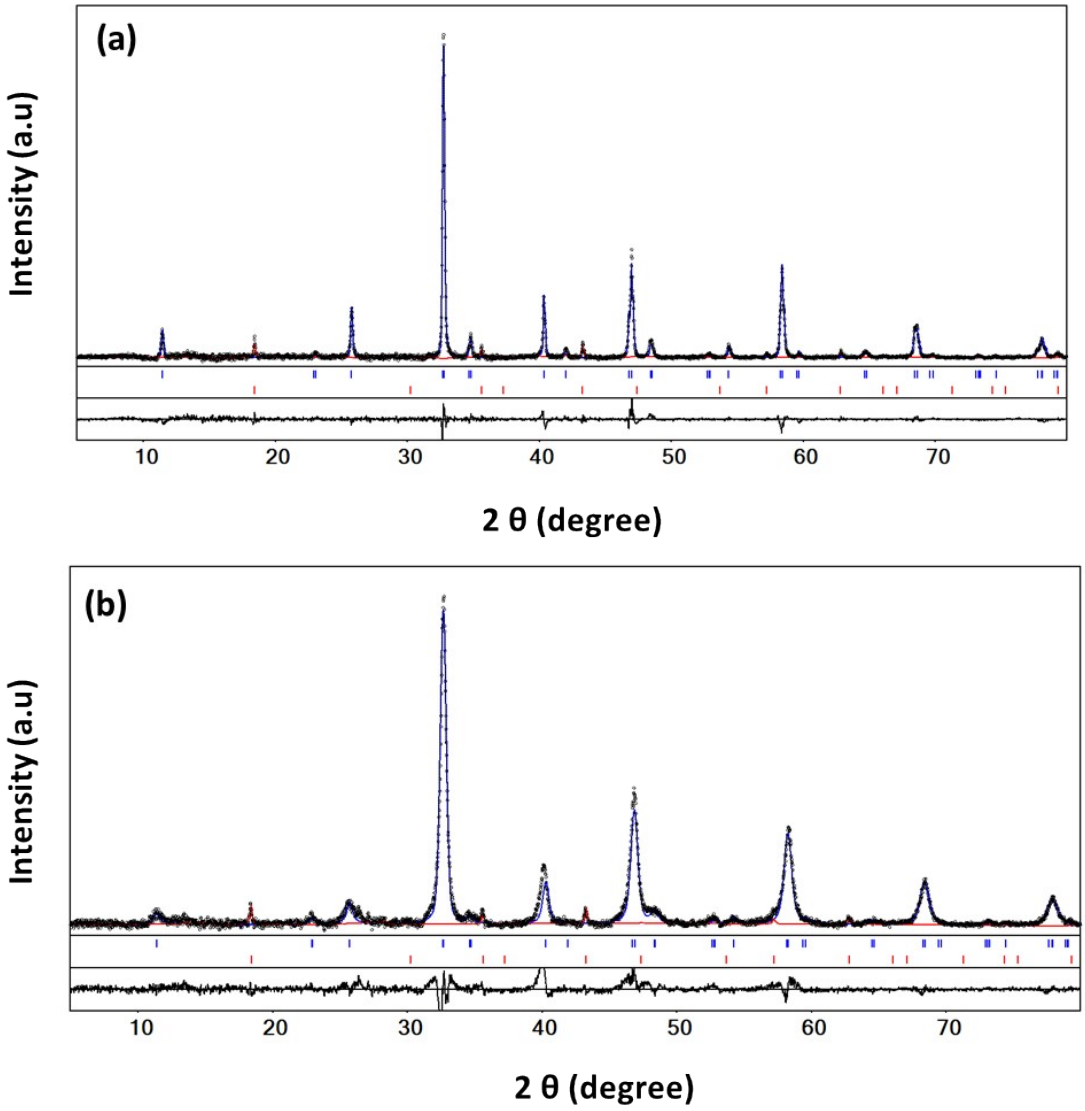

Figure S1. Rietveld refinement of (a) LLTO NF-900 and (b) LLTO NP-800.

Table S1. Lattice parameters, fractional coordinates and displacement parameters of atoms in $Li_{0.33}La_{0.55}TiO_3$ structure (space group *P*4/*mmm*).

Lattice parameters, residuals	Atoms, sites	*x/a*	*y/b*	*z/c*	$B_{iso/eq}$, Å^2	Occupancy
a = 3.8677(4) Å *c* = 7.7672(9) Å *V* = 116.19(4) Å^3	La1, 1*a*	0	0	0	0.66(15)	0.79(2) La^{3+} + 0.20* Li^+
	La2, 1*b*	0	0	½	2.8(4)	0.304(6) La^{3+} + 0.46* Li^+
	Ti, 2*h*	½	½	0.2647(12)	1.3(2)	1.00(2) Ti^{4+}
R_I = 0.0355 R_P = 0.1297	O1, 4*i*	0	½	0.265(2)	5.7(9)	O^{2-}
	O2, 1*c*	½	½	0	6.3(20)	O^{2-}
	O3, 1*d*	½	½	½	2.1(14)	O^{2-}

* Fixed according to nominal composition

Table S2. Different phases of LLTO NF and LLTO NP

Compound	**Main phase**	**additional phases**
LLTO NF-700	Amorphous phase	$Li_{0.33}La_{0.55}TiO_3$
LLTO NF-800	Tetragonal $Li_{0.33}La_{0.55}TiO_3$	La_2TiO_3 + $LiTiO_3$
LLTO NF-900	Tetragonal $Li_{0.33}La_{0.55}TiO_3$, narrow peaks	$Li_4Ti_5O_{12}$ + amorphous component
LLTO NP-800	Tetragonal $Li_{0.33}La_{0.55}TiO_3$, significant peak broadening	$Li_4Ti_5O_{12}$ + amorphous component