Supporting Information

Monodispersed mesoporous $Li_4Ti_5O_{12}$ submicrospheres as anode materials for lithium-ion batteries: morphology and electrochemical performances

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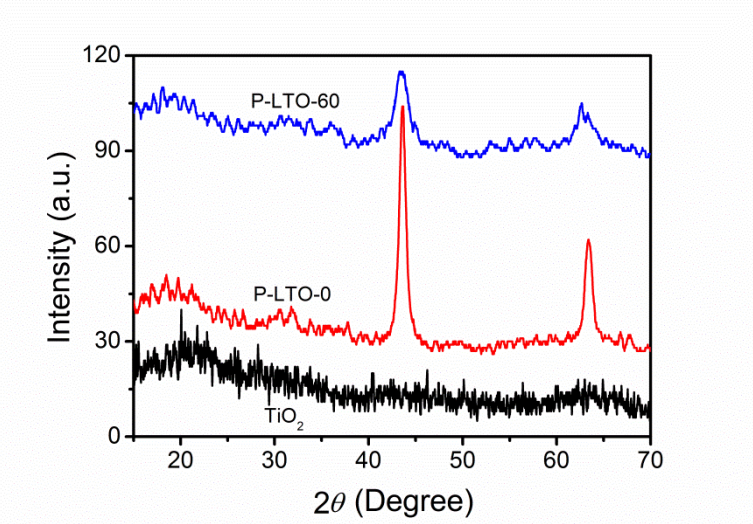

Fig. S1. XRD spectra of precursor TiO_2 submicrospheres and the samples after the solvothermal process (P-LTO-0 and P-LTO-60).

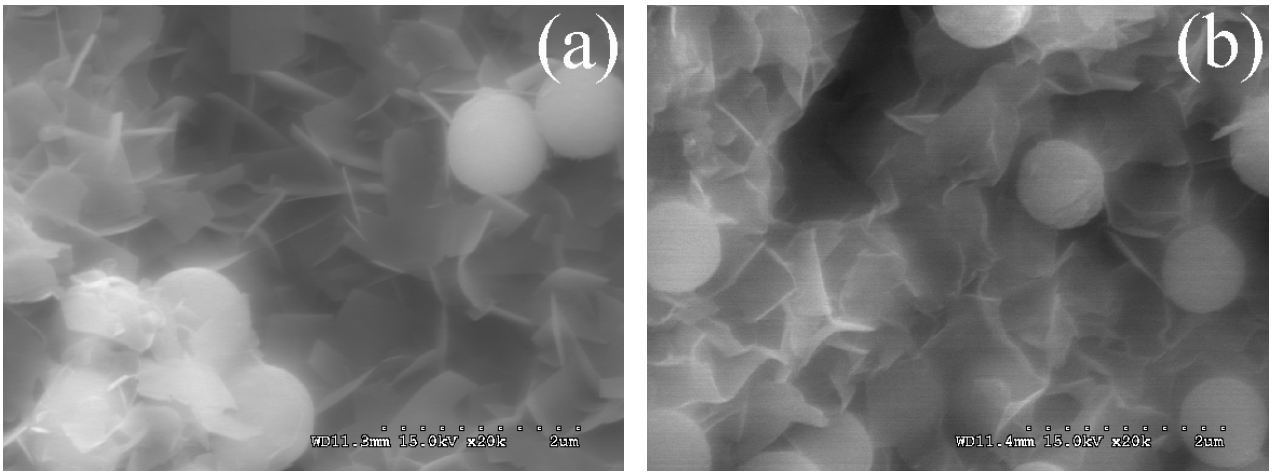

Fig. S2. FESEM images of (a) P-LTO-30 and (b) LTO-30-500.

The chemical reactions of the solvothermal process and the sintering process in Fig. 2 can be expressed as Eq. (S1) through Eq. (S3).

$$(1+x)Li^+ + (2-y)TiO_2 + (4y+2\delta)OH^- \xrightarrow{hydrothermal} Li_{1+x}Ti_{2-y}O_{4+\delta} + (2y+\delta)H_2O \quad \text{(S1)}$$

$$Li_{1+x}Ti_{2-y}O_{4+\delta} \xrightarrow{\Delta} \frac{3-x-2y}{6}Li_4Ti_5O_{12} + \frac{-3+5x+4y}{6}Li_2TiO_3 \quad (5x+4y>3) \quad \text{(S2)}$$

$$Li_{1+x}Ti_{2-y}O_{4+\delta} \xrightarrow{\Delta} \frac{1+x}{4}Li_4Ti_5O_{12} + \frac{3-5x-4y}{4}TiO_2 \quad (5x+4y<3) \quad \text{(S3)}$$

$(1+x-4y=2\delta)$

Li^+ ion diffusion coefficient D can be calculated from the EIS plots in the low frequency region based on Eq. S4 and Eq. S5 [7,8].

$$Z' = R_\Omega + R_{ct} + \sigma_W \omega^{-0.5} \quad \text{(S4)}$$

$$D = R^2T^2/(2A^2F^4\sigma_W{}^2C_{Li^+}^2) \quad \text{(S5)}$$

where Z' is the real part of the impedance, σ_w, the Warburg impedance coefficient, ω, the angular frequency, R, the gas constant, T, the absolute temperature, A, the surface area, F, the Faraday's constant, and C_{Li^+}, the molar concentration of Li^+ ions.