Supporting Information

Hydrothermal synthesis of caterpillar-like one-dimensional $NiCO_3$ nanosheet arrays and primary lithium battery application

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Equations S1-2:

$$i_0 = A\exp(-E_a/RT) \quad (1)$$

$$i_0 = RT/nFR_{ct} \quad (2)$$

where i_0, A, E_a, R, T, n, F are the exchange current, the temperature-independent coefficient, the active energy, the gas constant, the absolute temperature, the number of transferred electrons and the Faraday constant, respectively.

Equations S3-4:

$$D_{Li}+ = (RT)^2/(2A^2n^4F^4C^2\sigma^2) \quad (3)$$

$$Z' = \sigma\omega^{-1/2} + R_s + R_{ct} \quad (4)$$

where A is the surface area of the electrode (here A = 0.64 cm^2), C is the molar concentration of Li^+ in the $NiCO_3$ sample, n is the number of reacting electrons, σ is Warburg factor.

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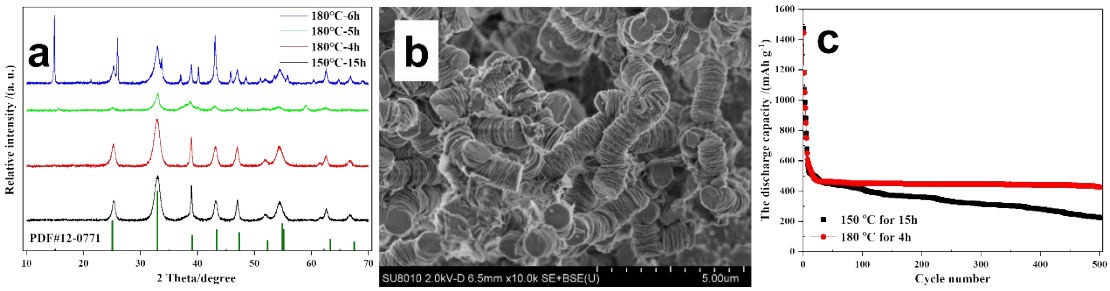

Fig. S1 (a) XRD patterns for the powders obtained under different conditions. (b) SEM for the sample heated at 150 °C for 15 h. (c) Cycle performance at 1.0 A g^{-1} for both $NiCO_3$ samples

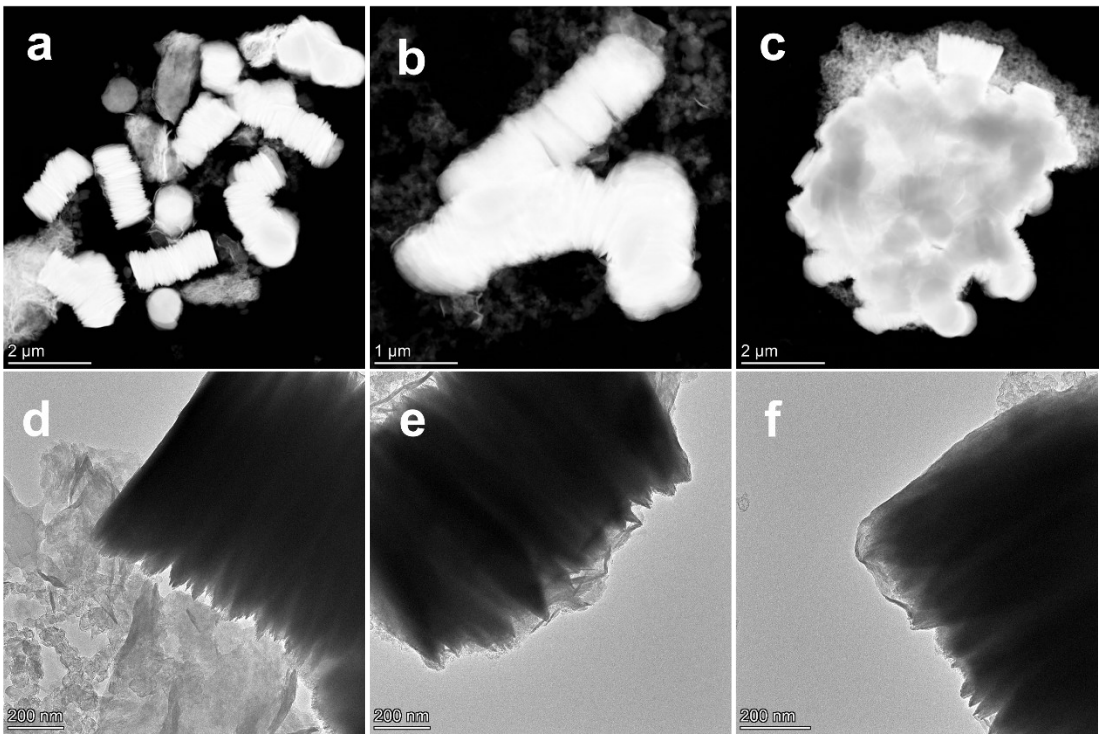

Fig. S2 The work electrode composed of $NiCO_3$ heated at 180 °C for 4 h: SEM (a) before adding electrolyte, (b) after adding electrolyte, (c) after cycles; TEM (d) before adding electrolyte, (e) after adding electrolyte, (f) after cycles

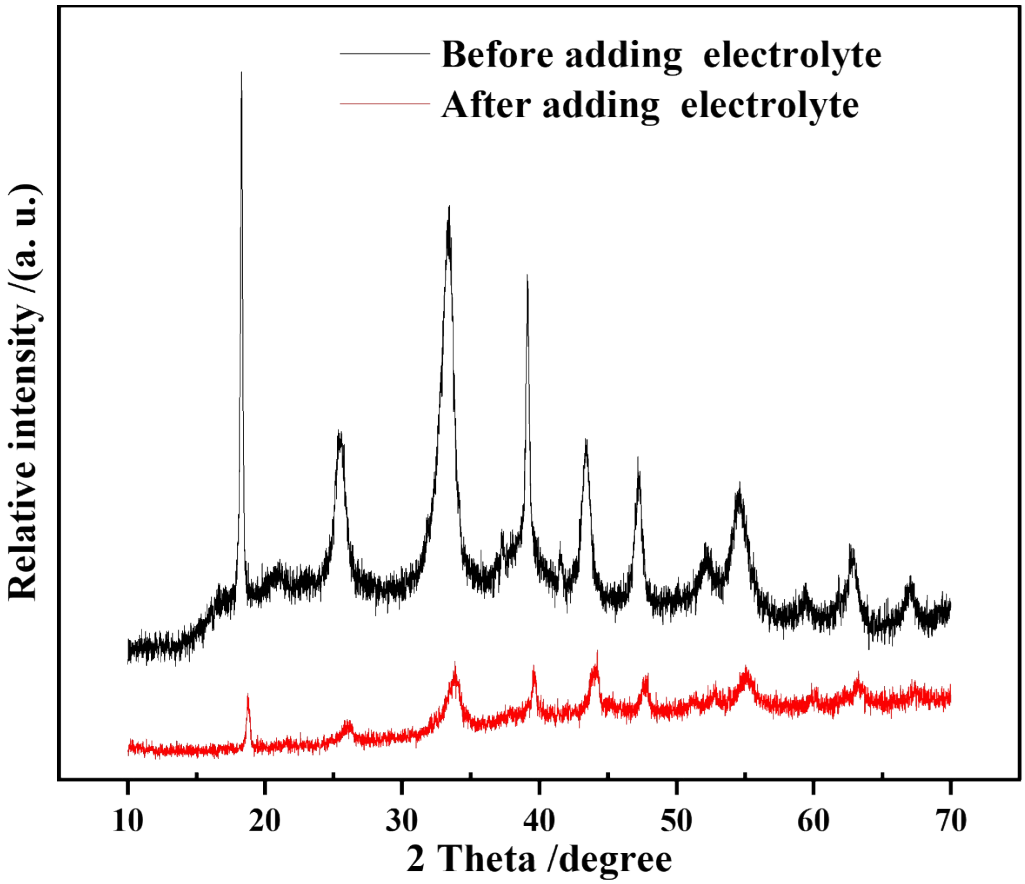

Fig. S3 XRD patterns before/after adding electrolyte for the work electrode composed of $NiCO_3$ heated at 180 ^oC for 4 h