

Supporting Information

Electrochemical Synthesis of Leaf-like CuO Mesocrystals and Their Lithium Storage Property

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SI-1 Characterization

The structure, morphology of the products were characterized with X-ray powder diffraction (XRD, Bruke D8-Advance, Cu-K α , $\lambda = 0.15406$ nm) and transmission electron microscopy (TEM, JEOL JEM-2100). Nitrogen adsorption-desorption isotherms were obtained with the surface area and pore size analyzer (Coulter SA 3100). BET method was introduced to calculate the surface area.

SI-2 Electrochemical measurement

Electrochemical performance of CuO nanostructures were investigated with two-electrode Swagelok cells. The working electrodes were prepared as follows: The mixture consisted of CuO, carbon black, and binder polyvinylidene fluoride (PVDF) at a mass ratio of 70:20:10 was dispersed in N-methyl pyrrolidinone (NMP). Then, the slurry was coated uniformly onto a copper foil with a diameter of 10 mm and dried in vacuum at 100 °C. Test cells were assembled in argon filled glove box. Metallic lithium foil was used as counter electrode. The electrolyte was made of 1 M LiPF₆ dissolved in the mixture of ethylene carbonate (EC) and diethylene carbonate (DEC) with

the volume ratio of 1:1. The galvanostatical charge and discharge tests were carried out on a battery testing system (Arbin BT2000) in the voltage range of 0.01 V–3.0 V (vs. Li/Li⁺). Cyclic voltammograms (CV) were performed on Ametek VMC-4 electrochemical testing system between 3.2 V and 0 V (vs. Li/Li⁺) at a scan rate of 0.2 mV s⁻¹.

SI-3

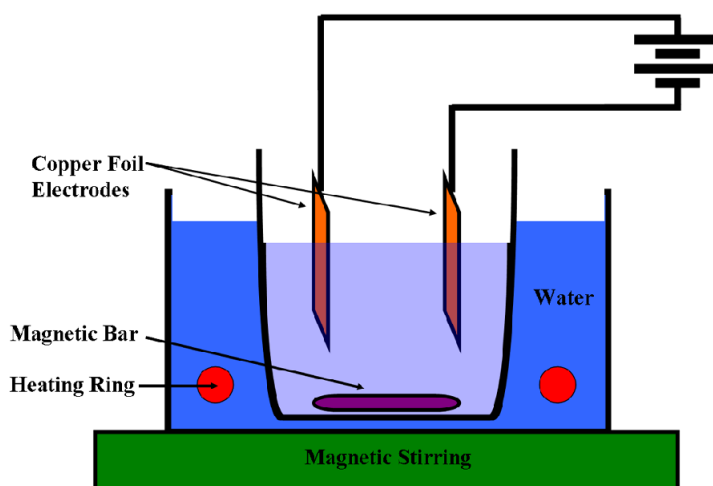


Fig. S1 Schematic illustration of the electrochemical synthesis of leaf-like CuO Mesocrystals.

SI-4

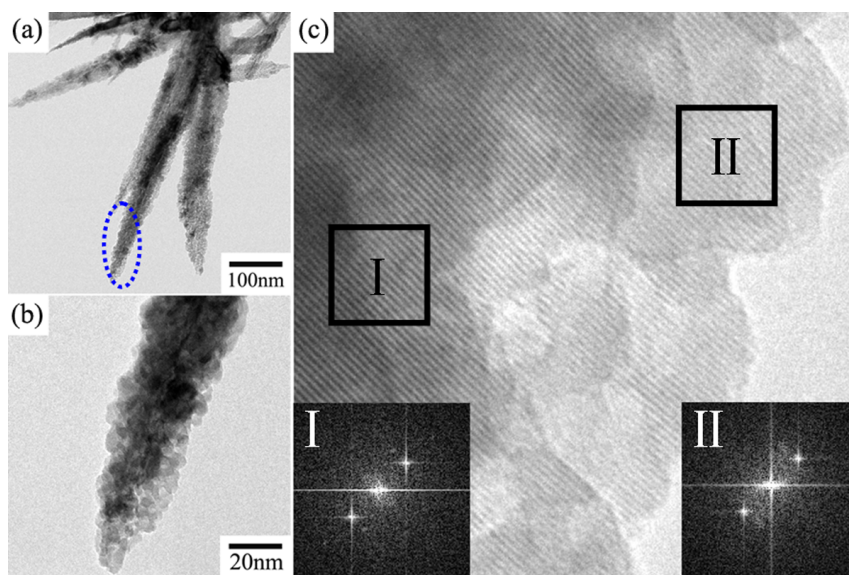


Fig. S2 (a) low-magnification, (b) high-magnification and (c) HRTEM images of CuO mesocrystal.

The inset in Fig. S2(c) is the FFT patterns originated from the marked areas.

SI-5 The synthesis and morphological images of CuO microflakes

The CuO microflakes were synthesized via an ammonia-evaporation-induced method. In the typical process, 10 ml ammonia solution (25%~28%), 40 ml deionized water and 2.4 g $\text{Cu}(\text{NO}_3)_2 \cdot 3\text{H}_2\text{O}$ were mixed together. Then, the homogeneous blue solution was heated at 90 °C. The solid product was harvested by centrifugation and dried at 70 °C.

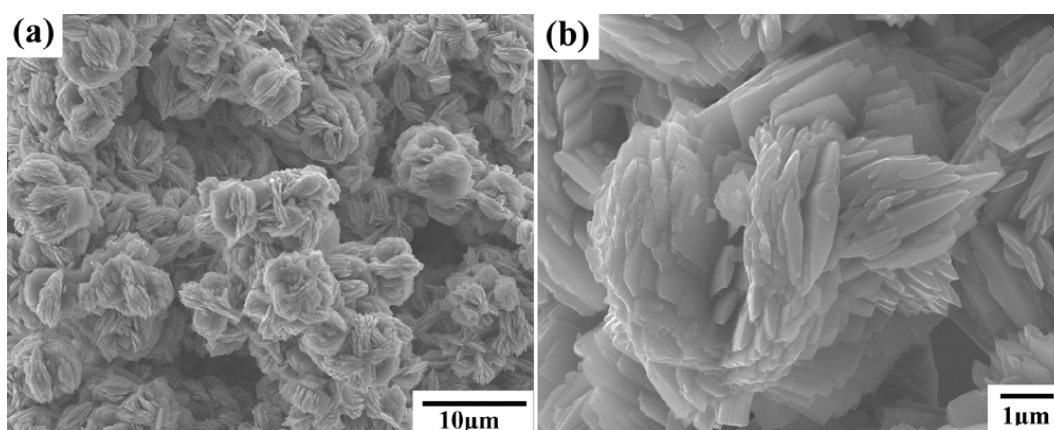


Fig. S3 SEM images of CuO microflakes in (a) low and (b) high magnification.

SI-6

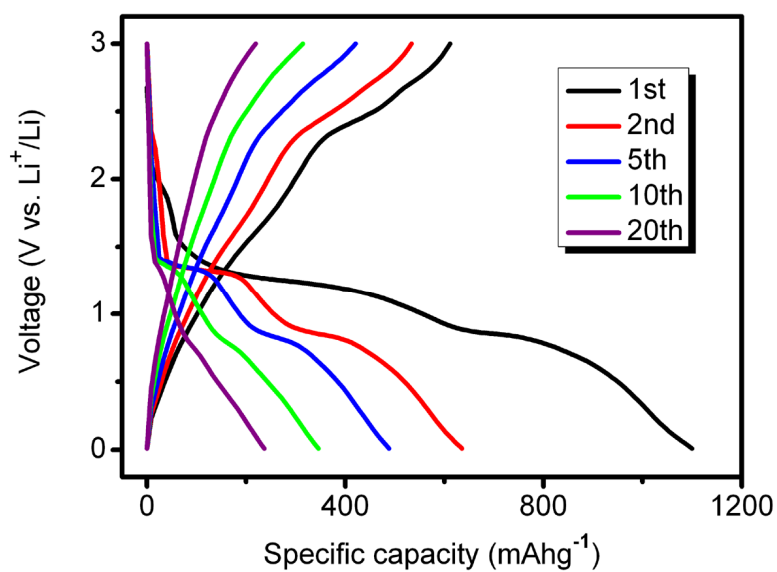


Fig. S4 the typical charge-discharge profiles for CuO microflakes.