

Electronic Supplementary Information

Facile synthesis of porous MnCo₂O_{4.5} hierarchical architectures for high-rate supercapacitors

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Part I: Calculations

The specific capacitance of the electrode was calculated from the C-V curves according to the following equation:¹

$$C = \frac{Q}{\Delta V * m}$$

where C (F g^{-1}) is the specific capacitance, m (g) is the mass of the active materials in the electrodes, Q (C) is an average charge during the charging and discharging processes, and ΔV (V) is the potential window.

The discharge specific capacitance is calculated from the discharge curves using the following formula:¹

$$C = \frac{I * \Delta t}{m * \Delta V}$$

where I (A), Δt (s), m (g), and ΔV (V) are the discharge current, discharge time consumed in the potential range of ΔV , mass of the active materials, and the potential windows, respectively.

Reference

- 1 J. Yan, E. Khoo, A. Sumboja, P. S. Lee, *ACS Nano* 2010, **4**, 4247.

Part II: Supplementary Figures

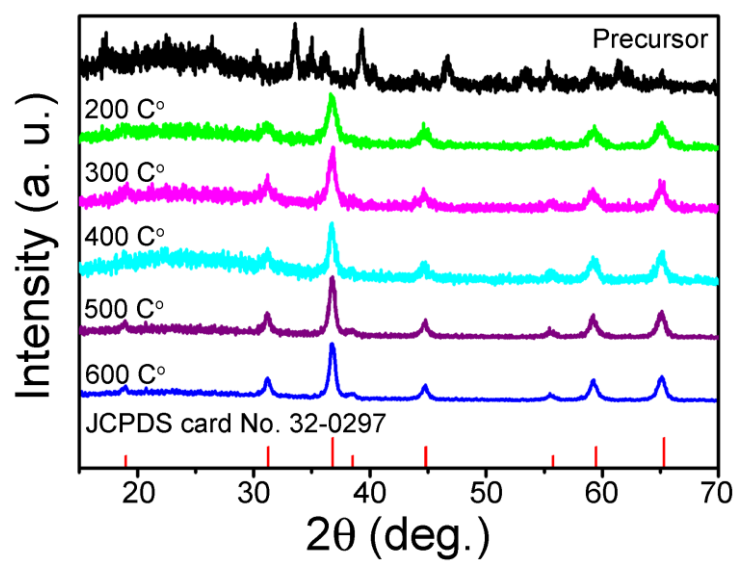


Fig. S1 XRD of the precursor before and after the calcination in different temperatures.

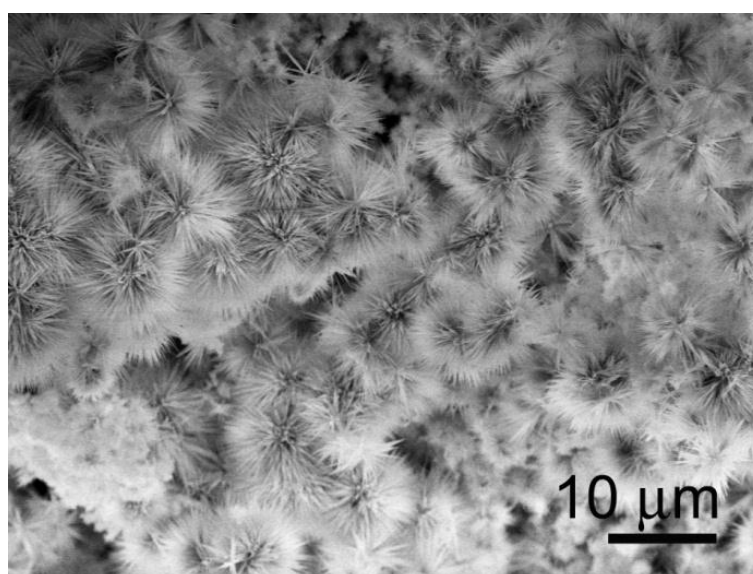


Fig. S2 Low-magnification SEM image of the precursors.

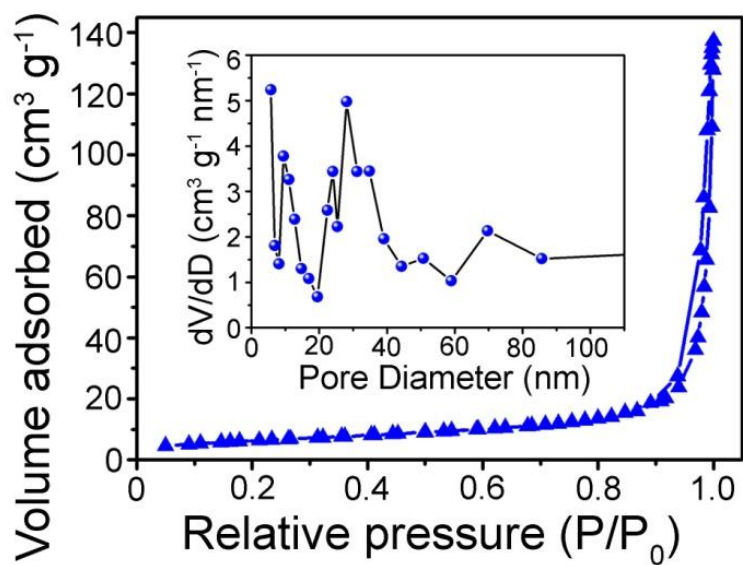


Fig. S2 N_2 adsorption-desorption isotherms of porous $\text{MnCo}_2\text{O}_{4.5}$ hierarchical architectures and corresponding pore size distribution curves.

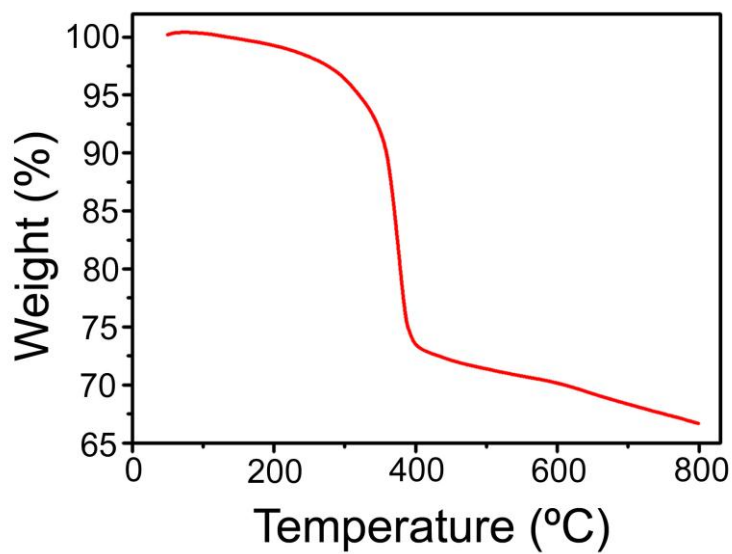


Fig. S3 TGA curves for the as-prepared precursor in air.

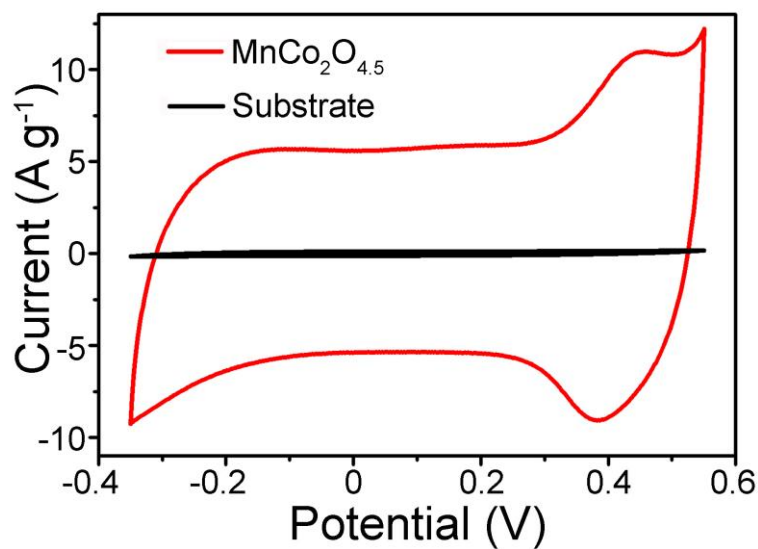


Fig. S4 CV curves recorded from the substrate and 3D urchin-like MnCo₂O_{4.5} hierarchical architecture, respectively, at a scan rate of 50 mV s⁻¹.

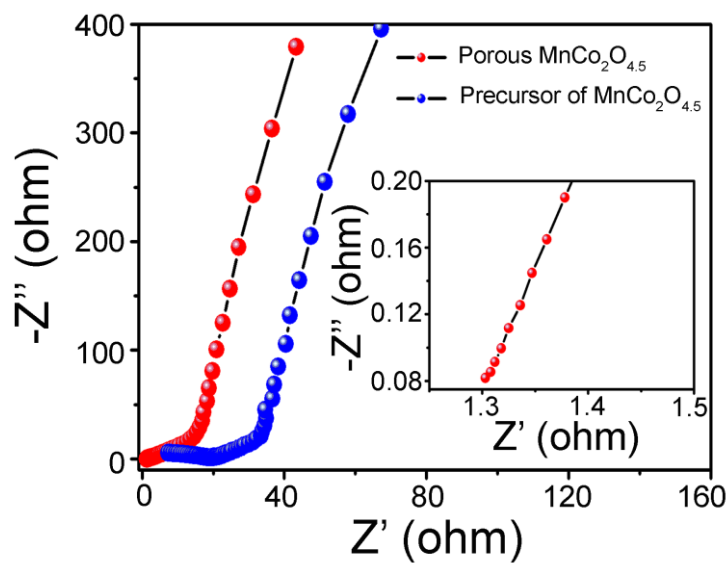


Fig. S5 Nyquist plots of the 3D urchin-like MnCo₂O_{4.5} hierarchical architecture and the precursor.

Table 1 The specific capacitance of MnCo₂O_{4.5} electrode under different scan rates

Scan rate (mV/s)	10	20	40	50	60	80	100
Specific capacitance (F/g)	130.4	121.8	114.4	111.2	108.2	103.2	98.4