Supplementary Information

Hierarchical mesoporous Mn₂O₃/NiO/Co₃O₄ nanocubes derived from Prussian blue analogues for high performance asymmetric supercapacitor

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1.The specific capacitance (C_F, F g⁻¹) from the GCD curve was calculated according

the equation:

$$C_F = \frac{I \times \Delta t}{m \times \Delta V} \#（1）$$

Where I is the discharge current (A), Δt is the discharge time (s), and m is the mass of

the active material (g), ΔV is the voltage window (V)

2.Assembly requirements of asymmetric supercapacitors are met according to the mass

balance formula in a two-electrode system ($Q^+ = Q^-$)

$$\frac{m_+}{m_-} = \frac{C_F^- \times \Delta V^-}{C_F^+ \times \Delta V^+} \#（2）$$

Where m is the mass (g) of the positive and negative electrodes active materials, C_F is

the specific capacitance (F g⁻¹), and ΔV is the voltage window (V).

3. The energy density (E, Wh Kg⁻¹) and power density (P, W Kg⁻¹) are calculated from

the following two equations

$$E = \frac{\int IV(t)dt}{3.6} \#（3）$$

$$P = \frac{3600 \times E}{\Delta t} \#（4）$$

Where I, V and Δt are the discharge current (A), voltage (V) and discharge duration (s) of asymmetric supercapacitors.

2.3 Materials characterization

Thermogravimetric analysis (TG) was performed using an SDT-Q600 instrument in air from 25 °C to 500 °C with a heating rate of 5 °C min^{-1}. The crystal structure and surface morphology of products were examined by X-ray diffractometer (XRD, Smartlab SE), field emission scanning electron microscopy (FESEM, Zeiss, Gemini Sigma 300/VP) and transmission electron microscopy (TEM, FEI Talos F200X). The elemental composition was investigated by X-ray photoelectron spectroscopy (XPS, ESCALAB 250Xi). The specific surface areas and pore distribution of the samples were characterized by using a V-Sorb 2800 P nitrogen desorption/absorption instrument.

2.4 Electrochemical measurement

All electrochemical tests were performed on a CHI660E workstation with an electrolyte of 3 M KOH. Powder samples (80%), acetylene black (10%), and polytetrafluoroethylene (10%) were mixed in an onyx mortar and ground to slurry with a few drops of N-methyl pyrrolidone. Then the slurry was coated on 1 cm^2 nickel foam. Hg/HgO and Pt electrodes were invoked as reference and counter electrodes.
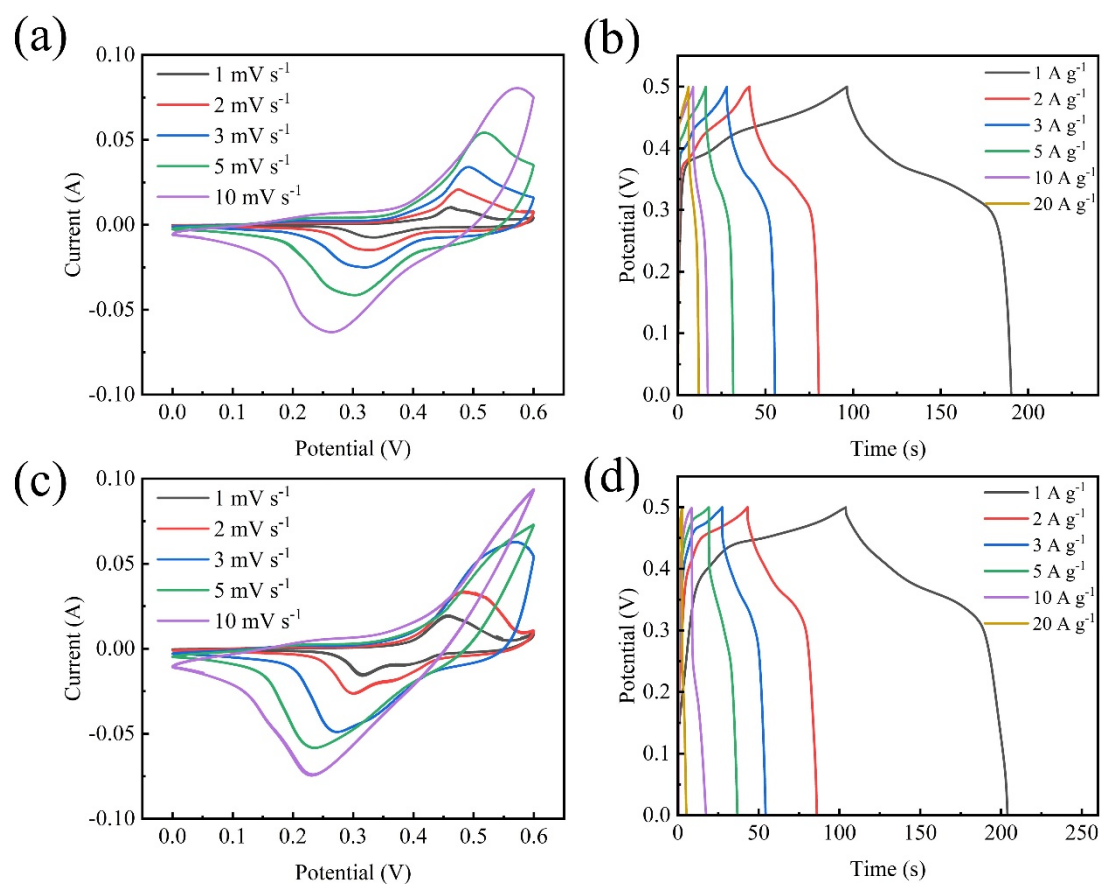
Figure S1 CV and GCD curves of (a) and (b)Mn_2O_3/Co_3O_4, (c) and (d) NiO/Co_3O_4。
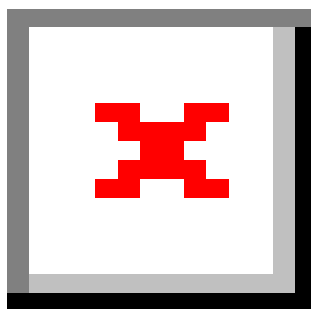
Figure S2 Specific capacitance of Mn_2O_3/Co_3O_4、NiO/Co_3O_4 and $Mn_2O_3/NiO/Co_3O_4$。