Supplementary information

Engineering 2D Multi-Layer Graphene-like Co$_3$O$_4$ Thin Sheets with Vertically Aligned Nanosheet as Basic Building Units for Advanced Pseudocapacitor Materials

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About the name of the CQU-Chen-Co-O-1

We report here a novel 2D multi-layer graphene-like Co$_3$O$_4$ thin sheets which was first synthesized using Co(NO$_3$)$_2$·6H$_2$O and acetic acid (AA). CQU is the abbreviation of Chongqing University, Chen is the surname of the corresponding author of Lingyun Chen. In addition, we use this abbreviation apart from other Co$_3$O$_4$ nanostructures synthesized in our laboratory.

Characterization

The crystal structure of the products were characterized by powder X-ray diffraction (XRD, Bruker D8 Advance X-ray diffract meter) using nickel-filtered Cu Kα radiation ($\lambda = 1.5406 \, \text{Å}$). Raman spectra were recorded in the range 200-3000 cm$^{-1}$ on a LabRAM HR Evolution (HORIBA Scientific, Japan). The morphology and microstructures of the samples were investigated by field-emission scanning electron microscopy (SEM, HITACHI S-4800 electron microscopy) with energy-dispersive X-ray (EDX) spectra at an accelerating voltage of 20 kV. TEM and SAED images were investigated on a Tecnai G2 F20 S-Twin operated at 200 kV.

Electrochemical measurements

All the electrochemical experiments were carried out with a CHI 660E electrochemical workstation (Chenhua Corp., Shanghai, China). A three-electrode system was employed in all the electrochemical experiments in 6 M KOH. The working electrode was made of as-prepared CQU-Chen-Co-O-1 (80 wt %), acetylene black (15 wt %) and polytetrafluoroethylene (PTFE) binder (5 wt %). After grinding, the mixed materials were pasted onto a piece of nickel foam under a pressure of 5.0 MPa and dried under vacuum at 60 °C for 12 h. Platinum foil and standard calomel electrode (SCE) were used as the counter and reference electrodes, respectively.
Fig. S1 Digital photography of the CQU-Chen-Co-O-1 in 50 ml beaker after hydrothermal reaction.
Fig. S2 Raman spectra of the CQU-Chen-Co-O-1.
Fig. S3 (a) and (b) SEM image of the CQU-Chen-Co-O-1 after charge/discharge cycles.