Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics

Supporting Information

DNA-assisted assembly of carbon nanotubes and MnO_2 nanospheres as electrodes for high-performance asymmetric supercapacitors

Chun Xian Guo, Amey Anil Chitre and Xianmao Lu*

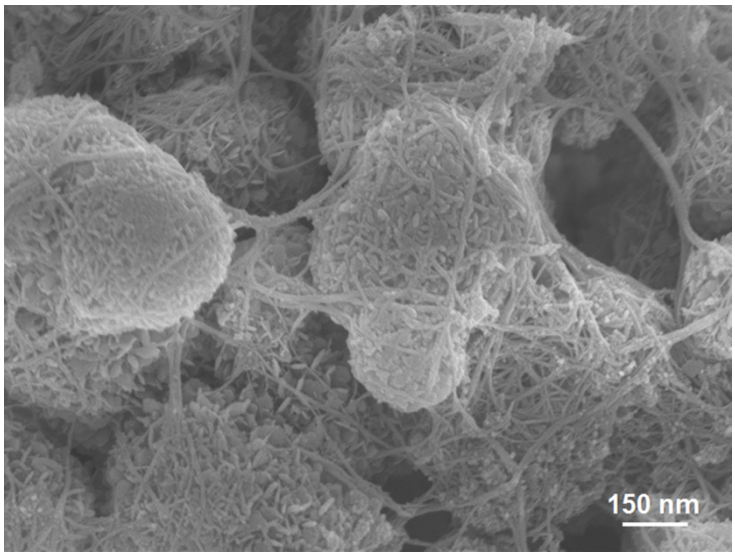

Fig. S1 SEM image of CNTs@DNA-MnO_2 electrode material.

Calculations for specific capacitance, energy density and power density

Specific capacitance values are calculated from the discharge curves for electrodes in a three-electrode configuration according to Eq. 1:

$C_{sp} = [(I \times \Delta t)/(\Delta V \times m)]$ ---------- Eq.1

where I is the current density for charge/discharge, $\Delta V/\Delta t$ is slope of the discharge curve and m is electrode material mass.

Specific capacitances are calculated from the CV curves at different scan rates in a three-electrode configuration using Eq.2:

$C_{sp} = [(i \times \Delta V]/(v \times m)]$ ---------- Eq. 2

where i is average cathodic current of CV loop, ΔV is the potential window, v is the scan rate and m is the electrode material mass.

Specific capacitance values are calculated from the discharge curves in a two-electrode supercapacitor device according to the Eq.3:

$C_{sp} = [(I \times \Delta t)/(\Delta V \times m)]$ ---------- Eq. 3

where I is the current density for charge/discharge, $\Delta V/\Delta t$ is slope of the discharge curve and m is total mass of electrode materials.

Energy density and power density for the asymmetric supercapacitors are calculated from the charge/discharge curves at different current densities using Eq. 4 and Eq. 5:

$E = 1/2 C_{sp} \Delta V^2$ ---------- Eq. 4

$P = E/\Delta t$ ---------- Eq. 5

where ΔV is the voltage window of the discharge process and Δt is the discharge time of the asymmetric supercapacitor devices.