Supporting Information

Hybrid Nanostructure of $MnCo_2O_{4.5}$ Nanoneedle/Carbon Aerogel for Symmetric Supercapacitors with High Energy Density

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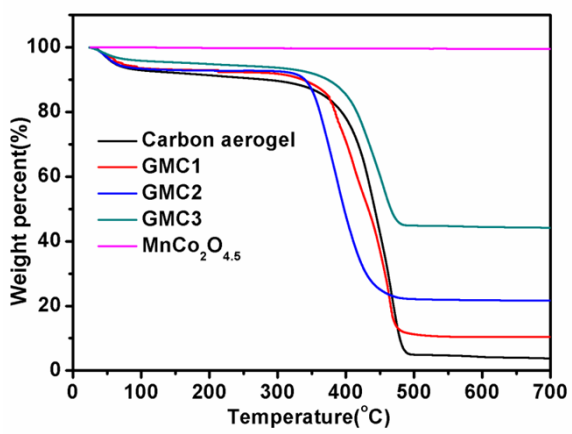

Fig.S1 TGA curves of all samples in air atmosphere from room temperature to 700 °C.

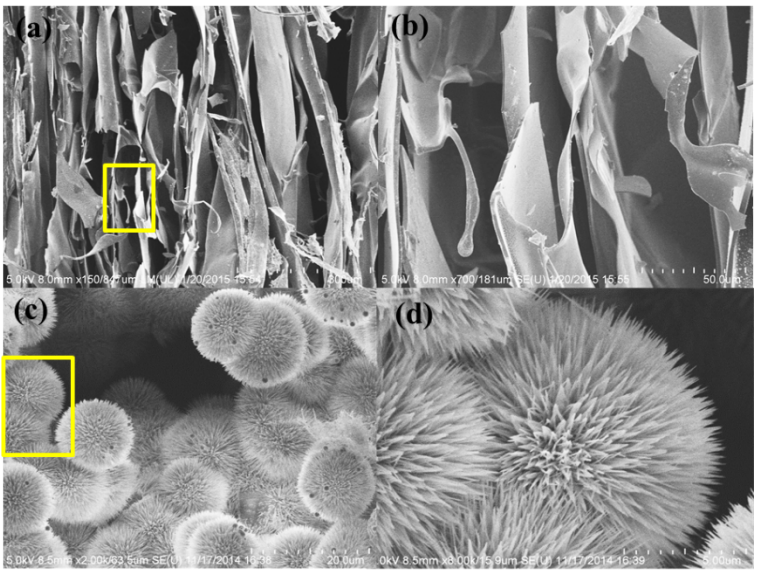

Fig. S2 SEM images of (a, b) carbon aerogel and (c, d) the precursor of $MnCo_2O_{4.5}$ nanoneedles.

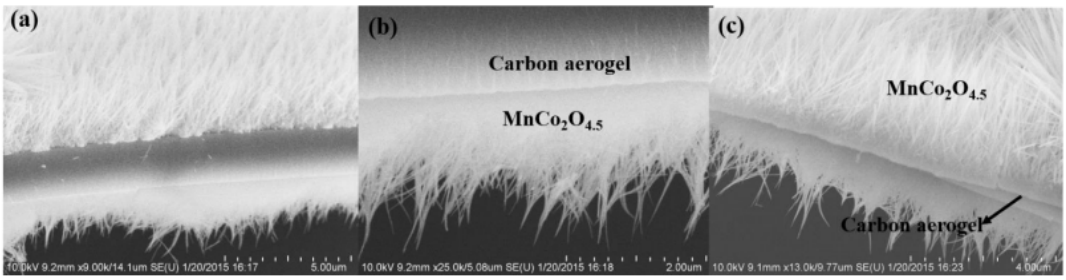

Fig. S3 SEM images of the cross section of GMC2 before and after ultrasonic irradiation: (a, b) before ultrasonic irradiation, (c) after ultrasonic irradiation.

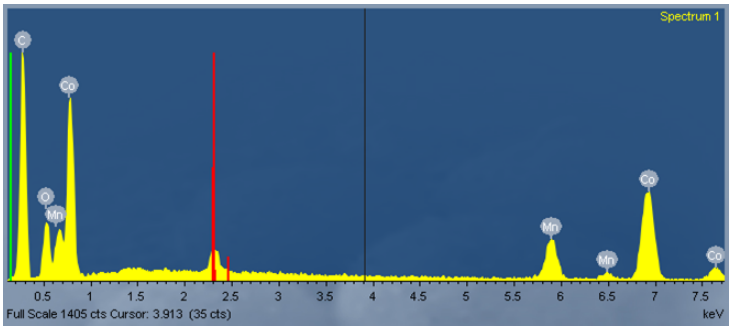

Fig.S4 EDS spectrum of GMC2.

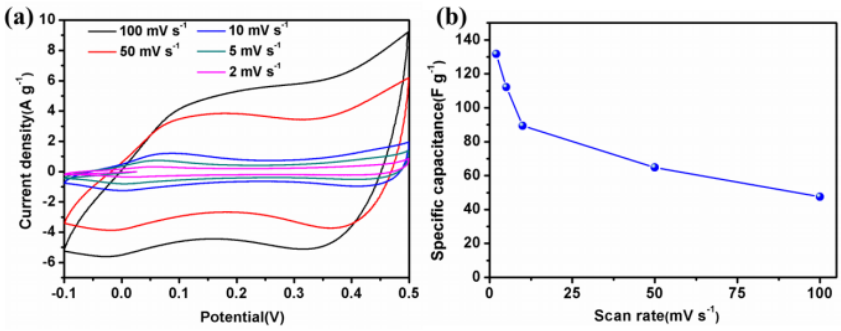

Fig.S5 CV curves of pure $MnCo_2O_{4.5}$ nanoneedles at various scan rates in 2 M KOH aqueous electrolyte in the three-electrode set-up.

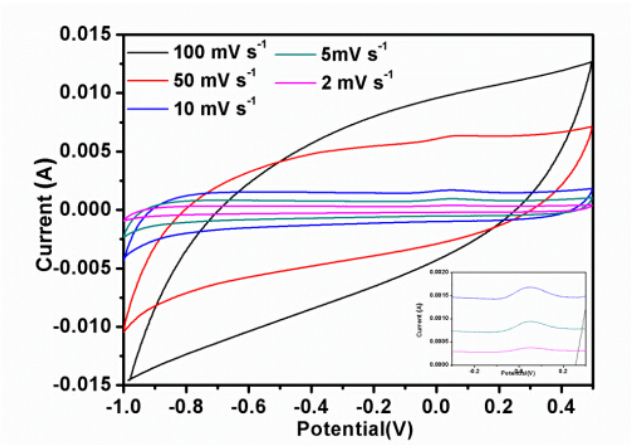

Fig.S6 CV curves of the hybrid structure at various scan rates in 1 M Na_2SO_4 aqueous electrolyte in the three-electrode set-up.

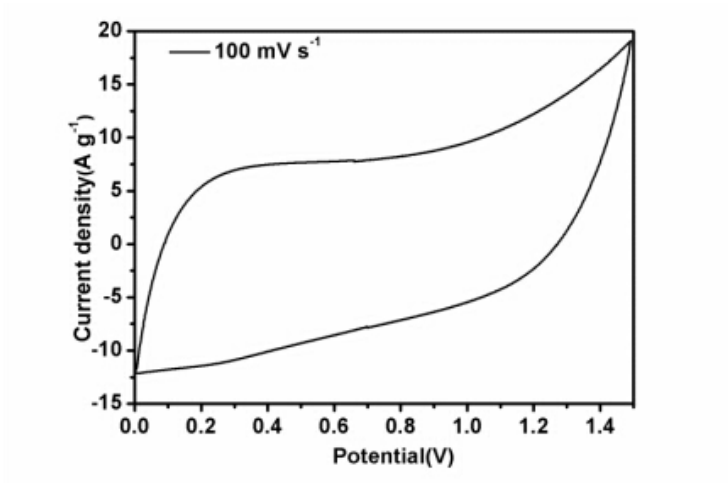

Fig.S7 The CV curve of GMC2 at the scan rate of 100 mV s^{-1} in 2 M KOH in the potential range of 0-1.5 V.

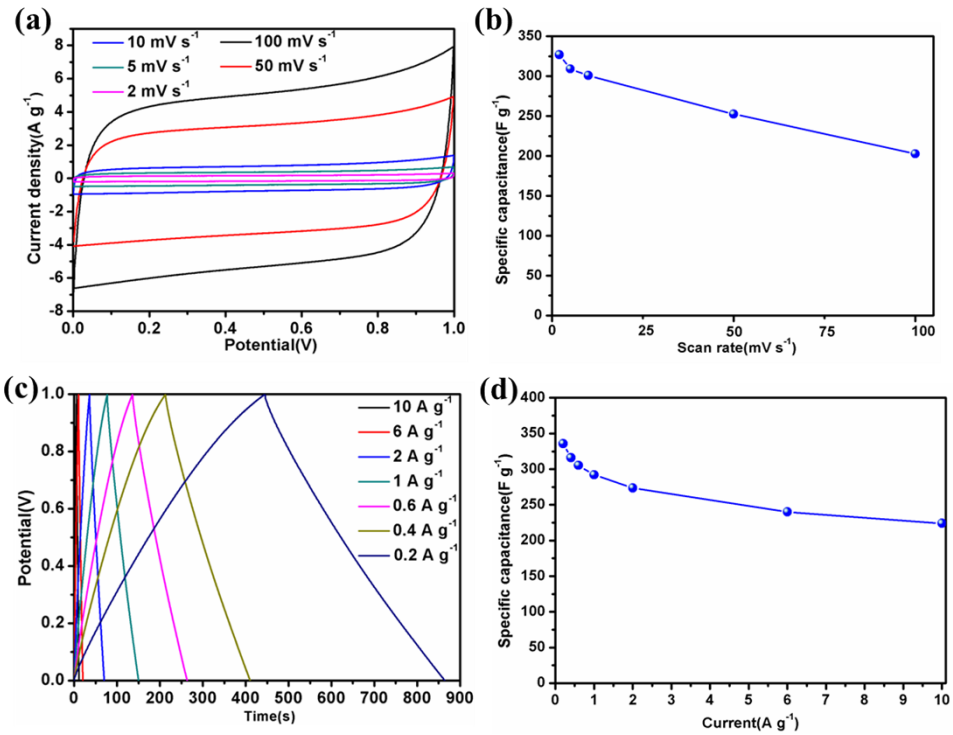

Fig.S8 (a) CV curves of GMC2 at various scan rates in 1 M H_2SO_4 aqueous electrolyte, (b) specific capacitance of GMC2 as a function of scan rate derived from (a), (c) charge/discharge curves of GMC2 at various current densities, (d) specific capacitance of GMC2 as a function of current density derived from (c).