Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

Flexible full-solid state supercapacitor based on zinc sulfide spheres growing on carbon textile with superior charge storage

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Figure S1: Optical photographs of carbon textile (CT). (A) Bare CT, (B) ZnS nanospheres assembled CT, (C) Annealed ZnS nanospheres assembled CT

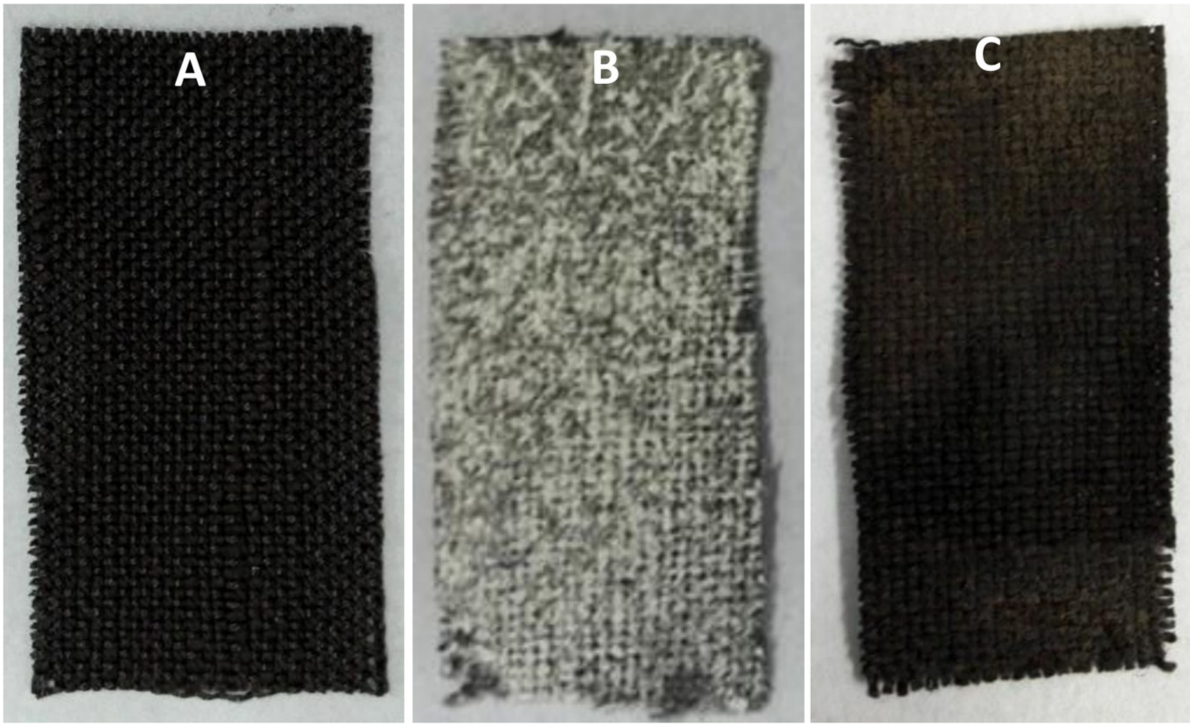
Figure S2: Schematic diagram of the fabrication process of ZnS assembled carbon textile with annealing process

Figure S3: (A) N_2 adsorption–desorption isotherm, (B) BJH adsorption pore size distribution of ZnS spheres.

Figure S4: (A) GDC curves and (B) Potential drop (IR drop) at different discharge current densities

Figure S5: (A) The comparison of CV curves of bare CT based supercapacitor and ZnS nanospheres assembled CT based supercapacitor, (B) The peak current density verses square root of scan rate.

Figure S6: (A) GDC curves and (B) Potential drop (IR drop) at different discharge current densities.



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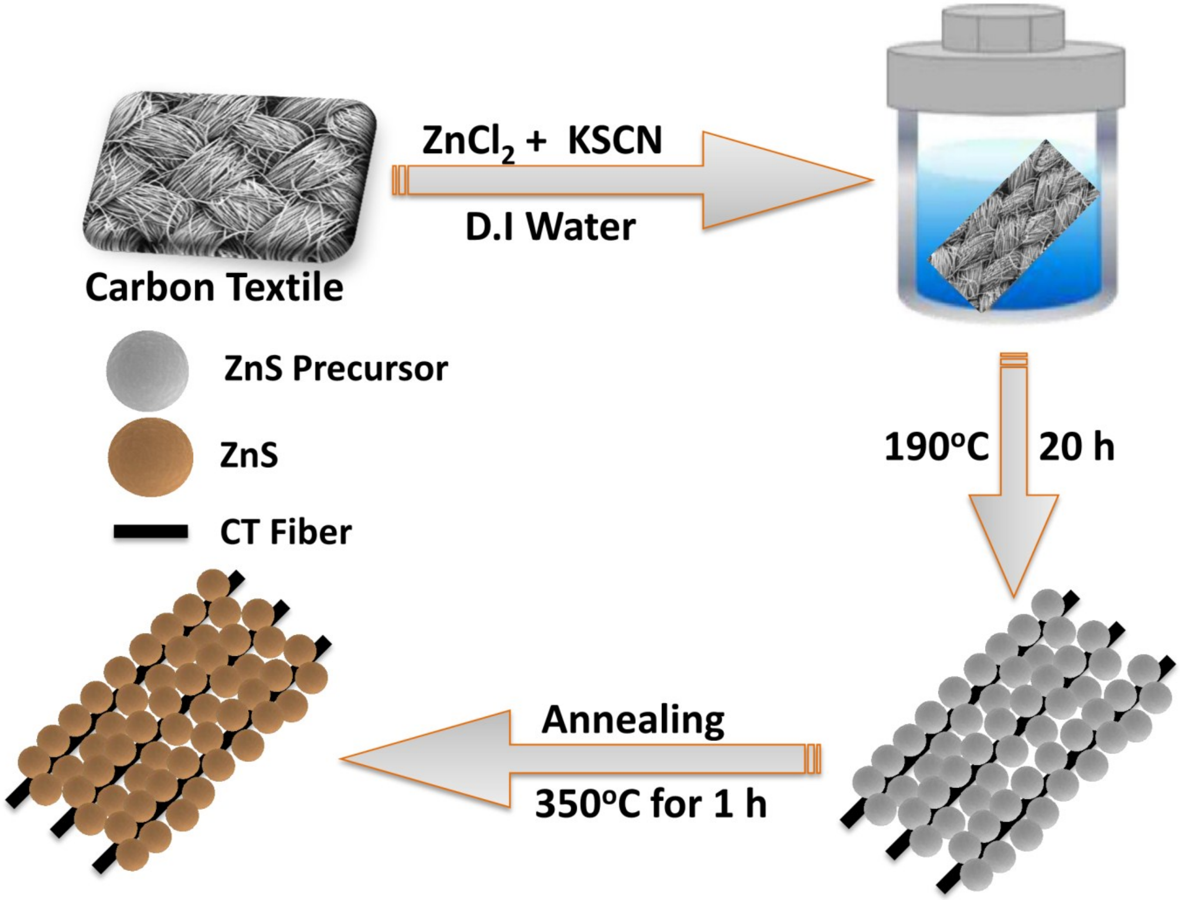

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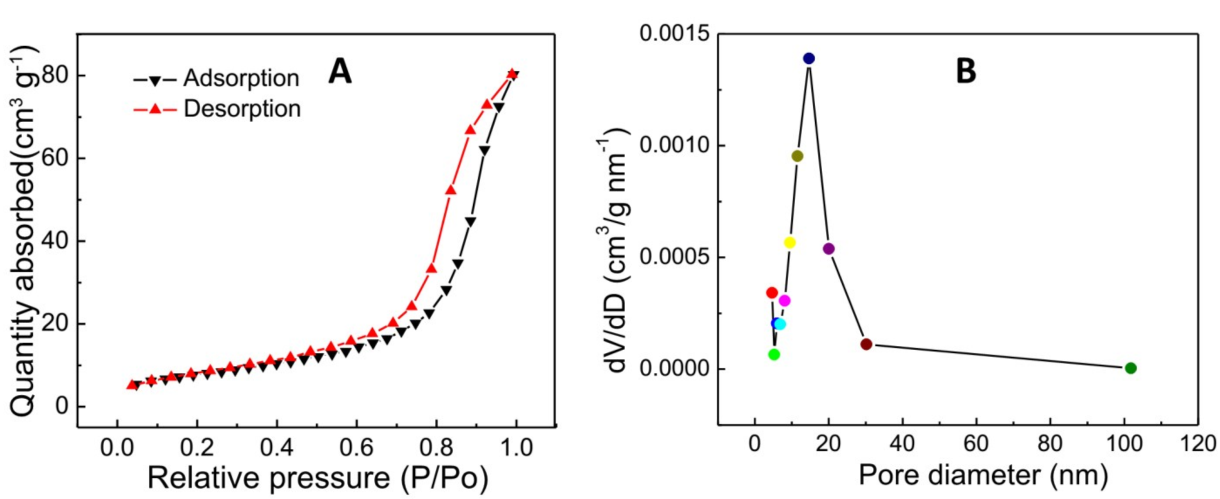

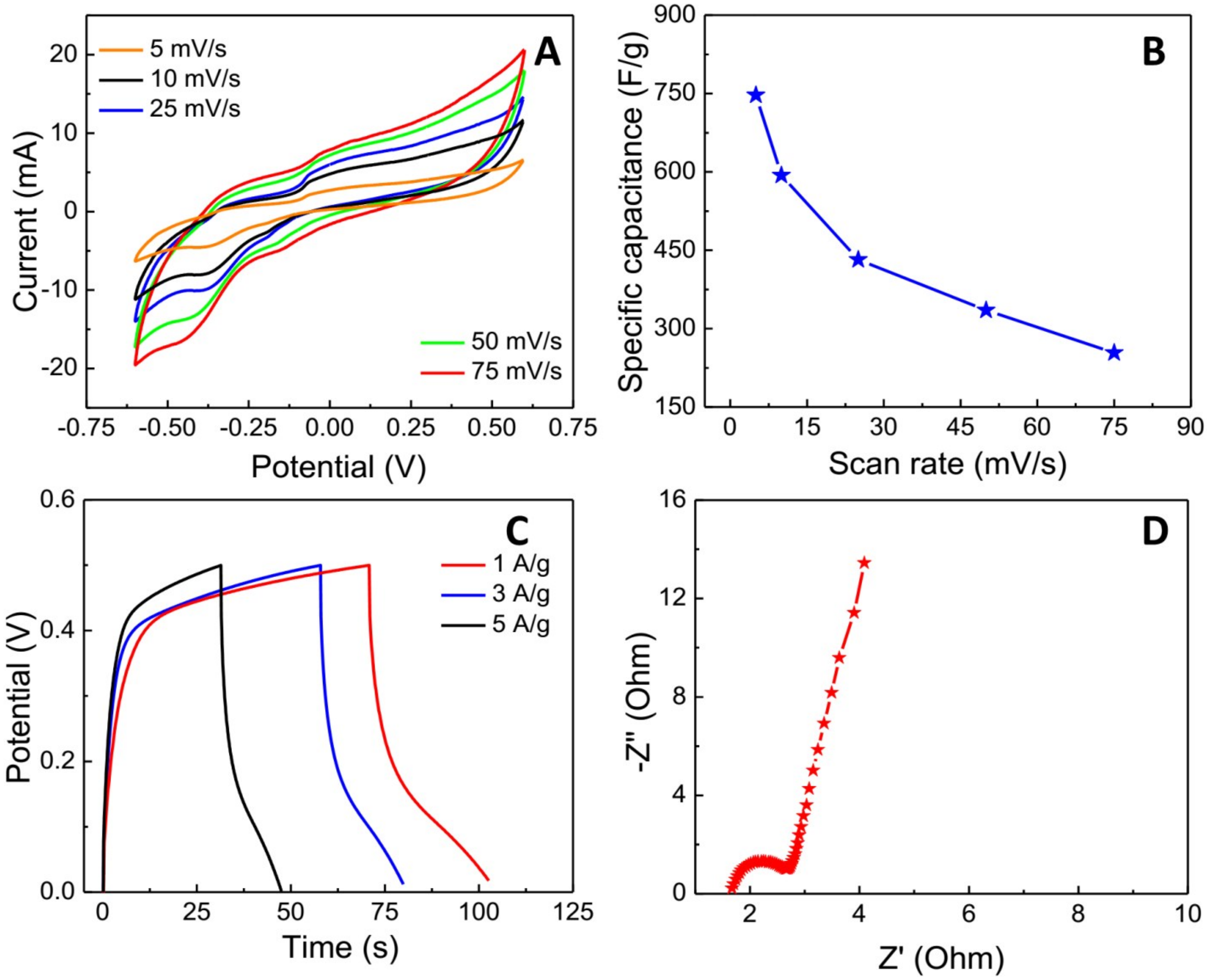

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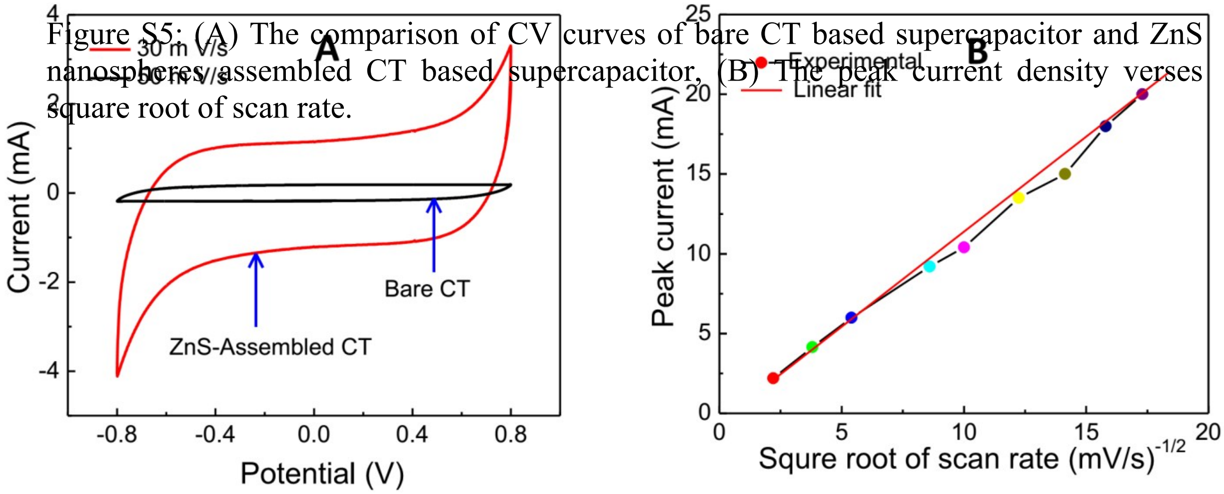

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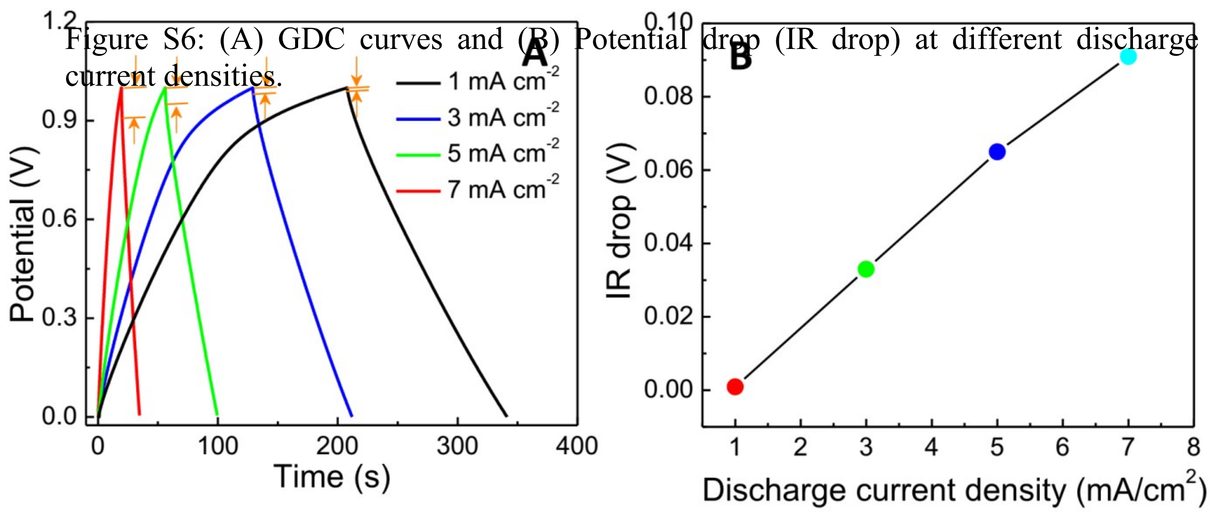

The specific capacitance (C_{sp}), energy density (ED), power density (PD) and columbic efficiency (η) of electrodes were calculated according to the following equations.[7-9]

$$C_{sp} = \frac{\int I\, dV}{M\, v\, (V_f - V_i)} \qquad (1)$$

$$C_{arl} = \frac{C_{sp}}{A} \qquad (2)$$

$$E = CV^2 \times \left(\frac{5}{36}\right) \qquad (3)$$

$$P = \frac{E}{t_d} = \frac{I\Delta V}{2M} \times 1000 \qquad (4)$$

Where C_{sp} (Fg^{-1}) is the specific capacitance; C_{arl} (F cm^{-2}) is the areal capacitance; $\int I\, dV$ is the area of CV curve; A is the active area of supercapacitor; M (g) is the mass of active material on one electrode; $\Delta V = V_f - V_i$ is the potential window; v (Vs^{-1}) is the scan rate; I (A) is the applied current; P (W kg^{-1}) is the power density; E (Wh kg^{-1}) is the energy density; Δt_c and Δt_d are charging and discharging time (s) respectively.