Supporting Information

Green Synthesis of N doped Porous carbon/Carbon dots Composite as Metal-Free Catalytic Electrode Materials for Iodide Mediated Quasi-solid Flexible Supercapacitor

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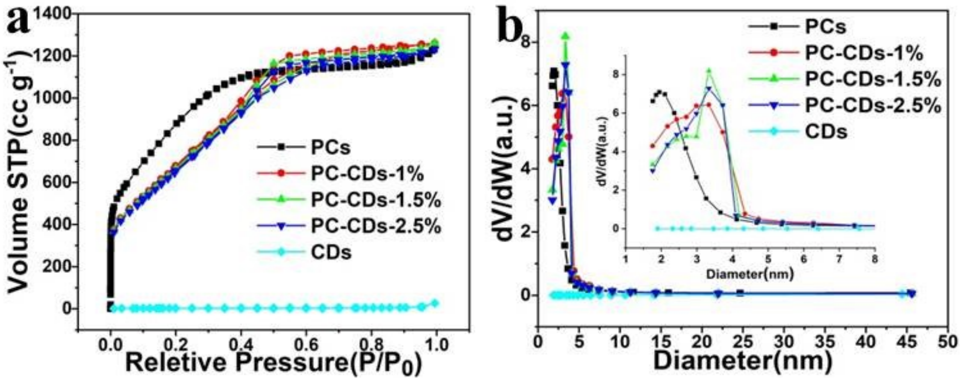

Fig. S1 (a) N_2 adsorption–desorption curves and
(b) pore size distribution for the PC, CDs and PC-CDs-1, PC-CDs-1.5%, PC-CDs-2.5

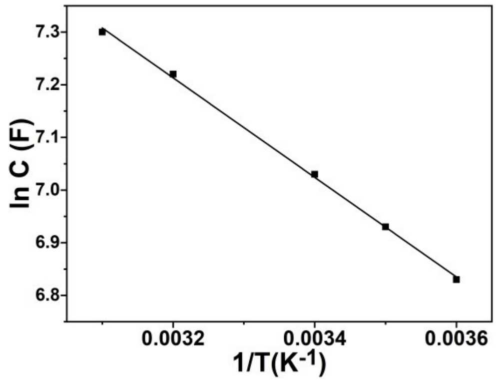

Fig. S2 Electrochemical properties of PC-CDs-1.5% symmetrical capacitor in 1M H_2SO_4/0.06 M KI electrolyte systems at different temperatures for Arrhenius linear relationship curve

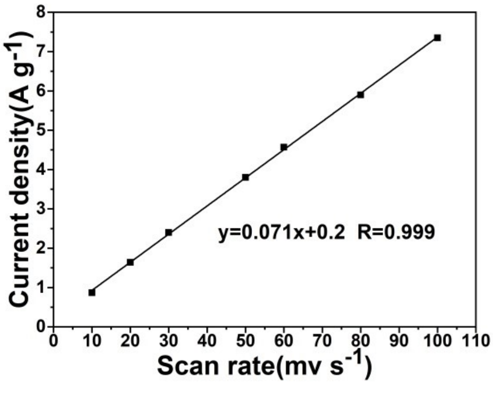

Fig. S3 Electrochemical properties of PC-CDs-1.5% symmetrical capacitor
in 1M H_2SO_4 electrolyte for current response curves at different voltage sweep speeds

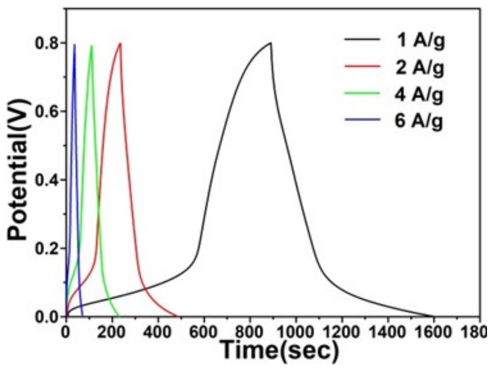

Fig. S4 GCD curves of different current densities of PC-CDs-1.5% based symmetric supercapacitor in 1 M H_2SO_4/0.06 M KI electrolyte

The detailed capacitive performances of the PC-CDs-1.5% supercapacitor were further investigated, Fig. S4 display the GCDs of the supercapacitor in 1 M H_2SO_4/0.06 M KI electrolyte at different current densities. At 1, 2, 4 and 6 A g^{-1}, the specific capacitances of the PC-CDs-1.5% supercapacitor are 1783, 1270, 810, and 525 F g^{-1}, respectively, and the rapid decay is common for redox electrolyte mediated supercapacitors. Despite this, the substantially enhanced capacitance is highly valuable for output performance of supercapacitor.

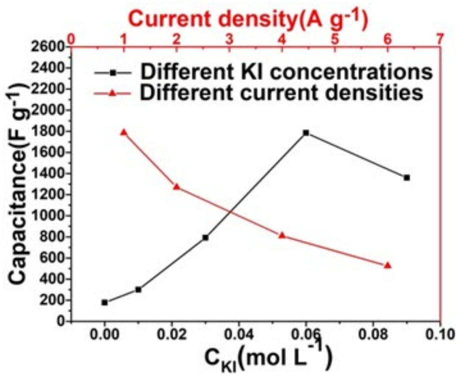

Fig. S5 PC-CDs-1.5% based symmetric supercapacitor at different KI concentrations *vs* 0.06M KI at different current densities

Fig. S5 exhibits the capacitance performance of PC-CDs-1.5% symmetric device at different KI concentrations with 1 A g^{-1}, and in electrolytes with 0.06 M KI concentrations at different current densities. It can be intuitively seen from the diagram that the capacitance reaches the maximum value at 0.06 M KI, and the capacitance tends to rise when towards 0.06 M. When the KI concentrations exceed 0.06 M, it begins to presented with a downward trend, which is consistent with the force between the concentration of ions in the solution.

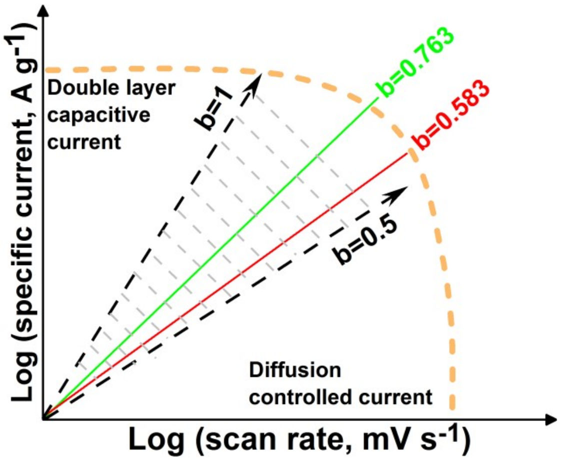

Fig. S6 The fitting plots between log (i) and log (v)

In order to further confirm the nature of the charge-storage process and illustrate the relationship of current and scan rate of the PC-CDs-1.5% solid state supercapacitor, we investigated it by a mathematical analysis (Dunn's method). In general, b values between 0.5 and 1.0 have been observed, which suggests a mixture of diffusion-controlled and capacitor-like responses. The b values of PC-CDs-1.5% solid state supercapacitor were calculated to be 0.763 and 0.583 (Fig. S6), which indicates the mainly diffusion-controlled charge storage process.