

## Supporting Information

# Carbon dots modified mesoporous carbon as supercapacitor with enhanced the light- assisted capacitance

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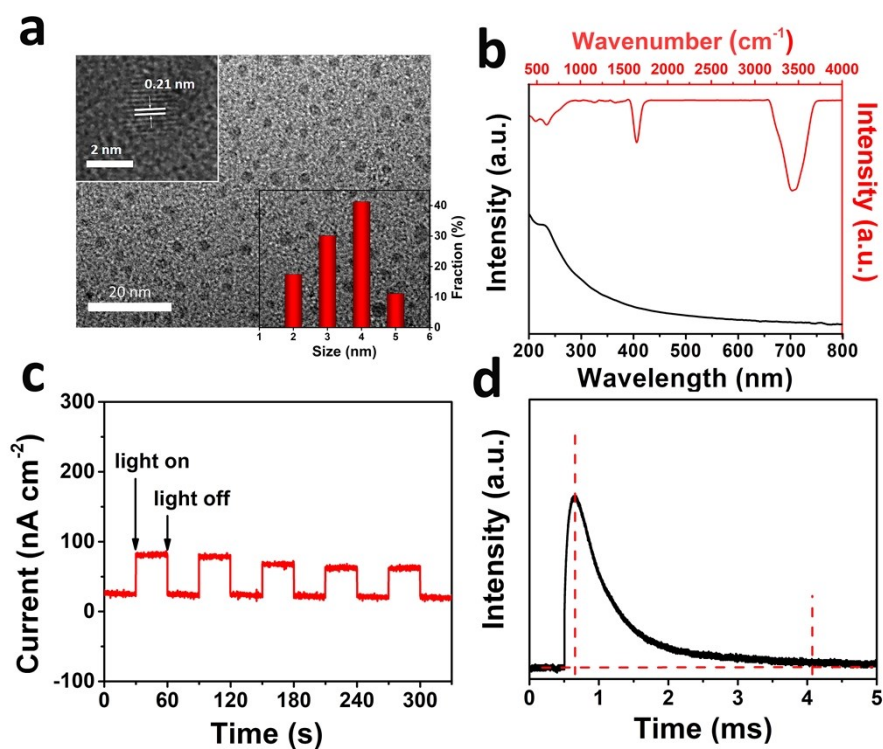
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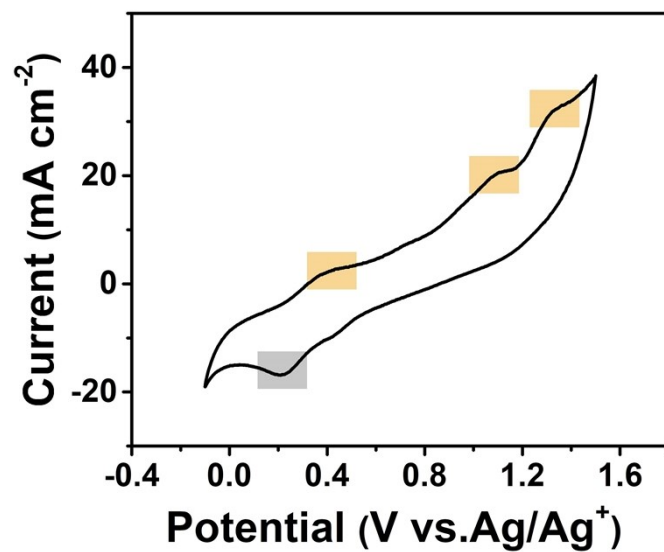
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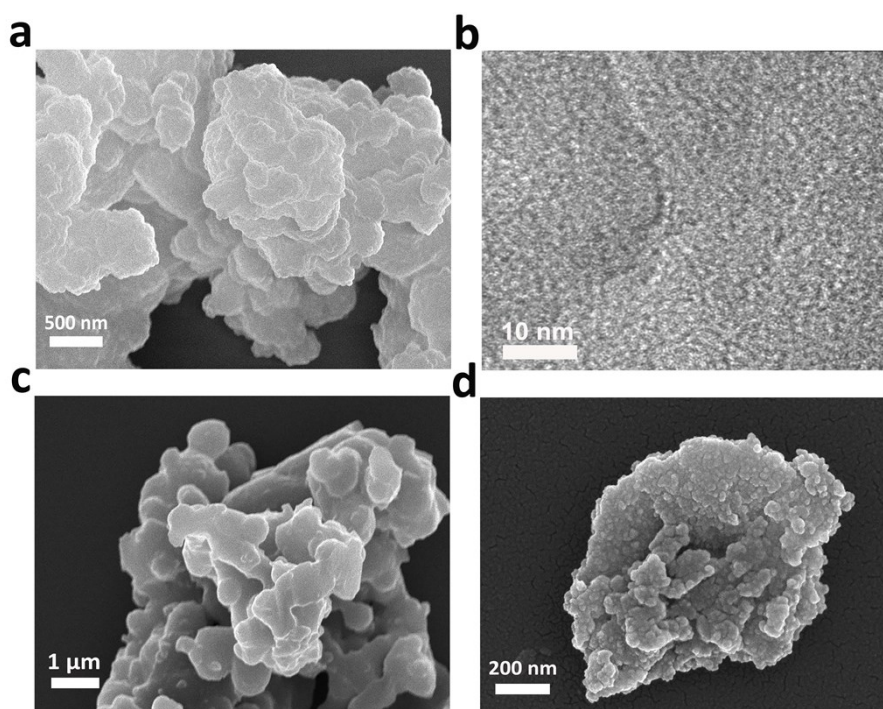
## Supplementary figures



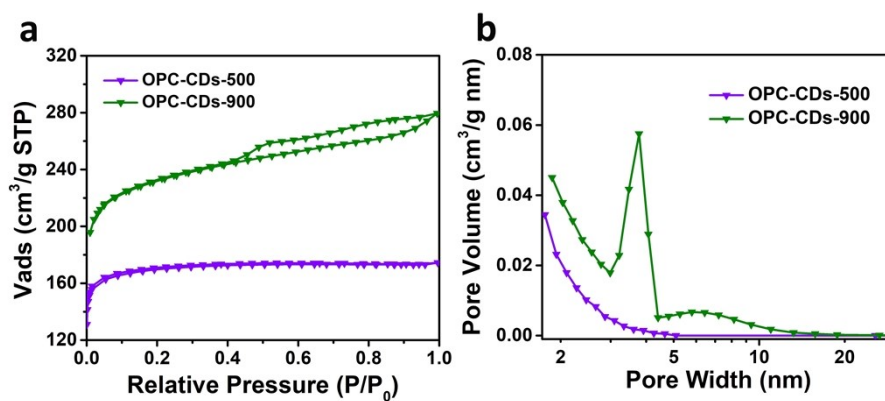
**Figure S1.** The typical morphology and characterization of CDs. (a) Typical TEM, HRTEM (left inset) images and corresponding size distributions (right inset) of CDs. (b) FTIR and UV-Vis spectra of CDs. (c) Transient photocurrent responses (TPR) of CDs. (d) Transient photovoltage (TPV) curve of CDs.



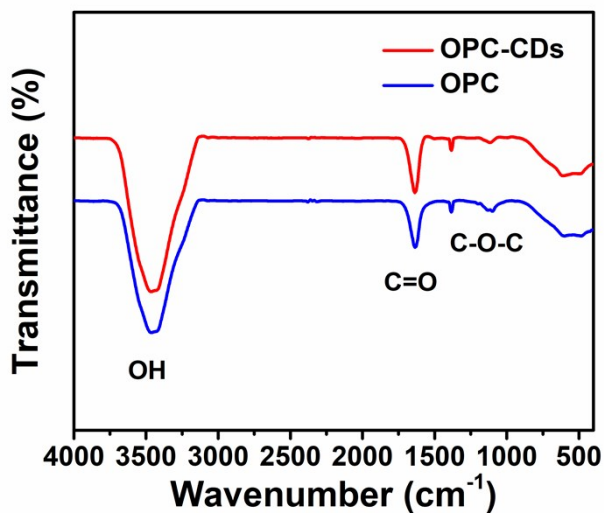
**Figure S2.** Cyclic voltammetry curves of CDs coated on glassy carbon electrodes in N<sub>2</sub> saturated anhydrous acetonitrile at 10 mV s<sup>-1</sup>.



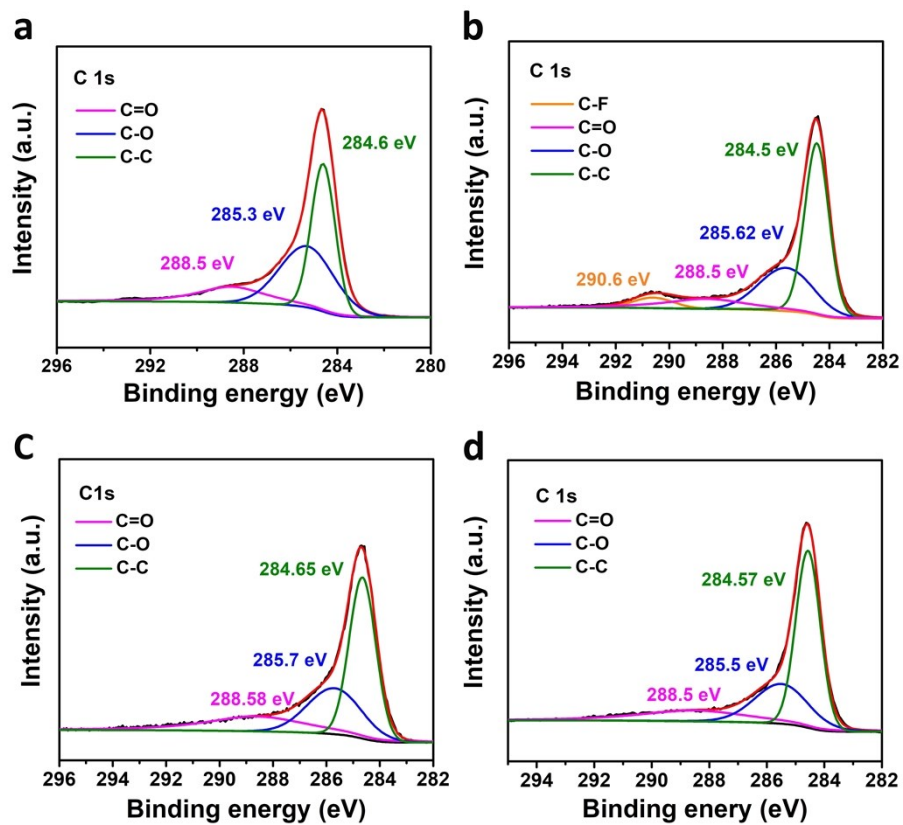
**Figure S3.** (a) SEM image of OPC-700. (b) TEM image of OPC-700. (c) SEM image of OPC-500. (d) SEM image of OPC-CDs-900.



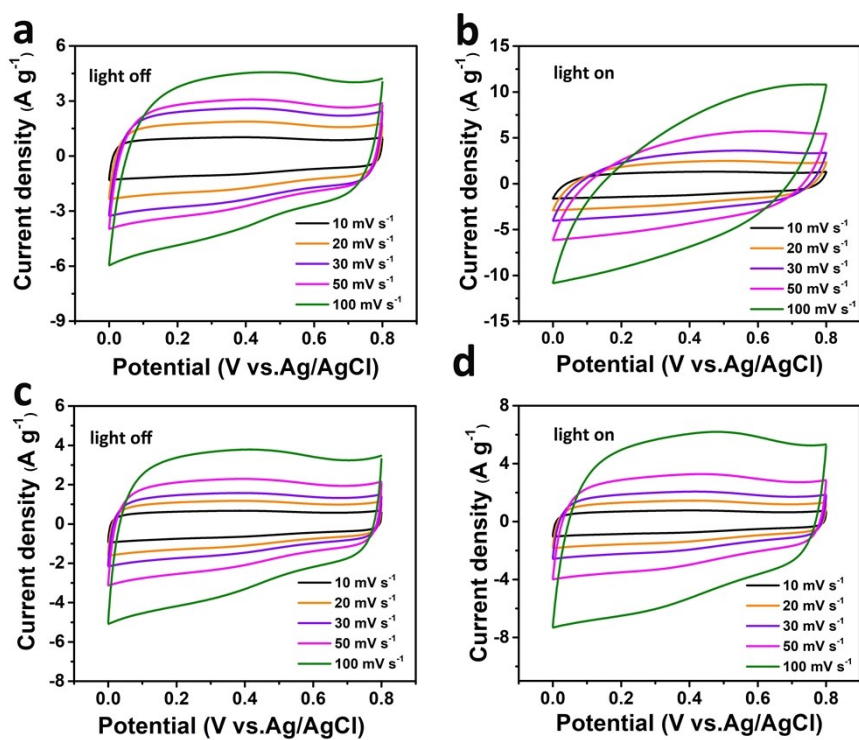
**Figure S4.** (a) Nitrogen adsorption-desorption isotherms and (b) corresponding pore size distribution curves of OPC-CDs-500 (purple trace) and OPC-CDs-900 (green trace).



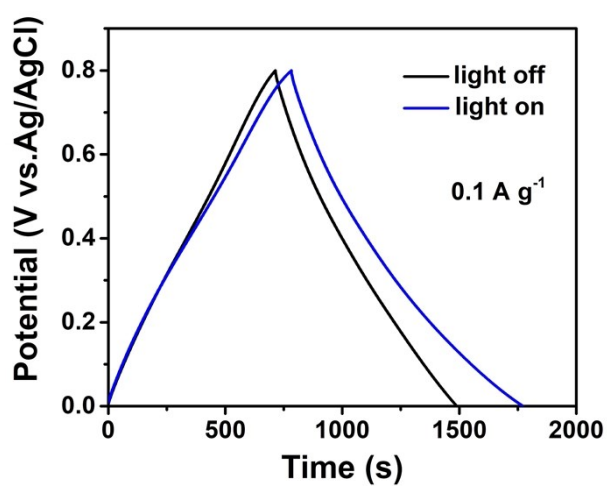
**Figure S5.** FTIR spectra of OPC-CDs-700 (red trace) and OPC-700 (blue trace).



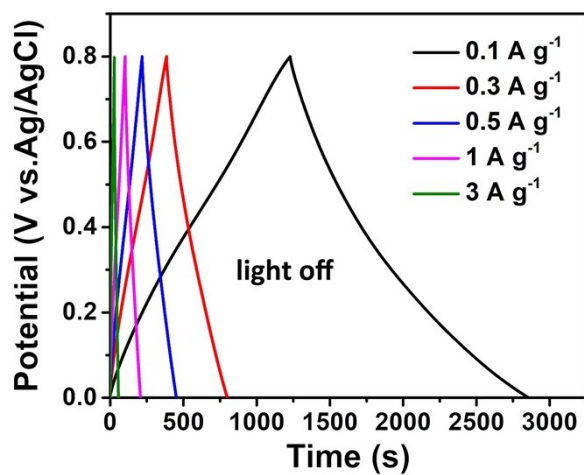
**Figure S6.** X-ray photoelectron spectroscopy (XPS) spectra of OPC-based powders. The corresponding C 1s spectra of (a) OPC-700, (b) OPC-CDs-700 after electrochemical test, (c) OPC-CDs-500, (d) OPC-CDs-900.



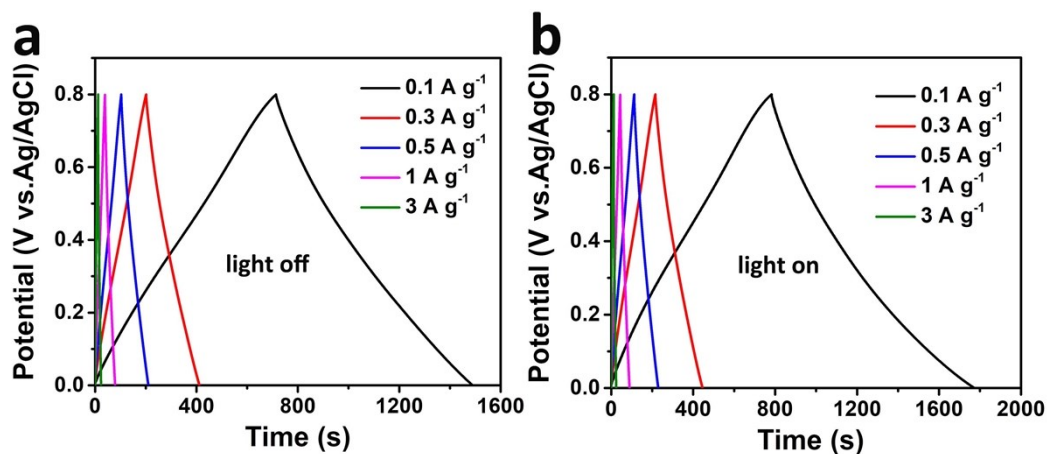
**Figure S7.** (a) and (b) are CV curves of the OPC-CDs-700 at various scan rates under dark and light illumination, respectively. (c) and (d) are CV curves of the OPC-700 at various scan rates under dark and light illumination, respectively.



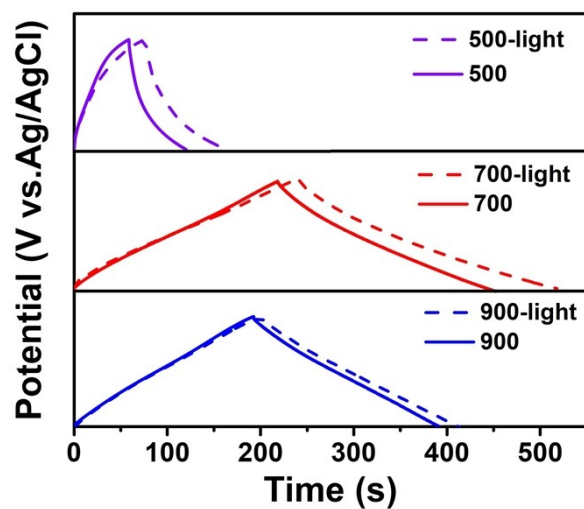
**Figure S8.** GCD curves of OPC-700 at 0.1 A g<sup>-1</sup> with/without light illumination.



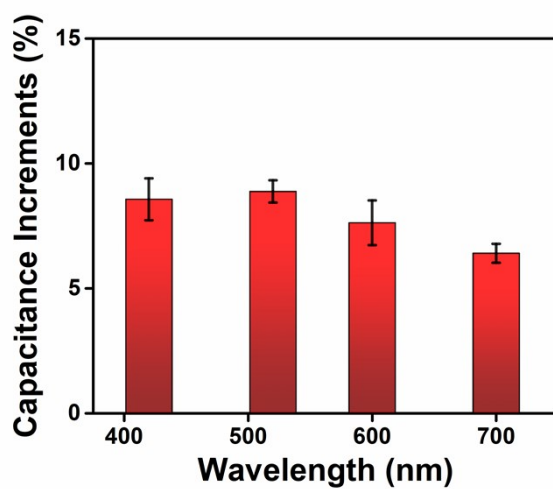
**Figure S9.** GCD curves of OPC-CDs-700 at different current densities under dark condition.



**Figure S10.** (a) and (b) are GCD curves of OPC-700 at different current densities under dark and light illumination, respectively.

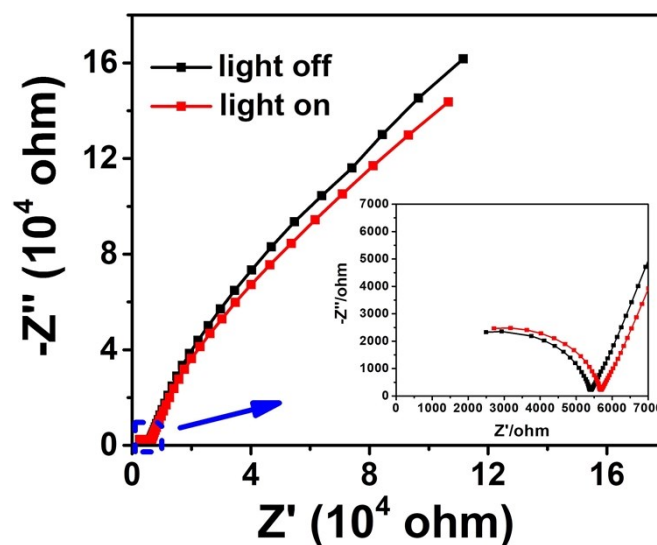


**Figure S11.** Comparison of GCD curves of OPC-CDs-500, OPC-CDs-700 and OPC-CDs-900 at  $0.5 \text{ A g}^{-1}$  under dark and light illumination.



**Figure S12.** Increments of capacitance achieved under different wavelength of OPC-CDs-700 at  $0.5 \text{ A g}^{-1}$ .





**Figure S13.** Nyquist plots of CDs electrode with/without light illumination.

**Table S1.** Activated carbon-based materials reported in the literatures applied for supercapacitor.

Order	Material	Measurement protocol	Electrolyte	Electrode configuration	Maximum specific capacitance	Reference
1	<b>OPC-CDs-700</b>	<b>GCD (0.1 A g<sup>-1</sup>)</b>	<b>3 M H<sub>2</sub>SO<sub>4</sub></b>	<b>3-electrode</b>	<b>203 F/g</b>	<b>Our work</b>
2	3D carbon nanotubes/poly(3,4-ethylenedioxythiophene) sponge electrodes	GCD (0.5 A g <sup>-1</sup> )	1M LiClO <sub>4</sub>	3-electrode	147 F/g	[1]
3	OMCS	GCD (0.2 A g <sup>-1</sup> )	6 M KOH	3-electrode	173 F/g	[2]
4	N <sub>3</sub> S-OMC	GCD (1 A g <sup>-1</sup> )	2 M KOH	3-electrode	167 F/g	[3]
5	N-OMC	GCD (0.1 A g <sup>-1</sup> )	1 M H <sub>2</sub> SO <sub>4</sub>	3-electrode	216 F/g	[4]
6	Nitrogen, oxygen and phosphorus decorated carbon	GCD (0.1 A g <sup>-1</sup> )	6M KOH	3-electrode	206 F/g	[5]
7	Cross-linked carbon nanofibers	GCD (0.5 A g <sup>-1</sup> )	6M KOH	3-electrode	222.9 F/g	[6]
8	Nitrogen-doped porous carbon	CV= -1-0 V	6M KOH	3-electrode	223.9 F/g	[7]
9	Microporous carbon	GCD (1 A g <sup>-1</sup> )	6M KOH	3-electrode	268 F/g	[8]

## References

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