

What is a photo-rechargeable capacitor?

This approach allows light to be used to recharge the capacitor directly and they can be operated in a continuous light powered mode. These capacitors show a photo-rechargeable specific capacitance of $\sim 11377 \text{ mF g}^{-1}$, a photo-charging voltage response of $\sim 850 \text{ mV}$, and a cyclability with $\sim 90\%$ capacitance retention over 1000 cycles.

What is a good capacitance of a photo-rechargeable supercapacitor?

The best sample has a specific capacitance of 252.4 mF/cm^2 at 0.71 mA/cm^2 . Photo-rechargeable supercapacitors, which are encouraging energy storage devices, have attracted much attention given their potential applications in smart electronics. They offer an appealing method for the application of sustainable solar energy.

What are the areal specific capacitances of a photo supercapacitor?

The areal specific capacitances in the dark are 10.4, 8.1, 7.8, 7.5, 5.9, and 5.2 mF/cm^2 at 0.26, 0.3, 0.34, 0.42, and 0.46, and 0.5 mA/cm^2 current densities, respectively. The GDC curves of this photo supercapacitor under light illumination, shown in Fig. 7 b, further confirm the enhanced capacitance under illumination.

How do photo-rechargeable zinc-ion capacitors work?

Here we propose the first photo-rechargeable zinc-ion capacitors, where graphitic carbon nitride acts simultaneously as the capacitor electrode and light harvesting material. This approach allows light to be used to recharge the capacitor directly and they can be operated in a continuous light powered mode.

How efficient is a photocapacitor?

While the highest reported charge storage efficiency of an integrated photocapacitor is approximately 20%, (28) further improvements in the intrinsic properties of the active materials, interface quality, and device integration are needed to enhance overall efficiency and commercial viability.

What is a photorechargeable supercapacitor?

Herein, such a photorechargeable supercapacitor (also called a photosupercapacitor) is developed via a three-electrode integration of a p-i-n halide perovskite solar cell with a gel electrolyte-type supercapacitor that uses mesoporous N-doped carbon nanospheres (MPNC) as the active electrode material.

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Electric vehicles using lithium-ion battery pack(s) for propulsion have recently attracted a great deal of

interest. The large-scale practical application of battery electric vehicles may not be ...

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Photo C-V is photoelectrical phenomena in junction capacitors whose capacitance (C) is time, voltage or charge dependent. There has been the observation of ...

Herein, we designed and fabricated a photo-supercapacitor based on a CdS/CdSe quantum dots co-sensitized solar cell and an active carbon-based supercapacitor with a shared electrode and separate aqueous electrolytes. The device achieved a 2.66% overall efficiency when being photo-charged and galvanostatic discharged at 1 mA/cm², with an areal ...

Schematic illustrating the integration of photocapacitors from individual components into a singular device capable of light harvesting and charge storage. Multiple applications are enabled by the use of photocapacitors, and their development will lead to more efficient and sustainable energy consumption.

Herein, we comprehensively discuss different types of photo-powered supercapacitors with their design configuration, working mechanism and fabrication. Finally, the future direction, opportunities and challenges in this research field are discussed.

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The photo-rechargeable batteries and supercapacitors, which hybridize solar energy harvest, conversion, and storage, exhibit great potential for the practical application of solar energy. In ...

In this study, a novel photo-assisted asymmetric supercapacitor (ASC) with dual photoelectrodes was specifically assembled. We rationally designed nanoflower-like ZnCo₂O₄ (ZCO NF) as the positive electrode, ...

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higher than ...

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