

Are organic photovoltaics suitable for high-speed optical data receivers?

We show that organic photovoltaics (OPVs) are suitable for high-speed optical wireless data receivers that can also harvest power. In addition, these OPVs are of particular interest for indoor applications, as their bandgap is larger than that of silicon, leading to better matching to the spectrum of artificial light.

What is an organic photovoltaic device (OPV)?

Organic Photovoltaic Devices A typical OPV has a layered structure involving: a substrate, transparent bottom electrode, photoactive layer and top metal electrode (fig. 1). Light is converted to electrical current in the photoactive layer, which has a typical thickness of ~ 100 nm.

Can neutral-color semitransparent organic photovoltaics improve solar energy harvesting in integrated buildings?

Neutral-color semitransparent organic photovoltaics (ST-OPVs) offer potential opportunities to improve solar energy harvesting in integrated buildings. Here, high-performance multifunctional neutral-color ST-OPVs are successfully fabricated by integrating a $\text{Ag/TeO}_2/\text{Ag/TeO}_2$ -based Fabry-Perot resonant optical coating (FPOC).

How efficient is a solar-to-electrical conversion rate compared to a photovoltaic cell?

We measured a solar-to-electrical conversion rate of 6.8%, exceeding the performance of the photovoltaic cell alone. The device operates more efficiently while reducing the heat generation rates in the photovoltaic cell by a factor of two at matching output power densities.

What is a photovoltaic system?

This dual function of photovoltaic (PV) systems is beneficially exploited for a wide variety of applications ranging from self-powered long-range free-space optical systems, where a large receiver exhibits significant advantages, to self-powered wearable devices as part of the future IoT 15.

Can solar fiber light be used for photovoltaic power generation?

Conclusions A combined solar fiber lighting and photovoltaic power generation system based on spectral splitting (SSLP) technology has been proposed in this study, with visible light for house lighting and near-infrared light for photovoltaic power generation.

The power conversion efficiency (PCE) of OPVs has increased substantially in the past two decades, with values of 9 - 11% now being attained for laboratory scale single and tandem-junction devices. These promising figures of merit ...

Here, we present an alternative approach that enables temperatures beyond $1,800^\circ\text{C}$ through a bilayer stack achieved by combining the optical and thermal properties of 2,809 coating/substrate pairs. By varying

the ...

[29-31] Photothermal conversion of solar energy refer that solar energy is first converted into heat and then heat energy is utilized to achieve the desired destinations, [15, 16, 28, 31-34] such as water purification, ...

Modeling of Optical and Thermal Performance, Electrical Yield, Energy Balance, Effect on Reduction of Greenhouse Gas Emissions ... The potential of solar electric power generation as a means to significantly reduce CO₂ emissions ...

to exploit the full solar spectrum for thermal or electric power generation for some reason as previously men-tioned. Against this background, this paper proposes a method that can exploit ...

When you install a solar electric system, you make the switch from fossil fuel to a cleaner, more economical source of power. Become energy independent, avoid costly rate hikes and enjoy peace of mind with little or no maintenance. ... GO ...

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