Photocurrent of solar cell

We investigated the photocurrent in poly 3-hexylthiophene-2,5-diyl P3HT : 6,6 -phenyl-C61 butyric acid methyl ester solar cells by applying a pulsed measurement technique. For annealed ...

Photocurrent is defined as the fraction of photogenerated electron-hole (e- -h +) pairs collected at the semiconductor edges by the electrodes. In case of photodetectors, photocurrent can be estimated by the following formula [29,30]:

Incorporating both optical and electrical properties, we study the influence of the heterojunction nanostructure (e.g., planar vs bulk junctions) on donor-acceptor organic solar cell efficiencies based on the archetype materials copper phthalocyanine (CuPc) and C 60.

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In p-i-n perovskite solar cells optical excitation of defect states at the interface between the perovskite and fullerene electron transport layer (ETL) creates a photocurrent responsible for a distinct sub-bandgap external quantum efficiency (EQE). The precise nature of these signals and their impact on cell performance are largely unknown. Here, the effect of n ...

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In this research, the effect of anodization time on the length of the titanium oxide nanotube arrays (TNAs) and photovoltaic parameters of back-side illuminated dye-sensitized solar cells (DSSCs) were investigated. The TNAs were characterized using X-ray diffraction (X-ray) or (XRD), and scanning electron microscopy (SEM). Anodic TNAs having tube lengths from 7.9 ...

Photocurrent is the electric current through a photosensitive device, such as a photodiode, as the result of exposure to radiant power. The photocurrent may occur as a result of the photoelectric, photoemissive, or photovoltaic effect. The photocurrent may be enhanced by internal gain caused by interaction among ions and photons under the influence of applied fields, such as occurs in an avalanche photodiode (APD).

We present intermediate-band solar cells manufactured using quantum dot technology that show for the first time the production of photocurrent when two sub-band-gap ...

Optical properties and limiting photocurrent of thin-film perovskite solar cells ... we use an optical model based on the transfer-matrix formalism for analysis of perovskite-based planar heterojunction solar cells using

experimentally determined complex refractive index data. We compare the modelled properties to experimentally determined data, and obtain good ...

Here we use an optical model based on the transfer-matrix formalism for analysis of perovskite-based planar heterojunction solar cells using experimentally determined complex refractive index data. We compare the modelled properties to experimentally determined data, and obtain good agreement, revealing that the internal quantum efficiency in ...

When the cell is illuminated (by sunlight), it will generate a photocurrent. Ideally, all the photo-generated carriers (one electron-hole pair per absorbed photon) will be collected to produce the cell"s photo-current.

Direct photocurrent mapping of organic solar cells (OSCs) using a novel implementation of a near-field scanning optical microscope (NSOM) is described. By rastering the light output from the NSOM through a semitransparent electrode across the OSC surface, it is possible to collect height and photocurrent images simultaneously with a lateral resolution that ...

In this work, we describe different components of the steady-state light intensity-dependent photocurrent (IPC) and charge collection efficiency under operational conditions. Further, we demonstrate how different loss mechanisms can be identified based on their unique signatures in the IPC.

Photovoltaic devices based on organic semiconductors, including solar cells, indoor photovoltaic cells, and photodetectors, hold great promise for sustainable energy and light-harvesting technologies. 1-4 However, these systems generally suffer from large non-geminate recombination of charge carriers, limiting the collection of photogenerated charge carriers and, ...

Increase in incident light and surface modification of the charge transport layer are powerful routes to achieve high-performance efficiency of perovskite solar cells (PSCs) by improving the short-circuit current density (JSC) and charge transport characteristics, respectively.

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