Magnetic solar photovoltaic

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The authors show that at low temperature and high magnetic field, thermal spin polarization is the chief source of magnetophotocurrent in organic photovoltaic cells. They find that longer-lived charge-transfer excitons substantially increase magnetoconductance, and their clear explanation of the mechanisms for the high-field effects provides ...

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Photovoltaic cells convert sunlight into electricity. A photovoltaic (PV) cell, commonly called a solar cell, is a nonmechanical device that converts sunlight directly into electricity.Some PV cells can convert artificial light into electricity. Sunlight is composed of photons, or particles of solar energy.These photons contain varying amounts of energy that correspond to the different ...

Incorporating magnetic nanoparticles in organic solar cells enhances stability and longevity, crucial for commercial viability. Optimal concentration and size of magnetic nanoparticles must be determined to maximize photovoltaic performance.

The bulk photovoltaic effect (BPVE) is a second-order optical process in noncentrosymmetric materials that converts the light into DC currents. BPVE is classified into shift current and injection current according to the generation mechanisms and their dependence on the polarization of light is sensitive to the spatial and time-reversal symmetry of materials. In ...

In organic photovoltaic devices, the separation and transport of photogenerated charges play crucial roles for power conversion efficiency. Magnetic doping in organic solar cells can effectively enhance the power conversion efficiency by introducing a static magnetic field. In this study, we observed that in pure organic magnetic solar cells ...

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Different technologies have been developed to improve the photovoltaic solar cells efficiency. Among these cells, polymer solar cells have received extensive attention due to their advantageous ...

In this article, photovoltaic (PV) unit has been combined with new cooling technique to ameliorate the efficiency. The operate fluid was mixed with nano-powder (Fe 3 O 4) and vertical magnetic field has been imposed. These techniques can augment the cooling rate of PV cell and efficiency in both view of electrical (? ele) and thermal (? th). ...

Recently, we developed a solar control of magnetism, allowing the magnetic moment to be manipulated by sunlight instead of the magnetic field, current, or laser. Here, binary and ternary photoactive systems with different photon-to-electron conversions are proposed.

An appropriate magnetic field (MF) can amplify the spin-orbit coupling effect between FA ions and chiral molecules, significantly increasing the magnetic dipole moment ...

Magnetic fields applied to solar cells, can influence different aspects of the photovoltaic process that include, magnetic field-assisted charge separation, magnetic nanostructures for light trapping, and magnetic field-induced quantum effects, among others.

"Today"s solar cells work by absorbing photons which are then sucked away to the electrodes to do the work," Prof. Schmidt says. "But as part of this process, a lot of this light is lost as heat. Which is why solar panels don"t run at full efficiency." Almost all photovoltaic solar panels on the market today are made from silicon. Co-author ...

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