

How do magnetic fields affect the photovoltaic process?

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.

Do magnetic fields affect quantum properties of photovoltaic materials?

Furthermore, influence of magnetic fields on the quantum properties of photovoltaic materials such as magnetoexcitons, magnetoexciton-polaritons, and magnetic field-induced quantum confined Stark effect (QCSE) in which electron-hole pair separation happens to manipulate the electronic and optical properties.

What is magnetism-assisted photovoltaic (MHD)?

Magnetism-assisted photovoltaic, studies to uncover the underlying mechanisms of magnetohydrodynamic (MHD) phenomena (explore how the application of magnetic fields influences the transport, recombination, and collection of charge carriers within PV devices) and harness the potential benefits.

What is bulk photovoltaic effect (BPVE)?

The bulk photovoltaic effect (BPVE) rectifies light into the dc current in a single-phase material and attracts the interest to design high-efficiency solar cells beyond the pn junction paradigm. Because it is a hot electron effect, the BPVE surpasses the thermodynamic Shockley-Queisser limit to generate above-band-gap photovoltage.

What is ferromagnetic photovoltaic CH_3NH_3 ?

Here, we report the synthesis of a ferromagnetic photovoltaic $\text{CH}_3\text{NH}_3(\text{Mn:Pb})\text{I}_3$ material in which the photo-excited electrons rapidly melt the local magnetic order through the Ruderman-Kittel-Kasuya-Yosida interactions without heating up the spin system.

Does a magnetic photogalvanic effect induce a giant BPVE?

While the guiding principle for BPVE materials is to break the crystal centrosymmetry, here we propose a magnetic photogalvanic effect (MPGE) that introduces the magnetism as a key ingredient and induces a giant BPVE. The MPGE emerges from the magnetism-induced asymmetry of the carrier velocity in the band structure.

The optical properties show that the material has high absorption and conductivity. The magnetic properties show that the material is antiferromagnetic in nature. Due to the direct band gap ...

In view of the imperfection in the previous studies, an efficient method is proposed in this paper for predicting

the magnetic field distribution and induced voltage in PV bracket systems. The ...

An effective method is proposed in this paper for calculating the transient magnetic field and induced voltage in the photovoltaic bracket system under lightning stroke. Considering the need for the lightning current ...

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