

How does a local built-in electric field induce photovoltaic polarization?

Volume 68, February 2020, 104327 A local built-in electric field induces in the active layer by incorporating ferroelectric additives. The Ferroelectric polarization induced by cosolvent recrystallization without a poling process, resulting in enhanced photovoltaic property is demonstrated.

Can ferroelectric polymers improve power-conversion efficiency in organic solar cells?

Inspired by the ever-increasing demand for advanced energy technologies, there have been recent attempts to utilise the built-in electric field generated by the electric polarization of ferroelectric polymers to improve the power-conversion efficiency (PCE) in organic solar cells (OSCs) [3, 13, , , ,].

Why do mapbi 3 based solar cells recombine a long-range charge?

On the basis of time-domain density functional theory and nonadiabatic molecular dynamics, Qiao et al. found the long-range charge separation and the slow charge recombination due to a ferroelectric reason in MAPbI₃-based solar cells .

Does ferroelectric polarization improve photovoltaic performance in ppsCs?

The presence of depolarization electric field (E_{dp}) due to the ferroelectric polarization is more helpful for the separation and transport of photogenerated charge carriers to enhance the photovoltaic performance of the materials system in PPSCs.

Is there a built-in electric field without a poling processing step?

Herein, a built-in electric field without a poling processing step was established by introducing developed PVDF-based ferroelectric additives within active-layer matrices of organic solar cells (OSCs).

Can a ferroelectric photovoltaic device have a higher PCE?

Lowering the E_g and preserving the ferroelectric properties are an appealing route to obtain photovoltaic devices with higher PCE. BiFeO₃ (BFO) is among the most attractive lead-free perovskite oxide materials to be used as the photoactive layer in ferroelectric photovoltaic devices.

The Landau-Ginzburg theory of ferroelectricity predicts the intrinsic coercive field for polarization reversal, but the observed extrinsic coercive field is always much smaller as a ...

It should be noted that the phenomenological theory tends to overestimate the coercive field relative to experiments because it does not account for external factors such as ...

The lattice constants of the wurtzite unit cell, $c = 5.2060 \text{ \AA}$; and $a = 3.2462 \text{ \AA}$; with $c/a = 1.603$ and unit cell volume of $47.51 \text{ \AA}^3$, were obtained which are matching that of the standard ZnO ...

Polymer solar cells (PSCs) with a bulk heterojunction (BHJ) device structure have incredible advantages, such as low-cost fabrication and flexibility. ... It is found that the ...

Ferroelectric (FE) materials are extensively applied in a myriad of critical technologies such as nonvolatile random access memories, field-effect transistors, sensors, actuators and solar cells 1 ...

An ultralow program/erase voltage ($|V_{P/E}| = 4 \text{ V}$) is demonstrated by using an antiferroelectric-ferroelectric field-effect transistor (AFE-FE-FET) through a multipeak coercive ...

(a) Optical image of the MAPbBr₃ single-crystalline film; (b) cross-sectional SEM image of the MAPbBr₃ single-crystalline film; (c - f) schematic showing the CTAC ...

A solar cell functions similarly to a junction diode, but its construction differs slightly from typical p-n junction diodes. A very thin layer of p-type semiconductor is grown on a ...

However, the light-to-electricity conversion efficiency (power conversion efficiency) of the bulk PV effect in ferroelectric thin film based solar cell is reported to be significantly lower ...

The spontaneous electric polarization inside each unit cell may be changed by an external electric field of sufficient strength; however, when considering randomly oriented ...

Multipeak Coercive Electric-Field-Based Multilevel Cell Nonvolatile Memory With Antiferroelectric-Ferroelectric Field-Effect Transistors (FETs) Chun Yu Liao, Kuo Yu Hsiang, Zhao Feng Lou, ...

Nanowires (NWs) solar cells are expected to outperform the thin-film counterparts in terms of optical absorptance. In this theoretical study we optimize the geometry ...

UV-induced degradation is an important factor affecting the stability of silicon heterojunction (SHJ) solar cells. Many works investigated the root cause of this degradation ...

??? (coercivity) ??? ??? ? ???, ? ?? ??????, ????????????? ???? ?, ????????????????? ???? ? ????????????? ? ...

Solar cells employing a halide perovskite with an org. cation now show power conversion efficiency of up to 22%. However, these cells are facing issues towards ...

Download scientific diagram | Coercive field, maximum magnetization at 7 T, and remnant magnetization values at 300 and 5 K, based on Figure 9 for Sb₂(1-x)Fe_{2x}S₃ (0.2 ≤ x ≤ 1). ...

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