

An, H., Fan, F. & Li, C. Unravelling charge separation via surface built-in electric fields within single particulate photocatalysts. *Faraday Discuss* 198, 473-479 (2017).

Another way to improve the efficiency of carrier separation is to build a built-in electric field in the catalyst [27], [28]. For instance, Yan et al. [27] used O and N co-doped g-C₃N₄ to build a built-in electric field inside the photocatalyst. This is due to the acceleration of the electron transfer from O and C atoms to the vicinity of N ...

Due to high power density, fast charge/discharge speed, and high reliability, dielectric capacitors are widely used in pulsed power systems and power electronic systems. However, compared with other energy storage devices such as batteries and supercapacitors, the energy storage density of dielectric capacitors is low, which results in the huge system volume when applied in pulse ...

In this work, an exceptional room-temperature energy storage performance with $W_r \sim 86 \text{ J cm}^{-3}$, $\eta \sim 81\%$ is obtained under a moderate electric field of 1.7 MV cm^{-1} in $0.94(\text{Bi}, \text{Na})\text{TiO}_3\text{-}0.06\text{BaTiO}_3$ (BNBT) thin films composed of super-T polar clusters embedded into normal R and T nanodomains. The super-T nanoclusters with a c/a ratio up to 1.25 are ...

The construction and regulation of built-in electric field (BIEF) are considered effective strategies for enhancing the oxygen evolution reaction (OER) performance of transition metal-based electrocatalysts. Herein, we present a strategy to regulate the electronic structure of nickel-iron layered double hydroxide (NiFe-LDH) by constructing ...

It is well known that semiconductor materials have already been successful in photovoltaic cells based on a built-in electric field (BIEF). Generally, ... Zhu B, Fan L, Mushtaq N, et al. Semiconductor electrochemistry for clean energy conversion and storage. *Electrochemical Energy Reviews* 2021; doi: 10.1007/0-306-48036-0_4. DOI.

The formed built-in electric field reduces the lithium-ion diffusion energy barrier at the interface and enhances the charge transfer kinetics of the GaZnON@NG composite anode. Electrochemical measurements and kinetic analysis confirm ...

Constructing a built-in electric field at the interface of semiconductors has been demonstrated to provide the driving force for spatial charge separation in photocatalysis. ... -in electric fields on the surface of semiconductor-based photocatalysts to boost spatial charge separation for solar energy conversion systems. About. Cited by ...

Built-in electric field energy storage

This study demonstrates the synergistic effect of the built-in electric field and heterostructures in spatially enhancing the stepwise conversion of polysulfides, which provides novel insights into the interfacial architecture for rationally regulating the ...

Driven by built-in electric field across the heterojunction, photoexcited electrons could rapidly (2 ps) transfer from the n-type ZnO core to the p-type SA-Co-CN shell, finally boosting the ...

The energy band structure and alignment, band bending and built-in electric field are all important elements in this context to realize the necessary fuel cell functionalities. This review further extends to semiconductor-based electrochemical energy conversion and storage, describing their fundamentals and working principles, with the ...

In this study, a novel yet general strategy is proposed and demonstrated to enhance the energy storage density (ESD) of dielectric capacitors by introducing a built-in electric field in the ...

Built-in electric field (BIEF) has recently emerged as a promising strategy for promoting charge transfer by supplying additional coulomb forces. However, the challenge lies ...

Developing new green energy storage and conversion technologies is an important approach to solving energy problems. In this regard, both water splitting and rechargeable metal-air batteries have certain research value. ... Therefore, improving catalysts becomes a key issue. The built-in electric field is caused by the uneven distribution of ...

The theoretical calculations disclose that the periodic and directional built-in electric-field along with the heterointerfaces of CoSe₂/NiSe₂@N-C can accelerate electrochemical reaction kinetics. ... (LIBs) in the fields of energy storage for renewable energy systems. Sodium-ion batteries ...

Constructing novel heterostructures has great potential in tuning the physical/chemical properties of functional materials for electronics, catalysis, as well as energy conversion and storage. In this work, heterostructured Bi₂S₃-Bi₂O₃ nanosheets (BS-BO) have been prepared through an easy water-bath approach. The formation of such unique BS-BO ...

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