Organic solar cell data analysis

great potential in the design of efficient optoelectronic devices like organic solar cells ... collected the calculations and experimental data of thousands of organic photoelectric molecules and ...

His research interests include the design and synthesis of organic semi-conductor materials for organic solar cells and computational analysis of organic solar cells. Jin-Liang Wang From 2008 to 2012, he was a Postdoctoral research fellow in The University of Akron and The University of North Carolina at Chapel Hill.

Organic solar cells (OSCs) are devices that convert sunlight into electricity using organic materials [9], [10]. The chemical similarity analysis can be used to find active layer materials for efficient charge generation and transport.

All-small-molecule organic solar cells (all-SMOSCs) have attracted tremendous attention on account of their special merits of easy purification, well-defined molecular structures, and better molecular ...

Nearly all types of solar photovoltaic cells and technologies have developed dramatically, especially in the past 5 years. Here, we critically compare the different types of photovoltaic ...

A team of researchers at the University of Kansas have studied a counterintuitive effect in organic semiconductors that may lead to solar cell efficiencies competitive with traditional silicon solar panels. The research is published in ...

Beginner"s guide to visual analysis of perovskite and organic solar cell current density-voltage characteristics Albert These 1,2, L. Jan Anton Koster 3, Christoph J. Brabec 1,4, and Vincent M. Le Corre * 1 1 Friedrich-Alexander-Universit at ...

6 · Benefiting from the innovations in molecular design and device engineering 1,2,3,4,5, organic solar cells (OSCs) have undergone a substantial progress in the past decade ...

By using machine learning, a general approach to predict the PCEs of organic solar cells was developed, which shows excellent performance (r = 0.79) without any DFT ...

Selective core fluorination of nonfullerene acceptors was achieved by the structural expandability of quinoxaline, yielding five acceptors (AQx-nF, n = 0-4). The effect of core fluorination on molecular physicochemical and aggregation properties has been explored systematically. The core fluorination enables adjustable molecular polarizability, downshifted energy level, blue ...

We present two automatically generated databases that contain photovoltaic properties and device material data for dye-sensitized solar cells (DSCs) and perovskite solar cells (PSCs), totalling ...

Therefore, it is extensively used in photophysics, photochemistry, and photobiology. TAS plays a crucial role in unveiling charge generation and recombination dynamics in organic solar cells (OSCs). However, the interpretation of TA data is sometimes difficult for

In this current research work, we have designed four small D-A-D units based bulk hetero junction organic solar cells with naphthalene diimide (NDI) as electron acceptor and triphenyl amine (TPA) as electron donor namely NDI-a-TPA in which the electron donor units TPA is attached at different positions on both side of central fragment of NDI (naphthalene diimide) ...

BM blended bulk heterojunction solar cell. Solar Energy Materials and Solar Cells, 175, pp.35-40. Komilian, S., Oklobia, O. and Sadat-Shafai, T., 2018. Data related to the PC 71 BM loading and it"s impact on nanostructuring for blend of PBDTTT-EFT: PC 71

Organic solar cells (OSCs), as a type of lightweight, flexible, and solution-processable photovoltaics, have shown promising prospects in integrating with wearable clothes, smart electronics and ...

This research represents the first theoretical investigation about the vibration behavior of circular organic solar cells. Therefore, the vibration response of asymmetric circular organic solar cells that represent a perfect renewable energy source is demonstrated. For this purpose, the differential quadrature method (DQM) is employed. The organic solar cell is ...

The data-analysis capability of machine learning methods is well known. This review is written about the use of machine learning methods for organic solar cell research. In this review, we have outlined the basics of machine learning and ...

a-d) Bandgap dependence of the photovoltaic parameters of perovskite solar cells from recently published papers (data-range 2019-2021) as derived from the open perovskite database (https://perovskitedatabase) [] ...

ogies were used to create a solar cell database with over 160000 literature from the Web of Science. Basedon this solar cell data-base, databases for organic solar cells were established, subse-quently. The analysis of each literature in the organic solar cell

Organic solar cells (OSCs) have been recognized to have tremendous potential as alternatives to their inorganic counterparts, with devices that are low-cost, lightweight, and easily processed and have less environmental impact. Challenges for OSCs to be utilized ...

The Harvard Organic Photovoltaic Dataset (HOPV15) presented in this work is a collation of experimental photovoltaic data from the literature, and corresponding quantum ...

Organic solar cells have emerged as promising alternatives to traditional inorganic solar cells due to their low cost, flexibility, and tunable properties. This mini review introduces a novel perspective on recent

advancements in organic solar cells, providing an overview of the latest developments in materials, device architecture, and performance ...

Polythiophenes with unprecedented photovoltaic performance are developed for organic solar cells (OSCs). A prominent efficiency of 17.2% has been achieved, which is the new efficiency record and represents a big breakthrough for polythiophene-based OSCs. Benefiting from the intrinsic structural simplicity and synthetic accessibility of polythiophenes, this work ...

Zhao et al. develop a comprehensive optoelectronic model to elucidate the underlying physics of two-terminal perovskite/organic tandem cells. To improve device efficiency, influential parameters and recombination losses ...

4 · Analysis using Solar Cell Capacitance Simulator-1D (SCAPS-1D) software shows that optimum performance is achieved with these specific parameter values. After optimization with NSGA-II, the power conversion efficiency increases by 39% compared to previous work.

The current density-voltage characteristic (JV) is a critical tool for understanding the behaviour of solar cells. In this article, we present an overview of the key aspects of JV analysis and introduce a user-friendly flowchart that facilitates the swift identification of the most probable limiting process in a solar cell, based mainly on the outcomes of light-intensity ...

Organic solar cells (OSCs) represent the next generation photovoltaics (PV) and they offer a wide range of novel and unconventional benefits such as integration into buildings and other devices, in addition to being of low cost, light weight, mechanically flexible and ...

organic solar cell, our strategy successfully offers a record binary organic solar cell efficiency of 19.31% (18.93% ... Source data are provided as a Source Data file. Full size image Table 1 ...

A research team at the University of Kansas have found that organic semiconductors known as non-fullerene acceptors demonstrate a high solar cell efficiency due to a reversed heat flow.

The discovery of novel high-performing materials such as non-fullerene acceptors and low band gap donor polymers underlines the steady increase of record efficiencies in organic solar cells ...

His main research interests focus on the material design of asymmetric and branched-chain-engineered organic photovoltaic acceptors for organic solar cells. Jicheng Yi received his PhD degree from Shanghai Institute of Organic Chemistry (SIOC) in 2019 under the supervision of Prof. Shu-Li You.

In this Perovskite Database Project, we have created an open-access database for perovskite solar cell device data and visualization tools for interactive data exploration, and we have populated ...

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Based on the automated fabrication and characterization steps, the complete workflow generated a large and systematic dataset including photographs of the thin films for ...

Additive-assisted layer-by-layer deposition creates a bulk p-i-n structure and vertically segregated fibril network morphology in the active layer of organic solar cells. This morphology optimizes exciton and carrier diffusion, thereby reducing recombination losses. Additionally, the micron-scale wrinkle-patterned morphology enhances the light capture ...

Organic solar cells (OSCs) are a promising renewable energy technology with the advantages of low cost, light weight and flexibility, and have attracted a considerable amount of research interest [1], [2], [3], [4].Due to rapid developments in the structural design of ...

1 · B) Database: Includes the full-text solar cell database (SCD), organic solar cell database (O-SCD), and ternary organic solar cell database (T-O-SCD). C) Topic Analysis of Literature: ...

Organic photovoltaics: We are working on the development of lighter, more flexible and more environmentally friendly solar cells based on semiconducting materials made from hydrocarbons. 2023 Indoor Photovoltaics for the Internet-of-Things - A Comparison of State