Organic solar cells have obtained a prodigious amount of attention in photovoltaic research due to their unique features of light weight, low cost, eco-friendliness, and semitransparency. A rising trend in this field is the development of all-small-molecules organic solar cells (ASM-OSCs) due to their merits of excellent batch-to-batch reproducibility, well ???

This work designed an 5-alkylthiophene-2-yl-substituted BDT monomer and synthesized two new PBDTTT-based polymers having either the thieno[3,4b], 4,7-dithiophene, 2,1,3-benzothiadiazole, and bithiazole properties, which showed promising photovoltaic properties. Polymer solar cells (PSCs) have attracted much attention because of their potential ???

Over the past 20 years, significant progress has been made in organic photovoltaics (OPVs) due to its advantages of being cost-effective, being lightweight, and having flexible manufacturability.

ALKOXYL AND ALKYL BDT ORGANIC PHOTOVOLTAIC

Three conjugated polymers based on thienyl-substituted benzodithiophene (BDT) and 4,7-bis-thienyl-benzothiadiazole (DTBT) with varied substitution positions of the alkyl side chains were synthesized to investigate the correlations between the structure and photovoltaic performance of the polymer photovoltaic materials. The three polymers named PBDTDTBT-p, ???

Among various electron-donating moieties, benzo[1,2-b:4,5-b???]dithiophene (BDT) has been widely used as the central building block for constructing high-performance A????????D????????A-type organic ???

Organic semiconductors can be employed as the active layer in accumulation mode organic electrochemical transistors (OECTs), where redox stability in aqueous electrolytes is important for long

ALKOXYL AND ALKYL BDT ORGANIC PHOTOVOLTAIC

Organic semiconductors can be employed as the active layer in accumulation mode organic electrochemical transistors (OECTs), where redox stability in aqueous electrolytes is important for long???term recordings of biological events. It is observed that alkoxy???benzo[1,2???b:4,5???b???]dithiophene (BDT) copolymers can be extremely unstable when ???

In Group 1, the BDT units in the polymers are substituted by alkoxyl groups; in Group 2, the three polymers possess identical backbone structures and alkyl side groups as the analogues in Group 1

We introduce the basic considerations for the construction of 2D-conjugated BDT-based polymers and systematic molecular design guidelines. For example, simply modifying an alkoxyl-substituted BDT to form an alkylthienyl-substituted BDT ???

ALKOXYL AND ALKYL BDT ORGANIC PHOTOVOLTAIC

Three random D-A copolymers containing thienopyrroledione (TPD) and benzodithiophene (BDT) named P-HBT-T, P-FBT-T, and P-FBT-O were synthesized. The effects of side chains on BDT and fluorination to benzothiadiazole on the photovoltaic performances of fabricated solar cells were investigated. The highest occupied molecular orbital (HOMO) levels ???

For example, the introduction of a conjugated side chain with electron deficient groups (such as para-alkyl-phenyl, meta-alkoxyl-phenyl, and 2-alkyl-3-fluoro-thienyl) allowed us to modulate the

BDT has been widely utilized in synthesizing high-performance photovoltaic materials, when copolymerized with TPD, a bunch of polymers (P86-92) was prepared with different alkyl side chains but the same backbone [82???84]. The experimental results indicated that controlling the number of aliphatic carbons in the linear N-alkyl-substituted TPD

ALKOXYL AND ALKYL BDT ORGANIC PHOTOVOLTAIC

This work reveals the importance of the branched alkyl chain topology in tuning the molecular packing and blend morphology, which leads to improved organic photovoltaic performance. View Show abstract

The maximum PCE of 9.18% achieved using DTBDT-S-C8-TTR suggests that substituting both alkylthio and alkyl groups into DTBDT can yield small-molecule-based organic photovoltaics (OPVs) displaying

Another dimension: Two newly designed two-dimensional (2D) conjugated polymers, PBDTTT-E-T (see scheme; left) and PBDTTT-C-T, were prepared and their properties compared to those of the alkoxy

ALKOXYL AND ALKYL BDT ORGANIC PHOTOVOLTAIC

Two different polymer donors J52 [73] and PBZ-2Si [67], with the same backbone units but different side chains (a branched alkyl side chain vs. a siloxane-terminated alkyl side chain) on the 2-dimensional benzodithiphene (BDT) unit, were chosen to pair with the acceptor to construct PSC devices, from which the side chain effect from the

In this review, we offered an overview of the organic photovoltaic materials based on BDT from the aspects of backbones, functional groups, alkyl chains, and device performance, trying to provide

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ALKOXYL AND ALKYL BDT ORGANIC PHOTOVOLTAIC

The effect of BDT and NDI substituents (alkyl vs alkoxy or linear vs branched) on the polymer performance in organic thin film transistors (OTFTs) and all-polymer organic photovoltaic (OPV) cells

A series of N-OR substituted thieno[3,4-c]pyrrole-4,6-dione (TPD) and benzo[1,2-b:4,5-b???]dithiophene (BDT) based copolymers are systematically investigated. The replacing CH2 with smaller size oxygen atom not only reduces the steric hindrance but also enhances the dipole moment (??? 1/4 ge), which is in favor of charge separation. while the optical and electrochemical ???

In this review, we offered an overview of the organic photovoltaic materials based on BDT from the aspects of backbones, functional groups, alkyl chains, and device performance, trying to provide

ALKOXYL AND ALKYL BDT ORGANIC PHOTOVOLTAIC

In this paper, a strategy of asymmetric alkyl and alkoxy substitution is applied to state???of???the???art Y???series nonfullerene acceptors (NFAs), and it achieves great performance in organic

@article{osti_1804529, title = {Asymmetric Alkoxy and Alkyl Substitution on Nonfullerene Acceptors Enabling High???Performance Organic Solar Cells}, author = {Chen, Yuzhong and Bai, Fujin and Peng, Zhengxing and Zhu, Lei and Zhang, Jianquan and Zou, Xinhui and Qin, Yunpeng and Kim, Ha Kyung and Yuan, Jun and Ma, Lik???Kuen and Zhang, Jie and ???

Sun and the coworkers introduced alkyl, alkoxyl and alkylthio substituted benzene rings on BDT unit and prepared the polymer donors named PBT1-O, PBT1-S and PBT1-C, respectively [55]. When blending with a NFA named ITCPTC, the PBT1-containing film shows an optimal interpenetrating morphology and thus obtained a high PCE of 12.8% in the OSC with

ALKOXYL AND ALKYL BDT ORGANIC PHOTOVOLTAIC

We then prepared a regioregular congener named PTVT-C12 (Figure 4), by copolymerizing monomers of alkyl ester-substituted thiophene-vinylene-thiophene (TVT) and V-Sn, to investigate the influence of regioregularity on photovoltaic properties of PTV derivatives. The higher regioregularity of PTVT-C12 was obtained by the locked direction of the

The all small molecule organic solar cell (SM-OSC) with SM1 as donor and a narrow bandgap n-OS IDIC as acceptor demonstrated a high power conversion efficiency (PCE) of 10.11% and a high fill