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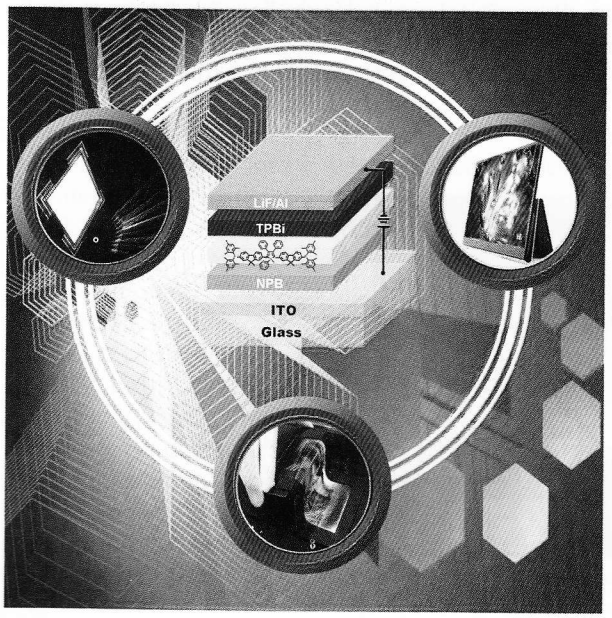
COVER PICTURE



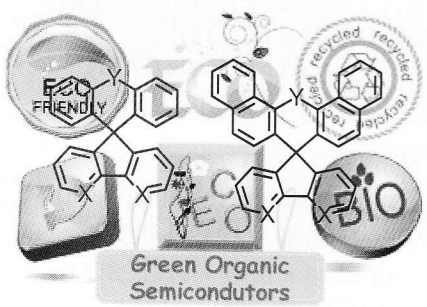
The cover picture shows efficient organic light-emitting diodes (OLEDs) that are fabricated using a new silole-based luminescent material with aggregation-induced emission (AIE) and good electron-transporting ability. This kind of AIE-active solid-state luminescent materials is of great potential in color displays and white lightning. More details are discussed in the article by Tang *et al.* on page 842—846.

REVIEWS

815

Toward Eco-friendly Green Organic Semiconductors: Recent Advances in Spiro[fluorene-9,9'-xanthene] (SFX)-Based Optoelectronic Materials and Devices

Mingli Sun, Ruochen Xu, Linghai Xie,* Ying Wei, Wei Huang*



Spiro[fluorene-9,9'-xanthene] (SFX)-based derivatives with the pot, atom and step-economy (PASE) synthetic route will be a new generation of spirocyclic aromatics to achieve green organic semiconductors.

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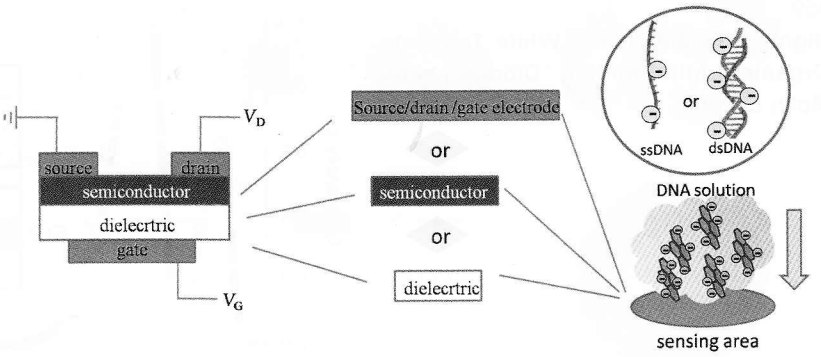
828
Label-Free DNA Sensors Based on Field-Effect Transistors with Semiconductor of Carbon Materials

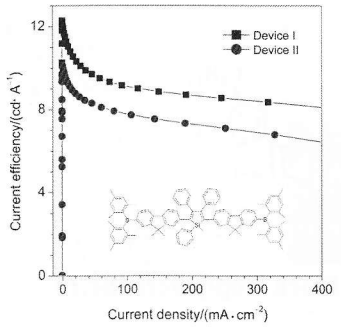
Lu Zhao, Dapeng Cao, Zhiqiang Gao, Baoxiu Mi,* Wei Huang*



COMMUNICATIONS

842
A Silole-Based Efficient Electroluminescent Material with Good Electron-Transporting Potential

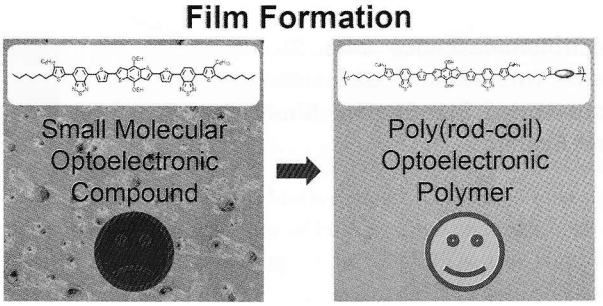
Changyun Quan, Han Nie, Rongrong Hu, Anjun Qin, Zujin Zhao,* Ben Zhong Tang*



A new silole derivative featuring aggregation-enhanced emission and good electron-transporting ability is prepared and utilized to fabricate efficient OLEDs.

847
Changing to Poly(rod-coil) Polymers: A Promising Way for an Optoelectronic Compound to Improve Its Film Formation

Wei Shao, Long Liang, Xuan Xiang, Hong-Jiao Li, Fu-Gang Zhao, Wei-Shi Li*

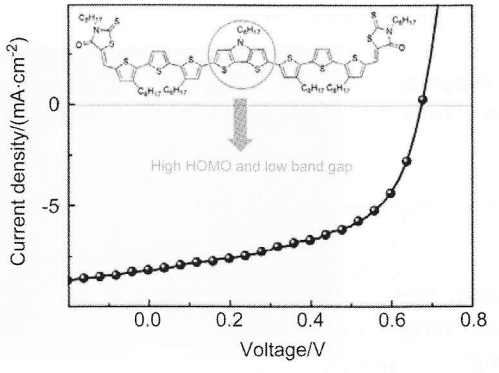


Small molecular optoelectronic compound **BDT(DTBT)$_2$** formed poor films on the substrates of glass and ITO glass. Such situation has been changed when it was changed into poly(rod-coil) polymers, which can improve its film formation capability as well as retaining the basic optoelectronic properties.

FULL PAPERS

852
Dithienopyrrole Based Small Molecule with Low Band Gap for Organic Solar Cells

Miaomiao Li, Wang Ni, Huanran Feng, Bin Kan, Xiangjian Wan,* Yamin Zhang, Xuan Yang, Yongsheng Chen*



A new low band gap small molecule with dithienopyrrole as core has been designed and synthesized for application in organic solar cell.

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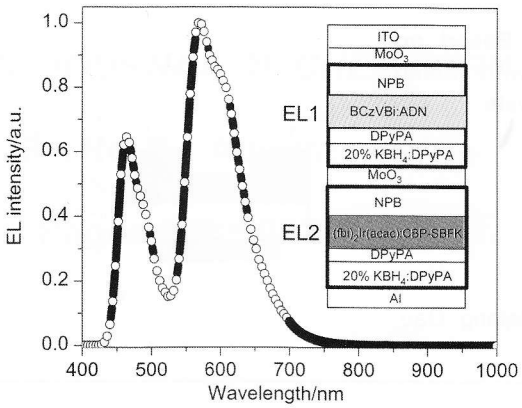
CONTENT

859

Highly Efficient Hybrid White Tandem Organic Light-Emitting Diodes with MoO_3 Layer

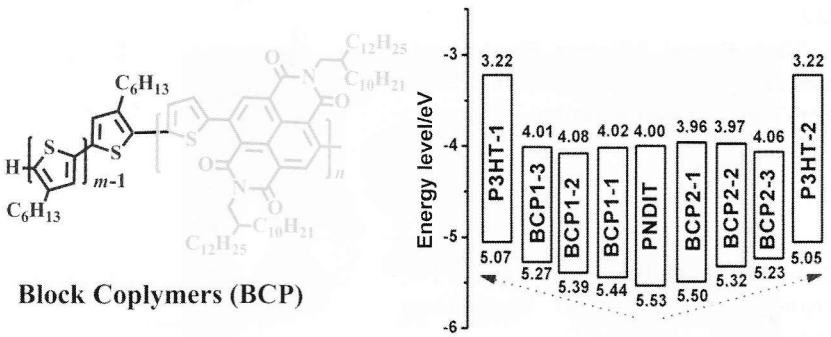


Lian Duan,* Taiju Tsuboi,* Yong Qiu

Electroluminescence characteristics have been studied for a highly efficient hybrid tandem white organic light emitting diode, showing that the yellow unit can be turned on at lower voltages and the charge generation from the charge generation layer of MoO_3/NPB bilayer only occurred at high voltages above 5.4 V.

865

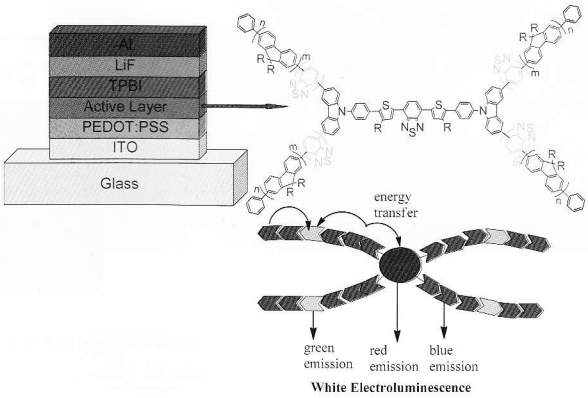
Engineering of Energy Levels for Fully Conjugated D-A Block Copolymers *via* Tuning the Ratios of Donor P3HT and Acceptor PNDIT



Shifan Wang, Yan Guo, Jie Yang, Youtian Tao,* Wei Huang*

873

White Electroluminescence with Simultaneous Three-Color Emission from a Four-Armed Star-Shaped Single-Polymer System

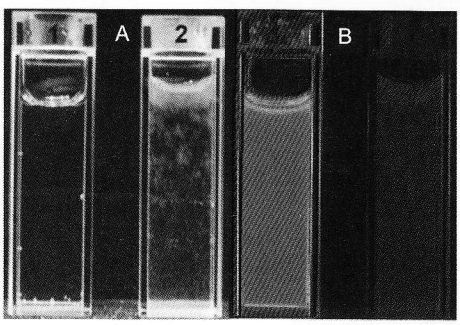


Yuanda Jiu, Jianyun Wang, Chengfang Liu, Wenyong Lai,* Lingling Zhao, Xiangchun Li, Yi Jiang, Weidong Xu, Xinwen Zhang,* Wei Huang

A four-armed star-shaped single-polymer system with simultaneous red, green, and blue (RGB) emission was designed and synthesized, which realized pure and stable white emission with a luminous efficiency (LE) of 1.59 cd•A^{-1} and CIE coordinates of (0.31, 0.34) in a typical single-emissive-layer device.

881

A Water-soluble Conjugated Polymer for Thiol Detection Based on "Turn-off" Effect



Gaoshan Zeng, Jie Li, Hao Liang, Yan Yuan, Xiang Li, Chao Yin, Zhen Yang, Quli Fan, Xiaomei Lu,* Wei Huang*

The detection mechanism for the probe is the aggregation induced fluorescence quenching by thiol-disulfide cleavage reaction.

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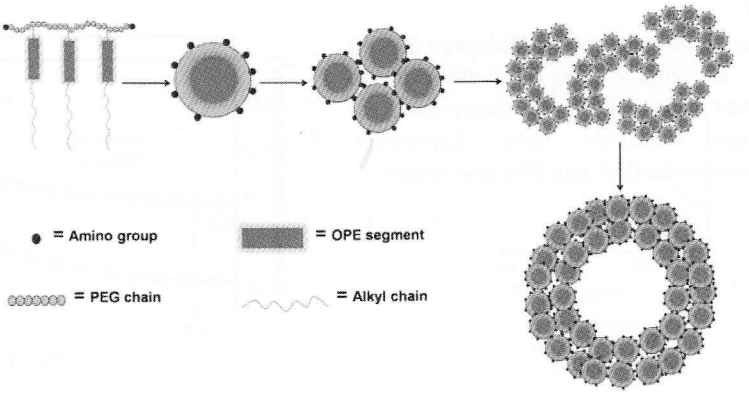
888

Morphology-Tunable Fluorescent Nanoparticles: Synthesis, Photophysical Properties and Two-Photon Cell Imaging

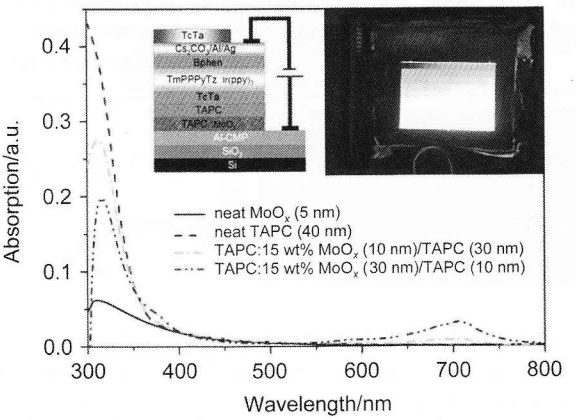


Xiaoming Hu, Chao Yin, Wenbo Hu, Zhen Yang, Jie Li, Xiang Li, Xiaomei Lu, Hui Zhao, Yufu Tang, Quli Fan,* Wei Huang*

Monodisperse single nanoparticles can be formed by self-assembly firstly, and then gathered to large aggregates with the increase of amphiphilic OPE concentration. Finally, these aggregates would crimp to form homogeneous hollow nanospheres through aging the solution for one week.

897

High Performance Top-Emitting Organic Light-Emitting Diodes for Super Video Graphics Array Monochromatic Microdisplays Application

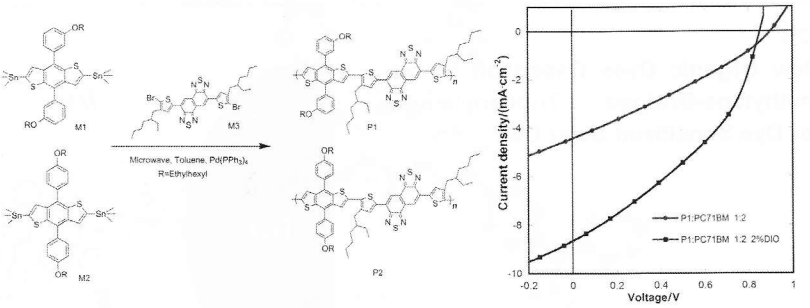


Charge transfer complex (CTC) (MoO_x^-/$TAPC^+$) is formed in the MoO_x-doped TAPC which is proven by absorption spectra. MoO_x-doped TAPC based hole injection layer (HIL) can not only improve the efficiency of hole injection and reduce the driving voltage, but also help to improve the stability of our TEOLEDs. Our high quality monochromatic OLED microdisplays without a high-voltage CMOS process show potentially low cost for commercial production.

Yukun Wu, Zhensong Zhang, Shouzhen Yue, Ran Huang, Huan Du, Yi Zhao*

902

Polymer Solar Cells Based on the Copolymers of Naphtho[1,2-*c*:5,6-*c*]-bis(1,2,5-thiadiazole) and Alkoxylphenyl Substituted Benzodithiophene with High Open-Circuit Voltages



Two novel naphtho[1,2-*c*:5,6-*c*]bis(1,2,5-thiadiazole) and alkoxylphenyl substituted benzodithiophene based polymers were synthesized and characterized. The two polymers exhibit broad absorption band in the range of 500—800 nm in thin films and deep HOMO energy level between –5.39 eV and –5.36 eV, respectively. The best device performance was achieved by P1, with an open-circuit voltage of 0.85 V, a short-circuit current density of 8.65 mA•cm^{-2}, a fill factor of 37.8%, and a PCE of 2.78% under simulated sunlight (100 mW•cm^{-2}, AM1.5G).

Liqian Liu, Guichuan Zhang, Baitian He, Fei Huang*

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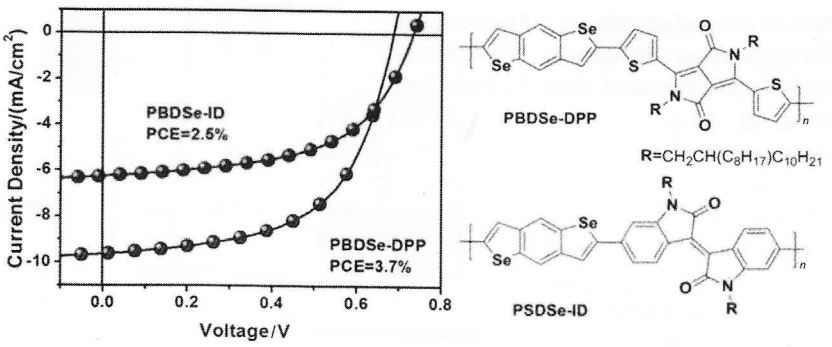
New Semiconducting Polymer Based on Benzo[1,2-b:4,5-b']diselenophene Donor and Diketopyrrolopyrrole/Isoindigo Acceptor Unit: Synthesis, Characterization and Photovoltaics

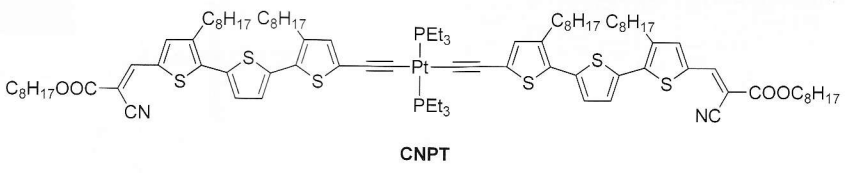


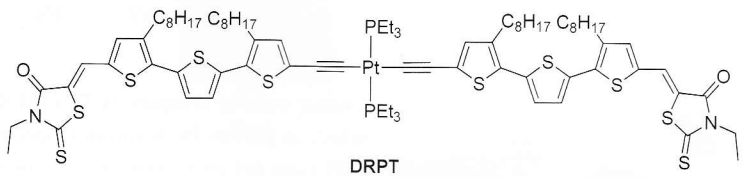
Zhongjie Xu, Guozheng Shi, Jianyu Yuan, Emily Glenn, Hai-Qiao Wang,* Wanli Ma*

D-A type polymers PBDSe-DPP and PBDSe-ID were synthesized to explore new photovoltaic semiconductors by conjugating acceptor unit diketopyrrolopyrrole/isoindigo to donor unit benzo[1,2-b:4,5-b']diselenophene. The thermal, optical, electrochemical, photoelectric and photovoltaic properties of the obtained polymers were studied systematically. Relatively high open circuit voltage (0.7 and 0.75 V) and fill factor (>65%) were demonstrated for both polymers. Huge increase (by 64% and 120%) of the short circuit current density was achieved for both polymer based devices by using additive compared to their references, resulting in decent power conversion efficiency.

917

Solution-Processable Platinum-Acetylide-based Small Molecular Bulk Heterojunction Solar Cells



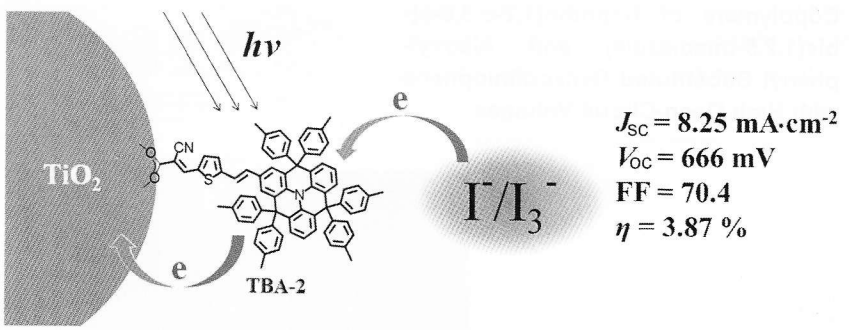


Hongyu Wang,* Ming Chen, Bin Jiang, Weiqi Tong, Qun Qian, Kunhua Lin, Feng Liu*

Two A'-D-≡-Pt(PEt$_3$)$_2$-≡-D-A' structured molecules **CNPT** and **DRPT** were synthesized and characterized for photovoltaic applications. And **CNPT** based BHJ solar cell devices achieved an optimal power conversion efficiency of 1.4%.

925

New Organic Dyes Based on Biarylmethylene-Bridged Triphenylamine for Dye Sensitized Solar Cell



Fei Wu, Haitao Liu, Lawrence Tien Lin Lee, Tao Chen, Min Wang, Linna Zhu*

Three new organic dyes based on bridged triphenylamine were synthesized. TBA-2 with vinylthiophene linkage shows the best performance of 3.87%, with J_{sc} of 8.25 mA•cm^{-2} and V_{oc} of 666 mV.

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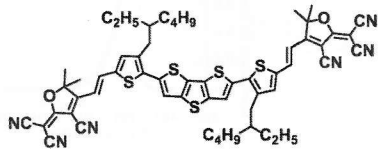
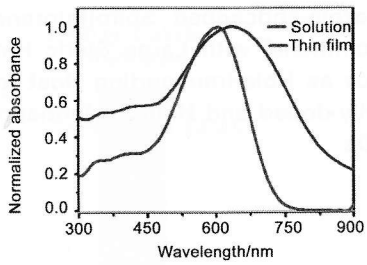
934

Acceptor-Donor-Acceptor Type Small Molecular Low Band Gap Organic Semiconductors Containing 2-Dicyanomethylen-3-cyano-4,5,5-trimethyldihydrofuran



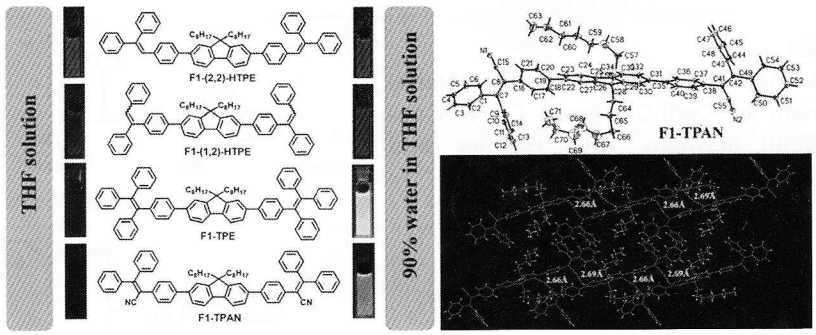


Sanlong Chen, Xiaolan Qiao, Heping Li,* Hongxiang Li*

Acceptor-donor-acceptor type compounds with 2-dicyanomethylen-3-cyano-4,5,5-trimethyl-2,5-dihydrofuran, dicyanovinyl and 3-ethyl-2-thioxothiazolidin-4-one as electron acceptors were designed and synthesized. Their physicochemical properties were thoroughly investigated.

939

Synthesis of Fluorene-Bridged Arylene Vinylene Fluorophores: Effects of End-Capping Groups on the Optical Properties, Aggregation Induced Emission

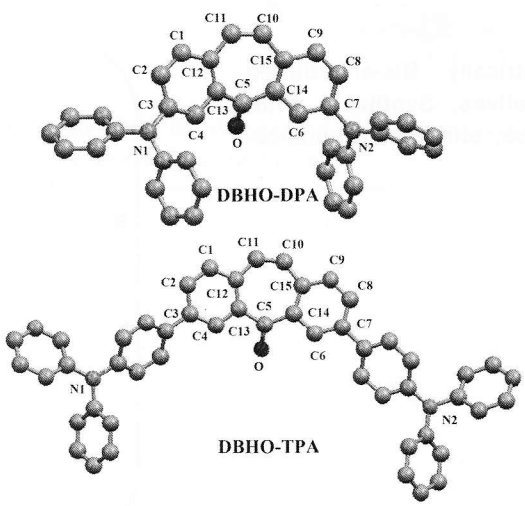


Guo-Feng Zhang, Tao Chen, Ze-Qiang Chen, Matthew P. Aldred,* Xianggao Meng,* Ming-Qiang Zhu*

Four different arylene vinylene substituents attached to the fluorene were synthesized, and the disparities of AIE-effect of these compounds were discussed. The cyano-groups in F1-TPAN will not only reduce the steric congestion of the peripheral phenyl rings, but also appreciably improve the molecular cohesion ability.

948

Synthesis and Characterization of Dibenzo[*a*,*d*]cyclohepten-5-one Derivatives for Light-Emitting Diodes



Liping Wang,* Limin Wang, Jianyao Huang, Gui Yu*

Three novel dibenzo[a,d]cyclohepten-5-one derivatives containing the hole-transporting groups were synthesized and characterized. Blue-green organic light-emitting diodes were fabricated based on these materials.

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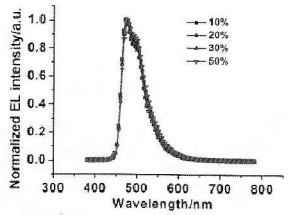
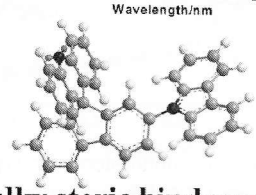
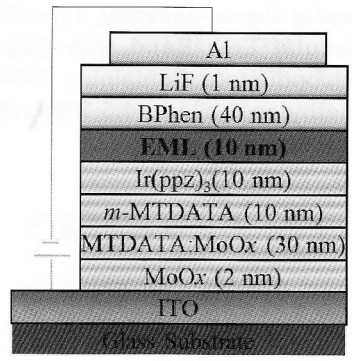
CONTENT

955

Carbazole-endcapped Spiro[fluorene-9,9'-xanthene] with Large Steric Hindrance as Hole-transporting Host for Heavily-doped and High Performance OLEDs







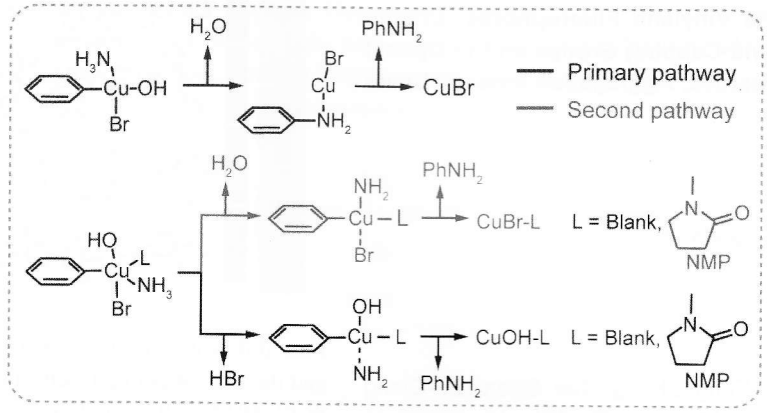
Bulky steric hindrance host

Xianghua Zhao,* Yukun Wu, Nannan Shi, Xiaoyu Li, Yi Zhao,* Mingli Sun, Dongxue Ding, Hui Xu, Linghai Xie*

The bulky steric hindrance spiro[fluorene-9,9'-xanthene] **SFX-Cz** based blue PhOLEDs which are concentration-insensitive have been researched, which might simplify fabrication proess to achieve high perormance and low cost device.

961

A Theoretical Insight into the Mechanism of Cu(I)-Catalyzed C—N Coupling between Aryl Halides and Aqueous Ammonia

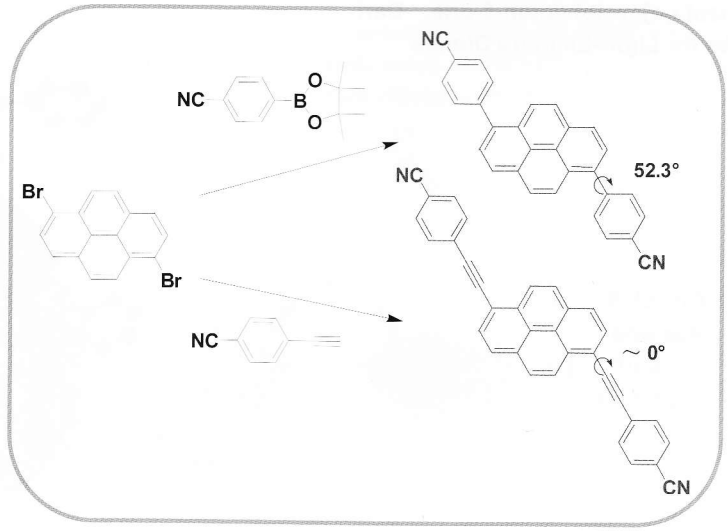


Ting Chen, Mingkuan Yan, Chao Zheng,* Jie Yuan, Shen Xu, Runfeng Chen,* Wei Huang*

The proposed mechanism of the ligand-free Cu(I)-mediated amination reaction for the preparation of primary aromatic amines and the specific roles of Cu species, reactants, and solvent molecules during the catalytic cycle of the amination processes.

967

Two Symmetrically Bis-substituted Pyrene Derivatives: Synthesis, Photoluminescence, and Electroluminescence



Xiaojie Gong, Xiang Xie, Naiwu Chen, Chaoyue Zheng, Jie Zhu, Runfeng Chen,* Wei Huang, Deqing Gao*

Two kinds of cyanophenyl terminated pyrene derivatives for OLEDs were synthesized and characterized. Both compounds exhibited blue photoluminescence and high fluorescent quantum yield of 85% and 75% in solutions. The result proved that energy transfer happened from the host PVK to the materials.

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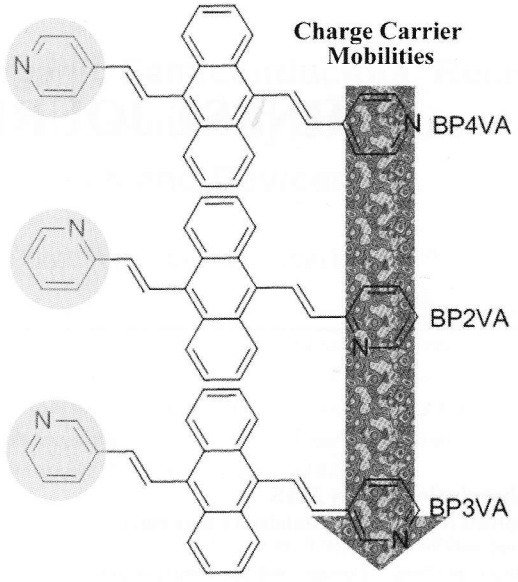
974

Theoretical Study of Electronic Structures and Charge Transport Properties of 9,10-Bis((*E*)-2-(pyrid-*n*-yl) vinyl) (*n*=2, 3, 4) Anthracene

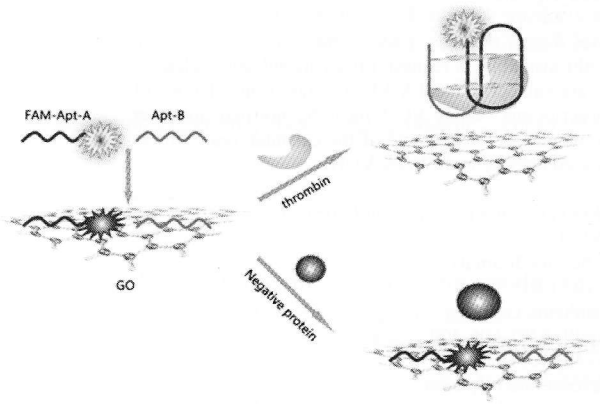


Qing Guo, Lijuan Wang, Yuanfei Jiang, Jing Guo, Bin Xu,* Wenjing Tian*

The linkage (*ortho*-, *meta*- and *para*-) between 9,10-divinyl anthracene unit and pyridine significantly influences the charge carrier mobilities, and shows the trend as $\mu_{BP4VA} > \mu_{BP2VA} > \mu_{BP3VA}$.

981

An Improved Turn-On Aptasensor for Thrombin Detection Using Split Aptamer Fragments and Graphene Oxide



Xingfen Liu,* Yonghong Yang, Xiaoxiao Hua, Xiaomiao Feng, Shao Su, Yanqin Huang, Quli Fan, Lianhui Wang, Wei Huang*

A new turn-on aptasensor based on split aptamer fragments and graphene oxide (GO) was designed to improve the sensitivity for thrombin detection.

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