Indium tin oxide electrodes organic photovoltaics

The demand for flexible indoor organic photovoltaic cells (OPVs) ... Indium Zinc Tin Oxide Bottom Electrode-Based Flexible Indoor Organic Photovoltaics with Remarkably High Mechanical Stability. Yongju Lee, Yongju Lee. School of Electrical and Computer Engineering, Center for Smart Sensor System of Seoul (CS4), University of Seoul, 163 ...

Alternative electrode materials and device geometries that avoid the use indium tin oxide -- an expensive and brittle material widely used for making transparent electrodes in organic solar cells -- are now coming to fruition. ... Woven Electrodes for Flexible Organic Photovoltaic Cells. William Kylberg Fernando Araujo de Castro +4 authors R ...

Alternative electrode materials and device geometries that avoid the use indium tin oxide -- an expensive and ... showing the substrate, organic photovoltaic and electrode layers. a b Substrate ...

The high charge mobility, low surface roughness, and high WF render these In 2 O 3:MoO X nanolaminates excellent candidates for hole-selective electrodes in OPV devices. To validate the photovoltaic performance, an In 2 O 3:MoO X nanolaminate film was deposited with a thickness of 144 nm as the bottom electrode. Thereafter, PM6:Y6 (139 nm), PDINO (10 nm), ...

The construction of many transparent electrodes is dominantly based on transparent conductive oxides (TCOs), primarily polycrystalline indium tin oxide (ITO). When deposited on a rigid glass substrate, commercially available ITO with a thickness of 100-200 nm typically exhibits >80% visible transmittance and 10-20 O sq -1 sheet ...

A nanostructured three-dimensional (3D) electrode using transparent conducting oxide (TCO) is an effective approach for increasing the efficiency of optoelectronic devices used in daily life. Tin-doped indium oxide (ITO) is a representative TCO with high conductivity and a high work function for anode applications. This paper reports the fabrication of a large-area ITO ...

Indium tin oxide (ITO) is commonly used as the transparent bottom electrode for organic solar cells. However, it is known that the cost of the ITO is quite high due to the indium element, and in some studies ITO coated glass substrate is found to be the most expensive component of device fabrication. Moreover, indium migration from ITO can cause stability issues in organic solar ...

Indoor Organic Photovoltaics. In article number 2300443, Heo, Kim, and co-workers revolutionize energy harvesting with flexible indoor organic photovoltaics, seamlessly ...

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Conventional indium tin oxide (ITO) faces scarcity issues, spurring exploration of alternatives. Here, we introduce non-atomically doped (NAD) ZnO electrodes with exceptional near-infrared (NIR) transmittance, fabricated via a sol-gel method. We investigate their performance in OPVs and OPDs using three different bulk heterojunction systems.

DOI: 10.1021/am101097d Corpus ID: 907390; Indium tin oxide nanorod electrodes for polymer photovoltaics. @article{Fung2011IndiumTO, title={Indium tin oxide nanorod electrodes for polymer photovoltaics.}, author={Man Kin Fung and Ye Sun and Annie Ng and Alan Man Ching Ng and Aleksandra B. Djuri{vs}i{"c} and Hung Tat Chan and Wai Kin Chan}, journal={ACS applied ...

Regarding flexibility benchmarks, most ultra-flexible OPVs have been demonstrated on ultrathin (~1 µm-thick) plastic substrates with rigid indium tin oxide (ITO) electrodes, exhibiting good ...

Nanotree indium tin oxide (ITO) electrodes were prepared via glancing angle deposition, structures that were previously demonstrated to be single-crystalline. A thin layer of zinc oxide was deposited on the ITO ... KEYWORDS: organic solar cells, photovoltaics, high surface area electrode, ITO, nanotree, bulk heterojunction, BHJ 1. INTRODUCTION

Oxide contacts in organic photovoltaics: characterization and control of near-surface composition in indium-tin oxide (ITO) electrodes Acc Chem Res. 2009 Nov 17;42(11) :1748-57. ... we review recent studies of one of the most common transparent conducting oxides (TCOs), indium-tin oxide (ITO), which is the transparent bottom contact in many OPV ...

Indium tin oxide (ITO) is a versatile optically transparent thin-film conducting oxide with wide applications as an electrode in optoelectronics, organic photovoltaics, spectro ...

Traditional indium tin oxide (ITO) electrodes fail to meet the ideal properties of high flexibility, conductivity, and transparency required for FOSCs. ... Palacios, T.; Grade?ak, S. Flexible Graphene Electrode-Based Organic Photovoltaics with Record-High Efficiency. Nano Lett. 2014, 14, 5148-5154. [Google Scholar] Rathmell, A.R.; Wiley, B.J ...

Various surface treatments significantly affect the work function and surface roughness of indium tin oxide (ITO), and thusly influence charge injection and overall performance of organic light ...

We have demonstrated ink-jet printed indium tin oxide (ITO) electrode for cost-efficient organic solar cells (OSCs). By ink-jetting of crystalline ITO nano-particles and ...

La Notte, L. et al. Sprayed organic photovoltaic cells and mini-modules based on chemical vapor deposited graphene as transparent conductive electrode. Carbon 129, 878-883 (2018). Article ...

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Indium tin oxide (ITO) is commonly used as the transparent bottom electrode for organic solar cells. However, it is known that the cost of the ITO is quite high due to the indium element, and in ...

Oxide contacts in organic photovoltaics: Characterization and control of near-surface composition in indium-tin oxide (ITO) electrodes. / Armstrong, Neal R; Veneman, P. Alex; Ratcliff, Erin et al. In: Accounts of Chemical Research, Vol. 42, No. 11, 17.11.2009, p. 1748-1757. Research output: Contribution to journal > Article > peer-review

Indium tin oxide (ITO) is a well-known n-type degenerate semiconductor with a wide variety of electronic and optoelectronic applications. Herein ITO is utilized as a photocathode material in p ...

Indium tin oxide (ITO) is a popular electrode choice, with diverse applications in (photo)electrocatalysis, organic photovoltaics, spectroelectrochemistry and sensing, and as a support for cell biology studies. Although ITO surfaces exhibit heterogeneous local electrical conductivity, little is known as to how this translates to electrochemistry at the same scale. ...

Nanostructured electrodes with increased surface areas have been fabricated using anodic aluminium oxide templates [8,13], organic vapour phase deposition [5,9] and vapour-liquid-solid (VLS ...

Downloaded to IP: 109.171.137.210 On: Mon, 11 May 2015 06:24:46 APPLIED PHYSICS LETTERS 100, 213302 (2012) Transparent conductive electrodes of mixed TiO22x-indium tin oxide for organic photovoltaics Kyu-Sung Lee,1 Jong-Wook Lim,2 Han-Ki Kim,2,a) T. L. Alford,1 and Ghassan E. Jabbour3,a) 1 School for Engineering of Matter, Transport and ...

Abstract. Transparent conductive electrodes are one of the essential components for organic optoelectronic devices, including photovoltaic cells and light-emitting diodes. Indium-tin oxide (ITO) is the most common transparent electrode in these devices due to its excellent optical and electrical properties. However, the manufacturing of ITO film requires precious raw materials ...

We have demonstrated ink-jet printed indium tin oxide (ITO) electrode for cost-efficient organic solar cells (OSCs). By ink-jetting of crystalline ITO nano-particles and performing a rapid thermal anneal at 450 °C, we were able to obtain directly patterned-ITO electrodes with an average transmittance of 84.14% and a sheet resistance of 202.7 O/square without using a ...

The demand for flexible indoor organic photovoltaic cells (OPVs) is growing dramatically due to their simple and practical use as a powering aid for various electronic gadgets connected to the Internet of Things. Due to the brittleness of inorganic material-based transparent bottom electrodes and their incompatibility with flexible organic substrates, it is extremely difficult to ...

Indium tin oxide (ITO) is a transparent conducting oxide widely used in electronic devices and photovoltaic

applications. Its unique combination of electrical conductivity and optical transparency makes it an essential component in hybrid solar cells, where it serves as an electrode that allows light to enter while conducting electricity efficiently.

Currently, indium tin oxide (ITO) is among the most widely used electrode materials owing to its high conductivity (10 3 S/cm-), wide bandgap (greater than3.5 eV), and excellent transmittance in the visible light wavelength region [5], [6]. However, it is plagued by certain severe drawbacks such as brittleness and high-temperature processing ...

Indium-free un-doped tin dioxide (SnO2) serves as a transparent conducting electrode for indoor organic photovoltaics (OPVs). SnO2 OPV systems demonstrate superior ...

Solution-processed organic photovoltaics (OPVs) are expected to have an advantage over traditional solar technologies due to their promise of lightweight, semitransparency, vivid colors, and flexibility, 1, 2, 3 which could allow more cost-effective applications, such as wearable electronics, biomedical devices, and building-integrated PVs. ...

Indium-tin oxide (ITO) electrodes have been modified with both fluorinated alkyl and aryl phosphonic acids [n-hexylphosphonic acid (HPA) and n-octadecylphosphonic acid (ODPA); 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl phosphonic acid (FHOPA), pentafluorobenzyl phosphonic acid (PFBPA), and tetrafluorobenzyl-1,4-diphosphonic acid (TFBdiPA)]. These are ...