

The preparation and characterization of heterojunction solar cell with ZnS nanocrystals synthesized by chemical bath deposition method were studied in this work. The ZnS nanocrystals were characterized by X-ray diffraction (XRD) and high-resolution transmission electron microscopy (HRTEM). Lower reflectance spectra were found as the annealing ...

@article{Hori2010PhotovoltaicPI, title={Photovoltaic Properties in Interpenetrating Heterojunction Organic Solar Cells Utilizing MoO₃ and ZnO Charge Transport Buffer Layers}, author={Tetsuro Hori and Hiroki Moritou and Naoki Fukuoka and Junki Sakamoto and Akihiko Fujii and Masanori Ozaki}, journal={Materials}, year={2010}, volume={3}, pages ...

The photovoltaic properties of the a-C:H-based heterojunction solar cell structures are discussed with the dark and illuminated current density-voltage characteristics as well as the optical ...

Figure 5c describes the internal quantum efficiency spectra of heterojunction photovoltaic cells using and not using ZnS nanoparticle/PMMA film. It is noted from the IQE spectra of the solar cell with ZnS nanoparticle/PMMA layer that the short wavelength response is partially enhanced (1-2%) from 300 to 450 nm [] other words, the IQE response is wholly ...

The photovoltaic properties of V₂O₅/Ge heterojunction under illumination at 100 mW cm⁻² show increased photoresponse with increased reverse bias voltage. The ...

All these heterojunction structures have excellent photovoltaic properties and more and more attention is being paid to their PGE studies [44], [45], ... Electronic properties of the MoS₂-WS₂ heterojunction. Phys. Rev. B, 87 (7) (2013), Article ...

The photovoltaic (PV) property of n-ZnO/p-Si heterojunction was investigated by using current-voltage (J-V) measurement under illumination at 70 mW/cm². The silver (Ag) metal thin film was ...

Request PDF | Photoconducting and Photovoltaic Properties of ZnO:TiO₂ Composite/p-Silicon Heterojunction Photodiode | A photodiode based on titanium dioxide:zinc oxide (TiO₂:ZnO) was fabricated to ...

The transverse pn heterojunction device has an excellent photovoltaic performance with a photocurrent of about 54.65 A, a photoresponse rate of about 18.22 mA/W, and a conduction/cut-off ratio of about 2.73, according to the results of the I-V characterization curve test and the photovoltaic performance test, while the longitudinal pn ...

Photovoltaic properties of heterojunction

To investigate the passivation condition for the high PV performance of the PEDOT:PSS/n-Si heterojunction solar cells, the annealing time and temperature were changed over a wide range.

It has long been argued that the performance of organic bulk-heterojunction solar cells critically depends on the morphology of the active layer, a mixture of donor and acceptor materials in which the charge generation from sunlight occurs. In this work, optical homogenization principles are utilized to model the structure of the common active layer ...

A silicon heterojunction solar cell that has been metallised with screen-printed silver paste undergoing Current-voltage curve characterisation An unmetallised heterojunction solar cell precursor. The blue colour arises from the dual-purpose Indium tin oxide anti-reflective coating, which also enhances emitter conduction. A SEM image depicting the pyramids and ...

Here, we present a device model that is able to fully reproduce the current-voltage characteristics of type-II van der Waals heterojunctions under optical illumination, including ...

Poor thermostability of Sb₂S₃ in vacuum hinders the possibility of achieving high-quality crystalline films. In order to enhance the photovoltaic properties of Sb₂S₃ planar heterojunction solar cells, a selenylation-based post-treatment approach has been employed. Selenylation performed over 15 min on the Sb₂S₃ film resulted in an enhancement in the ...

We report on the fabrication and study of bulk heterojunction (BHJ) solar cells based on a novel combination of a donor-acceptor poly(9,9-dioctylfluorenyl-2,7-diyl)-co-(N,N'-diphenyl)-N,N'-di(p-butyl-oxy-phenyl)-1,4-diamino-benzene) (PFB) and [6, 6]-phenyl-C₆₁-butyric acid methyl ester (PCBM) blend composed of 1:1 by volume. indium tin oxide (ITO)/poly(3,4 ...

In this study, semiconductor oxide cuprite (Cu₂O) and indium tin oxide (ITO) heterojunction solar cells with and without a 10 nm thick titanium (Ti) thin film as the buffer layer were fabricated and characterized for comparison. The Cu₂O film was formed by low-cost electrodeposition, and Ti and ITO layers were deposited on a glass substrate by sputtering. ...

Materials, 2022. Graphene combines high conductivity (sheet resistance down to a few hundred Ω/sq and even less) with high transparency (>90%) and thus exhibits a huge application potential as a transparent conductive electrode in gallium nitride (GaN)-based light-emitting diodes (LEDs), being an economical alternative to common indium-based solutions.

To analyze the photovoltaic properties of the MoS₂/Si heterojunction solar cells, the current density-voltage (J-V) characteristics were conducted using an Agilent B1500-A semiconductor parameter analyzer in the dark and under an AM 1.5 solar simulator at 25 ± 0.5°C. The capacitance-voltage (C-V) curves were measured by Agilent B1500-A ...

Photovoltaic response of the p-SnSe/n-Si heterojunction To obtain information about the photovoltaic properties of the fabricated SnSe/Si cell, the output I-V data of the un-illuminated and illuminated cells of area 0.2 cm² were plotted on the screen of an oscilloscope as shown in Fig. 10a and b, respectively.

lead antimony sulfide (PbSb₂S₅) thin films were successfully grown on an n-Si substrate by a thermal evaporation technique. The XRD spectrum clarifies the orthorhombic structure of the prepared PbSb₂S₅ thin films and the EDX analysis specifies that its composition is near stoichiometric. In the dark conditions, I-V characteristics of the PbSb₂S₅/n-Si ...

In this study, semiconductor oxide cuprite (Cu₂O) and indium tin oxide (ITO) heterojunction solar cells with and without a 10 nm thick titanium (Ti) thin film as the buffer layer were fabricated and characterized for comparison. ...

A number of reports [9][10][11][12] have been focused largely on its catalytic and gas sensitive properties; however, photovoltaic cells based on CuO received more attention due to their excellent ...

@article{Minami2016RelationshipBT, title={Relationship between the electrical properties of the n-oxide and p-Cu₂O layers and the photovoltaic properties of Cu₂O-based heterojunction solar cells}, author={Tadatsugu Minami and Toshihiro Miyata and Yuki Nishi}, journal={Solar Energy Materials and Solar Cells}, year={2016}, volume={147}, pages={85 ...

OverviewHistoryAdvantagesDisadvantagesStructureLoss mechanismsGlossaryHeterojunction solar cells (HJT), variously known as Silicon heterojunctions (SHJ) or Heterojunction with Intrinsic Thin Layer (HIT), are a family of photovoltaic cell technologies based on a heterojunction formed between semiconductors with dissimilar band gaps. They are a hybrid technology, combining aspects of conventional crystalline solar cells with thin-film solar cells.

In this paper, we describe the improvement of the photovoltaic properties of Cu₂O-based heterojunction solar cells using AZO thin films prepared by the sputtering apparatus ...

The effect of doping rate on structural, morphological, optical and electrical properties was investigated. Furthermore, the numerical simulation by ATLAS Silvaco software ...

Thin film of SnSe is deposited on n-Si single crystal to fabricate a p-SnSe/n-Si heterojunction photovoltaic cell. Electrical and photoelectrical properties have been studied by the current density-voltage (J-V) and capacitance-voltage (C-V) measurements at different temperatures. The fabricated cell exhibited rectifying characteristics with a rectification ratio of ...

DOI: 10.1016/J.MSSP.2013.10.003 Corpus ID: 94070181; Electrical and photovoltaic properties of SnSe/Si heterojunction @article{ElRahman2014ElectricalAP, title={Electrical and photovoltaic properties of SnSe/Si

heterojunction}, author={K. F. Abd El-Rahman and A. A. A. Darwish and Ehab A. A. El-Shazly}, journal={Materials Science in Semiconductor Processing}, ...

ZnO nanorods (NRs) heterojunction arrays have been widely used in photovoltaic cells owing to the outstanding photoelectrical characteristics, high stability and low cost. The NRs arrays structure can integrate multiple functional components, so that it can exhibit more excellent physical and chemical properties than even independent components ...

The Impact of Molecular Orientation on the Photovoltaic Properties of a Phthalocyanine/Fullerene Heterojunction. Barry P. Rand, Corresponding Author. ... orientation between donor and acceptor needs to be taken in order to fully optimize the numerous processes required for photovoltaic energy conversion. References,,,,,,,,, ...

Tin monoselenide (SnSe), which belongs to group IV-VI monochalcogenides, has obtained significant attention in the field of photodetection owing to its ultrahigh carrier mobilities. However, the great challenges of preparing high-quality films and high-performance devices still need to be conquered. Herein, high-density continuous SnSe films were deposited on a Si ...

Bedia Z, Bedia A, Kherbouche D, Benyoucef B (2013) Electrical properties of ZnO/p-Si heterojunction for solar cell application. Int J Mater Eng 3:59-65. Google Scholar Purica M, Budianu E, Rusu E (2000) Heterojunction with ZnO polycrystalline thin films for optoelectronic devices applications. Microelectr Eng 51-52:425-431

The gas pressure dependence of the obtained photovoltaic properties is shown in Fig. 2 for AZO/n-ZnO/p-Cu₂O heterojunction solar cells fabricated with a 50-nm-thick ZO or ZnO:Al thin film, prepared at RT by PLD. The n-ZO and n-ZnO:Al thin-film layers were deposited under a range of introduced O₂ or O₃ gas and O₂ gas pressures, respectively, as shown in ...

But the photovoltaic properties of the Cu₂O-based heterojunction solar cells fabricated by it were poorer than those of PLD. In this paper, we describe the improvement of the photovoltaic properties of Cu₂O-based heterojunction solar cells using AZO thin films prepared by the sputtering apparatus with our newly developed multi-chamber system.

Double-side contacted silicon heterojunction (SHJ) solar cells have demonstrated efficiencies of up to 26.81%, a recent value so far not reached by other advanced silicon-based technologies such as tunnel oxide passivated contact ...

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