Indium-doped solar cells

Is indium-doped silicon a p-type material for solar cells?
The data that support the findings of this study are available from the corresponding author upon reasonable request. Indium-doped silicon is considered a possible p-type materialfor solar cells to avoid light-induced degradation (LID),which occurs in cells made from boron-doped Czochralski (Cz) silicon.

Can evaporating indium tin alloy reduce the cost of SHJ solar cells?
The use of evaporating indium tin alloy and reacting with oxygen to prepare ITO film is conduciveto lower the cost of SHJ solar cells,and a conversion efficiency of 25.38 % is achieved. Sn-doped indium oxide (ITO) film is one of the widely used transparent conductive oxide (TCO) materials.

What is SN-doped indium oxide (ITO) film?
Sn-doped indium oxide (ITO) film is one of the widely used transparent conductive oxide (TCO) materials. In recent years,reactive plasma deposition (RPD) technology has been used to prepare high-quality ITO film. Here,indium tin alloy is used to replace indium tin oxide as the evaporation source of RPD.

Do indium-doped Niox layers have electrochemical deposition properties?
In this work, the electrochemical deposition (ECD) of indium-doped NiOx layers (NiOxIn) on indium tin oxide (ITO) substrates was investigated for the first time and their properties as HTL in IPSCs were evaluated.

Can indium-doping improve the optoelectronic properties of ZnO layers?
In this paper,an indium-doping approach is developed to improve the optoelectronic properties of ZnO layersand reduce the required annealing temperature. Inverted OSCs based on In-doped ZnO (IZO) exhibit a higher efficiency than those based on ZnO for a range of different active layer systems.

What annealing temperature can be reduced after doping with indium?
In addition,after doping with indium,the annealing temperature can be decreased to 140 °C,which is suitable for flexible substrate. An ultrathin flexible device with a total thickness of 1.2 µm is also developed using IZO ETL,achieving an efficiency of 17.0%.

<p>In recent years, all-inorganic perovskite materials have set off a research boom owing to features, such as good thermal stability, suitable bandgap, and fascinating optical properties. However, the power conversion efficiency (PCE) and the ambient stability of all-inorganic perovskite solar cells still remain a challenge. Herein, we investigate the effect of the addition ...

Photovoltaic parameters of a perovskite top cell with a separate SHJ solar cell, a SHJ bottom cell, and 4T perovskite/silicon tandem solar cell. Device VOC (V) JSC (mA cm-2) Fill Factor (%) PCE (%) Perovskite top cell 1.20 20.75 76.10 18.96 Stand-alone SHJ cell 0.72 38.72 79.79 22.18 SHJ bottom cell 0.65 14.96 80.17 7.82 4 T tandem solar cell ...

Indium-doped solar cells

Impurity photovoltaic effect is investigated in two groups of indium-doped single-crystalline silicon solar cells with n-type and p-type dopants in the base layer.The continuity equation for minority carriers is solved numerically using the charge neutrality condition and current-voltage characteristics are found.

In this work, the electrochemical deposition (ECD) of indium-doped NiOx layers (NiOxIn) on indium tin oxide (ITO) substrates was investigated for the first time and their properties as HTL in ...

As compared with our reference hydrogenated cerium-doped indium oxide (ICO)-based solar cells, the IZO-based devices show even higher fill factor parameters. Our amorphous state stable In-reduced IZO film could find versatile application in the sustainable development of temperature-sensitive devices such as SHJ and perovskite/silicon tandem solar cells, as well ...

Indium-doped silicon is considered as a possible p-type material for solar cells to avoid light-induced degradation (LID) which occurs in the cells made from boron-doped Czochralski (Cz)...

Aluminum-doped zinc oxide (AZO) has long been known as a promising low-cost alternative contact to conventional expensive indium-doped tin oxide (ITO) on silicon heterojunction (SHJ) solar cells.

We have used a solution-based approach to incorporate boron (B) and indium (In) dopants into the conventional SnO 2 electron transport layer (ETL) to create high ...

Complete solar cell device is fabricated using TiO 2 and (2,2,7,7-tetrakis(N,N-di-p-methoxyphenylamine)-9,9-spirobifluorene) ... Efficient indium-doped TiOx electron transport layers for high-performance perovskite solar cells and perovskite-silicon tandems. Adv. Energy Mater., 7 (2017), p.

Al-doped zinc oxide (AZO) is a potential candidate to substitute tin-doped indium oxide in silicon heterojunction (SHJ) solar cells due to its low cost and low ecological impact.

Thus, flexible organic solar cells based on sol-gel processed ZnO exhibit significantly lower efficiency than rigid devices. In this paper, an indium-doping approach is developed to improve the optoelectronic properties ...

Copper indium gallium selenide (CIGS)-based solar cells have received worldwide attention for solar power generation. CIGS solar cells based on chalcopyrite quaternary semiconductor CuIn 1-x GaxSe 2 are one of the leading thin-film photovoltaic technologies owing to highly beneficial properties of its absorber, such as tuneable direct band gap (1.0-1.7 eV), ...

To avoid the use of indium, basic strategies include: (a) developing TCO-free SHJ solar cells; (b) using indium-free TCO materials such as aluminum-doped zinc oxide (AZO) [16], [17], which has attracted much

attention.Although the concept of TCO-free SHJ solar cells has been demonstrated, development has been hindered by contact and passivation issues [18].

Herein, organic-free all-solid-state based perovskite solar cells (PSCs) are successfully fabricated by one-step method. The absorption position of the non-perovskite cesium lead iodide (?-CsPbI 3) was significantly shifted ...

Highlights o Indium-doped NiOx layers as HTL in inverted perovskite solar cells. o The champion cell was based on NiOxIn-0.5% with a PCE of 20.06%. o Favorable ...

Indium phosphide (InP) thin film solar cells have considerable potential for low-cost space photovoltaic applications due to their efficiency, ultralight weight form factor, favorable surface recombination properties, optimal bandgap, and innately high radiation resistance compared to silicon and gallium arsenide (GaAs). However, InP cells have received less attention than their ...

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