Antimonide thin film solar cells

Are antimony chalcogenide absorbers suitable for thin-film solar cells?
The search for an ideal absorber layer in thin-film solar cells seems to be a never-ending task. Apart from the solar absorber characteristics, antimony chalcogenide materials are gaining research interest predominantly due to their ribbon orientation and bandgap tunability in the entire solar spectrum.

What is the thickness of an antimony chalcogenide thin film solar cell?
, ZnS, and ZnSe with the thickness of 40 nm. The modelled structure with optimized thickness (2 mm&2.5 mm) resulted in higher efficiency (~22 %) antimony chalcogenide thin film solar cells. 1.

Which thin film solar cells have the highest power conversion efficiency (PCE)?
However,the highest power conversion efficiency (PCE) of Sb 2 Se 3thin film solar cells with a CdS/Sb 2 Se 3 superstrate configuration is so far 5.6% 2,4,5,6,7,8,9,10,11,and with a ZnO/Sb 2 Se 3 superstrate configuration 5.93% 1.

Can thin-film solar cells be used in low-cost photovoltaics?
Sci. Technol. 31 063001 Due to their promising applicationsin low-cost,flexible and high-efficiency photovoltaics,there has been a booming exploration of thin-film solar cells using new absorber materials such as Sb 2 Se 3,SnS,FeS 2,CuSbS 2 and CuSbSe 2.

Can thin films be used as light harvesters for semiconductor sensitized solar cells?
Cite this: ACS Appl. Mater. Interfaces 2014,6,4,2836-2841 Sb 2 Se 3 thin films are proposed as an alternative light harvester for semiconductor sensitized solar cells. An innovative electrodeposition route,based on aqueous alkaline electrolytes,is presented to obtain amorphous Sb 2 Se 3.

Can SB 2 SE 3 electrodeposited thin films be used in semiconductor sensitized solar cells?
The potential of the Sb 2 Se 3 electrodeposited thin films in semiconductor sensitized solar cells is evaluated by preparing TiO 2 /Sb 2 Se 3 /CuSCN planar heterojunction solar cells. The resulting devices generate electricity from the visible and NIR photons, exhibiting the external quantum efficiency onset close to 1050 nm.

AlSb thin-film solar cell consisting of p-type AlSb was prepared on n-type Si substrate by using thermal evaporation. The effect of the preparation and partial replacement of Aluminum with Indium ...

The present work proposes a reliable idea of using an alternate material such as Antimony Chalcogenide (Sb 2 Ch 3; Ch = O, S, Se, Te) which substantially has been used as ...

Matching the photocurrent between the two sub-cells in a perovskite/silicon monolithic tandem solar cell by using a bandgap of 1.64 eV for the top cell results in a high tandem Voc of 1.80 V and ...

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throughput. In the composition of a solar cell, window layer material provides a fateful job to enhance the efficiency of a solar cell [28]. Aluminium antimonide (AlSb) could be a spanking option as a window layer in AIT-based thin film solar cell. AlSb is a part of group III-V material having a bandgap of 1.6 eV at a temperature of 300 K [29].

Between 2014 and 2030, the market share of c-Si solar cells is expected to drop from 92 to 44.8%. Over the same period, thin-film solar cells are expected to increase by 44.1%, from a base of 1% in 2014 [1, 2].The motivation behind this shift is the increasing need for applications that are lighter, more flexible, and can be integrated into buildings.

Thin-film solar cells are produced through the deposition of one or more thin layers (referred to as thin films or TFs) of photovoltaic material onto a substrate. The most common substrates are ...

The thin film specimen consisted of a 600 nm thin layer of zinc-antimonide deposited by magnetron co-sputtering on a 350 µm thick glass substrate. The proposed device configurations generate peak power of 3.5 mW and 13.5 mW at hot side temperatures of ...

Chalcogenide semiconductors offer excellent optoelectronic properties for their use in solar cells, exemplified by the commercialization of Cu(In,Ga)Se2- and CdTe-based photovoltaic technologies. Recently, several ...

The invention discloses an aluminum antimonide thin film solar cell, wherein the hetero PN junction consists of n-CdS and p-AlSb, an absorption layer is AlSb, a buffer layer is CdTe, and...

We report a numerical simulation based design and optimization of single-junction gallium antimonide (GaSb) solar cell using the two-dimensional device simulator (SILVACO-ATLAS) under AM1.5G spectrum. We considered the gallium antimonide (GaSb) material as the absorber layer because of its low band gap and silicon (Si) as the substrate layer. Previously ...

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