Schematic diagram of germanium-based solar cell

What are the electrical properties of germanium-based solar cells?
The devices obtained in this study have good electrical properties. The VOC of the germanium-based solar cells under the single-junction CC nanostructure absorber structure array is 0.31 V, and the JSC reaches 45.5 mA/cm 2. The FF value of the device can be calculated as 72.7% by Equation (4).

What are the research findings on multijunction germanium based solar cells?
In 2016, Masuda [12] reported on the growth of multijunction germanium-based solar cells based on molecular beam epitaxy technology, and the open-circuit voltage of ~0.175 V was obtained. In 2020, Baran [13] studied the effect of temperature and light intensity on the conversion efficiency of Ge-based solar cells.

How do germanium-based solar cells improve absorption efficiency?
In this paper,germanium-based solar cells were designed based on germanium (Ge) materials,and the cross-cone (CC) nanostructures were used as the absorber layer of the solar cells. The optical path inside the absorber layer was increased by microstructure reflection,thereby increasing the absorption efficiency of the germanium-based solar cell.

What is the VOC of germanium-based solar cells?
The VOC of the germanium-based solar cells under the single-junction CC nanostructure absorber structure array is 0.31 V,and the JSC reaches 45.5 mA/cm 2. The FF value of the device can be calculated as 72.7% by Equation (4). The ? of the device of 10.3% can be reached by Equation (5).

What is a solar cell simulation?
al solar cell simulation, some selected examples simulating a simple amorphous/crystalline silicon solar cell are shown. The absorber of the solar cell (designed for photon absorption) is constituted by a 300 um thick p-doped textured silicon wafer, c-Si, whereas the emitter of the solar cell (designed for minority carrier extraction, that is e

How thick is the absorber layer of a solar cell?
In this paper,using Ge as the substrate,a solar cell with a Ge cross-cone nanostructure as the absorber layer was designed with a thickness of only 1.8 um. The structure optimization and model numerical simulation were carried out separately under optical and electrical conditions.

In this study, a theoretical analysis of an efficient perovskite solar cell (PSC) with cuprous oxide (Cu2O) as the hole transport material (HTM) and zinc oxysulfide (ZnOS) as the electron...

Solar Cell Definition: A solar cell (also known as a photovoltaic cell) is an electrical device that transforms light energy directly into electrical energy using the photovoltaic effect. Working Principle : The working of

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solar ...

In this article, we will discuss in detail the realistic potential of Ge-based four-junction concentrator solar cells. This analysis is based on a wafer-bonded GaInP/AlGaAs//GaInAs/Ge cell structure ...

a) SEM cross-sectional view of GeSe solar cell and a schematic of the device structure. b) Schematic diagram of the band alignment about GeSe solar cell. c) PCE statistical distribution ...

We designed a new type of germanium-based perovskite structure to improve the efficiency (FTO/Cd 0.5 Zn 0.5 S/IDL1/CH 3 NH 3 GeI 3 /IDL2/MASnBr 3 /Au). We chose Cd 0.5 Zn 0.5 S and MASnBr 3 as electron transport material (ETM) and ...

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In this paper, qualitative investigation of the numerical model of silicon germanium heterojunction solar cell is performed using MATLAB graphical user interface. The heterostructure is...

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The CIGS-based solar cell has a tetragonal chalcopyrite structure. The chemical formula is CuIn x Ga 1-x Se 2 for the molecule, where x is in the range from 0 to 1.

In this paper, germanium-based solar cells were designed based on germanium (Ge) materials, and the cross-cone (CC) nanostructures were used as the absorber layer of the solar cells. The optical path inside the absorber layer was increased by microstructure reflection, thereby increasing the absorption efficiency of the germanium-based solar ...

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Schematic diagram of germanium-based solar cell

Download scientific diagram | Schematic diagram of solar cell with i-layer crystalline (a) Si, (b) Ge, and (c) Si1-xGex heterolayers. from publication: Effect of Multijunction...

Perovskite solar cells are the most cutting-edge photovoltaic technology having high efficiency and short fabrication time. In recent decades, there has been a significant rise in the study of the ...

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