Solar Germanium Single Crystal Field

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.

Can germanium-based solar cells be used as absorber layer?
Author to whom correspondence should be addressed. 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.

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).

Can cross-cone nanostructure improve the absorption rate of germanium-based solar cells?
In this work, we designed the cross-cone nanostructure as the absorption layer of germanium-based solar cells, which can increase the optical path of light transmission in the absorption layer and improve the absorption rate of the whole band and the Ge materials as the absorption layer can broaden the absorption band.

What are the advantages of a germanium electrode?
The fifth layer is germanium substrate with a thickness of 800 nm, which can improve the efficiency of electron transport and enhance the efficiency of light absorption. The sixth layer is the silver (Ag) electrode layer with a thickness of 200 nm, which has the advantages of high reflectance and high conductivity.

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Two main methods of single crystal growth in germanium, Czochralski method(CZ)and vertical gradient freeze method(VGF), were briefly introduced. Technical parameters such as the method of germanium crystal growth, diameter and resistivity of germanium in popular germanium material-producing enterprises at home and abroad were analyzed and ...

lower-performing solar cells associated with a high dislocation density in the cell material. We demonstrate a 23.4% efficient single-junction solar cell on sp-Ge under conditions where no spalling defects are present and without the use of a CMP step. These best devices are within 2% relative of nominally identical

Semantic Scholar extracted view of "Epitaxial Growth of Germanium on Single Crystal Spinel" by D. Dumin . Skip to search form Skip to main content Skip to account menu. Semantic Scholar"s Logo. Search 223,139,717 papers from all fields of science. Search. Sign In Create Free Account. DOI: 10.1149/1.2426722; Corpus ID: 94657052; Epitaxial Growth of ...

The product application fields cover industries such as infrared optics, solar cells, optical fiber communication, semiconductor special gas, and PET catalyst. Germanium substrate, germanium single crystal and wafer for solar cell. The 4-6 inch VGF method "zero dislocation" germanium substrate for solar cells produced by the company. The products are ...

This paper will conduct a systematic study on method of recovering Ge from pulverized fuel ash in Lincang prefecture, Yunnan province. Details are like this, in view of the fact that Ge contained ...

Based on the properties of different single-crystal materials, the application fields and development status of germanium single crystals for infrared optics, germanium single crystal ...

In 2022, Lombardero proposed a new solar cell manufacturing process based on a chemical etching method, which can make a substrate thickness of 47.5 um for germanium-based single-junction solar cells and a ...

The Reuse and Recyclability of Germanium Substrates in Solar Energy Production. The realm of solar cells has recognized germanium substrates as potent absorber material, exhibiting high efficiency. A typical ...

Growing single-crystal semiconductors directly on an amorphous substrate without epitaxy or wafer bonding has long been a significant fundamental challenge in materials science. Such technology is especially important for semiconductor devices that require cost-effective, high-throughput fabrication, including thin-film solar cells and transistors on ...

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1 Introduction. III-V solar cells have the highest conversion efficiency of any solar technology, with demonstrated single-junction efficiencies >29%. [] However, high production costs keep III-Vs from widespread use in terrestrial applications. [] The cost of epitaxial growth, the single-crystal substrate on which solar cells are grown, and back-end ...

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Abstract: Thin film and single crystal germanium solar cells are of interest for use in low cost thermophotovoltaics [1,2] and in multijunction solar cells. Single crystal Ge substrates have been utilised for the growth of high-efficiency III-V concentrator solar cells which have achieved high efficiencies [3]. In this paper, we consider the ...

One of the possible applications of germanium single crystals in photonics at present is its use for stabilizing the emission frequency of IR laser diodes by generating optical ...

Germanium single crystal for solar cell ???? ??? ?? ?????????????? ? TC203 (??????????????????)??,????? ????? ?

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