

SolarTech Power Solutions

Columbia Transparent Series solar Panel Crystalline Silicon



Overview

What is crystalline silicon (c-Si)?

Crystalline silicon (c-Si) is one of the best candidates to develop transparent solar cells with high efficiency and stability, because conventional c-Si solar cells are known to exhibit high efficiency and long-term stability compared with other solar cells.

Are transparent c-Si solar cells effective?

However, the opaque characteristic of the c-Si wafer hinders the development of transparent solar cells using c-Si. Here, we present a novel approach to develop neutral-colored transparent c-Si solar cells that exhibit the highest efficiency among neutral-colored transparent solar cells developed to date.

How are ABC transparent c-Si solar cells fabricated?

Fabrication of ABC Transparent c-Si Solar Cells. The ABC transparent c-Si solar cells were fabricated using p-type Si wafers (float zone p-type) with a resistivity of 1 to 3 Ω cm and a thickness of 150 μ m.

What are the photovoltaic characteristics of transparent c-Si solar cells?

To evaluate the photovoltaic characteristics of the transparent c-Si solar cells, the current density-voltage (J - V) was measured at an illumination of AM 1.5 G (Figure 4 D). The solar cells showed a 12.2% PCE with a transmittance of 20%, V_{oc} of 588 mV, J_{sc} of 29.2 mA/cm², and FF of 71.1%.

What is the area of fabricated transparent c-Si solar cells?

The area of the fabricated transparent c-Si solar cells was 1 cm². The area of the solar cells is the total area, including the microhole areas. The photovoltaic properties of the solar cells were investigated using a solar simulator (Class AAA, Oriel Sol3A, Newport) under AM 1.5 G illumination.

What are crystalline silicon solar cells?

Crystalline silicon solar cells are today's main photovoltaic technology, enabling the production of electricity with minimal carbon emissions and at an unprecedented low cost. This Review discusses the recent evolution of this technology, the present status of research and industrial development, and the near-future perspectives.

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