

Title: Absorption of sodium ions from solar glass

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Is sodium induced shunting a problem in crystalline Si solar modules?

Abstract: Sodium induced shunting continues to be a challenging issue in crystalline Si solar modules. Potential-Induced Degradation of the Shunting type (PID-s) has been linked to Na, but the source is unclear. In this paper we evaluate the ion migration kinetics in encapsulant material under operational conditions.

How does sodium diffusion affect the CIGS absorber layer?

The sodium diffusion either from the glass substrate or from the Mo rear contact plays a large role in the grain growth of the CIGS absorber layer, as the sodium can promote the grain growth of the CIGS absorber layer. Na diffusion to the front surface of the CIGS absorber is beneficial for forming large crystallites near the front surface.

How does glass encapsulation improve photon absorption?

Glass-glass encapsulation, low-iron tempered glass, and anti-reflective coatings improve light management, durability, and efficiency. Advances in glass compositions, including rare-earth doping and low-melting-point oxides, further optimize photon absorption and conversion processes.

How does Na assist the incorporation of Se into the absorber?

For example, the Se/M ratio of the absorbers formed on Dia/Mo substrates was the highest (1.25) of the three investigated glass substrate types. Thus, Na can assist the incorporation of Se into the absorber by the formation of Na_2Se_x .

In these conditions, the ion-exchange process was triggered: the silver ions diffused inside the glass replacing the alkaline ions, such as sodium, widely present in the ...

Detailed analysis discovers that the sodium ions (Na^+) coming from the indium tin oxide (ITO) glass substrates are responsible for the spontaneous passivation effect.

In this work, we have investigated sodium calcium silicate glasses containing and ions, focusing on how the properties of these materials would affect the electrical power output ...

Different possibilities in sodium ion migration control are presented, considering the influence of glass composition on sodium diffusion & its chemical potential as well as passivation of sodium ...

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A standardized model is presented for evaluating the efficiency of spectral converters integrated into PV glass, systematically assessing spectral absorption and ...

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Sodium ions are commonly found in the glass used in solar panels, typically as a result of the composition of the glass material or contamination during manufacturing. Under ...

A standardized model is presented for evaluating the efficiency of spectral converters integrated into PV glass, systematically ...

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