What are the ion sputtering processes for photovoltaic panels

What is sputter damage in solar cells?

This issue, known as ?sputter damage', presents challenges in multiple solar cell structures, including a-Si:H-based SHJ solar cells, polycrystalline silicon (poly-Si)-based solar cells, and nc-SiC:H-based TPC solar cells. [2 - 6] The origin of sputter damage remains unclear due to the multitude of potential factors during the sputtering process.

How ion-beam sputtering deposited a semitransparent perovskite solar cell?

In this work, the semitransparent perovskite solar cell with p-i-n architecture is fabricated with ITO back electrode deposited directly on C 60 electron transporting layer. A comparative analysis was conducted to evaluate the performance and properties of ITO films deposited using ion-beam sputtering (IBS) and the more common MS method.

How can ionization be controlled by a sputtered atom?

By ionizing the sputtered atoms the ion energy at the substrate can be controlled by applying a substrate biasand also a directional deposition and collimation of these ions with the plasma sheath adjacent to the substrate surface is made possible.

Does sputter deposition damage the passivation quality of a solar cell?

However,their deposition can damage the passivation qualityin the solar cell. This damage during the sputter deposition is a complex issue that has not been fully understood,particularly in various silicon-based materials like amorphous silicon,polycrystalline silicon,or nanocrystalline silicon carbide.

What determines the ionization process in a RF sputter?

The electron densitydictates the dominating ionization process within the discharge. Coburn and Kay (1971) demonstrated that the Penning mechanism is responsible for the ionization of the sputtered material in the rf sputter tool.

What is the sputter rate of a cathode ion?

The sum is taken over all the ions in the discharge, and Yj is the sputter yield of the cathode target material for ion j. Equation (38) states that the sputter rate depends on the sum of Yj Ji,j for each ion bombarding the target.

Sputtering process is one of the processes to form thin films is very useful across several industries such as optical coatings, ... They are an integral part of microelectronics, photovoltaic systems, integrated optics, optoelectronics, and ...

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