Passivation of photovoltaic cells

Nature Reviews Chemistry - Defect passivation is a key concept for optimizing the performance of perovskite solar cells. This Review summarizes our understanding of ...

Effective surface passivation is pivotal for achieving high performance in crystalline silicon (c-Si) solar cells. However, many passivation techniques in solar cells ...

A derivative of 4,4?-dimethyldiphenylsulfone strongly coordinates with Pb2+ on perovskite surfaces, optimizing charge distribution and energy level alignment for efficient passivation of surface defects. He and Chen et al. show ...

Surface passivation using organic molecules with appropriate charge distribution and geometric structure is crucial for achieving high-performance perovskite solar cells.

1. Introduction. A basic cell structure of crystalline silicon PERC (passivated emitter and rear cell) cells commonly fabricated by industry is shown in Figure 1 [], where ...

Effective surface passivation is pivotal for achieving high performance in crystalline silicon (c-Si) solar cells. However, many passivation techniques in solar cells involve high temperatures and cost. Here, we report a ...

The main bottleneck in the commercialization of perovskite solar cells is the long-term stability of device operation. Sustainable passivation of defects from device ...

Surface passivation methods can be categorised into two broad strategies: Reduce the number of interface sites at the surface. Reduce the population of either electrons or holes at the surface. ...

The carrier recombination is a major bottleneck in enhancing the power conversion efficiency of first-generation solar cells. As a remedy, passivation minimizes the ...

Recent studies have demonstrated that optimizing the position of functional groups (N-H and C=O) in molecules can enhance the passivation effect on surface defects, ...

In the 1980s, advances in the passivation of both cell surfaces led to the first crystalline silicon solar cells with conversion efficiencies above 20%. With today"s industry ...

Herein, a low-temperature, non-vacuum liquid-based edge passivation strategy (LEPS) to improve the power conversion efficiency (PCE) of PK/Si tandem solar cells is ...

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In order to avoid an unacceptably large efficiency loss when moving towards thinner silicon materials, the near-term challenge in the c-Si PV industry is to implement an ...

Within the PV community, crystalline silicon (c-Si) solar cells currently dominate, having made significant efficiency breakthroughs in recent years. These advancements are ...

Metal halide perovskite solar cells (PSCs) have achieved a power conversion efficiency (PCE) of 26.7%, establishing them as strong candidates for next-generation solar ...

The steadily increasing bulk carrier lifetimes of crystalline silicon (c-Si) wafers for the application to commercial c-Si solar cells makes recombination at the cell surfaces and at ...

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