Lead-free solar cells

Organic-inorganic hybrid halide perovskites have recently attracted enormous interest as photovoltaic materials because of their superior solar cell performance and straightforward fabrication. Unfortunately, the poor ...

The suitable band gap with outstanding optoelectronic characteristics makes Sn-based perovskites one of the promising candidates for the preparation of efficient lead-free perovskite solar cells (PSCs). However, preparing Sn 2+-based ...

The optical and electrical properties of Pb-based perovskites look almost perfect for solar cells 4.The latest efficiency of perovskite solar cells reached 23.7% 5, outperforming that of Cu(In,Ga ...

Here, we discuss the environmental and toxicological implications of lead, paying particular attention to the existing regulations. Both regulation and common sense suggest that perovskite solar cells have to become lead free to deliver a sustainable technology. Thus, we provide a critical overview of the current research and an outlook of the ...

Vol.0123456789 1 3 Lead-Free Perovskite Materials for Solar Cells Minghao Wang1, Wei Wang1, Ben Ma1, Wei Shen1, Lihui Liu1, Kun Cao1, Shufen Chen1,2 *, Wei Huang1,2 * HIGHLIGHTS o The toxicity issue of lead-based halide perovskites hinders theirs large-scale commercial applications in solar cells.

Currently, the reported experimental efficiency of Pb-free perovskite cells in the field of HaP solar cells is generally below 15%, and the highest recorded efficiency is shown for FASnI3 solar cells with 15.7%. 50, 51 The SLME value of the perovskite component predicted by our method is 21.5%, which shows a discrepancy compared to the experimental value.

Related lead-free compounds include AgBi 2 I 7, for which solar cells with PCE of 1.22% were reported, and HDABiI 5, where HDA is the divalent organic cation 1,6-hex ...

Substituting toxic lead with tin (Sn) in perovskite solar cells (PSCs) is the most promising route toward the development of high-efficiency lead-free devices. Despite the encouraging ...

The advantages of lead substituted metals have been discussed. Lastly, critical analysis and discusses is reported on the progress to enhance the efficiency and stability of lead-free perovskite solar cells and devices by energy-band engineering and inorganic transport layers.

Perovskite solar cells containing tin rather than lead, which is usually employed, are reported. These cells have a power conversion efficiency of 5.7% and retain 80% of their performance over a ...

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However, improved stability and tunable optical properties make some of these lead-free perovskites suitable candidates for solar cell and display devices. A recent effort to ...

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