Antimony-based perovskite solar cells

Are all-inorganic antimony-based perovskite-inspired solar cells a viable alternative to lead-based solar cells?
The emergence of all-inorganic antimony (Sb)-based perovskite-inspired solar cells (PISCs) has attracted much attention due to their good stability and non-toxicity compared with lead (Pb)-based perovskite solar cells (PSCs). However, it is still a great challenge to develop a simple, highly repeatable, and

Are antimony-based perovskite materials safe?
However,there is an urgent call for alternative perovskite materials with toxicity levels and poor stability to UV radiations. Antimony-based perovskites have proven to be a material with unique optoelectronic properties,conventional fabrication processes,low-toxicity levels and high stability values.

Are group 15 metals a promising alternative to perovskite solar cells?
Group 15 metals,Bismuth (Bi) and Antimony (Sb) have garnered significant attention from researchers in recent years. These elements are emerging as promising alternativesfor novel perovskite solar cells due to their trivalent structure,stability,and low toxicity.

Should antimony be replaced with Pb-based perovskites?
Ideally, these new materials, especially Antimony based perovskites, should exhibit exceptional stability, high absorption coefficients, high carrier mobilities, minimal toxicity, etc if we plan to replace it with alreday exsisting Pb-based perovskites.

What is a perovskite based solar cell?
The fundamental building block of a cubic structure perovskite is an octahedron (BX 6),where halide anions surround the B cation. A solar cell composed of a perovskite absorber layeris referred to as Perovskite-based solar cells (PVSCs). The evolution of the perovskite-based solar cell is very impressive.

How can we improve the stability of perovskite materials and solar cells?
Various methods,including defect passivation,use of additives,and application of deoxidizers,have been implemented to address the stability challenges associated with perovskite materials and solar cells. Preparation techniques are known to affect the stability of perovskite.

The poor PCE of antimony chalcogenide (Sb-Chs)-based solar cells is attributed to the self-trapping of photoexcited carriers by distortions in the Sb 2 S 3 lattice. Seok et al. demonstrated ...

Perovskite Solar Cells, Photovoltaic Technology, Lead-free Perovskites, Solar Cell Materials, Antimony-based Perovskites

A strong candidate for photovoltaic technology, perovskite-based solar cells with a planar structure offers a very high power conversion efficiency (PCE). In the meantime, the strive for ...

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Herein, we propose an efficient strategy to introduce antimony (Sb3+) into the crystalline lattices of CsPbI2Br perovskite, which can effectively regulate the growth of perovskite crystals to ...

The other interest of this work was to improve the solar cell efficiency by forming the first hybrid organic-inorganic cesium antimony perovskite-inspired material with the structure ...

Recently, numerical simulation of lead (Pb)-free perovskite solar cells (LFPSCs) has attracted scientific community and received great attention. All-inorganic cesium antimony ...

Based on this method, Sb-based perovskite-like solar cells (PLSCs) achieve the highest recorded power conversion efficiency (PCE) of 3.34% and retain 90% of the initial ...

The environmental toxicity of Pb in organic-inorganic hybrid perovskite solar cells remains an issue, which has triggered intense research on seeking alternative Pb-free ...

Antimony (Sb)-based perovskite-inspired materials (PIMs) are garnering significant interest due to their high chemical stability, low toxicity, and abundant reserves. ...

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Boopathi et al. explored Sb perovskites for their applications in solar cells [8]; they found that solar cells based on the perovskite containing methylammonium (MA) ions (i.e., MA ...

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