



# Progress in inorganic perovskite batteries

DOI: 10.1016/j.mtener.2021.100891 Corpus ID: 243789904 Recent progress in inorganic tin perovskite solar cells @article{Zhang2021RecentPI, title={Recent progress in inorganic tin perovskite solar cells}, author={Miaomiao Zhang and Zhiguo Zhang and Hong-Xia Cao and Tao Zhang and Haixuan Yu and Jianying Du and Yan Shen and Xiaoli Zhang and Jun Zhu and ...

Cesium-based all-inorganic wide-bandgap perovskite solar cells (AIWPSCs) have been demonstrated with exceptional optoelectronic properties such as intrinsic optical wide-bandgap and high thermal st...

As a new generation of solution-processable optoelectronic materials, organic-inorganic hybrid halide perovskites have attracted a great deal of interest due to their high and balanced carrier mobility, long carrier diffusion length and large light absorption coefficient. These materials have demonstrated wide applications in solar cell, light-emitting diode, laser, ...

All-inorganic lead halide perovskite nanohexagons for high performance air-stable lithium batteries Nanoscale, 11 ( 2019 ), pp. 882 - 889 CrossRef View in Scopus Google Scholar

In this review, we focus on inorganic Na-ion SSEs, including Na-v/v&quot;-Al<sub>2</sub>O<sub>3</sub>, Nasicon, layered oxides, anti-perovskite, complex hydrides and halides, etc. We first discuss the mechanism of Na-ion transport and the structures of these typical SSEs. We then specify ...

Recently, power conversion efficiency (PCE) of organic-inorganic hybrid perovskite solar cells (PSCs) has been improved to 26.1%. However, the toxicity issue of lead ...

DOI: 10.1039/C4TA04953E Corpus ID: 135671556 Recent progress in organic-inorganic halide perovskite solar cells: mechanisms and material design @article{Luo2015RecentPI, title={Recent progress in organic-inorganic halide perovskite solar cells: mechanisms and material design}, author={Shiqiang Luo and Walid A. Daoud}, ...

Request PDF | Zwitterions for Organic/Perovskite Solar Cells, Light-Emitting Devices, and Lithium Ion Batteries: Recent Progress and Perspectives | Zwitterions, a class of materials that contain ...

In this review, the research progress and application potential of a series of novel all-inorganic perovskite electrode materials in the fields of batteries and supercapacitors are reviewed. Strategies to modulate perovskite materials are ...

Incorporating a two-dimensional (2D) Cs<sub>2</sub>PbI<sub>2</sub>Cl<sub>2</sub> capping layer between the perovskite active layer and hole-transport layer stabilizes the interface while increasing power conversion efficiency of the all-inorganic ...



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Following this, the progress in various perovskite oxides, including single perovskite and derivative perovskite oxides, is depicted, focusing on their electrochemical performance. Furthermore, several optimization ...

Organic-inorganic perovskites are crystalline light absorbers which are gaining great attraction from the photovoltaic community. Surprisingly, the power conversion efficiencies of these perovskite solar cells have rapidly increased by over 25% in 2019, which is comparable to silicon solar cells. Despite the many advances in efficiency, there are still many areas to be ...

This Review is focused on ion-transport mechanisms and fundamental properties of solid-state electrolytes to be used in electrochemical energy-storage systems. Properties of the migrating species significantly ...

Hybrid perovskites, materials composed of metals and organic substances in their structure, have emerged as potential materials for the new generation of photovoltaic cells due to a unique combination of optical, ...

Nowadays, the soar of photovoltaic performance of perovskite solar cells has set off a fever in the study of metal halide perovskite materials. The excellent optoelectronic properties and defect tolerance feature allow metal halide perovskite to be employed in a wide variety of applications. This article provides a holistic review over the current progress and ...

Solid electrolyte is an important part of all-solid-state lithium-ion battery, and it is the key and difficult point in the research of all-solid-state lithium-ion battery. Both solid polymer electrolyte and inorganic ceramic electrolytes have obvious deficiencies in electrochemical and mechanical properties, but polymer-inorganic filler solid composite electrolyte is obtained by ...

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In this review, the research progress and application potential of a series of novel all-inorganic perovskite electrode materials in the fields of batteries and supercapacitors are reviewed. Strategies to modulate perovskite materials are discussed, including tailoring chemical composition and synthesis methods, controlling crystallinity and morphology, surface/interface ...

Halide perovskite materials have attracted worldwide attention in the photovoltaic area due to the rapid improvement in efficiency, from less than 4% in 2009 to 26.1% in 2023 with only a nanometer lever photo-active layer. Meanwhile, this nova star found applications in many other areas, such as light emitting, sensor, etc. This review started with ...

Herein, we give an overview on the progress of the inverted inorganic PSCs organized as follows. Based on the crystal structure of inorganic perovskites, recent progress on strategies used to modify perovskite films is



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Over the past few years, all-inorganic perovskite solar cells (PSCs), especially CsPbI<sub>2</sub>Br PSCs, have received much attention because of their excellent thermal stability and a suitable trade-off between light absorption and higher phase stability among the family of inorganic perovskites. In this progress report, the realization of highly efficient and stable ...

The power conversion efficiency (PCE) of perovskite solar cells (PSCs) has seen effective performance upgrades, showing remarkable academic research and commercial application value. Compared with commercial silicon cells, the PCE gap is narrowing. However, the stability, cost, and large-scale production are still far behind. For scale-up preparing high ...

Abstract Organic-inorganic hybrid perovskite solar cells (PSCs) are considered as one of the most promising emerging photovoltaics with outstanding performance. However, the commonly used organic hole transport ...

All-inorganic lead halide perovskite nanocrystals have great potential in optoelectronics and photovoltaics. However, their biological applications have not been explored much owing to their poor stability and ...

Li-S batteries have been investigated since the 1960s and have drawn great attention in recent years. This is because sulfur cathodes and lithium metal anodes can deliver exceptionally high theoretical specific capacities (i.e., Li metal ~ 3800 mAh g<sup>-1</sup> and sulfur ~ 1675 mAh g<sup>-1</sup>) and a high specific energy (2600 Wh kg<sup>-1</sup>, based on batteries using sulfur cathodes and Li metal ...

Today, organic-inorganic perovskite hybrid solar cells are especially attracted by the energy industries to design and develop new-generation photovoltaic devices. They are the most promising materials for high PCE and cheap solar cells. They can also solve the current energy demand of society and the global crisis. Over the past few years, the power conversion ...

While there are several candidates for lead replacement, copper-based ternary metal halides have arisen as some of the most interesting "perovskite-inspired" materials. Here we review the recent work on copper-based ternary metal halides, including all-inorganic and organic-inorganic hybrid, perovskite and non-perovskite, and ternary copper halides.

Porous perovskite oxides applied in the air electrode of Li-air batteries have been extensively studied in recent years. 63, 64, 68, 127, 141, 150, 152, 195-203 For instance, in 2014, Zhang et al. synthesized the porous perovskite LaNiO<sub>3</sub> ...

Organic-inorganic hybrid perovskite solar cells (PSCs) have emerged as a new class of optoelectronic semiconductors that revolutionized the photovoltaic research in the recent years. The perovskite solar cells present numerous advantages include unique electronic structure, bandgap tunability, superior charge transport



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properties, facile processing, and low ...

Solid-state batteries are attractive due to their potential safety, energy-density and cycle-life benefits. Recent progress in understanding inorganic solid electrolytes considering multiscale ion ...

To address the limitations of contemporary lithium-ion batteries, particularly their low energy density and safety concerns, all-solid-state lithium batteries equipped with solid-state electrolytes have been identified as an up-and-coming alternative. Among the various SEs, organic-inorganic composite solid electrolytes (OICSEs) that combine the advantages of both ...

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