

Metal-halide perovskites for photovoltaic and light-emitting devices

Metal halide perovskites are an emerging class of nonepitaxial semiconductors that have garnered the attention of the photovoltaic and light-emitting-device (LED) research communities due to their remarkable optoelectronic properties and wide-wavelength tunability.

Metal halide perovskites have emerged as a class of promising semiconductors for high-performance optoelectronics in the last decade. Their unique optical and electrical properties render them with great potential for applications in photovoltaics, light-emitting diodes, lasers and photodetectors.

This Review discusses recent developments in photovoltaic and light-emitting optoelectronic devices made from metal-halide perovskite materials. Metal-halide perovskites are...

Metal halide perovskites (MHPs) have been developing rapidly in recent years due to their outstanding optoelectronic properties and tremendous contributions from worldwide researchers. The external quantum efficiencies of perovskite light-emitting diodes (Pero-LEDs) have all exceeded 20% for the green, red, and near-infrared emitting ones.

Metal-halide perovskites are crystalline materials originally developed out of scientific curiosity. Unexpectedly, solar cells incorporating these perovskites are rapidly emerging as...

The current understanding of the physics of light emission in state-of-the-art metal-halide perovskite devices is presented and pathways toward reaching device efficiency limits and how the unique properties of perovskites provide a tremendous opportunity to

Over the past few years, solar cells based on metal-halide perovskite absorbers, and in particular organic-inorganic hybrid compounds, have sprung to the forefront of photovoltaic research

Metal-halide perovskites are crystalline materials originally developed out of scientific curiosity. Unexpectedly, solar cells incorporating these perovskites are rapidly emerging as serious contenders to rival the leading photovoltaic technologies. Power conversion efficiencies have jumped from 3% to over 20% in just four years of ...

Here, we review the rapid progress in perovskite solar cells, as well as their promising use in light-emitting devices. In particular, we describe the broad tunability and fabrication methods of these materials, the current understanding of the operation of state-of-the-art solar cells and we highlight the properties that have delivered light ...

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