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## Solar Energy South Africa

# Perovskite photovoltaic

## Overview

A perovskite solar cell (PSC) is a type of solar cell that includes a perovskite-structured compound, most commonly a hybrid organic–inorganic lead or tin halide-based material as the light-harvesting active layer.  Perovskite materials, such as methylammonium lead halides and all-inorganic cesium lead halide.

The raw materials used and the possible fabrication methods (such as various printing techniques) are both low cost. Their high absorption coefficient enables ultrathin films of around 500 nm to absorb the complete visible.

Perovskite solar cells hold an advantage over traditional in the simplicity of their processing and their tolerance to internal defects. Traditional silicon cells require expensive, multi-step processes, conducted at high temperatures (>1000 °C).

An important characteristic of the most commonly used perovskite system, the methylammonium lead halides, is a controllable by the halide content. The materials also display a diffusion length for both holes and electrons of over one .

Perovskite materials have been well known for many years, but the first incorporation into a solar cell was reported by et al. in 2009. This was based on a architecture, and generated only 3.8% power conversion.

The name "perovskite solar cell" is derived from the ABX3 of the absorber materials, referred to as , where A and B are and X is an . A cations with radii between 1.60 and 2.50 Å have been found to form perovskite.

Toxicity issues associated with the lead content in perovskite solar cells strains the public perception and acceptance of the technology. The health and environmental impact of toxic heavy metals has been much debated in the case of CdTe solar cells, whose efficiency.

Perovskite solar cells function efficiently in a number of somewhat different architectures depending either on the role of the perovskite material in the device, or the nature of the top and bottom electrode. Devices in which positive charges are extracted by the.

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### Perovskite Solar Cells: An In-Depth Guide

Perovskite solar cell technology is considered a thin-film photovoltaic technology, since rigid or flexible perovskite solar cells are manufactured with absorber layers of 0.2- 0.4 um, resulting in even thinner ...

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