# Solar cell light-absorbing materials

It is believed that excitonic absorption extends the spectral response in photovoltaic semiconductor materials since it enables absorption of photons with energy smaller than the fundamental band gap ... Thin single ...

We have successfully implemented this 2D perovskite family in solid-state solar cells, and obtained an initial power conversion efficiency of ...

The key to creating a material that would be ideal for converting solar energy to heat is tuning the material"s spectrum of absorption just right: It should absorb virtually all wavelengths of light that reach Earth"s surface from ...

The most prominent application of halide perovskites is as light-absorbing materials in solar cells. Miyasaka and coworkers first applied halide perovskite materials in...

SLME measures the performance of solar cells in absorbing light from different wavelengths in the solar spectrum. ... composed of 488 entries, meets the stability and photoelectric characteristics required for perovskite solar cells (eligible materials are listed in Table S15). The compounds in this dataset fully cover the 14-dimensional ABX 3 ...

Design of the high-efficient light trapping structure for perovskite solar cell. Recently, nano-scaled dielectric and metallic structures based light trapping has been exposed to exhibit excellent ...

A multi-institute team led by Oxford has unravelled the factors enabling efficient charge-carrier transport in the light-harvesting materials for solar cells, in a work published in ...

Organic/inorganic metal halide perovskites attract substantial attention as key materials for next-generation photovoltaic technologies due to their potential for low cost, high performance, and ...

Enhanced light absorption can also be confirmed by much improved PV performance of nanodome solar cell. Fig. 9 b shows the I-V characteristic of a nanodome solar cell showing V oc of 0.75 V, J sc of 17.5 mA cm -2 with a FF of 0.45 and efficiency of 5.9% [88].

In photovoltaic devices, semiconductor NCs can act as efficient light harvesters for high-performance solar cells. Besides light absorption, NCs have shown great significance as functional layers for charge (hole and ...

It is generally known that the maximum efficiency achievable for any single-junction solar cell has been established by the Shockley-Queisser theory. The thermodynamic limit depends on the bandgap energy of the light absorbing material where the maximum value at optimum condition is around 33 % [59].

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We are also working on new light absorbing materials to broaden the possibilities for future cell design. Dye-sensitised Solar Cells are based on attachment of a coloured dye to a mesoporous metal oxide such as TiO2. This allows the low ...

Their new light-absorbing material is, for the first time, thin and flexible enough to apply to the surface of almost any building or common object. Using a pioneering technique ...

1. Introduction. Improving absorptivity of light-absorbing materials is very significant in laser machining, solar cell manufacturing, and light-sensitive detector fields, wherein ...

PSCs emerged from dye sensitized solar cells (DSSC) when the light absorbing dye was replaced with perovskite nanocrystals material by Kojima and co-workers. 19 The rapid reaction of ...

Solar cells can be made of a single layer of light-absorbing material (single-junction) or use multiple physical configurations (multi-junctions) to take advantage of various absorption and ...

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