

Solar power generation efficiency is low indoors

How to calculate efficiencies of solar cells at indoor conditions?

The efficiencies of the solar cells at indoor conditions were calculated with equation (2), where P_{out} ($W\ cm^{-2}$) is the output power of the solar cell and P_{in} ($W\ cm^{-2}$) is the incident power of the light source, measured by a calibrated Si-diode or the lux meter:

Can solar cells operate efficiently under indoor lighting?

Solar cells This article has been updated Abstract Solar cells that operate efficiently under indoor lighting are of great practical interest as they can serve as electric power sources for portable electronics and devices for wireless sensor networks or the Internet of Things.

Can solar cells harvest low-intensity diffused indoor light energy?

In the past few years, the development of PV cells specifically designed for harvesting low-intensity diffused indoor light energy has attracted the interest of researchers [19, 20, 21, 22, 23]. Various PV materials have been employed so far to develop efficient solar cells for indoor applications.

Can a photovoltaic cell harvest low-intensity indoor light?

Most of these devices require power in the microwatt range and operate indoors. To this end, a self-sustainable power source, such as a photovoltaic (PV) cell, which can harvest low-intensity indoor light, is appropriate. Recently, the development of highly efficient PV cells for indoor applications has attracted tremendous attention.

Are solar cells suitable for indoor applications?

Therefore, the fabrication of specially designed solar cells for indoor applications is not an easy task. Different parameters of solar cells must be optimized for indoor light conditions. The device should be designed in such a manner that it can operate efficiently under the illumination of the most commonly used indoor light sources.

Are indoor photovoltaics a good energy source for wireless devices?

Until recently, with the advent of the Internet of Things (IoT), indoor photovoltaics (IPVs) that convert indoor light into usable electrical power have been recognized as the most promising energy supplier for the wireless devices including actuators, sensors, and communication devices connected and automated by IoT technology (5,6).

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