Solar Energy South Africa

# Hydrophilic film on photovoltaic panel surface

## Overview

Is superhydrophilic surface suitable for photovoltaic module?

After UV irradiation, all samples presented superhydrophilic behaviour (angle $< 5°$), except uncoated glass, showing how coating applications were efficient to give superhydrophilic property to the glass. Superhydrophilic surface is promising for photovoltaic module due to its self-cleaning effect.

Can superhydrophobic coatings improve the efficiency of solar PV cells?

Superhydrophobic coatings can increase the efficiency of solar PV cells by enhancing and improving their durability. This development provides a comparable alternative to other nonrenewable or eco-unfriendly energy sources which have high efficiency.

Why do photovoltaic panels need a transparent coating?

When sunlight shines on the photovoltaic panel, part of the visible light will be reflected, and the rest will be converted and utilized. Therefore, the transparency and anti-reflection of the self-cleaning coatings applied on photovoltaic modules cannot be ignored.

What are the characteristics of a photovoltaic coating?

For photovoltaic application, besides the self-cleaning properties, the coating should present adequate adhesion and transparency in the wavelength region 300–1800 nm.

Why do photovoltaic panels need a self-cleaning coating?

The self-cleaning coating has attracted extensive attention in the photovoltaic industry and the scientific community because of its unique mechanism and high adaptability. Therefore, an efficient and stable self-cleaning coating is necessary to protect the cover glass on the photovoltaic panel. There are many self-cleaning phenomena in nature.

Can reflected light improve the efficiency of PV panels?

Reflected light represents uncaptured energy; therefore, decreasing the proportion of reflected light represents a promising approach for increasing the efficiency of PV panels. Textures on the front surfaces of the panels are often used to reduce the reflectance; however, it will be significant if the surfaces achieve lower reflective light.

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## Self-adaptive interfacial evaporation for high-efficiency photovoltaic ...

It consists of a PV module with a thin-film hydrophilic wicking evaporator and an adaptive control platform. By using the potential difference of water, the thin-film evaporator ...

## Simple, Scalable Route to Produce Transparent ...

The hydrophobic coating can eliminate dust particles using only fresh air. The high-speed wind enhances the self-cleaning process, which also increases the coated PV panel's overall efficiency. In addition, compared with ...

## CFD simulation and validation of self-cleaning on solar panel ...

solar panel surfaces with superhydrophilic coating Jin Hu1*, Nicolas Bodard1, Osmann Sari1 and Saffa Riffat2 In other words, water film flows, either on hydrophilic surface or water drop ...

## Micron-Smooth, Robust Hydrophobic Coating for ...

Abstract. Photovoltaic (PV) power generation is a clean energy source, and the accumulation of ash on the surface of PV panels can lead to

power loss. For polycrystalline PV panels, self-cleaning film is an economical ...

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