Light absorbers for solar power generation

With the increasing development of photothermal techniques in various fields, particularly concentrated solar power (CSP) systems and solar thermoelectric generators (STEGs), the demand for high-performance spectrally ...

2 ???· First, the geometry and dimensions of the absorber are optimized to enhance its capacity for light absorption and the conversion of solar energy into thermal energy. This optimization process was pivotal in maximizing the efficiency of the solar energy absorption system. Next, an in-depth investigation was undertaken to uncover the underlying fundamental ...

For decades, human has to face the most pressing challenges of the global energy crisis and freshwater resources shortage. So, more and more researchers are devoted to exploring efficient energy conversion [[1], [2], [3]] and water purification technologies [4, 5].Solar steam generation is regarded as a promising and environmental-friendly solution to meet the ...

In this context, high-entropy nitrides, as novel solar selective absorbers (SSAs) materials, play a crucial role in these applications, demonstrating excellent spectral selectivity and strong thermal and chemical stability at high temperatures and in harsh environments.

Herein, carbonized melamine foams obtained through one-step calcination were first used as integrative solar absorbers (ISAs) for water evaporation, realizing highly efficient solar steam generation. The optimized ...

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Solar energy is a green, stable and universal source of renewable energy, with wide spectrum and broad area characteristics [1] is regarded as being one of the renewable energy sources with the greatest potential to achieve sustained, high intensity energy output [1], [2].The conflict between population growth and water shortage has become one of the most ...

Materials and structures engineering of sun-light absorbers for efficient direct solar steam generation. Sogol Karami, ... Seyed Mojtaba Sadrameli, in Solar Energy, 2021. 4 Absorbers in solar steam generation systems. The typical structure of solar steam generators has a photothermal material as the light absorber that plays a vital role in the ...

Thermoelectric technology is gaining paramount importance for solar energy conversion and electricity production to increase green energy resources with high efficiency. An enormous amount of research is being

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Here we present a perfect broadband solar absorber for efficient photothermal conversion of sunlight employing a low-cost ultraviolet laser-induced graphene (UV-LIG) prepared on a polymer material using the conventional direct laser writing method.

2 ???· First, the geometry and dimensions of the absorber are optimized to enhance its capacity for light absorption and the conversion of solar energy into thermal energy. This ...

Absorbers in solar steam generation systems The typical structure of solar steam generators has a photothermal material as the light absorber that plays a vital role in the process.

The films show strong light absorption near the band edge and photoluminescence in the visible region, validating BaZrS3 as a suitable candidate for ultrathin front absorbers in tandem solar cells. The photodetector devices show fast and efficient photo response with the highest ON/OFF ratio reported for BaZrS3 films thus far. Our study opens ...

41 ?· Materials and structures engineering of sun-light absorbers for efficient direct solar steam generation. Sogol Karami, ... Seyed Mojtaba Sadrameli, in Solar Energy, 2021. 4 Absorbers in ...

Recently, Karami et al. demonstrated a novel solar steam generator based on multicore@ shell nanostructured aerogels of carbon and silica as the light absorber-heat insulator. This system was designed with excellent thermal managing and prevent heat losses through all mechanisms comprising conduction, convection, and radiation. At ...

Herein, carbonized melamine foams obtained through one-step calcination were first used as integrative solar absorbers (ISAs) for water evaporation, realizing highly efficient solar steam generation. The optimized ISA shows excellent light absorption (>96%) for solar energy due to the features of high porosi

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