

Solar steam power generation patent

Can origami-based solar steam generator use solar energy?

For the 1st time, the authors report a deployable, three-dimensional (3D) origami-based solar steam generator capable of near full use of solar energy.

How does a solar steam generator work?

The solar steam generator fabricated with a unidirectional pathway design satisfactorily absorbed incoming solar illumination, provided localized heat at the air-water interface and produced steam at a rate of 1.386 kg m⁻² h⁻¹, exhibiting an excellent photothermal efficiency of 90.88% under 1 sun (1000 W m⁻²) illumination.

What is solar steam generation?

Solar steam generation is a promising technique using solar energy to obtain fresh water from seawater, industrial waste water, or sewage. In the current work, a green-tide waste, *Enteromorpha prolifera* (EP), is used as raw material to prep. efficient absorbers and light-to-heat converters for solar steam generation.

Can solar energy be used to generate steam?

Currently, steam generation using solar energy is based on heating bulk liq. to high temps. This approach requires either costly high optical concns. leading to heat loss by the hot bulk liq. and heated surfaces or vacuum. New solar receiver concepts such as porous volumetric receivers or nanofluids have been proposed to decrease these losses.

How a multilayered solar steam generation system is fabricated?

In this work, high-performance, low-cost, environmentally friendly multilayered solar steam generation systems are fabricated by engineering the structure and using a biomass photothermal material...

Is a 3D solar steam generator a photothermal device?

The 3D solar steam generator device with a nanocarbon composite of graphene oxide and carbon nanotubes being photothermal component in this work shows a very strong dependence between its solar energy efficiency and surface areal density.

Steam generation by solar energy (solar steam) has been also recently investigated in a broad variety of other applications, for instance enhanced oil recovery 12,13, ...

An innovative steam generation system for a solar power plant has been designed in Germany by Balcke-Duerr. In order to assist its construction, a dynamic simulation ...

Interfacial solar steam generation (ISSG) is deemed to be a promising solution to get freshwater from seawater or wastewater 2. Compared with traditional solar distillation, ...



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One promising path to achieve an energy efficiency beyond the theoretical limit (i.e., $>100\%$) under 1.0 sun is to increase the net energy gain from environment during solar ...

Solar Powered Steam Generator. A solar-powered steam generator is a device that harnesses the energy from sunlight to produce steam, typically for various industrial and energy-related applications. These ...

Solar steam generator was first worked on to power a vehicle by George et al. (1956) and the ... "Vehicle having Solar Steam Generator." Patent ... This project work ...

The other half is turning that heat into useable power. Enter CMI's 2009 patent. This receptor produces high-pressure superheated steam (a good 986 degrees Fahrenheit), which can be used directly in a turbine for ...

The brighter the light, the more steam is generated. The new material is able to convert 85 percent of incoming solar energy into steam -- a significant improvement over recent approaches to solar-powered steam ...

Solar Steam Generation. The Hidden Challenge Heat accounts for 74% of the industrial energy consumption. It is mostly provided using fossil fuels. ECOTHERM Virtual Reference City. ...

The Solar Steam experimental prototype pictured on this website was tested alongside the Phoenix head office in Bourne, Lincolnshire, UK. It was the first real scale solar thermal linear ...

The utility model discloses a solar steam power generation system, and belongs to solar generating sets. The solar steam power generation system is low in cost and long in service ...

On a Charged Aerosol Wind/Electric Power Generator, electrically charged water droplets are dispersed into the wind stream. Using Induction Electric Charging, a water jet issues under ...

SUNCNIM guarantees the annual energy production of the solar steam generator through simple indicators in order to monitor the level of performance. This performance guarantee is valid ...

Siemens Energy steam turbines are the most often used power generation product in solar thermal power plants. Our tailored steam turbines are reliably operating in all common ...

Efficient harvesting of solar energy for steam generation is a key factor for a broad range of applications, from large-scale power generation, absorption chillers and ...

The invention described a process for generating steam, wherein a heat transfer carrier is heated to a temperature between 700 to 1500 $^{\circ}\text{C}$ in a high temperature receiver. The heat transfer...

Such stable solar steam generator integrated with efficient photothermal converting material and rational



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structural design highlights the practical consideration toward ...

The solar steam power generation system has the advantages of being capable of continuously and stably generating electricity even at night, simple in structure, stable...

The role of renewable energy in global power generation is growing -- particularly for solar power. Thanks to increasing innovation and decreasing costs, global solar ...

Recently, Neumann et al. in "Solar vapor generation enabled by nanoparticles," ACSNano 7, 42-9 (2012) and "Compact solar autoclave based on steam generation using broadband light ...

We report the development of a new approach and corresponding material structure that localizes the solar energy where evaporation occurs and minimizes the heat ...

In US patent number US 3452132 A, 300 ... solar thermal power generation efficiency and exergetic efficiency. Our results indicate that the optimum evaporation ...

the steam-to-electrical energy converting system includes a steam generator for retaining water and producing steam, a solar collecting device with lens arrays that can be free standing or ...

The mini review is followed by a list of notable recent patents and articles. However, the list is by no means exhaustive or complete, and quite possibly some important ...

A low cost, highly flexible and environmentally friendly water generation method known as interfacial solar steam generation (SSG) has recently been popularized by many ...

In this work, we have explored MoS₂-based composites as efficient solar evaporators and energy generators for solar steam and water-driven energy generation. In ...



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