

Can solar-driven chemistry solve environmental problems?

With the development of society, energy shortage and environmental problems have become more and more outstanding. Solar energy is a clean and sustainable energy resource, potentially driving energy conversion and environmental remediation reactions. Thus, solar-driven chemistry is an attractive way to solve the two problems.

How to drive chemical reactions by solar energy?

To drive chemical reactions by solar energy, there are three main strategies considering energy conversion processes, as shown in Figure 1. The main strategies to drive chemical reaction by solar energy: L-C (Light-Chemistry), L-E-C (Light-Electricity-Chemistry), and L-H-C (Light-Heat-Chemistry).

Can traditional environmental engineering systems be integrated with solar-based photo (electro)catalytic technology?

Traditional environmental engineering systems can be actively integrated with the solar-based photo (electro)catalytic technology. This special issue provides some examples and guidelines for environmental engineers who actively seek solutions for a sustainable future.

Should energy and chemistry be accelerated?

This review evidences the need to accelerate studies on these directions, being a crucial element to catalyze the transition to a more sustainable use of energy and chemistry. It is remarked, however, the need to go beyond the traditional approaches, with some examples given.

Are photobiocatalytic solar fuel and solar chemical conversion possible?

Overall, obvious achievements have been made in photobiocatalytic solar fuel and solar chemical conversion in recent years, as innovative PBSs are constructed, molecular mechanisms are explored, and tentative solutions are proposed for scale-up, but huge challenges still exist.

What are the current commercial electrochemical processes in chemistry?

Current commercial electrochemical processes in the area of chemistry are quite limited, essentially adiponitrile synthesis and few minor industrial organic electrosyntheses, in addition to the chlor-alkali process. New large-scale electrolysis units for H₂ production using RES has been also announced.

The use of chemical process simulation software to design and optimize the renewable energy conversion process not only provides ideas for the improvement of product ...

Environmental is more about wastewater treatment, recycling and environmental management. Sure they have renewable energy classes but that's not the focus of the course and if we are being honest, the random

renewable energy material thrown ...

Solar energy is expected to play a large role in decarbonization of the energy sector globally. In the United States, solar energy is forecasted to generate roughly 45% of the electricity by 2050. Although solar energy mitigates the negative effects of climate change by providing electricity without releasing greenhouse gases, little is known about the implications ...

Utilizing solar light as a sustainable energy source has been one of the most wanted holy grails in the research communities looking for solutions for sustainable energy and environmental protection.

It also provides a review on energy-related environmental problems which include acid rain, ozone layer depletion, and global climate change. ... This is followed by solar chemistry applications, which include reforming of fuels and solar cells. ... Solar ...

Environmental Progress & Sustainable Energy; Biotechnology Progress; Process Safety Progress; CEP Magazine; Books; Join AIChE; aiche ; AIChE Journal. Volume 56, Issue 11 p. 2762-2768. Perspective. Chemical engineering in a solar energy-driven sustainable future. Rakesh Agrawal, Corresponding Author. ... School of Chemical ...

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Converting renewable solar energy into fuel and value-added chemicals is a long-term objective of researchers and a promising solution for the energy crisis, environmental pollution, and global war...

What do chemical engineers working in the environment, energy, and sustainability do? Energy, water, food, and the environment are all interconnected. Chemical engineers use their knowledge of physics, math, ...

Semantic Scholar extracted view of "Chemical engineering for a solar economy (2017 P. V. Danckwerts Lecture)" by R. Agrawal ... Engineering, Environmental Science, Chemistry; Chemical Engineering Science; View via Publisher. Save to Library Save. ... Solar energy is by far the largest exploitable resource, providing more energy in 1 hour to the ...

With energy and environmental problems becoming increasingly prominent, driving chemical reactions by solar energy is an attractive solution. Compared with the low spectral efficiency ...

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