

Towards artificial leaves for solar hydrogen and fuels from carbon dioxide

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Description

The development of an “artificial leaf” that collects energy in the same way as a natural one is one of the great challenges for the use of renewable energy and a sustainable development. To avoid the problem of intermittency in solar energy, it is necessary to design systems that directly capture CO₂ and convert it into liquid solar fuels that can be easily stored. However, to be advantageous over natural leaves, it is necessary that artificial leaves have a higher solar energy-to-chemical fuel conversion efficiency, directly provide fuels that can be used in power-generating devices, and finally be robust and of easy construction, for example, smart, cheap and robust. This review discusses the recent progress in this field, with particular attention to the design and development of ‘artificial leaf’ devices and some of their critical components. This is a very active research area with different concepts and ideas under ...

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