

<div class="df\_qntext">Can solar-driven thermochemical cycles contribute to the green energy transition?

1. Introduction Solar-driven thermochemical cycles can be considered valuable systems for clean energy production, contributing to the green energy transition [1, 2].

<div class="df\_qntext">Can ceria thermochemical cycle produce solar thermochemical hydrogen?

The implementation of a novel approach was exemplified in the ceria thermochemical cycle for producing solar thermochemical hydrogen, specifically in the H<sub>2</sub>O-driven oxidation step. The H<sub>2</sub> production rate equation was derived, rearranging apparent kinetics from experimental data in the literature into a more suitable analytical form.

<div class="df\_qntext">Can solar thermochemical reaction systems be used in a continuum model?

This aspect is highlighted in a recent review on solar thermochemical reaction systems modelling : "The use of this experimental data directly in a continuum model [...] requires some care since this is a bulk solid measurement that must be related to local gas/solid concentrations".

<div class="df\_qntext">Can a solar tower fuel plant produce kerosene from CO<sub>2</sub>?

A solar tower fuel plant for the thermochemical production of kerosene from H<sub>2</sub>O and CO<sub>2</sub>. Joule 2022, 6, 1606-1616. [Google Scholar] [CrossRef] Marxer, D.; Furler, P.; Takacs, M.; Steinfeld, A. Solar thermochemical splitting of CO<sub>2</sub> into separate streams of CO and O<sub>2</sub> with high selectivity, stability, conversion, and efficiency. Energy Environ.

<div class="df\_qntext">Is ceria oxidation controlled by temperature swing redox cycles?

Below 1000 °C, H<sub>2</sub>O-driven ceria oxidation is reported to be controlled by surface kinetics rather than thermodynamics [54,61], calling for the modelling investigation of the oxidation kinetics when dealing with temperature swing redox cycles.

<div class="df\_qntext">Do perovskite OCS reduce reoxidation?

When dealing with thermochemical splitting, this condition is typically met when using perovskite OCs, which have shown a higher reduction extent and lower reduction temperatures than ceria but a lower reoxidation extent at the same time unless the oxidant in excess is used to boost the thermodynamic driving force [7,15].

In today's dynamic energy landscape, harnessing sustainable power sources has become more critical than ever. Among the innovative solutions paving the way forward, solar energy ...

Impressively, the optimal Mn<sub>3</sub>O<sub>4</sub> with abundant unsaturated defects (O and Mn) displayed efficient and steady solar-heating photothermal ethyl acetate oxidation (about 97 % ...

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Concentrating solar thermal systems use reflectors or mirrors to collect and focus the sun's rays onto tubes known as absorbers (or receivers) which absorb the sun's rays, convert them ...

The two reactor concepts were tested within non-solar-aided lab-scale and solar-aided campaigns, respectively. The feasibility of both concepts was shown and good chemical conversions ...

In contrast, with HfO<sub>2</sub> nanoparticles deposited, the photogenerated holes are not only effectively extracted from the bulk of γ-Fe<sub>2</sub>O<sub>3</sub> but are also promptly injected into the electrolyte for water ...

In the past few years, various surface heating approaches have been developed, such as photothermal heating (Solar), Joule heating (Ohmic heating) and induction heating. Photothermal ...

A corrosion test under dynamic conditions on common container materials used in TES systems for CSP Plants, CSA516 and SS347, was successfully performed with molten solar salt ...

Oleic acid exhibited self-heating at lower temperatures compared with polyethylene glycol according to each measurement method. Thus, the comparative risk of heat generation of ...

The thermodynamics of the BaO/BaO/sub 2/ system are surveyed, and three experiments involving BaO powder heated in electric furnaces were performed to study the practicality of the BaO/BaO/sub 2/ ...

Unlike some other solar collectors, ETCs do not require solar tracking and exhibit lower heat loss. Moreover, the heat conversion performance of ETCs is significantly higher than simple flat ...

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