



WALMER ENERGY

Chemical solar container battery Efficiency





Overview

Are coupled organic solar batteries efficient?

Coupled solar batteries enable direct solar-to-electrochemical energy storage but show low efficiencies due to insufficient solar spectrum utilization. Here, we report the exciton-coupled redox reactions over molecular photoelectrochemical materials for wide-spectrum, high-efficiency, coupled organic solar batteries.

Do coupled solar batteries have high efficiencies?

Coupled solar batteries enable direct solar-to-electrochemical energy storage but show low efficiencies due to insufficient solar spectrum utilization. Here, we report the exciton-coupled redox reactions over molecular photoelectrochemical materials for wide-spectrum, high-efficiency, coupled organic solar batteries.

Are coupled solar batteries a viable alternative to redox-electrode solar energy storage?

Unlike the indirect approach of integrated solar flow batteries combining photoelectrodes with redox-electrodes, coupled solar batteries enable direct solar energy storage, but are hampered by low efficiency due to rapid charge recombination of materials and misaligned energy levels between electrodes.

How efficient is solar-to-electrochemical energy storage?

A record-high solar-to-electrochemical energy storage efficiency of 12.1% and an exchange photocurrent of 11.2 mA cm⁻² at 0.93 V were achieved under full-spectrum illumination.



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