Norbornadiene solar energy storage Estonia

Molecular solar thermal energy storage (MOST) systems can convert, store and release solar energy in chemical bonds, i.e., as chemical energy. In this work, phenyl- and naphthyl-linked bis- and tris-norbornadienes are presented as promising MOST systems with very high energy densities.

ularly relevant in order to be able to exploit renewable energy resources such as solar energy, since these are typically intermittent and not evenly distributed. The work presen-ted in this thesis is focused on trying to optimise norbornadiene-quadricyclane systems to harness and store solar energy. Norbornadienes are able to absorb light, and ...

The norbornadiene/quadricyclane (NBD/QC) photoswitch pair represents a promising system for application in molecular solar thermal energy storage (MOST). Often, the NBD derivatives have very limited overlap with the solar spectrum, and substitution to redshift the absorption leads to a decrease in t ...

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A general challenge is to combine efficient solar energy capture with high energy densities and energy storage time into a processable composite for device application. Here, norbornadiene (NBD)-quadricyclane (QC) molecular ...

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norbornadiene as route for energy storage to the sophisticated molecular design of numerous derivatives with optimized properties.

Developing norbornadiene-quadricyclane (NBD-QC) systems for molecular solar-thermal (MOST) energy storage is often a process of trial and error. By studying a series of norbornadienes (NBD-R2) doubly substituted at the C7-position with R = H, Me, and iPr, we untangle the interrelated factors affecting MOST p

A ray of sunlight absorbed by a solution will be stored and later released as heat energy. The norbornadiene derivatives designed and studied in this work swirl around the flask like autumn leaves symbolizing the cyclic nature of molecular solar thermal energy storage; and as leaves turn red in autumn, so the absorption of these molecular ...

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storage of solar energy is focused on its conversion into chemical energy by means of a photochemical reaction, usually termed molecular solar thermal energy storage (MOST). This method utilizes photoactive compounds that are converted into photoproducts with higher energy upon absorption of sunlight. In turn, this reaction is reversible, so

A major challenge in the field of molecular solar thermal energy storage is designing visible light-absorbing photoswitches with long energy storage half-lives. Five novel visible light-absorbing norbornadiene dimers were prepared, with half-lives up to 23.0 hours, and high energy densities up to 379.3 kJ/kg.

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