

Can paraffins be used for solar thermal energy storage?

Thermal energy storage (TES) using phase change materials (PCMs) has received increasing attention since the last decades, due to its great potential for energy savings and energy management in the building sector. As one of the main categories of organic PCMs, paraffins exhibit favourable phase change temperatures for solar thermal energy storage.

Can paraffin-based PCM TES improve solar thermal energy storage?

5. Conclusions Paraffins, as one of the main categories of phase change materials, offer the favourable phase change temperatures for solar thermal energy storage. The application of paraffin-based PCM TES in buildings can effectively rationalise the utilisation of solar energy to overcome its intermittency.

Can paraffin wax be used for thermal energy storage?

A paraffin wax with the melting temperature of 58-62°C was used as PCM and filled into evacuated tubes for thermal energy storage by Abokersh et al. . The heat transfer between the water and PCM was achieved by different U-tube heat exchangers with and without fins inside the evacuated tubes, respectively.

Can a paraffin encapsulated cylinder be used as heat storage media?

A paraffin encapsulated in aluminium cylinders was used as the heat storage media by Padmaraju et al. for a DHW system. The comparative test results showed that the thermal energy stored in the paraffin-based PCM TES system far exceeded that stored in a sensible heat storage system of the same size of the storage tank.

What are the advantages and disadvantages of paraffin?

Besides the desired phase change temperature ranges, paraffins have the advantages of congruent phase transition, self-nucleation to avoid supercooling, non-corrosiveness, long-term chemical stability without segregation and commercial availability at reasonable costs [13, 14].

Is paraffin wax a suitable phase change material?

However, storage capacity and temperature range are the two main factors that determine the suitability of phase change materials for specific applications. Therefore, paraffin wax (PW) has been introduced as a promising PCM, especially for free cooling applications [2,3,4,5].

To utilize paraffin wax as a thermal energy storage in SWH, it is necessary to conduct research related to the thermal energy storage process for several conditions of solar radiation and the ...

The efficient utilization of solar energy technology is significantly enhanced by the application of energy storage, which plays an essential role. Nowadays, a wide variety of applications deal with energy storage. Due to the ...

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This chapter reviews the development and performance evaluation of solar thermal energy storage using paraffin-based PCMs in the built environment. Two case studies of solar-assisted radiant heating and desiccant ...

The low thermal conductivity and leakage of paraffin (PA) limit its wide application in thermal energy storage. In this study, a series of form-stable composite phase change materials (CPCMs) compo...

Paraffin wax has received considerable attention in thermal energy storage because of its good thermal physical properties, including a suitable melting temperature, high latent heat energy, negligible supercooling, ...

Introduction. Intermittent thermal energy, particularly from renewable resources such as solar energy, has entailed the need to develop reliable thermal energy storage (TES) technologies, mainly for heating and ...

Phase-change materials (PCMs) are essential modern materials for storing thermal energy in the form of sensible and latent heat, which play important roles in the efficient use of waste heat and solar energy. In the ...

The development of physical models and methods for measuring the thermal properties of natural materials suitable for the energy storage of thermal energy in the earth's ...

Moreover, PCM microcapsules still have other potential applications such as solar-to-thermal energy storage, electrical-to-thermal energy storage, and biomedicine . Zhang ...

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