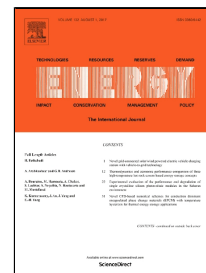


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Experimental analysis of a coiled stirred tank containing a low cost PCM emulsion as a thermal energy storage system

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Title

Experimental analysis of a coiled stirred tank containing a low cost PCM emulsion as a thermal energy storage system

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Keywords

PCM slurry; PCM emulsion; Stirred tank; Thermal Energy Storage density

Highlights

- A coiled stirred tank with a low cost PCM emulsion has been experimentally analysed
- It improves the storage efficiency, achieving the maximum storage capacity
- The overall heat transfer coefficient is 4 times higher due to the agitation
- The overall heat transfer coefficient reaches similar values to those of conventional water tanks

Abstract

This article presents the results of heat transfer coefficient and volumetric energy density measurements in an agitated tank containing a low-cost phase change material emulsion, heated by water flowing in a coil. For the stirring a three-stage impeller is placed in the central axis of a 46 l commercial tank. By measuring the temperature dependency on time and solving the transient enthalpy balance, the heat transfer coefficient between the helical coil and the agitated phase change material emulsion is determined, based on the impeller Reynolds number. The thermal energy storage

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