

# Accepted Manuscript

A review of numerical studies on solar collectors integrated with latent heat storage systems employing fins or nanoparticles

Shahab Bazri, Irfan Anjum Badruddin, Mohammad Sajad Naghavi, Mehdi Bahiraei



PII: S0960-1481(17)31134-5

DOI: [10.1016/j.renene.2017.11.030](https://doi.org/10.1016/j.renene.2017.11.030)

Reference: RENE 9432

To appear in: *Renewable Energy*

Received Date: 29 July 2017

Revised Date: 24 October 2017

Accepted Date: 12 November 2017

Please cite this article as: Bazri S, Badruddin IA, Naghavi MS, Bahiraei M, A review of numerical studies on solar collectors integrated with latent heat storage systems employing fins or nanoparticles, *Renewable Energy* (2017), doi: 10.1016/j.renene.2017.11.030.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# A review of numerical studies on solar collectors integrated with latent heat storage systems employing fins or nanoparticles

Shahab Bazri<sup>a,b,\*</sup>, Irfan Anjum Badruddin<sup>c</sup>, Mohammad Sajad Naghavi<sup>a</sup>, Mehdi Bahiraei<sup>d</sup>

<sup>a</sup> Department of Mechanical Engineering, Faculty of Engineering, University of Malaya, Kuala Lumpur 50630, Malaysia

<sup>b</sup> Young Researchers and Elite Club, Islamic Azad University, Mashhad Branch, Mashhad, Iran

<sup>c</sup> Department of Mechanical Engineering, College of Engineering, King Khalid University, PO Box 394, Abha 61421. Kingdom of Saudi Arabia

<sup>d</sup> Department of Mechanical Engineering, Kermanshah University of Technology, Kermanshah, Iran

\*Corresponding author Email/Phone number: Shahab.bazri@gmail.com / +60187930299

## Abstract

As far as there is concern with the supply and demand of energy, thermal energy storage becomes critical for the efficiency enhancement of all solar thermal energy systems. On the other hand, latent heat storage has been located in the middle of attractions by different applications because of its high energy capacity, specifically without changing in the temperature. The exact analysis of problems that deal with solar thermal collectors is not easy due to their non-linear nature; therefore, numerical solutions should be employed. In the current paper, it is tried to review the most recent numerical studies on solar thermal collectors operated with Phase Change Materials (PCMs) by considering the effects of adding solid nanoparticles and applying different fins as appropriate techniques for energy efficiency improvement. The published articles show that using nanoparticles and fins along with PCMs affect the performance of solar collectors significantly. In addition, challenges and directions for future research in this area are presented and discussed. Regarding to the new generation of solar collectors, which is called as fourth generation, use of heat pipes integrated with nano-PCMs is an excellent idea for future work.

## Keywords

Download English Version:

<https://daneshyari.com/en/article/6765128>

Download Persian Version:

<https://daneshyari.com/article/6765128>

[Daneshyari.com](https://daneshyari.com)