

## عنوان مقاله:

Experimental and Analytical Study on Enhancing the Efficiency of the Photovoltaic Panels by Using the Polyethylene-Glycol 600 (PEG 600) as a Phase Change Material

## محل انتشار:

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## خلاصه مقاله:

The electricity generation from renewable sources is growing rapidly. The use of photovoltaic panels is one of the most popular renewable power generation methods that is available in most parts of the world. One of the problems facing to this industry is increasing the temperature of the panels during the hot days of the year; which reduces their output power. The use of phase change materials (PCMs) is a way to prevent the rapid rise of the temperature of the panels. In this paper, polyethylene glycol 600 (PEG 600) is used behind the panel as a PCM. This material, absorbs a portion of the panel's heat and causes to lower the temperature of the panel. In order to enhance the heat absorbed by the PEG600, a number of fins are also mounted on the back of the panel, and the results are compared with the non-fin state. The results show that at the beginning 150 minutes from the start of the experiment, the temperature difference between panel with both PCM and fin compared with conventional panel, is between 18 C and 34.1 C. Furthermore the maximum efficiency difference between the panel with both PCM and fin, with conventional panel is 4.65% and for the panel with PCM and non-fin, with conventional panel is 2.45%. Finally, the comparison of both experimental measurement and analytical calculation were performed.

## کلمات کلیدی:

PCM, polyethylene-glycol 600, PVT, Photovoltaic, Efficiency

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