

## عنوان مقاله:

Performance Assessment of Parabolic Trough Collector Receiver with  $Al_2O_3$  Nanofluid

## محل انتشار:

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## خلاصه مقاله:

This paper discusses the experimental and theoretical performance of a parabolic trough receiver using a nanofluid. The main aim of this work is to analyze the performance enhancement of the parabolic trough collector system. The thermal model is developed using Engineering Equation Solver (EES). Experimental analysis was done with a water volume flow rate of 10 L/min and water inlet temperature range from 0 to 45 OC, also the volume fraction of  $Al_2O_3$  nanoparticle varied from 1% to 5%. Experimental analysis conducted using  $Al_2O_3$  nanoparticle mixed with water and used as heat transfer fluid in solar parabolic trough collector. Results compared and observed that the model has very good acceptance with the experimental results. It is observed that the thermal efficiency of the collector increased by 2 to 4% and receiver heat loss decreased from 0.82% to 2.72%. The receiver water temperature increased by 15% for the range of  $Al_2O_3$  nanoparticle volume fraction. This work was carried out to investigate the use of renewable energy for water heating applications on rural farms in India. Small-sized PTC is simple in construction, economical, and does not require special skills to operate. However, considering the space requirement it would be better to investigate the method to improve the performance of PTC without changing the dimensions. One way to improve the performance is with the use of nanofluids. This work's main finding is that the Nanoparticle with a volume fraction of 4 will improve the performance. It was observed that the temperature of the water was improved by 15% and the thermal efficiency was increased by 4%.

## کلمات کلیدی:

Parabolic Trough Collector, nanofluid, Heat Transfer, Thermal Analysis

## لینک ثابت مقاله در پایگاه سیویلیکا:

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