

## عنوان مقاله:

Thermal Analysis of a Parabolic Dish Concentrating Photovoltaic/Thermal (CPVT) System in Shiraz

## محل انتشار:

ششمین کنفرانس سالیانه انرژی پاک (سال: 1397)

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## خلاصه مقاله:

In this paper, the thermal performance of a Concentrating Photovoltaic/Thermal (CPVT) system under Shiraz climate condition has been investigated. The collector is based on an integration of a parabolic dish solar collector and triple-junction solar cells. The CPVT system allows simultaneous generation of electrical and thermal energy through solar radiation. The CPVT system includes a parabolic dish and a flat receiver. Also, the system is equipped with a two-axis tracking system. The bottom surface of the receiver is equipped with triple silicon cells, while its top surface is insulated. In order to analyze the performance of the CPVT collector, a mathematical model was implemented. This model is based on a one-dimensional energy balance in control volume of the system. The simulation model allows accurate calculation of the temperature of the main components of the system (PV cell, heat exchanger and outlet fluid) and the electrical and thermal efficiencies. The input parameters of the model include all climatic conditions (temperature, insolation, wind velocity, etc.) and geometric/material parameters of the system (mass flow rate, concentration ratio). This study also included sensitivity analysis to investigate the imposes of changing input variables on temperatures and both electrical and thermal performance. The results showed that electrical and thermal efficiencies are in the range of 0.23-0.28 and 0.63-0.67 respectively when the mass flow rate changes from 0.02 to 0.1 kg/s and concentration ratio is 500.

## کلمات کلیدی:

CPVT, MJPV, Solar Energy, Parabolic Dish

## لینک ثابت مقاله در پایگاه سیویلیکا:

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