عنوان مقاله:

A PVT collector in combination with booster diffuse reflectors and an array of transparent vacuum tubes

محل انتشار:

پنجمین کنفرانس بین المللی پژوهش های کابردی در مهندسی برق مکانیک و مکاترونیک (سال: 1397)

تعداد صفحات اصل مقاله: 15

نویسنده:

Ehsan Seyfali - *Technical department and facilities, Bahar Dalahoo Dairy Co. (Manizan), Islam Abad Gharb, Kermanshah, Iran*

خلاصه مقاله:

PV-Thermal (PVT) collectors are among the most fascinating areas of research and development in recent years. The reason for the interest can be attributed to the cost reduction they bring about and the potential they display for theس efficiency improvement. In the present study, a new approach to PVT collectors design, based on sunlight filtration concept, is proposed and investigated. The proposed PVT collector makes use of an array of transparent water-filled vacuum tubes placed before a photovoltaic solar panel. The water in the transparent vacuum tubes absorbs the infrared radiation of the sunlight; as a result the temperature of the water itself increases preventing a rise in the solar panel temperature, leaving the visible part almost unaffected. This allows a good PV efficiency and heat production. Based on this concept, a PVT panel was assembled and experimentally studied. The test results for the PVT collector showed an overall efficiency of 42.52%. In addition, the average temperature of the solar panel in the PVT collector obtained was around 10 below the average temperature of the PV-alone system.

کلمات کلیدی:

Hybrid solar system, Solar water heater, Photovoltaic/thermal, sunlight filtration