

ABSTRACT

Nocturnal cooling is an alternative energy utilization derived from night stratosphere radiation. The nocturnal cooling system works passively without any other assistive devices and it can be seen that there is a difference between the temperature in the system and the environment. In this study will be designed an isolated system with the top using a glass of 45 x 45 cm which has a thickness of 3 mm and uses a stainless steel plate and aluminum of 40 x 40 cm which has a thickness of 2 mm black as the object of receiving radiation. On the inside there is a fluid as a medium to be cooled and as a measuring instrument using the temperature sensor DS18B20. Tests are carried out at night at 08:00 PM to 05:00 AM. The results of the study showed that there was a nocturnal cooling phenomenon. In both systems, there was a difference in the difference in temperature reduction, in stainless steel decreased by 3.25 ° C and in systems using aluminum decreased by 3 ° C. The decrease in the system using stainless steel has a greater temperature decrease than aluminum, because stainless steel has an emissivity value of 0.98 greater than aluminum which has an emissivity value of 0.82. there is a system test depending on actual conditions such as cloudy and bright. In cloudy conditions the temperature difference of the two systems with the environment has a small difference, inversely proportional to the clearly conditions. The largest average temperature drop occurred between the hours of 11:30 to 12:30 PM.

Keywords : *Nocturnal cooling, Stratosphere, Radiation, emissivity*