

Experimental study of an inverted absorber solar still

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Received 2 March 2009; Accepted in revised form 27 December 2009

ABSTRACT

In this communication, an experiment based study of an inverted absorber solar still (IASS) conducted in Muscat, Oman is presented. An IASS is an improved design of a single slope solar still with a curved reflector under the basin. This arrangement helps in more heating of the basin of a solar still from both sides (i.e. top and bottom surfaces) directly and indirectly. The reflector under the basin adds additional heat to increase temperatures of the basin, water and condensing glass cover than that of a conventional single slope solar still. Experimental results show that the productivity of an inverted absorber solar still is more than 3.5 l/m² in duration of 12 h, i.e. 7:00 AM–7:00 PM. It is also found that IASS is not capable of holding thermal energy for long duration after 16:00. The thermal storage is lost to ambient through incased air under the basin when the amount of reflected solar radiation reduces. Hence, it is recommended to have an insulation layer under the basin to utilize thermal storage occurred during the day for the evaporation to get more yield per day.

Keywords: Solar distillation; Inverted absorber solar still; Thermal performance; Productivity

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