Optimum inclination of still and bottom reflector for tilted wick solar still with flat plate bottom reflector

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ABSTRACT

In this report we present a theoretical analysis of a tilted wick solar still with a flat plate bottom reflector extending from the lower edge of the still. We theoretically predicted the daily amount of distillate produced by the still, and determined the optimum inclination of both the still and the reflector throughout the year at 30°N latitude, both of which vary considerably from month to month and is slightly affected by the ratio of reflector length to still length. An increase in the daily amount of distillate produced by the still in comparison to a conventional tilted wick solar still would average about 21, 28 and 33% throughout the year by using a flat plate bottom reflector, and adjusting the inclination of both the still and the reflector to a proper angle for each month when the ratio of the reflector length to still length is 0.5, 1.0 and 2.0, respectively.

Keywords: Solar desalination; Solar distillation; Solar still; Tilted wick; Bottom reflector; Mirror