*Desalination and Water Treatment*
www.deswater.com

doi:10.5004/dwt.2017.20647

72 (2017) 100–111
April

# Evaluating thermal performance of a basin type modified active solar still

Sandeep[a,*], Sudhir Kumar[b], Vijay Kumar Dwivedi[c]

[a]*KIET, NIT Kurukshetra,Ghaziabad, UP, India, Tel. +91 8266924441, email: sandeep.chhabra@kiet.edu*
[b]*Department of Mechanical Engineering, NIT Kurukshetra, Haryana, India, email: mail2sudhir@rediffmail.com*
[c]*Galgotia College of Engineering &Technology, Gr. Noida, U.P., India, email: vkdwivedi94@gmail.com*

**ABSTRACT**

In this paper, an attempt has been made to compare the thermal performance of a modified solar still with that of a conventional single slope basin type active solar still in the summer climatic conditions. Comparison has been made on the basis of theoretical performance indicators like internal heat transfer coefficients and energy fractions. Dunkle's model has been utilized to assess internal heat transfer coefficients at different water depths. Values of various heat transfer coefficients for the modified still are observed superior to the conventional solar still. At 0.01 m water depth, daily average value of evaporative heat transfer coefficient for modified still is observed 13.9% higher than that for the conventional still. Average values of radiative coefficient and convective coefficient for modified still are also higher by 3.5% and 4.5% respectively than those of conventional still. Reliance on different heat transfer coefficients on water depth in the still is likewise analyzed. The modified still has demonstrated on an average 42.85% higher daily evaporative heat transfer coefficient at 0.01 m water depth in comparison to its value at 0.03 m depth. With the increment in water depth (from 0.01 m to 0.03 m), there is a marginal variation in convective coefficient. The energy fractions are also figured and compared. The distillate yield count utilizing thermal model has additionally been done and compared with the experimental results. Theoretical and experimental results are observed to be in close proximities.

*Keywords:* Modified still; Heat transfer coefficients; Energy fraction; Theoretical yield

*Corresponding author.