

Abstract

Considering the growing need for fresh water and also taking into account the fact that most of available water on earth exists in seas and oceans in the form of saline or non-drinkable water, desalination has been paid heed to through the history. Location of Iran, especially in its eastern or south eastern areas, has brought about abundant radiation of sun through the year which can be considered as a high potential for desalination. Hence, solar still can be a good candidate in here. But, there exist two major drawbacks i.e. the low yield of solar stills along with big spaces for desalination required. Through the present study, a design of solar still with the aim of its productivity enhancement was proposed. The fabricated solar still was an active one compared with a non-active completely the same fabricated solar still during the tests. Seven different tests each including specific changes into the system were studied and the results were compared with those of the other solar still as the control. These variations in tests included attachment of a thermosyphone solar collector (preheating), cooling the condensing cover through shading, combination of preheating and shading, attaching reflectors, side troughs, combination of all these changes and finally the combination of all except for shading. The results revealed that Shading has detrimental effects on solar still yield; Application of preheating enhanced the solar still efficiency by 24%; Attaching side troughs could increase the efficiency by 32%; The contribution of all changes, except for shading, applied was of 84% to solar still efficiency.

Key words: Solar still, Salty water, Distillation.



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