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Experimental study of simultaneous effect of evacuated tube collectors coupled with parabolic reflectors on traditional single slope solar still efficiency

- **ملخص البحث (السابع) باللغة الإنجليزية**

Enhancing the performance characteristics of solar still is considered one of the most significant factors to increase the still efficiency. This research aims to modify the single slope still to enhance efficiency and maximize freshwater productivity. For this purpose, three evacuated tube collectors have been coupled with traditional still to heat up the basin saline water. Also, a parabolic trough reflector has been combined with each evacuated tube collector to increase the amount of solar radiation received. In this work, the performance characteristics and energy analysis of the modified stills were experimentally investigated by considering the effect of traditional still unit only, traditional still unit coupled with an evacuated tube collector, and traditional still unit coupled with both evacuated tube collector and parabolic trough reflectors in combination. The results show that using both modifications simultaneously is more efficient than using each of them separately. According to the results, an increase in productivity of 82.26% when the still coupled with the evacuated tube collectors is used, and 112.57% increase when both modifications are used simultaneously. According to the cost evaluation, using simultaneous mechanisms not only enhances the solar still performance and increase efficiency but also decrease freshwater production cost.