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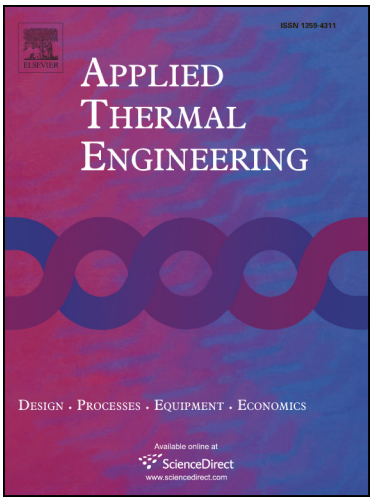

Experimental investigation of different air heating methods near to the evaporation surface in closed triangular shape unit powered by solar energy, one stage - indoor experiment -

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Experimental investigation of different air heating methods near to the evaporation surface in closed triangular shape unit powered by solar energy, one stage - indoor experiment -

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Abstract

Most of the studies that are made on the solar desalination are focusing on enhancing its productivity by changing the temperature of the solar still, using two methods: either heating water and air or cooling the walls. Each solution is affecting the other; heat increases the temperature of the cold surfaces and vice versa.

The originality of this experimental work that falls within the same field of productivity enhancement of the solar desalination is using different air heating modes (time range) next to the evaporation surface in closed triangular shape, one stage. The manipulation consists of air heating without overheating the cold surfaces; this could be possible, using the pulse heating. The setup constructed and tested through indoor experiments, in the shade, where different heat pulses are investigated, while changing the duration of the pulse.

The results show that a particular combination of the pulse duration gives an efficiency enhancement of 5% in comparison to the one without air heating. And a distillate production increase of 19%, using a minor energy investment that doesn't exceed 5%.

Keywords: `Impulse heating`, Hot air, humidification-dehumidification cycle (HDH), Desalination, Solar energy

1. INTRODUCTION

The world is urged to reduce its emission of warming gas to the three square of its actual consumption; it's a coefficient that required rational petrol consumption followed by massive changes in how we manage and how we design

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