

Numerical analysis of solar desalination using humidification–dehumidification cycle

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ABSTRACT

This paper has studied a desalination unit with humidification–dehumidification cycle which uses solar energy as its source of heating (SDHD). For thermodynamic analysis, mass and energy balance equations have been written for the humidifier, condenser and other cycle components. The resulted nonlinear equations have been solved simultaneously to study and analyze the effects of cycle parameters on the amount of desalinated water produced by the plant. Therefore the effects of brackish inlet water flow rate, its temperature, solar collector area, condenser characteristic, humidifier characteristic and inlet air conditions on the rate of fresh water production have been investigated and discussed.

Keywords: Solar desalination; Humidification–dehumidification cycle; Thermodynamic analysis; Simulation

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