

Solar Seawater Desalination Still with Seawater Preheater Using Efficient Heat Transfer Oil: Numerical Investigation and Data Verification

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Abstract : The feasibility of improving the performance of the proposed solar still unit which operated in very hot climate is investigated numerically and verified with experimental data. This solar desalination unit with proposed auxiliary device as seawater preheating system using petrol based textherm oil was used to produce pure fresh water from seawater. The effective evaporation area of basin is about 1 m^2 . The unit was tested in two main operation modes which are normal and with seawater preheating system. The results showed that, there is good agreement between the theoretical data and the experimental data; this means that the numerical model can be accurately dependable for predicting the proposed solar still performance and design parameters. The results also showed that the fresh water productivity of the solar still in the modified preheating case which is higher than normal case, leads to an increase in productivity of 42%.

Keywords : improving productivity, seawater desalination, solar stills, theoretical model

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