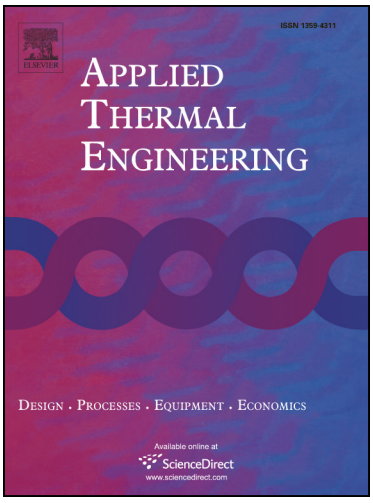
Accepted Manuscript



Steady state investigations of a commercial diffusion-absorption refrigerator: Experimental study and numerical simulations

Rami Mansouri, Mahmoud Bourouis, Ahmed Bellagi

PII: S1359-4311(16)34487-8
DOI: https://doi.org/10.1016/j.applthermaleng.2017.10.010
Reference: ATE 11208

To appear in: *Applied Thermal Engineering*

Received Date: 29 December 2016
Revised Date: 30 July 2017

Please cite this article as: R. Mansouri, M. Bourouis, A. Bellagi, Steady state investigations of a commercial diffusion-absorption refrigerator: Experimental study and numerical simulations, *Applied Thermal Engineering* (2017), doi: https://doi.org/10.1016/j.applthermaleng.2017.10.010

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Steady state investigations of a commercial diffusion-absorption refrigerator: Experimental study and numerical simulations

Rami Mansouri[a,b], **Mahmoud Bourouis**[b*], **Ahmed Bellagi**[a]

[a]U. R. Thermique & Thermodynamique des Procédés Industriels
Ecole Nationale d'Ingénieurs de Monastir, ENIM
Avenue Ibn El Jazzar, 5019 Monastir
University of Monastir – Tunisia

[b]Department of Mechanical Engineering, Universitat Rovira i Virgili,
Av. PaïsosCatalans No. 26, 43007Tarragona, Spain

[*]Corresponding author
Email: mahmoud.bourouis@urv.cat

Abstract

Experimental investigations and numerical simulations of a low capacity commercial diffusion-absorption refrigerator (DAR) in stationary mode are carried out. The tests are performed under different heat input conditions. Optimal operation of the DAR refrigerator is reached with a power supply of 46 W at a generator temperature of 167ºC, corresponding to a coefficient of performance (COP) of 0.159. Numerical simulations of the refrigerator using a model developed with the commercial flow-sheeting Aspen-Plus software are also perfomed. The computer model is validated by comparing its predictions with experimental data for three generator heat supply rates: 46W, 56W and 67W. Deviations between model predictions and experimental measurements in terms of cooling capacity and coefficient of performance are less than 1%. The proposed model could be very useful to predict the functioning of the commercial diffusion-absorption refrigerator under steady-state regime.

Keywords: diffusion-absorption refrigeration, ammonia/water/hydrogen, steady-state mode, Aspen-Plus.

Download English Version:

https://daneshyari.com/en/article/7046519

Download Persian Version:

https://daneshyari.com/article/7046519

Daneshyari.com