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# Performance analysis of a dual component evaporator-absorber of an absorption heat transformer

J. Delgado-Gonzaga[a], A. Huicochea[a], J. Torres-Merino[b], I. Canela-Sánchez[a], D. Juárez-Romero[a,*]

[a]*Centro de Investigación en Ingeniería y Ciencias Aplicadas, Universidad Autónoma del Estado de Morelos, Av. Universidad 1001, Col. Chamilpa, Cuernavaca, C. P. 62209, Morelos, México, email: javier.delgado@uaem.mx (J. Delgado-Gonzago), huico_chea@uaem.mx (A. Huicochea), justo_007@hotmail.com (I. Canela-Sánchez), Tel. (52-777) 3297984, email: djuarezr7@gmail.com (D. Juárez-Romero)*

[b]*Mezysep S.A. de C.V, 1a. Cerrada de Corcéles N° 9, Colina del Sur.,Ciudad de México C. P. 01430, email: jtorresmerino@gmail.com*

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**ABSTRACT**

In this work, the behavior of a dual component evaporator-absorber (EV-AB) applied to an absorption heat transformer (AHT) operated with LiBr-$H_2O$ is analyzed theoretically and experimentally. The purpose of this work is to obtain heat loads to improve the coefficient of performance (COP) of a thermodynamic cycle for water purification by distillation. The dual component EV-AB is composed of a chamber where processes of evaporation and absorption are carried out simultaneously. In both processes, heat transfer takes place by falling film. Internally there are two concentric vertical helical coils, which are fed by a refrigerant and an absorption mixture respectively by two independent drop distributors. The experimental results indicate that maximum amount of distilled water was 1.44 kg/h with a heat load in the absorber of 1.87 kW with a concentration of 55.24% by weight of LiBr-$H_2O$ mixture to the inlet of the absorber. Regarding the COP of the AHT, a value close to 0.50 was registered. Experimental analysis indicates that the increase in the mass flow of refrigerant towards the evaporator, improves heat loads of the EV-AB. Through a mathematical model the effect of wetting efficiency of the evaporator was estimated, also is the analysis of wetting in the absorber shows the degradations of its heat transfer.

*Keywords:* Absorption heat transformer; Evaporator-absorber component; Falling film; Heat transfer; Heat transfer intensification

*Corresponding author.

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