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Title of the Thesis: *Analysis of Vapor Absorption Refrigeration System*

Abstract

In this research work, simulation and optimization of the lithium bromide/water VAS, the solar flat plate collector (SFPC) is used to power the generator of the VAS. First of all, the thermodynamic analysis of SFPC based VAS, the COP of 0.857 was obtained at 4.1033 kW of heat supplied to the generator. It was observed that at constant COP, any increase in supply heat, increases the flow rate of vapor and cooling load. Next, the generator was analysed using Kern method and CFD, It was found the design model with smallest baffle spacing has the highest heat transfer coefficient, further, an efficient VAS is proposed by adding a steam ejector cycle, the development to the system is achieved, the COP of the established system is developed by up to 45% compared with that initial system. Furthermore analysis the effect of fin shapes on the performance of compact finned tube heat exchangers. Finally, the performance of combined steam ejector single effect LiBr/H_2O VAS was evaluated. The main contribution of this study lies in optimizing the system and in establishing the fact that the thermodynamic cycle such as VAS can be effectively optimized by using the unconventional techniques, employing theoretical formulations using MATLAB code, Kern Method and CFD.