

SOLAR ABSORPTION AIR CONDITIONING

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ABSTRAK

Pada masa kini, kebanyakan mesin hawa pendingin menggunakan teknologi pemanipulan di bidang pejabat dan rumah. Tetapi, teknologi ini memerlukan banyak tenaga elektrik untuk berfungsi, Selain itu, C.F.C. yang digunakan akan membocorkan lapisan ozon. Oleh itu, ahli sains mementingkan pemajuan teknologi penerapan mesin hawa dingin (Solar Absorption air conditioning) dengan tenaga solar. Dalam projek ini, mesin hawa pendingin dengan tenaga solar direka dan dikajikan. Semua persamaan matematik yang diperlukan akan dicari dan diatirkan. Selepas itu, semua persamaan disusunaturkan ke dalam MATLAB untuk menghasilkan 'simulation'. Dalam 'simulation', COP bagi mesin dicarikan dalam keadaan satu komponen mempunyai suhu yang berbeza, komponen lain mempunyai suhu yang tetap. Selepas itu, keputusan diambil dan dikaji. "Exergy" juga diambil dan dikajikan.

ABSTRACT

The compression refrigerator system is one of the most conventional cooling systems for both offices and residential usage. However, this system leads to the high-energy consumption and the material it uses i.e. CFC, which believed, could impoverished the layer of ozone. Therefore, a study of a solar powered absorption system could be interesting. This project is aimed to investigate the process of the solar absorption air conditioning with LiBr-H₂O by simple computer modeling using Matlab for education purpose. The conceptual modeling was done to determine energy, concentration of solution and steam, mass statement of each cycle. In the simulation process, the variation of coefficient of performance solar absorption air conditioning was determined in different temperature of one component with other components maintains as constant. The relationship between the COPs and temperature of components was analyzed and studied. The exergy study also had been conducted in this final year project study.

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NOMENCLATURE

COP	–	Coefficient of Performance
E _{th}	–	Thermodynamic Efficiency
E _{ex}	–	Exergetic Efficiency
I _{ex}	–	Exergy Index
T _a	–	Temperature of absorber
T _c	–	Temperature of condenser
T _e	–	Temperature of evaporator
T _g	–	Temperature of generator
Q _a	–	Heat of absorber
Q _c	–	Heat of condenser
Q _e	–	Heat of evaporator
Q _g	–	Heat of generator

CHAPTER 1

INTRODUCTION

1.1 SOLAR ABSORPTION AIR CONDITIONING

Air conditioning is the electric device, which supply the cooling effect to the environment. The common type technology for building air-conditioning system is the electric vapor compression cooling. However, this technology leads to the higher energy consumption. So, the solar absorption air conditioning is an alternative.

Using solar energy systems to provide heat and electricity for the daily usage are the common activities. It is because solar energy system do not emit harmful pollutants and can achieve the target of energy saving. Can solar energy be related to the cooling system? The answer is YES. Solar can be used as the power source for absorption air-conditioning which just needs less energy for operation.

Figure 1.1 shows the schematic diagram of a typical absorption air conditioning and table 1.1 describes the components and their function.