

THE EVALUATION OF FLAT PLATE SOLAR COOKER

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ABSTRACT

In Malaysia, the utilization of solar energy is still in early stage. The development and utilization of solar energy at our country is not rapid as other country. At present, Malaysia have developed only several devices that used solar energy such as solar water heating system, flat plate solar collector and solar panel. However, at this moment our country still does not have developed any types of solar cooker. Therefore, in order to know whether solar cooker can be performed well in this country, it is decided to conduct a research on flat plate solar cooker. The main objective of this research is to design and construct a simple flat plate solar cooker and also to evaluate and compare the effectiveness of the cooker using copper and aluminum plate. From the result, it has shown that the performance of solar cooker for copper type is better than the aluminum type. Copper type achieves higher temperature than aluminum type where the maximum temperature of copper is 100°C and for aluminum is 91°C. The copper type is more effective than the aluminum type because the thermal conductivity of the copper is higher than aluminum.

CHAPTER 1

INTRODUCTION

1. Introduction

Solar energy is the one of the most permanent source of renewable energy. Solar energy is free and the most important things are, it is none polluting and therefore helps in lessening the greenhouse effect. The amount of solar energy intercepted by the planet earth is 170 trillion kW .30% of this amount is reflected to space,47% is converted to low temperature heat and reradiated to space, and 23% powers the evoporation/precipitation cycle of the biosphere. Less than 0.5% is presented in the kinetic energy of the wind and waves and in photosynthesis storage in plants. In Malaysia, the climatic conditions are favorable for the development of solar energy due to the abundant sunshine throughout the year. The solar radiation in Malaysia ranges from 6.5 kwh/m² in the months of January and drops lower to 6.0 kwh/m² in the months of August (Mariyappan, 2000).

Solar energy have been used for thousands years such as for dry clothes and food. Before 1970, some research and development was carried out in a few countries to exploit solar energy more efficiently and effectively, but it just for academic purposed. After 1970, when the prices of oil in this world increase, many countries began to formulate extensive research and development programmed to exploit solar energy. From the researched and development programmed there are many product