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**TITLE: PHOTODEGRADATION OF NATURAL
DYE FOR SOLAR APPLICATION**

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ABSTRACT

Due to its availability, purity, and diversity, solar energy is one of the most potential alternative energy sources. It is also among the absolute cheapest sources of energy. Some of the popular varieties of solar cells used in the process of gathering solar energy include organic dye solar cells, hybrid solar cells, non-crystal, multiple crystal, and single crystal silicon solar cells. Natural dyes are preferred over other colourants because they are less hazardous to the environment, more hygienic, easier to apply, and last longer. Any catalytic process that uses light is referred to as a photocatalytic process, and degradation of a particle that is accomplished using a catalyst while being affected by light is referred to as a photocatalytic degradation. The study used bougainvillea flowers because they were simple to find and collect. This research was to investigate the potential of natural dye being used in solar energy applications, observe the colour variations of the natural dye following exposure to UV light during the process of photodegradation for a week and to study the potential of metal oxide to help the natural dye degradation process and for applications involving solar energy. The conductivity of natural dye was increase after doped with MgO and exposed to sunlight from 7.40 to 12.65. The colour of natural dye also changed after exposed to solar which was from dark brown to light brown. It was discovered that one alternate way for solar application can be the photodegradation of natural dye. This can take the place of synthetic dye, which pollutes the environment by contaminating the water. The colour of natural dye changed after being exposed to sunlight with the help of magnesium oxide, which made this study successful.

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CHAPTER ONE

BACKGROUND

1.1 Introduction

Any energy source that is created from natural resources, such as wind, sun, geothermal, or hydropower, is considered to be a renewable energy source. Because of the rapid depletion of fossil fuels and the growing need for energy supplies, the research for clean and renewable energy sources has become one of the most difficult tasks facing our society. Solar energy is one of the most promising forms of alternative energy because of its exhaust, purity, and flexible application. It is also one of the cheapest forms of energy. Solar cells are one of the probable possibilities for finding a solution to the current energy issue that the world is facing. Organic dye solar cells, hybrid solar cells, non-crystal, multiple crystal, and single crystal silicon solar cells are some of the common types of solar cells that are used in the process of solar power harvesting. Solar cells can also be categorised into different types based on the composition of their material, such as single crystal silicon solar cells. In Malaysia, solar energy along with natural dyes is not being utilised to its full potential. This will help in the creation of hybrid solar cells that are designed to appeal for the climatic conditions of Malaysia (Kamarulzaman et al., 2018).

Natural dyes are highly recommended to other colourants because they are less harmful to the environment, more hygienic, simpler to apply, and more durable. Because natural dyes have a coloration quality that is comparable to that of synthetic dyes, their substitution is a possibility before the introduction of synthetic dyes. Pigment extracted from leaves, fruits, seeds, wood, and roots was used in the dying process for textiles and in the production of paint for use in art and craft. Natural dyes and colourants produced from plants are thought to be risk-free since they are not poisonous, do not cause cancer, and biodegrade quickly in the natural environment. These days, natural dyes are in demand not only in the textile business but also in the cosmetics industry, the leather industry, the food industry, and the pharmaceutical industry (Naik & Shireesha V, 2019).

Most organic compounds can have their physical and chemical properties changed when exposed to energy in the form of light. Inks, foods, pharmaceuticals,