

**TRANSPORT PHENOMENON OF PHOTO
INJECTED ELECTRONS IN DYE SENSITIZED
SOLAR CELLS.**

BY:

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**THIS PROJECT REPORT IS SUBMITTED AS
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DECLARATION

This project report is my own work and has not been presented for a degree in any other university.

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ABSTRACT

Transport phenomenon of photo injected electrons in Dye Sensitized Solar Cells (DSSC) has been studied and reported whereby the movement of charge carriers has been assumed to be predominantly by diffusion. A theoretical model was developed to study the effects of temperature on solar cell parameters. Based on the research paper by Koide et al.(2006) which clearly shows that the conventional solar cells equations are also applicable to Dye Sensitized Solar Cells (DSSC), explicit and implicit equations were developed that relate Open Circuit Voltage, V_{oc} , and Short Circuit Current, I_{sc} , respectively with the temperature, T , within the range $25^{\circ} (298K) \leq T \leq 55^{\circ} (328K)$. Optoelectronic properties such as Efficiency, Fill Factor (FF) and Maximum Power Output ($P_{max.}$) were found to depend on the V_{oc} .

Matlab computer software was used for simulation of the equations that were developed. The results obtained show curves that were similar to those obtained experimentally. The characteristic of the curves obtained show that V_{oc} decreases with the increase in temperature while I_{sc} increases slightly with the increase in temperature.