

**EFFECT OF NANO-SIZED SILICON DIOXIDE (SiO<sub>2</sub>) ON THE  
ELECTRICAL PROPERTIES OF CHITOSAN BASED POLYMER  
ELECTROLYTE**

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**Final Year Project Report Submitted in  
Partial Fulfilment of the Requirements for the  
Degree of Bachelor of Science (Hons.) Physics  
In Faculty Of Applied Sciences  
Universiti Teknologi MARA**

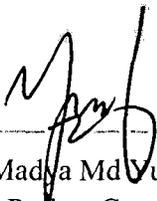
**JULY 2012**

This Final Year Project Report entitled “**Effect of Nano-Sized Silicon Dioxide (SiO<sub>2</sub>) on the Electrical Properties of Chitosan Based Polymer Electrolyte**” was submitted by Arifah Hussain, in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Physics, in the faculty of Applied Science, and was approved by



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## ACKNOWLEDGEMENTS

Bismillah Hirrahman Nirrahim,

All praises and thanks to Him, the Almighty and the Lord of the Universe. Without whose His Bounty and Mercy, the author would not have complete this final year project. Alhamdulillah, with His blessed I finally managed to complete this project and its report within the period of given time although I faced many problems during the process of completing this project.

I would like to thank my supervisor, Dr. Tan Winie for her guidance, help and continuous encouragement in the duration of completing this final year project. With her guidance, this project have been done successfully and the report can be documented.

Last but not least, this final year project report owes it success to the helpful and supportive senior for the guidance, to all my friends and lecturers. Also a big thanks to lab assistant and technician for their contributions and personnel help which is truly appreciated and will always be remembered.

Arifah Hussain.

## ABSTRACT

### EFFECT OF NANO-SIZED SILICON DIOXIDE (SiO<sub>2</sub>) ON THE ELECTRICAL PROPERTIES OF CHITOSAN-BASED POLYMER ELECTROLYTE

Polymer electrolyte based on lithium triflate, LiCF<sub>3</sub>SO<sub>3</sub>, and high molecular weight of chitosan was prepared using solution casting technique. The ionic conductivity for chitosan-LiCF<sub>3</sub>SO<sub>3</sub>-SiO<sub>2</sub> samples were tested over wide range of frequency and temperatures between 303K and 343K. The conductivity is due to the mobile ions from the salt and pathways created during the reaction. The conductivity was calculated by using the bulk resistance, R<sub>b</sub> obtained from the Cole-Cole plot through impedance spectroscopy which illustrating the variation of the real and imaginary impedance. Dielectric data were analyzed by using the dielectric constant, ε<sub>r</sub>, dielectric loss, ε<sub>i</sub>, real electric moduli, M<sub>r</sub>, tangent loss, tan δ, relaxation time and activation energy. The temperature dependence conductivity data obeys Arrhenius relationship.

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