OPTIMIZATION OF PREPARATION PARAMETERS OF POROUS SILICON NANOSTRUCTURE
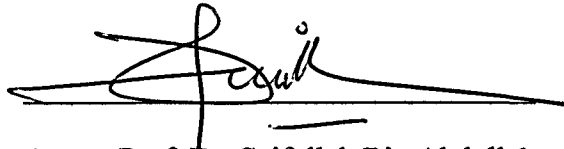
HARTINI BINTI AHAMAD RAFAIE

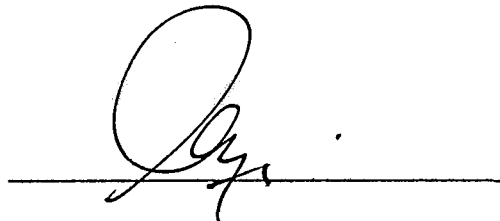**BACHELOR OF SCIENCE (Hons) PHYSICS**
FACULTY OF APPLIED SCIENCES
UNIVERSITI TEKNOLOGI MARA

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This Final Year Project Report entitled " **Optimization of Preparation Parameters of Porous Silicon Nanostructure**" was submitted by Hartini Binti Ahmad Rafaie, in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons) Physics, in the Faculty of Applied Sciences, and was approved by
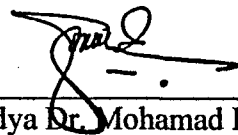
Assoc. Prof. Dr. Saifollah Bin Abdullah
Supervisor
Faculty of Applied Sciences
Universiti Teknologi MARA

Encik Khairunnadim Bin Ahmad Sekak
Co-Supervisor
Faculty of Applied Sciences
Universiti Teknologi MARA

Dr Muhd Zu Azhan Yahya
Head of Programme
B.Sc.(Hons) Physics
Universiti Teknologi Mara

Prof. Madya Dr. Mohamad Kamal Hj. Harun
Dean
Faculty of Applied Sciences
Universiti Teknologi Mara

Date: **2 5 MAY 2006**

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ABSTRACT

OPTIMIZATION OF PREPARATION PARAMETERS OF POROUS SILICON NANOSTRUCTURE

Porous Silicon (PSi) is emerging materials in nanotechnology applications as an excellent material for nano-optical and nano-devices. This is largely due to the ease fabrication and freedom of design allows. However the properties of PSi are much depends on the preparation parameters. In this work we study the effects of electrodes distance and etching time on PSi properties. Porous Silicon has been prepared by electrochemical etching. The p-type [100] Silicon Wafer with surface resistivity of 1-10 ohm cm $^{-1}$ was used as a substrate while ethanoic hydrolfluoric (HF) solution at 1:1 atio used as an electrolyte. The samples were prepared under various etching time and electrode distance. The Photoluminescence (PL) spectrum used to characterize optical properties, while Scanning Electron Microscope (SEM) is to study the surface structure of the samples. The result shows PL intensity is increase while electrode distance is decrease and longer etching time. The SEM micrograph shows more surface cracking while electrode distance is decrease. The possibilities of the mechanism also explained in this study.