

**OPTIMIZED FABRICATION OF TiO₂
NANOTUBE ARRAYS BY ANODIZATION FOR
SOLAR CELL APPLICATIONS**

NYEIN NYEIN

UNIVERSITI SAINS MALAYSIA

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**OPTIMIZED FABRICATION OF TiO₂ NANOTUBE ARRAYS BY
ANODIZATION FOR SOLAR CELL APPLICATIONS**

by

NYEIN NYEIN

**Thesis submitted in fulfillment of the
requirements for the degree
of Doctor of Philosophy**

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DECLARATION

I hereby declare that I have conducted, completed the research work and written the dissertation entitles “Optimized Fabrication of TiO₂ Nanotube Arrays by Anodization for Solar Cell Applications”. I also declare that it has not been previously submitted for the award of any degree or diploma or other similar title of this for any other examining body or University.

Name of Student: Nyein Nyein

Signature:

Date: 19th, April, 2017

Witnessed by

Supervisor: Assoc. Prof. Dr. Zainovia Lockman

Signature:

Date: 19th, April, 2017

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LIST OF SYMBOLS

%	Percentage
<	Less than
>	Greater than
°	Degree
°C	Degree Celsius
ml	Mililitre
wt%	Weight percentage
V	Voltage
g	Gram
h	Hour
s	Second
M	Molarity
$h\nu$	Photon energy
2θ	Diffraction angle
Å	Angstrom (10^{-10} m)
nm	Nanometer (10^{-9} m)
µm	Micrometer (10^{-6} m)
β	Full-width at half-maximum (radius)
C	Capacitance
C'	Estimated capacitance
e^-	Electrons
η	Photoconversion efficiency
h^+	Holes
λ	Wavelength
α	Absorption coefficient

μ	Growth rate
θ	Bragg's angle
σ	Ionic conductivity
D	Crystallite size
S	Dye at the ground state
S*	Excited state
S ⁺	Oxidized dye
Z	Impedance
Z'	Real impedance
V ₀ ^{••}	Oxygen vacancies