

**UNIVERSITI TEKNOLOGI MARA
CAWANGAN PULAU PINANG**

**COMPARATIVE STUDY OF AC BREAKDOWN VOLTAGE
FOR PMMA:TIO₂ NANOCOMPOSITE THIN FILM
INFLUENCE OF ELECTRODE SHAPE AND
HYDROTHERMAL AGEING**

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**BACHELOR OF ENGINEERING (HONS)
ELECTRICAL AND ELECTRONIC
ENGINEERING**

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AUTHOR'S DECLARATION

I declare that the work in the thesis was carried out in accordance with the regulation of Universiti Teknologi MARA. It is original and is the results if my own, unless otherwise indicated or acknowledge as reference work.

I, hereby acknowledge that I have been supplied with the Academic Rules and Regulations, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

This research is a comparative study of AC breakdown voltage of poly(methyl methacrylate):titanium dioxide (PMMA:TiO₂) nanocomposites thin films to be used as insulation in high voltage applications. The objectives of this research is to study the AC breakdown voltage of PMMA:TiO₂ nanocomposites thin films by varying the hydrothermal ageing (annealing) temperature from 60°C, 90°C, 120°C, 150°C and 180°C. Moreover, different type of electrodes shape was used to observed the insulation properties of PMMA:TiO₂ thin films. Spin coating technique was used to make the PMMA:TiO₂ nanocomposites thin film The electrical properties was measured using high voltage test while the structural properties was measured using structural profiler and atomic force microscopy (AFM). As a result, the thickness and the surface roughness of the thin film are affected by the annealing temperature. Thus, the electrical performance of PMMA:TiO₂ nanocomposites thin film as an insulation in high voltage also affected For the shape of electrodes, the surface area of an electrode will affect the conducted surface area between PMMA:TiO₂ nanocomposites thin film and the electrode.