



UNIVERSITI TEKNOLOGI MARA

**STUDY ON ZINC DOPED WITH ALUMINIUM OXIDE THIN
FILM TOWARDS STRUCTURAL AND OPTICAL**

MUHAMMAD FATHI FIKRI BIN BURHAN

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ABSTRACT

This project is about Zinc oxide, ZnO doped with Aluminium Oxide, Al₂O₃ were fabricated on substrates by depositing the thin layer. The thin film is prepared by using the spin-coating technique. The Aluminium oxide were varies by atomic mass of 2%, 4%, 6% and 8%. The aiming for this project is to prepare ZnO doped with Al₂O₃ thin film for structural and optical characterization. As for the characterization, the dopant solution between ZnO and Al₂O₃ for optical and structural properties. As for the result, these two characterization were observed for the analysis. The project is to check the changes in chacterization due to the result from these doping process. As for the result shows the changes for every doped atomic percentage between ZnO and Al₂O₃.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Zinc oxide (ZnO) is a n-type transparent semiconductor material which has wide band gap of 3.3eV at 300K and Young's modulus of 150 – 240 GPa (for thin films) [1]. It is paying considerations for some applications, for example, gas sensors, piezoelectric transducers, and side-entryway transistors. Based on fabrication techniques that usually used in laboratory on shaping ZnO film are Radio Frequency magnetron sputtering, substance vapor testimony, beat laser statement. micrometers, it is outlandish because of low statement rate. Additionally, ZnO has a few highlights as takes after. The nearness of aluminum in ZnO can be essentially enhances its electrical conductance.

Zinc oxide comes to fruition in two essential structures which is hexagonal wurtzite and cubic zinblende one. This wurtzite structure is the most enduring at encompassing conditions and in this way by and large ordinary compare to zinblende while zinblende structure can be offset by creating ZnO on substrates with cubic cross area structure. In the two cases, the zinc and oxide centers are tetrahedral known as the most trademark geometry for Zn(II). ZnO converts to the rocksalt topic at decently high weights around 10 GPa. In such circumstances, techniques for designing ZnO at smaller scale/nano scale is as yet a critical prerequisite for miniaturized scale/nano ZnO gadget manufacture in such circumstances, techniques for patterning ZnO at smaller scale/nano is still an urgent