DEPOSITION OF ZINC OXIDE ON P-TYPE SILICON WAFERS

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ABSTRACT

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The samples of p-type silicon wafers were cleaned and deposited by aluminium as a contact. After deposit of aluminium, wax was placing around the samples as a shield. Zinc oxide was prepared via sol-gel method. Initially, the starting materials, zinc nitrate were weighed out. Then, the materials were dissolved in the ethanol by using magnetic stirrer. Next, zinc oxide was deposited onto p-type silicon wafers by using spin coater to obtain uniform surface. The samples was anneal at different temperatures which were at 270°C, 280°C, 290°C and 300°C to get the purity. Aluminium was deposited once again after annealing process. Finally, all the samples were characterized using scanning electron microscope (SEM), energy dispersive x-ray spectroscopy (EDX) and I-V characteristics. From the result scanning electron microscope (SEM) and energy dispersive x-ray dispersive (EDX) results show the uniform surface of zinc oxide on the samples. I-V characteristic result shows that the samples functioning as a resistor due to the I-V graph which current is directly proportional to the voltage and thus the zinc oxide is p-type semiconductor.

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CHAPTER 1

INTRODUCTION

1.1 Background of study

Zinc oxide thin films have been extensively investigated in the last decade. Zinc oxide (ZnO) is an organic compound and it is often called a II-IV semiconductor because zinc and oxygen due to the 2nd and 6th groups of the periodic table. Zinc oxide is a wide direct band gap energy which is three and above electron volts (>3eV) semiconductor at room temperature and it is n-type conductivity (O.Mandelung,2004). This semiconductor has another several favorable properties such as good transparency, high electron mobility and strong room temperature luminescence. Therefore, it is widely used as a transparent conducting window layer in thin film solar cells on copper indium and gallium arsenide as well as gas sensors, ultrasonic oscillators and transducer (M.L Olvera,1993).