THE STUDY OF STRUCTURAL AND ELECTRICAL PROPERTIES OF ZnO NANOSTRUCTURES LAYER COATED ON MILD STEEL SURFACE

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ABSTRACT

THE STUDY OF STRUCTURAL AND ELECTRICAL PROPERTIES OF ZnO NANOSTRUCTURES LAYER COATED ON MILD STEEL SURFACE

Zinc coated mild steel is usually applied to protect the surface from corrosion. In this study, Zinc Oxide nanostructure is applied on the surface of mild steel. The Zinc Oxide nanostructure was synthesized using sol-gel method. After the solution was prepared, it is coated on mild steel surface using spin coater at 2000 rpm and anneal at different temperature to see the effect of Zinc Oxide growth. After the sample has been coated it will characterize using FESEM, AFM, XRD and Linear Polarization. For surface morphology the figure showed different structural size and pattern at higher anneal temperature. The AFM used to investigate the surface topography and measure the average roughness of coated sample. For sample at 500°C the surface roughness is higher about 41.88 nm. XRD used to determine the composition of ZnO on mild steel surface. Lastly, the linear polarization resistance used to see the performance of coated sample. The lower corrosion rate obtained for sample that anneal at 300°C.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

Nowadays, people talked about the benefit of using nanotechnology in our life. A lot of product in the market has already using this technology because of its unique properties. Nanotechnology, the manipulation of matter at the molecular scale, is bringing new materials and new possibilities to industries as diverse as electronics, medicine, energy and aeronautics (George Elvin, 2007). The wide range of application make this technology become popular and many research currently done to find a new nanomaterial. This powerful technology will contribute to economic growth for the country.

One of the nanomaterials that have various application and great potential is nanosized ZnO. It can be used in cosmetics, medical, coating, electrical and optical devices. ZnO nanostructures were synthesized in the form of nanorods, nanowires, nanotubes, nanobelts, nanocombs, and nanoflowers. The properties of nanomaterial are changing when the size of the material is reduce compared to bulk material.