COMPARATIVE STUDIES OF AMINO ACID AND SOYBEAN AS CORROSION INHIBITORS OF STEEL IN HYDROCHLORIC ACID

NURUL IZZATI BINTI ROSLI

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ABSTRACT

COMPARATIVE STUDIES OF AMINO ACID AND SOYBEAN AS CORROSION INHIBITORS OF STEEL IN HYDROCHLORIC ACID

Amino Acid and Soybean potentials as organic corrosion inhibitors were examined through a few tests conducted. Sample characterization is performed to analyze compounds contained in soybean and glycine by using FTIR and UV-VIS. From FTIR spectrum obtained both soybean and glycine has N-H and C-N bond indicating the presence of nitrogen as a compound that reduces corrosion rate. UV-Visible spectrum runs show that both soybean and glycine are spotted in the range of 260nm. The potential of amino acid and soybean as corrosion inhibitors are measured through immersion test and potentiodynamic polarization test. Immersion test were performed with and without the presence of corrosion inhibitors for 3 days. Corrosion rate and inhibition efficiency of soybean and glycine were measured in this test. From the immersion test conducted, we found out that both soybean and glycine work best at 1.5g/L in 0.5M HCl medium. The purpose of potentiodynamic polarization test is to analyze type of inhibitions of soybean and glycine. As the results obtained, both soybean and glycine show anodic inhibition. Based on microstructure result, pitting corrosion is observed on the metal sample. The highest inhibitions recorded by soybean is 72.75% whereas the highest inhibition by glycine is only 69.10%. This shows that soybean has better inhibition compared to glycine.

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

Utilization of metal-based materials are the norm in industrialized nations. Steel is exploited in a wide range of applications, including residential and commercial constructions, bridges and trusses, automobiles, passenger trains, railroad carriages, ships, piers, docks, bulkheads, pipelines and storage tanks, and motors.

Metals are widely used in our surroundings. Whatever their final application, all common metals react with their surroundings to varying extents and at distinct rates. Thus, corrosion is a natural occurrence that occurs when a metal is attacked by its surroundings, causing the metal's qualities to deteriorate. Corrosion is the degradation of a material as a result of a chemical reaction with its surroundings (Abdul Aziz *et al*., 2021). Typically, the reaction takes the form of oxidation. When an exposed metal surface comes into contact with a gas or liquid, corrosion begins, and the process is exacerbated by exposure to heated temperatures, acids, and salts. Corrosion affects almost all metals, but all materials1 deteriorate over time.