CORROSION INHIBITION OF MILD STEEL WITH SCHIFF BASE COMPOUNDS IN 1.0 M SULPHURIC ACID SOLUTION

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ABSTRACT

CORROSION INHIBITION OF MILD STEEL WITH SCHIFF BASE COMPOUNDS IN 1.0 M SULPHURIC ACID SOLUTION

Two Schiff base compounds have been synthesized by condensation reaction between 2-hydroxybenzaldehyde or 2-hydroxy-3-methoxybenzaldehyde and 1,3-propanediamine in ratio of 2:1. Both Schiff base compounds have been characterized by using basis elemental analysis, FTIR spectroscopy and ^{1}H NMR spectroscopy. Results from elemental analysis and ^{1}H NMR spectroscopy showed that the theoretical and experimental values are closely matched. These indicate that the resulted compounds have been successfully synthesized. The inhibition effect of resulted Schiff base compounds toward the corrosion of mild steel in 1.0 M H_2SO_4 solution has been measured using weight loss method at different concentrations of 1 x 10^{-2} M, 5 x 10^{-3} M and 1 x 10^{-3} M exposed for 4 days. It is found that the inhibition efficiency increases with increasing concentration for SB 2 with the highest inhibition of 46.41% at 1 x 10^{-2} M. It also found that for SB1, the inhibition efficiency increases with decreasing concentration with the highest inhibition of 72.81% at 1x 10^{-3} M.

CHAPTER 1

INTRODUCTION

1.1 Background and problem statement

Not all spontaneous electrochemical processes always beneficial. Consider the corrosion as an example. Corrosion can cause serious problem and damage many things such as buildings, furnitures, bridges, cars, storage tanks, pipelines, and plumbing systems as well as ships (Upadhyay *et al.*, 2007). Corrosion occurs by the oxidation process through the reaction with water, air, and/or salt solutions. This means that corrosion occurs naturally in the presence of moisture (Sethi *et al*., 2007).

According to Chang (2002), corrosion refers to the deterioration of metals by an electrochemical process. Chemical reaction or dry environment reaction can occur by the contact with vapors or gases, without the presence of liquids. With frequency, dry environment reaction is closely associated with high temperatures. Corrosion can also refer to the degradation of ceramic materials as well as the discoloration and weakening of polymers by the sun's ultraviolet light.