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

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TABLE OF CONTENTS

		Page
ACKNOWLEDGEMENT TABLE OF CONTENTS LIST OF TABLES LIST OF FIGURES LIST OF ABBREVIATIONS ABSTRACT ABSTRAK		iii iv vi vii viii ix x
CILA	DEED 1 INVEDODICEION	
1.1	APTER 1 INTRODUCTION Background and problem statement	1
1.2	Significance of study	2
1.3	Objective of study	4
СНА	APTER 2 LITERATURE REVIEW	
2.1	Mild steel	5
2.2	Organic corrosion inhibitor	5
2.3	Schiff base compounds	8
2.4	Sulphuric acid as the acidic media	14
2.5	Characterization	14
	2.5.1 Elemental Analysis	14
	2.5.2 FTIR Spectroscopy	16
	2.5.3 NMR Spectroscopy	16
2.6	Weight loss method	17
	APTER 3 METHODOLOGY	
3.1	Materials	23
3.2	Synthesis of Schiff base compounds	23
	3.2.1 Synthesis of SB 1 compound	24
	3.2.2 Synthesis of SB 2 compound	25
3.3	Structure of Schiff base compounds investigated	26
3.4	Characterization methods	28
	3.4.1 Elemental Analysis	28
	3.4.2 FTIR Spectroscopy	28
2.5	3.4.3 NMR Spectroscopy	29
3.5	Corrosion inhibition measurement	30
	3.5.1 Preparation of 1.0 M sulphuric acid solution	30
	3.5.2 Preparation of inhibitor concentration	30
	3.5.3 Preparation of mild steel coupons	30
2.6	3.5.4 Cleaning process of mild steel coupons	31
3.6	Weight loss method	31

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 ¹H NMR spectroscopy. Results from elemental analysis and ¹H 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 H₂SO₄ 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.