

**STUDIES ON CORROSION INHIBITION OF STEEL BY
TANNIN AND COCONUT HUSK**

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This Final Year Project Report entitled “**Thermodynamic Studies of Corrosion Inhibition of Steel by Tannin and Coconut**” was submitted by Noor Nasuha Binti Noor Ariffin in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Applied Chemistry, in the Faculty of Applied Sciences, and was approved by

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TABLE OF CONTENTS

ACKNOWLEDGEMENT	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	viii
LIST OF ABBREVIATIONS	x
ABSTRACT	xi
ABSTRAK	xii
CHAPTER 1 INTRODUCTION	1
1.1 Background of study	1
1.2 Problem statement	3
1.3 Significance of study	5
1.4 Objectives of study	6
CHAPTER 2 LITERATURE REVIEW	7
2.1 Corrosion	7
2.1.1 Introduction to corrosion	7
2.1.2 Effect of temperature on corrosion	8
2.1.3 Organic corrosion inhibitor	9
2.1.4 Role of organic corrosion inhibitor in the corrosive medium at various temperature	11
2.2 Adsorption	12
2.2.1 Chemical adsorption	13
2.2.2 Physical adsorption	14
2.2.3 Combination of chemical and physical adsorption	15
2.3 Adsorption Isotherm	17
2.3.1 Langmuir Isotherm	17
2.3.2 Temkin Isotherm	18
2.4 Thermodynamic and adsorption studies on organic corrosion inhibitor	19
2.4.1 Tannin	19

ABSTRACT

STUDIES ON CORROSION INHIBITION OF STEEL BY TANNIN AND COCONUT HUSK

Studies on the inhibition of steel corrosion by tannin and coconut husk are attempted in this work. Aim of this study is to identify the efficiency inhibition rate at various temperature and concentration of corrosion inhibitor, adsorption behaviour and occurrence of corrosion on steel. In order to investigate, the recovered coconut husk and tannin were used to protect stainless steel coupons from corroding in an acidic setting. Acetone was utilised to successfully dissolve natural alternatives such as coconut husk and tannin powder. The capacity to suppress stainless steel corrosion at various temperatures was weight loss and immersion test at concentrations of 0.5, 1.0, 1.5, 2.0, and 2.5 g/L and 0.5, 1.0, 1.5, 2.0, and 2.5 g/L coconut husk and tannin respectively. The findings demonstrated that when both corrosion inhibitor concentration and inhibition effectiveness rose, the rate of corrosion reduced at various temperatures. The Langmuir model and Temkin model was determined to be the best models to describe the interaction of tannin inhibitor with the active sites on stainless steel surface by isotherm adsorption. The morphology of the stainless steel altered following the addition of corrosion inhibitors, according to the optical microscope study. A blue-black tint on the surface of the stainless steel hinted at the need to produce ferric tannate as a surface preserver. As a result, Tannin performed for the highest efficiency with 84.38% at 40 °C. Meanwhile, Coconut husk shows the greatest efficiency with 77.50% at 40 °C. Last but not least, corrosion inhibitors derived from coconut husk and tannic acid are more effective against stainless steel when subjected to 1 M HCl at low temperatures. This study revealed that lower temperature has showed good inhibition properties with presence of corrosion inhibitors to protect the stainless steel from corroding.