

INHIBITION EFFECT OF CARICA PAPAYA (PAPAYA) LEAVES  
EXTRACTS ON SS400 MILD STEEL IN SEAWATER

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SCHOOL OF MARITIME STUDIES AND SCIENCE MARINE  
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ON SS400 MILD STEEL IN SEAWATER**

**By**

**Mohd DhiyaulRahman Bin Mesni**

**Research Report submitted in partial fulfillment of  
the requirement for the degree of  
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**DECLARATION AND VERIFICATION REPORT**  
**FINAL YEAR RESEARCH PROJECT**

It is hereby declared and verified that this research report entitled: **Inhibition Effect of Carica Papaya (Pawpaw) Leaves Extracts on SS400 Mild Steel in Seawater** by **Mohd Dhiyaulrahman bin Mesni**, Matric No. **UK 20625** have been examined and all errors identified have been corrected. This report is submitted to the Department of Maritime Technology as partial fulfillment towards obtaining the **Bachelor Degree of Applied Science (Maritime Technology)**, Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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## DECLARATION

I hereby declare that this thesis entitled **INHIBITION EFFECT OF CARICA PAPAYA (PAWPAW) LEAVES EXTRACTS ON SS400 MILD STEEL IN SEAWATER** is the result of my own research except as cited in the references.

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## INHIBITION EFFECT OF EXTRACTS OF CARICA PAPAYA (PAWPAW) LEAVES ON SS400 MILD STEEL IN SEAWATER

### ABSTRACT

The inhibitive effect of carica papaya leaves extracts on the corrosion of mild steel in seawater will be investigated. The study been carried out using the mild steel SS400 and carica papaya leaves extract as a corrosion inhibitor. The constituent of carica papaya leaves extracts showed that it has potential as inhibitors of SS400 mild steel corrosion in seawater and marine environment. The laboratory immersion test technique been used to study either carica papaya extracts is a good corrosion inhibitor in the weight loss method and electrochemical experiments. The components of carica papaya leaves extract were studied through fourier transform infrared spectroscopy (FTIR). Type of natural inhibitor, and inhibition efficiency were studied through Polarization Test and Impedance Test by electrochemical impedance spectroscopy (EIS). Based on the test that have been done, several objectives been achieve, that is the effect of carica papaya leaves extract for the inhibition of mild steel in seawater, the corrosion inhibition efficiency of the carica papaya leaves extract by using electrochemical impedance spectroscopy, the corrosion inhibition of carica papaya leaves extract inhibitor with respect to immersion period and get to identify the functional group in carica papaya leaves that help it to be good corrosion inhibitor.

**Keywords:** Carica Papaya Leaves Extracts, EIS, FTIR, Mild Steel (SS400), and Seawater

# KESAN PERENCATAN EKSTRAK DAUN BETIK PADA KELULI LEMBUT SS400 DALAM AIR LAUT

## ABSTRAK

Kesan perencatan ekstrak daun betik pada keluli lembut akan di kaji. Kajian ini dijalankan dengan menggunakan keluli lembut SS400 dan ekstrak daun betik. Kandungan ekstrak daun betik dikatakan mempunyai potensi untuk merencat pengaratan pada keluli lembut SS400 yang terdedah dengan air laut dan persekitaran marin. Teknik ujian rendaman digunakan bagi mengkaji sama ada ekstrak daun betik ini merupakan bahan perencat pengaratan yang baik dengan menggunakan kaedah pengurangan berat dan elektrokimia eksperimen. Komponen ekstrak daun betik ini di kaji dengan menggunakan spektroskopi inframerah transformasi fourier (FTIR). Jenis perencat semulajadi dan kecekapan perencatan dikaji dengan menggunakan kaedah ujian polarisasi dan ujian impedans melalui spektroskopi impedans elektrokimia (EIS). Berdasarkan ujian yang dijalankan beberapa objektif telah dicapai iaitu, kesan ekstrak daun betik terhadap proses perencatan pengaratan pada keluli lembut dalam air laut, kecekapan perencatan ekstrak daun betik dengan menggunakan spektroskopi impedans elektrokimia, hubungan antara perencatan pengaratan oleh perencat ekstrak daun betik dengan tempoh masa rendaman dan mampu mengenal pasti kumpulan fungsi yang terdapat pada daun betik yang membantu dalam menjadikan ia sebagai perencat pengaratan yang baik.

**Kata kunci:** Ekstrak Daun Betik, EIS, FTIR, Keluli Lembut (SS400), and Air Laut