

CORROSION BEHAVIOUR OF MILD STEEL IN
SEAWATER INHIBITED BY TAPIOCA STARCH

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FACULTY OF MARITIME STUDIES AND
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**CORROSION BEHAVIOUR OF MILD STEEL IN SEAWATER INHIBITED BY
TAPIOCA STARCH**

By

ADIBAH HUSNA BT MUSA

**A Thesis Submitted in Partial Fulfilment of
the Requirements for the Degree of
Bachelor of Applied Science (Maritime Technology)**

**DEPARTMENT OF MARITIME TECHNOLOGY
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU**

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UNIVERSITI MALAYSIA TERENGGANU

DECLARATION AND VERIFICATION REPORT
FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled: **Corrosion Behaviour of Mild Steel in Seawater Inhibited by Tapioca Starch** by **Adibah husna Bt Musa**, Matric No. **UK 21046** 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, Unitversiti Malaysia Terengganu.

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DECLARATION

I hereby declare that this thesis entitled **CORROSION BEHAVIOUR OF MILD STEEL IN SEAWATER INHIBITED BY TAPIOCA STARCH** is the result of my own research except as cited in the references.

Signature : 

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Matric No. : UK21046

Date : 13 JANUARY 2012

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CORROSION BEHAVIOUR OF MILD STEEL IN SEAWATER INHIBITED BY TAPIOCA STARCH

ABSTRACT

Marine corrosion usually occurs due to the exposure of metal to marine environment. In this study, the inhibitory action of tapioca starch on the corrosion of mild steels has been investigated at four different concentrations (200ppm, 400ppm, 600ppm and 800ppm) using weight loss method and EIS. The inhibition of the corrosion on mild steel by tapioca starch powder in seawater solutions was study using immersion technique. Mild steel plates tested using different concentration of tapioca starch powder and immersed for 35 days. The characterization of the corrosion was tested by using potentiodynamic polarization (PP), weight loss, electrochemical impedance spectroscopy (EIS), fourier transform infrared spectroscopy (FTIR) and scanning electron microscope (SEM). The percentage of inhibition efficiency (IE %) was calculated by using equation and this study showed the corrosion rate increase by decreasing concentration of the tapioca starch. Tapioca starch serves as an effective and non-toxic inhibitor of the corrosion on mild steel.

TINGKAH LAKU PENGARATAN KELULI LEMBUT DI DALAM AIR LAUT DIRENCAT OLEH KANJI UBI KAYU

ABSTRAK

Marin kakisan biasanya berlaku disebabkan oleh pendedahan logam untuk persekitaran marin. Dalam kajian ini, tindakan perencatan kanji ubi kayu pada kakisan keluli lembut telah dikaji pada kepekatan yang berbeza (200ppm, 400ppm, 600ppm dan 800ppm) dengan menggunakan kaedah kehilangan berat dan EIS. Perencatan kakisan pada keluli lembut oleh serbuk kanji ubi kayu dalam air laut adalah kajian yang menggunakan teknik rendaman. Plat keluli lembut diuji menggunakan kepekatan tepung kanji ubi kayu yang berbeza dan direndam selama 35 hari. Pencirian kakisan telah diuji dengan menggunakan polarisasi potentiodynamic (PP), penurunan berat, spektroskopi impedans elektrokimia (EIS), Spektroskopi inframerah transformasi fourier (FTIR) dan mikroskop imbasan elektron (SEM). Kecekapan peratusan perencatan (IE%) telah dikira dengan menggunakan persamaan dan kajian ini menunjukkan peningkatan kadar kakisan dengan meningkatnya kepekatan kanji ubi. Kanji ubi berfungsi sebagai perencat kakisan pada keluli lembut yang berkesan dan ianya tidak bertoksik.