

EFFECT OF HENNA IN ETHYL ACETATE FOR THE
INHIBITION OF ALUMINIUM IN SEAWATER AT
HIGH CONCENTRATION

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**EFFECT OF HENNA IN ETHYL ACETATE FOR THE INHIBITION OF
ALUMINIUM IN SEAWATER AT HIGH CONCENTRATION**

By

Siti Nurfarahin Binti Muhd Nasir

**Research Report submitted in partial fulfillment of
The requirement for the degree of
Bachelor of Applied Science (Maritime Technology)**

**Department of Maritime Technology
Faculty of Maritime Studies and Marine Science
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DECLARATION AND VERIFICATION REPORT
FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled: **Effect of Henna in Ethyl Acetate for the Inhibition of Aluminium in Seawater at High Concentration** by **Siti Nurfarahin binti Muhd Nasir**, Matric No. **UK 20201** 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 **EFFECT OF HENNA IN ETHYL ACETATE FOR THE INHIBITION OF ALUMINIUM IN SEAWATER AT HIGH CONCENTRATION** is the result of my own research except as cited in the references.

Signature : 
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ABSTRACT

Aluminum alloy type 5083 or AA5083 is suitable for marine applications because of its characteristic. A smart approach to overcome this problem by introduced the existence of inhibitor where it works by retarding the rate of corrosion by forming a surface layer as it protect any metal from reacting to the environment. This study was using a plant extract (henna) which is 600ppm, 700 ppm, 800ppm, 900ppm and 1000ppm are use. Aluminium was cut into 25mm x 25mm x 3mm and was polish manually using 600, 800 and 1200 grit of emery paper. Henna was extracted using a solvent which are ethyl acetate using rotary evaporator (Rotavap). To investigate the content of each extraction, a Fourier Transform Infrared Spectroscopy (FTIR) device was used. The corrosion behavior was investigated using several methods which were weight loss measurement, potentiodynamic polarization measurement, electrochemical impedance spectroscopy (EIS) and scanning electron microscope (SEM). Calculation of inhibition efficiency, IE (%) for weight loss, polarization resistance, corrosion current density and corrosion rate.

KESAN INAI DALAM ETIL ASETAT UNTUK PERENCATAN ALUMINIUM DALAM AIR LAUT PADA KEPEKATAN TINGGI

ABSTRAK

Jenis aluminium aloi 5083 atau AA5083 adalah sesuai untuk aplikasi marin kerana ciri-cirinya. Satu pendekatan yang bijak untuk mengatasi masalah ini dengan memperkenalkan kewujudan perencat dimana ia berfungsi dengan memperlahankan kadar kakisan dengan membentuk lapisan permukaan kerana ia melindungi mana-mana logam daripada bertindak balas terhadap alam sekitar. Kajian ini telah menggunakan ekstrak tumbuhan (inai) dengan kepekatan sebanyak 600ppm, 700ppm, 800ppm, 900ppm dan 1000ppm. Aluminium telah dipotong ke 25mm x 25mm x 3mm dan menggilap manual dengan menggunakan 600, 800 dan 1200 kertas pasir. Inai telah diekstrak menggunakan pelarut iaitu etil asetat menggunakan penyejat putar (Rotavap). Untuk mengetahui kandungan setiap pengekstrakan, spektroskopi inframerah transformasi Fourier (FTIR) peranti telah digunakan. Aktiviti pengurangan berat bahan ujikaji, ukuran polarisasi potentiodynamic dan spektroskopi impedans elektrokimia (EIS) selain itu, pengiraan kecekapan perencatan IE (%) untuk kehilangan berat bahan ujikaji, rintangan pengutuban, ketumpatan arus kakisan dan kadar kakisan.