PREPARTION ENVIRONMENTAL FRIENDLY OF INHIBITOR BASED ON NATURAL HENNA FOR ALUMINIUM PROTECTION

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By

MOHD IZWAN BIN ZAKARIA

A thesis submitted in partial fulfillment of the requirement for the award of the degree of Bachelor of Applied Science (Maritime Technology)

DEPARTMENT OF MARITIME TECHNOLOGY
FACULTY OF MARITIME STUDIES AND SCIENCE MARINE
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FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research entitled: **Preparation Environmental Friendly of Inhibitor Based on Natural Henna for Aluminium Protection** by **Mohd Izwan bin Zakaria;** Matric No. **UK 17651** has 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 **Preparation Environment Friendly of Inhibitor Based on Natural Henna for Aluminium Protection** is my own research except as cite in the references.

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PREPARATION ENVIRONMENTAL FRIENDLY INHIBITOR BASED ON HENNA FOR ALUMINIUM PROTECTION

ABSTRAK

Projek ini merupakan satu aliran untuk menerokai teknologi baru atau kelebihan yang boleh memberi manfaat sama ada dalam industri atau kehidupan manusia. Tumbuh-tumbuhan semulajadi atau mesra alam biasa digunakan dalam industri sebagai penghalang kakisan. Kesan perencatan daun Inai (Lawsonia Inermis) akan dikaji tentang kadar kakisan dan kecekapan perencat antara tiga parameter. Ekstrak inai dicampur ke dalam pelarut atau parameter yang berbeza untuk membandingkan prestasi kakisan. Campuran ini telah digunakan sebagai pigmen dan pelarut untuk mewujudkan cat baru atau formulasi sebelum sampel dicat. Aluminium aloi jenis AA5083 yang digunakan dan disalut oleh formulasi cat yang mengandungi ekstrak inai. Kemudian, sampel yang bersalut telah diuji dengan semburan air laut selama 30 hari. Pengukuran kadar kakisan dan kecekapan perencat telah ditentukan menggunakan polarisasi, EIS dan Pengukuran Kehilangan Berat. Sebelum ini, hanya penyelidikan rendaman yang digunakan sebagai kaedah untuk mengkaji kemungkinan tumbuhan sebagai perencat kakisan. Projek ini hanya bertumpukan kepada kaedah salutan untuk mengkaji kesesuaian perencat sama ada boleh meningkatkan rintangan kakisan dalam penggubalan yang dipilih. Skop kajian hanya tertumpu untuk bahan tertentu pada aloi aluminium dan ekstrak Inai. Penyelidikan lanjut boleh menggunakan jenis logam dan perencat untuk membandingkan prestasi perencat dalam kaedah salutan. Kajian menunjukkan prestasi inai bergantung kepada ciri-ciri pelarut. Formulasi dengan air suling menunjukkan tahan tinggi disebabkan ciri air suling. Penyulingan air menghilangkan kandungan mineral dan menghapuskan elektrolit.

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ABSTRACT

This project is a flow to discover the new technology or advantages that can give benefit either in industry or human life. The natural plants or environment friendly is been common used in the industry as corrosion inhibitor. The inhibition effect of Henna leaves (Lawsonia Inermis) will be studied about corrosion rate and inhibitor efficiency between three parameters. The henna extract was mixed in different solvents or parameters to compare the corrosion performances. These mixtures were used as pigment and solvent to create new paint or formulation before coating samples. The aluminium alloy type AA5083 were used and coated by the paint formulation which is mixing with henna extract. Then, the coated samples were tested with salt spray for 30 days. The measurement of corrosion rate and inhibitor efficiency had been determined using the polarization, EIS and Weight Loss Measurement. The past researches just used immersion test as method to study the possibility of a plant as corrosion inhibitor. This project is focused only on coating method to study the suitability of inhibitor either can improve the corrosion resistance in selected formulation. The scope of study only focuses for certain material which is aluminium alloy and Henna extract. The further researches can use more type of metals and inhibitors to compare the performance of inhibitors in coating method. The research shows performance of henna depends on the characteristic of solvent. Formulation with distilled water show high resistant due to characteristic of distilled water. Distillation of water removes the mineral content and eliminates electrolyte.