

**TANNIC ACID AS A CORROSION INHIBITOR FOR
ZINC IN DIFFERENT CORROSIVE MEDIUM**

AMELIA NATASHA BINTI MUHAMAD NAZARUDDIN

**BACHELOR OF SCIENCE (Hons.) CHEMISTRY WITH
MANAGEMENT
FACULTY OF APPLIED SCIENCES
UNIVERSITI TEKNOLOGI MARA**

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AMELIA NATASHA BINTI MUHAMAD NAZARUDDIN

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The Final Year Project Report entitled “**Tannic Acid as a Corrosion Inhibitor for Zinc in Different Corrosive Medium**” was submitted by Amelia Natasha binti Muhamad Nazaruddin in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Chemistry with Management, in the Faculty of Applied Sciences, and was approved by:

Dr. Solhan Binti Yahya
Supervisor
B. Sc. (Hons.) Chemistry with Management
Faculty of Applied Sciences
Universiti Teknologi MARA
02600 Arau
Perlis

Dr. Siti Nurlia Binti Ali
Project Coordinator
B. Sc. (Hons.) Chemistry with
Management
Faculty of Applied Sciences
Universiti Teknologi MARA
02600 Arau
Perlis

Dr. Nur Nasulhah Binti Kasim
Head of Programme
B. Sc. (Hons.) Chemistry with
Management
Faculty of Applied Sciences
Universiti Teknologi MARA
02600 Arau
Perlis

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ABSTRACT

TANNIC ACID AS A CORROSION INHIBITOR FOR ZINC IN DIFFERENT CORROSIVE MEDIUM

This study investigates the potential of tannic acid as a corrosion inhibitor for zinc in three different corrosive mediums. The aims of this work are to determine the corrosion rate of zinc in different corrosive medium (HCl, NaOH and NaCl), evaluate the inhibition efficiency of tannic acid as corrosion inhibitor and investigate the corrosion effect via microscope. This work was performed through an analysis of tannic via FTIR, corrosion test and surface morphology study. Analysis of functional groups revealed the presence of many active components exists in the tannic acid such as O-H, C=O ester, C=C aromatic, C-H and C-O. Analysis of corrosion rate using weight loss measurement was found to vary significantly across the different environments. The highest corrosion rate was observed in 1M HCl (139.4 mm/yr), followed by 1M NaCl (3.21 mm/yr) and 1M NaOH (1.27 m/yr). Evaluation on the corrosion inhibition efficiency of tannic acid reveals that tannic acid effectively inhibited corrosion, with the highest inhibition efficiency of 94.9% observed in NaCl solution at a concentration of 0.2 g/L. In 1M NaOH solution, tannic acid at 1 g/L gives 74.19% inhibitor. Meanwhile, inhibitor efficiency of tannic acid in HCl shows 69.45%. Surface morphology revealed uniform corrosion in HCl, while localized corrosion was observed in NaOH and NaCl. In summary, tannic acid has shown different inhibitory effect in different medium. The corrosion inhibition efficiency by tannic acid was also concentration dependent. The study concludes that tannic acid is a promising corrosion inhibitor for zinc, particularly in neutral environments, and that its effectiveness varies depending on the corrosive medium.