FACULTY OF ENGINEERING

DEPARTMENT OF TEXTILE AND GINNING ENGINEERING

FINAL YEAR PROJECT REPORT

PROJECT TITLE

INVESTIGATING THE EFFECT OF MULBERRY LEAF DYE EXRACTS TOWARDS STAINLESS STEEL CORROSION.

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A research project report submitted to the Department of Textile and Ginning Engineering in partial fulfillment for the award of a bachelor of science in polymer, textile and industrial engineering

DECLARATION

I **AKELLO PROSCOVIA** Reg. No**. BU/UG/2017/5** hereby declare that this project work is my original work and that the information contained in this project work is out of my research except where explicit citation has been made and it has not been presented to any institution of higher learning for any academic award.

Signature…………………………   Date………………………..

AKELLO PROSCOVIA BU/UG/2017/5

APPROVAL

This project report entitled 'Investigating the inhibition efficiency of mulberry leaf dye extracts towards stainless steel corrosion has been written under the supervision of;

Main supervisor

Madam Namuga Catherine

Signature: …………………………….

Date: …………………………………

Co. Supervisor

Mr. Tigawalana Dan

Signature: ……………………………..

Date: ……………………………….

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I would love to extend my gratitude to a number of people whose efforts have managed me to progress and put a landmark in my academics. First of all, all thanks to God for giving me the strength, wisdom and ability to carry on with my final year project research. Sincere thanks go to Busitema University, department of Polymer, Textile and Industrial Engineering and most importantly my supervisors Ms. Namuga Catherine and Mr. Tigawalana Dan for the great guidance and consultations towards my project.

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DEDICATION

I dedicate this report to my lecturers, course mates and family.

I also dedicate this report to my **father, Mr. Torach Geoffrey and my mother, Mrs. Torach Hellen Santa** for all the support they gave me towards my successful completion of industrial training.

ABSTRACT

Plant extracts from leaves, roots, stems, flowers and many other parts have become very vital in the eco-system as corrosion inhibitors to various metals because they are less toxic, accessible, cheap and have simple developing processes. In this study, the effect of mulberry leaf dye extracts containing 10% HCL, on stainless steel corrosion was studied using the weight loss method. Fourier Transform Spectroscopy (FT-IR) was used to characterize the mulberry leaf extracts to examine the adsorptive functional groups of the phytochemicals and phytochemical screening was carried out using reagents. The morphological structure of the stainless-steel coupons was studied using the Scanning Electron Microscope (SEM). The inhibition efficiency was found to depend on temperature and concentration of both HCL and the dye. The results from characterization confirmed the formation of a protective layer through chemisorption bonding on the stainless-steel surface. The inhibitory effect of the mulberry leaf extracts was higher at high concentration of the dye with 98% which confirmed the dye as a corrosion inhibitor of stainless-steel.

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