CONDUCTIVE EFFECT OF FERRIC CHLORIDE ($FeCl_3$) ON CARBONIZED *CHLORIS BARBATA Sw.* STEM VIA ACTIVATION-CARBONIZATION-PYROLYSIS METHOD

DEBIE T. RETIZA

THESIS SUBMITTED TO THE FACULTY OF THE INSTITUTE OF COMPUTING, ENGINEERING, AND TECHNOLOGY, DAVAO DEL SUR STATE COLLEGE MATTI DIGOS CITY, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

BACHELOR OF SCIENCE IN AGRICULTURAL AND BIOSYSTEMS ENGINEERING

MAY 2024

ABSTRACT

RETIZA, DEBIE T., Davao del Sur State College (DSSC) Institute of Computing, Engineering and Technology, Matti, Digos City. May 2024. **"CONDUCTIVE EFFECT OF FERRIC CHLORIDE ($FeCl_3$) ON CARBONIZED *CHLORIS BARBATA Sw.* STEM VIA ACTIVATION-CARBONIZATION-PYROLYSIS METHOD"**. Undergraduate Thesis.

Adviser: **RONNEL T. ESPARAGOZA, CHE.E**

This study was conducted to determine the conductive effect of ferric chloride ($FeCl_3$) on carbonized *Chloris barbata sw.* stem via the activation-carbonization-pyrolysis method. The study was accomplished utilizing a Completely Randomized Design, which comprised five (5) treatments and three (3) replications. The activated carbon produced was made using *C. barbata* stem and ferric chloride ($FeCl_3$) at different molar concentrations. Control –no $FeCl_3$ (T1), 1 molar concentration (T2), 2 molar concentration (T3), 3 molar concentration (T4), and 4 molar concentration (T5).

The study was carried out to determine the electrical conductivity, surface characteristics in terms of pore and elemental composition, surface area, and the cost analysis of the activated carbon. The data were analyzed using One-Way ANOVA of Variance at 1% and 5% significance levels,

Scanning Electron Microscope (SEM), Energy Dispersive X-ray Spectroscopy (EDX), Brunauer-Emmett-Teller (BET), and Fourier Transform Infrared Spectroscopy (FTIR).

The results revealed that the electrical conductivity of all treatments was shown to be statistically highly significant. According to the findings, T5 (4 M) registered the highest electrical conductivity at 2677.06 x 10^{-6} µS/m. It was also found to display micropore structure and various organic and inorganic functionalities, register relatively low surface area, and more acceptable production cost per unit mass.

Keywords: Activated Carbon, *Chloris Barbata Sw.* stem, Ferric Chloride, Electrical Conductivity, Pore Structure, Element, Surface Area