

**THE EFFECT OF TEMPERATURE AND TIME ON THE  
PRODUCTION AND PROPERTIES OF BIOCHAR  
FROM PYROLYSIS OF SAWDUST BIOMASS WASTE**

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## SUBMISSION FOR EVALUATION FINAL YEAR PROJECT 2 – RESEARCH PROJECT

### THE EFFECT OF TEMPERATURE AND TIME ON THE PRODUCTION AND PROPERTIES OF BIOCHAR FROM PYROLYSIS OF SAWDUST BIOMASS WASTE

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## TABLE OF CONTENTS

	<b>Page</b>
<b>ACKNOWLEDGEMENTS</b>	iii
<b>TABLE OF CONTENTS</b>	iv
<b>LIST OF TABLES</b>	vi
<b>LIST OF FIGURES</b>	vii
<b>LIST OF ABBREVIATIONS</b>	viii
<b>LIST OF SYMBOLS</b>	ix
<b>ABSTRACT</b>	x
<b>ABSTRAK</b>	xi
<b>CHAPTER 1 INTRODUCTION</b>	
1.1 Background of study	1
1.2 Problem statement	4
1.3 Significance of study	5
1.4 Objectives of study	6
<b>CHAPTER 2 LITERATURE REVIEW</b>	
2.1 Biomass	7
2.2.1 Characteristic of biomass	8
2.2.2 Characteristic of sawdust	9
2.2 Biochar	10
2.3 Pyrolysis	13
2.3.1 Type of pyrolysis	13
2.3.2 Instrumentation of pyrolysis	14
2.3.3 Mechanism of pyrolysis of biomass	14
2.4 Methylene Blue	17
<b>CHAPTER 3 METHODOLOGY</b>	
3.1 Instrumentation	19
3.2 Sample preparation	20
3.3 Pyrolysis	21
3.4 Analysis of sawdust and biochar	22
3.4.1 Ultimate analysis	22

## **ABSTRACT**

### **THE EFFECT OF TEMPERATURE AND TIME ON THE PRODUCTION AND PROPERTIES OF BIOCHAR FROM PYROLYSIS OF SAWDUST BIOMASS WASTE**

Sawdust is a byproduct of wood processing, is commonly disposed of improperly, leading to environmental and health issues. Pyrolysis was implemented to investigate the potential and performance of sawdust as a feedstock for producing biochar (BC). BC can improve soil fertility, sequester carbon, and help mitigate climate change. It can increase soil pH, benefiting crops sensitive to acidity, and be gasified to produce syngas, a renewable energy source. Optimizing pyrolysis parameters can enhance BC production and minimize environmental impact. While other methods like hydrothermal carbonization, gasification, and torrefaction exist, pyrolysis is the most efficient for high BC yield and energy efficiency. Most of the researchers states that higher pyrolysis temperatures and times decrease BC yield. The highest production of biochar is by pyrolysis at temperature 250°C at 20 minutes. Percentage removal of MB concentration which was optimum on sample 250°C, 40 min. Based on the ultimate analysis, the sample also has the highest percentage of oxygen which increases its ability to adsorb methylene blue from aqueous solutions because high surface of BC is enhanced by the presence of functional groups of oxygen, which helps to draw and retain contaminants like MB.