

MALAYSIA NATURAL FIBRES FOR DIVERSED BIO-BASED APPLICATION

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Optimization Of Kenaf Biomass's Pre-Treatment For Polylactic Acid's Monomer Production

Nurhafizah Seeni Mohamed, Nur Aimi Mohd Nasir, Mohd Adlan Mustafa Kamalbhryn, Hazleen Anuar, Maizirwan Mel, Rashidi Othman

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- Introduction
- Materials and Methods
- Determination of Best Pre-treatment Solvent
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- Kenaf Bast's Optimization Process
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Summary

Kenaf (*Hibiscus cannabinus* L) is a lignocellulosic material which is naturally resistant to breakdown to its structural sugars that will inhibit microorganisms to be accessed through. Since lignocellulosic materials have a complex structure, it needs to undergo several pre-treatment processes in order to liberate glucose. In this present research, the preferable pre-treatment method is chemical pre-treatment since it is more cost effective and environmental friendly compare to other existing method such as biological, physical, and physiochemical pre-treatment method. The main aim of this research is to select the best pre-treatment solvents for the maximum glucose production from kenaf biomass (core and bast), to optimize the pre-treatment condition for maximum production of glucose from kenaf core and its bast as well as to make a comparison between them. This study was planned to evaluate the potential of kenaf core and bast to be used as an alternative raw material for lactic acid production as it can be further contributed to the synthesis of biopolymer.

Introduction

Lignocellulosic materials such as kenaf biomass which are kenaf core and kenaf bast contain many different components which include polysaccharides, protein, lignin, lipids and minerals. The major components are polysaccharides in the forms of cellulose (40 to 50%) and hemicellulose (25 to 30%) and, lignin (25 to 30%) (Teter et al., 2006). Those materials are cellulose, hemicellulose and lignin which cause the lignocellulose to have a complex structure that cannot be directly converted into end products such as ethanol and lactic acid (Ren et al., 2007, Sun and Cheng, 2002). Therefore, lignocellulosic material must undergo two processes which are hydrolysis of cellulose in the lignocellulosic materials to fermentable reducing sugars, and fermentation of the sugars to lactic acid (Sun and Cheng, 2002).