THE EFFECT OF PLASTICIZER CONECENTRATION ON THE PROPERTIES OF BIOPLASTIC BASED ON CELLULOSE ACETATE FROM PINEAPPLE LEAVES

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This Final Year Project Report entitled "The Effect Of Plasticizer On The Properties Of Bioplastic Based On Cellulose Acetate From Pineapple Leaves" was submitted by Nurul Shazana Binti Moohamakorreeya Jehyor in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Applied Chemistry, in the Faculty of Applied Sciences, and was approved by

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ABSTRACT

THE EFFECT OF PLASTICIZER ON THE PROPERTIES OF BIOPLASTIC BASED ON CELLULOSE ACETATE FROM PINEAPPLE LEAVES

Conventional plastics have been used for packaging due to several advantages, such as resistance to water, oil, light, and heat and low cost. However, conventional plastics also contributes to environmental harm. It is believed that producing bioplastics from natural sources rather than conventional plastic would be an alternative for increasing the efficiency of the plastic industry. To improve the quality of bioplastics, cellulose is acetylated to produce cellulose acetate (CA). CA has a high glass transition temperature (Tg) and cannot be melt-processed as a raw material, so plasticizers are added to reduce stiffness and allow polymer melting without heat degradation. Preparation of cellulose acetate from pineapple leaves was done by purification of the leaves by alkali and bleaching treatment to extract the cellulose, followed by acetylation with acetic acid. Some goals need to be addressed which are to prepare and characterize the pineapple leaves cellulose acetate bioplastic films with various glycerol content, mechanical, thermal and physical properties through Fourier transform infrared (FTIR), tensile test, water solubility test and swelling test, respectively. The films were anticipated to have a water uptake percentage of greater than 50% since biopolymers are naturally hydrophilic. The cellulose acetate molecules in the film are connected by crosslinking, which could improve intermolecular interactions, thus improving the mechanical and thermal properties of the bioplastics. The goal of this work was to show that the CA found in pineapple leaves may be used in the production of biodegradable plastic and might be an acceptable replacement for conventional plastic. The idea of this research is to identify a new and effective process for producing bioplastics from various forms of agricultural waste such as pineapple leaves.

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