EFFECT OF VARIOUS PLASTICIZER TO THE PROPERTIES OF BIODEGRADABLE FILM DERIVED FROM FRUIT PEELS-MICROCRYSTALLINE CELLULOSE (MCC)

NORADURRAH BINTI SAMSUDIN

BACHELOR OF SCIENCE (Hons.)
APPLED CHEMISTRY FACULTY OF
APPLIED SCIENCES
UNIVERSITI TEKNOLOGI MARA

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NORADURRAH BINTI SAMSUDIN

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This Final Year Project Report entitled "**Effect of Various Plasticizer to The Properties of Biodegradable Film Derived from Fruit Peels-Microcrystalline Cellulose (MCC)"** was submitted by Noradurrah Binti Samsudin in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Applied Chemistry, in the Faculty of Applied Science and was approved

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Wahida Binti Abdul Rahman
Supervisor
B. Sc. (Hons.) Applied Chemistry
Faculty of Applied Sciences
Universiti Teknologi MARA
02600 Arau
Perlis

_____

Dr.Nurlia Binti Ali
Coordinator
B.Sc. (Hons.) Applied Chemistry
Chemistry Faculty of Applied Sciences
Universiti Teknologi MARA
02600 Arau
Perlis

_____

Dr Zuliahani Binti Ahmad
Head of Programme
B. Sc. (Hons.) Applied Chemistry
Faculty of Applied Sciences
Universiti Teknologi MARA
02600 Arau
Perlis

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ABSTRACT

EFFECT OF VARIOUS PLASTICIZER TO THE PROPERTIES OF BIODEGRADABLE FILM DERIVED FROM FRUIT PEELS-MICROCRYSTALLINE CELLULOSE (MCC)

A biodegradable plastic is an alternative in improving the environmental quality due to pollution by synthetic plastic packaging. This bioplastic made up from MCC of fruit peels of mango (Mangifera indica L.), papaya (Carica papaya L.) and banana (Musa sp.) with addition of difference plasticizer. The aim of this study to characterized the chemical, physical and mechanical properties of MCC bioplastic derived from different type of fruit peels. To evaluate the effect of different type of plasticizer on MCC bioplastic derived from different type of fruit peels and to evaluate the effect of MCC. Bioplastic produce by combination of MCC from difference fruit peels and corn starch as filler and with various plasticizer of sorbitol, glycerol and matrix with glycerol-sorbitol as plasticizer. The method used for this study is mixing 0.25 g of MCC extraction powder, 3ml glycerol, 3g sorbitol, 10g corn starch and 200ml NaOH and dried in oven for overnight at temperature of 40˚C. The result obtained in the form of thin film of bioplastic were analyses chemical component by using ATR-FTIR, physical and chemical properties also the sensory evaluation. In term of characterization, spectra of FTIR show a slightly same peak for both MCC commercial film. Based on the analysis glycerol plasticizer from different MCC fruit peels most soluble in water with 13.1%, 13.98%, 11.59% and 13% for C-MCC, B-MCC, P-MCC and M-MCC film. Moisture content showed that glycerol plasticizer higher than sorbitol plasticizer with 26.67%, 53.62%, 28.44% and 33.16% for C-MCC, B-MCC, P-MCC and M-MCC film. Biodegradation result glycerol plasticizer over sorbitol and mixture of glycerol and sorbitol plasticizer most degraded in soil with higher gradient loss weight. The elastic of the film has been conducted with Tensile Strength test. Sorbitol reached higher Tensile Strength over glycerol and mixture of glycerol and sorbitol with 1.21 MPa, 0.52 Mpa, 0.8 Mpa and 0.32Mpa and decrease lower Elongation at Break (EAB) at 0.14 mm/mm, 0.11 mm/mm, 0.14 mm/mm and 0.1mm/mm for for C-MCC, B-MCC, P-MCC and M-MCC film. From there, MCC in extracted film has been determine and had been discuss its function to mechanical and physical properties of film when compare with commercial film as control film.

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