

UNIVERSITI TEKNOLOGI MARA

**PRODUCTION OF BIOPLASTIC
FROM CASSAVA PEEL WITH
DIFFERENT CONCENTRATION OF
GLYCEROL AND ADDITION OF
CALCIUM CARBONATE AS FILLER**

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of the requirements for the degree of
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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Undergraduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Nowadays, plastics are made from petroleum that can cause negative impact toward environment such as air and water pollutions. It also gives impact toward human health. Therefore, due to awareness of the negative impact on the current plastic this study is to produce eco-friendly plastic from agriculture waste which is cassava peel. The bioplastic from cassava peel were formulated with different concentration of glycerol which are at 20 %, 30 % and 40 %, respectively. Without glycerol, as in control, the bioplastic was not formulated. Then, the characterization of the bioplastic was observed through FTIR analysis. The finding shows that each sample have similarities in spectra, thus it indicates that bioplastics have similar chemical composition in term of functional group present which are hydroxyl group in alcohol and phenol (O-H), aliphatic saturated hydrocarbon chain (C-H) and ester, ether, carboxylic acid as well as anhydride group (C-O). Other than that, the several tests had been done which are tensile strength test, water absorption test and soil burial test. For tensile strength, the results show that the bioplastic with 20 % of glycerol has the highest tensile strength (5.82 ± 1.00 MPa), Young's modulus (99.79 ± 42.03 MPa) and tensile strain (10.34 ± 2.43 %). While for water absorption test, the highest is 40 % glycerol which is 28.64 ± 0.16 % and the lowest is 20 % (24.49 ± 0.21 %). For biodegradable test, all sample of bioplastic are fully degraded at week 4 (100 ± 0.00 %) but the fastest is bioplastic with 40 % of glycerol followed by films with 30 % and 20 % of glycerol. Therefore, the most suitable bioplastic to be used for packaging would be bioplastic with 20 % of glycerol because the degradation is not fast as 30 % and 40 % of glycerol but still within 4 weeks and the best in mechanical properties.

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