UNIVERSITI TEKNOLOGI MARA

PRODUCTION OF BIOPLASTIC FROM CASSAVA PEEL WITH DIFFERENT CONCENTRATION OF GLYCEROL AND ADDITION OF CORN STARCH AS FILLER

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Thesis submitted in fulfillment
of the requirements for the degree of
Bachelor of Sciences (Hons) Biology

Faculty of Applied Sciences

January 2020

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, current plastics are derive from petroleum based that give negative impact not only towards environment but also to animals, its' habitat and human's health. Therefore, this study had been carried out to create bioplastics that environmental friendly in order to reduce the negative impacts. In this study, bioplastic had been created from agriculture waste which is cassava peel with different concentration of glycerol with addition of natural filler (corn starch). This is because to optimize which concentration of glycerol that created the best bioplastic. The characteristic of the bioplastics are determine through FTIR analysis. The results show that all the bioplastics have similarities in spectra that indicates the bioplastics have same chemical composition in term of functional group which are hydroxyl group (O-H), aliphatic saturated hydrocarbon chain (C-H), alkene (C=C) and ester, ether, carboxylic acid as well as anhydride group (C-O). Other than that, mechanical test of this bioplastic divided into tensile strength test, water absorption test and soil burial degradation test. In tensile strength, it is shows that bioplastic with 20 % glycerol has highest tensile strength (2.24 ± 0.34 MPa), Young's modulus (67.23 ± 2.20 MPa) and elongation at break (22.70 ± 2.85 %). For water absorption, the highest is bioplastic with 40 % glycerol (71.23 ± 0.43 %). Next, for soil burial degradation test, all the bioplastic fully degrade (100.00 ± 0.00) and the faster rate of degradation is bioplastic with 40 % of glycerol at week 3. The result in this study shows bioplastic with 20 % glycerol has better mechanical properties in term of tensile strength test even though it degradation is slow compare to the bioplastic with 40 % glycerol. Besides that, bioplastic with 20 % glycerol suitable for packaging due to it can store longer and not degrade too early.

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