UNIVERSITI TEKNOLOGI MARA
Cawangan Terengganu
Kampus Bukit Besi

TITLE: STARCH BASED BIOPLASTIC FROM SWEET POTATO WITH PLASTICIZER AND FILLER

SUPERVISOR:
PM Ts Dr Sarifah Fauziah binti Syed Draman

SCHOOL OF CHEMICAL ENGINEERING
COLLEGE OF ENGINEERING

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ABSTRACT

One of the many workable alternatives to polymers made from petrochemical industries is the use of bioplastics. Bioplastics have several advantages over conventional plastics, including a lower carbon footprint, increased energy efficiency, increased biodegradability, and increased adaptability. In this study, sweet potato starch-based bioplastic was made using the casting method along with plasticizer and filler. Box-Behnken Design analysis was used to determine the best way to prepare the bioplastics for water absorption. The sweet potato was used to extract the starch. Wood dust is used as a filler, and sorbitol and glycerol are used as plasticizers. Investigations were made into physical characteristics such as content moisture. The bioplastic was weighed initially, dried in an oven for three hours at 35C, and then weighed once more for the final weight. The final optimization calculation for content moisture is: content moisture = +5.8911764705882 + 1.41375 starch + 20.94375 filler + 0.989025 plasticizer + 6.8625 starch * filler + 0.053125 starch * plasticizer + 7.359375 filler * plasticizer. The minimum percentage is 7.58%. Starch-based substances have enormous potential for use as biodegradable plastics, which will help to protect the environment. Continued research into this bioplastic is necessary.

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CHAPTER ONE
BACKGROUND

1.1 Introduction

Plastics are extremely common in the environment we live in, and this is not with good cause; not only are they affordable, but they are also quite simple to acquire, and they have an exceptionally long-lasting. Due to these characteristics, they are ideally suited for use in a diverse selection of situations and circumstances. This is due to the fact that they have the capability of continuing to be utilized for a really extended period of time (Narissara and Shabbir, 2013). To date There has been a cumulative output of plastics totalling to somewhere in the neighbourhoods of 8.3 billion metric tones' worth during history. Although this information is readily available, a grand total of 6,300 metric tons of waste plastic has been produced. On the other hand, of that quantity, only nine percent of the waste plastic was recycled, twelve percent of it was burned, and the remaining seventy percent is either piling up in sanitary landfills or being dumped into the environment. Burning the waste plastic was an option for 12 % of the waste plastic. It is anticipated that by the year 2050, a total of 12,000 metric tons of discarded plastics will have accumulated either in a restricted landfill or in the open environment. This estimate is based on projections made for the year 2050. This estimate was calculated using the prevalent rates of accumulation. As was just mentioned up above, this is based on a forecast (Geyer et al., 2017). It is anticipated that by the year 2050, the ocean will contain more plastic than fish because of the rising production and disposal rates that are currently in place, as well as the low proportion of waste that is recycled. These factors combined will lead to an increase in the overall amount of waste. This forecast is based on the data analysis that both the production and disposal rates that are presently in effect are increasing at an exponential rate. This is because current recycling rates are significantly lower than they should be in today's society. This is because, in comparison to the overall amount of waste that is produced, only a small portion of waste is recycled. This is a problem because recycling helps the environment (Sardon and Dove, 2018). Plastics have a variety of disadvantages, all of which have the potential to negatively impact both human life and the natural ecosystem on this planet.