

**FABRICATION AND CHARACTERIZATION OF JACKFRUIT
SEED POWDER AND POLYVINYL ALCOHOL BLEND AS
BIODEGRADABLE PLASTIC**

MUHAMAD FAIZAL BIN HARON

**Final Year Project Report Submitted in
Partial Fulfilment of the Requirement for the
Degree of Bachelor of Science (Hons.) Physics
in the Faculty of Applied Sciences
Universiti Teknologi MARA**

JULY 2017

ABSTRACT

FABRICATION AND CHARACTERIZATION OF JACKFRUIT SEED POWDER AND POLYVINYL ALCOHOL BLEND AS BIODEGRADABLE PLASTIC

The biodegradable plastics was fabricated from jackfruit seed powder starch and polyvinyl alcohol (PVA) blend in order to develop an environment friendly material that can replace the petro-chemical plastics that widely use nowadays. In order to ensure the bioplastic is reliable enough, several testing was conducted which to identify the mechanical properties and biodegradability. Mechanical properties of the bioplastic was analyzed by the tensile testing which shown that the increase in amount of jackfruit seed powder starch will causing the tensile strength of the sample to decrease. Meanwhile for biodegradability of the bioplastics was determined by Fourier Transform Infrared Spectroscopy shows that the samples from week 0 to week 8 would have any changes in term of structural modification. Thus it is proved that, the sample with high amount of jackfruit seed powder starch have better biodegradability characteristics.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	viii
ABSTRACT	ix
ABSTRAK	x
CHAPTER 1 INTRODUCTION	
1.1 Background of Study	1
1.2 Problem Statement	3
1.3 Objective of Study	4
1.4 Significant of Study	4
CHAPTER 2 LITERATURE REVIEW	
2.1 Compositions and Characteristics of Jackfruit Seeds Starch	6
2.2 Polyvinyl Alcohol Characteristics	7
2.3 Current Bioplastic Technology	9
CHAPTER 3 METHODOLOGY	
3.1 Material	10
3.2 Preparation of Jackfruit Seed Flour and Starch	10
3.3 Jackfruit Seed Starch and PVA Blend	11
3.4 Sample Formation	12
3.5 Validation of The Characteristics of Fabricated Bioplastic	12
3.5.1 Mechanical Properties	12
3.5.2 Biodegradability	13
CHAPTER 4 RESULTS AND DISCUSSION	
4.1 Introduction	14
4.2 Mechanical Properties	14
4.3 Biodegradability Based on FTIR Spectroscopy	19
CHAPTER 5 CONCLUSION AND RECOMMENDATIONS	
5.1 Conclusion	23
5.2 Recommendation	24

LIST OF TABLES

Table	Caption	Page
3.1	Mixture of bioplastics with different Polyvinyl Alcohol (PVA) percentage.	11

LIST OF FIGURES

Figure	Caption	Page
4.1	Tensile strength graph from tensile testing	16
4.2	Elongation percentage of samples	17
4.3	Young's modulus of samples	18
4.4	FTIR Spectroscopy testing graph for (PVA/Jackfruit seed starch)	19