

UNIVERSITI TEKNOLOGI MARA

**THE EFFECT OF CARBONIZED
SAGO PITH WASTE (SPW) ON THE
CHARACTERIZATION, PHYSICAL
AND MECHANICAL PROPERTIES
OF VULCANIZED NATURAL
RUBBER**

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Thesis submitted in fulfillment
of the requirements for the degree of
Bachelor of Sciences (Hons.) Polymer Technology

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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 Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Sago Pith Waste (SPW) is a fibrous residue that is rich in sago starch that is extracted from the rasped of the sago palm. It is an agricultural waste that is most commonly being disposed into the river. Thus, making the river polluted. This study aims to investigate the used and effect of different incineration temperature of SPW. The Sago Pith Waste Ash (SPWA) is used as a natural filler in the rubber compounding to test the mechanical and physical properties of the vulcanized rubber in the tensile strength, tensile modulus, elongation at break, hardness, abrasion-resistant and swelling index. Meanwhile, the sample particle of SPW and SPWA at 600 °C, 700 °C and 800 °C were characterized by particle size analysis (PSA), Fourier Transforms Infrared (FTIR) and also the rheology properties of the sample. The FTIR was conducted to confirm the presence of silica and carbonated group. The compounded rubber show an increasing pattern of hardness, tensile modulus and swelling index. Meanwhile, 5 phr loading was the optimum loading high abrasion resistant index and high elongation at break for a sample of SPWA 800 °C. Plus, SPWA 800 °C gives a high tensile strength at filler loading of 10 phr and 15 phr loading. As other compound samples show a lower value of tensile strength, only SPWA 600 °C that shows a positive increment of tensile strength as the filler loading increase. Generally, SMR L filled with SPWA can give a better improvement in the mechanical properties of the compounded rubber. Thus, can be considered to be used as a natural filler for future usage.

TABLE OF CONTENTS

	Page
AUTHOR'S DECLARATION	ii
ABSTRACT	iii
ACKNOWLEDGEMENT	iv
TABLE OF CONTENTS	viii
LIST OF TABLES	xi
LIST OF FIGURES	xiii
LIST OF ABBREVIATION	xiii
LIST OF SYMBOLS	xiv
CHAPTER ONE INTRODUCTION	1
1.1 Research Background	1
1.2 Problem Statement	2
1.3 Significant of Study	3
1.4 Objectives	3
CHAPTER TWO LITERATURE REVIEW	4
2.1 Natural Rubber	7
2.2 Composites	7
2.3 Natural Fiber	8
2.4 Sago Pith Waste	11
2.5 Carbon Black and Silica	15
2.6 Surface Treatment	17
CHAPTER THREE RESEARCH METHODOLOGY	18
3.1 Raw Material	18
3.1.1 Sago Pith Waste	18
3.1.2 Natural Rubber	18
3.1.3 Zinc Oxide	18
3.1.4 Filler	19

3.1.5	Stearic Acid	19
3.1.6	N-cyclohexy 1-2-benzothiazole-2-sulphenamide (CBS)	19
3.1.7	2,2,4-Trimethyl-1,2-Dihydroquinoline polymer (TMQ)	20
3.1.8	Sulphur	20
3.2	Formulation	21
3.3	Preparation of Material	21
3.3.1	Preparation of Sago Pith Waste Ash	21
3.3.2	Preparation of Compounding Material and Process	22
3.4	Cure Characteristic	23
3.4	Hot Press	23
3.6	Characterization and Testing	24
3.6.1	Fourier Transformation Infra-Red (FTIR) test	24
3.6.2	Mooney Viscosity and Scorch Time	24
3.6.3	Tensile Test	25
3.6.4	Hardness Test	25
3.6.5	Swelling Test	25
3.6.6	Abrasion Test	26
3.7	Flow Chart and Method	27
CHAPTER FOUR RESULTS AND DISCUSSION		28
4.1	Characterization of Sample	28
4.1.1	Particles Size	28
4.1.2	Fourier Transformation Infra-Red (FTIR)	29
4.1.3	Cure Time	30
4.1.4	Scorch Time	31
4.1.5	Rheometer Torque	33
4.1.6	Mechanical Testing	35
4.1.7	Hardness	39
4.1.8	Abrasion Resistant	40
4.1.9	Swelling Index	42
CHAPTER FIVE CONCLUSION AND RECOMMENDATION		44
5.1	Conclusion	44
5.2	Recommendation	44