# UNIVERSITY OF TEKNOLOGI MARA

# EFFECT OF DIFFERENT FORMULATION OF NATURAL RUBBER AND STYRENE-BUTADIENE RUBBER BLEND ON PHYSICAL PROPERTIES

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Thesis submitted in fulfilment
of the requirement for the degree of
**Bachelor of Engineering**
**(Chemical)**

**FACULTY OF CHEMICAL ENGINEERING**

**JULY 2018**

## ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious and the Most Merciful. Alhamdulillah, all praises to Allah for the strengths and His blessing in completing this thesis. I would like to express my gratitude and appreciation to all those who gave me the possibility to successfully complete this thesis. During the work thesis, there are certain people that involved and with their help and support, my research and thesis writing have been gone well and successful.

First of all, I would like to express my deepest gratitude to my supervisor, Dr Rahida Wati Sharudin for her assistance and expert guidance in helping me to complete this research project successfully. In additional, I would like to express my appreciation to Dr Rahmah binti Mohamed , who always assist my research and his guidance really helped me in completing this project. I also would like to thank to all the laboratory staffs for guiding and providing necessary equipment in order to perform the experiment. My gratitude also goes to Fakulti Kejuruteraan Kimia , UiTM, Shah Alam that have provided us with complete and necessary equipment in order to complete this research.

Besides, my gratitude and appreciation also go to my friends who are directly and indirectly involved in completing the thesis for their supports, encouragement, and motivations. Last but not least, my deepest gratitude goes to my beloved family for their prayers, encouragement, motivation, and moral supports to me for completing this thesis. My gratitude also goes to those who indirectly contribute ideas and opinions in completing this thesis.

## Abstract

The demand for synthetic rubber is increasing every year. However, this petroleum-based product will have some harmful effects to the environmentt and air quality. Moreover, it can cause the depletion of petroleum resource. All this contribution has recently created an increase interest in natural base rubber with the use of renewable resources. Because of the problem this research was conduct to prepare the blend of natural rubber and styrene-butadiene rubber sample with different formulation. Then to study the effect of different formulation of natural rubber and styrene-butadiene rubber blend on the physical properties. For the preparation, natural rubber latex was clean and dry completely before going through mastication process to reduce the molecular weight of the rubber to make sure it dissolve easily in solvent. Styrene butadiene rubber was cut into small pieces and then dissolves in toluene and chloroform solution. The rubber was mix with 4 different formulations before been heat and dry overnight in the oven. Then the sample was prepare for testing using tensile tester. The speed was set to 500 mm/min .The speed was constant throughout the test to make sure same force was applied to all sample. The result shows that that blend of 50% of natural rubber with 50 % styrene-butadiene rubber has the highest value of tensile strength which was 1.145 MPa. While the highest tensile modulus for all formulation was sample with 80 % natural rubber and 20 % styrene-butadiene rubber. The value for all 3 tensile modulus was 0.38 MPa , 0.445 MPa and 0.66 MPa for M100 ,M300 and M500 respectively.

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# INTRODUCTION

## 1.1 BACKGROUND STUDY

The natural rubber that had been used by industry can be acquire by tapping the Hevea tree. The natural rubber that had been acquire from this activity is known as latex. The rubber is tree is known as Hevea Brasiliensis and earlier found at Brazil but nowadays most of rubber production come from Asia country especially Malaysia, Indonesia and Thailand. At the end of eighteenth century, rubber was known throughout Europe as rubber had greater properties which can give benefit to them. The Europeans had found the best tapping process which can cause the latex can be take out regularly. Production of latex can be affected by the tapping method efficiency.(Fainleib, Pires, Lucas, & Soares, 2013)

Hevea brasiliensis or commonly known as rubber plant is the plant that almost entirely natural rubber is obtained and it has been used since long time ago. Natural rubber that obtained from this plant contain more than 99% of poly-cis-1.4 isoprene

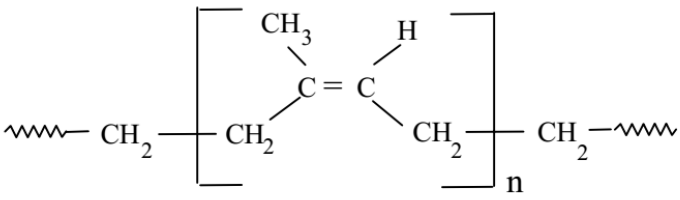


Figure 1.1 : poly-cis-1.4 isoprene

Natural rubber is one of the most crucial polymer because it has many unique properties which many of synthetic rubber do not have it such as strength , tear