

**ELECTRICAL AND PHYSICAL PROPERTIES OF NATURAL
RUBBER GLOVES**

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TABLE OF CONTENTS

	Page
ACKNOWLEDGMENT	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATION	viii
ABSTRACT	ix
ABSTRAK	x
CHAPTER 1 INTRODUCTION	
1.1 Background	1
1.2 Significance of study	2
1.3 Objective of study	3
CHAPTER 2 LITERATURE REVIEW	
2.1 Dipping	4
2.1.1. Leaching process	4
2.1.2. Dry coagulant dipping	6
2.2 Natural Rubber	7
2.1.1. Protein	8
2.3 Electricity	11
2.4 Electrical Conductivity	12
2.5 Insulator	14
2.6 Impedance Spectroscopy Testing	14
CHAPTER 3 METHODOLOGY	
3.1 Materials	
3.1.1. Raw materials	15
3.1.2. Chemicals	15
3.1.3. Apparatus	16
3.1.4. Formulation	16
3.2 Methods	17
3.2.1 Preparation of dry coagulant latex dipping	18
3.2.2 Electrical testing	19
3.2.3 Tensile Testing	20
CHAPTER 4 RESULTS AND DISCUSSION	
4.1 The conductivity of the latex deposit with different pH and leaching in water	22
4.2 The conductivity of the latex deposit with different pH and leaching in potassium hydroxide (KOH)	24
4.3 The effect of leaching medium to the conductivity of the latex deposit	26
4.4 Tensile strength of the latex deposit with different pH and leaching in water	27

ABSTRACT

ELECTRICAL AND PHYSICAL PROPERTIES OF NATURAL RUBBER GLOVES

Electrical conductivity and physical properties of natural rubber latex with variation of pH and leaching medium such as water and potassium hydroxide solution were investigated using Impedance Spectroscopy HIOKI 3532-50 LCR HiTESTER. Dry coagulant dipping method was used to produce latex deposit. Natural rubber latex was compounded with ingredients in different pH. Each compound will then leach in different medium to remove the extractable protein in the natural rubber latex product. Results shows that the extractable protein content of the deposit reduced when leach in potassium hydroxide solution. The electric conductivity will decrease when the extractable protein content is decrease. The extractable protein can be described as amphoteric polyelectrolytes in latex. Differences in pH also caused the changes in polarity which is effect the electrical conductivity. The physical properties such as tensile strength also decrease when the extractable protein content is decrease. The extractable protein content act as cement in the latex which crosslink with the latex particles.

CHAPTER 1

INTRODUCTION

1.1 Background and problem statement

Electrical shock occurs when a person comes in contact with two conductors of a circuit or when the body becomes part of the electrical circuit. In either case, a severe shock can cause the heart and lungs to stop functioning. Also, severe burns may occur where current enters and exits the body. Therefore, rubber insulating gloves (rubber electrical gloves) are among the most important articles of personal protection for electrical workers. Rubber electrical gloves are used to protect workers against electrical shock while working around energized systems. To be effective, the gloves must incorporate high dielectric and physical strength, along with flexibility and durability. Therefore, electrician gloves shall be made from good quality Natural or Synthetic rubber or from a mixture of these, in conjunction with suitable compounding ingredients.

Natural Rubber latex (NRL) contains two types of protein. There are high molecular weight protein which are tightly bound to the rubber particles in the latex, and low molecular weight water soluble protein. These water soluble proteins are called extractable protein (EP). Being water soluble, it will allow a current flow through the NRL. This will make it high conductivity and less