

**PECTIN FROM POMELO (*Citrus grandis*) FRUIT PEELS:
EXTRACTION AND POTENTIAL APPLICATION IN HAND CREAM**

SITI NUR ADNIN BINTI ZAMRI

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(SITI NUR ADNIN BINTI ZAMRI)

ABSTRACT

PECTIN FROM POMELO (*CITRUS GRANDIS*) FRUIT PEELS: EXTRACTION AND POTENTIAL APPLICATION IN HAND CREAM

Pomelo or “Limau Bali” also known as *Citrus grandis* (L.) Osbeck is the highest demand fruit crops grown in the world especially in Asian countries including the South East Asia due to its aromatic smell and soft juicy pulp. Gelatin can be found in citrus fruit as they are rich with pectin and they have a number of advantages when used in the food and pharmaceutical industry. The primary component of citrus peel, is in a form of a complex heteropolysaccharide that is frequently utilised as a functional ingredient, such as a thickening, gelling, and emulsifying agent, thus it is the perfect substitute for gelatin. This study focus on the extraction of pectin from the local pomelo (*Citrus grandis*) fruit peels and its potential application in hand cream. Hydrochloric Acid (HCl) is used as a solvent to extract the pectin. The characterization of pectin was run with Fourier Transform Infrared Spectroscopy (FTIR) to record the infrared spectrum of absorption, emission, and photoconductivity of the sample, Optical Microscope(OM) to magnify the image of an object specimen, Equivalent weight (Eq. W) and methoxyl content and Degree of esterification, (DE) to know the exact amount of methoxyl content inside a pectin. The hand cream containing pectin is analysed through the pH, hand cream removal and appearance, and homogeneity and smear test. The percent yield of the pectin obtained is 22.1%. The identification of pectin in FTIR is detected with the presence of bands that indicate the stretching of carboxylate ions (COO) at 1732 cm^{-1} and ester carbonyl groups (C=O) at 1632 cm^{-1} . The Equivalent weight (Eq. W) and methoxyl content and DE indicates that the pectin is a high methoxyl pectin as the methoxyl content is 7.39% and the DE is 98%. To sum up, the extraction of pectin from the local pomelo (*Citrus grandis*) fruit peels were successfully obtained using HCL as a solvent and the successful extraction was confirmed with the physicochemical and structural properties of extracted pectin by using degree of esterification (DE), equivalent weight and methoxyl content, Fourier Transform Infrared Spectroscopy (FTIR) and Optical Microscope (OM). Lastly, the parameter test proves the unique properties of pectin as a thickener and gelling agent

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

The biggest organ in the human body is the skin. The epidermis, dermis and hypodermis are a complex structure on our skin protect our skin by blocking any harmful material from the environment and stops the skin from losing moisture (Hameed et al., 2019) The older we get, the weaker our skin operate thus our skin and health might face some disturbance. The disturbance occur because, collagen and elastin fibers that keep our skin tight deteriorate, resulting in loosening, wrinkles and sagging (Hameed et al., 2019).

Extreme skin dryness or also known as xerosis and greater sensitivity to irritant dermatitis are two characteristics of ageing skin that indicate an aberrant skin barrier (Chuong et al., 2002; Tobin, 2017). The skin aging for a person is also caused by the environment, genetic, and biological influences. Hormonal changes and UV-ray exposure that have an effect on the skin thus increasing the risk of skin cancer. As a result, skin health is an important element of overall health, and we must care for it properly.

The outermost layer of the epidermis or also known stratum corneum contain a “Natural Moisturizing Factors” in which the bound water bound to a variety of different molecules and free water that can