EXTRACTION AND CHARACTERIZATION OF PECTIN FROM KEY LIMES PEELS USING ACETIC ACID BASED DEEP EUTECTIC SOLVENT (DES)

NUR SHAHIRAH BINTI AZHARUDIN

Final Year Project Report Submitted in
Partial Fulfilment of the Requirements for the
Degree of Bachelor of Science (Hons.) Chemistry with Management
In the faculty of Applied Sciences
Universiti Teknologi MARA

FEBRUARY 2024

This Final Year Project Report entitled **"Extraction and characterization of pectin from key limes peels acetic acid based deep eutectic solvent (DES)"** was submitted by Nur Shahirah Binti Azharudin in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Science (Hons.) Chemistry With Management, in the Faculty of Applied Sciences, and was approved by

_____

Dr Rizana binti Yusof
Supervisor
B. Sc. (Hons) Applied Chemistry
Faculty of Applied Science
Universiti Teknologi Mara
02600 Arau
Perlis

_____

Dr Siti Nurlia binti Ali
Project Coordinator
B. Sc. (Hons) Applied Chemistry
Faculty of Applied Science
Universiti Teknologi Mara
02600 Arau
Perlis

_____

Dr. Nur Nasulhah Binti Kasim
Head of Programme
B. Sc. (Hons) Applied Chemistry
Faculty of Applied Science
Universiti Teknologi Mara
02600 Arau
Perlis

Date: _____

TABLE OF CONTENTS

ABSTRACT

EXTRACTION AND CHARACTERIZATION OF PECTIN FROM KEY LIMES PEELS USING ACETIC ACID BASED DEEP EUTECTIC SOLVENT (DES)

Pectin has been used widely as thickener, stabilizer and gelling agent. However, pectin industry uses corrosive solvent such as acid hydrochloric to extract pectin. The strong acid may obtain high yield of pectin but it is very toxic. Hence, DES is introduced to drawback the toxicity. The objective of this research is to extract pectin from key limes peels using conventional solvent of acetic acid and deep eutectic solvent DES based acetic acid. The extracted pectin from both solvents were characterize in terms of ash content, degree of esterification (DE), water solubility, moisture content, anhydrouronic acid content and methoxyl content using standard methods. Pectin extracted with 10% DES obtained high yield compared to 10% acetic acid which 26.84% and 9.34, respectively. DE, moisture content, ash content and methoxyl content obtained almost similar value. Next, the methoxyl content for pectin extracted using both solvents were found 14.54% and 15.62% which grouped under high methoxyl pectin and able to form gel as well as strong cohesive and adhesive properties. Pectin extracted with 10% DES have lower water solubility and lower AUA compared to 10% acetic acid. AUA from 10% DES was categorized as high AUA due to it exceed 65% and suitable for food industry. The water solubility for 10% DES was 66.42% which low compared to 10% acetic acid which 70.43%. The insolubility of extracted pectin is most likely due to the presence of electrolytes in de-methylated pectin acid.