

**UNIVERSITI TEKNOLOGI MARA**

**SOLUBILIZATION OF IBUPROFEN BY  
SUCROSE ESTER SURFACTANTS**

**TAUFEQ HIDAYAT BIN MISDI**

**Dissertation submitted in partial fulfillment of the requirements for  
the Bachelor of Pharmacy (Hons.)**

**Faculty of Pharmacy**

**2013**

## **ACKNOWLEDGEMENT**

First of all, I would like to give my greatest appreciation to Allah S.W.T. because of His blessings, I am able to complete this research successfully. My greatest gratitude to my helpful supervisor, Professor Dr. Mohamed Salama, Faculty of Pharmacy, Universiti Teknologi MARA for his full of guidance and supports throughout the research. I wish to thank Mr. Ahmad Moustafa Eid for the guidance and sharing a lot of knowledge to complete the research. Also, I would like to thank my colleagues, Mohd Jamil and Mohd Hakim for the cooperation and a lot of brilliant ideas and knowledge we shared. Last but not least, the members of Nanopharmacy Laboratory and research assistants who were always helpful in giving advices and teaching on technical aspects during my laboratory work.

## TABLE OF CONTENTS

	<b>Page</b>
<b>TABLE OF CONTENTS</b>	iii
<b>LIST OF TABLES</b>	vi
<b>LIST OF FIGURES</b>	vii
<b>LIST OF ABBREVIATIONS</b>	ix
<b>ABSTRACT</b>	xii
<b>CHAPTER 1 INTRODUCTION</b>	
1.1 Introduction	1
1.2 Problem statement	4
1.3 Objective of the present study	4
1.4 Hypothesis of the present study	4
<b>CHAPTER 2 LITERATURE REVIEW</b>	
2.1 Solubility	5
2.2 Non-steroidal anti-inflammatory drugs	8
2.3 Ibuprofen	10

## **ABSTRACT**

Different concentrations of sucrose laurate solution with constant amount of ibuprofen were prepared to study the effect of sucrose laurate surfactants on solubility of ibuprofen. A study on standard calibration curve of ibuprofen was conducted to determine the amount of ibuprofen dissolved. Uv-vis spectroscopy was used to analyze the solubility of ibuprofen in sucrose ester surfactants. The results proved that sucrose laurate can improved the solubility of ibuprofen.

Keywords: solubility, ibuprofen, surfactant, sucrose laurate

# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction.

The poor solubility and low dissolution rate of poorly water soluble drugs in the aqueous gastro-intestinal fluids often cause insufficient bioavailability. This can be achieved by incorporating the drug in a hydrophilic carrier material obtaining products called solid dispersions. Depending on the properties of both, drug and carrier, and depending on their ratio, a solid solution or a solid suspension of the drug in the carrier material may be formed. The mechanisms involved in solubility and dissolution rate enhancement include transformation of unstable modifications into more stable ones or even into the amorphous state, reduction of particle size possibly to the molecular level as well as improvement of wettability and solubility of the drug by the carrier material. However, if a solid dispersion represents a thermodynamically unstable system, it is prone to convert into a more stable state (Mohanachandran, Sindhumol, & Kiran, 2010).

Ibuprofen is one of the drugs that are classified under non-steroidal anti-inflammatory drugs (NSAIDs). It acts by inhibiting isoforms of cyclo-oxygenase 1 and 2. NSAIDs are usually poorly soluble in water and it has usually associated with