UNIVERSITI TEKNOLOGI MARA

ELUCIDATION OF MOLECULAR PROCESSES DURING SOLUBILITY ENHANCEMENT OF AQUEOUS INSOLUBLE DRUG BY NMR SPECTROSCOPY

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ABSTRACT

β-cyclodextrin is one type of cylodextrins that has six dextrose rings and has the ability to act as a hydrotropic agent. It has the ability to bind to organic molecules in aqueous solution which may result in solubility enhancement of the guest molecule. An inclusion between Griseofulvin, an antifungal drug which has a poor solubility in aqueous solution with β-cyclodextrin was obtained. The inclusion complex was then investigated by means of ^{1}H NMR spectroscopy in aqueous solution. NMR spectroscopy is the most reliable method for the study of inclusion complex interactions as both the host and guest molecules can be observed simultaneously.

CHAPTER 1

INTRODUCTION

1.1   Introduction

The ability to interact within aqueous environment will determine the solubility of a substance in aqueous solution. To ensure the drug delivery and its bioavailability in specific body's tissues as well as cells to be optimum, the important thing that should be into account is the solubility of the drug.

Due to this element, there are many approaches that have been developed to improve the solubility of drugs. Some of the ways to improve the drug solubility are by increasing the total surface area of drug, by modification of crystal form of drug, and also by inclusion together with complexation of drug substance with excipient.

Complexation of drugs is very important in pharmaceutical industry because it may serve as a mechanism to improve release and effectiveness of drugs. The carrier are used in drug delivery system as control release technology to prolong the dissolution time of drugs in the body, decrease drug metabolism and also reduce drug toxicity.