UNIVERSITI TEKNOLOGI MARA

MICROSCOPIC CHARACTERISATION OF SPHEROIDS

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ABSTRACT

The influence of microwave treatment on spheroid pore and surface characteristics against drug release profile was investigated. The spheroids were prepared by extrusion-spheronization process followed by drying in hot air oven. Both blank and drug loaded spheroids were treated by microwave. The physical changes of spheroids were observed microscopically using a stereo microscope to observe the changes before and after spheroids subjecting to microwave treatment. Drug release profile was determined by performing drug dissolution test for both untreated and treated spheroids. Microwave treatment changed pore and surface characteristics of spheroids. However, an increase in drug dissolution of microwave treated spheroids did not necessary accompany by an increase in pore population of spheroids. Other factors such as drug-polymer interaction, polymer-polymer interaction, polymorphism and crystallinity of drugs, could have roles in drug dissolution.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Spheroids are multiparticulate drug delivery dosage form which offers therapeutic advantages such as less irritation of gastrointestinal tract. They demonstrate better flowability, provide less friable microparticles, have a very low percentage of fines and are easy to coat due to their surface morphology which is less porous and more spherical (Chukwumezie et al., 2002). They are suitable for use as multiple-unit dosage form because of their ability to readily release the active constituent from either hard gelatin capsules, tablets or sprinkles. These advantages help their role in drug release and drug dissolution process. There are many terms used to describe drug release process: delayed release indicates that the drug is not being released immediately following administration but at later time; repeat action indicates that an individual dose is released fairly soon after administration and the next dose will be released at intermittent intervals in subsequent phase; prolonged release indicates that the drug is provided for absorption over a long period of time; sustained release indicates an initial release of drug sufficient to provide a therapeutic dose soon after administration, and then gradual release over an extended period. Extended release dosage forms release drug slowly, so that plasma drug concentration is maintained at a therapeutic level for a prolonged