UNIVERSITI TEKNOLOGI MARA

DISSOLUTION OF CROSSLINKER FROM ALGINATE BEADS

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ABSTRACT

The influence of microwave on dissolution media and their effects on calcium release properties from alginate beads was investigated. The beads were prepared by an extrusion method with sulfanilamide, sulfamerazine and sulfathiazole as model drugs. Deionized water was used as dissolution medium, either as untreated water or treated water by microwave at 80 W for 37.5 min or at 300 W for 10 min. The profiles of calcium dissolution were determined by dissolution testing and atomic absorption spectrophotometry assay. Sulfanilamide-alginate beads gave the highest rate of Ca^{2+} release when untreated water was used as dissolution medium. Sulfamerazine-alginate beads gave the highest rate of Ca^{2+} release for water treated at 80 W, while sulfathiazole-alginate beads gave the highest rate of Ca^{2+} release when water treated at 300 W was used. This could be due to different acidic level and energetic status among these dissolution media.

CHAPTER 1

INTRODUCTION

Polysaccharide such as alginate has been widely employed in the formulation of pharmaceutical solid dosage forms. Wide application of alginate is attributed to its biodegradability and low oral toxicity. Recent efforts in dosage form development result in a number of controlled drug delivery systems containing of a drug encapsulated within a suitable polymer carrier such as alginate. The embedded drug molecules generally exhibit a fast rate of drug release via diffusion through the pores of the matrix. However, such rate of drug release is undesirable in the case of need to target the drugs to the lower part of gastrointestinal tract, particularly, the colon. The objective of this study was to determine release profiles of calcium ion from calcium alginate beads, with sulfanilamide, sulfamerazine and sulfathiazole as the model drugs. The percentage of calcium ion released from the alginate beads in dissolution medium treated by microwave was compared to those of the untreated dissolution medium.