UNIVERSITI TEKNOLOGI MARA

SOLUTION STATE CHARACTERIZATION OF POLYVINYL PYRROLIDONE (PVP) WRAPPED INDOMETHACIN

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Dissertation submitted in partial fulfillment of the requirement for the Bachelor of Pharmacy (Hons)

BACHELOR OF PHARMACY

2013

ACKNOWLEDGEMENTS

I am highly indebted to my respected supervisor Dr. M. K. Tripathy whose constant supervision, meticulous guidance and encouragement, this work has been carried out to completion. I thank him for the freedom of thought, expression and his trust, which was greatly bestowed upon me. I wish to express my appreciation to Ms Raden and Ms Mala for their guidance and encouragement during this whole research period.

I also would like to thank all the master students from Fundamental of Pharmaceutics Laboratory and my entire lab mate for their cooperation and kindness to teach me along the research period and always correct me when I was wrong.

Last but not least, I find no words to express gratitude to my parents and all my family members for their love, affection and forbearance during the course of the study. I wish to express my deepest gratitude to Faculty of Pharmacy, UiTM and any person or organization, direct or indirectly contributed to this research.

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ABSTRACT

Indomethacin is an acidic non-steroidal anti-inflammatory agent that used mainly for the relief of pain and severe inflammation in the treatment of rheumatic disease and similar disorders. Indomethacin is a poorly water-insoluble drug that leads to low absorption and bioavailability. The solution state characterization of polyvinyl pyrrolidone (PVP) wrapped was studied by using saturation solubility, drug content assay and dissolution efficiency. The standard plot was calibrated after obtained $R^2 = 0.9992$. From the experiment, polyvinyl pyrrolidone wrapped indomethacin samples D (PVP-IDM-D) was showed maximum saturation solubility, 21.5 fold while the minimum saturation solubility is polyvinyl pyrrolidone wrapped indomethacin samples A (PVP-IDM-A), 8.63 fold. From the drug content assay, PVP-IDM-D showed 13.64% drug presence as compared to pure IDM with 96.94%. The dissolution study revealed a good result with 97.38% drug dissolved for PVP-IDM-D compared to 5.19% for pure IDM. In this study the results of the saturation solubility study and the dissolution study are complimenting each other.

CHAPTER 1

INTRODUCTION

1.1 Background of study

Rheumatoid arthritis is an autoimmune disease, in which the body's immune system mistakenly attacks the healthy tissues and leads to inflammation of the joints and surrounding tissues. It is a long term disease and can affect other organs. Usually women are more prone to have rheumatoid arthritis as compared to men, due to infection, genes and hormones. The joints that are commonly affected by rheumatoid arthritis are wrists, fingers, knees, feet, and ankles. These disease require early treatment such as medications, physical therapy, exercise and possibly surgery to delay the joint destruction (Board, 2011). The medications those are suitable for rheumatoid arthritis are methotrexate, leflunomide, aspirin, indomethacin and ibuprofen. Indomethacin is not commonly used because of its property of poor aqueous solubility and inappropriate bioavailability. It is classified as a Biopharmaceutics Classification System (BCS) Class II API with poor water solubility and high permeability (Keck & Müller, 2006).