

UNIVERSITI TEKNOLOGI MARA

**SYNTHESIS OF BENZOTHAZOLE DERIVATIVE
COMPOUNDS WITH POTENTIAL ANTI BACTERIAL
ACTIVITIES**

NOOR ARFIQAH AHMAD

**A dissertation submitted in partial fulfilment of the requirements for the
degree Bachelor of Pharmacy (Hons.)**

FACULTY OF PHARMACY

2013

ACKNOWLEDGEMENT

Alhamdulillah, all praise and glory be to Allah for making things easier for me in my life. My parent, without their encouragement, I would not be have been here. I thank to them for their unflinching prayers. It is my pleasure to express my deepest gratitude and appreciation to my main supervisor, Associate Professor Dr.Hesyam Rashwan. To my co-supervisor,Dr Mohammad Taha Hussein, I say may Allah continue increase their health and knowledge in any aspects of current life and hereafter. I also would like to thank and gratitude to my colleagues especially to Fatin Ummi Farhanah Mohd Nor and NoorShahida Ahmad Kamal for being sincere, useful suggestion, help and moral support during my hard time in completing this thesis. Last but not least, I would like to express my heartfelt thank to UiTM family especially staff Faculty of Pharmacy.

TABLE OF CONTENT

| TITLE | PAGE |
|--------------------------------------|------|
| TABLE OF CONTENT | i |
| LIST OF ABBREVIATIONS | iv |
| LIST OF TABLES | vi |
| LIST OF FIGURES | vii |
| ABSTRACT | viii |
| CHAPTER 1 – INTRODUCTION | |
| 1.1 Background of study | 1 |
| 1.2 Objective | 3 |
| 1.3 Research question | 3 |
| 1.4 Hypothesis | 3 |
| 1.5 Level of study | 4 |
| CHAPTER 2 – LITERATURE REVIEW | |
| 2.1 Infectious disease | 5 |
| 2.2 Antibiotics | 6 |
| 2.2.1 History | 6 |

ABSTRACT

Inappropriate use of anti-bacterial drugs for human caused evolving of the public health thread due to development of resistance by the bacteria towards the available anti-bacterial agents. Benzothiazole which is a bicyclic ring system having sulphur and nitrogen in the ring have found to possess various pharmacological activities including anti-bacterial activity. Due to this idea, a series of 26 benzothiazole derivative compounds have been synthesized through the reaction between several substituted aldehyde and 2-aminothiophenol. The synthesized products were undergone thin layer chromatography and nuclear magnetic resonance to study their structures and to check their purity. Further study will be conducted in order to identify the anti-bacterial potential of the compounds.

CHAPTER 1

INTRODUCTION

1.1 Background of Study

Search for new antibacterial agents to treat bacterial infections was carried due to increased incidence of multi resistant bacterial infections in hospitals and in the community and development of bacterial resistance to available antibiotics (Namita & Mukesh, 2012). Due to the rapid development of bacterial resistance to antibacterial agents, it is vital to discover novel scaffold for the design and synthesis of new antibacterial agents to help in the battle against pathogenic microorganism (Ghodgaonkar et al., 2010).

Thiazole is a heterocyclic compound that contains both sulphur and nitrogen atoms. It is also members of the azoles heterocycles that includes imidazole and azoles. Thiazole is a very useful compound in pharmaceutical and agricultural industry (Kaspady et al., 2009). For example, aminothiazole is an important structure in medicinal chemistry as it has broad applications in drug development as anti-fungal (Khabnadideh, et al., 2012), anti-tumor (El-Subbagh, Abadi, & Lehmann, 2002), anti-bacterial (Kaspady et al.,