

CHAPTER I

INTRODUCTION

I.1 Background

In recent decades the demand of antibiotics have been increasing significantly since people aware that general medicine is getting less power in curing diseases. Antibiotic is also used for external medication particularly for first aid of wound or external injures. The utilization of antibiotic in external medication is mainly to prevent the infection of certain bacteria when somebody get injure.

Antiseptics are usually used for first aid for external injures before wound get infection. The function of antiseptics are for medical equipment after surgery, cleansing skin after injury, cover wounds before infected, and preparation before injection to skin surfaces. Antiseptics are used for killing bacteria because the main compound of antiseptics are iodine and thimerosol. The tincture of iodine effectively kill bacteria, but if the dosage is too high, it can cause skin irritation. Thimerosol contain mercury compound that dangerous for environment and human body. Another antiseptic that commonly used is ionic silver. Ionic silver properties is bactericidal, it means has ability to kill bacteria effectively, but ionic silver will cause metal pollution on soil and water. Water and soil pollution because high concentration of ionic silver will be dangerous for health.

That is important to find new antibacterial that safe for human body. Antibiotic composite is one of the solution. Antibiotic composite is safe for skin since it keep skin from irritation. Doripenem is one of generic antibiotic and easy to find. Doripenem has ability to be inhibitor for synthesis protein so bacteria will be dead and it has wide spectrum of bacteria inhibition.

This research will study the process of making antibiotic composite (bentonite and doripenem). Antibiotic composite will be made by adsorption of doripenem into bentonite. The effect of various pH, kinetic adsorption, and isotherm adsorption of doripenem into bentonite are investigated in order to determine the best condition of adsorption. This study are investigated the effect of antibacterial composite on *nutrient agar* so everyone can used this antibacterial composite for medical purposes.

I.2 Objectives

1. To study the effect of various pH on the adsorption of doripenem into bentonite.
2. To study the characterization of bentonite before and after doripenem adsorption on its functional group using FTIR.
3. To study the isotherm adsorption and adsorption kinetics of doripenem into bentonite.
4. To study the effectiveness of doripenem bentonite to prevent infections.