

CHAPTER I

INTRODUCTION

1.1 Introduction

In the recent years (1991-1993), United Pharma Antibiotic Industries Co., Ltd. had a problem in separation of triethylamine, the problems are low percentage recovery, the emulsion interphase between layers, and low purities (approximately 55% triethylamine before demulsification). A further study is to find a more economical process for the manufacture of amoxicillin trihydrate by using recovered triethylamine.

Mother liquor of amoxicillin trihydrate has various solvents, acetone and methylene chloride approximately 10% and triethylamine approximately 5%. Therefore, triethylamine must be recovered and purified.

The solvents could be separated by fraction distillation and the triethylamine could be recovered from the aqueous layer by mixing with the alkaline solution (50%w/v NaOH) with an aqueous base and adjusting pH values greater than 9 [1]. At temperatures below 15°C, triethylamine is miscible with water, above 15°C triethylamine and water were only slightly miscible. A triethylamine chilled below 15°C mixes well with water [2]. Triethylamine was separated from the water-triethylamine mixture by heating the mixtures to temperatures above the miscibility point (about 55°C).

When the organic compound was separated from mother liquor, COD of mother liquor decreased.

1.2 Objectives

The objectives of this research are as follows:

- 1). To study the separation of triethylamine from residual mother liquor of amoxicillin trihydrate process.
- 2). To study the reuse of the recovered triethylamine in production of amoxicillin trihydrate.

1.3 Scope of the Investigation

In this research, the necessary procedures to carry out the successful research are as follows:

1. Literature survey and in-depth study of the research work.
2. Distillation of mother liquor from process of amoxicillin trihydrate to separate the solvents (methylene chloride and acetone).
3. Separation of triethylamine from residual mother liquor of amoxicillin trihydrate process by amine salt reaction.
4. Purification of triethylamine by distillation and demosturization by adsorption.
5. Preparation of the amoxicillin trihydrate from fresh triethylamine and recovered triethylamine and comparison of the result.
6. Analysis of COD value of mother liquor and residual mother liquor.