



CHAPTER I

INTRODUCTION

In recent years petrochemical industry is the most favorite industry in Thailand. It has been developed since 1966[1]. Petrochemical complex is classified into 3 groups as follows:

1. Primary petrochemical industry, this section is used to produce primary petrochemical substances as follows : ethylene, propylene, butadiene, toluene and xylene. These materials are produced from natural gas or petroleum or naphtha or LPG.

2. Secondary petrochemical industry, it takes materials from primary petrochemical industry to produce plastics and synthetic rubbers.

3. Finally petrochemical industry, this section is used to produce plastic instruments.

Catalytic reforming is a main process in the production of aromatics such as benzene, toluene and xylene in petrochemical industry. The feedstocks, naphthenes-reformer feed stocks, are complex mixtures of paraffins, naphthenes, and aromatics, generally containing six to ten carbon atoms per molecule. The catalytic reforming processes consist of the reactions as follows:

1. Dehydrogenation of naphthenes to aromatics
2. Isomerization of naphthenes and paraffins
3. Dehydrocyclization of paraffins
4. Hydrocracking of paraffins.

The modeling of these reactions have been developed in recent years. Most of the studies so far conducted have been carried out in isothermal mode of operation with pure hydrocarbons or with lumped hydrocarbons in adiabatic mode of operation with using narrow ranges of conditions. Thus, the effect of operating conditions on catalytic reforming processes have not been evaluated.

Catalytic reforming process is also the main unit operations in petroleum refining processes, which is used for increasing octane number [1-4]. The main problem in operating this unit is the difficulty to predict the behavior of the process because the mechanism of reactions that take place in this process is complex. Moreover, the process depends on a number of process parameters and variables such as process operating condition, catalytic activity, feedstocks, etc.

The Objectives of This Study

To model an actual process of catalytic reforming in a refinery for predicting the behavior of the catalytic reforming process.