

## **CHAPTER I**

### **INTRODUCTION**

Natural gas from the gulf of Thailand is separated by gas separation plants to improve the quality of products such as methane, ethane, propane, liquefied petroleum gas (LPG) and natural gas liquid (NGL). Nowadays, the Petroleum Authority of Thailand (PTT) has increased the separation capacity by constructing 4 units of gas separation plants, which can serve the demand of petrochemical industries, domestic energy consumption and also export to China, Vietnam, Singapore and Indochina countries. According to total productivity of 4 units, LPG is produced with the highest capacity of approximately 900,000 tons per year and followed by ethane and propane with the capacity of approximately 500,000 tons per year (The Petroleum Authority of Thailand, 1999). With high productivity of LPG, PTT has concentrated in improving the value of LPG via separating out isobutane, which is contained about 20% by mole to make new product. The isobutane product is more valuable than LPG and can serve refrigerant customers' demand.

The commonly used processes for separating isobutane are distillation, adsorption and a combination of distillation and adsorption. The distillation process was selected for this study because of its widely used. Also, distillation is not complicate to operate and maintenance.

For the preliminary estimate design, a computer design and simulation are simple and economical way to study. The PRO/II software was selected to be a tool for the design and simulation, and EXCEL was used in the cost and profit estimation.