CHAPTER I

INTRODUCTION

The discovery of natural gas reserves in the Gulf of Thailand came up with the pride and joy for all Thai people. Such discovery can be considered a variable support in ensuring the Thai position in petrochemical development. Thailand has thus emerged as a newly industrialized country with tremendous invesment opportunity. This is truly the beginning of Thailand's economic prosperity. To bring out uttermost benefits of indegenous natural gas, NPC was established to support a great success in the first stage development of petrochemical industry.

Up to now plastics have become not only of a higher quality than previously, but also of greater importance than ever before. In appearance, strength and other qualities, plastics can duplicate declining natural resources, such as wood and metals, and therefore have a vital role to play as materials in daily use. Ethylene, the most important building block in the chemical industry, is a monomer that is used in preparing a number of olefin polymers.

Pyrolysis of hydrocarbons is the industrial process to produce ethylene, which is invariably contaminated by small amount of acetylene. Depending on feed and process conditions, acetylene may range from 0.05 to 0.08 wt% of the ethylene stream. In the manufacture of polyethylene where even small amounts of acetylene can destroy the polymerization catalyst, it is thus generally required that the acetylene content be less than about 10 ppm, most preferably less than about 5 ppm [1,2]. The commercial process to remove traces of acetylene in a large excesss of ethylene is selective hydrogenation over palladium-based catalysts. Among the metals of group VIII, palladium is the most active and selective metal for acetylene hydrogenation [3,4]. Although palladium is the most suitable metal for selective hydrogenation, high ethylene loss is still inevitable.

Consequently, catalysts with higher selectivities to ethylene have been sought to improve the performance of this process.

In this study, an attempt is made to improve the performance of selective hydrogenation catalysts by alloying palladium with group IB (Ag) to serve as a promoter.

The objectives of this thesis are as follows:

1) To study the preparation method of palladium-based and silver-promoted palladium catalysts.

2) To study the effect of nitrous oxide addition on the promoted palladium catalyst.

3) To study the stability of the promoted catalyst under non-N_2O and N_2O addition.