CHAPTER I
INTRODUCTION

One of the most common problems of post harvest fruits and vegetables is the limitation of their fresh and shelf-life. The new food-packaging systems have been developed as a response to trends in consumer preferences towards mildly preserved, fresh, tasty and convenient food products with a prolonged shelf-life. Traditional systems are reaching their limits with regard to further extension of shelf-life of packaged food. To provide this shelf-life extension, and to improve the quality, safety and integrity of the packaged food, innovative active and intelligent packaging concepts are being developed. Active packaging changes the condition of the packaged food to extend shelf-life or improve food safety or sensory properties, while maintaining the quality of packaged food. Examples of active packaging systems are oxygen scavengers, ethylene absorbers, moisture regulators, taint removal systems, ethanol and carbon dioxide emitters, and antimicrobial releasing systems. Intelligent packaging systems monitor the condition of packaged food to give information about the quality of the packaged food during transport and storage. Typical examples of intelligent packaging include indicators of gas leaks, time-temperature history and microbial spoilage. .

The main problem of a prolonged shelf-life of fresh fruits and vegetables is ethylene gas. Ethylene (C_2H_4) acts as a plant hormone that has different physiological effects on fresh fruit and vegetables. It accelerates respiration, leading to maturity and senescence, and also softening and ripening of many kinds of fruit. Furthermore, ethylene accumulation can cause yellowing of green vegetables and may be responsible for a number of specific postharvest disorders in fresh fruits and vegetables. To prolong shelf-life and maintain an acceptable visual and organoleptic quality, accumulation of ethylene in the packaging should be avoided. Ethylene can also be removed by using a number of chemical processes.

According to the structure of organoclay which has high surface area, it can adsorb gas such as oxygen and ethylene gas. The addition of ethylene scavenger chemical to organoclay would enhance the efficiency of organoclay to eliminate ethylene gas from the system. When ethylene scavenger based on organoclay blend with

polypropylene, it can be applied as packaging film to improve the shelf-life of the fresh products.

All above ideas lead to the purpose of this research, the preparation of the ethylene scavenger film based on PP/organomodified clay. The contents of clay mineral and ethylene scavenger will be optimized and incorporate into the packaging film. The effect of clay mineral and ethylene scavenger on the mechanical properties and thermal properties are also studied. X-ray Diffractometer (XRD), Fourier Transform Infrared Spectroscopy (FTIR), and Thermogravimetric Analysis (TGA) are used to characterize ethylene scavenger film. The ethylene gas permeability and the capable to use as ethylene scavenger film are also investigated.