CHAPTER I

INTRODUCTION

Nowadays food packaging systems are increasingly important in food products because the problem of post harvest fruits and vegetables or meat products are the limitation of their fresh and shelf-life. Innovative packaging with enhanced functions is developing to response the consumer demands or industrial production in order to preserve the fresh and tasty of convenient food products by prolonged shelf-life and controlled quality.

In general, innovative packaging for food product can be categorized into sub-different class; active and intelligent packaging. Active packaging is defined as a packaging that changes the condition of the packed food to extend shelf-life or to improve safety or sensory properties while maintain the quality of packaged food. Intelligent packaging, distinctly different concept from active packaging system, it is the packaging that monitor the condition of packaged food to give information about the quality of food during transport and storage to the manufacturer, retailer and consumer.

Up to the present time, intelligent packaging technologies are used for quality control such as time-temperature indicators, integrity indicators (leak indicators) and freshness indicators. At present, freshness indicators are interesting techniques which are used to monitor the status of food spoilage. Freshness indicators provide the direct product quality information resulting from microbial growth or chemical changes within food product resulting in pH changes, formation of toxic compounds, off-odors and gas formation. The indication of freshness can be based on the reaction between the indicator and the metabolites produced from food product.

Recently, porous clay heterostructure (PCH), one of the most common used materials in smart packaging due to the excellent barrier properties as well as superior ability of gas adsorption from its high surface area. Moreover, in order to synthesize PCH with organic-inorganic hybrid structure, the structure of inorganic frame works is combined with organic group in pore structure for providing the high gas adsorption property for gas molecules and selectivity for organic compound.

The food industries are interested in developing methods to evaluate the real time freshness of food product. The development of a freshness color indicator in the form of smart packaging is the one concept that cans response the industry demand.

In this study, we have focused on the preparation of colorimetric indicator for detecting fish and climacteric fruit freshness based on polypropylene/chromophores (methyl red) modified functionalized PCH nanocomposite films and low density polyethylene/chromophores (bromothymol blue) modified PCH nanocomposite films, respectively. Methyl red and bromothymol blue acted as the pH indicators for determine freshness of product through the visible color change. The mechanical properties, thermal properties, permeability and the effect of processing conditions of the nanocomposites were investigated. In addition, leaching of the dye was also studied to assess the suitability of the sensor formulation for food packaging application.