



## CHAPTER 1

### INTRODUCTION

Plastics are widely used in many applications because of their advantages over other materials such as light weight, low cost and easy to process etc. However they also create some environmental problems after use. Plastic waste is undegradable by itself. The most common method to get rid of the plastic waste in Thailand is landfills. Which is not efficient enough to cope with the rapid growing of all the waste. Many methods have been investigated to solve this problem which includes recycle technique and synthesis of photodegradable and biodegradable plastics. In this work, emphasis was made on the photodegradable mechanism of commercial grade polyolefin films.

Usually, disposable packaging is made of polyethylene and polypropylene (Appendix A). The exposure of polyolefins at high energy radiation causes the formation of various free radicals. Some of these radicals combine with oxygen dissolved in the polymers to initiate chain reaction and form thermally unstable products. The oxidative process involves peroxide radicals derived directly from the radiation reaction and also these initial peroxide radicals attack on the polymer. Hydroperoxide (ROOH) are believed

to slowly breakdown and produced carbonyl compounds. The carbonyl compounds predominate those expected from the Norrish type I and II process.

In the past, investigations on photooxidative degradation of polyolefins. Have been carried out extensively. They found that the chemical and mechanical properties were changed when exposed to UV light. However, the different whether condition in each country creates different UV intensity which directly effects the properties of the films. The purpose of this is to study the influence of UV light on degradation of polyolefin films under a tropical climate in Bangkok metropolis (Thailand) by observing the changes in chemical and, mechanical properties. A comparison is also made in the simulated chamber condition of Xenotest Beta Lamp.



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