

## **CHAPTER I**

### **INTRODUCTION**

Nowadays, petrochemical industries become an important role in our daily life. Most of materials or some parts of materials are polymers. It is notice that world population are increasing every year and it would cause a serious issue in petroleum resource. Therefore, the petrochemical industries such as polymer industries are interested in recycling material, reducing the cost of products line and also maintain properties of materials in order to reserve the petroleum resource for the next generation.

Polymer blend is the concept of mixing two or more polymers together. Materials which are satisfied customers should be low price and has suitable properties. Since the industry must reduce the amount of polymer by replacing another material to keep polymer properties the same.

When two or more polymer is mixed, it could cause miscible and immiscible blend. If we get immiscible blend, polymer properties would be drop. In order to solve this problem, compatibilizers play a crucial role in making two phases mixing well.

In polymer market share, Polyethylene (PE) comes first because PE has the simplest structure therefore it cause less money for producing. Polyethylene has several types like high-density polyethylene (HDPE), Low-density polyethylene (LDPE) and Linear low density polyethylene (L-LDPE). One of the importance types of polyethylene is HDPE. HDPE is one of the most polymers that people are using.

The other polymer that our group is interested is the PBT. PBT is thermoplastic that play an essential role in car, electronic appliance industries. Since PBT have high melting point, it can use in high temperature environment and high impact resistance. In the production line in industries, replacing of polybutylene terephthalate (PBT) into other polymers will reduce the cost of materials and also reserve the resource much longer for the next generation.

HDPE and PBT blend polymer cause immiscible blend therefore finding a

proper compatibilizer is the main point of this issue. Previous study indicated that a compatibilizer must have physical or chemical interaction with both parts of polymer blends.

In this research, we are studying the compatibilization and mechanical properties of HDPE and PBT polymer blend by using Fusabond as a compatibilizer.