



## CHAPTER I INTRODUCTION

Nowadays, the environmental problem is the most important critical problem that all the world concern and pay attention. One of cause of problems is from post consumer waste especially plastic waste, so recycling of plastic wastes is the a solution to reduce pollution from post consumed waste.

Although plastic waste recycle has been studied for long time, but the existing technique still exhibit some problem involving waste separation step. Owing to the large amount of house waste consists of many different type of materials (e.g. PE, PP, or PVC) or engineering materials from different source. These wastes have to be separated into main type result in economical loss and also time consuming of this step.

Blending of polymer is a developed technique to improve polymer properties using principle of mixing of different multi polymers. Objective of making polymer blend is combination the excellent properties of each component to compensate the weak point of each other. Moreover it can be applied to recycling industry to overcome the waste separation step. For example, blending of high density polyethylene (HDPE) with polypropylene (PP), both of the polymers are commodity polymers which widely used in household. Another purpose of making HDPE/PP blends is to improve the impact strength of PP at low temperature by addition of PE. At the same time adding PP into HDPE can also increase transparency to HDPE also (Schurmann, 1997).

Main problem of polymer blending is miscibility between different types of polymer component. In case of HDPE blend with PP, generally it is not miscible with each other (immiscible) resulting in the poor adhesion between two phases and form coarse morphology (Souza, 2002) and final mechanical properties of the blend is low and cannot reach the goal of the blend. However some scientists report that using of appropriate ratio of HDPE/PP can enhance mechanical properties, tensile strength. Adding of HDPE can increase the impact strength of PP. These properties depend on mixing condition.

From the studies, there are many ways to improve miscibility and compatibility of polymer blends such as adding of compatibilizer, using of block or graft copolymer which offer reaction by in situ compatibilization during melt processing also known as reactive compatibilization, maleated functionalized polymer which is widely used for compatibilization in polymer blend especially in polyamide blend with polyolefin like PP or PE due to maleic anhydride (MAH) which is already functionalized onto those polyolefin can further react with amide group of PA and form block or grafted copolymer and locate at the interface of PA/polyolefin to reinforce the blend.

The mainly purpose of this work is to study effect of using two set of grafted material prepared from MAH functionalizes PE and PP to compatibilize PE/PP blend. Different grade of PE and PP were used in grafting preparing step and also used for polymer base component in the blend step. It was expect that PP and PE segment from PP-g-MAH and PE-g-MAH can miscible with PP and PE matrix or minor phase in the blend, however we predict that the totally miscible cannot reinforce at the interface of the blend component. The prepared blend will be test in mechanical, flow properties and thermal properties.