CHAPTER I
INTRODUCTION

Thermoplastics reinforced with wood fillers are highly growth due to their many advantages such as light weight, flexible processing and eco-friendly. Natural wood, which consists primarily of cellulose, hemicelluloses and lignin, is preferably served as building and engineering material. However, the global warming and environmental problem are resulted from deforestation and the price of natural wood is drastically increased. The conversion of wood particle, such as chip, fibers and powder which are the waste from wood process, into useful products like wood plastic composites are economical and ecological solution for mentioned problems.

The plastics used for wood plastic composites usually are commodity plastics such as polyethylene (PE) and polypropylene (PP). They have good properties and low price, as well as versatility in processing and applications. However, due to the poor compatibility between hydrophobic thermoplastics and hydrophilic wood particles several treatments are developed to improve the interfacial bonding. Among of those treatments, the use of compatiblizer like maleated polyolefin is the most favorable in producing WPCs.

Although WPCs contain many advantages, the lack of properties in thermal resistance, creep resistance and especially water resistance limit its applications. The incorporation of nanoclay is recently focused since the improvement in mechanical properties, heat resistance and gas permeability is observed even at the low clay content. At 5 wt % of clay loading, the strength is increased over 70% and heat resistance is improved almost 100% in the nylon-clay system (Wu *et al.* 2002).

There are some studies reported on the addition of nanoclay into WPCs, but, mostly, the used nanoclay is retrieved from only one company or two. The purpose of this research is to fabricate WPCs from PP and wood flour with an incorporation of nanoclay obtained from domestic Bentonite using maleic anhydride grafted on polypropylene (MAPP) as a compatibilizer. The properties of the composites, including the morphology, are also investigated.