CHAPTER 1

INTRODUCTION

Wood is the most popular natural resource from the past until now, especially hard wood due to its properties on relatively high strength and durability. However, wood with decent properties is now become shortage and expensive. Therefore, seeking for new sources of raw wood materials with sufficient supply e.g. softwood is an alternative option that could be very useful. However, the quality of softwood is inferior to hardwood unless improvement is made to enhance the properties. This process should help improving the shortage supply of wood.

In the past, many research works were carried out on the improvement of many kinds of softwood e.g. rubberwood, durianwood through wood polymer composites. This process involved impregnation of monomers into void spaces of wood with subsequent polymerization. The most popular monomers for these purposes were styrene, methyl methacrylate, acrylonitrile and unsaturated ester for instances.

Coconut wood is a kind of softwood with plenty of supply. The tree has a long, lean stem and capable for versatile applications. The inner thorns of the wood are straight, fits just right the kind of beneficial wood. After transforming, straight wood, with beautiful pattern can be achieved and so far no experiment had been tried to improve the quality of coconut wood. Because of low natural durability of coconut wood, this is thus a motivation to improve the quality of coconut wood to replace the supply of hardwood for applications in wood industry, furniture and building structures in the future. [1]

1.1 Objectives of the Research Work

1. To study the influential factors of making coconut wood polystyrene composites
2. To determine physical and mechanical properties of coconut wood polystyrene and coconut wood poly(styrene-co-methyl methacrylate) composites

1.2 Scopes of the Research Work

In this study, coconut wood polymer composites were prepared by impregnating the coconut wood with styrene and the combinations of styrene and methyl methacrylate under reduce pressure and subsequent polymerization by catalyst-heat treatment. Influential factors such as evacuating time, soaking time, initiator content, curing temperature, ratios of monomer and cross-linker content were investigated. Finally, the water absorption, water repellent effectiveness, volumetric swelling coefficient, antiswelling efficiency, flexure stress, modulus of elasticity, compressive parallel to grain, termite resistance and microstructure by scanning electron microscopy of coconut wood polymer composites were investigated.