

## CHAPTER 5

### CONCLUSION

Coconut wood polymer composites were prepared by impregnating the coconut wood with styrene and the combinations of styrene and methyl methacrylate under reduced pressure and subsequent polymerization by catalyst-heat treatment. The results showed that the properties of coconut wood polymer composites were affected by evacuating time, soaking time, initiator and cross-linker contents. The optimum conditions for low and medium density coconut wood polymer composites were shown in the table below.

Condition	Low density-WPC	Medium density-WPC
Evacuating time (hrs.)	0.5	2
Soaking time (hrs.)	1.0	4.0
MEKP content (%) by weight	2.0	2.0
Curing temperature (°c)	70	70

Low density coconut wood polystyrene composites which obtained under the optimum condition gave high polymer loading resulted in improvement on the properties. The water absorption and volumetric swelling coefficient were decreased by 63% and 46%, respectively. The flexure stress, modulus of elasticity (MOE), compression and density were increased by 100%, 72%, 34% and 117%, respectively.

For low density coconut WPC-ST/MMA, the water absorption and volumetric swelling coefficient were decreased by 50% and 19%, respectively. The flexure stress, modulus of elasticity (MOE), compression and density were increased by 21%, 3%, 126.76% and 68%, respectively.

Medium density coconut wood polystyrene composites which obtained under the optimum condition gave high polymer loading resulted in improvement on the properties. The water absorption and volumetric swelling coefficient were decreased by 53% and 46%, respectively. The flexure stress, modulus of elasticity (MOE), compression and density were increased by 19%, 27%, 77% and 50%, respectively.

For medium density coconut WPC-ST/MMA, the water absorption and volumetric swelling coefficient were decreased by 29% and 14%, respectively. The flexure stress, modulus of elasticity (MOE), compression and density were increased by 8%, 19%, 80% and 37%, respectively.

The microstructure investigation of impregnated coconut wood by SEM showed that the lumen of wood could be fully filled with polymer which resulted in improvement on the mechanical properties.

#### Suggestions for further study

1. Applications of low and medium density coconut wood polymer composites for furniture, vessel, wall, and high density coconut wood for flooring material, furniture, paneling, parquet, household and others should be explored.
2. The coconut wood polymer composites using other monomers should be investigated.