

Narubodin Mathurasa 2010: A Study of Factors Affecting Properties of Polypropylene/Sugarcane Bagasse Fiber and Recycled Carbon Nanotube Composite using Experimental Design. Master of Engineering (Industrial Engineering), Major Field: Industrial Engineering, Department of Industrial Engineering. Thesis Advisor: Mr. Chuckaphun Aramphongphun, Ph.D. 113 pages.

This research work is aimed to study the properties of Polypropylene composites mixed with sugarcane bagasse fiber and recycled carbon nanotubes in which maleic anhydride grafted Polypropylene (MAPP) is used as a compatibilizer. The composite materials were prepared by melt compounding and formed by injection molding. The Full Factorial design was used to plan the experiments and consider the influence of each factor on Young's modulus, tensile strength and impact strength. These conditions consist of three factors: (a) %wt content of sugarcane bagasse fiber: 0, 15 and 30 %wt, (b) %wt content of maleic anhydride grafted Polypropylene: 0, 5 and 10 %wt, (c) %wt content of recycled carbon nanotubes: 0 and 0.5 %wt, Analysis of Variance (ANOVA) indicated that all factors including the content of sugarcane bagasse fiber, carbon nanotubes, and MAPP significantly affected mechanical properties. In addition, according to the most suitable mixture in the experiments, it was found that Young's modulus was increased by 2.96 times and tensile strength was increased by 13.24 % compared to Polypropylene.

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