

**UNIVERSITI TEKNOLOGI MARA**

**THE EFFECT OF DIFFERENT SILANE  
COUPLING AGENT CONCENTRATION  
TOWARDS PHYSICAL AND MECHANICAL  
PROPERTIES OF POLYPROPYLENE/BANANA  
FIBER COMPOSITE**

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Thesis submitted in fulfilment  
of the requirement for the degree of  
**Bachelor of Science (Hons.)**  
**Polymer Technology**

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## AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in the accordance with the regulation of University Technology MARA. It is original and is the result of my own work, unless otherwise indication or acknowledgement as referenced work. This thesis has not been submitted to any other academic institution or non- academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, University Technology MARA, regulating the conduct of my study and research.

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## **ABSTRACT**

Untreated and treated PP/BF composite had been prepared in this research using melt mixing process. The effect of different silane concentration (0.0%, 0.5%, 1.0%, 1.5% and 2.0%) for the BF treatment had been studied towards the physical and mechanical properties of the PP/BF composite. FTIR spectra show the removal of some hemicellulose and the reduction of OH group on BF surface after chemical modification. As for tensile testing, the tensile strength and tensile modulus shows the increasing in trend with the increasing of silane concentration used. This is due to the better interfacial adhesion properties between BF and PP matrix. However, there are gradually decreased in percent elongation break of PP/BF composite by increasing silane concentration, due to stiffening effect of BF on the composite sample was increase. Besides that, there are gradually increased in impact strength of the PP/BF composite with the increase in silane concentration used during treatment process as compared to the PP/BF filled with untreated BF. This is due to the better interaction between fiber and polymer matrix. Other than that, the increase silane concentration used during treatment process had lead to the decrease in percent of water absorption of the PP/BF composite. This is due to the reduced amount of OH molecules that can interact with water molecule. The highest silane concentration used (2%) to treat BF imparts highest physical and mechanical properties. This is due to the better interfacial adhesion between BF and PP matrix was achieved, and also the decreased of the OH group in the fiber due to the chemical treatment that had been done.