

UNIVERSITI TEKNOLOGI MARA

**THE EFFECT ON MECHANICAL
AND PHYSICAL PROPERTIES OF
COCONUT SHELL BIO-FIBER AS
REINFORCEMENT IN
UNSATURATED POLYESTER RESIN**

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AUTHOR'S DECLARATION

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ABSTRACT

THE EFFECT ON MECHANICAL AND PHYSICAL PROPERTIES OF COCONUT SHELL BIO-FIBER AS REINFORCEMENT IN UNSATURATED POLYESTER RESIN

The purpose of this project was carried out to investigate the physical and mechanical properties of coconut shell bio-fiber as reinforcement in unsaturated polyester resin composite. The coconut shell was treated by 50 wt % of alkaline treatment with NaOH solution and compared their mechanical and physical properties with untreated coconut shell. The treated of coconut shell strengthened unsaturated polyester was determined to have the largest impact on both the mechanical and chemical properties of the composites. Nevertheless, the tensile strength of CS/UPR treated with alkaline therapy was greater than that of untreated CS/UPR due to present of lignin. CS/UPR treated decreases the elongation at break owing to strong wettability. Elongation at break culminated in a decrease in its quality with a rise in fiber content. Engagement with treated CS reinforced unsaturated polyester resin had increased the hardness and impact intensity leading to strong crosslinking identification due to NaOH treatment. Moreover, CS/UPR treatment demonstrated the lowest water absorption. In summary, the optimal loading for treated CS is 20 php, which leads to high tensile strength, high modulus, higher impact intensity, lower elongation at break and low water absorption. As a consequence, the CS treated can be used as a filler in UPR composite.