

# MORPHOLOGY, MECHANICAL AND THERMAL PROPERTIES OF POLYPROPYLENE (PP) /KENAF REINFORCED COMPOSITES SUBJECTED TO DIFFERENT FIBRE TREATMENTS

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## ABSTRACT

In this study, different modifications were varied and combined in an attempt to find a desirable combination of modification, which will produce polymer composites with better mechanical properties, good resilience and improved environmental and thermal resistance. Composites of PP containing 0, 10, 15 and 20 % by weight kenaf fibre were prepared. Kenaf fibres, both unwashed and NaOH washed, were soaked in vinyl trimethoxy silane (VTMS) solution and then mixed with the thermoplastic in a Brabender mixer before extrusion. The effect of fibre loading in all the PP/Kenaf composites was investigated as well as the mechanical performance of the composites when VTMS solution was used. Kenaf fibres were examined using ATR-FTIR to confirm the formation of siloxane moieties that form bridges between the fibre and the PP matrix. Solid state  $^{13}\text{C}$  NMR was used to further characterize the modification on the composites. SEM micrographs showed better adhesion in NaOH washed fibre composites when compared with the composites reinforced with untreated fibre. Further improvement of interfacial adhesion was observed when the fibre was treated with VTMS with or without NaOH wash. The elongation at break for all the composites decreased significantly. The tensile strength and Young's modulus of the silane treated fibre composites slightly increased compared to the untreated composites. The TGA results show improved thermal stability for the silane treated composites when compared to the unwashed and NaOH washed fibre composites.