

Mechanical properties of hybrid glass/sugar palm fibre reinforced unsaturated polyester composites

Abstract

A research has been carried out to investigate the mechanical properties of composites made by hybridizing sugar palm fibre (*Arenga pinnata*) with glass fibre into an unsaturated polyester matrix. Hybrid composites of glass/sugar palm fibre were fabricated in different weight ratios of strand mat glass fibres: sugar palm fibres 4:0, 4:1, 4:2, 4:3, 4:4, and 0:4. The hybrid effects of glass and sugar palm fibre on tensile, flexural and impact properties of the composites were evaluated according to ASTM D5083, ASTM D790 and ASTM D256 respectively. Results have been established that properties of hybrid glass/sugar palm composites such as tensile strength, tensile modulus, elongation at break, toughness, flexural strength, flexural modulus and impact strength are a function of fibre content. The failure mechanism and the adhesion between fibres/matrix were studied by observing the scanning electron micrographs of impact fracture samples. In general, the incorporation of both fibres into unsaturated polyester matrix shows a regular trend of increase in the mechanical properties.

Keyword: Tensile test; Flexural test; Impact test; Hybrid composite; Sugar palm fibre