Mechanical properties of kenaf fibre thermoplastic polyurethane-natural rubber composites

ABSTRCT

Thermoplastic polyurethane-natural rubber TPUR-NR composites filled with treated and untreated kenaf fiber as filler were prepared at different TPUR and NR contents. The content of kenaf fiber was maintained at 12.5 wt % and the fiber was treated with 6 % solution of sodium hydroxide (NaOH), then dried for 24 hours in 100 °C, hot blended with polymer components, pulverized and pressed. The mechanical properties of the composites such as tensile, flexural and impact strength were determined, and their dependence on NaOH treatment of kenaf fibers was investigated. The analysis using scanning electron microscope (SEM) was implemented to identify the effect of alkali treatment on the microstructure of kenaf fiber and TPUR-NR composites. An improvement of fiber surface roughness and bonding between the fiber and polymer as well as an increase in impact energy and elongation at break of the composites was observed.

Keyword: Thermoplastic polyurethane-natural rubber TPUR-NR; Kenaf fiber; Microstructure.