

Ultra-violet radiation-cured biofiber composites from kenaf: The effect of montmorillonite on the flexural and impact properties

Abstract

Biofiber composites, cured by ultra-violet (UV) radiation were produced using kenaf fibers as the reinforcing agent and unsaturated polyester as the matrix. This research work focused on the effects of the incorporation of kenaf fiber, montmorillonite (MMT), and cetyl trimethyl ammonium bromide-modified MMT (CTAB-MMT) in the unsaturated polyester composite. Overall, the incorporation of kenaf fibers in the form of mat had improved the flexural and impact properties of the composites. Addition of MMT into the kenaf fiber-polyester system showed an improvement up to 1% MMT after which it decreased. The increase was attributed to better stress transfer mechanism in the matrix. However, further increase in the MMT loading had resulted in the decrease in the properties, which was believed to be due to agglomeration. Modification of MMT with CTAB had produced composites with higher flexural and impact properties as compared to those without modification. This was attributed to a combination of effective dispersion of MMT in the matrix, availability of effective high aspect ratio MMT, and enhanced compatibility between CTAB-MMT with the matrix.

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