

FTIR and TGA analysis of biodegradable poly (lactic acid) / treated kenaf bast fibre: Effect of plasticizers

Abstract

A biodegradable composite (PLA/KBF blends) was prepared using melt blending technique in a brabender mixer and characterized with FTIR and TGA analyzer. Five percent of triacetin and glycerol contents were used as plasticizers to plasticise PLA matrix. KBF was treated with 4% NaOH solution, while 30 wt% offibre loading was used constantly for all the composite samples. From the FTIR analysis, the additions of triacetin and glycerol to PLA composites did not produce any significant difference, and there were no chemical changes in both the plasticized PLA with the treated and untreated KBF, respectively. Observation done on the TGA analysis revealed that both plasticizers did improve the thermal stability of the composites, and this might be due to the modification on the fibre surfaces, which further led to the delay in the degradation of the PLA matrix and to significant stabilization effect.

Keywords

FTIR analysis; Glycerol; Kenaf bast fibre; Polylactic acid; TGA; Triacetin