

Influence of fibre contents on mechanical and thermal properties of roselle fibre reinforced polyurethane composites

ABSTRACT

The aim of this paper is to study the effect of fibre content on mechanical and morphological properties and thermal stability of roselle fibres (RFs) reinforced polyurethane (TPU) composites. The RF/TPU composites were prepared at difference fibre contents; 10, 20, 30, 40 and 50 wt% by melt mixed mixer and hot press at 170 °C. Mechanical (tensile, flexural and impact strength) and Thermogravimetric analysis (TGA) properties of RF/TPU composites were measured according to ASTM standard. Obtained results indicated that effect of fibre contents display improved tensile and flexural and impact strength properties. RF/TPU composites show the best mechanical and thermal properties at 40 wt% roselle fibre content. Scanning electron microscopy (SEM) micrograph of fractured tensile sample of the roselle composite revealed good fibre/matrix bonding. TGA showed that RF/TPU with difference fibre contents had improved thermal stability.

Keyword: Roselle fibre; Polyurethane (TPU); Mechanical properties; Thermal properties