

Thermal degradation and mechanical behavior of banana pseudo-stem reinforced composites

ABSTRACT

Banana fiber has potential to be utilized in bio-based composite structures due to its low price, abundantly available and biodegradability. However, the performance of this fiber is still not comparable to the synthetic polymeric system. In this work, the thermal stability analysis and tensile test of optimized banana fiber that was initially evaluated using response surface method were conducted. The thermal analysis and the tensile test were conducted using thermogravimetric analyzer and universal testing machine respectively. It was shown that the banana fiber content offered an outstanding performance in thermal stability. The highest thermal stability however, was found in neat epoxy resin system. The TG and DTG results showed the lowest amount of residue occurred in banana/epoxy composite. The tensile data properties revealed that banana composite is comparable to synthetic samples.

Keyword: Thermal analysis; Tensile strength; Banana; Epoxy; Synthetic fiber