

Mechanical properties of polymer composites with sugarcane bagasse filler

Abstract

Natural fibers reinforced polymer composites have gained more interest because of their biodegradable, light weight, less expensive sources, easy processing, high specific modulus and also environmentally friendly appeal. This paper presents an overview of a study aimed at showing on how the bio-composites which is bagasse fibers combined with resins as an alternative of bagasse fiber- based composites panel. Transforming bagasse fibers into panel products provides a prospective solution. Bagasse-fiber-based composites offer potential as the core material replacing high density and expensive wood-based fiberboard. Biodegradable composites reinforced with bagasse fibres after being modified or treated by alkali treatment were prepared and also the mechanical properties were investigated. The bio-composites panel samples were processed by hot press machine. All panels were made with aspect ratios between bagasse fibers and polystyrene thermoplastics resins and also the sieve size of bagasse fibers which has short fibers and combination of short fiber and granules fibers. The polystyrene was added as a modified from natural fibers to determine the effect it had on physical and mechanical properties of the panel. Resin content level and panel density were very important in controlling the strength properties of the panels. Surface hardness value, compressive strength, bending strength and bending modulus values all increases in resin content level and panel density. Bagasse-based-panel products can be commercialize successfully if have good development of a cost manufacturing process on an establishment of a market base for the products.

Keywords

Fibre panel composites; Mechanical properties; Polystyrene; Sugarcane bagasse fibre