

## **The effect of polypropylene maleic anhydride on polypropylene/(recycled acrylonitrile butadiene rubber)/(sugarcane bagasse) composite**

### **Abstract**

The effect of polypropylene maleic anhydride (PPMAH) on the tensile properties and morphology of polypropylene (PP)/(recycled acrylonitrile butadiene rubber) (NBRr)/(sugarcane bagasse) (SCB) composites has been studied. Six different composites (100/0/10, 80/20/10, 70/30/10, 60/40/10, 50/50/10, and 40/60/10), with fixed 5 wt% of PPMAH compatibilizer and without PPMAH addition, were carried out. The composites were prepared through melt-mixing technique at 180°C for 9 min using a rotor speed of 15 rpm. The specimens were analyzed for mechanical properties and examined with scanning electron microscopy. The tensile strength was found to decrease with increasing filler content. However, tensile strength and Young's modulus of the PPMAH compatibilized composites were found to increase, while the elongation at break showed the opposite trend as compared with the control composites. The morphology results support the tensile properties and indicated a better interaction between the SCB filler and PP/NBRr matrices with the presence of PPMAH as a compatibilizer. This is due to the esterification bonding between the SCB filler and PP matrix in the presence of PP/NBRr matrices.

### **Keywords**

Bagasse; Butadiene; Elastic moduli; Fillers; Maleic anhydride; Polymer blends; Recycling; Rubber; Scanning electron microscopy; Tensile strength