

Preparation and characterization of polypropylene biocomposites reinforced palm fruitlet fiber

Abstract

Polypropylene (PP) biocomposite containing 5, 10, 15, 20 and 25wt% of sodium hydroxide treated palm fruitlet fiber (TPFF) were prepared using Z-blade at 180°C at 50rpm. The composite was introduced with 3wt % of maleated anhydride grafted polypropylene (PP-g-MAH) as compatibilizer. The composites were characterized by performing tensile test and scanning electron microscopy (SEM) analysis. Results indicated that, the present of PP-g-MAH improved the tensile strength as the increasing of treated filler content. The improvement properties of the composite were attributed to better interfacial adhesion between the PFF and PP matrix in the presence of the PP-g-MAH. As for the overall results, 5wt% TPFF/PP/PP-g-MAH composite shows the highest value tensile strength, 20wt% TPFF/PP/PP-g-MA composite exhibits the highest in Young's modulus. While from the observation through SEM, the smooth surface fractured of 5wt% TPFF/PP/PP-g-MA which indicated as high rigidity compare to the other ratios.

Keywords — Alkaline treatment, palm fruitlet fiber, polypropylene-grafted-maleic anhydride