

STUDY OF THE PROPERTIES OF BLEND OF MALEIC ANHYDRIDE GRAFTED POLYETHYLENE AND PLASTICIZED STARCH WITH HYPERBRANCHED POLIOL POLYESTER

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ABSTRACT

Different blends of maleic anhydride grafted Low density Polyethylene (LDPE-gMA) and plasticized starch (thermoplastic starch or TPS) were prepared using LDPE functionalized with AM and starch plasticized with 40 wt % of a hyperbranched polyester polyol of fourth generation (HBP). The blends were obtained employing a torque rheometer. The compositions of the blends (LDPE-gMA/TPS) were: 20/80, 30/70, 40/60 and 50/50. IR spectra of the blends were different that those of the individual components evidencing the interaction between LDPE-gMA and TPS. Differential scanning calorimetry (DSC) analyses showed a slight increase in melting point when TPS content decreased. The thermal stability showed insignificant changes, plus the weight loss curves are located between the individual components of the blends showing good compatibility. X ray diffraction (DRX) analysis of the materials showed a reduction in the A type crystallinity (17.5°). The blends exhibited pseudoplastic behavior, due to the bonds rupture between LDPE-gMA and TPS. Scanning electronic microscopy (SEM) analysis, showed starch granules without deconstructing. Mechanical properties, such as the elastic modulus decreased with increments of polyethylene proportion.