



EFFECT OF PLASTICIZER TYPE ON THE PROPERTIES OF THERMOPLASTIC STARCH/POLYETHYLENE BLENDS

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Four different types of polyols were used in the thermoplastic starch preparation as plasticizers. The difference between the polyols is principally their molecular weight. Thermal, mechanical and dynamic-mechanical properties of the TPS/PE blends, as well as their morphology, were investigated. The ability of all four polyols to effectively gelatinize starch is demonstrated by differential scanning calorimetry and was confirmed by morphological analysis. Higher molecular weight plasticizers show a much less pronounced β peak in the loss modulus curve as compared to glycerol (a low M_w polyol). Furthermore this β peak appears at significantly higher temperatures as compared to the glass transition of the pure plasticizer. This indicates less phase separation between the plasticizer and the starch likely due to the increased level of hydrogen bonding between plasticizer and starch molecules. The mechanical properties of the various mixtures with different plasticizers are also reported.