

Preparation and Characterization of Poly(lactic acid) -based Blend Toughened with TPU Elastomer

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In general, polymeric packaging film needs an appropriate level of ductility, as it usually undergoes various types of deformation including bending and wrapping during the period of usage. Although biodegradable poly(lactic acid) (PLA) has a variety of advantages in the aspect of environment, processability, property, it still shows somewhat limitation in application of packaging film due to its intrinsic stiffness. In this study, therefore, PLA was blended with biodegradable TPU elastomer via solution blending method to overcome the shortcoming of PLA itself. The PLA/TPU blend solution was prepared by dispersing the TPU as a minor phase in the continuous PLA matrix, and then was casted to yield a thin film. The compatibility in the blend system was evaluated through FTIR analysis and morphological observation by SEM. Thermal properties and crystallization behavior of the blend was also examined by DSC experiment. Finally, the toughening effect of TPU elastomer on the PLA -based blend was explored in terms of measurement of mechanical tensile properties such as strength, modulus, and elongation for the prepared blend films.