

An Investigation of Morphology and Properties for Biodegradable PLA/PBS/Clay Nanocomposite Films

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Poly(lactic acid) (PLA) has received much attention as a biodegradable polymers due to biocompatibility, good mechanical properties, and low cost. However, PLA has some drawbacks of low HDT and inferior barrier properties. In this study, therefore, poly(butylene succinate) (PBS), was employed to compensate for the inferior properties of PLA itself. Nano clay was also incorporated to prepare PLA/PBS nanocomposites with enhanced properties such as barrier, thermal, mechanical properties. The compatibilizer (PLA-g-MAH), which was obtained by reactive extrusion, was used to improve compatibility between PLA and PBS. The morphology of PLA/PBS nanocomposites was observed by TEM. The viscoelastic and tensile properties were examined using DMA and UTM instrument. In addition, cold crystallization behavior of the nanocomposite with various clay contents was studied using DSC. The results showed that The degree of crystallinity of PLA was not significantly affected by the contents of incorporated clay. Barrier properties of the nanocomposite films were investigated by the measurement of the oxygen and water vapor permeability.