

Relationship between the stereocomplex crystallization behavior and mechanical properties of PLLA/PDLA blends

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Poly (L-lactide) (PLLA) is a good biomedical polymer material with wide applications. The mass production of PLA from renewable agricultural resources has delved this green material as a top alternative to replace the petroleum-based conventional polymers. Being different from other types of biodegradable polymers, the diverse isomeric forms of PLLA provided great opportunities for thermal and mechanical enhancement through stereocomplex formation. The addition of Poly(D-lactide) (PDLA) as a nucleation agent and the formation of stereocomplex crystals (SCs) have been proved to be effective methods for improving the crystallization of PLLA. In this work, PLLA was blended with PDLA with various compositions by a melting blending process to evaluate their general properties for a potential flexible field. The effects of the additions of PDLA on the crystallization behavior of (PLLA were investigated by means of differential scanning calorimetry (DSC) and X-Ray diffraction (XRD). Both SCs and homo crystals (HCs) were observed in a mass ratio of PLLA/PDLA. The mechanical properties, including the tensile strength and modulus, were observed.