

## Effects of Small Amount of Poly(D-Lactic Acid) on the Properties of Poly(L-Lactic Acid)/Microcrystalline Cellulose/Poly(D-Lactic Acid) Blends

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**Abstract :** This research is a systematic study of effects of poly(D-lactic acid) (PDLA) on the properties of poly(L-lactic acid)(PLLA)/microcrystalline cellulose (MCC)/PDLA blends by stereo complex crystallization. Blends were prepared with constant percentage of (3 percent) MCC and different percentage of PDLA by solution casting methods. These blends were characterized by Fourier Transform Infrared Spectroscopy (FTIR) for the confirmation of blends compatibility, Wide-Angle X-ray Scattering (WAXS) and scanning electron microscope (SEM) for the analysis of morphology, thermo-gravimetric analysis (TGA) and differential thermal analysis (DTA) for thermal properties measurement. FTIR Analysis results confirm no new characteristic absorption peaks appeared in the spectrum instead shifting of peaks due to hydrogen bonding help to have compatibility of blends component. Development of three new peaks from XRD analysis indicates strongly the formation of stereo complex crystallinity in the PLLA structure with the addition of PDLA. TGA and DTG results indicate that PDLA can improve the heat resistivity of the PLLA/MCC blends by increasing its degradation temperature. Comparison of DTA peaks also ensure developed thermal properties. Image of SEM shows the improvement of surface morphology.

**Keywords :** microcrystalline cellulose, poly(l-lactic acid), stereocomplex crystallization, thermal stability

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