

Isothermal crystallization behaviors of PLA/cellulose nanocrystal nanocomposites

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Poly (lactic acid) (PLA) is an eco-friendly plastic that can be produced by polymerizing monomers obtained by fermenting sugar beet or corn starch. It is widely used as packaging materials with moderate performance due to low crystallinities. In this study, the effects of cellulose nanocrystal (CNC) content on the isothermal crystallization (5 min at 80~130 °C) behaviors of PLA/CNC nanocomposites were investigated by differential scanning calorimetry (DSC). Crystallization rates and crystallinities of the nanocomposites increased as the isothermal crystallization temperature was closer to 105 °C and as the CNC content increased. Two melting peaks were observed in the dynamic DSC curves of the PLA and PLA/CNC nanocomposites scanned after quenching the isothermally crystallized samples.