

Crystallization behavior of poly(lactic acid) nanocomposites with cellulose nanocrystal

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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 mainly used for medical products and packaging materials because of its excellent tensile properties and biodegradability. In this study, PLA nanocomposites containing cellulose nanocrystals (CNC) were prepared by melt blending and compression molding. The crystallization behaviors of the nanocomposites with various CNC contents were investigated by differential scanning calorimetry (DSC). As a result of the isothermal crystallization experiment by DSC for 5 minutes at 95 ~ 115 °C temperature region, crystallization rate and crystallinity were found to be increased as the isothermal crystallization temperature of PLA/CNC nanocomposites increased and as the CNC content increased. Two melting point peaks were observed in the DSC curves of PLA and PLA/CNC nanocomposites that were quenched after isothermal crystallization at 100 °C and above, indicating that two crystal structures were formed.