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Biodegradability and Thermal Properties of Polycaprolactone/Starch Nanocomposite as a Biopolymer

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Abstract : In this study, a biopolymer-based nanocomposite was successfully prepared through melt blending technique. Two biodegradable polymers, polycaprolactone and starch, environmental friendly and obtained from renewable, easily available raw materials, have been chosen. Fatty hydrazide, synthesized from palm oil, has been used as a surfactant to modify montmorillonite (natural clay) for preparation of polycaprolactone/starch nanocomposite. X-ray diffraction and transmission electron microscopy were used to characterize nanocomposite formation. Compatibility of the blend was improved by adding 3% weight modified clay. Higher biodegradability and thermal stability of nanocomopeite were also observed compared to those of the polycaprolactone/starch blend. This product will solve the problem of plastic waste, especially disposable packaging, and reduce the dependence on petroleum-based polymers and surfactants.

Keywords : polycaprolactone, starch, biodegradable, nanocomposite
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