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PREPARATION OF LAYERED SILICATE POLYCAPROLACTONE NANOCOMPOSITES BY IN SITU RING OPENING POLYMERIZATION

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Biodegradable polymers such as poly(ϵ -caprolactone) (PCL) and poly(lactide) (PLA) are attracting a considerable interest in materials science research since they have strong promise in designing eco-friendly green nanocomposites for several applications, mainly for packaging and agricultural products. Polycaprolactone is a synthetic biodegradable polymer whose physical properties and commercial availability makes it a good substitute for conventional non-biodegradable polymers used not only for common applications but also for specific areas such as medicine and agricultural. However, the application of these biodegradable polymers is limited because of their deficiencies in mechanical and barrier properties. One option is to incorporate an environmentally acceptable filler to improve the properties of such biodegradable polymers particularly for use as packaging materials. Clay is suitable filler, so biodegradable polymers reinforced by clay are now being investigated. So, the performances of PCL can be greatly enhanced by the dispersion of nanometer-sized particles. In the present study, the effect of different clays, catalysts, and reaction conditions (temperature and time) on the morphology of the composites is analyzed.