

PREPARATION OF PMMA/OMMT NANOCOMPOSITES AND THERMAL DEGRADATION KINETICS

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ABSTRACT

Poly(methyl methacrylate)(PMMA)/organomodified montmorillonit clay (OMMT) nanocomposites were prepared by in situ polymerization method and characterized by fourier transform infrared spectroscopy^{1,2}. The interlayer spacing of the organoclay platelets and the polymer clay nanocomposites were determined by X-ray diffraction spectroscopy. It was determined that the clay dispersion in the polymer matrix was exfoliated behavior. Their thermal behaviors and thermal degradation kinetics were investigated using thermogravimetric analysis at various heating rates. Further kinetic analysis was performed using isoconversional methods and the invariant kinetic parameters method was used to estimate the kinetic parameters, i.e. the pre-exponential factor, and the activation energy as well as the reaction model³⁻⁵. The thermal characteristics of these nanocomposites were enhanced by incorporating silica into the PMMA matrix. The initial decomposition temperature was approximately 20 °C higher than that of pristine PMMA depending upon the silica content.

Acknowledgement: We would like to thank the Scientific Research Projects Unit of Adiyaman University for financially supporting this research under Contract No. FEFLAP-2012-0002.

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