

## **Preparation and characterization of poly ( $\epsilon$ - caprolactone)/TiO<sub>2</sub> micro-composites**

### **ABSTRACT**

Based on XRD results, the study of crystallization of the PCL/TiO<sub>2</sub>MCs showed that TiO<sub>2</sub>MPs have significant influence on crystallization behaviour of poly ( $\epsilon$ -caprolactone) in the PCL/TiO<sub>2</sub>MCs. The FTIR spectra indicated that the C=O of PCL shifted when TiO<sub>2</sub>MPs was added, indicating that some Van der Waals bonding between the alkyl groups of TiO<sub>2</sub> and the ester group of PCL were formed. In comparison with the pure PCL, TGA data indicated an enhancement of thermal stability of PCL/TiO<sub>2</sub>MCs. SEM results confirmed the surface of TiO<sub>2</sub>MPs has sufficient compatibility with PCL through the link of the coupling agent between TiO<sub>2</sub>MPs and PCL, which can reduce the aggregation of TiO<sub>2</sub>MPs and improve dispersity. Transmission electron microscope (TEM) studies were performed to provide evidence for the micrometric dispersion of the TiO<sub>2</sub>MPs into PCL matrix on microscale.

**Keyword:** Polycaprolactone; Titanium oxide; Octadecylamine; Micro-particle; Micro-composites