

## PHOTODEGRADATION OF BIODEGRADABLE PCL/TiO<sub>2</sub> COMPOSITES

GOVORCIN BAJSIC Emi, VRANJES PENAVA Nina, SUTLOVIC Igor

*University of Zagreb, Faculty of Chemical Engineering and Technology, Zagreb, Croatia*

### **Abstract**

The objective of this work is to determine the influence of TiO<sub>2</sub> micro- and nano- particles as well as Ti-nanotubes (Ti-NT) on properties of PCL composites before and after UV irradiation. The PCL/ TiO<sub>2</sub> composites with a ratio of 1wt% TiO<sub>2</sub> micro- and nano-particles and PCL/TiNT (1 wt% Ti-nanotubes) were prepared by melt mixing using a laboratory Brabender mixer. Pure PCL and PCL composites were irradiated for 120 and 240 hours using UV lamp. To characterize the thermal properties of PCL composites before and after UV irradiation the differential scanning calorimetry (DSC) were used. Thermal stability was determined using thermogravimetric (TGA) technique. Changes made on the characteristic functional groups after UV radiation were observed by FT-IR ATR spectroscopy. The obtained results show that the glass transition temperature and melting temperature decreased when the samples are exposed to UV irradiation while the crystallization temperature and degree of crystallinity increased. The addition of fillers leads to an increase in thermal stability wich decreases by time of exposing the samples to UV irradiation.

**Keywords:** Polycaprolactone (PCL), PCL/TiO<sub>2</sub> micro and nano composites, Ti-nanotubes, biodegradability, photodegradation, thermal stability

**Author did not supply full text of the paper/poster.**