

**Oral (Tema Livre)****92-2 IN VITRO BIODEGRADATION BEHAVIOR OF A NOVEL PCL/HA POLYMER.**

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**Resumo**

The poly( $\epsilon$ -caprolactone) (PCL) is one of the aliphatic biodegradable polyester which is considered highly biocompatible and have been used as biomaterial for new medical device development and applications. In this study, a novel hydroxyapatite composite of poly( $\epsilon$ -caprolactone) (PCL/HA) bioabsorbable matrice were synthesized by ring-opening polymerization of  $\epsilon$ -caprolactone. The "in vitro" biodegradation behavior of this polymers was investigated for 384 hours in hydrolytic and enzymatic conditions at 36,5 +/- 0,5 degrees •C with pH7.4 phosphate buffer solution (PBS group) and pH7.4 lipase enzymatic solution 40 U/mL (lipase group). The changes, composition and thermal properties of the polymer were monitored by water sorption, weight loss, DSC, TGA, FTIR, DRIFT, XRD and MEV techniques. The results showed that the presence of a lipase enzymatic solution accelerated the degradation of PCL comparing to PBS group which was not strongly affected by the phosphate buffer solution. This behavior was supported by the DRIFT and X-ray diffraction data. The alterations observed in morphology by MEV depended highly of the degradation time, which are further confirmed by the weight loss measurements at 96, 192, 288 and 384 hours. The presence of cavities and weight loss increased at the lipase group comparing to PBS group. Based on the cited analysis it is likely that "in vivo" response the lipase plays an important role in the biodegradation of a PCL/HA implant.

**Palavras-chave:** Biodegradable polymers, Enzymatic biodegradation, Hydrolytic biodegradation, Lipase, Poly ( $\epsilon$ -caprolactone)