The main objective of this research was to study the dynamic degradation of PLGA copolymer 90:10 %wt and the adsorption and desorption of drug (Prednisone) in the polymer matrix for a future application as drug dosifer. The PLGA copolymers were synthesized by ring opening polymerization (ROP). The process of in vitro PLGA degradation took place on vials with saline solution (0.9 % NaCl) at 37 °C and a pH of 7.4 ± 0.2; the study period set was two months. The degradation process was developed trying to mimic physicochemical properties of the blood and the dimension and volumetric flow of the arteries. It was observed that the dynamic degradation process was divided into three stages. The first stage happened during the initial two hours of degradation in which the material had not a significant mass loss; however the average molecular weight decreased. A second stage during the next 48h in which the erosion began and a final stage (T=720h) in which the degradation rate become fast and the material lose mass due to erosion. A heterogeneous degradation type was observed for the static degradation of PLGA, noticed that the profile of average molecular weight differed from the percentage of weight loss, while the copolymer that was degraded dynamically presented an homogeneous degradation type, observed that the molecular weight and average percentage of weight loss had a same profile. A yield of 85% of Prednisone adsorption was obtained by de polymer matrix and the 100% of desorption took over a period of 336h.

Keywords: PLGA, drug eluting stent, Degradation

References:

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