

PO3025

Biocompatible thin films obtained from Heparin-methane plasma process

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The heparin is interesting to be an appropriate biomolecule to suppress the thrombus formation in the initial stages of blood contact with an artificial material. Discharges in low pressure by plasma process in hydrocarbon-heparin mixtures are responsible for the production of plasma thin films containing important groups that present biocompatible characteristics. In this work was used a cylindrical shaped glass reactor with circular plane and parallel electrodes made of stainless steel to deposit heparin/CH₄ plasma films. The plasma state was established by a radio-frequency source operating in 13,56 MHz from 50 to 10W. The heparin was diluted in ethanol and its mixtures with methane 50; 50%, was responsible by the operation pressure of 100 Pa. The molecular structure of the films was characterized by FTIR analysis presenting C-H, O-H and C-O stretching and bending groups. It was used a goniometer technique to evaluate the wettability of the samples showing contact angles values from 65 to 20°. The distribution islands of heparin in the films were observed by optical microscopy. The coagulation time of blood placed in contact with glass substrates covered by plasma heparin/methane films was measured by thrombosis times and activated thromboplastin.

Keywords

heparin
plasma
thin film
biocompatible
blood