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STUDY OF THE INTERACTION OF IONIZING RADIATION IN POLYURETHANE POLYMER FILMS AS BIOMATERIAL

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New materials are being studied and widely applied in the health area, highlighting biocompatible polymers as the most versatile. Among these polymers, we developed the methodology for the manufacture of Thermoplastic Polyurethane films for application as Biomaterials. The proposed sterilization by ionizing radiation requires the study and characterization of the material to evaluate possible losses or modifications, due to the influence that the radiation can cause in the polymer chains, losing the characteristics for the purpose used. Therefore, the present work evaluates, through chemical and physicochemical characterization, the possible extension of the changes caused by the radiation in the polyurethane film. The material is produced in an environment with controlled temperature and humidity and subjected to increasing doses of gamma (15, 25 and 50 kGy), ethylene oxide and plasma as comparative techniques. The techniques DSC (Differential Scanning Calorimetry) TGA (Thermogravimetry), FTIR-ATR (Fourier Transform Infrared Spectrometry), SEM (Scanning electron microscopy) and OCT (Optical coherence tomography), have proved that the material, after applied the sterilization techniques, maintains its physico-chemical characteristics and does not suffer any modifications after the treatment.