

# PC 47

## **FT-IR DETERMINATION OF CHEMICAL DEGRADATION OF PET DURING IMPLANTATION TIME FOR FILAMENTS USED FOR VASCULAR PROSTHESES**

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Due to the major advances in the treatment and prevention of heart disease which have been achieved in the last two decades, diseases of the cardiovascular system contribute to about 20% of the fatalities in people between the ages of 36 and 74. Thus, much importance is given for vascular prostheses to replace damaged or diseased blood vessels. Polyethylene terephthalate (PET) remains a primary choice of vascular prostheses.

During the implantation, the pulsatile arterial stress and the enzymatic environment of the tissular host response may accelerate the polymer degradation. Consequently, many complications can occur during implantation time, owing to breakage of fibres and dilatation or rupture of the prosthesis. So, it is important to analyze chemical degradation observed on different explants.

However, the end-group concentration is very important to characterize of polyethylene terephthalate (PET) and to determine the mechanisms of degradation of the textile structure. Carboxyl and hydroxyl are the two major end-groups determinations have been described.

The aim of this study was developing a method to determine the end-group concentrations in PET using Fourier-transform infrared spectroscopy (FTIR). This technique was based on absorption peaks that characterize the considered end-groups. The infra-red microspectrophotometry in a transmission spectrum has been used to have more sensitivities and precise and the end-group IR spectrum of a sample was obtained by subtracting the IR spectrum of a deuterated control sample from the experimental sample IR spectrum.

The number of molecules responsible for IR absorption depends directly on the concentration of a species. In order to quantify the effect of chemical ageing on PET fibers to improve the lifetime of textile prostheses, the Beer-Lambert law was used to relate the absorbance of the specific peaks to their end-group contents