

Fractal polymeric surfaces by plasma processing

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The aim of this project is to show the use of a low pressure plasma to modify the surfaces morphology of a plastic material, yielding different physical and chemical properties. The surface modification is extremely important for different applications, such as sensor devices, tissue colouring, anti-fouling and antibacterial properties. Recently, nano-structures have been studied exploiting roughness at the micro and nano-scales produced by a competition of plasma etching and deposition processes. Specifically, for PET films an analysis of the distribution function of the rugosity showed they are distributed in space with a fractal index between 2 and 3 [1]. This work is devoted to the plasma treatment of Teflon films. An oxygen capacitive plasma is used in order to promote the chemical etching of samples. We analyse the plasma treated samples by means of SEM microscopy and by evaluating the contact and roll-off angles. Different statistical tools are employed in order to study the morphological descriptors as a function of the main plasma parameters, such as power, treatment time and vacuum pressure. Finally microbiological analyses are performed in order to evaluate the fouling and anti-fouling properties of the samples.

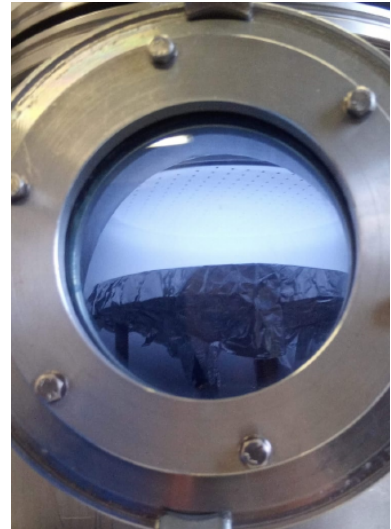


Figure 1: *Image of the used plasma device.*

References

- [1] C. Piferi et al., *Advanced Materials Interfaces* **8**, 19 (2021)