

## **$\gamma$ -RAY INDUCED GRAFTING POLYMERIZATION FROM A PA-66 REINFORCED PVDF MICROPOROUS ORGANIC MEMBRANE: ARE BOTH POLYMERS CHEMICALLY MODIFIED?**

**N. Fortin<sup>1)</sup>, S. Rouif<sup>2)</sup>, D. Portinha<sup>1)</sup> and E. Fleury<sup>1)</sup>**

<sup>1)</sup>Université de Lyon, INSA-Lyon, CNRS, IMP@INSA, UMR 5223, F-69621, Villeurbanne, France.

<sup>2)</sup>IONISOS - Parc Dombes Côtière Activités, Dagneux, F-01120, France

Synthetic polymeric membranes have gained interest in separation science, engineering and technology. Fluoropolymers and especially poly(vinylidene fluoride) (PVDF) are used for such applications. Indeed they are well-known for their good properties in terms of chemical, thermal and electrical stabilities, inertness to acids, solvents and oils, and high resistance to ageing and oxidation. However, the high hydrophobicity of the PVDF membrane could limit its application when the fluid phases to be treated are dispersed in an aqueous medium. Therefore there is a need for the development of new surface modification processes, which renders the membrane more hydrophilic and which are clean and robust enough to be used in industrial field.

This work focuses on the  $\gamma$ -ray induced grafting of different hydrophilic monomers onto a PA-reinforced PVDF membrane. These polymers are known to be radio-sensitive, and radicals can be generated on both components and their relative proportion determined by ESR [1]. The influence of various parameters was evaluated, related either to the radiation process or the polymerization step, and a global methodology based on thermal properties, viscosimetry and spectroscopic techniques was used to point out the highly selective modification of the PVDF component of the membrane only [2]. Finally, the surface properties of the membrane were evaluated and confirmed the membrane modification.

### **References**

- [1] N. Fortin, B. Albela, L. Bonneviot, S. Rouif, J.-Y. Sanchez, D. Portinha, E. Fleury, submitted to *Polym. Degrad. Stab.* 2010
- [2] N. Fortin, S. Rouif, D. Portinha, E. Fleury, submitted to *Polymer*, 2011