

# Extraction of Penicillin G by polypropylene fibers treated with nitrogen plasma

Naima. Hachache<sup>1,2</sup>, Youcef. Bal<sup>2</sup>, Dominique. Debarnot<sup>1</sup>, Fabienne. Poncin-Epaillard<sup>1</sup>

<sup>1</sup>Laboratoire Polymères, Colloïdes et Interfaces, CNRS UMR 6120, University du Maine, Le Mans, 72085, France

<sup>2</sup>Laboratoire de Chimie physique Moléculaire et Macromoléculaire, Université de SAA'd Dahleb, Blida, Algérie

E-mail: hachachenaima@yahoo.fr

This work has been devoted to improve penicillin G (PNG) extraction using polypropylene fibers treated by nitrogen plasma and loaded with cationic surfactant Trioctylmethylammonium chlorid (TOMA-Cl).

In the first part, the adsorption of surfactant was studied on two types of fibers: virgin polypropylene fibers (FPPV) and treated polypropylene fibers (FPPT). It was found that the adsorption on FPPT is better than with that of FPPV. This is due to the difference between the physico-chemical properties of the two surfaces; the first has been plasma-treated. Therefore some new polar functionalities have been attached. The fiber becomes more hydrophilic and thus promotes electrostatic interaction between the surface and the surfactant molecules, contrariwise to the FPPV surface is hydrophobic, so the only possible interactions between the surface of fibers and the surfactant molecules are hydrophobic - hydrophobic type.

In the second part, by using the two types of fiber for the extraction of PNG, we found that the extraction is enhanced with the loaded and plasma-treated FPPT than FPPV. The effect of initial concentration of PNG, temperature and pH was also studied.

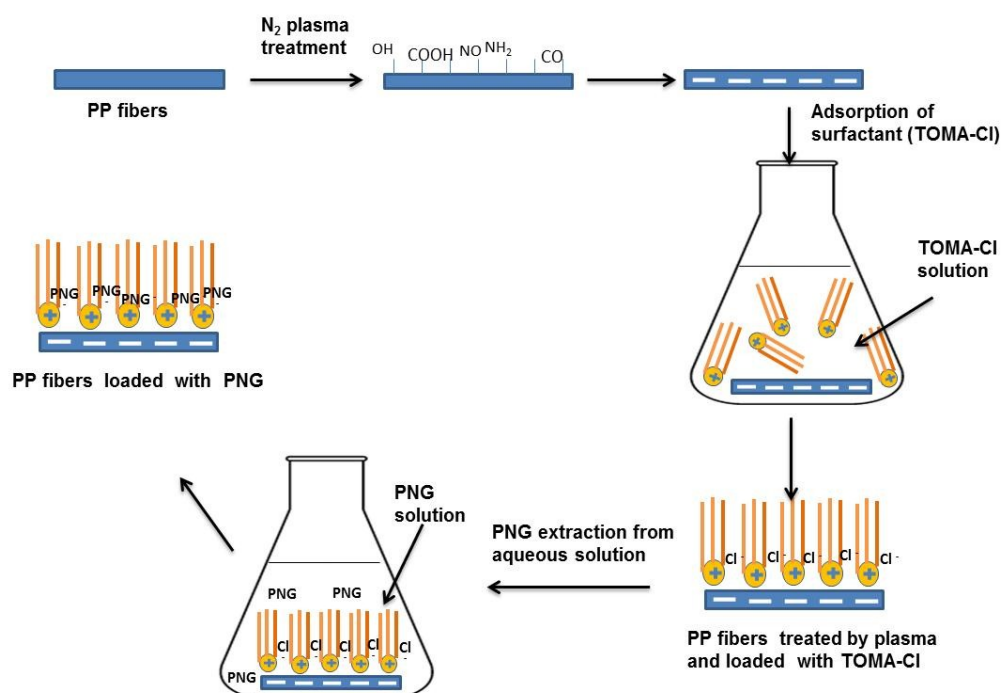


Figure 1: Outlined plan of experiment work