

Proposal of an internship
Study of an oxidative CVD process
for deposition of conductive polymers thin films

Conductive polymers attract more and more attention these last years because they are multifunctional organic materials combining optical transparency, lightness, electrical conductivity, and they can be deposited on flexible substrates like plastics or fabrics. Consequently, their potential applications concern innovative fields such as organic solar cells, flexible electronic devices, anti-fouling coating in particular for filtration systems.

Most of these applications necessitate coating complex substrates presenting submicronic trenches or pores, by conductive polymer thin films with an excellent conformity. Contrarily to classical deposition processes, which use liquids, the oCVD (oxidative Chemical Vapor Deposition) process meets this objective thanks to the use of gaseous precursors at reduced pressure. Moreover, the presence of an oxidant allows operating at temperatures lower than 100°C, which opens the possibility to coat thermosensitive substrates. This process does not use any toxic or aggressive solvent, allowing the treatment of papers, plastics, fabrics and polymeric membranes.

The project concerns the experimental study of an oCVD process, in order to establish correlations between the processing conditions, the polymeric thin films characteristics (thickness, uniformity, chemical composition, ...) and their properties (electrical conductivity, optical transparency, ...). This will allow to understand the phenomena involved during the deposit and to optimize the film properties regarding promising applications like OLEDs or organic photovoltaic cells.

The work will be conducted in collaboration between LGC for the oCVD process engineering aspects and CIRIMAT for the characterization of polymer thin films.

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