Laboratoire PPSM – UMR CNRS 8531

Photochimie et Photophysique Supramoléculaires et Macromoléculaires

Séminaire PPSM

Lundi 25 novembre 2019 - 14h00

Amphithéâtre Tocqueville, Bâtiment d'Alembert

Professeur Christel LABERTY-ROBERT

Laboratoire de Chimie de la Matière Condensée de Paris,

Sorbonne Université, France

Invitée par : Pr Fabien Miomandre

«Electrospinning as tool for making efficient durable material for energy storage and conversion»

With the depletion of fossil fuels and the pollution of environment, it is urgent to develop renewable energy technologies to replace the traditional fossil fuels and satisfy the environmental needs. Nanofiberous materials (NFMs) have been widely used in electrochemical energy storage devices in recent years and considered to be promising candidates to address these critical issues because of their excellent properties, such as extremely large surface area, high length/diameter ratio, good flexibility, high porosity, and multiple functionalities. Electrospinning is a particularly low cost, simple, and versatile method to produce nanofibers from various kinds of materials, and the improved coaxial electrospinning can fabricate nanotubes and core/shell structural nanofibers. This presentation highlights research efforts that have been pursued in LCMCP into the use of electrospinning to create nanofibers network for the applications in microbial fuel cell, batteries and fuel cell. In microbial fuel cell, we took the advantage of the microstructure of the carbon nanofibers paper to design a ready to use electrode with optimize stability and power density. This processing can also be extended to the design of hybrid organic-inorganic ultrastretchable membranes that can be used as mechanical support for efficient electrolyte in polymer membrane fuel cell as well as separator for batteries.

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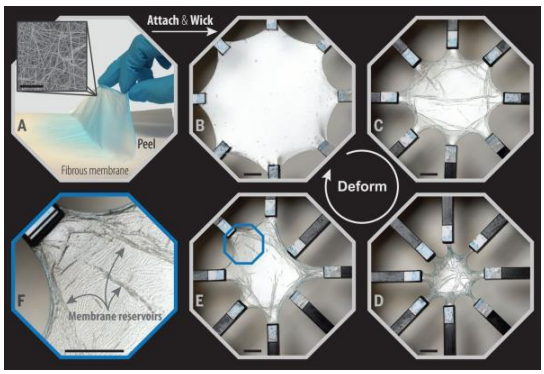
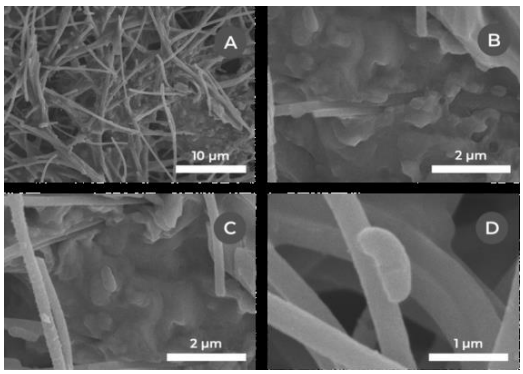


1. Composite Ultra-strechable membrane



2. Carbon Nanofibers Paper as electrodes for Shewanella Oneidensis bio-fuel cell.

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