MEMBRANES BASED ON POLYVINYLPYRROLIDONE AND CELLULOSE ACETATE THROUGH ELECTROSPINNING

Héctor López-Calderón¹, Carlos Solís Rojas¹, Katiushka Arévalo-Niño¹
¹Instituto de Biotecnología Facultad de Ciencias Biológicas, UANL

The electrospinning technique works by the electrostatic principle. A lot of different types of parameters influence the outcome of the process¹. The aim is to produce fibers at micrometric and nanometric level, providing properties which may mimic the structure of the extracellular matrix². A variety of polymers have been processed with purposes related to medical biotechnology, preferred those which are biocompatible. Polyvinylpyrrolidone has been used previously in medical applications. Cellulose acetate has proved to immobilizing biomolecules and PVP confers structural improvements. This work is focused on getting membranes based on a mixture of PVP/AC using the method of electrospinning. The membranes obtained are white, bright, silky and flexible with an average thickness of 230 µm. The morphology of membranes was evaluated by scanning electron microscopy (SEM), where not presence of pearls in the fibers was observed and an average diameter of 1.2 µm. The FT-IR shows the amide carbonyl group at 1670 cm⁻¹ from AC PVP, peaks 1020 cm⁻¹ and 1230 cm⁻¹ are presented corresponding to CO single bond, 1700 cm⁻¹ carbonyl group and bands in 2850 to 2950 cm⁻¹ corresponding to CH₃ groups. In the test of wetting, the membranes were unchanged for more than 48h, while in the solubility test these were maintained for more than 72h. Thermal stability of membranes was determined by thermogravimetric analysis (TGA) until 350 °C. These characteristics suggest that the membranes are stable enough to be used as covers and vehicles for the release of active ingredients in skin wounds.

Keywords: Polyvinylpyrrolidone, Cellulose acetate, electrospinning

References:


Presenting author’s email: karevalo01@hotmail.com