PÔSTER - DISPOSITIVOS ELETRÔNICOS E ÓPTICOS
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ANALYSIS OF PVDF POLYMORPHISM PROCESSED BY ELECTROSPINNING AND CASTING FILMS

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The polymer poly(vinylidene fluoride) - PVDF is a piezoelectric material that has been widely studied due to its particular electrical and optical properties1. The PVDF beta phase is the most desirable in important technological applications such as sensors and actuators because it has better piezoelectric activities2. The objective of this work is to study the PVDF dissolution parameters in casting and nanofibers by electrospinning (for comparison) which is a simple and versatile technique to produce fibers of nanometric diameter from a sufficiently viscous polymeric solution3 for nanogenerators and sensor of pressure. These

piezoelectric devices are present in several technologies using in various arrangements, that is, this technological concept allows input signals to be converted into output responses, thus enabling, through different applications, the resolution of some sensory monitoring problems and even power generation4. The PVDF was dissolved in DMF and deposited on glass plates for drying, varying its concentration from 10 to 20 %wt, dissolution time 2h temperature from 25°C to 70°C. These membranes were analyzed by FTIR to check their chemical and crystalline structures. For electrospinning, the solution was placed in a 3.0 mL syringe inside the infusion pump, setting the flow to 0.5 mL/h, keeping the needle at a distance of 15 cm from the collector. The power supply was maintaining the voltage at 15 kV ejecting the solution to the rotary collector maintained at 300 rpm. The PVDF/solvent concentration in both techniques was 15 %wt. Through the FTIR spectra we can calculate the relative percentage of the presence of the most predominant crystalline phase, comparing the ratio between beta and alpha phase present in casting PVDF and in electrospun nanofibers. Through optical microscopy (OM) and/or scanning electron microscopy (SEM) images, linearity, continuity and thickness can be observed in nanometric orders. The result of the electricity and DC conductivity tests will be used in the next step of this work to check the piezoelectricity by “fingertests”.

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