

S1.6.1 INFLUENCE OF PRODUCTION PARAMETERS ON FIBER MORPHOLOGY AND FILTRATION PERFORMANCE OF ELECTROSPUN NANOFIBROUS CELLULOSE ACETATE

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This presentation discusses the impact of the key parameters of electrospinning; tip-to-collector distance, voltage, deposition time and solution concentration; on the fiber size distribution and filtration quality of Cellulose Acetate (CA). CA is a biodegradable polymer that is widely used for filtration applications. Understanding the parameters necessary to produce fibers as thin as possible would increase the filtration efficiency. The manufacturing parameters of CA have been discussed by several papers, this paper contributes to the canon by providing additional data. Nanofibrous mats were produced using the electrospinning technique. Various concentrations of CA were dissolved in 2:1 concentrations of N,N-dimethylacetamide and acetone. The produced solutions (concentration 10 wt.% to 20 wt.%) were electrospun with voltages ranging from 8 kV to 12 kV, distances from 10 cm to 15 cm and deposition times of up to 30 min. The produced fibrous mats were analyzed with SEM imaging in regards of fiber size and tested for filtration efficiency using nanosized NaCl particles. A maximum total filtration efficiency of 99.8% was obtained with the CA concentration of 15 wt.%, the applied voltage of 12 kV, the tip-to-collector distance 10 cm and the deposition time of 15 minutes. It was possible to produce nanofibrous CA mats with excellent filtration performances.