

Effect of various parameters on morphological structure of PCL nanofibers

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Nanofibers have been the subject of recent intensive research due to their unique properties, such as large surface-area-to-volume ratio, flexibility in surface functionality, superior mechanical properties (stiffness ,tensile strength), and the fact that they can be produced from a wide range of organic and inorganic polymers . Electrospinning process with needle is the most desirable method for producing nanofibers, because it is a low-cost and effective method . Polymer nanofibers are the optimal candidates for providing novel applications in many research areas, such as medical areas, textiles, filtration etc .The characteristics of the electrospun jet and the morphology of the resultant fibres are highly dependent on the properties of the polymer solution ,applied voltage, distance of collector etc. PCL is biodegradable polyester and is used for many applications such as a drug delivery device, suture or adhesion barrier. [1-4]

Aim of this study, was the investigation of different parameters in order to produce PCL nanofibers, using solvents such as dichloromethane (DCM), chloroform and acetone. It was found that increment of the concentration, produced higher diameter nanofibers. Also, it was derived that a relation between applied voltage and distance of the collector, affect the formulation of fibers or beads.

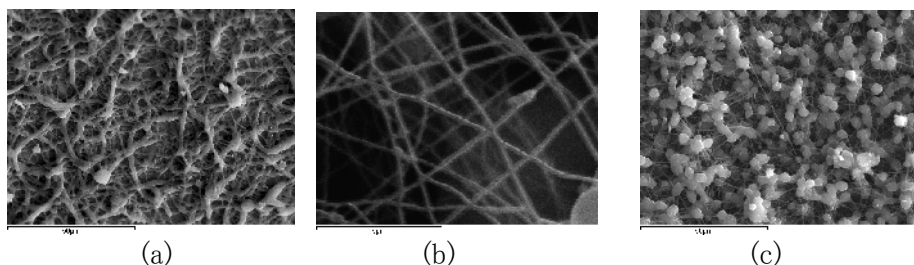


Figure 1: Electrospun nanofibers of (a) 30% PCL-solvent DCM, Flow rate=0.01ml/min, Distance(d)=4.5cm (b) 15 %PCL- solvent DCM, Flow rate=0.01ml/min, d=4.5cm, V=12KV and (c) beads-V= 17KV

References

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