

## Determining the Electrospinning Parameters of Poly( $\epsilon$ -Caprolactone)

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**Abstract :** Electrospinning is a versatile way to occur fibers at nano-scale and polycaprolactone is a biomedical material which has a wide usage in cartilage defects and tissue regeneration. PCL is biocompatible and durable material which can be used in bio-implants. Therefore, electrospinning process was chosen as a fabrication method to get PCL fibers in an effective way because of its significant adjustments. In this research study, electrospinning parameters was evaluated during the producing of polymer tissue scaffolds. Polycaprolactone's molecular weight was 80.000 Da and was employed as a tissue material in the electrospinning process. PCL was decomposed in dimethylformamid(DMF) and chloroform(CF) with the weight ratio of 1:1. Different compositions (1%, 3%, 5%, 10% and 20 %) of PCL was prepared in the laboratory conditions. All solvents with different percentages of PCL have been taken into the syringe and loaded into the electrospinning system. In electrospinning dozens of trial were applied to get homogeneously uniform scaffold samples. Taylor cone which is crucial point for electrospinning characteristic was occurred and changed in different voltages up to the material compositions' conductivity. While the PCL percentages were increasing in the electrospinning, structure started to arise with droplets, which was an expressive problem for tissue scaffold. The vertical and horizontal layouts were applied to produce non-woven structures at all.

**Keywords :** tissue engineering, artificial scaffold, electrospinning, biocomposites

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