SPINNING ELECTRODES FOR NANOFIBROUS MATERIALS PRODUCTION

ŘEBÍČEK Jiří, POKORNÝ Marek, RŮŽIČKOVÁ Jana, SUKOVÁ Lada, VELEBNÝ Vladimír

Contipro Biotech Ltd., Dolni Dobrouc, Czech Republic, EU

Abstract

Electrospinning is a simple, efficient and versatile method for producing fibers of diameter from tens of nanometers to micrometers. In the electrospinning process a high voltage is used to create an electrically charged jet of polymer solution out of a spinneret. Nowadays, the most commonly used electrode is a single needle jet. It forms a high gradient of the electrostatic field surrounding the drop of the polymer solution and so leading to the highest spinnability. Increase in productivity of electrospinning process is reached by needle multi jet systems. Another approach is needleless electrospinning principle capable of scale-up of the nanofibrous materials production. Combination air-blowing force and the applied electric field allow the electrospinning process be more efficient especially in case of biopolymers such as the hyaluronic acid. Design of the electrodes will be always compromising between spinnability and spinning production capacity.

Our research group deals with a development and optimization of spinning electrodes. These electrodes have to satisfy following requirements: a) small drop of a polymer compound initial formation, b) high voltage gradient creation in the vicinity of the drop, c) relatively large conductive surface, d) significant tangential airflow contours, and e) scale-up capabilities, easy cleaning, etc. Presented spinning electrodes meet all these requirements and selection one of the four electrodes allows to optimize the spinnability and productivity of the electrospinning process.

Keywords: Electrospinning, nanofibers, spinning electrodes

Author did not supply full text of the paper/poster