

Electrospun fibers with controlled surface properties for fog collectors

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The fog collectors are produced with various designs to increase their efficiency in collecting water. Currently, one of the directions to make them more effective is increasing their surface area by incorporating electrospun polymer fibers. Electrospinning is becoming the main production method of nano- and microfibers with scaling up possibilities. This is a cost-effective method as fiber's properties can be controlled with the experimental setting avoiding any additional postprocessing or chemical treatments. We are able to control the wetting of fibers via their roughness [1], which can be also tuned to biomimic spider webs known to be natural fog collectors [2]. In our research, we present a few strategies to increase the efficiency in single step electrospinning to obtain the hydrophobic and hydrophilic properties of fiber networks with single and double nozzle set-up. To verify the wetting phenomena, we use advanced microscopy technique to visualize the contact angles at nano- and macro scale [3] and mechanical testing stage for analysis of their mechanical properties. Our studies show the potential of including electrospun fibers in existing fog collector structures.

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