INNOVATIVE ELECTROSPUN NANOFIBER MEMBRANE BY COUPLING ELECTROSPINNING AND PHOTOINDUCED PROCESS

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Electrospinning is well-known as a versatile technique for generating fibers down to the nanoscale and has emerged as a prominent technique with widespread application[1]. Electrospun nanofiber membranes (ENMs) are candidates for water purification due to their exceptional properties, including large surface area, high porosity, adjustable pore structure, which surpass current conventional materials and techniques[2]. Further, photo-crosslinking can be employed to improve the thermal, mechanical, and solvent resistance of the membranes, and the photoinduced process can also impart or augment specific functionalities to ENMs[3].

In this study, electrospinning of styrene-butadiene rubber latexes (thus using only water as a solvent to mitigate environmental and human concerns) and subsequent thiol-ene photoinduced crosslinking are studied. The influence of polymer suspension properties, electrospinning conditions, and photo-crosslinking parameters and conditions are assessed to tailor the final properties of the ENMs. The resulting electrospun nanofiber membranes will be evaluated in a wide range of applications, including water treatment for heavy metal removal.

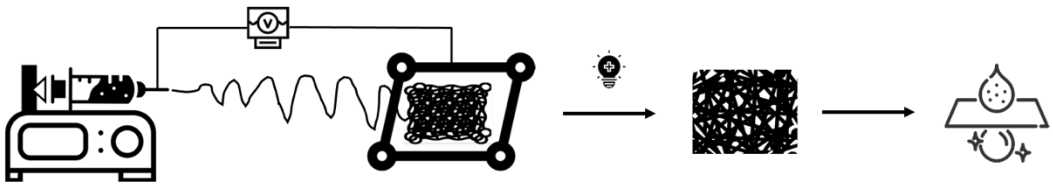

Figure 1. A multi-step and multi-scale approach for generating functional ENMs for water treatment

References

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