

# Ion-exchange nanofiber membranes for advanced water treatment applications

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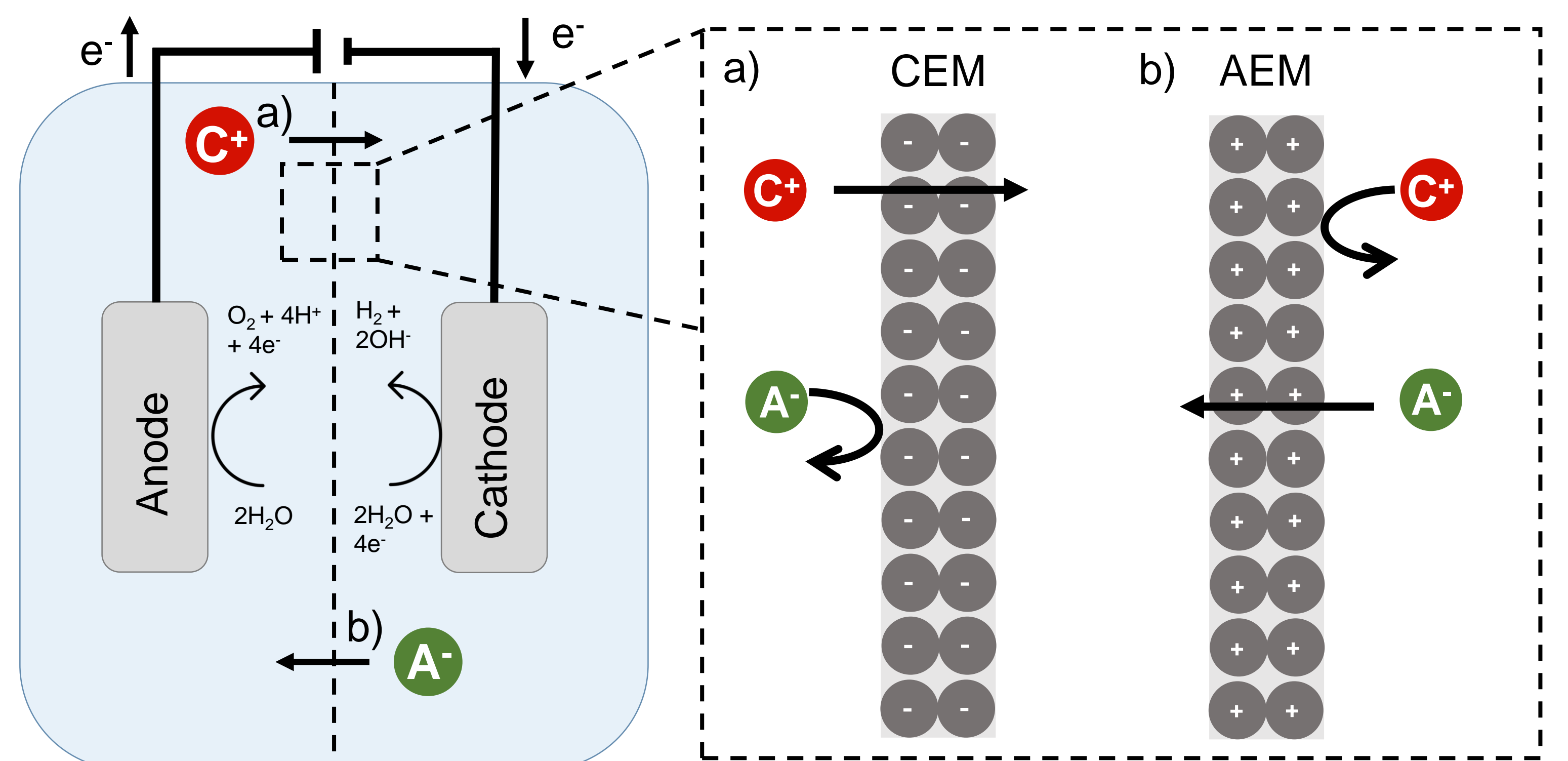
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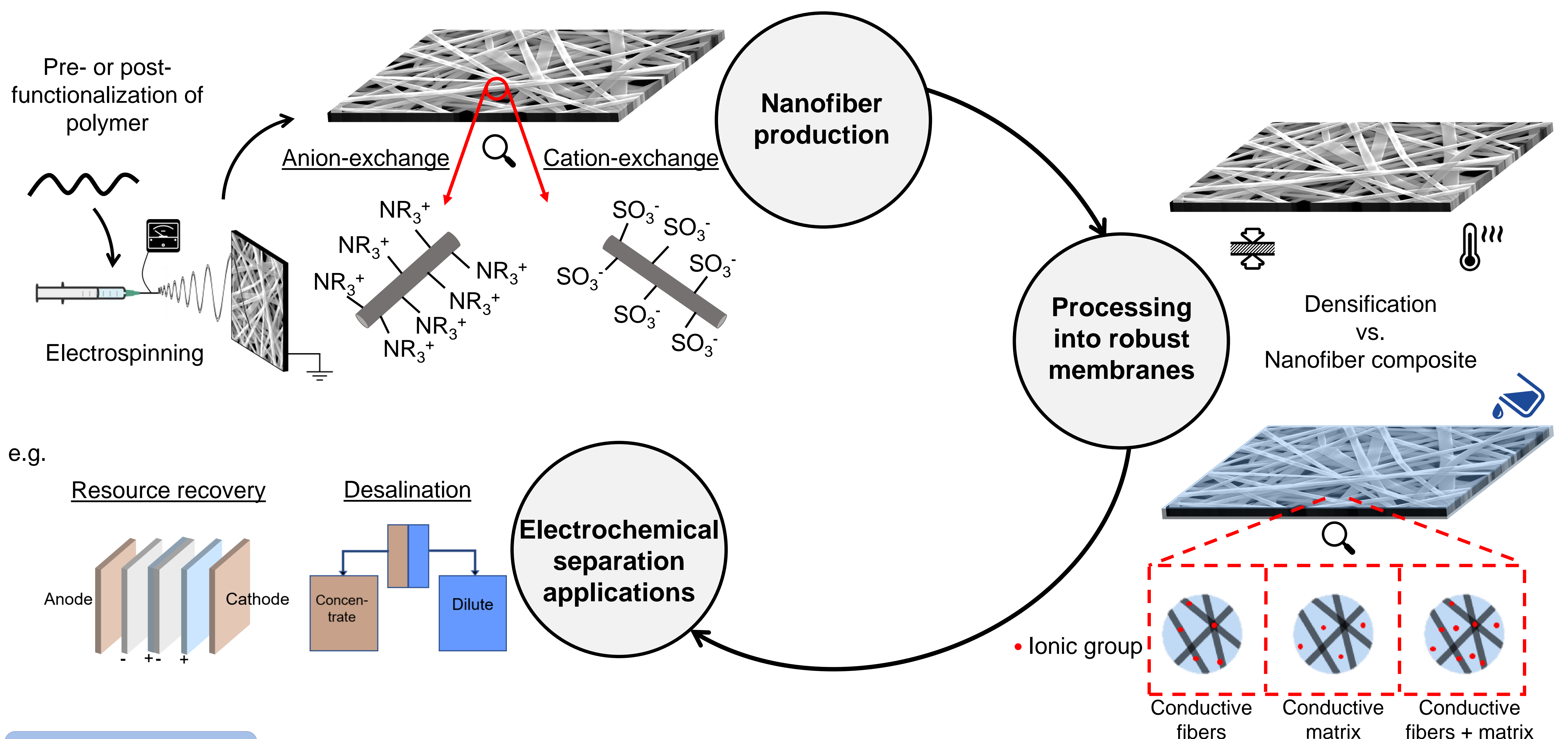
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Challenges in clean water availability have risen over the years, and especially third world countries are in great need of localised, low-cost water purification techniques. Electrochemical treatments in (waste)water management show high potential in the global water resource crisis, but are often limited by the performance of the ion-exchange membrane (IEM). Therefore, extensive research has been performed on the use of alternative IEMs, such as nanofiber membranes. Nanofibers have outstanding ionic properties due to their interesting morphology. In this research, their structure, properties, processing and performance are assessed so that they can be used as the next generation IEMs.

## PRINCIPLE



## STRUCTURE AND PROCESSING



## PERFORMANCE

- ✓ Improved ion flux
- ✓ Lower membrane resistance
- ✓ Improved dimensional stability

Nanofibers show high potential as next generation ion-exchange membranes (IEMs) due to their outstanding ionic properties as a result of their morphology. They are often processed into robust membranes by means of densification or with the aid of a pore-filling matrix. This results in a membrane with an excellent ionic conductivity and dimensional stability, tackling the issues of conventional IEMs.

### CONTACT

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READ MORE: B. Swanckaert, J. Geltmeyer, K. Rabaey, K. De Buysser, L. Bonin, and K. De Clerck, "A review on ion-exchange nanofiber membranes: properties, structure and application in electrochemical (waste)water treatment," *Separation and Purification Technology*, vol 287, 2022.