Facile Membrane Surface Activation for Eliminating Fouling

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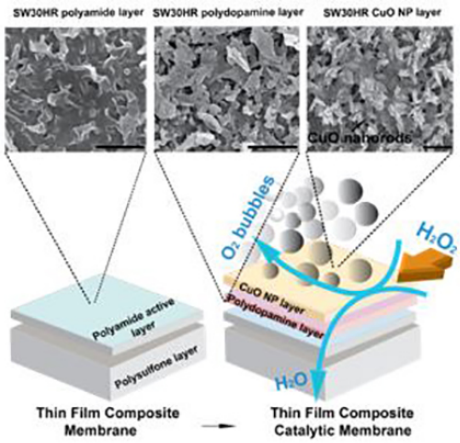

Catalytic membrane assembly

Technology Summary

The subject invention covers a modified thin film composite membrane or another membrane system that enhances mass transfer and reduces concentration polarization (CP) significantly when implemented. The system disrupts cake fouling layers, dispersing and degrading the particulate or organic matter and efficiently prevents particulate deposition through a synergistic physical action. The inventors demonstrated a complete mitigation of CP at different operating fluxes while hindering biofilm formation but not changing the intrinsic membrane permeability and salt rejection over repeated use. More specifically, the flux recovery ratio was almost three to six times (3-6X) of the flux decline ratio. The mass transfer coefficients were almost thirty (30) times higher than at normal process conditions.

Application & Market Utility

This novel, robust, self-cleaning system is scalable in situ to industrial capacities, eliminates or lessens operational interruptions due to cleanings and results in water purification efficiencies while decreasing energy expenditures. This real-time fouling elimination approach may have the ancillary benefit of removing harmful environmental pollutants, including industrial byproducts such as textile dyes including methylene blue, industrial solvents and food processing wastewaters laden with bioactive compounds monitored by governmental regulatory agencies.

Next Steps

Seeking licensing opportunities.

TECHNOLOGY READINESS LEVEL 4-7

Seeking

Investment | Licensing | Research

Keywords

- high-flux membranes
- water purification
- desalination
- anti-fouling
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