Antimicrobial Effect of Sulfidized Silver Nanoparticles after an 18-Day Operation Period in a Reverse Osmosis Module

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Research question: Will the antimicrobial activity of sulfidized silver nanoparticles be conserved after an 18-day operation period?

Motivation
• Biofouling hinders membrane performance over time shortening life expectancy
• Silver nanoparticles (Ag-NPs) are loaded onto the membrane for biofouling mitigation
• Fast silver release from silver-coated membranes impair long-term performance of antimicrobial coatings.
• Silver nanoparticles are sulfidized to slow down silver release

Objective
1. Quantification of the antimicrobial activity of membrane functionalized with nanoparticles of 10⁻² sulfidation.

Obstacles faced/overcome
• Dilution factor issues
• Zero CFU mL⁻¹ while plating
• Various experiments were done with different dilutions
• The different dilutions were analyzed, and the best dilution results was used

Materials and Methodology

Conclusion/ future works
• Decrease (82 % ) in live bacteria on Ag-NP before the operation
• Ag-NPs after the 18-day operation is acting as the control may be due to silver leaching
• Na₂S (10⁻²) has a decrease in live bacteria but is not keeping the same antimicrobial activity as Ag-NPs
• Quantify silver release of the testbed modules

CFU Counts: Plating

References

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