

FUNCTIONALIZATION OF SILVER NANOPARTICLES ON MEMBRANES AND ITS INFLUENCE ON BIOFOULING

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The aim of this project is modifying the attachment of silver nanoparticles (Ag-NPs) on water treatment membranes, such as cellulose acetate (CA), and to observe its effect towards biofouling. Biofouling results from the accumulation of live/dead microorganisms present in water on the membrane surface and pores, and it creates several performance problems such as clogging of pores, higher operating cost, higher pressure drop, etc. Minimizing this would be ideal to lower operating cost and save expensive materials. In this project, *Pseudomonas Fluorescens Migula* are used because this species generates extracellular polymeric substances (EPS). EPS produced from bacteria helps create a viable structural foundation for biofilm accumulation with densely packed matrices, which in turn fouls the polymeric membranes. In this study, Ag-NPs are added to CA membranes for biofouling minimization. A concern with combining Ag-NP with membranes is the leaching of nanoparticles. If the Ag-NPs are chemically attached to the membranes, it is believed that leaching can be prevented. Different methods of introducing the Ag-NPs to the membranes studied here will include physical blending, chemically-activated blending, and chemically-crosslinked blending.