Manufacturing of antibiofouling polymeric membranes with bismuth-BAL chelate (BisBAL)

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\section*{ABSTRACT}

Recent developments indicate an increase in demand of water supply and protection of natural water source quality with a requirement of advanced wastewater treatment systems. Formation of biofilms on the membrane surfaces and in the pores of membranes which are caused by extracellular polymeric substances and soluble microbial products has been identified as the main source of biofouling in membrane operation. The secretion of total polysaccharides and proteins by micro-organisms can be lowered when they are exposed to the bismuth-BAL chelate (BisBAL) at near minimum inhibition concentration. Our study aimed at controlling the population and co-products of micro-organisms that cause biofouling. After successful studies with the inhibition of \textit{Escherichia coli} and \textit{Streptococcus pyogenes} in activated sludge, BisBAL-containing membranes were fabricated. The effect of BisBAL on membrane performance was also observed. FTIR, SEM, contact angle, and surface roughness analyses were performed for the characterization of the membranes. Originality of this study comes from the usage of BisBAL for the first time for membrane synthesis.

\textit{Keywords:} Antibiofouling membrane; Membrane manufacturing; PSf membranes; PES membranes; BisBAL; Xanthan gum; Membrane resistances

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