

# Antifouling properties of biocidal incorporated polymer carbon nanocomposites membranes

Fitri Khoerunnisa\*, Hendrawan, Widda Rahmah, Salma Zahra

Department of Chemistry, Indonesia University of Education, Bandung, Indonesia

\*Email:fitri.khoerunnisa@gmail.com

Biofouling is a major operational challenge in ultrafiltration membranes, stimulating many innovations of biofouling control strategies. Potassium iodide and benzalkonium chloride have been selected as biocidal agents to improve antifouling properties of polymer carbon nanocomposites based ultrafiltration membranes. Both biocidal agents were successfully immobilized into polymer carbon nanocomposites membranes through phase inversion method. The effect of both biocidal agents on antibacterial activity of nanocomposites membranes toward *S. aureus* and *E. coli* was intensively studied. The minimum inhibitory concentration (MIC) of potassium iodide and benzalkonium chloride toward *E. Coli* and *S.Aureus* were found at (0.025% and 0.015% *b/v*) and (0.010% and 0.005% *b/v*), respectively. Meanwhile, the addition of biocidal agents notably improved the bacterial killing ratio of polymer carbon nanocomposite membranes toward *S. Aureus* (12.2% to 99.2%) and *E.Coli* (2.8% to 100%). The nanocomposites membranes demonstrated the permeability and selectivity of 52 L/m<sup>2</sup> h and 96%, respectively. Modification of surface morphology and permeability of nanocomposites membranes at various operational pressures due to immobilization of biocidal agents are still under investigation.

## Reference(s)

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