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Effect of chemical cleaning on membrane biofouling in seawater reverse osmosis processes

Lan Hee Kim[a], Am Jang[b], Hye-Weon Yu[a], Sung-Jo Kim[a], In S. Kim[a]*

[a]*School of Environmental Science and Engineering, Gwangju Institute of Science and Technology (GIST), 261 Cheomdan-gwagiro (Oryong-dong), Buk-gu, Gwangju, 500-712, South Korea*
Tel. +82 (62) 715-3381; Fax +82 (62) 715-2434; email: iskim@gist.ac.kr
[b]*Department of Civil and Environmental Engineering, Sungkyunkwan University, 300 Cheoncheon-dong, Jangan-gu, Suwon, Gyeonggi-do 440-746, South Korea*

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ABSTRACT

Reverse osmosis (RO) membranes are widely used for desalination plant. However, membrane biofouling cause decreasing membrane performance. This work focused on finding optimum cleaning conditions in RO membrane processes. The effect of cleaning conditions such as agent concentration, temperature and cleaning time on cleaning efficiency were investigated in Centers for Disease Control (CDC) annular biofilm reactor. Alkaline cleaning agent, sodium hydroxide (NaOH) which is well known for removing organic foulant on membrane, was used. Total bacteria number was measured with diamidino-2-phenylindole (DAPI) dye and cell viability were analyzed by using two different DNA-binding dyes (SYTO9/PI). The optimum temperature, cleaning time and cleaning agent concentration were found as 30°C, 20 min and 1.0 wt%, respectively.

Keywords: Desalination; Reverse osmosis membrane; Membrane biofouling; Membrane cleaning; Alkaline cleaning

* Corresponding author.