Biofouling of Membrane Systems

Because of the uneven distribution of fresh water in time and space and the increasing human population, a large number of regions are experiencing water scarcity and stress. Membrane-based desalination technologies like reverse osmosis have the potential to solve the fresh water crisis in coastal areas. However, in many cases membrane performance is restricted by biofouling.

Biofouling of Membrane Systems gives a comprehensive overview on the state of the art strategies to control biofouling in spiral wound reverse osmosis membrane systems and point to possible future research directions. Despite the fact that much research and development has been done to overcome biofouling in spiral wound membrane systems used for water treatment, biofouling is still a major practical problem causing performance decline and increased energy demand. Biofouling of Membrane Systems is divided into three sections including modelling and numerical analysis, non-destructive characterization and feed spacer geometry optimization. It focuses on the development of biomass in the feed channel of the membrane module and its effect on pressure drop and hydrodynamics.

This book can be used to develop an integral strategy to control biofouling in spiral wound membrane systems. An overview of several potential complementary approaches to solve biofouling is given and an integrated approach for biofouling control and feed spacer design is proposed.