

## Abstract

Since their introduction in the 1970s, reverse osmosis and nanofiltration membranes have revolutionized desalination and water treatment. However, biological fouling, or biofouling, remains a persistent and critical challenge. Biofouling occurs when bacteria adhere to membrane surfaces and form biofilms. If left unchecked, these rapidly growing biofilms can compromise the mechanical integrity of membrane elements, causing irreversible damage. Additionally, organic fouling, caused by the deposition of organic matter on membranes, often intertwines with biofouling, further reducing membrane performance and permeability. This book explores the mechanisms behind biological fouling, the factors that influence its development, and practical strategies for its mitigation and prevention. By shedding light on these interconnected phenomena, it provides valuable insights for ensuring the efficient and reliable operation of reverse osmosis systems in desalination and water treatment plants.

