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## Chlorine Attack on Reverse Osmosis Membranes: Mechanisms and Mitigation Strategies

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### ABSTRACT

Aromatic polyamide has emerged as the most prominent material for thin film composite (TFC) reverse osmosis and nanofiltration membranes. However, these membranes are susceptible to free chlorine attack, and lose their performance after about 1000 ppm·h of chlorine exposure. This necessitates removal of chlorine from the feed water before desalination, leading to an increase in the cost of water treatment in desalination plants, especially for drinking water. Chlorine and chloramine being widely used disinfectants of drinking water the world over, a chlorine resistant membrane (CRM) is highly desirable to extend the membrane's life and bring down costs. This paper reviews the mechanisms of TFC membrane degradation by chlorine and strategies for its mitigation. Induced physiochemical changes by N-chlorination and concomitant ring chlorination reaction in presence of chlorinating agent are seen to be the major degradation

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