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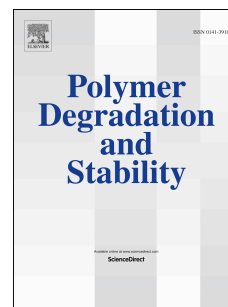
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Stability of Polyethersulfone Membranes to Oxidative Agents: A Review

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Abstract

Polyethersulfone (PES) is one of the most commonly used polymers for preparation of ultrafiltration and nanofiltration membranes. However, oxidative degradation of PES-based membranes, which results from exposing the membranes to oxidative agents, is limiting their operational lifespan and possible areas of application. Despite the high need for a fundamental understanding of the detailed oxidative degradation mechanism(s) of PES membranes in order to improve the effectiveness of cleaning/disinfecting agents and/or develop PES membranes with a higher tolerance to oxidative agents, it still remains an insufficiently understood topic. Therefore, this review aims at analyzing and critically discussing the recent state-of-the-art on the degradation mechanisms of PES membranes, focusing on the effects of chlorine-based oxidants (mainly NaOCl) and H₂O₂. Strategies that can be useful for minimizing/preventing oxidative PES membranes attack are presented. Finally, further prospective study possibilities to fill in the existing research gaps in this area are highlighted.

Key words: Polyethersulfone membranes, Oxidative degradation mechanism, Sodium hypochlorite, Hydrogen peroxide, Degradation prevention

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