

# Wastewater

## 1- Membrane Technologies in Wastewater Treatment: A Review

**By:**

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**Volume:** 10

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**Abstract:**

In the face of water shortages, the world seeks to explore all available options in reducing the over exploitation of limited freshwater resources. One of the surest available water resources is wastewater. As the population grows, industrial, agricultural, and domestic activities increase accordingly in order to cater for the voluminous needs of man. These activities produce large volumes of wastewater from which water can be reclaimed to serve many purposes. Over the years, conventional wastewater treatment processes have succeeded to some extent in treating effluents for discharge purposes. However, improvements in wastewater treatment processes are necessary in order to make treated wastewater reusable for industrial, agricultural, and domestic purposes. Membrane technology has emerged as a favorite choice for reclaiming water from different wastewater streams for re-use. This review looks at the trending membrane technologies in wastewater treatment, their advantages and disadvantages. It also discusses membrane fouling, membrane cleaning, and membrane modules. Finally, recommendations for future research pertaining to the application of membrane technology in wastewater treatment are made.

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### **3- Recent advances in polysaccharide-based adsorbents for wastewater treatment**

**By:**

[Qi, XL](#) (Qi, Xiaoliang) [1] ; [Tong, XQ](#) (Tong, Xianqin) [2] , [3] ; [Pan, WH](#) (Pan, Wenhao) [2] , [3] ; [Zeng, QK](#) (Zeng, Qiankun) [2] ; [You, SY](#) (You, Shengye) [2] , [3] ; [Shen, JL](#) (Shen, Jianliang) [1] , [2] , [4]

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**Document Type:** Article

**Abstract:**

The existence of toxic water contaminants (heavy metals, dyes, phenols, oils, pharmaceuticals and nutrients) restricts the sustainable supply of clean water globally. Among various economic and accessible wastewater disposal technologies, adsorption is the most extensively practiced approach due to its economic, feasible and sustainable characteristics. In recent years, polysaccharides have been extensively employed for constructing adsorption materials due to their intrinsic properties including high adsorptive ability, low cost, renewability, biodegradability, biocompatibility and ease of modification. Here, a systematic review of polysaccharide-based adsorbents for wastewater treatment is given. This review is aimed at providing: (1) general design principles for polysaccharide-based adsorbents, (2) some critical factors that may affect the adsorption and (3) future directions for the development of polysaccharidebased wastewater adsorbents. Overall, this review provides guidelines on the rational fabrication and application of polysaccharide-based adsorbents, which will be beneficial to novice/expert researchers in the field of wastewater remediation. Furthermore, the authors expect that this review provokes interdisciplinary discussions that would bring a revolution to the application of polysaccharide-based wastewater adsorbents.

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### **4- Critical review of advanced oxidation processes in organic wastewater treatment**

**By:**

Ma, DS (Ma, Dengsheng) [1] , [2] ; Yi, H (Yi, Huan) [1] , [2] ; Lai, C (Lai, Cui) [1] , [2] ; Liu, XG (Liu, Xigui) [1] , [2] ; Huo, XQ (Huo, Xiuqin) [1] , [2] ; An, ZW (An, Ziwen) [1] , [2] ; Li, L (Li, Ling) [1] , [2] ; Fu, YK (Fu, Yukui) [1] , [2] ; Li, BS (Li, Bisheng) [1] , [2] ; Zhang, MM (Zhang, Mingming) [1] , [2] ;

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**Document Type:** Review

**Abstract:**

With the development of industrial society, organic wastewater produced by industrial manufacturing has caused many environmental problems. The vast majority of organic pollutants in water bodies are persistent in the environment, posing a threat to human and animal health. Therefore, efficient treatment methods for highly concentrated organic wastewater are urgently needed. Advanced oxidation processes (AOPs) are widely noticed in the area of treating organic wastewater. Compared with other chemical methods, AOPs have the characteristics of high oxidation efficiency and no secondary pollution. In this paper, the mechanisms, advantages, and limitations of AOPs are comprehensively reviewed. Besides, the basic principles of combining different AOPs to enhance the treatment efficiency are described. Furthermore, the applications of AOPs in various wastewater treatments, such as oily wastewater, dyeing wastewater, pharmaceutical wastewater, and landfill leachate, are also presented. Finally, we conclude that the main direction in the future of AOPs are the modification of catalysts and the optimization of operating parameters, with the challenges focusing on industrial applications. (C) 2021 Published by Elsevier Ltd.

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## 5- Application of coagulation/flocculation in oily wastewater treatment: A review

**By:**

Zhao, CL (Zhao, Chuanliang) [1] , [2] ; Zhou, JY (Zhou, Junyuan) [1] ; Yan, Y (Yan, Yi) [1] ; Yang, LW (Yang, Liwei) [1] ; Xing, GH (Xing, Guohua) [1] ; Li, HY (Li, Huanyu) [1] ; Wu, P (Wu, Pei) [1] ; Wang, MY (Wang, Mingyuan) [1] ; Zheng, HL (Zheng, Huaili) [3]

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**Document Type:** Review

**Abstract:**

Volumes of oily wastewater are inevitably generated by every walk of life. The removal of oil particles from oil-contaminated wastewater which is characterized as huge amounts, intricate composition, and great threats to human health and the ecological environment is a research hotspot in water treatment fields. Due to high treatment costs and undesirable treatment efficiencies, oily wastewater treatment remains a topical and urgent issue. At present, coagulation/flocculation as an indispensable oily

wastewater treatment technology receives much attention because it is very well established, economical, practical and relatively efficient. The influencing factors of oil wastewater treatment by coagulation/flocculation have also been summarized in-depth, like dosage, pH, etc. In consideration of its complex composition and treatment difficulty, this paper will also compare the treatment effects of different coagulants/flocculants used alone and combined effects in oily wastewater treatment: inorganic coagulants, organic synthetic polymeric flocculants, natural flocculants and modified polymeric flocculants. Additionally, in this review, the mechanisms of removing oily substance by coagulation/flocculation are emphasized. Given strict emission standards and the refractory nature of oily wastewater, the combination process with coagulation/flocculation, such as electrocoagulation, coagulation-membrane filtration hybrid process, and coagulation/flocculation-flotation can present better application potential and are discussed in this review. To provide a proper choice in practical application, the operating cost of coagulation and several conventional technologies are also compared. Finally, the existing challenges in the treatment of oily wastewater by coagulation are analyzed, and the feasible research direction is proposed. (C) 2020 Elsevier B.V. All rights reserved.