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PII: S0926-3373(18)30302-3
DOI: https://doi.org/10.1016/j.apcatb.2018.03.095
Reference: APCATB 16553

To appear in: *Applied Catalysis B: Environmental*

Received date: 14-11-2017
Revised date: 17-2-2018
Accepted date: 26-3-2018

Please cite this article as: Al-Ghafri B, Bora T, Sathe P, Dobrestov S, Al-Abri M, Photocatalytic microbial removal and degradation of organic contaminants of water using PES fibers, *Applied Catalysis B: Environmental* (2010), https://doi.org/10.1016/j.apcatb.2018.03.095

Photocatalytic microbial removal and degradation of organic contaminants of water using PES fibers

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Highlights

- Electro-spun Polyethersulfone fibers possesses high surface area
- Addition of DMF improved flux, mechanical strength and hydrophobicity
- Photocatalytic $OH^{\bullet}$ radical from PES fibers gave efficient MB degradation
- PES fibers also exhibited antibacterial activity

Abstract

Photocatalytic bacterial removal and dye degradation by polyethersulfone (PES) fibers under visible light is reported here. PES fibers were arranged in a random mesh structure using electro-spinning technique that allows utilization of maximum surface area of the fibers. The influence of concentration of PES polymer, type of solvent and surface chemistry of the fibers on their mechanical properties and photocatalytic activities was investigated. Ratio of solvent (DMF (Dimethylformamide) to NMP (N-Methyl-2-pyrrolidone)) while preparing the PES fibers was found to be crucial in terms of the PES fiber thickness, fluid flux, mechanical strength and hydrophobicity