

ABSTRACT

Electrospinning is an efficient method for the production of polyamide nanofiber membranes that are suitable for water filtration. Previous studies have shown that nanofiber membranes have high clean water permeability. The pathogen removal efficiency can be improved by functionalization with (organic) biocides. However, these membranes, like other membranes, are vulnerable to fouling which reduces the filtration efficiency. Therefore the present article investigates the potential of zinc phthalocyanines, which can produce singlet oxygen in the presence of visible light, as a functionalizing agent. The polyamide nanofiber membranes were functionalized with phthalocyanines using both a pre-functionalizing and post-functionalizing method. Only the post-functionalization method shows to result in nanofiber membranes capable of producing singlet oxygen. After 30 min 45% of 1,2-diphenylisobenzofuran (DPBF), used as an oxygen quencher, was removed by reaction with singlet oxygen. This resulted in a removal rate of $0.33 \text{ mol DPBF mol}^{-1}\text{Zn min}^{-1}$. During short term leaching tests, phthalocyanines could not be detected. © 2014 Wiley Periodicals, Inc. *J. Appl. Polym. Sci.* **2014**, *131*, 40486.