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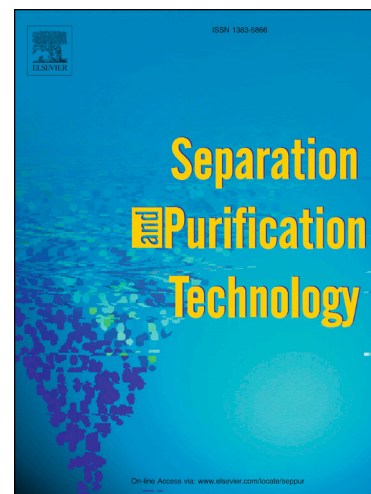
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A novel and highly efficient photocatalytic degradation of malachite green dye via surface modified polyacrylonitrile nanofibers /biogenic silica composite nanofibers

Alaa Mohamed <sup>a,b,c,\*</sup>, Mohamed M. Ghobara <sup>a,d</sup>, M K Abdelmaksoud <sup>a,e</sup>, Gehad G. Mohamed <sup>a,f</sup>

<sup>a</sup> Egypt Nanotechnology Center (EGNC), Cairo University, El-Sheikh Zayed, 12588, Egypt.

<sup>b</sup> Membrane Technology Department, Institute of Functional Interfaces (IFG), Karlsruhe Institute of Technology (KIT), 76344, Germany.

<sup>c</sup> Production Engineering and Printing Technology Department, Akhbar El Yom Academy, 12655 Giza, Egypt

<sup>d</sup> Department of Physics, Freie Universität Berlin, 14195 Berlin, Germany.

<sup>e</sup> Physics Department, Faculty of Science, Cairo University, Giza, 12613, Egypt

<sup>f</sup> Chemistry Department, Faculty of Science, Cairo University Giza, 12588, Egypt

\*Corresponding author: Dr. Alaa Mohamed

Email: [alakha@kth.se](mailto:alakha@kth.se)

Phone: +201069676710

**Abstract:**

In this work surface modified polyacrylonitrile nanofibers /biogenic silica composites were investigated for their promising and efficient photocatalytic degradation of malachite green (MG) dye. This photocatalyst was based on polyacrylonitrile (PAN) nanofibers fabricated using electrospinning technique, then crosslinked with two kinds of biogenic silica, diatomite and rice husk nanosilica. The photocatalytic activities of MG dye were compared for the two biogenic silica. The prepared membranes was analyzed using SEM, TEM, EDAX, FTIR, and XRD techniques. The photocatalysis performance investigations of malachite green were carried out under visible light illumination in aqueous solutions. Moreover, several factors affecting the degradation were studied including; dye concentration, solution pH, and irradiation time. The results indicated that the investigated composite nanofibers have excellent photodegradation performance for Malachite green. The highest photodegradation efficiency of the MG was obtained at pH 7 and it is relatively a very fast process.

**Keywords:** Electrospinning; Composite nanofibers; Diatomite; Rice Straw; Photocatalytic degradation; Malachite green dye.

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