

Accepted Manuscript

Sol-Gel Membrane Modification for Enhanced Photocatalytic Activity

Rosa M. Huertas, Maria C. Fraga, João G. Crespo, Vanessa J. Pereira

PII: S1383-5866(16)31173-X

DOI: <http://dx.doi.org/10.1016/j.seppur.2017.02.047>

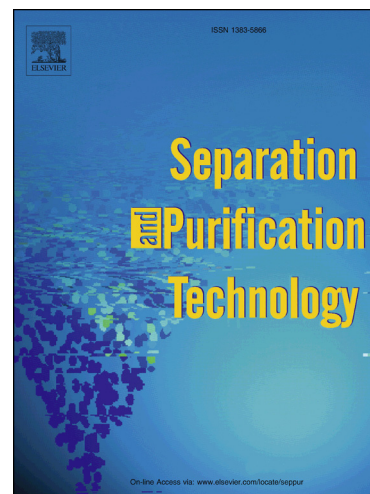
Reference: SEPPUR 13579

To appear in: *Separation and Purification Technology*

Received Date: 25 July 2016

Revised Date: 23 February 2017

Accepted Date: 24 February 2017



Please cite this article as: R.M. Huertas, M.C. Fraga, J.G. Crespo, V.J. Pereira, Sol-Gel Membrane Modification for Enhanced Photocatalytic Activity, *Separation and Purification Technology* (2017), doi: <http://dx.doi.org/10.1016/j.seppur.2017.02.047>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Sol-Gel Membrane Modification for Enhanced Photocatalytic ActivityRosa M. Huertas¹, Maria C. Fraga^{1,2}, João G. Crespo², Vanessa J. Pereira^{1*}

¹ iBET, Instituto de Biologia Experimental e Tecnológica, Apartado 12, 2780-901 Oeiras, Portugal

² LAQV-REQUIMTE, Departamento de Química, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa (UNL), 2829-516 Caparica, Portugal

*Corresponding author: email: vanessap@itqb.unl.pt; Tel.: +351 2144695654

Abstract

Novel materials comprising titanium dioxide (TiO₂), silicon dioxide (SiO₂) and silicon carbide (SiC) semiconductors, were deposited over silicon-carbide substrates to develop photocatalytic membranes. The synergistic effect between TiO₂ obtained by sol-gel process, Degussa P25 and silicon carbide nanoparticles were tested in terms of photocatalytic degradation of methylene blue and their influence over porosity. The surface of the photocatalyst layers developed were characterized by scanning electron microscopy (SEM) showing that the immobilization was carried out successfully whereas the contact angle measurements revealed improved hydrophilic properties. Different surface properties were obtained depending on the different coating compositions applied.

Several photocatalytic experiments were conducted and reproducibility was tested using the most promising membranes in terms of photodegradation potential that reached up to 72% degradation of methylene blue. Comparison of UV degradation efficiency between unmodified and modified substrates revealed a synergistic effect when TiO₂ and SiC were combined. The most promising membrane in terms of

Download English Version:

<https://daneshyari.com/en/article/4989714>

Download Persian Version:

<https://daneshyari.com/article/4989714>

[Daneshyari.com](https://daneshyari.com)