



Contribution ID: 287

Type: Poster

HETEROGENEOUS PHOTOCATALYSIS OF TiO₂ NANOSTRUCTURES IMMOBILIZED ON GLASS SUBSTRATES FOR THE DECOLORIZATION AND DEGRADATION OF TEXTILE DYES

The elimination of dyes in the effluents of the textile industry currently represents a technological challenge in wastewater treatment processes, the present study reports on the evaluation of the photocatalytic properties of TiO₂ nanostructures with controlled crystalline structure and immobilized on glass substrates. Using the dipping technique, electrospun TiO₂ nanofibers were deposited on the glass substrate. Scanning electron microscopy (SEM) allowed us to corroborate the presence of the films formed by the nanostructures. Furthermore, Raman scattering and X-ray diffraction confirmed that the phase present is anatase. Azo-type reactive dyes were used to evaluate the photocatalytic properties under UV light exposure. FTIR spectroscopy was used to monitor the bands assigned to the dye chromophore, which decreased as a function of time. The kinetics of the reaction were also followed by UV-vis spectroscopy, measuring the intensity of the main absorption bands. The absorbance spectra showed a gradual decrease in this band, obtaining discolorations close to 100% in a time of approximately 70 min, which can be attributed to its high surface area and the incorporation of impurities that benefit the photocatalysis process.

Keywords

Titanium dioxide, Immobilized TiO₂ nanofibers, Textile dyes

Reference

L. Núñez, J. García-Hortal, and F. Torrades, Study of kinetic parameters related to the decolourization and mineralization of reactive dyes from textile dyeing using Fenton and photo-Fenton processes. *Dyes and Pigments*, 75 (2006) 647-652. <https://doi.org/10.1016/j.dyepig.2006.07.014>

This work was supported by

The authors are grateful for the financial support provided by CONAHCYT for the realization of this research work.

Author approval

I confirm

Author will attend

I confirm

Author: SECUNDINO SÁNCHEZ, Oscar (CINVESTAV-Instituto Politécnico Nacional. Departamento de Física. Av Instituto Politécnico Nacional 2508, Col. San Pedro Zacatenco, Delegación Gustavo A. Madero, Ciudad de México, C. P. 07360)

Co-authors: DÍAZ REYES, Joel (CIBA-Instituto Politécnico Nacional. San Juan Molino Km 1.5 de la Carretera Estatal Sta. Inés Tecuexcomac-Tepetitla, Tlaxcala, 90700. México.); AGUILA LÓPEZ, Josefina (UPIITA-Instituto Politécnico Nacional, Av. Instituto Politécnico Nacional 2580. Barrio Laguna Ticomán, 07340. México); SÁNCHEZ RAMÍREZ, José Francisco (CIBA-Instituto Politécnico Nacional. San Juan Molino Km 1.5 de la Carretera Estatal Sta. Inés Tecuexcomac-Tepetitla, Tlaxcala, 90700. México.); HERRERA PÉREZ, José Luis (Instituto Politécnico Nacional-Unidad Profesional Interdisciplinaria en Ingeniería y Tecnologías Avanzadas); GUILLÉN CERVANTES, José Ángel (Depto. de Física, CINVESTAV-IPN.); MENDOZA ALVAREZ, Julio Gregorio (Departamento de física, Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional (CINVESTAV-IPN), Av. IPN 2508, Col. San Pedro Zacatenco, 07360, Ciudad de México, México.); RODRÍGUEZ FRAGOSO, Patricia (Depto. de Física, CINVESTAV-IPN.)

Presenters: AGUILA LÓPEZ, Josefina (UPIITA-Instituto Politécnico Nacional, Av. Instituto Politécnico Nacional 2580. Barrio Laguna Ticomán, 07340. México); SECUNDINO SÁNCHEZ, Oscar (CINVESTAV-Instituto Politécnico Nacional. Departamento de Física. Av Instituto Politécnico Nacional 2508, Col. San Pedro Zacatenco, Delegación Gustavo A. Madero, Ciudad de México, C. P. 07360)

Session Classification: NANOSTRUCTURES

Track Classification: Nanostructures