



Optimización del proceso sono-foto-Fenton para el tratamiento de aguas residuales usando un diseño central compuesto [

2020

text (article)

Analítica

ABSTRACT Introduction: Due to the increased toxicity of wastewater and the limited efficiency of conventional systems, the application of alternative processes is required, among which the sono-photo-Fenton system is highlighted. Objective: This work aims at optimizing the variables that directly affect the oxidation power of the sono-photo-Fenton process, such as the pH of the solution and the concentration of the oxidizing and the promoting agents, for the treatment of a petrochemical wastewater, in order to validate the suitability of using designs of experiments based on a reduced number of runs. Materials and methods: For this purpose, a face-centered composite central experiment design was used, whose second-order regression model was validated. The results achieved were compared to those ones reported in the literature using a larger number of experimental runs. Results: Under optimized operating conditions (3 pH units, 525 mg/L H₂O₂ and 25,70 mg/L Fe²⁺), COD removals > 70 % were obtained. These results were similar to the optimal conditions previously obtained and informed in the literature by using a full factorial experiment design. Conclusions: Therefore, it is demonstrated the importance of conducting designs of experiments that allow optimizing water treatment systems using a reduced number of runs, which results in the reduction of both economic costs and times of experimentation and analysis of the response variable of interest

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Título: Optimización del proceso sono-foto-Fenton para el tratamiento de aguas residuales usando un diseño central compuesto [electronic resource]

Editorial: 2020

Tipo Audiovisual: diseño de experimentos tratamiento del agua proceso avanzado de oxidación contaminante persistente contaminación design of experiments water treatment advanced oxidation process persistent pollutant pollution disenõ de experimentos tratamiento de água processo avançado de oxidação contaminante persistente contaminação

Documento fuente: Producción + Limpia, ISSN 1909-0455, Vol. 15, N°. 2, 2020, pags. 24-45

Nota general: application/pdf

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Lengua: Spanish

Enlace a fuente de información: Producción + Limpia, ISSN 1909-0455, Vol. 15, N°. 2, 2020, pags. 24-45

Baratz Innovación Documental

- Gran Vía, 59 28013 Madrid
- (+34) 91 456 03 60
- informa@baratz.es

