

EVALUATION OF KINETICS DEGRADATION OF METHYLENE BLUE IN UV SYSTEM WITH PHOTOCHEMICAL GENERATION OF OZONE.

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Abstract

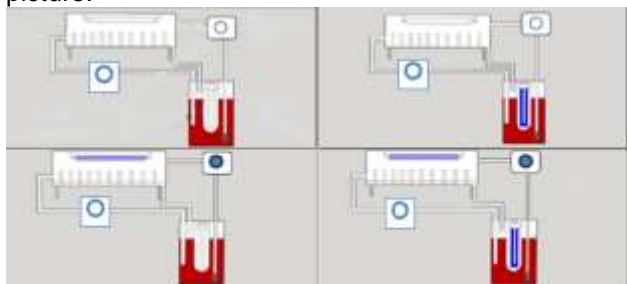
To evaluate the kinetics degradation of methylene blue in an UV_{254nm} system, with circulation of ozone created in a reactor with an UV_{185nm} lamp.

Introdução

Advanced oxidation processes (AOPs) have received a lot of attention from researchers in the last years, given their high efficiency in degrading organic compounds and being relatively cheaper. However, preliminary studies of the process are needed, investigating, besides reactional parameters, the kinetics involved in this process. With that purpose, kinetic models are developed in order to test and classify the experimental data. This work aimed to evaluate the kinetics degradation of a synthetic dye (methylene blue) in an UV_{254nm} system, with circulation of ozone photochemically created in a reactor with an UV_{185nm} lamp.

Resultados e Discussão

The reactors were configured, as is shown in the picture:



Picture 1. Configuration of the reactors

The solution of methylene blue had 5 mg.L⁻¹ of concentration. The test ran for 1 hour. The samples were read in a PróAnálise® spectrophotometer with a wavelength of 665 nm¹. The results shown degradation of the dye in the three configurations, though the one using only the UV_{254nm} lamp has had an erratic performance, taking around 20 minutes to start degrading the dye. On the ozone-based configuration, and especially in conjunction with the UV_{254nm} lamp, the degradation was very efficient all

the time along. The kinetic constants were calculated using the Lagergren method.

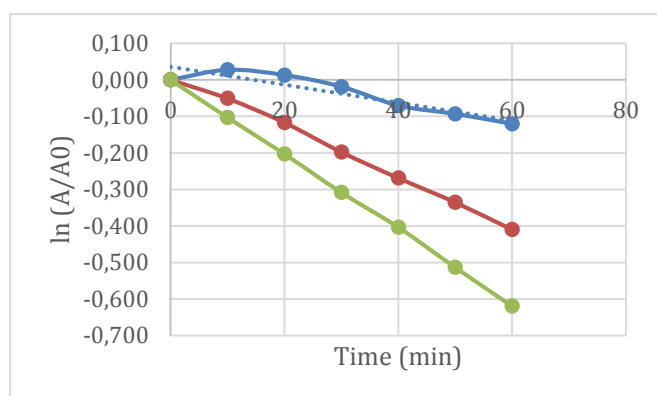


Table 1. Kinetic constants of degradation of methylene blue in each process.

Process	Kinetic constant (min ⁻¹)
UV	-0,0025
O ₃	-0,007
UV/O ₃	-0,0103

Conclusões

The system used was efficient in degrading the synthetic dye, and there was greater efficiency in combining the UV_{254nm} lamp and ozone. In future studies, tests are planned with real wastewater, as well as recirculation of the sample through the UV_{185nm} reactor.

Agradecimentos

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¹ Atun, G., et al. "Adsorptive removal of methylene blue from colored effluents on fuller's earth." *Journal of colloid and interface science* 261.1 (2003): 32-39.