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KINETICS OF PHOTODEGRADATION OF ALIZARIN GREEN IN AN ACOUSTIC FLUIDIZED BED USING TIO_2 CATALYST

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The kinetics of photodegradation of alizarin green (AG) in an acoustic fluidized bed was investigated using Degussa P25 catalyst and N-doped TiO_2 catalyst, respectively. The effects of initial concentration of AG, catalyst amount, initial pH value and liquid flow rate on the photodegradation rates were the main goal of present study. The degradation rate increased with increasing amount of photocatalyst, pH value and liquid flow rate, reached a maximum and then decreased. The degradation rate decreased with increasing initial concentration. According to the Langmuir–Hinshelwood model, the disappearance of the AG followed pseudo-first-order kinetics. Experimental results showed that AG can be degraded effectively by Degussa P25 catalyst and N-doped TiO_2 catalyst in an acoustic fluidized bed reactor. N-doped TiO_2 catalyst has high and significant photocatalytic activity and in comparison with Degussa P25 catalyst was photocatalyst.

Keywords: TiO_2 catalyst, photodegradation, fluidized bed, acoustic.

Introduction

Advanced oxidation processes (AOP) are recognized as a high and significant alternative to transform and decontaminate the dye-containing waste water [1]. These processes named AOP all rely on the generation of highly reactive ·OH radical as the main oxidative species for the potential destruction and conversion of organic pollutants into harmless substances [2, 3]. Photocatalysis is one typical example of AOP for the degradation of dye-containing and other organic pollutants in water [4, 5].

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