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Photochemical degradation of typical herbicides simazine by UV/H_2O_2 in aqueous solution

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ABSTRACT

Aqueous solutions of simazine (SIM, 1-chloro-3,5-bisethylamino-2,4,6-triazine; 2,4-bis(ethylamino)-6-chloro-s-triazine) were photolyzed ($\lambda = 254$ nm) under a variety of solution conditions. The initial SIM concentration ranged from 69 to 315 μg/L to approach the typical concentration found in contaminated surface waters. The effects of the initial concentration of hydrogen peroxide (H_2O_2), initial concentration of SIM, pH values, light intensity and different water quality to the degradation of SIM were investigated in the study. The most favorable reaction conditions appear to be a moderate concentration of 120 mg/L H_2O_2 for the highest removal of simazine. In addition, the experimental results show the initial concentration of SIM has little effect on the removal of SIM. The time-dependent degradation profiles of SIM were successfully modeled using an approximation of the pseudo first-order equation and the kinetic parameters were determined.

Keywords: Simazine; Photodegradation; Hydrogen peroxide (H_2O_2); pH; UV-irradiation

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