A study on the enhancement of sonochemical degradation of eosin B using other advanced oxidation processes

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ABSTRACT

Eosin B is a xanthenes dye and is a derivate of fluorescein. The efficacy of sonochemical degradation coupled with other advanced oxidation process (AOP’s) has been studied for eosin B degradation in aqueous solution. The study compares the effects of \( \text{H}_2\text{O}_2 \) concentration, saturating gas (argon, \( \text{N}_2 \), and \( \text{O}_2 \)), temperature and pH (3–11). Furthermore, kinetic comparison and a figure of merit for the electrical energy consumption were carried out for the degradation under combination of different AOP’s. Higher rate constant was obtained under Ar as a saturating gas and higher mineralization rate was found under acidic condition. It was also observed that rate constant decreases with the increase in temperature. The kinetic analysis indicate that of all the degrading setups used, the US + \( \text{O}_3 \) was fastest in decomposing the eosin B, whereas, in energy consumption scale, UV + \( \text{H}_2\text{O}_2 \) was found to be the most efficient.

Keywords: Advanced oxidation process; Sonolysis; Eosin B; Hydroxyl radical