



Assessment of photocatalytic n-TiO₂/UV and n-TiO₂/H₂O₂/UV methods to treat DB 86, RY 145 and AV 90 dye mix containing wastewater

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ABSTRACT

This study examined and compared the n-TiO₂/H₂O₂/UV and n-TiO₂/UV processes to remove the content of synthetic wastewater containing Direct Blue (DB86), Reactive Yellow (RY145) and Acid Violet (AV90) dye mix. The optimum parameters for both processes have been determined as pH 3, 125 mg/L n-TiO₂ and 45 min, and the H₂O₂ dose has been specified as 750 mg/L in the n-TiO₂/H₂O₂/UV process. While the removal efficiencies were 54.38% at 436 nm, 44.20% at 525 nm and 85.72% at 620 nm for the n-TiO₂/UV process, 90.63% at 436 nm, 92.27% at 525 nm and 99% at 620 nm were obtained for n-TiO₂/H₂O₂/UV process. With H₂O₂ addition to the process, treatment efficiencies have been increased drastically. Moreover, due to the results of the kinetic analyses for both processes, the pseudo-second-order was observed to be the most appropriate kinetic model, depending on the regression coefficient in color removal.

Keywords: Direct Blue (DB86); Reactive Yellow (RY145); Acid Violet (V90); n-TiO₂/H₂O₂/UV; n-TiO₂/UV

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